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ISSN 2344-4088
ISSN-L 2344-4088

Address: 6D Regiei Blvd.
060204 – București, România
Tel: (+40)21-312.97.82
Fax: (+40)21-312.97.83
E-mail: editura@niculescu.ro
Internet: www.niculescu.ro

FAIMA Business & Management Journal is indexed in international databases: ProQuest, ERIH PLUS, Index Copernicus and Google Scholar.

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Managers Are Also Controlled

To lead is a general term referring to directing entities while moving, changing organizations.

For organizations, there are several variants of leadership, for example, management, governance, administration. Management represents the organization's successful orientation. Administration represents leading organizations on the basis of predetermined rules.

Governance refers to leading organizations based on trust. Such an organization is the state, but the term governance began to be used also for the association of owners, which is an organization based on trust. Governance means the combination of processes, customs, policies, laws that affect how a company is run. Corporate governance refers to all relations between owners (within the General Assemblies or Councils of Administration) and the relations between owners and managers (appointing managers, managers' evaluation). A good governance should result in increasing the value of the enterprise

The term „governance" has been used since 1937 by Ronald Coase in his work *The Nature of the Firm*, but the subject has begun to be approached more frequently after the year 1992 when in the UK it was elaborated a code of best practices in management (by the committee headed by Sir Adrian Cadbury), it was created an international network for corporate governance, a corporate governance manual was created in the USA (by the committee headed by Mervyn King). While the O.E.C.D. has developed principles for corporate governance.

Previously there were a few key moments that led to the clarification of governance matters. Among these, we mention that J. Burnham identified the *managerial revolution* around 1925, which represented the separation between owners and managers. Sociologists have begun to define the enterprise as a collection of contacts *(contractual theory),* there are employment contracts for the performers, but also management contracts for the leaders. In sociology, the managers are seen as employees. In this manner it was identified an „informational asymmetry", managers having more accurate information than the owners. There is a large influence of managers over the election of the Board of Directors in companies in which ownership is dissipated. Managers' power becomes larger than that of the owners.

The *agency theory* was developed by Mac Jansen and W. Meklin (1976); within the theory the manager is seen as the agent of the owner. Also, contracts for profit sharing were made (gain-sharing contracts) as a result of owners understanding the role of the managers but also the role of employees in value creation. Profit is shared among owners, managers and employees, which leads to the emergence of social peace.

Governance emphasizes on the appointment of managers and administrators on control functions (audit) and the creation of a managerial philosophy (vision, mission, policy, strategy). The main shareholders are entitled to be informed and to decide who will lead the company.

The OECD principles with regards to corporate governance foresee shareholders' rights to be specified; fair treatment of shareholders; the role of interest groups in the governance of corporations to be specified; information transparency; responsibilities of the Board of Directors to be specified. Lately, the world has increasingly focused on improving corporate governance, that arose the need for universal standards applicable to the performance of companies, in addition, an index was developed to assess the governance in companies with dispersed shareholders.

Taking into account the impact it has on corporate governance, the term governance is also used to manage systems of systems, quality systems, or information systems. All these actions are directed to ensure the health and effectiveness of the body which is the company.

„Corporate Governance is simply the system by which companies are directed and controlled."
Mervyn King

Sorin Ionescu
Editor-in-Chief

Portability of Projects

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Abstract

This article introduces the concept of project portability for industrial and technical assistance projects, where a special characteristic of these projects is that they can be replicated in terms of technology, know-how, plans and procedures, but applied in different environments. The purpose is to save resources both from reutilization of planning and design and from improved procedures for avoiding risks. As is well known, the main impact on the success or failure of new implementations comes from cultural factors, ceteris paribus. In order to assess the influences of cultural diversity, the article offers a practical instrument, the cultural profile radar that may identify cultural incompatibilities that affect the success of a project. The instrument has eight cultural dimensions that are analyzed for each of the four project partners, namely the implementing organization or the initiator of the project, the project manager, the project team and the host community in which project is implemented. While communication, transfer of information and knowledge, the mobility of workforce and specialists are constantly increasing, cultural diversity still impacts projects and represents a continuing challenge for managers and implementing organizations.

Keywords: portability, cultural diversity, cultural profile radar, project management

„The governance framework is there to encourage the efficient use of resources and equally to require accountability for the stewardship of those resources"
Sir Adrian Cadbury

Introduction

A significant portion of any project's budget is allocated to feasibility studies and the design phase, which includes research, market analysis, planning, recruiting, and sometimes training of the team

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and manager. For large projects, it may also be necessary to have a pilot implementation at a reduced scale in order to estimate risks. The aggressive competition requires organizations to exploit all their competitive advantages while easy access to information and open product and workforce markets erode traditional differences and make the world flatter (Friedman, 2005).

Portability Concept

Organizations would like to reduce the time and cost of the preliminary stages of a project, and a way to standardize projects and anticipate risks is to replicate successful earlier experiences. For example, the budget of a regular construction project may include up to 10% of the total cost just for the design phase, and standardization of design solutions may save 20% – 50% of the design efforts (OAR, 2006). Due to economic forces and risk aversion, more and more sponsors want to repeat a successful experience in a different context, creating a clone, if possible.

The concept of portability is suggested to describe the features of a project that can be replicated in a different environment in terms of technologies, know-how, planning and budgeting. The term portability has been previously used for insurance and pension funds that can be transferred from one system to another without affecting the interest of beneficiaries. More recently, portability refers to the ability of software to be accessed from different devices or systems. Portability is also the term for the ability to transfer phone numbers from a provider to another.

Portability, as used in this article, brings significant advantages in the case of industrial, engineering and technical assistance projects, focusing on the transfer of technologies and know-how. Industrial and engineering projects have military origins related to the constructions of bridges and roads, while technical assistance projects were developed after the Second World War to support disadvantaged communities. Sometimes the two types of projects intersect and disadvantaged groups that need technical assistance are provided with engineering projects carried out by international organizations or philanthropic groups like the World Bank or United Nations agencies in the areas of water supply, sewage treatment, or food processing. At the same time, industrial projects may lead

to changes in the lifestyles of the host communities as in the case of oil exploration and processing projects that require the development of connected industries (transportation, environmental). Research and design for new interventions, feasibility studies, and sometimes pilot applications require important financial and human resources as well as time; therefore, multiple uses of the preparatory efforts may lead to savings if the implementations are successful. It is important to mention that both industrial and technical assistance projects are developed in multicultural settings, first because the transfer of know-how requires people with special types of expertise regardless their cultural background, and second because the implementation of a new project is in a new milieu chosen due to resource availability or the needs of disadvantaged communities.

However, the clone of a successful project does not guarantee the same result for an implementation in another context. Even if all technical and economic specifications are replicated and required resources are made available, there are cultural differences that may influence the course of action. Portability is sensitive to cultural differences among the implementing organization, the project manager, the project team and the host community in which project is implemented. Therefore, an organization that wants to predict the results of a project that replicates a previous experience in a different environment must analyze the cultural compatibility among the four implementing parties.

Portability Radar

From a literature review and a survey of managers with multiple, multicultural experiences in implementing industrial and technical assistance projects in different geographical areas, the author developed a list of eight cultural factors that have an important impact on the development of a project if there are important dissonances between the partners. These eight cultural dimensions are relevant for all four parties involved in implementation (Zarzu, 2017).

I. ***Monochronic – polychronic*** refers to the interpretation of time. Monochronic cultures have a linear perspective of time; they consider it a valuable resource and therefore they carefully plan activities in sequences. Polychronic cultures consider time an endless resource, with a cyclical perspective, and thus

multi-tasking is common. Incompatibility in terms of the approach to time may hamper activities due to poor synchronization of project activities and time alignment (Hall, 1990; Guirdham, 2005). In such cases, the four parties are unlikely to have a common understanding of planning, which will decrease in value and importance.

II. ***High – low context communication*** is the dimension that characterizes the level of details shared; the subjective and indirect transfer of information; and the use of innuendoes, codes, and allusions. The dialogue between people from these two communication extremes is difficult, with distorted messages. (Hall, 1990; Groves & Feyerhem, 2011; Brett *et al.*, 2006; Abbasi *et al.*, 2014). This type of incompatibility may lead to a poor understanding of directions and useless feedback, not to mention the risk of improper actions.

III. ***Tolerance to uncertainty*** describes the capacity of people to accept new, unknown, unplanned events. A low level of tolerance to uncertainty characterizes groups who avoid new experiences and risks. Such groups can delay decisions and lead to slow progress (Hofstede, 1983; Ting–Toomey, 1999; DeCarlo, 2004; Schneider & Barsoux, 2003; Chevrier, 2003). Incompatibility in the case of industrial or technical assistance project implementations, usually associated with unforeseen events, may lead to contradictory tendencies and solutions.

IV. ***Multicultural experience*** is important for the acceptance of diversity and for adaptability of the team manager, team members and the implementing organization. Groups with multicultural experiences communicate better and are more likely to avoid conflicts (Ting–Toomey, 1999; Kloppenberg, 2009). Tolerance to uncertainty is often improved by extensive multicultural experiences.

V. ***Individualism – collectivism*** represents the cultural dimension that refers to the relationship between group members, and characterizes the level of compromise and integration of the group (Hofstede, 1983; Trompenaars, 1996). Together with tolerance to uncertainty, this cultural dimension facilitates the evaluation of risks and interpretation

of conflicts due to the competition for available resources.

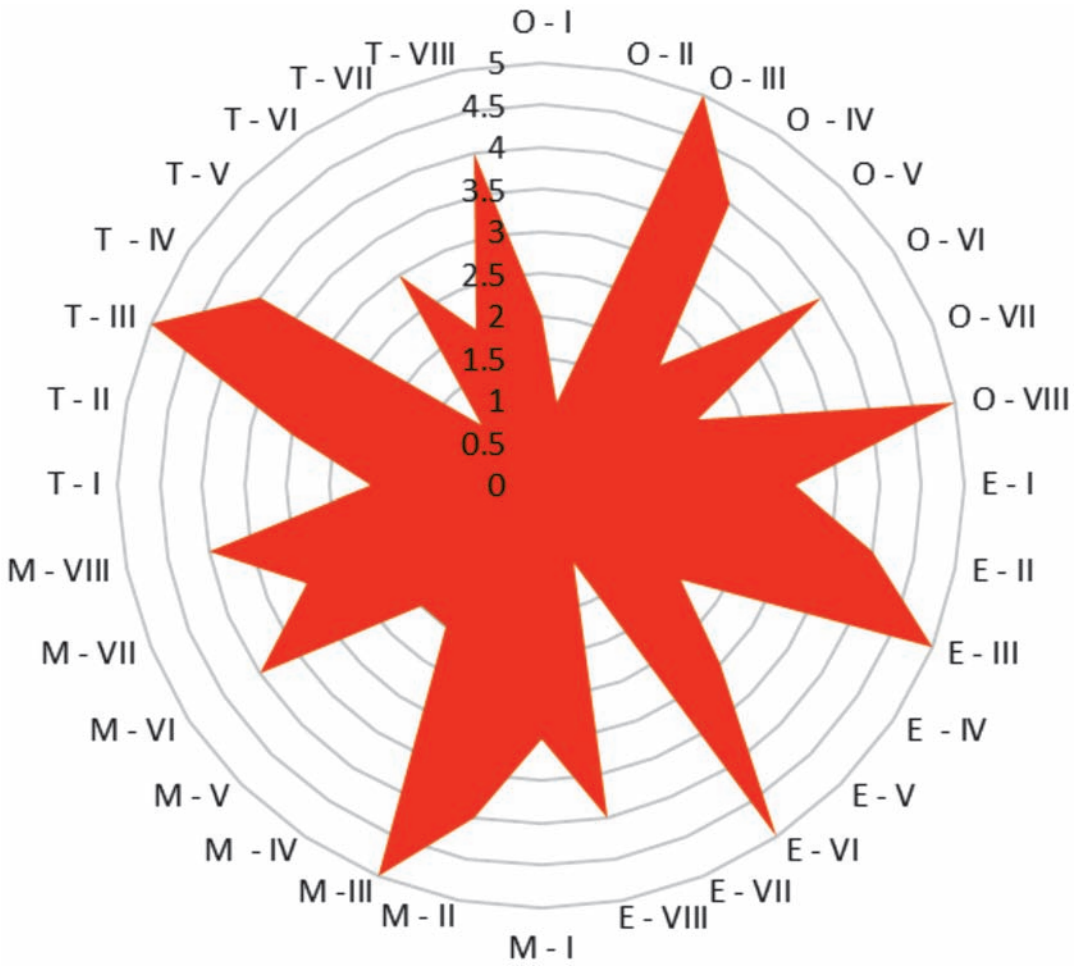
VI. ***Etic – emic***, are the extremes regarding interpretation and acceptance of cultural values and customs. The emic analysis is internal, looks to local values, and is specific to mono-cultural groups, while etic analysis takes an external point of view and considers global criteria (House & Aditya, 1997; Lord & Maher, 1993; Morris *et al*., 1999).

VII. ***Power distance*** measures the acceptance of authority and subordination and of hierarchies. People from different groups with different views on hierarchies may have serious cooperation incompatibilities (Hofstede, 1983; Ely & Thomas, 2001; House *et al*., 2004). Incompatibility in this respect may hamper the proper transfer of knowledge and know-how sometimes associated with imposed subordination.

VIII. ***Learning interest*** characterizes people open to new experiences, eager to change and willing to accept new approaches. Learning capacity reflects the ability to absorb, transfer, translate and redefine concepts and objectives specific to the project (Hofstede, 1983; Thomas & Ely, 1996). Each project is unique, representing a learning opportunity and needs people able to adapt.

Measuring the eight cultural dimensions for the four partners of a project, namely the implementing organization, the project manager, the project team, and the host community, and combining the dimensions into a unique diagram may provide indications of the potential success in replicating the initials stages of a project. For this purpose, the authors suggest utilization of a specific instrument, the cultural profile radar (*Figure 1*. The cultural profile radar), which considers four sectors, one for each implementing partner, and in each sector the eight cultural dimensions. Given that the main characteristics of the cultural radar are known as previously defined in the literature, the article does not provide detailed information regarding the specifics of associated measurements and procedures for the analysis.

The cultural profile radar representation allows one to identify the cultural incompatibilities among the implementation partners, thus providing indications regarding possible dysfunctions during the development of projects.



Legend:

Cultural dimensions

I – High – Low Communication
II – Tolerance of uncertainty
III – Multicultural experience
IV – Monochronic – Polichronic
V – Individualism – Collectivism
VI – Etic – Emic
VII – Power Distance
VIII – Learning Interest

Implementation partners

O – Implementing Organization
T – Team members
M – Team Manager
E – Implementing Environment / Host Community

Figure 1 – *The cultural profile radar*

Failures may result from an improper understanding of instructions due to poor communication between the implementing organization and the host community, lack of synchronization between the manager and the team due to different perceptions of time, incompatible decisions due to intolerance of uncertainty or denial of authority between the team, project manager and host community. In addition, one may develop cultural profile radars for participants in the original project and in the replication in order to compare the cultural differences between the two

groups and to identify their incompatibilities on the eight cultural dimensions. It is not mandatory that all parties have identical scores, but similar shapes show compatible cultural profiles, regardless the procedures used for the analysis of the eight cultural dimensions. Practically for a new implementation the organization focuses primarily on the cultural specificity of the host community, and based on that decides the criteria for the selection of team and managers.

Drawing the cultural profile radar starts with the analysis of the eight dimensions for each of the partners and then comparing tendencies between them. The culture of the implementing organization is the distinctive label of the project, and the basis for the recruitment of the project manager and team members. Selection of the manager and the team should take into consideration the knowledge and abilities of the candidates as well as their cultural profiles so that they are compatible with the organization. However, to fine tune, the organizations may allocate resources for training and adaptation of the new recruits, not only to the values and principles of the organization but also to those of the host community in which project is implemented. The host community may have unpredictable reactions, may refuse to adopt and integrate new working procedures, and may reject behaviours that differ from the local ones. Therefore, the cultural profile radar may predict cultural clashes, may suggest appropriate cultural profiles for the manager and the team, and may direct preparatory actions before the actual implementation of a project in a new environment.

Conclusions

The article brings to attention a new concept, project portability applicable for industrial and technical assistance projects, areas in which savings from replication of solutions are seldom considered. Attached to the portability concept is the cultural profile radar, a practical instrument for early evaluation of the impact of cultural factors on the implementation of similar project concepts in different cultural environments.

The cultural profile radar as an instrument may be most valuable for organizations that implement industrial and technical assistance projects in different cultural environments, especially if they focus on specific types of projects that are replicated one or more times. There may be different water treatment projects replicated in different parts of the world, using the same technology but dealing with different communities with various interests and priorities, or projects that encourage women in business, but local cultures may be hostile. The partners of a project build temporary relationships and it is important to anticipate incompatibilities in order to save time and resources to adjust or replace people that do not fit.

The application of the portability concept and the cultural profile radar needs further study and confirmation on actual projects as the current conclusions reflect the experiences of a limited number of managers who have implemented industrial and technical assistance projects.

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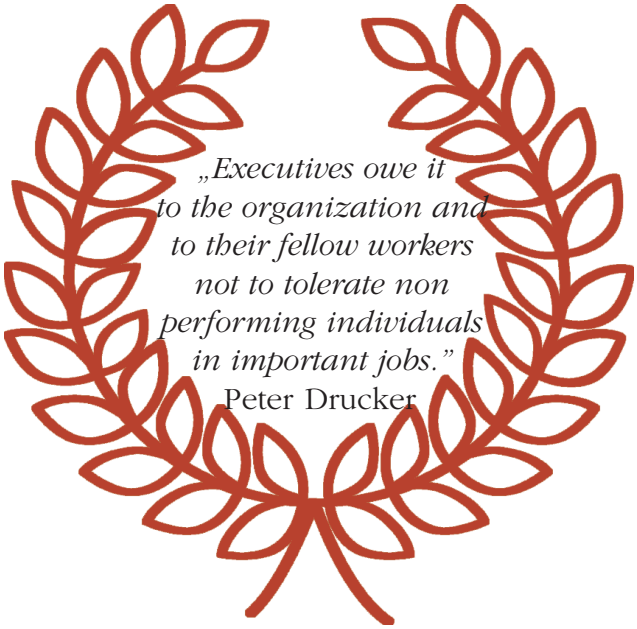

Model of Business-IT Alignment

Alena Buchalcevova, Jan Pour
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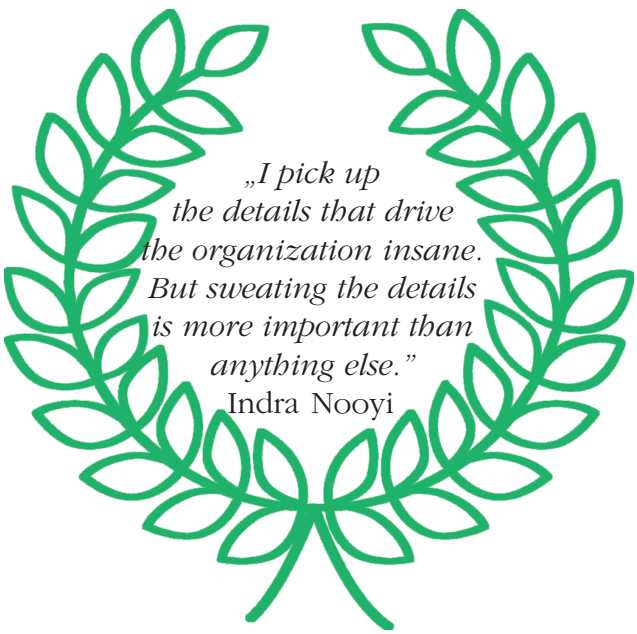
Abstract

The article focuses on a current highly discussed subject of interest related to Business-IT alignment. Following an overview of Business-IT alignment concepts and current research in the field, the Management of Business Informatics model is analyzed from the Business-IT alignment perspective in order to demonstrate its role in achieving alignment between business and IT. Several examples of real MBI model use cases that address the relationship between business and IT in university education and practice in the Czech companies are outlined.

Keywords: management of business informatics, business-IT alignment, metrics, analytical application

Introduction

To leverage all benefits of IT in business, it is essential to manage IT in an alignment with business requirements. This initiative was established as a Business-IT alignment is a top concern of IT managers for almost 40 years up to the present (Luftman & Derksen, 2012). Responding to this continuing concern of practice, scholars have directed their attention to the understanding how aligning business and IT generates a value for individual companies. Positive impacts of Business-IT alignment on company performance have been well established in previous research (Chan *et al.*, 1997; Chan *et al.*, 2006; Oh & Pinsonneault, 2007; Preston & Karahanna, 2009; Tallon, 2008; Tallon & Pinsonneault, 2011). However,



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academic research on alignment has still provided a little practical value to organizations. As Hiekkanen *et al.* (2012) pointed out, the causes lie in the imperfection of existing models aimed at Business-IT alignment that are not feasible, are rather conceptual, lacking the connections with the real world (Ciborra, 1997); have no concise validated results, and incline to subjectivity (Zhou & Cai, 2011; Avison *et al.*, 2004).

To increase the practical value of academic research in the area of Business-IT alignment, the MBI (Management of Business Informatics) model was developed (Buchalcevova & Pour, 2015). In contrast to existing methods and frameworks for IT management and governance, the MBI model focuses not only on IT management but also on governing IT as a part of business management, i.e. Business-IT alignment. The aim of this article is to describe how the MBI model supports and promotes Business-IT alignment in practice.

This article is organized as follows. First, the concept of Business-IT alignment is introduced, followed by an overview of conducted research in this field. Then, the analysis of the MBI model from the Business-IT alignment viewpoint is presented. In section 4, several examples of real MBI model use cases that address the relationship between business and IT in university education and practice in the Czech companies are outlined. Finally, conclusions are discussed.

Business-IT Alignment

Luftman *et al.* (2013) presents the major insights gained from the 2012 survey in Europe, Asia (including Australia), Latin America, and the United States focused on key IT and management issues. In all of the geographies, IT and business alignment ranks among the top 10 management concerns, ranking second in the United States and Europe, first in Latin America, and sixth and fourth in Asia and Australia, respectively.

Business-IT alignment has been actively studied since the early 1980s (e.g., Chan & Reich, 2007; Chan *et al.*, 1997). In their extensive bibliographical study, Chan & Reich (2007) summarized 150 different articles on alignment, spanning three decades of research in the field. On top of that, Gerow *et al.* (2014) conducted a meta-analysis of past research on strategic alignment.

As Wu *et al.* (2015) state, strategic alignment can be classified into two dimensions (Reich & Benbasat, 2000): (1) the intellectual, and (2) the social. Studies on the intellectual dimension concentrate on the content of plans and planning methodologies while those dealing with the social dimension focus on the people involved in the creation of an alignment (Reich & Benbasat, 1996). Looking at the intellectual dimension (strategy, plan, operation, or process alignment), studies show an existing relation between strategic alignment and performance as for example Tallon & Pinsonneault (2011). On the other side, in case of the social dimension, the grounds of social alignment, as well as the relation between both dimensions, are principal matters of research (e.g., Preston & Karahanna, 2009; Reich & Benbasat, 2000).

As to other classification, three forms of Business-IT alignment can be distinguished:

functional (e.g., Henderson & Venkatraman, 1999; Oh & Pinsonneaul., 2007; Tallon & Pinsonneault, 2011), structural (e.g., Broadbent & Weill, 1993; Hodgkinson, 1996), and dynamic (e.g., Itami & Numagami, 1992; Sabherwal *et al.*, 2001). Functional alignment focuses on the role of IT as an enabler and supporter of business strategy and a source of competitive advantage. It suggests how alignment can be sustained. (Nieminen & Pekkola, 2015) In this form, a competitive advantage is gained from the capability of constantly utilizing technology better than the competitors. The Strategic Alignment Model (SAM) (Henderson & Venkatraman, 1999) is a widely used model of the functional form of Business-IT alignment (Chan *et al.*, 2007).

Structural alignment concentrates on the relation between the organization-wide strategy and business unit strategies, and how they create a value (e.g., Broadbent & Weill, 1993; Hodgkinson, 1996). In this area, Broadbent and Weill's (1993) alignment model is used as a framework for structural alignment. Although the model is grounded on the same four domains as the SAM model, it is argued that a competitive advantage is gained through superior organizational policies and practices. Whereas nonalignment is viewed as a natural state of an organization, strategic alignment is then considered temporal (Broadbent & Weill, 1993).

Dynamic alignment focuses on creating a value by enabling organizations to be more flexible when confronting and responding to environmental changes (Reynolds & Yetton, 2013). Sabherwal *et al.* (2001) developed the Strategic Information Systems Management Profile (SISMP) which serves as a framework for dynamic alignment.

Luftman (2000) argues that achieving the alignment is an evolutionary process, which requires strong support from senior management, good working relationships, strong leadership, appropriate prioritization, trust, and effective communication, as well as a thorough understanding of the business and technical environments. He proposed a strategic alignment maturity assessment mechanism for evaluating these activities within an organization to understand its position in terms of alignment and possible improvements.

MBI Model Analysis from Business-IT Alignment Viewpoint

To overcome issues in business informatics management and ensure Business-IT alignment, the Management of Business Informatics (MBI) model was developed. The objective of the MBI model is to provide a support for business informatics management activities in companies that figure as the users of ICT services. The MBI model was described in detail in (Vorisek

et al., 2012) and presented in several articles (Pour, Vorisek & Feuerlicht, 2013; Vorisek, Pour & Buchalcevova, 2015; Buchalcevova & Pour, 2015). For the purpose of an effective MBI model demonstration, evaluation, and usage, the MBI model was implemented as a web application (at the URL mbi.vse.cz). During the evaluation phase of the MBI model development, the analysis of Business-IT alignment within the model was conducted and the following areas of the MBI model dealing with Business-IT alignment were identified:

1. Provision of high-quality and qualified communication and cooperation between company managers and IT managers, especially the CEO, CFO, CMO on one side and the CIO on the other side.
2. Clear identification and detailed definition of the relations between IT management and business management tasks.
3. Definition of metrics (and KPI) for business management as well as IT management which are mutually in compliance, are a part of the specification of defined services and respect the objectives stated in corporate strategy and other strategic documents.
4. Development and deployment of analytical and planning applications aimed at an evaluation of key monitored metrics and identification of an overall quality of IT services and their alignment with the business needs.
5. Specification of factors influencing the level of Business-IT alignment.

These areas are described in detail in the following subsections.

Communication and Cooperation between Business Management and IT Management. The MBI model is focused on an examination and evaluation of business and IT relations. To support the principle of Business-IT alignment, the MBI Group of Tasks IT as a Part of Business was developed within the domain of Strategic Management. This Group of Tasks incorporates best practices and recommendations for ensuring an alignment between business and IT at the level of strategic company management. For example, the aim of the Task Role of IT in Achievement of Business Objectives is to ensure that the CIO and other IT managers perfectly understand the business objectives and are able to assess the opportunities of IT contributing to their achievement. The Task Review of IT Strategy According to Business Requirements focuses on setting best practices and recommendations for adjusting an IT strategy to newly emerging business requirements. The Task Management of IT and Business Communication then defines the rules and communication standards that lead to a highly effective communication between business leaders and IT managers.

Communication and Cooperation between Business Management and IT Management. The MBI model is focused on an examination and evaluation of business and IT relations. To support the principle of Business-IT alignment, the MBI Group of Tasks IT as a Part of Business was developed within the domain of Strategic Management. This Group of Tasks incorporates best practices and recommendations for ensuring an alignment between business and IT at the level of strategic company management. For example, the aim of the Task Role of IT in Achievement of Business Objectives is to ensure that the CIO and other IT managers perfectly understand the business objectives and are able to assess the opportunities of IT contributing to their achievement. The Task Review of IT Strategy According to Business Requirements focuses on setting best practices and recommendations for adjusting an IT strategy to newly emerging business requirements. The Task Management of IT and Business Communication then defines the rules and communication standards that lead to a highly effective communication between business leadership and IT managers.

Relations between Business Management and IT Management Tasks. The MBI model as any other methodology or framework for IT management defines the Tasks of IT management (e.g. IT Service Catalogue Development or Reporting, Monitoring and Assessment of SLA, etc.), as well as the Tasks, focused on a specific IT solution or IT development (e.g. Business Intelligence Feasibility Study, Requirements Analysis of Business Intelligence, Modelling and Design of Business Intelligence, etc.)

Apart from the above-mentioned Tasks of IT management and IT development, the MBI model also comprises the Tasks that focus on business management. These Tasks and Groups of Tasks that belong to a separate domain identified as *IT in Business Management*. As the MBI model comprises a mechanism that enables to define the relations between Tasks, it is possible to specify mutual relations between the Business Management and IT Management Tasks.

The system of Metrics Definition. The MBI model includes a system of metrics assessing IT management as well as business management. First, the metrics for IT management were defined followed by the metrics aimed at business performance and management which gradually develop and together form a system of business metrics. Each metric is characterized not only by its content but also by related analytical dimensions. Considering the metrics being bound to individual IT and business Tasks and the relations existing between these Tasks, it is possible to derive the relations between IT and business metrics as well. Figure 1 depicts the relation between the business management and IT management Tasks and metrics that are linked to these Tasks. This example illustrates particular

IT services that are related to sales management through SLAs, their quality, fulfillment etc.

The current version of the MBI model implements the relations between metrics deriving them from the Tasks. However,

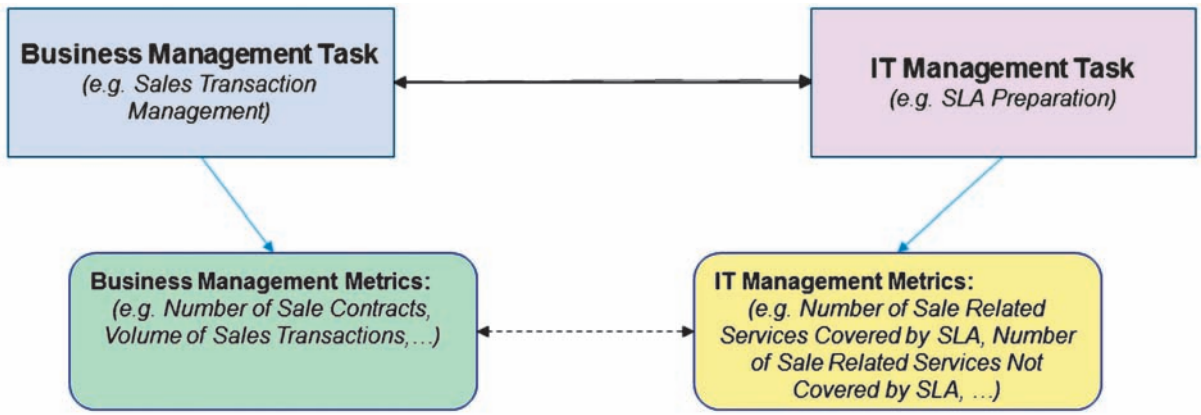

Figure 1 – *Relations between IT and Business Metrics Derived from Task Relations*

we expect to address essential direct relations between metrics in the next MBI model versions.

Development and Deployment of Analytical and Planning Application. After defining appropriate metrics, it is necessary to carry out measurements and assess defined metrics. For this purpose, we designed a group of applications within the MBI model on the grounds of self-service BI (Russo & Ferrari, 2013), that provides users with an environment to execute their analytical tasks without the necessity to utilize complex and usually highly complicated BI systems.

Factors Influencing Business Management and IT Management. Within the MBI model, a system of management and technological factors is defined that also affect the level and quality of business and IT management Tasks and subsequently their relations. These factors include example Economic Environment and IT Market Performance factors. The MBI model contains over 100 defined factors that significantly influence both IT and business. An analysis of such factors and their impact on the business and IT Tasks constitutes the basis for a realistic assessment and management of Business-IT alignment. Taking these factors into consideration also helps to facilitate a company's success and improve its competitiveness while enabling to continuously update the content and principles of the MBI model to incorporate new technologies, management approaches etc.

In conclusion, the above-mentioned approaches and utilization of the objects developed within the MBI model provide an opportunity for a more accurate, comprehensive, and concrete solution to the Business-IT alignment issue according to specific conditions of individual companies and organizations.

MBI Model Utilization in Business-IT Alignment

Information, experience, and recommendations that are incorporated in the MBI model and available at the portal http://mbi.vse.cz are currently utilized in

two interconnected areas, i.e. as a supporting tool and facilitator in university education, and as a solution addressing specific issues in practice in the Czech companies. In the case of university education, the MBI model is utilized particularly in the following areas and courses:

- Courses focused on management of business informatics (e.g. *Management of Business Informatics* course at the University of Economics in Prague, or *MBI – Management of Business Informatics* course at the Czech Technical University in Prague) where individual IT management Tasks are presented based on the MBI model (e.g. *IT Strategic Management*, *IT Service Management*, etc.) including their relations to other management objects,
- Courses focused on analysis, design, and implementation of IT applications, e.g. in the field of Business Intelligence applications, where the MBI model offers a complex overview of the business management Tasks (Strategic Management, Sales Management, Marketing, etc.) including corresponding metrics and dimensions derived from practice,
- Courses aimed at the preparation of future users of IT at the Faculty of Business Administration and Faculty of International Relations at the University of Economics in Prague,
- MBA courses held within the Prague International Business School where the MBI model is utilized as a basis for analyses of effective IT utilization in specific business conditions that are relevant to the participants, i.e. managers of the Czech companies,
- Courses for managers of trading companies from the Czech and Slovak Republic at the Faculty of International Relations at the University of Economics in Prague.

In addition to the above-mentioned courses, the MBI model also offers a number of possibilities being applied in diploma and doctoral theses, or final projects of MBA programs. The main contribution of the MBI model utilization in university education is the understanding and solution of efficient relations between business and IT where all materials incorporated in the MBI model are verified by practice.

Concerning the application of the MBI model in practice, the Czech companies make especially use of experience and recommendations included in the manage-

ment Tasks, particularly at the level of the CIO and other business managers and specialists. A perfect example represent the following companies; iPodnik (provision of cloud services), Auto Kelly (trading and service company), AutoCont (implementation of large-scale IT solutions), Aquasoft (consultancy, analytical and implementation services for the commercial sector and public administration), MIBCON and Clever Decision (analytical and implementation services in the field of Business Intelligence), and others. However, it is important to note that in these example projects the MBI model was used only to address partial and specific issues and not to be fully implemented within the companies. Also, the MBI model is currently utilized only by the Czech companies or Czech subsidiaries of foreign companies, as localization into English is in progress. Nevertheless, a gradual expansion of the model's application into other fields of education and business in the Czech Republic as well as abroad is expected.

Conclusions

The aim of this article was to outline the fundamental views on addressing issues associated with achieving Business-IT alignment. One of the possible methods to implement such an approach is the utilization and further development of the MBI model available at the portal http://mbi.vse.cz. We demonstrated that Business-IT alignment is addressed within the MBI model in several areas, e.g. communication and cooperation between company managers and IT managers, definition of the relations between the IT management and business management Tasks, definition of metrics, development and deployment of analytical and planning applications and specification of factors influencing the level of Business-IT alignment. Finally, the application of the MBI model and Business-IT alignment in university education and practice in the Czech organizations was described.

Acknowledgment

The work reported in this article was processed with a long-term institutional support of research activities by the Faculty of Informatics and Statistics, University of Economics, Prague.

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Space Systems as Critical Infrastructures

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Abstract

Space systems have become critical enablers for a wide variety of applications on which advanced, as well as emerging, societies have come to rely more and more. These applications run the gamut from command and control to information gathering and communications and are becoming critical to the operation of the infrastructure system-of-systems. We argue that space systems, rather than being just a component of wider infrastructures, can be described as standalone critical infrastructures and included in the critical infrastructure protection framework that has been developed in recent decades. At the same time, critical space infrastructures exhibit key differences from their terrestrial counterparts, affecting risk and security governance.

Keywords: critical infrastructure protection, critical space infrastructures, resilience, security governance, space systems

Introduction

Since the launch of the Sputnik satellite heralded the expansion of human civilization into space, there has been an effervescence of human activity, first driven by government and now, increasingly, by private companies. The most significant of the assets placed in space, from the perspective of this article, are the satellites in Earth orbit, which provide specific services to a larger number of users, ultimately impacting billions of beneficiaries. The current stage of globalization and economic efficiency would not have been possible without the critical application enabled by the growing capabilities of these satellites.

„The quality of the company's board has now become an important evaluation factor for institutional investors."
Russel Reynolds

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We are, therefore, right to assume that, far from being a simple component of discrete infrastructures as defined by the regulatory frameworks in existence, space systems constitute a new class of critical infrastructures. According to Moteff *et al.* (2003), these are „infrastructures so vital that their incapacitation or destruction would have a debilitating impact on the defence or economic security".

Over the past few decades, critical infrastructure protection (CIP) has emerged as a useful multidisciplinary framework for understanding the interconnections between the components of complex systems and the emerging properties arising from their interaction, while also developing methodologies for measuring criticality and allocating scarce resources to increase the resilience of the system-of-systems.

Space capabilities

Critical infrastructures are a socio-technical substrate on which many societal functions, both economic, political, defensive or social operate (Muresan *et al.*, 2016). The more advanced and prosperous a country is the more infrastructures it has developed and the more vulnerable it is to a myriad of risks, vulnerabilities and threats. Complexity is an issue within the wider „system-of-systems", as unanticipated threats arise from what Perrow (1999) called „normal accidents", which are an inherent property of interlinked systems after a certain threshold of complexity. Critical infrastructures include pipelines, railroads, ports, electricity grids, but also hospitals, financial markets and public administration. An increasingly expansive taxonomy of critical infrastructures has been developed to support governance processes in the US and the European Union, among others. The aim is to increase resilience, which is the ability of a system to recover its functionality as quickly as possible after the materialization of a threat, maintaining business continuity and quality of life and with minimum damage or casualties (Hokstad *et al.*, 2012) and is paired with concepts such as robustness, flexibility, absorptive capacity and so on.

As critical infrastructures, space systems face the full range of vulnerabilities and threats described in the speciality literature, including cascading disruptions, escalating disruptions and common cause failures (Rinaldi *et al.*, 2001). At the same time, they operate in the most hostile environment known to man and with a host of specific threats and constraints, which lends urgency to the protection efforts, as „any disruptions or manipulations of these critical functions must be brief, infrequent, manageable, geographically isolated and minimally detrimental to the welfare" (PDD-63, 1998, regarding critical infrastructures). This

is especially important, as a key aspect of CIP theory is that of interdependencies and interconnections, which Gheorghe and Schlapfer (2004) defined as a „bi-directional relationship between two infrastructures, through which the state of each infrastructure influences or is correlated to the state of the other". These interconnections are geographic, physical, logical and cybernetic/informational (Gheorghe and Schlapfer, 2004), of which the final two are the most relevant for space systems. This means that the malfunction, destruction or adulteration of a space system and its output can send shockwaves throughout the entire system-of-systems, through the chain of dependency, with potentially disastrous effects. This article will expound on these differences and draw conclusions as to how space systems will fit into the CIP paradigm.

Space systems have become critical enablers for a wide variety of applications, possessing a spectrum of capabilities that is rapidly increasing (Figure 1). In general, the services that satellite systems provide, which may be considered systemically important for critical infrastructure systems, fall into five categories, as listed in the chart below.

Command, control and coordination refer to the ability of space systems to provide important mediation services for various governance processes, in economic areas as well as military or crisis and emergency situation management. Communications are a key capability and a backbone of global infrastructure, supporting both command processes, as well as countless other activities from the most mundane to the most important. They become especially vital when they are the last resort provider of communications services, in case ground lines or other forms of communication have been interrupted.

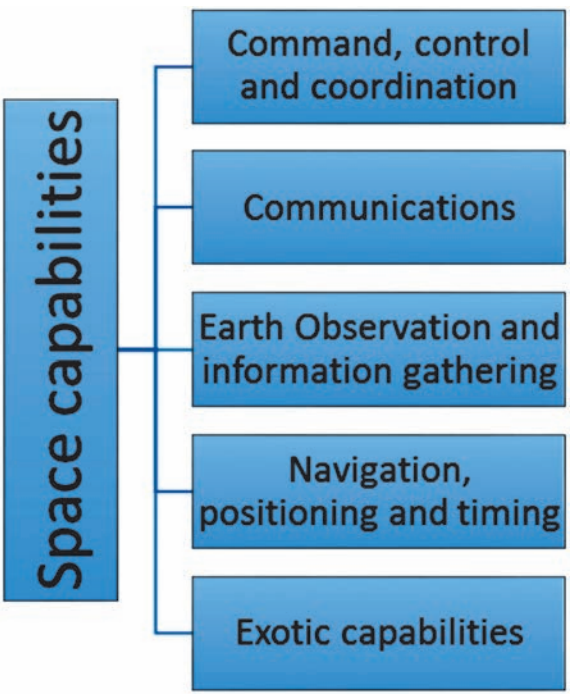

Figure 1 – *Classes of satellite system capabilities with relevance to critical infrastructure system-of-systems*

Earth Observation and information gathering are vital for the smooth functioning of the global transport system, for crisis and emergency management, for sustainable resource management and for everyday conveniences like weather reports. The issue of space systems and their exploitation is also of increasing interest to the private sector (see Figure 2).

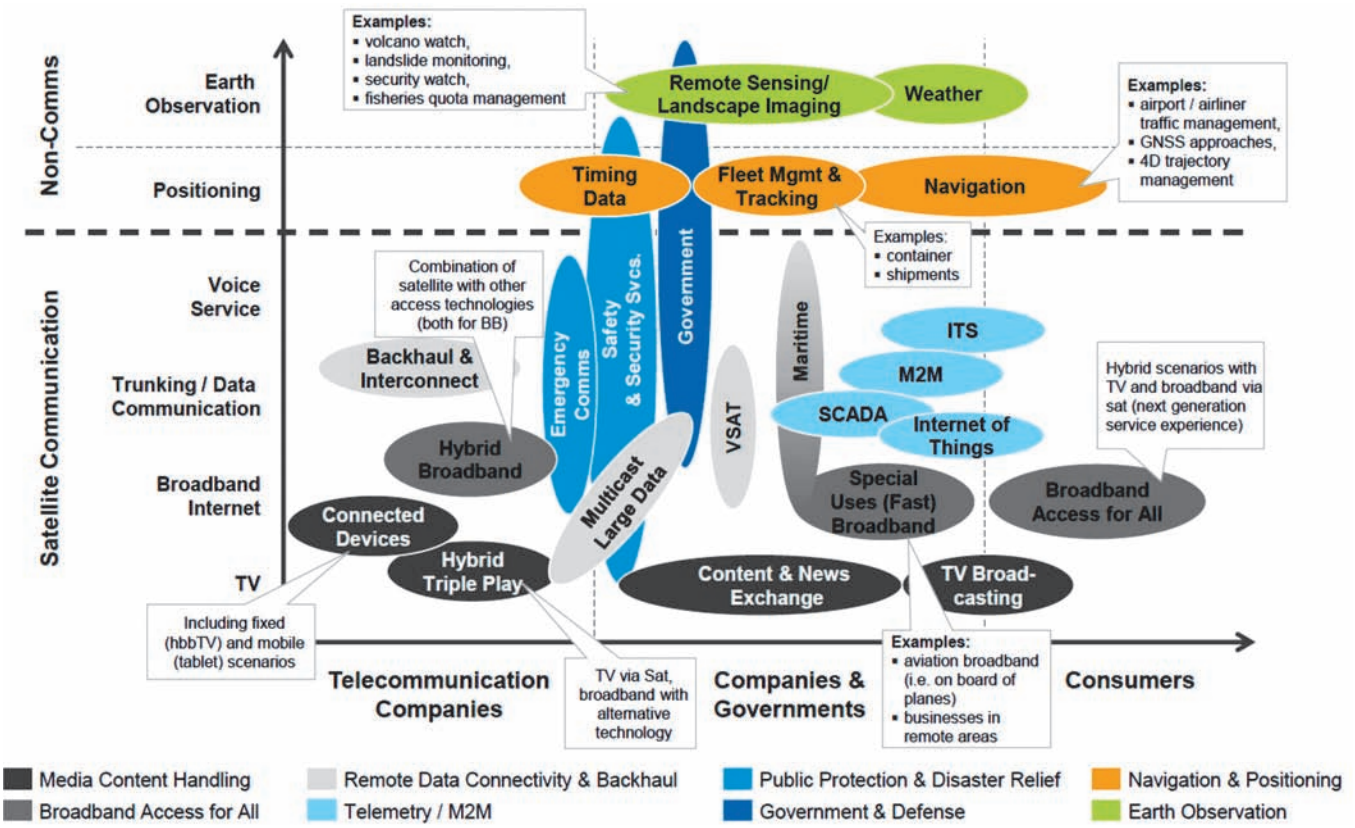

Figure 2 – *Applications utilizing space capabilities*
(Source: Acker et al, 2013)

Navigation, positioning and timing are all capabilities of GNSS constellations (Global Navigation Satellite Systems), of which the best known are the American NavStar and the Russian Glonass, followed by the still being developed European Galileo and the Chinese Compass systems. Global production chains would lose much of the efficiency required for „just in time" inventory management without GNSS navigation services, while positioning is used for managing crowded ports and air lanes. Finally, the capacity for synchronization which the onboard atomic clocks allow is vital for the management of electricity grids, of global databases and of financial markets.

What we termed as exotic capabilities are those critical services which are not provided by assets orbiting Earth. It is unlikely that various space probes with exclusively scientific missions would be considered critical infrastructures for the purposes of security governance, but there are some which fit the bill and are an even more endangered system than those in close proximity to Earth. For instance, as this article will mention, space weather phenomena are a threat not only to space

systems, but also to terrestrial critical infrastructures, as amply proven in the past. Certain space systems are an integral part of the management of this issue – probes such as the Advanced Composition Explorer are located between the Earth and the Sun and provide early warning against solar flares, in addition to research on the phenomena, thereby enabling mitigation measures to be put in place.

The rise of private interests is readily quantifiable. The US State of the Satellite Industry report (Bryce, 2016) appears yearly and underscores impressive growth rates for the industry itself and for the stock of space assets. The 2016 report highlights that the industry's growth outstrips global or US economic growth rates, reaching 208 billion dollars, double what it was a decade earlier (Figure 3).

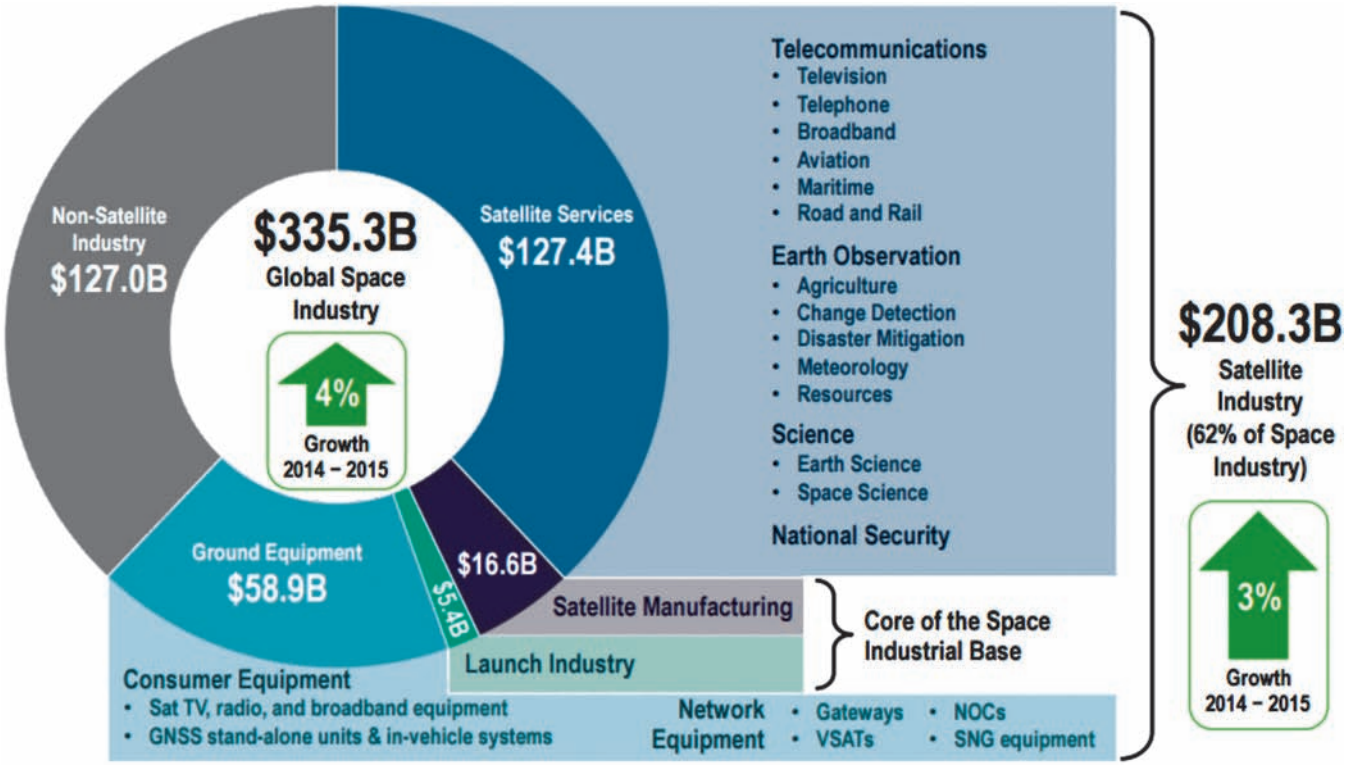

Figure 3 – *Breakdown of revenue for the global satellite industry*

Critical Space Infrastructure

Critical space infrastructures (CSI) are space assets, together with their personnel, communication links, ground stations and other peripheral components whose disruption or destruction would entail significant damage to other critical infrastructures (Mureșan and Georgescu, 2016). Usually, we speak of bi-directional relationships, but these are valid for space systems only with regards to cybernetic threats, though future developments may lead to greater bilateral ties within the system-of-systems.

According to the Union of Concerned Scientists, which maintains an open source database of satellites, there were around 1459 satellites in orbit at the beginning of 2017 (Table 1).

Table 1 – *Breakdown of known active satellites currently in orbit*

Total number of operating satellites: 1459			
United States: 593	Russia: 135	China: 192	Others: 539
LEO (Low Earth Orbit): 803	MEO (medium earth orbit): 96	Elliptical: 38	Geostationary: 522
Total number of US satellites: 593			
Civil: 10	Commercial: 297	Government: 136	Military: 150

(Source: UCS, 2017)

This underscores an important reality: with millions of users and billions of beneficiaries, space systems consist of a relatively small inventory of assets placed in the most hostile environment known to man. Georgescu (2015) underscores that space systems are difficult and time-consuming to replace and their creation involves significant technological and financial hurdles. The current economic model, which is undergoing a paradigm shift in recent years, is for space assets to be unique systems dedicated to specific functions, which both raises the costs and limits their interoperability. Redundancy is expensive to implement, and the logic of economic efficiency limits how much companies are willing to invest in increased resilience in this manner.

The paradigm shift is related to the growing use of cubesats, modular and mass-produced satellites outfitted for particular missions, changing the underlying economics of space exploitation. While technically limited in endurance and capabilities, compared to bespoke systems, cubesats are an order of magnitude cheaper to manufacture and transport. Bryce (2016) underlines that 53% of satellites launched by the member companies of the Satellite Industry Association were cubesats, leading to a doubling in recent years of satellites launched (to over 200).

From the perspective of the CSI risk profile, this has significant repercussions (Georgescu *et al.*, 2014). Spontaneous malfunctions are relatively common and the lack of interoperability makes it difficult to immediately compensate for the loss in critical service provision capacity. As an exception, the European Galileo GNSS is purposefully designed to be able to utilize the signal from both the American and the Russian GNSS to improve its own functionality, even though the two are not inter-compatible.

Space is also a very international environment, whose legislative and administrative framework is still developing and suffers from serious gaps with regards to regulatory ability in the context of sovereign nations being the main spacefaring actors. Many of these gaps relate to the ability to enforce compliance with measures or standards (proposed, for instance, by the UN Committee on the Peaceful Uses of Outer Space) intended to promote the sustainable exploitation of space by minimizing the creation of space debris or curbing dangerous practices. Adoption of these measures is voluntary and there is no authority to sanction those who eschew the standards or whose activities bring harm to the „global space commons" (Salter, 2015).

The orbital dynamics are also a specific CSI variable, since, unlike terrestrial critical infrastructures, which are grounded in one or more geographic areas, space systems in orbits lower than geosynchronous orbits revolve around the Earth on trajectories dictated by physics and markets. This perfect predictability ensures that passing over a potentially unfriendly or lawless territory may result in attacks against the satellite (Gheorghe and Vamanu, 2007).

Indeed, the first to concern themselves with the security of space systems were the militaries of spacefaring nations (Georgescu *et al.*, 2015) who understood both the civilian and the military dependence on critical space infrastructures and sought to protect them from the enemy and to deny them to the enemy. However, the dynamics of interdependence between nations in a globalized world extends also to the use of space services and countries find themselves in a potential logic of „mutually assured destruction" should they attempt to harm an enemy through his space systems – firstly, because it invites retaliation, secondly, because the shared environment makes collateral damage control more difficult, with debris not distinguishing between friend or foe and, thirdly, because many countries are dependent on the same systems. This is where the non-state actors and rogue states come into play.

While lacking the technical sophistication of countries like the US, China and Russia, the first two having tested kinetic anti-satellite weaponry (ASAT) (the US in 1984 and 2008, China in 2007), these actors may utilize means of moderate or low sophistication, with low cost and low risk, but high potential benefit. Moreover, damaging or destroying satellites does not resonate with the wider public as a critical issue, but rather as property damage, morally distinct from attacks with casualties. In addition to the use of cyber-attacks against a satellite (Gheorghe and Vamanu, 2007), these actors may use other relatively accessible ASAT options – blinding sensors with lasers, jamming ground receivers or, with the expected decrease in launch costs, using maneuvering satellites to deorbit other systems, or simply depositing debris in the

predictable path of a target (Georgescu *et al.*, 2014). In addition to the ASAT threat, there are two noteworthy specific space threats – space debris and space weather phenomena.

Space debris represents the byproduct of human activity in space – remains from satellites, launch vehicles and other objects which constitute a hazard for functioning systems, with the most important and profitable orbital bands being also the most heavily „polluted". There are 6,300 tons of space debris in orbit, of which 2,700 are in low Earth orbit (Salter, 2017), a very important space but also one of the most regenerative because of rapid descent into the atmosphere. At higher altitudes, space debris can persist for centuries. Space debris is also one of the most pernicious threats, being subject to aggravation due to unsustainable practices by spacefaring actors. There are also no instruments in use to deal with space debris, only to prevent their creation and mitigate the effect of impacts. With powerful sensors monitoring Earth's vicinity under the various Space Situational Awareness initiatives, the most common means of mitigation is the use of on-board propulsion to maneuver the space asset away from incoming debris, after a warning from the competent authorities. This depletes on-board fuel reserves necessary for station keeping and reduces the lifespan of the space mission.

Space weather phenomena consist of charged particles and radiation from solar activity or from deep space, with the potential to damage or destroy sensitive electronics. They are a natural threat not only to space systems but also to terrestrial systems, a fact which has been proven repeatedly through blackouts because of the effects of geomagnetic induced currents on power transformers and electricity grids (13-14 March 1989 in Quebec, the Bastille Day event on 14 July 2000, Halloween event 2003 which affected GNSS satellites and recorded solar flares that missed Earth in 1972 and November 2003) (RAENG, 2013). Humanity's vulnerability to these events has grown exponentially because of increasing technological sophistication and dependence on critical infrastructure systems, now including space systems.

Critical Space Infrastructure Protection

Finally, there is these issue of how to protect critical space infrastructure systems. At the micro level, space systems can be hardened to increase resilience against all manner of threats. The development of new technologies can also assist by increasing the underlying robustness of systems and by offering decision makers new tools. Components can be shielded against radiation and the system itself can be shielded against impacts. In-orbit refueling can increase the lifespan of systems while also enabling maneuvers that reduce not only

the danger of impact but the danger of new debris creation. The critical space infrastructure system, in its wider sense, can be hardened to make it more difficult for malicious actors to use cyber-attacks or jamming.

At the medium level, from the perspective of security governance, early warning systems for solar flares for instance (a number of missions, including NASA's Advanced Composition Explorer) and having procedures in place to immediately limit the damage by shutting down sensitive systems or engaging back-ups, disengaging from potentially dangerous processes mediated by space systems, can increase overall resilience and ensure more rapid resumption of normal activity. At the level of the system-of-systems, the entire chain of dependence must be aware and prepared for a cascading disruption starting from the critical space infrastructure or from space phenomena and possibly to even have back-up capacity in place to substitute for a useful level of the provision of space services (wire communications instead of satellite communications).

At the macro level, there are significant hurdles to overcome. More than any other transnational critical infrastructure system, critical space infrastructure protection must be tackled collectively, which raises questions regarding geopolitics, politics, sovereignty and coordination. These are very difficult to achieve and limit the progress that can be made in raising the resilience level for the entire inventory of space assets and the wider infrastructure system-of-systems. Coordination and cooperation on standards limiting vulnerability to space weather, limiting the creation of new debris and hardening satellites against existing ones, and also on limiting the militarization of space, are very important, yet hard to achieve.

This coordination problem will likely persist for the foreseeable future, even as new classes of risks, vulnerabilities and threats are made apparent, requiring not only the involvement of government but also of private companies which, as in the case of critical infrastructures on Earth, are heading towards eventual prominence in owning and operating critical space infrastructures.

Conclusions

Space systems are the newest class of critical infrastructures, recognized as such by military actors and now by civilian authorities on the basis of existing critical infrastructure protection frameworks and policies. Space systems must be included in that framework, but with allowances for the specificities of their design and operation which require different instruments and new levels of international cooperation and coordination. Since the „global commons" (Salter, 2015) is beset by environmental and man-made threats, but is

also a medium for the rapid propagation of risks, regardless of national origin of the asset at risk, countries are „condemned to cooperate" either at intergovernmental level, through bodies like the Inter-Agency Debris Commissions, or under the auspices of international organizations, such as the UN and its Committee on the Peaceful Uses of Outer Space. The rise of transnational and transcontinental critical infrastructures, such as pipelines and transport routes is slowly building up cooperation capacity, tools and experience in such coordination that will be useful for managing the security of critical space infrastructure and, by extension, the wider system-of-systems. Ultimately, the security governance of CSI is a process combining technological, organizational and political (and policy) solutions that are in an incipient stage.

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„Leadership, like swimming, cannot be learned by reading about it."
Henry Mintzberg

New Methods for Project Monitoring

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Abstract

Project management process has been widely discussed within the past many years along with various industries around the world. Proper planning has been stated by specialized institutions as being the main key to meeting projects' objectives, respectively projects' success. Past few years' research and debates about project management resulted in having, even more, statements that project monitoring does equally contribute to projects' success or failure. Efficient measurement of project's performance enables early identification of bottlenecks, development of efficient solutions for business decisions, minimizes risks and guides to organization's success. Conducting a systematic and integrated monitoring process by applying the most suitable and cost-effective management model saves projects from failure and engages all relevant stakeholders to project's objectives. The purpose of this paper is to evaluate the main project monitoring methodologies currently applied within most industries at international level and to extract similarities, best practices and most commonly utilized instruments for project monitoring.

Keywords: monitoring, evaluation, supervision, control, audit

Introduction

The Monitoring Process Group consists of those processes required to track, review and regulate the progress and performance of the project. It identifies any areas in which changes to the plan are required and initiates the corresponding changes. The key benefit of this process group is that project performance is observed and measured regularly and consistently to identify variances from the project management

„The lack of corporate governance practice in the private sector is appalling."
Denis Davis
(Cape High Court)

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plan (PMI (2013). Monitoring includes status reporting, progress measurement, and forecasting. The Monitoring and Controlling Process Group not only monitors and controls the work being done within a process group but also monitors and controls the entire project effort.

Once the project is established, the monitoring process should be in place. This process gathers information regularly on progress, finances, and utilization of resources compared with baselines, adherence to quality and other standards, stakeholder satisfaction etc. (IPMA 2015).

Project monitoring represents an ongoing performance evaluation done by the project owner through project's lifetime. At the same time, operational control is performed by the project manager starting with the initiating phase of the project up to its closing. Monitoring and controlling processes use different principles even if they might seem to be similar. Project operational control is done along project's phase up to its closing and it compares planned performance indicators' values with the actual ones. Project monitoring is done at certain dates along project's performance that might coincide with the closing of project's phases, but it is especially linked to project owner's payment cycle and it represents the measurement of project's performance against project management plan in terms of scope, schedule, cost, and quality, as well as proposal of corrective and preventive actions when necessary.

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years' research and debates about project management resulted in having, even more, statements that project monitoring does equally contribute to projects' success or failure.

Efficient measurement of project's performance enables early identification of bottlenecks, development of efficient solutions for business decisions, minimizes risks and guides to organization's success. Conducting a systematic and integrated monitoring process by applying the most suitable and cost-effective management model saves projects from failure and engages all relevant stakeholders to project's objectives. The purpose of this paper is to evaluate the main project monitoring methods currently applied within most industries at international level and to extract similarities, best practices and most commonly utilized instruments in project monitoring, as well as to address the importance of the monitoring process for project success and business gain.

Current project monitoring methodologies exposed and motivated by various authors within presented papers at international conferences are stated and analyzed, the importance of the monitoring, evaluating and controlling process, as well as most frequently utilized project monitoring instruments is justified.

Project Monitoring – Current Research

Project Management is applied in context with a high degree of innovation, characterized by uncertainty and high technical – organizational complexity. Time, cost and quality are the basic principles that guide project completion (Fregonara, 2017).

The high complexity of developed projects worldwide raised the need for standards as well as the need for performance monitoring and measurement tools. The main PM standards worldwide recognized are:

- A guide to Project Management Body of Knowledge (PMBoK Guide), fifth edition published in 2013 by Project Management Institute (PMI). The document classifies PM processes in Process Groups: Initiating, Planning, Implementing, Controlling and Closing and in Subject Groups: Integration, Stakeholder, Scope, Resource, Time, Cost, Risk, Quality, Procurement, Communication.
- The Standard ISO 21500: 2012 which is drafted with the aim to highlight the relevant concepts and processes, looking at the best practices in project management (Fregonara, 2017).

Standards, processes, and procedures have been developed with the scope of having well planned, monitored, completed, successful projects. The aim of a project is to be successful. The quantification of a project's success is difficult to define though, mostly authors name a project is successful if the product is delivered in time, cost and specified quality and the client declares satisfaction.

It is well known and accepted that project's success is linked to its efficient and realistic planning. Lately, even more authors and researchers state that monitoring the project is a critical factor to project's success as well. A project is evaluated as being successful or not after it is completed.

Some authors (e.g. Luping, 2013) rank the project completion degree, evaluated through internal audit, to five points, as below:

- First grade: Failure: the project goal is unrealistic and can't be achieved and it should be stopped when compared to the costs.
- Second grade: Unsuccessful: the success probability is small; it rarely profits when compared to the costs.

- Third grade: Partial success: part goals of the project have come true; it only achieves a certain profit when compared to the costs.
- Fourth grade: Successful: most goals have achieved. The project has achieved its expectation when compared to the costs.
- Fifth grade: Completely successful: all goals have been achieved, and get great profit when compared to the costs (Luping, 2013).

According to the authors, project results will be divided into five grades by acceptance. First grade: not agree, Second grade: uncertain, Third grade: agree, Fourth grade: recognition, Fifth grade: totally agree (Luping, 2013).

Monitoring and evaluation are critical to the performance of industry projects and it seek to facilitate strategic decision making to guarantee successful project implementation through a systematic and routine collection of project information and assessment. Activities related to project monitoring and evaluation require close supervision to ensure that they are executed right at first hand to eliminate re-work, increased project cost and prolonged project duration and the need to monitor and evaluate projects to achieve the desired outcome (Tengan, 2016).

Kalnins (Kalnins *et al.*, 2016) presents a model for project monitoring based on evaluation criteria, indicators and corresponding scores and weights of the five indicators criteria: Relevance, Efficiency, Effectiveness, Impact, Sustainability:

- Relevance – determines that the selection criteria ensure the selection of initiatives which produce results that address the issues and priorities identified;
- Efficiency – determines that the selection criteria developed ensures the selection of initiatives, the implementation of which will permit reaching the goals set;
- Effectiveness – determines whether the selection criteria developed to secure the selection of initiatives with appropriate financing to meet the results prescribed;
- Impact – determines whether the selection criteria makes it possible to select initiatives that have a clearly defined link between planned investments, activities and products/services which will lead to the expected impact;
- Sustainability – determines whether the selection criteria leads to selecting actions that will establish partnerships, legal and/or institutional frameworks, which will lead to the sustainability of the results beyond the finalization of the specific intervention.

The criteria are defined in a quantitative way through criteria scores based on project objectives (Kalnins *et al.*, 2016). Performance indicators like the cost performance indicator, schedule performance indicator, earned value and others demand

a detailed plan in order to provide the correct information. Project plans are often a combination of many stakeholders plans (Andresen 2016).

One of the main key performance indicators for a project is to complete the entire project in time. One of the most frequently monitoring tool for project time/ schedule is Critical Path/ Critical Chain.

Some authors (Hajdu *et al*., 2012) used the progress line method to evaluate the performance of the project from the schedule point of view. Progress lines are drawn in the Gantt chart in MS Project (Szentirmai, 2011) and Primavera (Harris, 2010).

In the P6 version of Primavera, four different evaluation lines can be applied:

- To indicate de difference between the baseline, start and scheduled start of the task;
- To indicate the difference between the baseline finish and scheduled finish of the task;
- To show the percentage of completion of activities;
- To show the remaining duration of activities.

In MS Project the progress of the activities can be displayed based on the percentage of completion (Araszkiewicz, 2017). The efficient display of project schedules and the comparison between the plans and the actual data have been key areas of project management since the appearance of planning techniques (Hajdu *et al*., 2012).

Based on the above, it could be concluded that the progress line method can only be used in the tracking phase of the project, after surveying the activities and updating the schedule. Furthermore, solely time-type data can be analyzed. Current applications are not suitable for the graphics display of cost-type and resource-type data (Hajdu *et al*., 2012).

Some authors report the existence of a relationship between national culture and project management. Hofstede argues that planning and control are extremely influenced by culture: planning is an attempt to reduce uncertainty, and control is an exercise of power. These authors argue that planning and control in organizations, rather than rational tools, contain an element of ritual and reflect basic cultural assumptions (Rodrigues *et al*., 2014).

Chevrier states that projects involving teams with members from different countries are not only international projects but mainly inter-cultural projects. According to this author, national culture is a factor of impact on project management, specifically on planning and control. In Portugal, there is evidence that planning and control of projects are not usually given much attention; many projects are started without clear planning and control systems and, therefore, tend to significantly exceed cost and time (Rodrigues *et al*., 2014).

Kendra and Taplin (Rodrigues *et al*., 2014) emphasize that planning and control are basic management functions, and therefore critical factors to lead a project to success. Izmailov applied the implementation of the project in accordance with the limits of the pipeline, project planning method, Critical Chain buffers and management decisions based on that

buffers and presented their result as a significant acceleration of the flow of the work and completion of the project (Izmailov *et al.*, 2016).

Zidane (quoted by Rodrigues *et al.*, 2014) lists a number of reasons mentioned in the literature for project delay. Articles discussing delay factors – suggest that reasons often are more external than internal. The articles surveyed point to reasons such as construction environment, working cultures, management style, and methods of construction, geographical condition, stakeholders, government policy, economic situation and availability of resources (Andresen, 2016). Frank presents planning and control [monitoring] as two of the 10 project critical success factors (Rodrigues, 2014).

The role of monitoring and evaluation in project implementation is enormous and as such must be given much attention by all stakeholders undertaking key roles in ensuring health and safety compliance, achievement of project quality and delivery to project time as well as cost. In view of the effort to ensure that projects succeed, factors such as weak institutional capacity, limited resources and budgetary allocations for monitoring and evaluation, weak linkage between planning, budgeting and monitoring & evaluation, weak demand for and utilization of monitoring and evaluation results and poor data quality, data gaps and inconsistencies present a challenge to project delivery (Tengan, Aigbavboa, 2016).

Limited resources and budgetary allocations for project monitoring and evaluation pose a barrier. Non-compliance with planning and project monitoring and evaluation guidelines, poor data quality, data gaps, and inconsistencies are also factors facing project monitoring and evaluation (Tengan, Aigbavboa 2016).

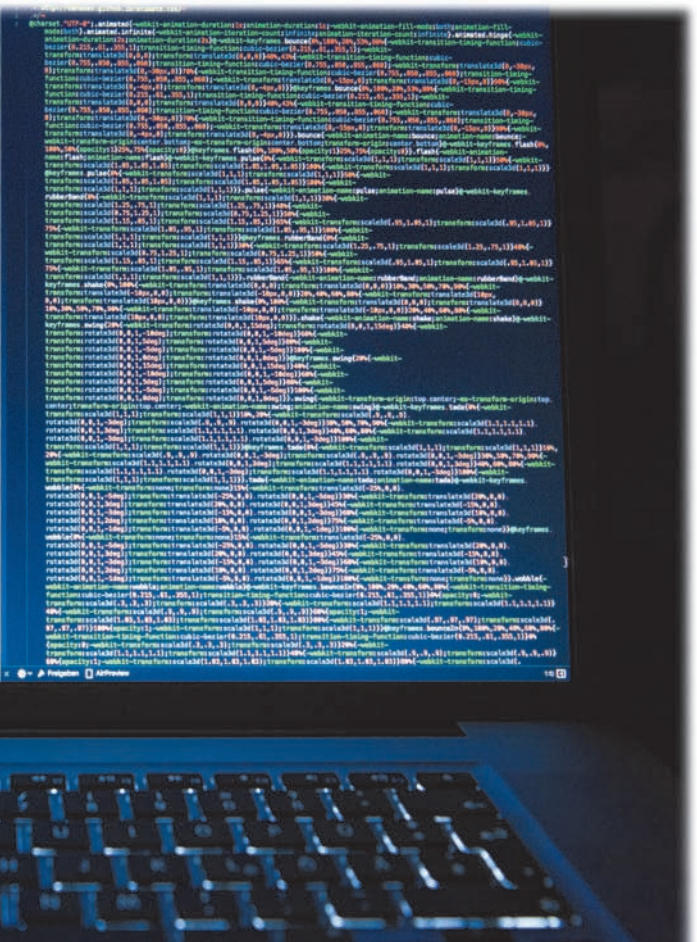
Perspectives on Project Monitoring

According to PMBoK published by Project Management Institute, USA 2013 and for the purpose of this paper, a project can be defined as possessing the following characteristics (Pinto, Slevin 1988): a defined beginning and end, a specific goal or set of goals, a series of complex or interrelated activities, a limited budget.

Monitoring and controlling is one of the five main PM process groups and it means measuring the performance of the project against the project management plan and approving change requests, including recommended corrective actions, preventive actions, and defect repair. Project monitoring is not only a key element for project success but mandatory in order to complete a project, to successfully deliver the product of the project, to link investments to company's strategic goals and to valuably acknowledge for future investments.

The most important key performance indicators involved in the Monitoring & Controlling process are Scope, Time/Schedule, Cost, Quality, Risks, Communications, Procurements, Stakeholder engagement. Project monitoring and evaluation represent, mainly, the measurement of the actual performance in comparison with the planned performance. The most feasible comparison is made between baselines and actual. There can be more than one baselines in one project. The baseline can be set up on any of the above mentioned key performance indicators, still, most companies set project baselines on Scope, Time and Cost.

The evaluation of the performance is linked to the result needed to be analyzed. For example, for one project that is very much delayed, the project owner may ask the time deviation between baseline and actual baseline in order to have the full picture of the deviation and understand the size of the factors that influenced the deviation. This could be an important information for a business decision on the respective projector for future investments in similar projects.



Project control involves identification of bottlenecks and solutions to minimize the performance deviation, preventive and corrective actions and defect repair. The most utilized project monitoring tools, per project management area, are WBS – for Scope, Gantt chart – for Time, BAC (Baseline at Completion) vs. AC (Actual Cost) for Cost. As per current research, Delphi method has started to be utilized in monitoring as well, not only planning phase, for Scope Monitoring purpose. The Gantt chart continues to be the main instrument for schedule planning and performance monitoring. It provides important information related to the Critical Path of the project, critical activities, and point in time where resources need to be available and allocated, indication on activities that might be executed in parallel in order to compress the schedule when necessary.

Estimation at Completion (EAC) is the most utilized cost performance indicator, together with the EV (Earned Value). EAC represents the forecast, what is forecasted to be still spent on the project. Earned Value represents the value completed in the project, activities done valued on budget. The deviation between BAC and EAC indicates the level of planning accuracy. We must mention that there can be cases when planning is properly done from the activities point of view but important risks that may completely deviate the cost from the approved budget, are not identified and planned in the planning phase of the project. Risk matrixes are used to monitor and evaluate the performance of the

activities in relation to identified risks in the project. Risk responses are prepared in the planning phase of the project and implemented through monitoring & controlling management process.

Scales and graphs are elaborated for the measurements of the project quality and various types of questionnaires are used and result evaluated to monitor procurements, communications or stakeholder's engagement. The larger the project is, the bigger the project monitoring effort is. Project monitoring and evaluation are explained to mean the effort to achieve project objectives, problems with project delays, cost overruns, and non-conformity, as well as environmental issues.

Conclusions

Project monitoring is a key element in improving project performance, program and portfolio performance, therefore organization's performance and success. There is no way to manage tens or even hundreds of projects in parallel without having a strong understanding and investment in the monitoring process.

Regardless the industry the projects are performed in, more and more companies invest in all project management areas. Efficient and effective monitoring skills are mandatory for a project manager. Ability to deal with all aspects concerning quality, risks, and management of people lead the project manager to a successful result of his/her project.

The WBS and Gantt chart are key instruments in project monitoring, therefore various monitoring and reporting templates may be developed using the data provided by those, containing indications on time, human resources allocation, and scope control.

Companies around the world are implementing different project management methodologies, adapting them to the type of project, complexity, and industry. For example, most IT business organizations implement Agile and Waterfall project management methodologies, whilst the construction and other industrial organizations follow the PMI and PRINCE management methodologies. Still, project monitoring is a mandatory and essential process regardless selected project management methodology.

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„Leadership involves finding a parade and getting in front of it."
John Naisbitt

Benchmarking in Manufacturing Companies

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Abstract

Benchmarking, or learning from the best, can be seen as a performance improvement strategy for companies worldwide. More than this, benchmarking enables companies to focus on their weaknesses and strengths, and thus, make a comparison with their main competitors' results so that they can remain competitive on the market. Benchmarking is one of the most common strategies for improving business performance nowadays.This study aims to analyze the implications of benchmarking in increasing performance within manufacturing companies, by analyzing successful methodologies that were implemented so far and proposing a best practice benchmarking method for manufacturing companies. The study contributes to the performance improvement of manufacturing companies, by analyzing benchmarking methodologies and best practices, as well as by offering solutions to existing challenges in the field.

Keywords: benchmarking, competitiveness, comparison, productivity improvement

Introduction

In order to ensure organizational productivity and improve operational performance, companies have to use different tools that can help them not only lower down their costs, but also enhance their customers' experience. According to the Global Benchmarking Network (Mann, Kohl 2010), benchmarking helps to sustain a company's success through the process of ongoing comparison and learning from other best practitioners, and it represents a key strategic point if practised well and a „fatal weakness" if not pursued.

„A firm is inherently fragile if its value added emanates more from conceptual as distinct from physical assets. Trust and reputation can vanish overnight, a factory cannot."
Alan Greenspan

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According to Spendolini (1992), „benchmarking is the continuous and systematic process of identifying, analysing, and adapting industries' best practices that will lead an organization to superior performance". Its main advantages are the opportunity to compare an organization's performance against industry competitors, learn from the leaders' experiences, see which competitors perform at the highest and lowest levels and determine strengths and weaknesses. The first benchmarking methodology was proposed by Dr. Robert Camp, when he introduced a ten steps process to be followed when willing to conduct benchmarking within a manufacturing company (Camp 1995). The ten steps can be seen in Figure 1.

Stage	Step	Camp Model
Planning	1	Identify what is to be benchmarked
	2	Identify comparative companies
	3	Determine data collection method & collect data
Analysis	4	Determine current performance 'gap'
	5	Project future performance levels
Integration	6	Communicate benchmark findings and gain acceptance
	7	Establish functional goals
Action	8	Develop action plans
	9	Implement specific actions & monitor progress
	10	Re-calibrate benchmarks
Maturity	Leadership position attained Practices fully integrated into processes	

Figure 1 – *Xerox ten steps benchmarking methodology*

Moreover, according to the benchmarking methodology proposed by American Productivity & Quality Center, the benchmarking process focuses on four main steps to be followed by companies: plan, collect, analyse and adapt.

Performance Benchmarking enables performance gaps to be identified through comparison of performance metrics or key performance indicators. Best Practice Benchmarking refers to the comparison of data obtained by studying similar processes or activities and identifying, adapting and implementing the practices that produced the best performance results. Best practice benchmarking projects typically take from 2 to 4 months to identify best practices. Informal Benchmarking refers to learning from others' experiences, consulting with experts, networking or checking websites, online databases, and publications, following an unstructured approach.

Benchmarking activities and methodology has evolved in the last years, and due to new technology, the process is much easier nowadays. According to speciality studies, benchmarking tops the performance improvement tools that are preferred by companies (Rigby, Bilodeau, 2009). Most research studies in the last few years have identified benchmarking is the number 1 tool in terms of usage and average in terms of satisfaction, as reported by organizations worldwide.

Experimental

In order to achieve the objectives of this paper, there was a case study conducted, on the recent benchmarking survey results within the Global Benchmarking Network, which targeted more than 40 countries. According to the Global Benchmarking Network Survey, the most wanted improvement tools for future adoption within companies are Performance Benchmarking, Best Practice Benchmarking and Informal Benchmarking.

In accordance to this, there was a complex research conducted in the various benchmarking typologies listed above and the phases that need to be followed in each case. Moreover, according to scientists in the field, a prerequisite for starting a benchmarking study in a manufacturing company is to have a Total Quality Management system implemented within the organization.

As of Juran, organizations need to ask themselves what their competitors do in order to perform at a high level. In order to find out the difference between performance results of different organizations, companies should introduce benchmarking as an approach for organizations that have adopted total quality management (TQM). For this, the paper also contains a research part on total quality management (TQM) and its influence on productivity, with focus on product development best practices (Ghete, 2014), (Thawesaengskulthai, Tannock, 2008).

Results

In regards to benchmarking tool usage, benchmarking is being used at a rate of around 70% of the companies in Europe, whereas the average rate of improvement tools lies around 50%. Moreover, higher involvement from employees is shown from organisations whose opinions are positive towards benchmarking and regarding the reasons why organisations are hesitating to adopt benchmarking, the three most important reasons seem to be the lack of resources, the lack of benchmarking partners and the lack of top management commitment.

The main issue for the organisations outside Middle East-Africa is the lack of benchmarking-understanding (North-America, Asia Pacific), lack of technical knowledge in planning benchmarking projects (China-India) and the lack of resources (Europe). Moreover, according to the Global Benchmarking Network Survey, most of the companies who start benchmarking projects have motivations like, performance improvement of their processes or addressing main strategic issues.

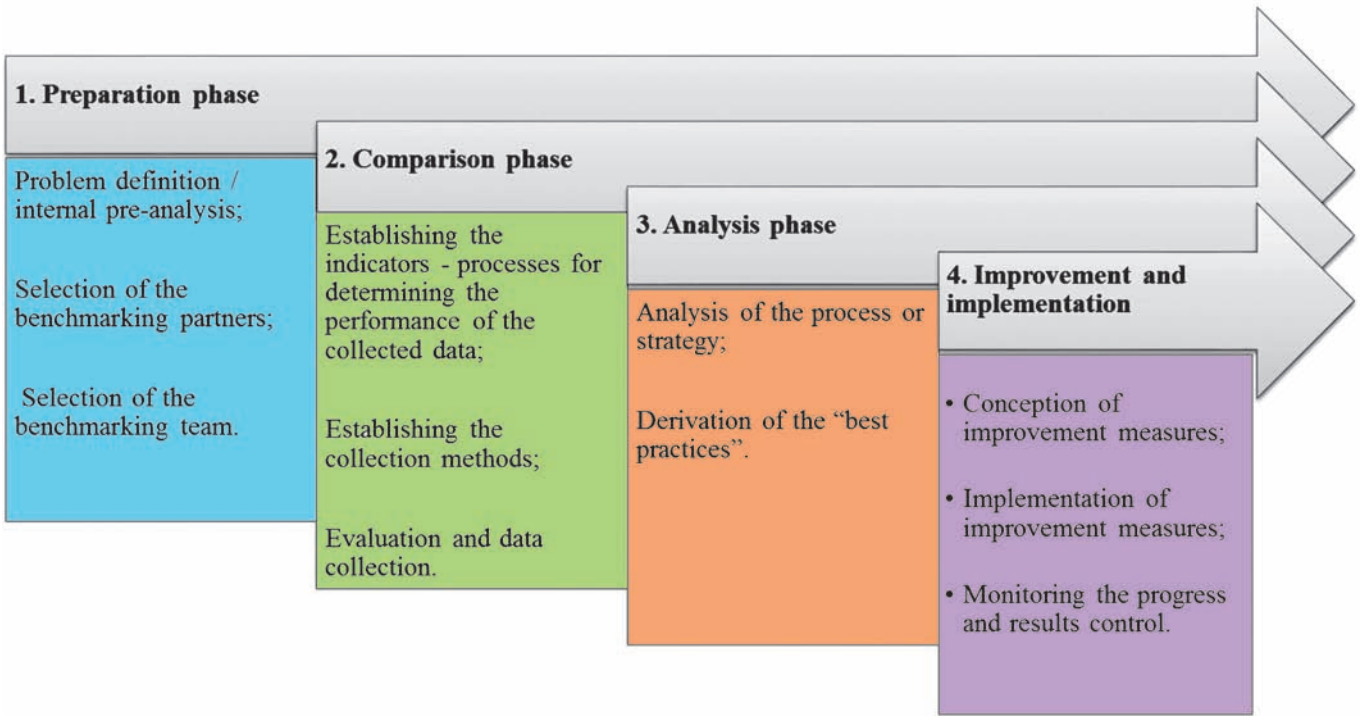

Figure 2 – *Benchmarking process proposal*

In order to be able to face all the challenges stated before, the proposed benchmarking process to be followed by a manufacturing company is in Figure 2.

Manufacturing companies should consider benchmarking for increasing their productivity and for a successful product development. The benchmarking approaches in manufacturing should focus on four main areas: performance management and measurement; new process development process standards and stages; governance; best and worst performing organizations.

Moreover, in order to remain competitive on the market, a prerequisite for manufacturing organizations worldwide is to have an effective New Product Development (NPD) process in place.

Therefore, a way of keeping up with trends, and adapting to the market demand in regards to new product development (NPD), is to integrate benchmarking for streamlining the paths for the new product offerings. Best practices benchmarking can be conducted based on product type, for example, in order to enable full productivity and team focus.

New product development (NPD) focuses on a complex set of stages, where benchmarking can definitely bring its contribution. According to Innovating Coach, the eight main stages of new product development are presented below, as follows:

1. Ideology generation: utilization of SWOT analyses and current marketing trends, as well as road maps designed to be in accordance with different projects types and risks.
2. Idea screening: establishment of criteria for ideas that should be either approved or denied. It is preferable to include benchmarking in this step, and screen the top competitors' new innovations, their market share and consumer's needs.

3. Concept testing: research on various patents, the design of the due diligence, making sure that the consumers understand, need, and want the product. Use creative benchmarking in order to be able to react to consumers' demand.
4. Business research analytics: inclusion of a KPI system for progress reporting and monitoring. Agree upon KPIs, in order to be able to calculate and compare valuable metrics, like average time for certain stages, or value of launched products, new product sales percentages and other important figures.
5. Marketability Tests: organizing private tests, launching beta versions of the product, and then form test panels, compare results in order to improve your product before its official launch.
6. Product development: making plans for product manufacturing, product marketing, and financial investing.
7. Commercialization: keeping track on the manufacturing flow, in order to be able to supply the market demand. Moreover, technical support is needed for a continuous monitoring of the progress.
8. Launch Review and Perfect Pricing strategy: the New Product Development has to be reviewed. In addition, an assessment of the NPD process efficiency has to be done.

It is also important to put efforts into continuous improvement and assess the overall value by analysing internal costs, in comparison to new product profits (Ghete, 2015).

Discussion

There are several obstacles preventing organisations from conducting benchmarking studies and the main is the lack of technical knowledge and the difficulty of finding benchmarking partners.

Other critical success factors of a benchmarking project, to take into consideration, are: the assessment and evaluation at the end of the benchmarking project, employee engagement and the preparation phase that has to be done prior to starting the benchmarking project.

According to the Global Benchmarking Network Survey (2010), successful benchmarking studies can make an organisation benefit from both financial and non-financial perspectives, as 20% of the GBN survey respondents declared an average financial return of over USD 250,000 per best practice benchmarking project.

Moreover, a very important factor is the support of the top management. Benchmarking teams are sometimes facing obstacles that cannot be solved without the support and involvement of the executive board.

Conclusions

However, benchmarking is acknowledged, nowadays, as being a core component of the quality improvement methodology and it can be regarded as the most important contribution to it after Deming's or Juran's foundations.

Benchmarking has the main purpose of assessing an organization's strategy, products, and processes and comparing them with those of the world's best-in-class organizations. Benchmarking can bring several benefits to the organization, including cultural change, improved performance and better trained employees.

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„Get all the education you can, but then, by God, do something. Don't just stand there, make it happen."
Lee Iacocca

Core Entities in IT Governance

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Abstract

Several worldwide known frameworks are accepted in the IT governance/management area. These frameworks use the terminology and entities to express their principles, structure, and implementation. The article deals with understanding entities process, function, and service. It discusses their definition and reasons that can lead to differences in perception of their substance and subsequently their usage. It stresses the importance of their role in the context of the level of abstraction in modeling. Proper use of entities across different frameworks (across the organization) is a prerequisite for application of frameworks and ability to achieve a company mission.

Keywords: process, function, service, information technology, framework, governance

Introduction

Benefits of best practice frameworks have first been verified in practice and then in theory. IT management/governance seems to be an area that is becoming more attractive for academic researchers. We can find a lot of articles and studies which discuss theoretical aspects of the governance. With the increasing complexity of IT systems, the importance of methodological support for implementation and holistic approach to a solution is growing. A holistic approach involves respect for all important aspects of the solution, which also means working with specialists in areas outside the IT and ability to understand each other. We discuss the usage of core terms (entities) in governance area: function, process and service and their perception in management.

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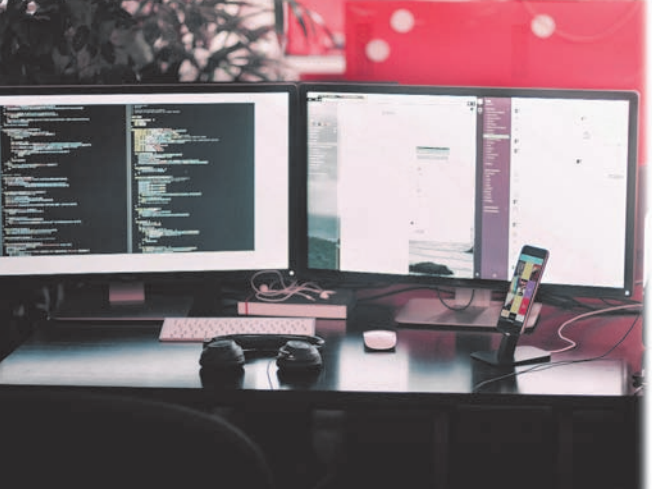


Function in IT Governance Area

According to Weill (2004), IT governance means: „Specifying the decision rights and accountability framework to encourage desirable behavior in the use of IT". We can specify areas for governance as follows: (1) the value creation (respecting and perception of the stakeholders), (2) achieving strategic goals (strategic alignment), (3) risk management, (4) optimizing resources, (5) performance measurement (ITGI, 2003; ISACA, 2012). Weill (2004, p. 10) continues with IT decisions which relate to ITG:

- IT principles – the role of IT in business;
- IT architecture – integration and standardization requirements;
- IT infrastructure – to determine how to share and enable services;
- The business application needs – business needs to purchased or internal development;
- IT investment and prioritization – financial question.

It is possible to discuss also other areas in IT governance/management. Authors consider as relevant also Enterprise Architecture and IT Service Management. The main reasons are as follows: 1) it is valuable to analyze the structure of organizations (the structure can be described by an architecture), 2) the importance of the service in IT is growing, 3) both domains have a worldwide known frameworks (TOGAF respectively ITIL) which are the de facto global standards, 4) the application of mentioned frameworks is often combined with the practice. Mingay and Bittenger (2002) discuss using of ITIL and COBIT and conclude: „Enterprises that want to put their ITIL program into the context of a wider control and governance framework should use COBIT." These three frameworks are taken as the basis for the analysis of function, process, and services in the article.

Moreover, there are studies focused on the theoretical foundation of frameworks. Researchers work with conceptual metamodels. Goeken and Alter (2009); Neto and Neto (2013) or Pereira and Silva (2012) create and analyze metamodels of Cobit or ITIL frameworks. TOGAF framework is described via metamodel directly in standard documentation (Open Group, 2011, Part IV). All these metamodels use entities which form the essence of the concept.

The Process Definitions

It is possible to find a lot of definitions of the process. Definitions according to the literature dedicated to ITIL (AXELOS source), Cobit (ISACA source) and TOGAF (Open Group source) follow. In AXELOS (2011a) is mentioned: „A structured set of activities designed to accomplish a specific objective. A process takes one or more defined inputs and turns them into defined outputs. It may include any of the roles, responsibilities, tools and management controls required to reliably deliver the outputs. The process may define Policies, Standards, Guidelines, Activities, and Work Instructions if they are needed." ISACA (2012) defines process as follows: „Generally, a collection of practices influenced by the enterprise's policies and procedures that takes inputs from a number of sources

(including other processes), manipulates the inputs and produces outputs (e.g., products, services) Scope note: Processes have clear business reasons for existing, accountable owners, clear roles and responsibilities around the execution of the process, and the means to measure performance." TOGAF (Open Group, 2011, Chapter 34) defines a process as follows: „A process is a flow of interactions between functions and services and cannot be physically deployed. All processes should describe the flow of execution for a function and therefore the deployment of a process is through the function it supports".

In short, the process is a sequence of activities and has both inputs and outputs. Outputs of the process are an end product or a service. The process expresses the dynamics of the state change. With respect to the level of abstraction, we can find and describe a process with several typical characteristics known from business process management (process owner, capability, policies etc.). The detail of process modeling can also differ according to the purpose of their description (depends on management/business needs). A process describes how the functionality expressed in functions or services is realized. It is important for managing because it says „what" is realized, as process generates output products or services. Processes described in more details also say when, why, who etc. ISACA (2017) states „A process by its nature is results-oriented in the way that it focuses on the final outcome while optimizing the use of resources". Other process characteristics:

- „Process cannot be physically deployed" (Open Group, 2011) and „… is a flow of interactions between functions and services". A process has a nonphysical character.
- A process is a description of sequence, the flow of activities, steps, functions, services – it optimizes the resources. And this sequence (process) should be meaningful, logical, effective and efficient to realize a predefined objective. (Bon & Hoving, 2008).
- Processes have a beginning and an end with an output.

- Processes are repeatable and the amount of core (important) processes is usually small.

As we can see above, one of the most important purposes of the process is to say (1) what they do, (2) typically in the form of the sequence which combines important activities (according to details level), functions or services. A process is an envelope for a description of important functionality (activities and their functions can be combined according to the purpose which results in the final output).

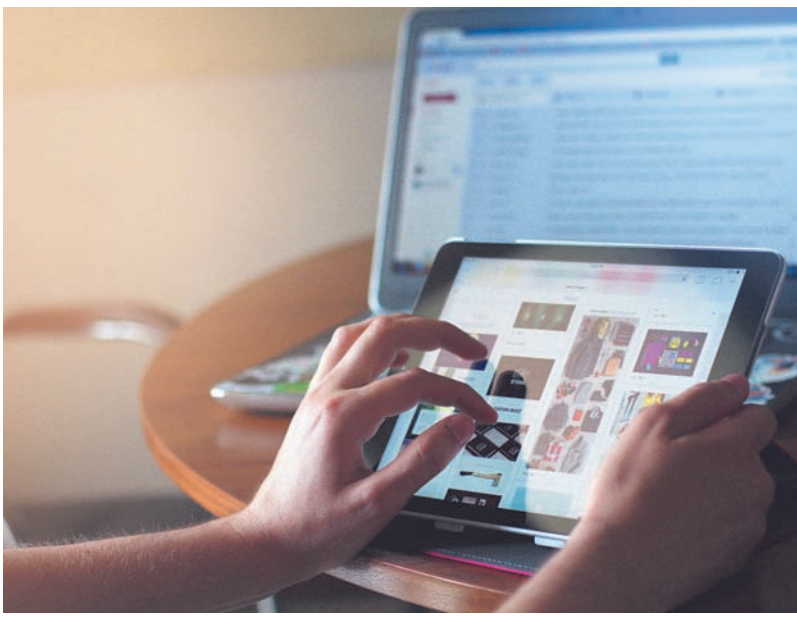
For understanding (using) of the process model, the purpose and modeling (abstraction) level are important. According to this factor, we can describe the process in more/fewer details or with the characteristics that are important for the purpose, e.g. process analysis and process maps designing. Moreover, we can distinguish between process type and process instance (Řepa, 2012). A process type description includes a basic characteristic of the process, relevant relationships and most importantly, all possible variants of activities flows. A process instance means a process in a specific environment, with constraints and resources. Again according to the purpose of modeling.

The Function Definitions

ITIL (AXELOS, 2011b) defines a function as follows: „A team or group of people and the tools or other resources they use to carry out one or more processes or activities". It depends on the organization type if a function is represented by a department, team or single person. According to ITIL, the term also has following meanings: (1) the purpose of person, team, process, asset or (2) statement that something works correctly. COBIT framework does not define the term function directly, but it uses it in two meanings: „functioning" when something works, and the function as „an expression for the essence of purpose" in a specific area. TOGAF states in (Open Group, 2011) that „function describes units of business capability at all levels of granularity". A summary of the functional characteristics follows:

- A function serves as a generally bounded unit of business activity (domain realized in the organization). „Functions are units of organizations specialized to perform certain types of work and responsible for specific outcomes". (Bon & Hoving, 2008)
- Functions are performed continuously, they represent some area (ability to do something) in an organization.
- A function expresses the content when we are looking from outside without defining any concrete parameters or quality. It is a label for a unit to express expected functionality.

The function groups internal business resources according to intended functionality. It describes a behavior of a part of the organization.



The Service Definitions

The most general definition of the term service uses ITIL „… means of delivering value to customers by facilitating outcomes customers want to achieve without the ownership of specific costs and risks" (AXELOS, 2011b). TOGAF understands the service as follows „Supports business capabilities through an explicitly defined interface" and „an element of behavior that provides specific functionality in response to requests from actors or other services" (Open Group, 2011). Although COBIT does not define a service directly, services (primarily IT services) are a natural element in the framework philosophy: (1) the services are organized by activities in processes, (2) IT services represent „day-to-day provision to customers of IT infrastructure and applications and support for their use." (ISACA, 2012) The service characteristics follow:

- A service should serve. A service must be produced by someone (individual, group of people, machine). A service satisfies someone's (something's) needs.
- A service has an interface that is used for communication with the surrounding.
- A customer meets the service. A service is an externally visible functionality (Lankhorst *et al*., 2009).
- A service realizes functions with specific parameters (respects resources, capability, technology etc.)

As we can see, a service serves to fulfil the specific task with defined parameters. It is a kind of agreement between the provider and the client. As Řepa (2012) states „an interface of processes is a service provided to another process" or in another word „A business service operates as a boundary for one or more functions" (Open Group, 2011). Services can play an important role within the organization as a unit of exchange between divisions (departments etc.).

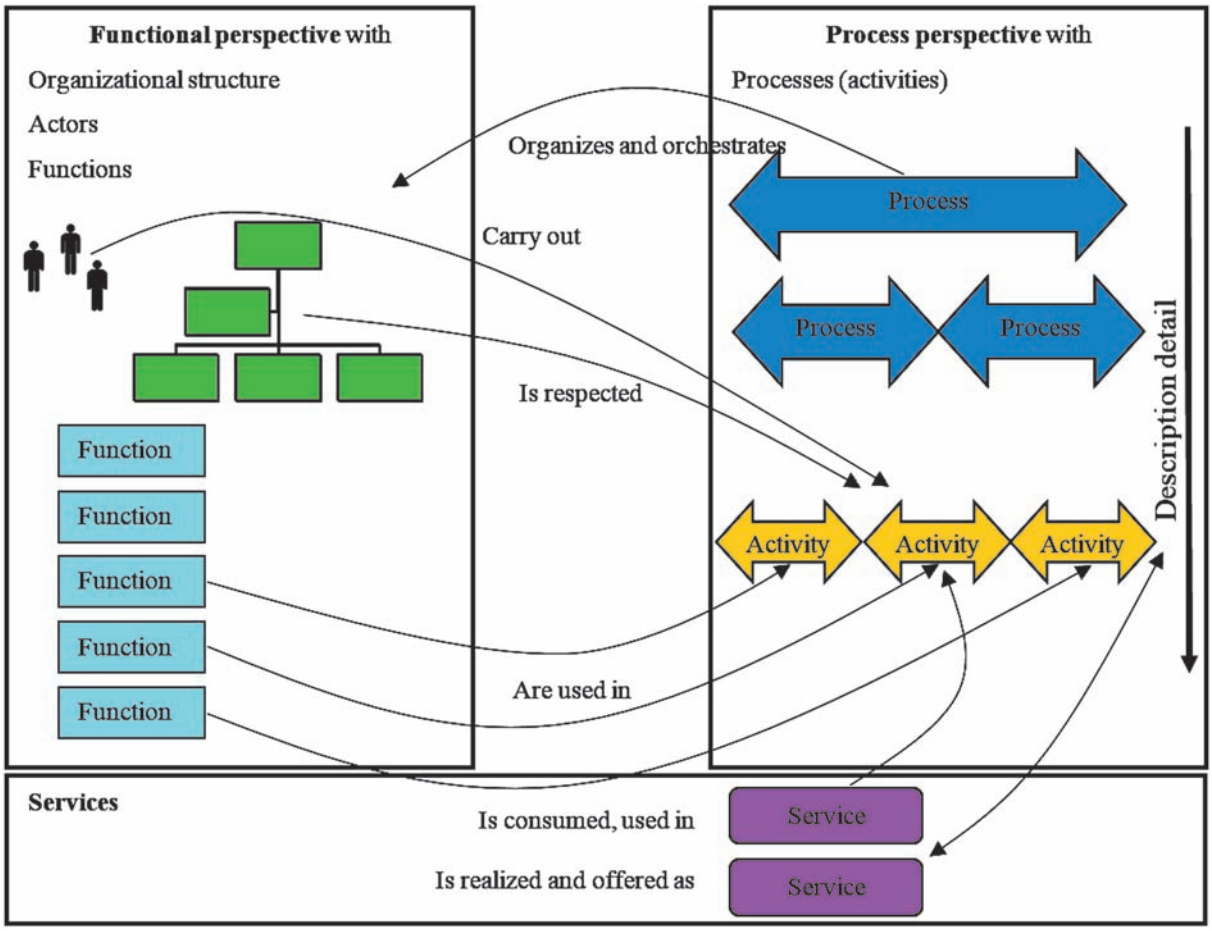


Figure 1 – *Managerial perspectives and entities relationships*
(Source: Rozehnal & Novák, 2017)

Management Perspectives

Bon and Hoving (2008) state „Functions are often mistaken for processes" in the paper where the essence of both terms is discussed. How to understand these terms and use them for the management purposes?

The use of functions as well as processes are based on human nature. People want to identify **what** the things (systems, people) do, **how** they are done and **who** realized them. According to these needs, we can discuss two different approaches to management: the functional and the process one (figure 1). Both approaches are valuable in practice, but they work in different perspectives and with different entities (which create a view of the organization). Both tell a different story. Moreover, there is the service based approach as well. The importance of services grows because they allow import/export functionality in and outside the organization.

The process and function perspective. The default entity for **process perspective** is a process. The organization is a set of processes that are carried out. The important issue is the level of detail description. The core processes (top level) express only the main purpose of the

process – they say what. If processes are modeled in more details, there are activities (or procedures, steps or even work instructions – again according to the level of detail) which extend description – they say why, when, who etc. See the figure 1 in (Bon & Hoving, 2008, p. 369).

The default entity for **function perspective** is a function. Functions express the functionality – the ability to do something (typically in the context of organization's situation). Functions create the structure of the organization by expressing the specialization. It is an element of uniqueness.

The specialization of resources (people, technology) expresses functionality, which they are able to manage better than others, is a natural phenomenon in the history of mankind. It is the foundation for building an organizational structure and it relates to roles, responsibilities, resources and so on.

As we can see in figure 2, functions (the ability to do something) are used in activities which realize processes. But less detailed described functions (high-level functions) may include processes which realize functions. Such functions express ability to realize processes according to the organizational structure of the organization (according to different areas of specialization).

Think about internal specializations in the hospital which express the medical area (ability to treat different diseases). We deal with a top-level function approach. In every medical area – department, we can found other specializations – subfunctions focus on a specific problem – low-level function (often linked to specialization and organized in accordance with specific resources). These functions are used in activities which make up the processes.

As we stated above functions express functionality. It is valuable to differ at least two levels of function description. High level described (complex) business functions are used for the description of an organization from functional approach perspective. Consider a hospital example and medical areas. Typically high-level description deals with the core of organization structure. Low-level description of functions (elementary) in an organization is used for expression of units of business activity according to sources and their ability to do something. Low-level functions can be combined in different processes according to the various output of product/service. This approach respects the definitions used above „Functions are units of organizations specialized to perform certain types of work and responsible for specific outcomes". (Bon & Hoving, 2008) as well as „function describes units of business capability at all levels of granularity" (Open Group, 2011). The idea is illustrated in figure 2.

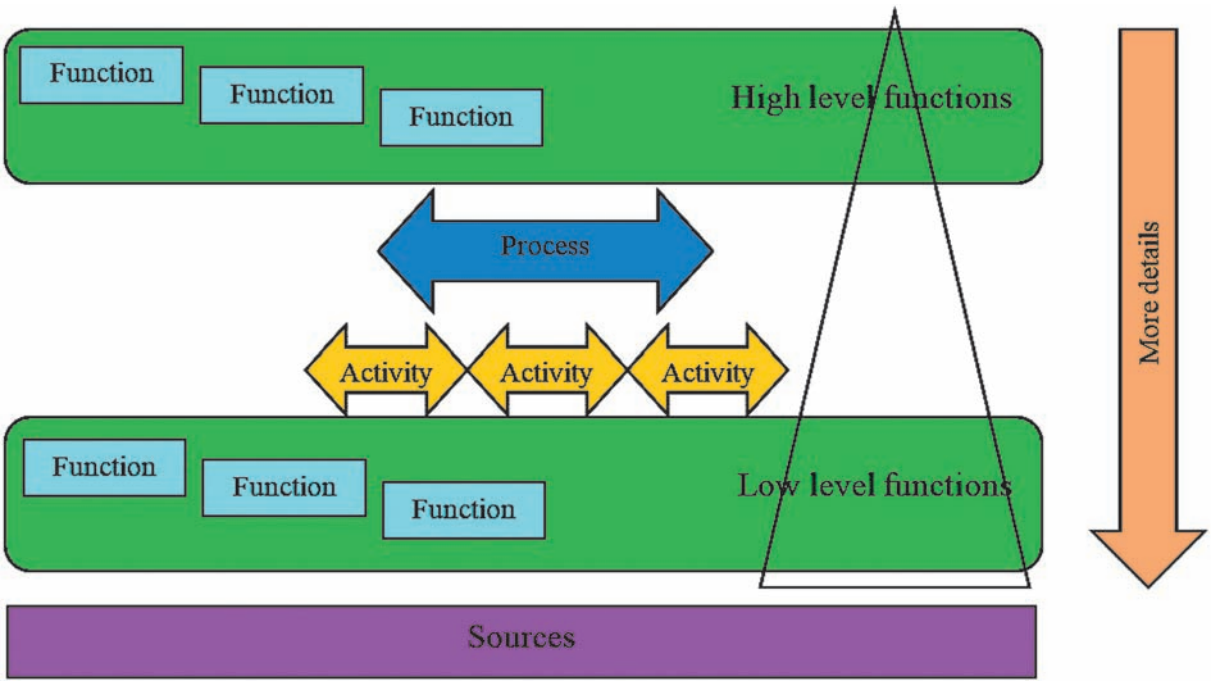


Figure 2 – *High and low-level function*

The service perspective. A service perspective tells us which services are offered and consumed, who offered and consumed them and with what parameters. It is a way how to deliver functionality within the scope of specific parameters and defined interface. Thus, a service may be an important unit for a description of relationships in the organization. Consider our example with hospital again. The hospital provides services for patients. Parameters of the services are set between the hospital and the insurance company (or patients) for example for payment purposes.

Summary Discussion

Potential problems with discussed terms are not within definitions in frameworks, rather in interpretation and communication between different people who are involved in their application.

TOGAF in the chapter Core Content Metamodel 34.3.1 (Open Group, 2011) uses all the terms together without any problems. On the contrary, it deliberately defines and works with those entities. Why? Simply put, TOGAF strictly differentiates each term (the area of enterprise architecture must differentiate it as well). The terms are not synonyms, but they have a different meaning. If people do not differentiate it, there are confusions and misunderstandings in communication across the organization (enterprise). Such a confusion could occur even when talking about the same entity (e.g. function) but describing different levels of details.

Also, other discussed frameworks understand the terms in the same way. Although they sometimes do not work with all terms directly, (e.g. COBIT does not define service as a primary element), COBIT as well as ITIL respect the pure meaning of the discussed terms. The difference in the use of terminology is caused by their specialization in different areas. ITIL focuses on

operational level – on services. COBIT focuses on the government and works especially with processes (and service is not crucial for it).

As Lankhorst *et al.* (2009) state there is a many-to-many relation among processes, functions, and services. There is possible to see several processes in reality that create a function, process which consists of several functions as well as a service which is realized by more processes (functions). Due to this fact it is important to distinguish among the terms. Each of them represents a different part of the business. Processes coordinate the deployment of functions to ensure desired outcomes. (see Core Content Metamodel 34.3.1, figure 34 – 6 (Open Group, 2011)) Functions themselves cannot ensure final goals of the organization, as they are limited and thus locked within their specialization.

Conclusion

Each of the discussed terms represents an entity which describes a piece of the behavior of an organization that fulfills the given purpose. The aim of this paper is to show that the discussed frameworks understand all terms in the same way and to declare the roles of terms as entities with a unique purpose. The terms represent perspectives for management approaches as well. Functions tell us what can be realized – general functionality, processes how it is organized – the sequence of activities or steps and services tell us the information necessary for delivery of functionality (price, time and other parameters). All these entities are necessary for managing of the organization.

Proper use of terms across frameworks (across the organization) is the first step in their integration in businesses, mainly

in communication. It is important to ensure that frameworks are used in a compatible manner as they are compatible with their nature and all discussed frameworks understand terms in the same way. Problems may occur by combining different description of details, managerial perspective or the purpose of description. It is necessary to be careful about mixing different levels of detail in the description. Or it is valuable to emphasize different levels of detail also in the description of entities.

When the same approach is respected, it is possible to manage the core entities in all frameworks across the spectrum of possible perspectives – functional, process or service. These perspectives are important for the holistic view of the organization. Professionals from different areas must understand the same things in the same way. An ability to communicate and cooperate across the organization will be more and more important because it is an assumption for flexibility in the adoption of technology (Pochyla, 2015) and in a wider context the ability to achieve a company mission.

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„Governance is the process whereby people in power make decisions that create, destroy or maintain social systems."
Maria Ramos
(CEO: Transnet)

Decision-Making in Major Sporting Events

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Abstract

EURO 2020 promises to be the grandest European football championship to date. 19 cities bid for the right to host matches and only 13 were selected by UEFA. The present paper undertakes a detailed analysis of the bidding dossiers, examining the strong points and the weaknesses of each bid, in an effort to determine the most important factors for selection. Following the analysis, the key criteria are determined to be the quality of the stadium, the commitment to continue investments in renovating and expanding existing facilities and the ability of the bidder to secure guarantees from local and central authorities that the interests of UEFA and its partners would be fully protected.

Keywords: City brand, city promotion, large scale events, strategic investment, EURO 2020

Introduction

Vancouver 2010, London 2012, Rio de Janeiro 2016 – these Olympic cities have remained fixed in public memory alongside the years in which they hosted this very important sporting event. The audience of major sporting events has increased exponentially due to media coverage. It is estimated that 4.7 billion people watched cumulatively the Olympics in Beijing, 2008, meaning that the cultural significance of such large-scale sporting events is indeed global (Maenning, Woods, 2013). But what chance do smaller cities stand to host large-scale events, if they do not have the vast and costly infrastructure which is necessary? One answer has been

„Corporate governance is not something that is put in place and then left. Ensuring its effectiveness depends on regular review, preferably regular independent review."
Jim Jones
(Business Day)

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provided by UEFA. Faced with growing numbers of participating teams and spectators from one edition to the next, they resorted to entrusting the organisation of the championship to two countries. The first time it happened in 2000 when Belgium and the Netherlands co-hosted. In 2008 it was Austria and Switzerland, and in 2012, Poland and Ukraine.

The economic crisis has affected sports as well. As a result of lower economic output, fewer and fewer cities could afford to invest in modern stadiums, capable of satisfying the requirements of the ever growing number of spectators. The solution proposed in 2012 by M. Platini, UEFA President between 2007 and 2015, was for the anniversary edition of 2020 to be hosted by an unprecedented number of cities, 13 to be more precise. Turkey was the only country which took issue with this suggestion and bid – unsuccessfully, it turned out – for the right to organise the championship on its own.

But what made Bucharest win the competition to host some of the matches and Sofia did not? Or how could Glasgow beat Cardiff? How does one city prepare for such an event and what impact does hosting it have on the prestige or brand of the city itself? What did Bucharest do so far and what more should it accomplish in order for Euro 2020 to be a success? At the end of the day, is it worth the trouble?

To begin with the answer to the last question, it certainly is. By some estimates, Euro 2016 was the most lucrative edition of UEFA's most successful tournament. It generated average profits of almost $18 million per match, (Klebnikov, 2016) ending up with a net profit of €847 million for the whole event. The tournament produced

total revenues of €1.92 billion, that is €500 million more than it did four years previously, at EURO 2012, co-hosted by Poland and Ukraine (Morgan, 2017). These profits are shared with national associations and federations. A total of €301 million was shared with those who qualified for the final tournament. The winners of EURO 2016, Portugal, earned a share of €25.5 million. Other associations received less, obviously, but each of the 55 members of UEFA received a 'solidarity payment' of €1 million, irrespective of whether or not their teams had qualified for the final tournament. Looking at the source of the revenue, more than half of the income (€1.024 billion) was generated by broadcast rights. Other revenue sources included sponsorship and licensing deals, as well as sales of tickets and hospitality (Malone, 2017).

Methodology

Having settled the question of whether or not it is profitable to host a UEFA event, we must now turn our attention to what it takes for a city to earn this right. In Table 1 is a comparative analysis of the 19 cities which bid to host matches of EURO 2020. Some of the factors taken into account were the size of the city's territory and the number of its inhabitants. Another was the capacity of the stadium and if it was an existing structure or a project waiting to be built. But the most important factors, in my opinion, were the investment proposed or the budget available to fund the sporting infrastructure absolutely necessary for UEFA 2020. Finally, I took into account the experience of the city – or even the experience of the stadium itself – of hosting large scale events, not necessarily football-related.

The data presented in Table 1 reveals the enormous sums invested in building stadiums. Costs necessary to build UEFA Category 4 stadiums have skyrocketed. It is telling that in 1996 it cost the city of Amsterdam €140 million, whereas the new stadiums in London and St. Petersburg, belonging to the same category, cost nearly 1 billion euro. The comparative analysis indicates clearly that cities which have invested in stadiums in the past and then continued to invest in keeping them up to date have had a much better chance of hosting large scale events, including EURO 2020. The notable exception here is Stockholm, but we will see below how that may be explained while looking at the criteria included by UEFA in their Evaluation Report (UEFA 2014), whereby they explain why they rejected 6 of the 19 cities which bid to host matches. The UEFA criteria, as outlined in the Tournament requirements, guided all associations in the bidding process. The criteria were, as follows:

Criterium 1: „Vision, Concept and Legacy – motivation of hosting focus on contribution developing the football across Europe and the infrastructure regarding organising big events; celebrating football at the 60th anniversary of the UEFA; long term strategy and other contacted initiatives."

Table 1 – *Breakdown of known active satellites currently in orbit*

	City	Population	Area km²	Stadium	Stadium capacity	Cost/ investment	Experince hosting important events
1	Baku	3,202,300	3.125	Baku Olympic Stadium – New	69,870	€710.6 million	2009 Islamic Culture Capital 2010 Eurovision Dance Contest 2015 European Games UNESCO World Heritage Site – Walled City of Baku with the Shirvanshah's Palace and Maiden Tower
2	Minsk	1,921,807	409.5	Dinamo Arena – New	35,000	€115 million	2014 IIHF World Championship 2016 European Speed Skating Championships 2019 European Games
3	Bruxelles	1,175,173	161.38	Eurostadium – New	62,613	€314.3 million	1972 UEFA European Football Championship, From 1977 Annual – IAAF Diamond League. 1985 European Cup Final 2000 UEFA European Football Championship, the opening game
4	Sofia	1,260,120	492	National Stadium – New	33,621	€49.5 million	1957 Eurobasket 1961 and 1977 Summer Universiades, 1983 and 1989 Winter Universiades 2012 FIVB World League finals Sofia applied to host the Winter Olympic Games in 1992, in 1994 and 2014 but was not selected
5	Copenhagen	763,908	86.39	Parken – 1992	38,190	€85,3 million (renov.)	2011 UCI Road World Championships taking advantage of its bicycle-friendly infrastructure
6	London	8,787,892	1,572	Wembley Stadium – 2007	90,652	€1.179 million	1908, 1948, and 2012 Summer Olympics and Paralympics 1934British Empire Games 2017 World Championships in Athletics
7	Munich	1,450,381	310.43	Fußball Arena München – 2005	70,067	€340 million	1972 Summer Olympics, 1993 Final stages of the FIBA EuroBasket 2006 one of the host cities for the Football World Cup Munich bid to host the 2018 Winter Olympic Gamesbut lost to Pyeongchang
8	Budapest	1,759,407	525.2	Puskás Ferenc Stadium – New	68,156	€341 million	2011 IIHF World Championship, 2014 World Masters Athletics Championships In 2015 Budapest decided to bid for the 2024 Summer Olympics. UNESCO World Heritage Site Budapest, including the Banks of the Danube, the Buda CastleQuarter and Andrássy Avenue
9	Dublin	553,165	114.99	Dublin Arena – 2010	51,711	€410 million	1982 Show Jumping World Championships 2003 Special Olympics 2011 UEFA Europa League Final – Rugby
10	Jerusalem	865,721	125.15	Teddy Stadium – 1992	32,000	€50.7 million	From 2011, annually, The Jerusalem Marathon, an international marathon race UNESCO World Heritage Site The Old City of Jerusalem and its Walls
11	Rome	2,877,215	1,285	Stadio Olimpico – 1990	68,993	€17 million (renov.)	1934 and 1990 final games FIFA World Cup 1960 Summer Olympics 1990 host qualification and the final match of the 1990 FIFA World Cup
12	Skopje	811,045	571.46	National Arena Philip II – 1980 / 2011	32,483	€60 million (renov.)	2008 European Women's Handball Championship together with Ohrid 2017 UEFA Super Cup

13	Amsterdam	851,573	219.32	Amsterdam ArenA – 1996	53,052	€140 million	1928 Summer Olympics Amsterdam 1998 UEFA Champions League Final 2000 Euro 2000 matches 2013 UEFA Europa League Final.
14	Bucharest	1,883,425	228	National Arena – 2011	54,851	€234,5 million	2012 Europa League Final
15	Saint Petersburg	5,323,300	1,439	Zenit Arena – New	61,251	€934 million	1980 Summer Olympics – part of the football tournament. 1994 Goodwill Games 2018 FIFA World Cup matches UNESCO World Heritage list as an area with 36 historical architectural complexes
16	Glasgow	603,080	149.9	Hampden Park – 2013	51,472	€65 million (renov.)	1937 European record for attendance at a football match: 149,547 2002 final of the UEFA Champions League 2007 UEFA Cup Final 2014 Commonwealth Games
17	Bilbao	345,141	41.50	San Mamés Stadium – New	53,289	€198.1 million	2015 Sports Building of the Year in the World Architecture Festival 2018 finals of the European Rugby Challenge Cup and Champions Cup.
18	Stockholm	935,619	188	Friends Arena – 2012	50,653	€300 million	1912 Summer Olympics, Stockholm 1992 UEFA Euro Second runner up in the 2004 Summer Olympics bids. Hosted the Nordic Games, a winter multi-sport event that predated the Winter Olympics
19	Cardiff	346,100	140.3	Millennium Stadium – 1999	74,154	€133.4 million	1958 Commonwealth Games 2001-2006 Rugby FA Cup finals six matches 2007 Rugby World Cup four matches 2014 European Capital of Sport

Criterium 2: „Social Responsibility and Sustainability – objectives regarding the environment, a sustainable economy, social engagement, healthy lifestyle, concrete issues pertaining to the multi-purpose role of the stadiums, health, energy, waste, accessibility, free local transport for match ticket holders, seats for disabled supporters, 'no tobacco' policy."

Criterium 3: „Political and Economic Aspects – concerning national political system and if is stable or not, institutions, organisational structure of the football federation, public support, national and local investments for hosting the event, focus on a commitment by all stakeholders. Data from independent institutions (World Bank for example) are also taking into consideration."

Criterium 4: „Legal Aspects – covering a wide range of laws and aspects such as labor legislation, national insurance system, risk coverage, anti-doping legislation, taxes regarding UEFA EURO 2020 activities, intellectual property, trademark protection, preventing unauthorised public viewing, protection of property rights, authorities guarantee for protection of intellectual property rights, permission to import goods concerning UEFA EURO 2020, customs regulations, list of international agreements on customs, import and export of goods, laws & regulations in the use of tickets, institutions responsible

for public safety and security, combating ambush marketing practices, authorities responsible for prohibiting counterfeit activities, regulations of commercial advertising & promotional activities, access procedures for foreign citizens who will work or will participate to UEFA EURO 2020."

Criterium 5: „Stadium – complex information about stadium, plans and photos, safety information, seat plan, technical utility information, stadium rental fee and operating expenditures, detailed calculation costs, stadium telecom infrastructure and service providers, public wireless and mobile phone coverage around the stadium, work planned to renovate stadiums, upcoming events."

Criterium 6: „Mobility – focus on connections to all major European and international destinations, by all means of transport. Airport technical information and capacity to cover the number of supporters, infrastructure map national level, information regarding the national infrastructure routes, infrastructure improvement, stadium transport connections and maximum importance for the last-kilometre accessibility of the stadium."

Criterium 7: „Accommodation – information about authorities responsible of tourism national and city level, hotel classification system, accommodation options for UEFA EURO 2020 located 20 kilometers from the stadium, hotel confirmation, list of hotels within a radius of 20 kilometers from the stadium, hotel reservation forms for UEFA key target groups, hotels to accommodate & training centres for the national teams and planned or proposed events in the host city during the UEFA EURO 2020 that could increase the demand for accommodation services."

Criterium 8: „Event Promotion – the interest is on the role of the host country in the event promotion, considering the host city experience in organizing major sporting or entertainment events. Also very important are the areas for the official fan zones."

Criterium 9: „Commercial Matters – legal measures to support UEFA commercial programme for UEFA EURO 2020 and UEFA's commercial partners in the exercising of their rights, advertising and promotion inventory, special focus on free advertising space in the city for the event and UEFA commercial partners." (UEFA 2013).

The Table 2 sets out in tabulated form the results of the evaluation carried out by UEFA on the bidding dossiers presented

by 19 associations/cities. A positive analysis, meaning the criterium had been fully satisfied, has been marked with 'yes'. A criterium which was definitely not fulfilled is marked with 'no' and a dash indicates that the bidding dossier did not include sufficient information for the evaluation panel to draw a conclusion. The last column, 'Results', indicates whether or not the association or city has been awarded the right to host matches at EURO 2020.

Table 2 – *Tabulated analysis of the evaluation report of the 19 cities*

	City	Crit. 1	Crit. 2	Crit. 3	Crit. 4	Crit. 5	Crit. 6	Crit. 7	Crit. 8	Crit. 9	Result
1	Baku	yes	yes	yes	yes	yes	yes	yes	yes	yes	YES
2	Minsk	yes	–	no	yes	–	yes	no	–	yes	NO
3	Bruxelles	yes	yes	yes	yes	yes	yes	yes	yes	yes	YES
4	Sofia	yes	no	–	no	–	yes	yes	yes	no	NO
5	Copenhagen	yes	yes	yes	yes	yes	yes	yes	yes	yes	YES
6	London	yes	yes	yes	yes	yes	yes	yes	yes	yes	YES
7	Munich	yes	yes	yes	yes	yes	yes	yes	yes	yes	YES
8	Budapest	yes	yes	yes	yes	yes	yes	yes	yes	yes	YES
9	Dublin	yes	yes	yes	yes	yes	yes	yes	yes	yes	YES
10	Jerusalem	yes	yes	yes	yes	no	yes	–	no	no	NO
11	Rome	yes	yes	yes	yes	yes	yes	yes	yes	yes	YES
12	Skopje	yes	yes	yes	yes	no	–	no	yes	yes	NO
13	Amsterdam	yes	yes	yes	yes	yes	yes	yes	yes	yes	YES
14	Bucharest	yes	yes	yes	yes	yes	yes	yes	yes	yes	YES
15	St. Petersburg	yes	yes	yes	yes	yes	yes	yes	yes	yes	YES
16	Glasgow	yes	yes	yes	yes	yes	yes	yes	yes	–	YES
17	Bilbao	yes	–	yes	yes	yes	yes	yes	–	yes	YES
18	Stockholm	yes	yes	–	–	yes	yes	yes	yes	yes	NO
19	Cardiff	yes	yes	yes	yes	yes	yes	yes	yes	yes	NO

Results

It would be easy to say that a successful bid came down simply to meeting the criteria set out by UEFA, but a closer look at the table above shows that cities which have met all criteria, such as Cardiff, did not win, while others, which met them only in part, such as Bilbao, were successful. Closer attention should, therefore, be dedicated to examining the bidding dossiers of the 6 cities which were rejected.

Minsk has scored quite low on the political and economic situation: „The political and economic situation in Belarus is rated relatively low by independent institutions such as the World Bank. The information provided by the bidder is minimal" (UEFA 2014). Also problematic was the Accommodation chapter. Finally, the stadium was still in the pre-project phase, which was deemed inadequate.

Sofia had one of the poorest bidding dossiers. It was the only city which met neither the Social Responsibility and Sustainability nor the Legal criteria: „The guarantee provided is insufficient and does not meet UEFA's needs. It is, for example, weak on tobacco. The pledge to entirely incorporate all the required dimensions of social

responsibility and sustainability are not backed by the guarantee... The host city agreement has not been signed... The legal section of the bid dossier is considered weak and incomplete. It does not provide sufficient legal comfort" (UEFA 2014).

Jerusalem also presented a dossier where a lot of key information was missing. For example, information about the stadium and plans to renovate it was not provided: „As no significant information has been given regarding stadium capacity and accessibility, this aspect could not be properly evaluated". The Event Promotion chapter presented problems: „The venues presented for the fan zone do not meet the requirements. The guarantee in relation to promotion at the national level and fan zones in non-host cities is unsatisfactory. The city has very limited experience in hosting major events". Lastly, the report pointed out there may be issues with regard to the contracts with UEFA partners: „No clear commitment to supporting UEFA's commercial programme. The risk of not delivering all the commercial partners' rights is high" (UEFA 2014).

Skopje is an interesting case because at the moment it submitted the bid for EURO 2020, its stadium did not meet UEFA standards in terms of minimum capacity, accessibility and parking areas. Nevertheless, it later addressed these issues and was granted the right to host UEFA Super Cup in 2017. The last two cities rejected were Stockholm and Cardiff. Their case has been discussed at length in the press because these two cities had presented very solid bidding dossiers and had, for the most part, fulfilled the criteria set out by UEFA. In the case of Sweden, evaluators pointed out that no large investments were anticipated and raised some question marks about government guarantees: „All agreements have been signed, but eight guarantees have not been provided on the grounds that Swedish public agencies are, by law, not entitled to issue such acts.... The absence of several guarantees could increase UEFA's financial exposure." Not the same could be said about the Welsh bid, where there were no major objections raised in the evaluation report. UEFA settled this issue by choosing Cardiff as the venue for the 2017 UEFA Champions League Final, the largest inter-club event in the world. One possible explanation for rejecting Cardiff is that there were already other British cities hosting matches at EURO 2020 – London and Glasgow (BBC Sport 2014).

Conclusions

Overall, a large part of the evaluation of each association's bid was dedicated to the stadium and the general investments promised in the area. As demonstrated by the very tight race between cities which bid to host the EURO 2020, this has become a very competitive endeavour, where the sums involved grow exponentially from one edition to the next and where coordination between the national football association, city authorities and national government is critical. The benefits of being selected to host such a large event are multiple. Those who have most to profit are national football associations, which can hope to receive a fair amount of the enormous sums of money generated by broadcasting rights, sponsorships (Jeanrenaud 2009) and ticket sales. The revenue generated thus is so great that some authors have come to point an accusing finger at the 'lucrative monopoly' exercised by these non-governmental entities and their influence on a very large, captive audience (Louw 2012).

On the other hand, the benefits of cities and countries are less tangible and some argue that there exists a 'budgetary gap', in the sense that most developments use public funds, yet public authorities receive back only a fraction of the revenues generated (Maenning, Zimbalist, 2013). Of course, there is revenue to be derived from the influx of tourists. An added benefit is that public works contracted with the occasion of the sporting event, such as improvements to transport infrastructure, will remain a local asset for many years after the event (Humphreys, van Egteren, 2013). Other benefits may not be as easily quantifiable, but should not be discounted, either. Mostly, they relate to strengthening the place brand and gaining media exposure. Also, a sense of national of civic pride often accompanies the successful bid to host mega sporting events, as it has done since Classical Greece, when sporting competitions became such prestigious panhellenic cultural events that more and more cities vied for the honour to host them and sought official recognition that their festival was equal in honour with the four most important ones: Olympian, Pythian, Isthmian and Nemean.

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„Potential stakeholders usually rely upon governance elements prior to investing their time, talent, and/or money."
Robert E. Davis