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KNOWLEDGE MANAGEMENT IN MODERN ORGANISATION BASED ON 3RD PLATFORM ICT SYSTEMS

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ABSTRACT

ICT (*Information and Communication Technology*) systems are the fundament of modern economic organisations. They are particularly important for intelligent organisations, for whom advanced ICT infrastructure is the *sine qua non* condition of efficient knowledge management. The purpose of this paper is to discuss the role of modern trends in ICT technology referred to as SMAC (*Social, Mobility*, *Analytics, Cloud*), which are the current canon of computer-aided management processes. These solutions help create new models of organisation functioning on global markets with the use of strategic resources such as knowledge supported with SMAC solutions.

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INTRODUCTION

The functioning of modern organisations in the global economy requires continuous adjustment of management methods and growth strategy to new economic conditions. It is particularly important in the process of digital transformation, which has been changing nearly all business sectors and areas considerably for the past several years. Dynamic development of ICT technologies observed in recent years has popularised the so-called ICT 3rd platform, also referred to as SMAC (*Social, Mobile, Analytics, Cloud*), which provides a peculiar ecosystem of IT solutions that help organisations develop their operations with lower financial investments and maximum scope of impact. The growing amount of data provided by mobile devices, social platforms, Internet browsers, and loyalty programmes creates a new business model based on the information

generated by the economic environment. The right processing of this information is the precondition of achieving business success.

The purpose of this paper is to discuss the nature and increasing importance of SMAC systems in the process of transformation. The discussion is illustrated with the results of the author's own research conducted in the years 2014-2016 in selected companies of the Mazowieckie and Wielkopolskie Provinces compared with the general development trends in this regard. According to a study of Cisco Global Cloud Index, in 2018 half of the global population will have Internet access and over 53% of this population will use cloud data storage tools through mobile devices (Cisco Global, 2014, p. 45).

ATTRIBUTES OF INTELLIGENT ORGANISATIONS

An intelligent organisation bases its philosophy of action on knowledge management (Adamczewski, 2016 b, p. 12; Waltz, 2003, p. 45). This term was popularised in the 1990s due to increasing ICT development, dynamically changing economic environment and growing market competitiveness. An organisation may be called intelligent when it keeps learning, it has the ability to create, acquire, organise, and share knowledge and use it to increase the efficiency of its actions and its competitiveness on the global market. The idea of such an organisation is based on a systemic approach to organisation, which requires treating it as a complex organism based on its existing structures and processes performed with special emphasis on the role of knowledge. In this approach, called by P. Senge the Fifth Discipline, thanks to knowledge and proper tools all elements of organisation and its staff can act together competently in order to accomplish defined goals (Senge, 2002, p. 77). Consequently, the entire organisation functions as an intelligent and successful system in a competitive environment. He explains the interrelations between the methods of accomplishing goals, understanding them, the ways of solving problems and both internal and external communication.

The key attributes of intelligent organisations include (Adamczewski, 2015 a, p. 255; Grösser, 2012, p. 145; Schwaninger, 2010, p. 45; Waltz, 2003, p. 89):

- speed and flexibility of action,
- ability to observe the environment,
- ability of early diagnosis of market signals and reaction to changes in the environment,
- ability of fast implementation of new solutions based on knowledge and drawing economic benefits from this.

The increasing volume of information used in an intelligent organisation increases its importance. It was already Peter Drucker who emphasised that traditional production factors: land, labour, capital are losing importance and are being replaced with a crucial resource for creative functioning of an organisation – knowledge. It is an immaterial resource connected with human action, whose application may be essential for gaining competitive advantage (Schwaninger, 2010, p. 123). Knowledge may be treated as information based in organisational context and the ability of its effective use in the course of the organisation's functioning. It means that knowledge resources are pieces of information on the customers, products, processes, environment, etc. in a formalised (documents, databases) or non-codified (employee expertise) form.

In practice, effective synergy of these elements requires the use of advanced ICT solutions. They exploit both technological and organisational innovations that have appeared in recent years. They concern almost all areas of the organisation's operation, starting from the development of the means of transport and equipment, through organisation and management of material and raw material flow, and finishing on the development of system structures responsible for implementation of business processes.

KNOWLEDGE MANAGEMENT – PURPOSE AND CONCEPTS

Dynamic evolution of ICT and growing competitiveness requirements of the global economy made knowledge the key creativity factor of modern organisations. It constitutes the company's immaterial resources connected with human actions the use of which may create competitive advantage. The term *Knowledge Management* (KM) refers to the process of knowledge identification, acquisition, and use aiming to improve the company's competitive advantage, which is supported by four factors: leadership, organisational culture, technology, and evaluation system (Waltz, 2003, p. 59).

Information and its effective management has become one of the key growth factors of modern organisations functioning in an information society. Advanced ICT solutions play a pivotal role here. Its foundations have been built with A. Toffler's ideas concerning the so-called Third Wave. Dynamic development of ICT and management pragmatics caused that the time paradigm has become equally important as the cost paradigm for economic activity conducted in the information society era. Practical reduction of the time path in cyberspace and leaving geographical boundaries aside have led to considerable acceleration of business processes in the global logistics chains.

The concept of knowledge management appeared in the early 1990s and gained importance during the computer revolution. At the beginning of the 21st century they underwent a fast metamorphosis. At present, there are many different schools and directions in this regard.

The classic approach to knowledge management includes (Schwaninger, 2010, p. 85):

- technocratic approach focusing on the systems of information processing, distribution, reproduction, and protection of knowledge resources, etc.,
- behavioural approach focusing on changing the organisation's philosophy of action and organisational behaviour: strategy, practices, creation of social networks (both external and internal); it uses the term 'intelligent organisations' or 'learning organisations',
- economic approach focusing on the conversion of knowledge to financial resources and the other way round.

It can be said with some simplification that the present research into this notion is based on multiple approaches (with the dominance of the technocratic and behavioural ones). It would be difficult to indicate a 'pure' project exploring the postulates of only one approach. This makes comparisons of projects and evaluation of the effectiveness of specific solutions difficult. Technocratic approaches were often promoted by the companies connected with the ICT industry, and behavioural approaches were usually pro-

moted by consultancy firms. The economic approach was created by consultancy firms, yet certain data on its results is missing. Generally, there are no scientific recommendations for specific solutions and due to insufficient exploration of this issue, each KM project is a certain experiment.

Knowledge Management is a developing discipline with highly diversified character. ICT revolution has had a great impact on the world of business and is still advancing with high dynamics. Companies are facing new challenges, yet the research carried out to date does not allow making explicit recommendations for solving their problems, and therefore most knowledge management projects have an experimental nature. In Poland, the age of fast development of this field has just started.

SMAC SYSTEMS IN A MODERN ORGANISATION

The published sources present two models of adaptation of ICT solutions in organisations (Model biznesu, 2013, p. 44):

- linear model ("ladder"),
- dependency / conditional model ("transporter").

The linear model assumes gradual implementation of ICT solutions by economic organisations divided into stages. This sequence advances in keeping with e-business generations. It has the following stages (Adamczewski, 2016 a, p. 15):

- Internet access (e-mail and web browser),
- company website,
- e-commerce – purchasing and selling online,
- e-business – e-commerce and IT systems optimising the operation of the company,
- forming a network together with other companies (electronic company ecosystems).

The conditional model assumes that implementation of ICT solutions in an organisation is not linear, but depends on two key factors:

- forecasting growth of the organisation,
- expected usefulness of Internet-related technologies.

The fundamental assumption of the second model is that adaptation of e-business does not have to be linear. Certain solutions may be adapted without the sequential procedure preceded by the approval of the organisation's management. It decides on the modification of its structure, taking into account the expected benefits, the company's readiness for changes and the possibility of their implementation, and external factors such as pressure from customers or business partners.

An intelligent organisation, as an economic system using in its internal organisation and communication (both internal and external) advanced ICT infrastructure, is now the basis of functioning of an information society in business areas. In practice it means support of the basic structures of an organisation with IT technology and *on-line* implementation of the *now economy* concept (Adamczewski, 2016 b, p. 420):

- the level of technical infrastructure (equipment),
- the level of system and communication infrastructure,
- the level of application software,
- the level of integration of business processes with external business partners.

Dynamic development of the ICT sector gave rise to a new technological standard represented by SMAC systems, which facilitate implementation of new business models. They are based on four pillars:

1. Social – social networks break the barriers of information flow between people and become platforms that make fast knowledge sharing more and more efficient. Communication through social media platforms is strongly supplanting phone or e-mail communication. This trend is also observed in the world of business, where fast exchange of information is very important. The use of social networks facilitates interaction with customers, so companies may react to problems faster and build up their knowledge base on the basis of user preferences and behaviour. Employees forming a community may exchange experience and interesting content much easier and faster and accelerate problem solving.
2. Mobile – mobile devices such as smartphones and tablets have become a permanent element of our day to day life. They also increased the companies' reach to customers, who got accustomed to shopping and using various portals and applications at any time and in any place thanks to the use of mobile devices. Growing popularity of mobile shopping forced the companies to develop their online marketing channels and make mobile channels available to their customers. In such conditions, presentation of company offer on mobile devices is a method of gaining or maintaining high market position.
3. Analytics – understanding customer behaviour and preferences is one of the biggest advantages of the use of analytics tools. The data collected and analysed by advanced algorithms helps companies conclude how to take care of customer loyalty, improve marketing campaigns, facilitate product development processes, and provide the services that match the customers' preferences and requirements. Thanks to discovering user preferences, companies are able to present the content matching their expectations, among others. The main purpose of the use of analytics tools in business is therefore to take the right decisions on the basis of current and aggregated information.
4. Cloud – cloud computing technology offers tools facilitating efficient collection of information and effective company management. The use of cloud tools helps organisations reduce their ICT costs, overcome geographical barriers, and gain access to data at any time and in any location. A cloud is the factor that brings other SMAC elements together.

In the past, there were numerous cases showing that expectations and the actual benefits of the use of ICT solutions may not tally. This may be caused by insufficient integration of the implemented systems. The key to successful application of SMAC technology is a combination of the four mentioned technologies, which produce the synergy effect by communicating between one another. None of these four technologies produces a full effect on its own. Only the synergy produced by all SMAC elements

working together helps create competitive advantage. Previously, organisations were investing in mobile solutions, cloud solutions, business analytics and business use of social media and created independent solutions, which often did not interact with one another. Combining them in 3rd platform ICT solutions helps create new services generating revenues, deepening relations with customers, and also improving the efficiency of the organisation's functioning.

Thanks to the development of cloud computing and mobile technology a shift from closed communication systems to social platforms occurred (Barry, 2013, p. 45: Mateos, 2011, p. 58). It has changed the system of work and business communication deeply and permanently. Social channels enabled fast content production and sharing, broader distribution of information, and also better cooperation and interaction with customers. Mobile technologies facilitated easier access to information through constant Internet connection. Data analysis is used to optimise customer relations management and increase the efficiency of sales channels. Cloud solutions are the basis of ICT systems in many companies. They increase their flexibility and scalability and help reduce data processing costs.

Organisations that want to maintain their position on competitive market must be ready to deliver their customers fully customised services. Thanks to the development of SMAC, IT technologies no longer only support the growth of business, but are a turning point that gives organisations competitive advantage. SMAC technologies deliver the right information in the right time, which facilitates making the right decisions and effective cooperation both inside and outside the organisation, i.e. throughout the entire cooperation chain.

A peculiar IT ecosystem of an intelligent organisation is usually based on advanced ERP (*Enterprise Resource Planning*) solutions. The traditional concept of ERP systems understood as solutions integrating an organisation's information infrastructure is no longer sufficient. Their basic functionality was enriched by *Customer Relationship Management* (CRM) systems, *Supplier Relationship Management* (SRM) systems, *Supply Chain Management* (SCM) systems and *Product Lifecycle Management* (PLM) systems. Thanks to their functionality, SMAC systems improve the efficiency of providing information required by business processes and ultimately increase market competitiveness of a company. It could even be argued that these solutions are no longer a way of gaining competitive advantage for an organisation, but are a factor determining whether a company will function on the global market these days.

According to IDC forecasts, over the next two years 80% of global companies will be initiated by digital transformation projects concerning knowledge management based on SMAC systems, out of which 50% will be connected with the 3rd platform ICT solutions (Report IDC, 2016, p. 37). The author's own research[1] suggests that the popularity of computer-aided management processes in specific SME areas may be presented in the following way (percentage of surveyed companies) (Adamczewski, 2015 b, p. 11):

- finance and accounting – 82%,
- human resources – 71%,
- warehouse management – 58%

[1] Conducted in the years 2014-2016 on a selected sample of 100 companies from the SME sector in the Mazowieckie and Wielkopolskie Province.

- production management – 19%,
- customer relationship management – 49%,
- office work support – 93% (of which electronic mail support accounted for 98%),
- support of purchasing or sales processes – 54%.

With regard to the use of SMAC solutions, Polish statistics reflect the general global trends, i.e. (Report IDC, 2016, p. 39):

- cloud technology is used in 18% of organisations (38% of the surveyed population plan to implement this solution),
- mobility is used in 29% of organisations (15% of the surveyed population plan to implement this solution),
- analytics tools are used in 9% of organisations (16% of the surveyed population plan to implement this solution),
- already 45% of Polish organisations declare that they use social media, and it is expected that this percentage will increase to 55% in the near future.

The development trends of Polish intelligent organisations undergoing digital transformation are supplemented by their declared present initiatives – c.f. (Report IDC, 2016, p. 77):

- office digitisation – 70%,
- modernisation of ICT infrastructure – 64%,
- consolidation with regard to information and advanced analytics – 49%,
- new mobile applications for the personnel – 49%,
- teamwork – 49%,
- self-service mobile applications for customers – 30%.

This means that modern Polish economic organisations reach for advanced SMAC solutions more and more frequently.

Increasing requirements of intelligent organisations with regard to computer-aided knowledge management generally results from their real time functioning (RTE – *Real Time Enterprise*). To meet them, SMAC systems help increase management efficiency through:

- reaching customers more effectively – thanks to mobile solutions,
- understanding customer needs better – thanks to highly processed analytics systems,
- communicating with customers more efficiently – thanks to the social media,
- reducing data processing costs – thanks to cloud solutions.

OVERVIEW

In the Polish reality, economic transformations and evolution of business relations are the reason of debasement of traditional sources of competitive advantage such as capital, infrastructure, access to various markets, or the quality of offered products and services. To compete on the global markets efficiently, modern organisations must make the organisation's flexibility, its ability to implement innovative business models, and reorganisation of its processes their priorities. Multiple examples of Polish compa-

nies show that the vision of a business entity managed in a modern way has entered a dynamic phase of implementation and that efficient knowledge management has become the ultimate paradigm. The issue of activation of the organisation's reserves through supporting its functioning with advanced ICT systems using SMAC solutions for knowledge management is no longer questionable. It should be emphasised, though, that designing and implementing these intelligent technologies has one basic business goal - to increase growth dynamics and improve the quality of the offered products and services with simultaneous reduction of operating costs. Although it seems obvious, paradoxically the innovation of Polish economic organisations is burdened with fear of the unknown, which deters companies from investing in solutions which are not widely popular yet.

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