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INFORMATION TECHNOLOGIES IN SUPPORTING COMMUNICATION PROCESSES IN HUMAN CAPITAL MANAGEMENT IN AN ORGANIZATION

Summary: All organizations have to deal with more or less efficient implementation of communication processes taking place in different areas of their operation. These processes are carried out often with the support of modern information technology. This article describes the results of a survey conducted on a group of nearly 200 respondents endeavor to identify which of the latest IT solutions are most often used to support communication processes in Human Capital Management (HCM) in employing their organizations. This research are part of the larger study aimed to develop a methodology to implement the latest available information technology to improve communication processes occurring in HCM in an organization.

Keywords: communication processes, HCM, IT solutions.

Introduction

The basic task of IT systems functioning in a modern organization is to support performed processes. There is a view that processes connected with using the potential possessed by people employed in an organization are among the most important ones, and employees create the real capital of an enterprise. Therefore organization managers are looking for tools that would allow them to effectively use the capital possessed by employees. To perform processes that are the most important ones from the perspective of the strategy adopted, many organizations use mechanisms of communication, information exchange and

knowledge management, aspiring thereby to be called knowledge-based organizations. According to this rule, processes connected with an organization's HCM are based on communication, information flow and knowledge distribution. Due to a huge amount of information present in processes connected with HCM, it is necessary for organizations to use the best solutions. This will allow them to improve the processes of searching, acquiring, transmitting, selecting, processing and gathering needed information. Possessed information makes it possible to extract knowledge that is contained in it and use it to take actions that are necessary to implement the HR strategy adopted. HR managers in modern organizations are constantly extending their sets of tools to include increasingly better and more efficient tools to support the management of their subordinates.

The type and range of tools supporting communication processes in organizations is very heterogeneous. However, there is a lack of methods for the unambiguous assignment of the available solutions to processes carried out in different areas of the organization. In such a situation, matching the right tools that should be used to support communication processes carried out in the area of HCM in the organization is difficult. Therefore it is necessary to organize knowledge of the processes of communication in the area of HCM. Create an appropriate methodology allowing the appropriate way to use the latest technical information technology to support the implementation of the communication processes also seems reasonable. The New methodology will allow organizations to optimally exploit the potential of these tools, providing support implemented in the area of HCM processes of communication.

The structure of the article is subordinate to the purpose of research and leads consistently to present the partial results of completed studies. In the first part of the article was taken subject conscious participation of employees in the communication processes taking place in their organization. Much attention was devoted to the influence which is exerted on the perception of information, through the use of modern information technologies. The next section describes the communication processes in the organization and their impact on the implementation of the processes of human capital management. The most important part of the article is a presentation of research results.

1. Ability to communicate – necessary competence of the modern employee

Ability to communicate is one of more important competencies of the modern employee, developed almost from birth. A human being is capable of abstract thinking from the moment of gaining awareness. Thinking allows a human

being to perceive the world in a certain way and understand stimuli coming from the environment. A human being communicates with their environment throughout the entire life using their senses which represent perception channels in processes of information transmission and reception. Communication processes are naturally supported in a human being by inborn ability to see, read, hear, speak, draw and write. Thanks to speech, a human being can communicate possessed information. The ability to write has enabled management of large civilizations since ancient times. Writing is connected with the ability to read which makes it possible to read information written in a form that can be understood by the receiver. Large amounts of data are usually presented in the form of tables or diagrams. Changes occurring in data can be presented in dynamically changing diagrams in the form of animations.

Computer aiding plays a particularly important role in communication processes. A decision-maker's contact with communication processes is both a necessary and common phenomenon. Communication processes represent one of the basic sources of information necessary in decision-making processes. Because of the necessity of gathering and processing huge amounts of data provided by modern IT systems, standard methods and techniques of their presentation by means of numbers and text become ineffective. A solution to this problem at every level of management can be the use of employees' inborn perceptual capabilities [1] supported by computer methods and techniques used in information presentation [2], [3], [4], [5]. Recently, data presentation techniques have become one of the basic tools to support communication processes in an organization [6]. An inevitable development of the possibilities of human senses is the use of IT tools that support naturally occurring perceptual processes. Nowadays, computer systems offer practically unlimited possibilities of supporting processes of communication and information exchange. Particular attention is given to the determinants of selection of optimal methods and forms of communication that ensure proper support of the receiver's perception capabilities with maximum representation of the communication author's vision. As visual perception channels are considered as dominant, most attention is given to communication techniques focused on this sense. Human ability to perceive and analyze analogue images is the basis for using visualization as one of the basic tools for information communication [6]. The second most important perception channel of a human being is hearing, while the third one – touch. The sense of hearing enables reception of information conveyed using voice and sound. However, the most legible and effective way of information transmission is visualization, i.e. presentation of information in the form of static or dynamic images. The effect

of combining two or more traditional forms of communication is multimedia communication, which uses at least two perception channels at the same time (sight and hearing) [7]. It is also possible to use solutions from the field of the so-called virtual reality, which more and more often are applied to support training solutions in medicine or military¹ [8], [9]. This creates premises for the development of techniques designed to support the use of IT tools supporting the different human senses used for information reception.

2. Communication processes taking place in HCM in modern organizations

Many contemporary researchers highlight the importance of communication processes for the fulfillment of the basic functions of HCM in an organization: planning, organizing, motivating and controlling employees [10], [11], [12], [13]. Effective communication is perceived as the foundation of the functioning of modern organizations [14]. It is a process in which employees strive to share meanings through symbolic messages [15]. The sense of the term communication originates from the Latin word "*communis*" (common) which means striving after the state of community, participating in common activities, common conferring, joint decision-making, discussion, sharing with all addressees [16]. All the definitions assume participation of two or more participants in communication processes. In this way, communication creates relationships between the participants of this process. In a modern organization, both people and programs can be participants of communication processes. Information can be exchanged between two employees, between two programs and between an employee and a program. The participation of special programs in communication processes in an organization allows many performed processes to be automated, but nothing can substitute a human being with their capability of abstract and creative thinking. Therefore, a lot of attention is given to supporting all types of communication processes, in particular those in which employees participate. Efficient communication processes have a significant impact on the functioning of individual employees, and consequently on the whole organization [17], [10]. Communication processes are particularly important in HCM, ensuring coordination of employees' behavior in teams and beyond them, making it possible to discuss opinions concerning performed business processes, and making it easier to implement the strategy adopted by an organization [16]. How communication pro-

¹ Examples include training courses held in Norwegian army.

cesses are performed has an influence on employees' attitudes, their actions and involvement (or lack of it) in matters of a given organization [18], [10].

An incorrectly constructed system of communication channels causes difficulties and conflicts between employees. Transmission of incorrect and unintelligible messages leads to incorrect and unintelligible responses.

A well-operating communication system in an organization eliminates internal barriers that disturb processes of information exchange, and makes work more effective and faster. Proper communication makes it possible to: [19]

- stimulate employees' creativity,
- increase employees' effectiveness,
- shape a strong organizational culture which is based on accepted values,
- for managerial staff to concentrate on employees' needs,
- improve the relationships between a manager and subordinates,
- improve the relationships between co-workers,
- increase employees' motivation,
- prepare employees for changes,
- decrease employees' resistance to changes, etc.

Systems of internal communication in organizations are constantly improved and perfected. Almost every modern organizational culture is based on communication. Communication processes are increasingly performed using innovative information and communication technologies, and their participants are mainly employees who are active, creative, enterprising, well-educated, young and not afraid of risk. The use of new methods of information distribution increases the effectiveness of message [20].

3. Research on the use of technologies designed to support communication processes in HCM in an organization

The research on IT tools designed to support communication processes in HCM in an organization which will be discussed in this paper is a fragment of comprehensive research on acquirement, creation and maintenance of human capital in an organization.

Quantitative studies conducted in January and February 2015 by the technique of paper questionnaire interviews (PAPI) on a sample of 196 people from different age groups, with different education and employment relationship show that organizations attach great importance to using IT technologies that improve communication processes. From the sample surveyed, a group of people having

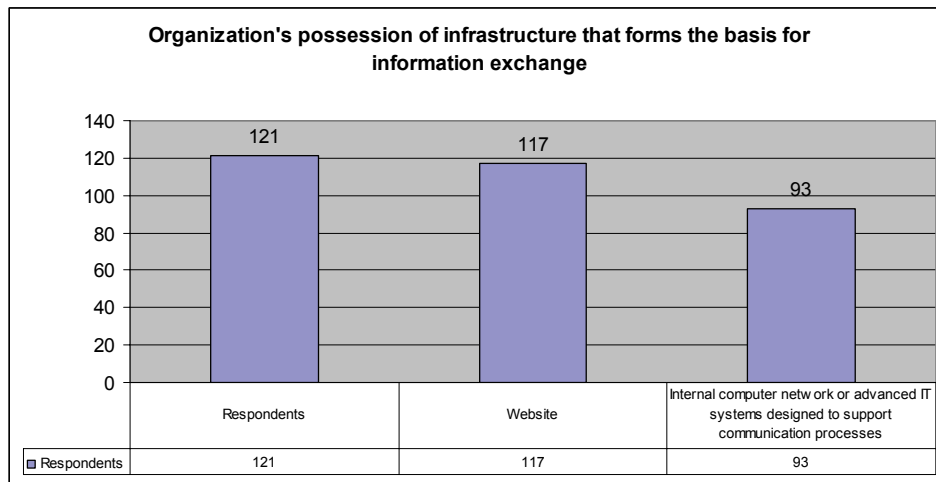
an employment relationship was selected. Of the 196 respondents, 121 people were employed at the moment the questionnaire was conducted, which accounts for 61.73% of the overall number. Although the survey was anonymous, both in the part concerning personal details of respondents, and in the section on details of the employing company, the majority of respondents indicated the name and address of their employer. However, even in cases where respondents were employed by the same employer for their opinions often differ from each other.

Of the 121 employed respondents, the authors selected the research sample, adopting two basic, complementary assumptions underlying information exchange in an organization.

- the use of a website or other service that improves information exchange with the environment, an internal computer network or specialised IT systems;
- possession of mechanisms that ensure a systematic knowledge exchange with the environment beyond the standard procedures connected with exchange of goods and services.

The first group of questions concerned an organization's possession of infrastructure that forms the basis for information exchange (Figure 1).

Figure 1. Organization's possession of infrastructure that forms the basis for information exchange



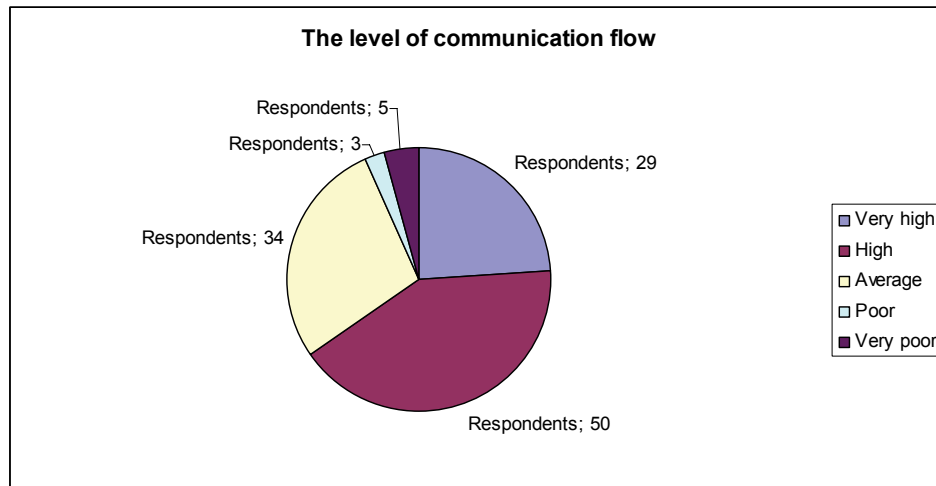
Out of the sample of 121 respondents declaring employment in organizations, as many as 117 people (96.69% of the sample) declared that their employers had a website. While slightly fewer 93 people (77.86% of the sample) declared the use of an internal computer network or advanced IT systems designed

to support communication processes by their organizations. This is an excellent result in terms of possession of communication infrastructure. Unfortunately in other areas, the results were not as promising as far as the use of this infrastructure for communication.

A natural consequence of information gathering and processing is extraction of knowledge contained in it. Almost half, i.e. 56 respondents (46.28%), declared that their organizations had mechanisms in place that allowed knowledge to be acquired, shared and exchanged with their environment apart from performing basic business processes. In the same group, 35 people (28.93%) declared that their organizations had or planned to implement in the near future an agreement to acquire, create or exchange knowledge with other organizations.

The respondents rate the level of communication and information flow in the organizations they represent rather high (Figure 2).

Figure 2. The level of communication flow

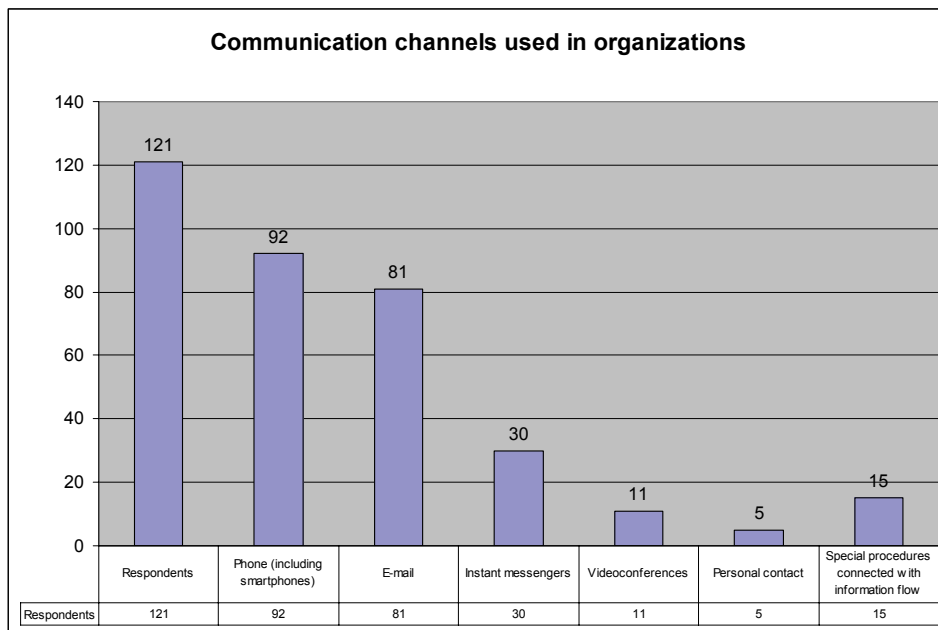


50 people (41.32%) declared high, and 29 (23.97%) very high level of communication processes in their organizations. Only 3 people declared poor, and 5 – very poor information flow. It is not however what is interesting in the results of the research.

At the next stage of the research, respondents were asked about communication channels used in their organizations. Most respondents declared the use of more than one of the channels listed. Noteworthy is the distribution of the use of the different forms of communication in the organizations surveyed. The most popular communication instrument declared by respondents was the telephone –

92 people (76.03% of respondents). This is understandable given the fact that on the one hand the telephone is traditionally used for making calls and sending SMSs, while on the other hand the smartphone is one of more important elements of ubiquitous systems. Modern smartphones, enabling access to the most important Internet communication services, instant messengers or social networks, replace a range of other, bigger devices. Their advantage, combined with information and communication networks, is portability and possibility of connection in almost any place and at any time. 81 respondents (73.55%) declared, that in their organizations information exchange via e-mail is used. 30 respondents (24.79%) declared the use of instant messengers in formal communication processes, while 11 (9.09%) using videoconferences in communication processes. 15 people (12.4%) declared that special procedures connected with information flow had been formulated in their organizations. Only 9 respondents (7.44%), declared the basic (and only) communication channel was personal contact with the interlocutor (Figure 3).

Figure 3. Communication channels used in organizations

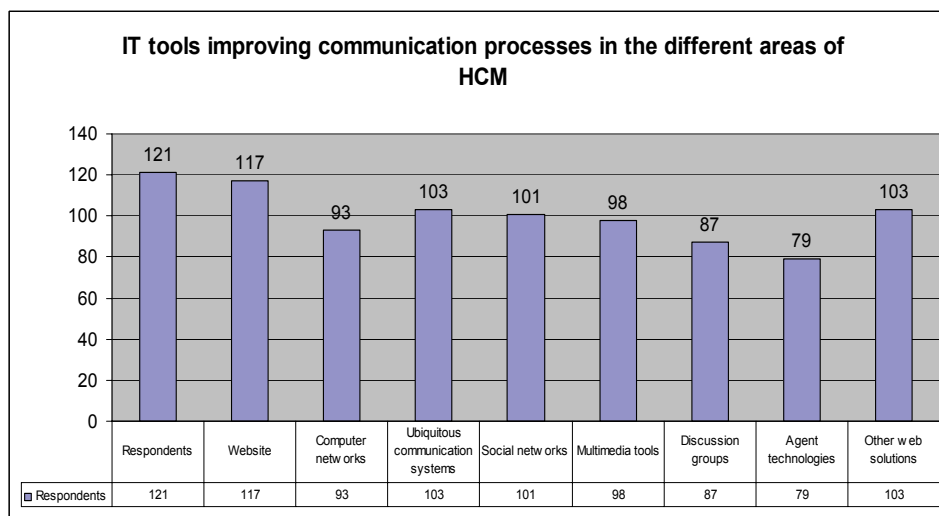


At the next part of the survey, the respondents were asked to rate on a 6-point scale (0 – no opinion, 1 – the lowest, 5 – the highest) the level of using several available on the market IT technologies to improve communication processes in

the different areas of HCM. In most cases, several solutions were indicated. Moreover, importance of the different technologies varied for different areas of HCM. 10 respondents refrained from expressing their opinions about any of the solutions analyzed.

According to respondents, the most frequently used technologies designed to support communication processes in HCM are computer networks and ubiquitous systems, mobile devices using, among other things, WiFi communication, smartphones and other mobile devices operating in 3G and 4G technologies (Figure 4).

Figure 4. IT tools improving communication processes in the different areas of HCM



117 people (96.69% of the sample) declared that their employers had a website. 103 respondents (85.12% of the sample) declaring the use of web solutions by their organizations to improve communication processes. In this group, 93 people (77.86% of the sample) declared the use of traditional internal computer networks in their organizations. Over half, i.e. 63 respondents (52.06%) think that network infrastructure supports information exchange in their organizations to a very large extent.

Similarly 55 respondents (45.45%) attached the greatest importance to ubiquitous communication systems.

Also social networks have a very high position among solutions that support communication processes. Social networks are used by 101 respondents

(90,18%), and in 42 surveys (34.71%) they are among the most important solutions supporting communication processes.

Information exchange in organizations is also supported by multimedia tools. 98 respondents (87,5%) declared their use, with 40 (33.06%) regarding them as very useful.

Next in the ranking came discussion groups, which were used for information exchange by 87 respondents (77,68%) and regarded as very important by 28 (23.14%) respondents.

Agent technologies were the last group of technologies examined in the research described. According to respondents, software agents can provide a significant support in the performance of communication processes in HCM. 79 respondents (70,54%) would declare using such solutions in their organizations. In this group, 36 people (29.75%) described their role was very important. Due to the size of the paper, only summary results of the research were presented. More detailed results were presented, among other things, in works [21].

The questionnaire surveys revealed that according to respondents, the role of advanced IT technologies in supporting the performance of communication processes in HCM in organizations employing them was very significant. Given that some of the solutions (agents, ubiquitous systems, social networks) are relatively new, and academic literature includes only a few papers describing the concepts of selected applications, the results received can be considered as satisfactory. Nevertheless, the above-presented results can encourage researchers to conduct further research on the use of new technologies to support communication processes in HCM. Noteworthy is also the small number of applied agent solutions. Referring to the results of the research described in work [22], [23], in which trends among leading Polish companies producing agent solutions were indicated, a lot of potential applications of such solutions can be indicated. The near future should show how the interests of producers and consumers will be reconciled.

Conclusions

The aim of the paper was to discuss the results of research concerning the applications of IT solutions in supporting communication processes in HCM in an organization. This area is nowadays intensively explored both in research and practice. There are already numerous applications that support information exchange in the different areas of HCM, which will play an increasingly important

role over time. Therefore, there is no end to searching for new, reliable and effective solutions. The advantage gained thanks to them lasts until the competitors start to use the same or better solutions. Usually, it does not take long before that happens.

Based on this foundation it seems reasonable to undertake studies aimed at creating a model of support in the area of communication processes in HCM in organization using modern IT tools. As with any solution that supports processes related to human capital, particular emphasis should be placed on the individual character of the worker. Each person has an unique individual characteristics [24]. As a result of human individuality, we can see differences in perceiving messages by different receivers. This takes place either at the stage of collection of information transmitted by receptors or in the process of inferring [25]. This phenomenon results from the subjective course of the process of perception, meaning that the perception of a specific message can change with a change of motivation and needs of a specific receiver [26], [25]. The factors presented above clearly show the directions of the development of modern communication technologies in HCM.

Computer technologies, telecommunication networks, social networks and ubiquitous systems are being used for an increasing number of applications and at the same time computer programs are becoming more complex. Unexplored areas still exist. For instance, there are no solutions that take into account societies of personal agents that act as intermediaries in information exchange and accompany an employee in his/her career. Research on new communication methods in Human Capital Management Information Systems focuses on human-computer interaction, natural language systems, gesture recognition, image recognition, ubiquitous systems and multimodal interfaces [27]. This justifies the need for better user interface technology. Intelligent user interfaces (IUIs) try to solve human-computer interaction problems by providing new methods of communication and by adapting to the user [28], [29]. Adapting to the user is done by using techniques from artificial intelligence to perform reasoning and learning, for example user modeling and plan recognition. For successful communication within and outside of an organization, it is necessary to use fast and secure information connections. Apart from fast web standards, we are observing a continuous development of wireless networks in the form of new, fast WiFi solutions. At the same time, we can also notice a dynamic development of mobile 3G, 4G telephony. All these factors lead to a change to the construction context of a range of solutions that have been stably functioning, resulting in the creation of a new space in communication processes in HCM in an organization.

With an increasingly fast technological development, the possibilities of such systems will increase, and the number of their applications in the area of communication processes in HCM will undoubtedly grow. New possibilities will emerge, but at the same time we have to be aware of new limitations connected with the development of information and communication infrastructure. In this area, particular pressure should be placed on the development of communication technologies connected with multimedia representation of information.

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**TECHNOLOGIE INFORMATYCZNE WE WSPIERANIU
PROCESÓW KOMUNIKACYJNYCH W ZARZĄDZANIU
KAPITAŁEM LUDZKIM W ORGANIZACJI**

Streszczenie: Jednym z fundamentów funkcjonowania współczesnych organizacji są procesy komunikacyjne zachodzące w różnych obszarach ich działania. Procesy te realizowane są coraz częściej przy wsparciu nowoczesnych technologii informacyjnych. W artykule opisano wyniki badań przeprowadzonych na grupie blisko 200 respondentów, mające na celu określenie, które z rozwiązań IT są wykorzystywane do wspierania procesów komunikacyjnych zachodzących w obszarze zarządzania kapitałem ludzkim (HCM) w organizacji. Niniejsze analizy stanowią jeden z etapów badań, których celem jest opracowanie metodologii zastosowania najnowszych dostępnych technologii informacyjnych w doskonaleniu procesów komunikacyjnych zachodzących w HCM w organizacji.

Słowa kluczowe: procesy komunikacyjne, ZKL, rozwiązania IT.