

Knowledge Management, Including the Cybernetic Theory of Human Character

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Abstract: Man and his functioning in an organization are of interest to specialists in various fields, including psychology, management, but also technicians who, despite the progress in their own disciplines, are not able to effectively solve the problem of human reliability in the process of knowledge management in an organization. The problem is insufficient knowledge about people. On the other hand, the demands placed on employees today are constantly increasing. They are expected to be more and more active, entrepreneurial, creative, and have a higher and higher level of many skills, such as: handling information, interpersonal communication, and making effective decisions. However, can all employees meet these requirements and what factors and mechanisms decide about compliance? These are questions that cannot be answered unequivocally based solely on past professional experience. Correct answers constitute forecasts that allow to predict how individual units will behave in various types of professional situations in the future. These deliberations are complemented and developed by the globally pioneering character's cybernetics theory as described by Prof. Mazur. The aim of the work is an attempt to test, in organizational conditions, the correlation between employees' knowledge and their cyber character, in order to check the compliance between the places occupied in the organization and their individual predispositions (character). The use of the cybernetic character theory, in connection with the elements of knowledge about organization and management, can be a tool for making optimal management decisions. The originality of the work is based on the combination of the cybernetic theory of characters with the mathematical apparatus using C.A. Shannon's information entropy.

Keywords: knowledge management, HRM, adult learning, entropy

1. Introduction

The third millennium brings dynamic changes in the global economy and rapid transformations in all areas of enterprise activity, forcing permanent improvement of the ways of functioning. The problem most companies face is how to deal with the new age of information, the age of knowledge (Turriago-Hoyos et al., 2016). Having knowledge resources, their dissemination and use becomes a strategic factor that determines the competitiveness of a modern organization, and the quick and effective use of knowledge is often a condition for the existence and survival of enterprises (Nowak, 2011). In addition, the uncertainty of the environment means that enterprises must constantly recognize what changes are taking place on an ongoing basis, and even in advance, draw conclusions that justify their own existence and development. In this context, the words of Peter Drucker, one of the most outstanding thinkers and theoreticians of the 20th century management, are still valid: "traditional resources, such as labour, land and capital become more of an obstacle rather than a driving force for the development of a company, and what is a key factor in creativity, in all areas of life, is the knowledge" (Drucker, 2002; 1999). A manifestation of this state of affairs is the development of the knowledge-based economy as a paradigm of sustainable development, stimulating knowledge management (Drucker, 1998).

Knowledge management is based on the assumption that each employee has the knowledge that enables the improvement of the functioning of the organization. The collective wisdom composed of the individual knowledge of employees and their experiences becomes the same resource that can be used and ensure competitiveness in relation to other organizations (Lendzion et al., 2005). An individual, similarly to an organization, has the best chance of surviving on the market only when he/she learns faster compared to the progression of changes in his/her environment (Kianto et al, 2016). The indisputable condition of flexibility are competences, which, according to M. Armstrong, characterize individuals who "meet the expectations regarding the achievement of specific results, are able to use their knowledge, skills and personality traits to achieve goals and standards assigned to their roles" (Armstrong and Taylor, 2016). Against this background, we can see an intensified educational expansion, the consequence of which is the societal awareness of the need for permanent development and the acquisition of a wide range of numerous competences (Supermane, 2018). Only this approach gives the individual a chance of adaptation to a rapidly changing environment – given that the employers' expectations of flexible professional adaptation are projected on employees (to the point of inflicting pressure), are greater today than ever before. (Zgrzywa – Ziemak, 2009). Considering this, changes in

the labour market require adequate developments in the knowledge management of the organizational and professional adaptation of adults. (Knowles et al., 2009). For this reason, it is important to take into account the andragogical perspective, which is the basis of knowledge management (and staff development) in the enterprise. The area of interest of this scientific discipline is focusing on the biological, social, economic and cultural determinants of adult didactics, enabling understanding of the process of transforming the individual's potential into a real ability to function efficiently in all social and organizational roles (Jarvis, 2012). On the other hand, models of an organization that are able to constantly adapt to new environmental conditions and changes in mutual relations are sought (Inken, 2016; Zouaria et al., 2018). And here comes the problem that contemporary organizations grapple with, which is "knowledge escape". Information, knowledge and competences are closely related to specific activities of the company, organizational units or even selected employees, and the rest of the organization has no idea about their existence. As a result, enormous amounts of time and effort are wasted on learning. There are no formal solutions to manage knowledge resources, update and share information about organizational potential. Enterprises do not have mechanisms that would protect against uncontrolled outflow of knowledge (Mierzejewska, 2005). This problem is especially prominent in Polish enterprises. The departure of a key employee is associated with the loss of not only knowledge and experience, but also of the key contacts. Knowledge management should therefore not only aim to protect the organization against such phenomena, but also to guarantee the effective use of intellectual capital and knowledge remaining in the organization, and as a result, improving innovation leading to a competitive advantage. (Grudzewskiego and Hejduk, 2004). Therefore, the most important processes in this understanding of knowledge management will be the systemic transfer of knowledge between employees and management, taking into account the dynamic nature of this process. Such solutions will allow to allocate knowledge resources at the right time and place. This allocation will be also effective from the point of view of professional adaptation.

The aim of this article is to present the proprietary model of knowledge management in the organization, taking into account the nature of employees in terms of cybernetics. The compatibility between professional adaptation and individual predispositions (cybernetic character) were examined. The study was conducted on employees of a company from the construction and installation industry, on a 10-person sample. As part of the research procedure a following thesis was formulated:

T (1): Character testing is an essential element in the knowledge management process.

2. Literature review

To begin with, there are some concepts which need clarification. Namely, knowledge is not the same as information. Knowledge is giving meaning and sense to information and its effective use in practice (Drucker, 1999). Information, in turn, is the basis of both knowledge and innovation (Donate and Pablo, 2015; Costa and Monteiro, 2016). Without information, there is no knowledge. In turn, knowledge in an enterprise can and must be managed (Brdulak, 2005). And so, knowledge management emerged as a response to the need of identification of determinants which influence the productivity of knowledge workers and knowledge-based organizations. This was associated with an attempt to formalize the processes related to the management of intellectual assets in organizations and organizational systems. The idea was to design such work systems where creative, well-educated employees would work efficiently and efficiently (Sahibzada et al., 2020). The year 1987 is thought of as the beginning of the concept of knowledge management. The first conference in the United States entitled "*Managing the knowledge assets into the 21st century*" was held then and the so-called Konrad Group, which initiated research on *intellectual capital management* was established in Sweden (Plvalin and Jylhca, 2017). The concept of knowledge management was developed by Karl Wiig (1997) in the second half of the 1990s, and popularized further by Japanese, Ikujiro Nonaka. In 1995, Nonaka and Hirotaka Takeuchi, published a book entitled *The knowledge - creating Company - How Japanese Companies Create the Dynamics of Innovation*. At present, there are three leading directions in the development of the concept of knowledge management. The first one is a result of research of mentioned Japanese, Nonaka and Takeuchi, who developed the "knowledge spiral" model, which was transformed in later years into a systemic approach to knowledge management. Nonaka and Takeuchi emphasize the importance of using "silent" knowledge (contained in the minds of employees) for the company's success (Nonaka et al., 2000). The second direction developed on the basis of the so-called the resource approach well-known from strategic management, whose main task is the thesis that only the knowledge contained in the so-called key skills or competences can ensure a sustainable competitive advantage, and the long-term development (Kianto et al., 2019;). Finally, the last, third direction of knowledge management development was created on the basis of practical experience of consulting companies (Wenger, 2002). In this model, three knowledge management processes are distinguished: the process of

knowledge codification; knowledge transfer process; knowledge creation process; The creators are T.H. Davenport and L. Prusak (1998).

From the beginning of the concept, the question was whether it was possible to manage something such as knowledge? Knowledge cannot be managed in the classical sense of the word. However, it can be managed to facilitate its creation, transmission and use. Therefore, the term knowledge management is only a general approximation (Dalkir and Liebowitz, 2011; Hejduk, 2005). Unfortunately, it has not been possible to work out a more precise definition so far. There is currently no definition of knowledge management that is generally accepted in both management theory and practice (Chatzoudes et al., 2015). This is due to the great popularity of this category and, as a result, the excess of various concepts and theories.

An effective approach to the issues of knowledge management requires combining the concept of human resources management with process management. For this purpose, it is necessary to examine and monitor the professional adaptation of the staff (Wilsz, 2005). Hence, this research assumed a purposeful study of the professional adaptation of the diagnosed employee resource in the context of the concept of permanent individual personality traits. This concept gives a clear picture of this phenomenon, enables the insight into its mechanisms and its forecasting. The basis of this concept is the cybernetic theory of characters, developed by prof. M. Mazur - a forgotten genius (Pawlak, 2020).

Marian Mazur's cybernetic character theory can be useful wherever tasks should be assigned to employees, who thanks to individual features and predispositions, can perform them best (i.e. in every institution, organization and in every enterprise). In the model of the autonomous system, Mazur distinguished properties that play an important role in the control processes taking place in it. Among them, he distinguished properties independent of environmental influences and rigid properties, which he assigned to the parameters of character. Character was defined as a set of rigid steering properties. Due to the treatment of rigid control properties as parameters of character, it follows that character cannot be processed (Mazur, 1999). According to Mazur's theory, the following character parameters are the most important: width, tolerance, susceptibility and dynamism (Mazur 1999). Susceptibility is the difference between the impassable dynamism and the dynamism closest to the limit of the dynamism of character. This means that a person with freedom of choice will choose situations that fall within the tolerance limits. He/she will be able to deal with forced situations within the limits of his susceptibility.

On the other hand, outside the limits of susceptibility, he will not come to terms with any situation, regardless of the consequences. Thus, tolerance and susceptibility mark the farthest limits of dynamism within which the acceptance of stimuli (ie, the existence of approval sufficient to trigger a decision and a reaction) is possible. Therefore, it is possible to extract a parameter of the character defined as width, which is the sum of the tolerance and susceptibility. Character dynamism refers to how an autonomous system converts energy. Since the dynamism factor changes with time, dynamism is a variable parameter of character. Each person has their own domain (of five types, distinguished and described by Mazur) (Table 1).

Table 1: Manifestations of character dynamism in the cybernetic approach

No.	the domain of character	Characteristics
1	endodynamism	very pronounced negative dynamism
2	endostatism	quite pronounced negative dynamism
3	statism	dynamism close to zero
4	exostatism	quite clear positive dynamism
5	exodynamism	Very clear positive dynamism

Source: Mazur 1999.

Knowing what character we are dealing with in an employee, we can predict the behaviour of a given person and entrust them with tasks that they will perform best. In addition, the forecast of the competency adaptation will become possible.

3. Research methodology

The roots of knowledge management lie in information theory, therefore the analysis of research data was carried out using the C.A. information entropy method. Shannon in reference to the cybernetic character theory of M. Mazur (1976). Measurement of competencies by the entropy method answers the question - whether the employee competency resources at the disposal of a given company have the right structure, are optimally used

in the desired areas and how to translate this information into a useful managerial tool. The method presented in this paper is qualitative and quantitative. This method can be used as an internal tool of the organization and can be integrated with the management information system. As a tool, it can be implemented in any type of enterprise. The stages of the research procedure are presented in Figure 1.

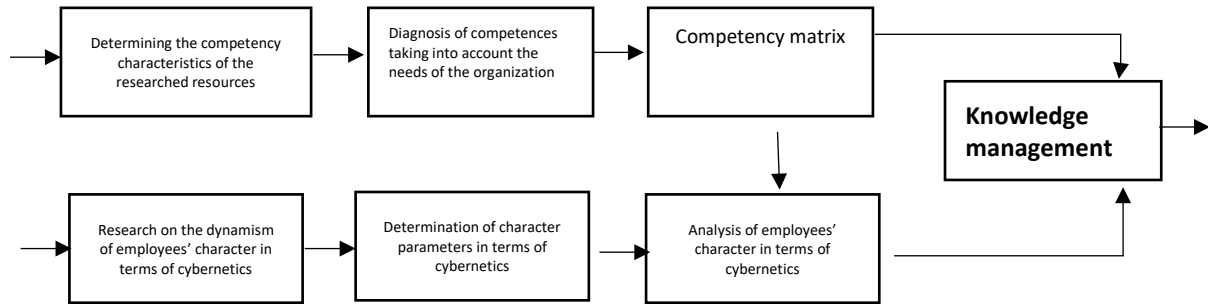


Figure 1: Research model

Source: Author own’s elaborations.

3.1 Examination of competencies as organizational needs

The competency model proposed by T. Oleksyn was used in the study. The model includes 10 competences enumerated according to the specific organizational needs, such as: knowledge, experience and skills, entrepreneurship, professionalism, cooperation, assertiveness, intelligence, discipline, communicating, knowledge.

The level of intensity of a given competence was determined by assigning requirement of each competence a numerical value ranging from <1 to 5>. In the study, the arithmetic mean formula was used. Then the matrix was created. The matrix is a space that reduces the multidimensional nature of competence to two dimensions (Gierszewska and Romanowska 1998), which are competences and their averaged intensities. In the presented matrix (Table 3), the lines are the numerical values of the intensity of competences (in the context of the entire resource). The columns create a competency profile for each employee separately, expressed in numerical values. The obtained competence matrix is the starting point for statistical analysis using the entropy method.

Table 3: Competency matrix: average values of competences

No competence	employee code										
	1	2	3	4	5	6	7	8	9	11	
1	3,57	3,86	3,86	3,71	3,86	3,43	2,29	3,57	3,71	3,86	
2	3,67	3,33	3,33	3,33	3	2,33	2	3	4	4	
3	3,4	3,8	3,6	4	3,2	2,4	2,4	3,6	4,2	4,2	
4	4,67	4,5	4,17	4	3,17	2,83	2,17	4,17	4,5	4,33	
5	4	4	3,5	3	3	3,5	2	4	4	4	
6	4,25	5	4,75	4,5	4,75	3,5	3	4,5	4,25	5	
7	4,67	5	4,67	5	4	4	4	5	5	5	
8	4,67	5	5	4,67	4	2,33	2,67	4,67	4,67	5	
9	4	4,67	4,33	5	4,33	3	3	4,67	4,33	5	
10	4,2	4,8	4,2	4,4	4,2	3,6	1,4	4,2	5	4,8	

Source: Author own’s elaborations

In order to determine the competency characteristics of the researched pool of employees, the entropy distribution was determined for all competencies (Table 4) – according to the following formula:

$$H = - \sum_{i=1}^n p_i \log(p_i)$$

where:

$$P_i = \frac{p_i}{\sum}$$

- the probability of the intensities of all features that make up a given competence

At this stage of considerations, only the mathematical distribution of the assigned numerical values for individual competences is analysed. From that moment on, we do not compare the numerical values of competences assigned to individual employees, but the probability of their occurrence. This will allow them to be assessed according to the probability of their occurrence. On this basis, the diversity and priority of competences are determined.

Table 4: Competency entropy distribution

No competence	employee code									
	1	2	3	4	5	6	7	8	9	11
1	0,092175	0,092766	0,096059	0,093604	0,101626	0,105933	0,095246	0,091806	0,090983	0,091264
2	0,093686	0,084887	0,088028	0,087772	0,087739	0,084616	0,087902	0,082625	0,095101	0,093205
3	0,089539	0,091912	0,092221	0,097778	0,091197	0,08616	0,097859	0,092261	0,097817	0,095896
4	0,107322	0,101326	0,100395	0,097778	0,090688	0,095046	0,092289	0,100436	0,101716	0,097596
5	0,09847	0,094722	0,090694	0,082341	0,087739	0,107102	0,087902	0,098089	0,095101	0,093205
6	0,101902	0,10738	0,107871	0,104468	0,113647	0,107102	0,110662	0,104787	0,098482	0,105784
7	0,107322	0,10738	0,106887	0,110578	0,103662	0,1149	0,127503	0,110901	0,107778	0,105784
8	0,107322	0,10738	0,110859	0,106608	0,103662	0,084616	0,103909	0,106929	0,103836	0,105784
9	0,09847	0,103443	0,102537	0,110578	0,10824	0,098297	0,110662	0,106929	0,099532	0,105784
10	0,101228	0,105021	0,100802	0,103179	0,106472	0,108738	0,07023	0,100843	0,107778	0,103435
Σ	0,997436	0,996218	0,996353	0,994684	0,994669	0,992511	0,984163	0,995605	0,998123	0,997735
%	99,74%	99,62%	99,64%	99,47%	99,47%	99,25%	98,42%	99,56%	99,81%	99,77%
redundancy	0,002564	0,003782	0,003647	0,005316	0,005331	0,007489	0,015837	0,004395	0,001877	0,002265

Source: Author own's elaborations

Entropy as a measure of non-uniformity is a function of a certain sequence of data, which can be expressed as the sum of the products of the probabilities, the occurrence of a given sign and the number of its occurrences in the sequence of data (where $p(i)$ is the probability of occurrence of the sign (i) in a given data set, and the number (i) is the number of its occurrences in this sequence) (Table 5). Unravelling the knowledge linked to the proposed concept is based on the measurement of the uneven distribution of certain competencies in a group of employees. Therefore, we are interested in the numerical determination of the degree of non-uniformity of the distribution of each competency value. Figure 2 presents the distribution of the competency entropy of the researched resource.

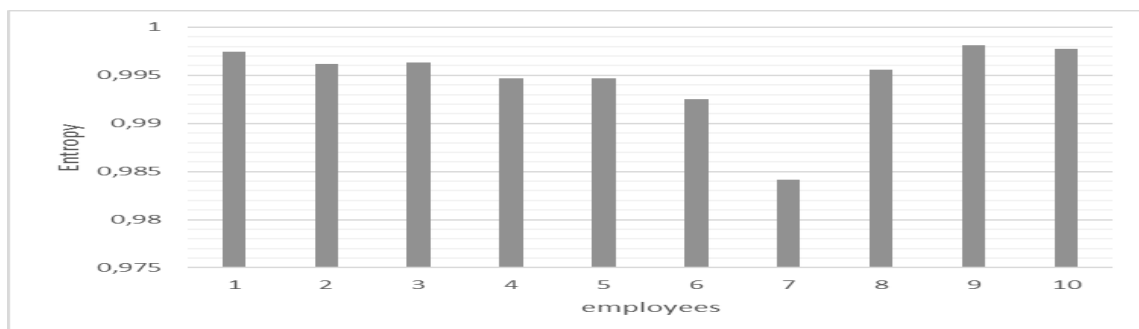


Figure 2: Competence entropy distribution

Source: Author own's elaborations

3.2 Competency matching study taking into account M. Mazur's cybernetic character theory

Mazur's theory gives rise to detailed statements about the influence of individual characters to various situations and phenomena. Knowing them allows for the proper management of representatives of any character. Examples of character manifestations are presented in Table 5.

The study of the dynamism of the character of employees was carried out on 10 employees with the use of a questionnaire of detailed manifestations of the dynamism of characters. The synthetic results are presented in Table 6 and Figure 3. Relative redundancy - $1 - (H / N)$ Relative redundancy (can be expressed as a percentage).

Table 5: Detailed manifestations of character dynamism (selected examples)

No.	manifestations of character dynamism Categories	Exodynamism (A)	Exostatism (AA)	Statisim (B)	Endodstatism (C)	Endodynamism (CC)
1	attitude to the rules	capriciousness - ambivalence	individualism	principle	flexibility	arbitrary extremism -
2	receiving information	gullibility	agility	literal	Suspicion	Distrust
3	deciding (anticipating)	carelessness (impulsiveness)	recklessness (improvisation)	straightforwardness (schedule)	providence (plan)	cunning (program)
... 35	...					

Source: Mazur,1999, op.cit.

Table 6: Summary table of the results of the character dynamism research in numerical form

Employees No.	A/AA	B	C/CC
1	17	6	12
2	11	11	13
3	7	17	10
4	14	13	8
5	11	14	10
6	21	9	5
7	18	5	12
8	18	13	4
10	16	14	5
11	7	22	6

Source: Author own’s elaborations

On the basis of the character dynamism determined by means of the character dynamism test, the character widths (L) and the tolerance (T), and then also the susceptibility (M) were established, according to the formula: $L = T + M$, as independent variables.

The width of the character can be large (broad character) or small (narrow character). Tolerance can be high (tolerant) or low (intolerant). Low susceptibility (hard character), high susceptibility (soft character).

Table 7: Character parameters in the form of calculated entropy

employee number	character parameters					Class of charakter	Description
	susceptibility (M)	Dynamism [log C/A]	Width (L)	Tolerance (T)	Tolerance %		
1	0,034102	-0,151268	0,477121	0,443019	92,85%	Exodynamism	tolerant non-susceptible (hard)
2	0,001393	0,072551	0,477121	0,475728	99,71%	Exzodynamism	tolerant non-susceptible (hard)
3	0,027014	0,196295	0,477121	0,450107	94,34%	Endodynamism	tolerant non-susceptible (hard)
4	0,011675	-0,243038	0,477121	0,465446	97,55%	Endodynamism	tolerant non-susceptible (hard)
5	0,004514	-0,041393	0,477121	0,472608	99,05%	endodynamism	tolerant non-susceptible (hard)
6	0,071614	-0,623249	0,477121	0,405507	84,99%	endodynamism	tolerant non-susceptible (hard)
7	0,04848	-0,176091	0,477121	0,428641	89,84%	endodynamism	tolerant non-susceptible (hard)
8	0,061179	-0,653213	0,477121	0,415942	87,18%	endodynamism	tolerant non-susceptible (hard)
9	0,004514	-0,146128	0,477121	0,435309	99,05%	endodynamism	tolerant non-susceptible (hard)
10	0,041812	-0,505150	0,477121	0,397843	91,24%	endodynamism	tolerant non-susceptible (hard)

Source: Author own’s elaborations



Figure 3: Width, tolerance, susceptibility and dynamism of character

Source: Author own's elaborations

Table 8: Character parameters in the cybernetic approach

employee No.	width	Tolerance	Relative situational entropy*	Relative tolerance
1	0,477121	0,928525	0,997429 <1	1,074208 >1
2	0,477121	0,99708	0,996204 <1	0,999121 <1
3	0,477121	0,943381	0,99634 <1	1,056137 >1
4	0,477121	0,97553	0,994656 <1	1,019606 >1
5	0,477121	0,99054	0,994641 <1	1,00414 >1
6	0,477121	0,849903	0,992454 <1	1,167726 >1
7	0,477121	0,898391	0,983908 <1	1,095189 >1
8	0,477121	0,871774	0,995586 <1	1,142023 >1
9	0,477121	0,99054	0,998119 <1	1,007651 >1
10	0,477121	0,912366	0,99773 <1	1,093563 >1

Source: Author own's elaborations

Thanks to tolerance a person is able to distinguish situations which agree with his/her character from all possible situations. Table 9 contains linguistic descriptions of matching the diagnosed cybernetic character parameters of the employees with the organizational situations.

Table 9: Linguistic description of the match of "characters" to the organization

Employees No.	Description
1, 3-10	Organizational situations are within the breadth but exceed the tolerance range – not agreeable with the character and only because of the susceptibility these are sometimes accepted by the employee. Actions depend on the pressure exerted, and the pressure is adjusted to the resistance
2	Organizational situations are within the tolerance of the employee and are agreeable with his/ her character, these are the situations he is striving for, so all pressure will be unnecessary in this case.

Source: Author own's elaborations

Based on Table 9, we can see that among the researched human resources, only employee No. 2 shows an optimal fit to the organizational function. Other employees do not perform tasks in the organization in accordance with their individual predispositions, therefore their allocation in the organization is not optimal.

4. Discussion

The lack of understanding of the breadth of character and its components is, as a rule, a source of harmful and at least unnecessary friction in human relations based on the dependence of one people on another. The underlying cause of this friction is that superiors most often unconsciously treat subordinates as if they had an unlimited breadth of character ($L = 1$). And which relies solely on the susceptibility of $L = M$. According to this principle, superiors exert pressure on them to cause a specific behavior of their subordinates, and by applying sufficient pressure they believe that it can cause any behavior of the subordinate. The mistake of such a belief results from the failure to distinguish between the following types of situations: 1) situations within human

tolerance are compatible with the character of a person - these are situations that a person strives for (practicing a beloved profession, studying his favorite discipline, etc.), any pressure is unnecessary here, because without it, a person takes actions in accordance with his character and even greater than the required one. 2) the situation within the width of the character, but exceeding the tolerance range, is inconsistent with his character and only thanks to his susceptibility they are sometimes accepted by him, in such situations his actions depend on the pressure applied, adjusted to the resistance. 3) situations that do not fit into the breadth of a person's character, are contrary to his character, he cannot be forced to take actions causing his opposition and all pressure is ineffective; in fact, managers hate such situations, about adapting work to character, they don't want to hear, they follow the principle where there is no pressure, no steering, and where there is no steering, managers are superfluous. Therefore, when a subordinate's work gives him pleasure, his supervisor is dissatisfied, he starts to think about how to make this work difficult for him, e.g. by making excessive demands; interfering with the details of work, subjecting a subordinate to meticulous control, setting unrealistically short deadlines for completing tasks, or finally assigning to work unpleasant for the employee; all this tends to provoke resistance from the subordinate and then the use of pressure becomes justified. the supervisor regains his well-being, so his person has become indispensable to the organization.

The research procedure was completed by a comparative analysis of the "characters of employees" (linguistic version) - Table 9, with the organizational needs presented in the table in terms of the best fit to organizational needs.

References

- Armstrong M. and Taylor S. (2016), *Zarządzanie zasobami ludzkimi*, Warszawa Wolters Kluwer.
- Brdulak J. (2005), *Zarządzanie wiedzą a proces innowacji produktu*, Oficyna Wydawnicza Szkoły Głównej Handlowej, Warszawa.
- Chatzoudes, D., Chatzoglou, P. and Vraimaki, E. (2015), "The central role of knowledge management in business operations: developing a new conceptual framework", *Business Process Management Journal*, Vol. 21 No. 5, pp. 1117-1139.
- Costa, V. and Monteiro, S. (2016), "Key knowledge management processes for innovation: a systematic literature review", *VINE Journal of Information and Knowledge Management Systems*, Vol. 46 No. 3, pp. 386-410.
- Dalkir, K. and Liebowitz, J. (2011), *Knowledge Management in Theory and Practice*, MIT press, Cambridge.
- Davenport T. and Prusak L. (1998), *Working Knowledge. How Organisations Manage What They Know*, Harvard Business School Press, Boston 1998.
- Donate, M.J. and de Pablo, J.D.S. (2015), "The role of knowledge-oriented leadership in knowledge management practices and innovation", *Journal of Business Research*, Vol. 68 No. 2, pp. 360-370.
- Drucker, P. (1999), *Spółeczeństwo postkapitalistyczne*, PWN, Warszawa
- Drucker, P. (2002), *Managing in the next society*, New York, NY: Truman Talley Books.
- Drucker, P. (1999), "Knowledge-worker productivity: the biggest challenge", *California Management Review*, Vol. 41 No. 2, pp. 79-94.
- Drucker, P.F. (1998), "Management's new paradigms", *Forbes Magazine*, Vol. 10 No. 2, pp. 98-99.
- Gierszewska G., Romanowska M. (1998), *Analiza strategiczna przedsiębiorstwa*, PWE, Warszawa [in:] Lenzion J. P. and Stankiewicz – Mróz A. (2005), *Wprowadzenie do organizacji i zarządzania*, Wolters Kluwer Kraków.
- Grudzewski W.M. and Hejduk I. (2004), *Zarządzanie wiedzą w przedsiębiorstwach*, Difin, Warszawa.
- Inkinen, H. (2016), "Review of empirical research on knowledge management practices and firm performance", *Journal of Knowledge Management*, Vol. 20 No. 2, pp. 230-257.
- Jarvis P. (2012), „Globalizacja, wiedza i uczenie się przez całe życie”, *Teraźniejszość – Człowiek– Edukacja*, 2(58).
- Kianto, A., Vanhala, M. and Heilmann, P. (2016), "The impact of knowledge management on job satisfaction", *Journal of Knowledge Management*, Vol. 20 No. 4, pp. 621-636.
- Kianto, A., Shujahat, M., Hussain, S., Nawaz, F. and Ali, M. (2019), "The impact of knowledge management on knowledge worker productivity", *Baltic Journal of Management*, Vol. 14 No. 2, pp. 178-197.
- Knowles M.S., Holton E.F., Swanson A.R. (2009). *Edukacja dorosłych – podręcznik akademicki*, Warszawa Wyd. Naukowe PWN.
- Mazur, M. (1999). *Cybernetyka i charakter*. Wyższa Szkoła Zarządzania i Przedsiębiorczości im. Bogdana Jasińskiego w Warszawie.
- Mazur, M. (1983). Homeostaza społeczna [in:] Pecherski M. and Tudrej J., *Procesy samoregulacji w oświacie. Problemy homeostazy społecznej*. PWN.
- Mazur, M. (1981), „Zagadnienie prawdy w nauce”, *Zeszyty Naukowe Stowarzyszenia PAX*, 1(30), 79–92.
- Mierzejewska B. (2005), "Społeczności praktyków. Efektywne tworzenie i wykorzystywanie wiedzy w organizacji", *E-mentor* 1/18.
- Nonaka, I. and Takeuchi H. (1995), *The knowledge creating company*, Oxford University Press.

- Nonaka, I., Toyama, R. and Konno, N. (2000), "SECI, Ba and leadership: a unified model of dynamic knowledge creation", *Long Range Planning*, Vol. 33 No. 1, pp. 5-34.
- Nowak A.W. (2011), *Podmiot, system, nowoczesność*, Wydawnictwo Naukowe Instytutu Filozofii UAM, Poznań.
- Wachowiak P.(ed.) (2005), *Pomiar kapitału intelektualnego przedsiębiorstwa*, Oficyna Wydawnicza SGH, Warszawa.
- Oleksyn T. (2017), *Zarządzanie kompetencjami. Teoria i praktyka*, Wolters Kluwer, Warszawa.
- Palvalin, M., van der Voordt, T. and Jylhca, T. (2017), "The impact of workplaces and self-management practices on the productivity of knowledge workers", *Journal of Facilities Management*, Vol. 15 No. 4, pp. 423-438.
- Sahibzada, U.F., Cai, J., Latif, K.F. and Sahibzada, H.F. (2020), "Knowledge management processes, knowledge worker satisfaction, and organizational performance", *Aslib Journal of Information Management*, Vol. 72 No. 1, pp. 112-129.
- Supermane, S., Tahir, L.M., Ahmad, J., Ali, M.F. and Udin, A. (2018), "The development of knowledge management competency model", *International Information Institute (Tokyo). Information*, Vol. 21 No. 3, pp. 895-906.
- Turriago-Hoyos, A., Thoene, U. and Arjoon, S. (2016), "Knowledge workers and virtues in Peter Drucker's management theory", *SAGE Open*, Vol. 6 No. 1, pp. 1-9.
- Wenger E., McDermott R. and Snyder W. (2002), *Cultivating Communities of Practice. A guide to managing knowledge*, Harvard Business School Press.
- Wiig, K. (1997), "Knowledge management: an introduction and perspective", *The Journal of Knowledge Management*, Nr 1, September.
- Wilsz J., (2009), *Teoria pracy. Implikacje dla pedagogiki pracy*, Impuls, Kraków.
- Wilsz J. (2005), *Właściwości sterownicze osób wykonujących zawody prawnicze pożądane ze względu na efektywne funkcjonowanie zawodowe* [in:] Plewka C., *Edukacja, tradycje, rzeczywistość, przyszłość*, Oficyna Wydawnicza CDiDN, Szczecin.
- Wyrozębski P., (2009) „Modele kompetencyjne w zarządzaniu projektami”, „E-mentor” nr 2(29), Warszawa.
- Vinas-Bardolet, C., Torrent-Sellens, J. and Guillen-Royo, M. (2018), "Knowledge workers and job satisfaction: evidence from Europe", *Journal of the Knowledge Economy*, Vol. 1 No. 2, pp. 1-25.
- Zgrzywa – Ziemak Z., Kamiński R. (2009), *Rozwój zdolności uczenia się przedsiębiorstwa*, Difin, Warszawa.
- Zouaria M.B., Dakhli S.B. and Zouari M.B (2018), "A Multi-Faceted Analysis of Knowledge Management Systems", *Procedia Computer Science* 138 (2018) 646–654.
- Pawlak A, (2020) "The forgotten Genius. Prof. Marian Mazur and the Polish School of Cybernetics", *E-Mentor* 5/87 Warszawa.