

Knowledge Exchange in the Context of Remote Work: Generation Z Perspective

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Abstract: The key element of knowledge management is that all knowledge, both explicit and tacit, accumulated by an organization becomes easily accessible to each of its members. This is important for decision-making processes and allows the organization to become more agile. In the literature there is an increasingly common attitude that more attention should be paid not only to the technological but also to the human aspect of knowledge management. The processes of knowledge exchange among employees have been subject to extensive research and studies, yet the recent years have added another thread to the discussion about the matter, i.e. a significant proportion of employees switching to the online work model. The aim of this article is to demonstrate how issues of knowledge exchange and learning influence preferences in choosing the form of work in the future. Based on the findings of the studies conducted on a group of employees representing Generation Z, the Principal Component Analysis (PCA) technique was applied to organize the factors with the highest relevance for the respondents in online work. Cluster analysis was used for segmentation purposes. PCA demonstrated that the components recognized as most important were those relating to knowledge transfer and their impact on employee efficiency, and on the other hand employee relations as a factor that supports the learning processes. Cluster analysis proved that learning and knowledge exchange opinions have an impact on the form of work preferences.

Keywords: Learning, Knowledge Exchange, Remote Work, Generation Z

1. Introduction

The knowledge resources of the organization and its members constitute the heart of the organization's functioning. However, this potential can be used and used up to build a competitive advantage only when it is diagnosed, located, developed and multiplied through permanent exchange. Knowledge is currently treated as a type of enterprise resources and therefore an element that is subject to management rules to the same extent as other organizational resources. The characteristic features of knowledge according to G. Probst, S. Raub, K. Romhardt (2004, p.26) are that it is: ordered, complex, context-dependent, dependent on the person using it and is reflected in behavior models. However, this division does not take into account the remaining basic universal principles of knowledge, namely:

- knowledge is born and located in the minds of people;
- sharing knowledge is based on trust;
- new technologies create new knowledge exchange behaviors;
- knowledge sharing must be supported and rewarded by the organization;
- knowledge exchange initiatives must be implemented in a planned manner, with quantitative and qualitative evaluation metrics defined;
- knowledge and innovation are the result of creativity, which should be encouraged and developed in many unusual and unconventional ways.

There are two basic knowledge management strategies: a strategy based on codification and personalization. The first one assumes the use of computer techniques as a basic tool for acquiring, processing and storing knowledge. This approach is characterized by a high level of centralization of knowledge management. The second type of knowledge management strategy is based on the assumption that knowledge is closely related to the person who possesses, processes and shares it. The main goal of this strategy is to create an appropriate organizational climate that favors direct contacts between organization members.

The aim of this article is to demonstrate how issues of knowledge exchange and learning influence preferences in choosing the form of work in the future.

2. Theoretical Foundations of the Issue

According to the concept of I. Nonaka, R. Toyoma (2007), people do not acquire knowledge passively; they interpret it and adapt it to their own situation and perspective. Referring to the personalization strategy in the field of knowledge transfers (which will be the research assumption of this study), we focus on individual

employees, their characteristics and mutual relations that favor or limit knowledge flows (social capital, human capital, intellectual capital) and on intra-organizational factors (tangible and intangible) that support these processes (i.e. IT systems, physical work environment, human resources management, project management, etc.).

The basic division of knowledge that can be found in the literature on the subject (Akhmadi & Tsakalerou, 2022; Bloodgood & Chen, 2021; González-Ramos et al., 2023) is the division into explicit and hidden, as well as declarative and procedural knowledge. Declarative knowledge, most often in an explicit form, is knowledge of the "I know what" type, while knowledge of a procedural and tacit nature is knowledge of the "I know how" type. Explicit and declarative knowledge, due to its verbalized nature, has existed in organizations for a long time and is subject to management processes. Tacit and procedural knowledge and methods of its transformation towards explicit and declarative knowledge are currently attracting greater attention of researchers.

Therefore, one of the key elements of knowledge exchange is the transformation of unnamed knowledge (which is "owned" by each employee) into named knowledge. This is a necessary process so that tacit knowledge can be passed on. It is in the process of transforming tacit knowledge into accessible and back into tacit knowledge that organizational knowledge is created. In this approach (identified with the Japanese approach (Nonaka & Takeuchi, 1995)), we treat the organization as a living organism - knowledge "must be felt", it must be experienced, it cannot be acquired only through education and training. Western companies believe that the organization is a machine serving only for processing information and knowledge and not for generating knowledge. The result of this approach is the assumption that only available knowledge is important, which is communicable, ordered and formalized in the form of hard data, scientific formulas and universal principles. According to the Japanese approach, knowledge should be treated differently. It is believed that knowledge expressed in numbers and words is just the tip of the iceberg. The most important is hidden knowledge, difficult to notice and verbalize. This is individual knowledge, difficult to formalize, based on the subjective participation of intuition and premonitions. It results from individual action and experience and is deeply hidden in individual ideals, values and emotions. Tacit knowledge can be understood in two dimensions (Hau et al., 2013):

- technical - know-how (often people who have it cannot express it based on scientific and technical principles) and
- cognitive – composed of patterns, mental models, beliefs and perceptions that are so deeply rooted that they are taken for granted.

Taking into account the above, knowledge exchange in the context of remote work can be understood in two ways. Adopting a codification approach, this form of work does not pose major obstacles to locating, storing or even creating knowledge, information processes and learning. However, if we analyze the problems of knowledge exchange from the perspective of the personalization approach (and this is the approach shared by the author of the study), remote work creates numerous obstacles to the exchange of knowledge between employees, their development and, consequently, effective work.

These regularities are confirmed in the publications of Kucharczyk (2023) based on "The Economist". Many publications, especially those created during the pandemic and earlier, raised the advantages of remote work, basing their conclusions on the publication by Emanuel & Harrington (2020), which emphasized the increase in productivity and efficiency among employees working remotely compared to stationary employees. These opinions expanded their circles of popularity even in the face of the fact that the same authors, in their subsequent publications based on more accurate and detailed data (Emanuel & Harrington, 2023b, 2023a), revised their views, pointing to opposite conclusions, which was also confirmed by research (Atkin et al., 2023; Gibbs et al., 2022). The cited research results emphasize, among other things, that remote communication is not conducive to solving everyday matters at work, and teleconferences are only an imitation of office meetings (Szombathelyi et al., 2023). In remote work, the coordination of many processes takes longer, becomes more complicated, formalized and therefore less effective. Remote work causes stagnation in development, both professional and social (Yarbrough & Ramos Salazar, 2023). According to Emanuel et al., (2024), people working on-site acquire the skills needed to effectively perform their duties more quickly.

The discussed issues gain additional value if employees representing the youngest generation of employees are taken as a reference point. For representatives of this generation, communication tools used in remote work dominate over the form of direct communication (Zeer et al., 2021). Through them, young employees build relationships, learn, acquire knowledge and share it. It should be noted, however, that for representatives of Generation Z, knowledge is sometimes identified with the category of information (Szymkowiak et al., 2021). Interestingly, for this generation, knowledge is not a competitive good (Albrychiewicz-Słocińska, 2022;

Bloodgood & Chen, 2021). However, the research results draw attention to the fact that in relation to Generation Z, there may be problems related to the exchange of knowledge understood as learning and teaching others (Sekala et al., 2023), which may result from different generational characteristics, including the values they profess, attitude towards work and expectations towards it, and adaptability to the work environment (Maloni et al., 2019; Cresnar and Nedelko, 2020; Chillakuri, 2020; Barhate and Dirani, 2021; Snieska et al., 2020). Noteworthy are the lack of competences in naming and expressing knowledge, which is tacit knowledge and often not realized by the employee himself, i.e. deficiencies in social and communication skills (Hegade & Shettar, 2022; Steyn et al., 2020). The above-mentioned competence deficiencies undoubtedly disturb their efforts to acquire professional experience early, engage in various types of activities, including volunteering, and believe in the need to build social capital, i.e. a network of contacts (Sidor-Rządowska, 2023, p. 31).

3. Methodology

The research results presented in the study are part of a quantitative survey on "Managerial aspects of remote work management", carried out among young people working remotely, representing Generation Z. The most popular division in the literature assumes that Generation Z includes people born after 1995, although some researchers sometimes include among its representatives those born in 1990, and in others only those who were born in 2000 and later (Dreyer & Stojanová, 2022; Skýpalová et al., 2023; Urick et al., 2017).

Due to the fact that there is no statistical data on the number of people representing Generation Z, the size of the population of people working in Poland in the age range of interest to researchers (15-34 years of age) was established at 4,802,000 people (GUS, 2022). For the population estimated in this way, with the following statistical assumptions: fraction size: 0.5; confidence level: 95%; maximum error: 5%, the size of the research sample was set at 384 people.

The study was carried out using quantitative research methods, using the CATI (Computer Assisted Telephone Interview - 50% of respondents) and CAWI (Computer Assisted Web Interview - 50% of respondents) techniques in December 2022. The study covered young people from Generation Z whose experience of remote work lasted at least year 2022.

The research tool used is a standardized questionnaire consisting of 57 closed statements and 8 questions regarding the socio-demographic characteristics of the respondents. A Likert scale was used for the responses (Kaczmarek, 2013), which allows determining the relative intensity of different responses (Babbie, 2004, p.192). The research tool (questionnaire) is original and was prepared by members of the research team - employees of the Department of Applied Sociology and Human Resources Management, Faculty of Management, Częstochowa University of Technology.

In the process of developing the research results, the principal component analysis (PCA) method was used, which is one of the most popular statistical techniques used as part of factor analysis, used in the area of analyzing respondents' behavior and attitudes (Pupelis & Šeinauskienė, 2023). The analytical procedure in the principal components method is described in the literature on the subject, especially in the field of psychological and social research methodology (Capecchi et al., 2023; Lloyd et al., 2023; Okóń, 1968). The use of principal components analysis requires variables measured on an interval scale, but it can also be used for measurements carried out on five- and seven-point ordinal scales (Sagan 2004, p. 89).

Cluster analysis was used for segmentation purposes. The cluster analysis method, also called feature and object segmentation, is an example of an analysis consisting in searching for and extracting clusters from data, i.e. groups of similar objects. Correctly performed cluster analysis allows for dividing the data set into groups in order to better understand the information contained therein and to determine the properties of groups of similar objects and their synthetic characteristics. (Korzeniewski, 2012, p. 5). However, the idea of cluster analysis (Zakrzewska, 1994, p. 21) is to divide a set of objects or variables into classes without a pre-existing external criterion. Both statistical methods were implemented using the STATISTICA program.

4. Research Results

According to the principal components analysis algorithm presented earlier, 57 variables were analyzed. The scale used in the responses was as follows: 1 - I completely disagree, and 5 - I completely agree. Four questionnaire validity procedures have been used: content (Rossiter 2008), face (Czakov 2014), construct (Cronbach and Meehl 1955) and nomological (Czakov 2014) ones. The scale reliability was validated using Cronbach's alpha that is a measure of internal consistency ($\alpha = .970019$). The correlation analysis was preceded

by an assessment of the values of the obtained descriptive statistics, in particular the standard deviation. In both conducted measurements, standard deviation values other than zero were obtained for all variables. Based on the correlation analysis, two low-correlated items were eliminated from the set of 57 statements: "remote work leads to a feeling of isolation" and "remote work places emphasis on written communication (e-mails, text messages, etc.)". There were few statistically significant correlations for these variables. The obtained values of the KMO index = 0.968 (Kaiser-Meyer-Olkin) and the Barlett's Test of Sphericity (result close to zero) for 55 variables allowed a positive decision to be made regarding the possibility of using principal components analysis to explain the structure of the correlation matrix.

After performing the scree test and using the Kaiser's eigenvalue criterion, 7 factors (components) were isolated, which explain a total of 72.23% of the variance (Table 1).

The analysis of the main components allows us to conclude that the opinions on remote work expressed by Generation Z employees, in relation to the conducted study, can be reduced to seven dimensions, the first two of which: (1) "knowledge, information and efficiency" and (2) "relationships and learning" refer to the issue of knowledge exchange in the context of efficiency and the social work environment. The first factor explains as much as 45.54% of the variance and the next factor 11.71% of the variance. The substantive construction of factors in terms of scale test items took into account both variable contributions, based on correlations, and common variable resources, based on correlations.

The remaining isolated factors, which do not provide such important information, are: (3) formal/task communication, (4) work-life in the context of time commitment, (5) work comfort and feedback communication, (6) stress-producing/disruptive elements and (7) professional development and work-life elements.

Table 1: Eigenvalues

Factor No	Eigenvalues (correlations), related statistics			
	Eigenvalues	% of total Variance.	Cumulative Eigenvalues	Cumulative %
1	25,05095	45,54719	25,05095	45,5472
2	6,44129	11,71143	31,49224	57,2586
3	2,63789	4,79617	34,13013	62,0548
4	1,74604	3,17462	35,87617	65,2294
5	1,50683	2,73969	37,383	67,9691
6	1,30544	2,37353	38,68844	70,3426
7	1,03688	1,88524	39,72533	72,2279
...
55	0,07432	0,13513	55	100

Source: own work

Chart 1 shows factor loadings, i.e. correlations between primary variables and principal components. The correlation coefficients have values in the range [-1;1] and are distributed within the so-called unit circle, also called correlation circle (Stanisz, 2007, p.192-193). The further a given point is from the center of the circle, the higher the correlation of a given variable with a given principal component. As can be seen from the presented graph, most of the variables are negatively correlated with the first component, in the case of the second component, some of the variables are positively correlated, some negatively. The angles between the vectors representing the studied variables indicate that these variables are correlated, acute angles (vectors located close to each other) indicate a positive correlation, a right angle (perpendicular vectors) indicates a lack of correlation, and obtuse angles (vectors on opposite sides of the center of the correlation circle) indicate a negative correlation. Analysis of the correlation circle reveals high correlation of variables.

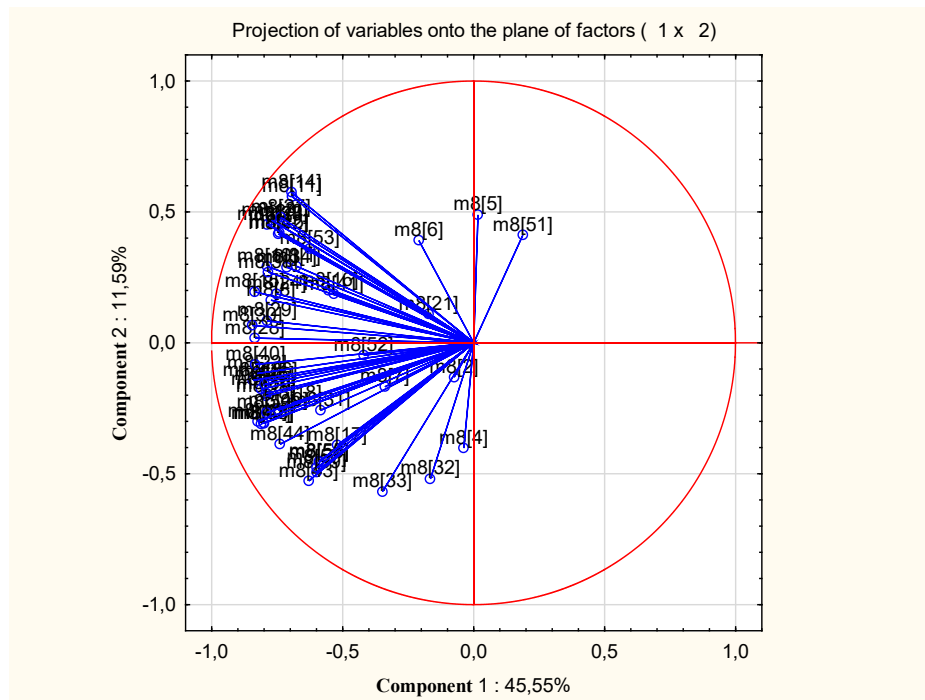


Figure 1: Correlation circle for components 1 and 2.

Source: own work

In the next step of the statistical analysis, representative variables were selected for individual components based on the highest values of factor loadings, i.e. the variables that had the greatest impact on individual components were selected. In relation to these variables, the cluster analysis method was used to diagnose how the respondents' attitude to individual dimensions of remote work influenced their preferences in choosing the form of work in the future. The cluster analysis carried out using the Ward method using percentage inconsistency as a distance measure led to the identification of three clusters of respondents with the characteristics presented in Table 2.

Table 2: Respondents profile.

Cluster	Form of Work* %	Components** %						
		1	2	3	4	5	6	7
1	34,4 H	98,9	74,2	89,3	63,4	89,2	67,7	84,9
	25,8 R	(4)+(5)	(4)+(5)	(4)+(5)	(4)+(5)	(4)+(5)	(4)+(5)	(4)+(5)
	39,8 S							
2	63,2 S	27,9 (3)	83,1	87,5 (5)	43,4	70,6	72,8	44,9
	22,1 H	50,0	(1)+(2)		(1)+(2)	(4)+(5)	(1)+(2)	(4)+(5)
		(1)+(2)						36,8
3	55,1 S	58,9	48,0 (3)	26,0 (3)	47,5 (3)	28,5 (3)	44,3 (3)	49,4 (3)
	29,7 H	(3)		63,9		42,4 (4)		
				(4)+(5)		26,6 (2)		

*H- hybrid, R-remote, S- stationary

** Scale: I fully disagree (1), I rather disagree (2), Neither (3), I rather agree (4), I fully agree (5)

Source: own work

Group 1 - in this group, as the only one, almost 26% of respondents reveal that the preferred form of work in the future is remote work, although the remaining respondents distributed their declarations in similar proportions in relation to hybrid and stationary work. Interestingly, this group is the only one with such a high percentage expressing positive opinions on the issue of access to knowledge and information, shaping employee relations and learning, similarly to the other components.

Group 2 - in this group, the vast majority of respondents declare their willingness to provide work in the future in a stationary form, and 22% - in a hybrid form. Respondents from this group mostly represent a negative

attitude towards the opportunities offered by remote work in terms of the flow of knowledge and information and their impact on efficiency and the possibility of shaping employee relations and learning.

Group 3 - this is a group that, similarly to group 2, declares to undertake full-time and hybrid work in the future, with a slightly greater share of the latter. This group is characterized by an ambivalent attitude towards most of the defined dimensions, including components 1 and 2.

5. Discussion

The survey results reveal that among employees with experience of remote work, this type of work is not the most frequently mentioned form of work in the future. This debunks the myth regarding Generation Z employees, for whom the use of modern technologies at work seems natural and obvious, and that they are much better suited to remote work (Albrychiewicz-Słocińska, 2022). It seems that the dominant preferences of young respondents in terms of stationary and hybrid forms of work should be associated with the importance of organizational learning (i.e. exchange of knowledge, information and learning) and employee relations presented in the study.

Table 3: Kendal's tau correlation index

Variable	Kendal's tau correlation $p < .001$ for components						
	1	2	3	4	5	6	7
Form of work	-0,201751	-0,223657	0,067872	0,023048	0,011060	-0,149418	-0,136288

Source: own work

An element that brings additional interpretive value to the results of the conducted analyzes is Kendall's tau correlation coefficient (an indicator recommended for examining the relationships between variables expressed on a Likert scale, the value is between -1 and 1 (Błażejczyk-Majka, 2018)), which shows numerous connections between components, however with a raised p (for $p < .001$) provides insight into strong relationships only between selected components (Table 3). The areas of knowledge, information and efficiency and relationships and learning have the strongest influence on the preferred form of work in the future. However, the minus sign next to all correlation coefficients draws attention to the direction of the correlation, according to which it should be interpreted that the worse the respondents rated individual dimensions of remote work, the more often they moved towards stationary or hybrid work.

These principal components analysis factors explain 57% of the total variance. This is confirmed by research (Dreyer & Stojanová, 2022; Hegade & Shettar, 2022) which emphasizes the importance of personal contacts and direct communication along with the related skills (Hans et al., 2023).

The importance of organizational knowledge exchange is also confirmed by the results of cluster analysis. It seems that the respondents from the first group, who were the only ones who indicated potential interest in remote work, based their preferences primarily on positive opinions regarding the exchange of knowledge, information and learning. In the remaining groups where these opinions were neutral or negative, remote work did not appear as a preferred form of work in the future. Therefore, organizations should particularly analyze the processes of organizational learning in relation to Generation Z employees, so that they meet the expectations of these employees.

6. Conclusions

The conclusions drawn by the author of the study from the analysis of the research results are positive. The analyzed group of young people with experience in remote work, not forced due to the pandemic, but chosen consciously and voluntarily, appreciates the importance of knowledge and information in the context of increasing their own effectiveness and learning in connection with building personal relationships. Therefore, even representatives of the youngest generation of employees understand how important direct contact with other people and their knowledge is. Such transfer of knowledge allows for a faster learning process, adaptation of knowledge to the requirements of organizational practice and verification of the acquired information without leading to information overload. The presented attitude of young employees towards the issue of knowledge and learning creates a platform for intergenerational knowledge transfer, which should undoubtedly be of interest to both researchers and practitioners, with particular emphasis on HR department employees.

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