BUSINESS PERSPECTIVES

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RELATIONSHIP OF GENERATIONS X, Y, Z WITH NEW COMMUNICATION TECHNOLOGIES

Abstract

At present times, the impact of new technologies on job creation is going to be a serious problem in personnel management. In the human resources contents, this issue still remains in minor attention. As a result of new communication technologies development in the near future, we will be facing too many changes in working patterns and demands on staff regarding job requirements. Simultaneously with the above stated changes on labor market, a new generation of workers is emerging that grew up with the development of communication technologies, they profess different lifestyle from the one the generations have had before. Many of these generations become employers and bring new approaches to employment of people being different from traditional working patterns. Despite the facts being alleged in this study, it is difficult to estimate to what extent those changes will affect Slovak labor market. Gradual development of technologies is an ongoing process in Slovakia as well and in four years robotics is to be a key technology in most manufacturing plants mainly in automotive industry. Currently, three generations are present on labor market that may have a different approach to changes being implemented nowadays. In this study, the authors analyze the survey results on the use of communication technologies by Generations X, Y, Z, and their abilities to be prepared for changes on labor market. Survey provides interesting information about the access of different generations to communication technologies and their relationship with technical innovations.

INTRODUCTION AND THEORETICAL BACKGROUND

We live in a period of time that is very dynamic and full of change. As a result of new technologies development in the near future, we are expecting many changes in working patterns, requirements for workers and job creation. Human beings will work in greater interaction with machines; it is assumed that the communication will take place within the interaction of a machine and a human being (Michelacci, Pijoan, & Mas, 2016).

Industry 4.0 Initiative, having been introduced in Germany, focuses on digitization, atomization and manufacturing connectivity and it aims to create smart factories. Investments into digitization industry in 2020 will exceed 700 billion Euros. It is expected that the added value should be at least 20% of increase in productivity and 15% of savings. The aim is to increase flexibility of production, to eliminate the possibility of errors and the human labor to be automated as much as possible. Industry 4.0 brings up an entirely new model, in which the production and non-production parts of organization will be interlinked. This model will put entirely different requirements on holders of jobs, as well as the creation of new jobs will pass through significant changes.

The vision of Industry 4.0 will have a major impact on required qualifications on labor market in general, while the social aspects of these impacts will need to be taken into consideration. These effects would lead to new work organization principles, to a change in the role of employer, changes in the structure and job description for most professions, completely new skills will be required, the impact of changes on employment and unemployment will be reflected and new labor market and education policies will be required as well (Marik et al., 2015; Kordos, Krajnakova, & Karbach, 2016).

A survey among more than four thousand small and medium-sized enterprises in all industry sectors in five countries – USA, Germany, China, India, Brazil – examining the links between the successful adoption of technologies and performance of businesses has revealed that regardless of the home country, entrepreneurs who had adopted new technology very soon have increased their annual profit by 15% faster than their competitors. Moreover, they have managed to create jobs twice as fast as other small businesses (Werngrem, 2015; Alexopoulos & Cohen, 2016).

Although the Industry 4.0 Initiative has generated a big response at industrial sites, despite the fact that this issue is closely linked with the labor market area, authors in human resource management hardly pay any attention to it. Currently they are focusing in particular on the issue of unemployment (Rievajová, 2015), migration (Divinský, 2007; Divinský, 2005; Vojtovič & Blunt, 2014) or problems in human resource management (Šikýř, 2014; Koubek, 2015; Armstrong, 2007; Španková & Gullerová, 2015).

Current trends in research are focused on solving partial problems, but do not reveal the context within the Industry 4.0. It is necessary that this issue should be seen more complex, far too much more context should be assessed than it has been customary before. In the near future, we expect a significant change in the ways of job creation and employment particularly in the context of significant technology replacement by human labor and changed workforce requirements. According to the World Economic Forum Report (WEF), published in January 2016, large advanced and emerging economies can expect to lose more than 5 million of jobs.

Gradual robotics is going on in Slovakia as well. Up to four years in the country particularly robotics is to be a key technology in most of the factories involved in the production of automobiles and parts, however, in the following years, not only the automotive industry will be affected. It is expected that robots will start replacing waiters, taxi drivers (Singapore), and people working in customer centers, call centers, banks, post offices (Germany). Pioneers in so-called smart factories implementation will be automotive industry firms, which make up a significant part of a total production in Slovak Republic. Even currently, in Volkswagen Slovakia a new aerial platform is being built up, which will have only 250 employees compared to the aerial platforms existing in this company where about 2500 employees work nowadays.

1. GOAL AND RESEARCH METHODOLOGY

Regarding these issues in the period of June-October 2016, we made a survey on the use of new communication technologies by Generations X, Y, Z. The questionnaires were distributed electronically; they contained 13 questions being answered by 366 respondents. According to the statistics of web pages, where the questionnaire was placed, 678 visits have been recorded. The questionnaire was completed by 78.7% of respondents through direct link and by 21.3% of respondents via Facebook. The time required to complete the questionnaire was approximately 1-2 minutes. Within all responses, the Generation Z (people born in the period of 1995–2020) representing 8.7% of respondents was the least represented, followed by Generation Y (born 1982–2000) comprising 50.3% of respondents, and Generation X (born 1961–1981) comprising 41% of respondents. The main goal of this study is to clarify the relationship of different Generations to innovations in communication technologies.

Despite the facts being presented in this study, we do not know to what extent those changes will affect Slovak labor market, to what extent they will affect the job creation and demand on labor, education system, socio-economic processes in society and economic growth. Currently on labor market there are three Generations, which may have a different approach to the changes being implemented.

Based on the objective, we have arranged the following research questions:

1. The variety of applications being used depends on the Generation.

2. The multiple mobile phone functions being used depends on the Generation.

3. The information about Industry 4.0 has been captured mostly by younger Generations.

4. Regular interests in technical innovations are shown by younger Generations.

5. The replacement of human labor by machines can be observed rather by younger Generations.

6. Information on humanoids and their use has been received rather by younger Generations.

To verify the research questions we used a statistical method – ANOVA test, which is used to test the correlation of two or more mean values (median) of independent files. It examines the impact of qualitative factors on the resulting quantitative traits, that is, the relations between the characters are being analyzed. The analysis of variance principle is the variability decomposition:

- variability being explained (between groups);

- variability being explained (residual, respectively, within groups).

On the one hand, the ANOVA test is mixing the measurements/results of inquiring from all groups and calculates the total variability, regardless of any impact factor (a measure of variability is shown by parameter SStotal). On the other hand, the ANOVA test will transfer the same for the each group. It will find out the variability within the groups and will make a sum of them per individual group what makes us to obtain the parameter of error variability – SSerror. The difference between the total variability and error is then expressed by the factor being examined as follows:

$$SSfactor = SStotal - SSnoise.$$

For values SStotal, SSerror, afterwards, the average variability MS will be calculated:

$$MS = SS / DF.$$

In the next step, the value F (impact factor) will be calculated as follows:

$$F = MSfactor / MSerror \text{ (the ratio of factor and error impacts).}$$

If F is "small" it means that the views of generations are so fragile that a small difference between the diameters is not to be taken seriously.

If F is "large", it means that the views of generations are different just minimally and the fluctuation of average views is large to such an extent that they should be taken seriously.

The P-value is a quantitative indication expressing to which side (depending on the value F) we are inclined to.

If the P-value is less than 5% the null hypothesis is to be rejected. It means that everything is induced mainly by an error and the factor impact is considered as adopted, i.e. alternative hypothesis is to be accepted.

If the P-value is more than 5%, the null hypothesis is not to be rejected and the impact factor is considered as proved.

We will use the Excel program features to calculate the parameter P:

$$P = FDIST (F; DF \text{ factor; } DF \text{ error}).$$

2. RESULTS OF THE SURVEY

The first research question has been set as follows: "I use the following number of applications".

Regarding this question, we have chosen the null hypothesis: The use of applications depends on ranking the Generations to the category of X, Y or Z.

The obtained data were processed in the form of a pivot table.

Table 1. The obtained data

Question 1	X-detected	Y-detected	Z-detected
Never used	10	8	0
1-5 applications	64	60	8
6-10 applications	50	62	14
11-20 applications	22	36	6
21 and more applications	4	18	4

Table 2. ANOVA test results

Source	DF	SS	MS	F	P
Factor	2	2545.6	1591	3.454	0.0653
Error	12	5160	1801		
Total	14	7705.6			

Based on the executed calculation, we note that P-value = 0.0653, that is, 6.53%. We do not reject the null hypothesis. It means we do not reject the hypothesis that the differences among Generations X, Y and Z are just "apparent" and are not caused more by error than by Generations themselves. We can conclude that the variety of applications being used is related to different Generations. This is obviously due to the use of cell phones and the relation of particular Generations to the applications being used. Since, in the near future, the workforce will be required to use a variety of applications, this finding is considered as substantial and probably it would be necessary to perform a more detailed research on this issue. We accept the alternative hypothesis that there is the influence of Generation upon this issue.

The second research question has been set as follows: My cell phone I use for. Based on that, we have chosen the null hypothesis: The use of several functions in cell phone depends on the particular Generation X, Y or Z.

Table 3. The obtained data

Question 2	X-detected	Y-detected	Z-detected
Making calls	12	0	0
Making calls + taking pictures	34	28	6
Making calls + social networking	16	16	2
Making calls + social networking + others	88	140	24

Table 4. ANOVA test results

Source	DF	SS	MS	F	P
Factor	2	3182	1591	0.8832	0.4464
Error	9	16211	1801		
Total	11	19393			

Based on the executed calculation, we note that P-value = 0.4464, that is, 44.64%. The null hypothesis therefore is to be rejected even if it is getting close to 50%, thus we do not reject the hypothesis that the differences among Generations X, Y and Z are just "apparent" and they are not caused more by error than by Generations themselves. We accept the alternative hypothesis that the influence of Generation upon this question does not exist, however, the additional prove will be also necessary on this research question.

The third research question has been set as follows: I have heard about the Industry 4.0. Based on that, we have chosen the null hypothesis: Information about the Industry 4.0 has been captured mostly by younger Generations.

Table 5. The obtained data

Question 3	X-detected	Y-detected	Z-detected
No	132	158	32
Yes	18	26	0

Table 6. ANOVA test results

Source	DF	SS	MS	F	P
Factor	2	6364	3182	0,6071	0,6006
Error	3	15722	5240,6		
Total	5	22086			

Based on the executed calculation, we note that P-value = 0.6006, that is, 60.64%. The null hypothesis therefore is not to be rejected, thus we do not reject the hypothesis that the differences between Generations X, Y and Z are just "apparent" and they are not caused more by error than by Generations themselves. We accept the alternative hypothesis that the influence of generation upon the question under examination does exist. In this case, the interesting finding was the answer of Generation Z that none of the respondents has stated that he or she would be aware of this kind of information.

The fourth research question has been set as follows: I am interested in technical innovations regularly. Based on that, we have chosen the null hypothesis: The regular interest in technical innovations is shown by younger Generations.

Table 7. The obtained data

???	X-detected	Y-detected	Z-detected
No	34	48	10
Partially	94	100	18
Yes	22	36	4

Table 8. ANOVA test results

Source	DF	SS	MS	F	P
Factor	2	4242	2121	2.3618	0.1751
Error	6	5390	898		
Total	8	9632			

The fifth research question has been set as follows: I can imagine that human labor will be replaced by machines. Based on that, we have chosen the null hypothesis: Replacement of human labor by machines can be imagined mostly by younger Generations.

Based on the executed calculation, we note that P-value = 0.1751, that is, 17.51%. The null hypothesis is to be rejected, but we do not reject the hypothesis that the differences between generations X, Y and Z are just "apparent" and they are not caused more by error than by Generations themselves. We accept the alternative hypothesis that the influence of a Generation upon the particular

issue does not exist. The interest in technical innovations can be caused by individual approach by particular members of Generations and indeed it may not be related to age.

Table 9. The obtained data

Question 5	X-detected	Y-detected	Z-detected
No	22	42	8
Partially	90	102	20
Yes	38	40	4

Table 10. ANOVA test results

Source	DF	SS	MS	F	P
Factor	2	4244	2122	2.4731	0.1646
Error	6	5148	858		
Total	8	9392			

Based on the executed calculation, we note that P-value = 0.1646, that is, 16.46%. The null hypothesis is to be rejected, however, we do not reject the hypothesis that the differences between Generations X, Y and Z are just "apparent" are not caused more by error than by Generations themselves. We accept the alternative hypothesis that the influence of Generation upon this particular issue does not exist.

Sixth research question has been set as follows: I've heard about humanoids and their usage. Based on that, we have chosen the null hypothesis: The information on humanoids and their usage is being disposed by younger Generations.

Table 11. The obtained data

Question 6	X-detected	Y-detected	Z-detected
Yes	90	74	4
No	60	110	28

Table 12. ANOVA test results

Source	DF	SS	MS	F	P
Factor	2	6364	3182	4.5916	0.1221
Error	3	1386	693		
Total	5	7750			

Based on the executed calculation we note that P-value = 0.1221, that is, 12.21%. The null hypothesis is to be rejected; however, we do not refuse the hypothesis that the differences between Generations X, Y and Z are just "apparent" and are not caused more by error than by Generations themselves. We accept the alternative hypothesis that the influence of Generation upon this particular issue does not exist.

CONCLUSION

We live in age where constant changes interfere into all areas of our living. Changing environment in which businesses exist is changing the demands on management quality in almost every area where business operates. Human factor and quality of its operating is one of the most important factors affecting the success or failure of a company in competitive environment.

As a result of changes that constantly take place and have forced new features to economic and social environment of companies, it has been shown that the quality of human resources and options how to use them while setting business development strategy and its implementation is becoming a crucial element for the success of an enterprise (Ližbetinová-Hitka, 2016). It is mainly about achieving a high degree of flexibility, responding to changes and adapting to new requirements and conditions in corporate strategies.

The environment in which we live is strongly influenced by new technologies and techniques, as well as new applications implementation. Because of that, requirements on labor force, especially its abilities, skills and flexibility, are about to be changed. At the same time, within the entry of new Generation into labor market also labor requirements on employers are being changed (Tiruneh & Štefánik, 2014). A new Generation grew up in an environment that is strongly influenced by implementation of new communication technologies and, therefore, the way of life and value orientation of young people is changing rapidly (Valter, 2013). As a current tendency, there are becoming issues such as not to work for one employer the whole life and the trend of independence. This means that the potential talents are becoming employers themselves and are creating new competitive environment with new flexible management methods compared to the outdated thinking of some corporate executives. This trend affects, but in the future it will affect more the labor market situation even. We can say that high-quality labor force will actually become an advantage, especially for those who offer interesting working conditions, while it will not be only about the salary, but especially it will be about the relationship of an employer to employees.

International management experience shows that the critical factors about which company is to reach top level or standard level of performance or which company would not succeed in economic competition are the result of organization's management capabilities to work effectively with human resources. What matters is the ability to form human resources in ways that ensure the use of intellectual potential and creativity of people in favor of achieving company´s objectives. This process involves the staff formation, its abilities and skills, as well as using such management tools that ensure a high level of quality and performance of all employees in businesses through effective motivation and high management level of all processes. It turns out that traditional approaches to management in global and multicultural environment become ineffective, and the area undergoing major changes is the area of human resources and accesses to human resources management. In our research, we tried to find out the differences among particular Generations and their access to technical innovations.

We dare to say that probably the influence of Generations in relation to required skills will not be as big as is widely being expected. Rather it will be about a capacity to learn and adapt to the new conditions of job creation and the new requirements that employers will make demands on labor (Katane, Baltusite, & Katans, 2016). Skills such as communication, technical literacy, learning ability and creativity would become key requirements in new conditions being brought by the fourth industrial revolution.

ACKNOWLEDGEMENTS

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