Organisational factors influencing the application of age management

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Keywords
Age Management, Quantitative research, Logit Model, Organisation, 50+ Employees

Abstract

There are currently significant differences in the approach to various age groups in many fields of human activity. Due to the global demographic trend of an increasing age of population and growing number of people in the 50+ category, it is necessary to adopt measures that take age into account on the social level and also in the process of organisational management; these measures are collectively referred to as age management. The aim of this paper is to identify and evaluate factors on the organisational level that influence the application of age management in organisations. The partial objective is then to determine the impact of these organisational factors. The data was collected through quantitative research, specifically a survey among n = 549 selected organisations in the Czech Republic. The results show that significant factors influencing the application of age management include the sector in which the company operates, size of the organisation and majority ownership. The article provides the formula for a logit function that can be used to determine the probability of various scenarios of the application of age management in organisations. The article is focused on organisational factors influencing the application of age management in practice to build the employer's good brand and to attract knowledge workers.

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First submission received: 6th May 2018
Revised submission received: 21st August 2018
Accepted: 12th November 2018

Acknowledgement
This contribution was supported by the Internal Grant Agency of the University of Life Sciences Prague (CIGA) No. 20171001, "Assessing the quality of instruction in the selected field at the Faculty of Economics and Management of the Czech University of Life Sciences Prague".

1 Introduction

Processes of systematic stereotyping and subsequent discrimination against or differentiation of people based on their biological characteristics (race, gender, age) regardless of their abilities manifests itself, from the sociological perspective, in lessened opportunities in various aspects of human life, including employment. Race and gender-based discrimination has a broad range of manifestations mainly on the individual level; thanks to the legal environment of democratic states, it is effectively suppressed on the institutional level. Chronological age or age group, however, as a characteristic that changes over time causes various differentiations on both the individual and institutional level mainly in the form of perceived qualitative inequality between the individual stages of human life, leading to stereotyping and discrimination (Vidovićová, 2005).

Age stereotypes are general ideas about the characteristics of a certain age group that often do not correspond to reality (Štorová, 2012). They are only based on the chronological age of a person and guide the expectations of specific persons or groups of people concerning the behaviour of the members of a specific age group. According to Vidovićová (2005), stereotypes lead people to think the behaviour of members of a certain age group is more homogeneous than it really is. Stereotypes arise from our innate need to assign specific characteristics to various objects and phenomena in order to help us sort and process information and relatively quickly understand our surroundings. It is important to emphasize that chronological age alone says very little about a person's characteristics, abilities and other attributes,

as confirmed by the research of Němec, Surynek (2014), Angeloni and Borgonovi (2016) or Tošnerová (2002).

There is currently significant variation in the approach to various age groups in many fields of activity of different organisations and in different geographic parts of the Czech Republic and Europe, as discussed in the research of Štorová (2012) or Principi, Fabbietti (2015). Higher chronological age is perceived as a positive differentiator for example in the education and health sectors where people of a higher age tend to have more knowledge that is essential for these particular fields. On the other hand, higher age increases the risk of failure for example in emergency or security services which require strength and physical ability that is reduced in advanced age (Ilmarinen, 2011).

The term ageism was coined in the USA in the 1960s. According to Vidovićová (2005) and Denzinger; Backers, Job, Brandstätter (2016), ageism is understood as discrimination on the basis of age caused by prejudice, discriminatory practices and institutional policies (Butler in Vidovićová, 2005) and applies to all age groups (Štorová, 2012; Collien, Sieben, Müller-Camen, 2016).

Ageism does not always have to be socially negative, as there is also positive ageism which leads to the establishment of teams with significant age differences. Štorová (2012) and Angeloni and Borgonovi (2016) note that age discrimination may be difficult to recognize, as it may be part of our everyday thinking and behaviour and the people who discriminate by age do not have to be aware of it. Discrimination is not only an individual process but may also be present in society as whole – for example in laws, organisational culture, culture in general, speech or art. Research by Hagenstad, Uhlenberg (2005) and Denzinger, Backers, Job, Brandstätter (2016) also points out that wherever there is a lack of significant and meaningful interactions between various age groups, there is a substantial risk of ageism on both the level of organisations and the social level. On the other hand, in environments where members of various age groups work together, age stereotypes and prejudice are relatively efficiently reduced (McNair, Flynn, 2005; Collien, Sieben, Müller-Camen, 2016).

In summary, ageism entails a broad range of processes and actions on the level of individuals, groups or organisations, which is why there still is no consensual definition that would cover this dynamic phenomenon in all its varieties and define its boundaries.

The significance of ageism (age discrimination) as a phenomenon on the individual and organisational level is becoming more pronounced due to the global demographic trend in which the average age of the population is shifting and the number of persons in the 50+ category keeps growing. Because the labour market is differentiated by age and because age determines the overall time spent by an individual on the labour market, it also influences the position of people of various age groups on the labour market. This means that efficient utilization of the potential of all persons on the labour market should be the key strategy of human resources management in organisations, requiring the adoption of corresponding measures (Wiktorowicz, 2013). One of the possible measures could be taking age into account on the social level and also in the process of organisational management, together referred to as age management. This phenomenon is also significantly affecting the retail sector, which is according to CZ-NACE classification second largest economic activity by number of employees (Czech Statistical Office, 2017).

The aim of this paper is therefore to identify and evaluate factors on the organisational level that influence the application of age management in organisations. The partial objective is to determine the impact of these organisational factors.

2 Research Methodology

The analysed primary data was obtained through quantitative research, specifically an online data-collecting questionnaire in organisations across various sectors of the economy in the Czech Republic (according to CZ-NACE). The sample was selected using the ALBERTINA database of organisations. Albertina is a unique database with important data about more than 2,700,000 organisations registered in the Czech Republic. Further data about the organisations was obtained from the AMADEUS database (financial indicators). The final sample consisted of 549 organisations, selected intentionally to match the fields of activity of business entities in the Czech Republic according to the Czech Statistical Office following these criteria:

- Sector of the economy: 20% from the primary, 20% from the secondary, 60% from the tertiary sector.
- Size of the organisation based on the number of employees: 60% from small, 20% from medium-sized, 20% from large organisations.
- The structure of organisations that took part in the survey was as follows:
- Sector of the economy: 19.9% primary, 20.2% secondary, 59.9% tertiary sector;
- By size of the organisation based on the number of employees: 53.2% from small (under 49 employees), 25.5% from medium-sized (50–249 employees), 21.3% from large organisations (250+ employees);
- By the ratio of women and men: in 29.0% of organisations, there are more women than men, in 24.4% organisations the ratio is balanced (50:50) and in 46.6% of organisations, there are more men than women.
- Employing foreigners: 93.8% of organisations mainly hire Czech employees, in 4.0% the ratio between foreigners and Czechs is balanced (50:50) and only 2.2% of organisations employ more foreigners than Czechs;
- Employing persons with disabilities: 39.3% of organisations employ people with disabilities, 60.7% of them do not.

Representativeness on the sample based on selected criteria (size of the organisation, sector of the economy) was verified with the Chi-squared test ($\chi 2$ test) (Urbancová, Hlavsa, 2014) which determined that the distribution of various types of businesses in the sample does not significantly deviate from the distribution according to CZ-NACE. The selected sample picked from the basic set can therefore be considered representative because it corresponds to the proportion of selected types of organisations in the basic set. The results can be generalized for the selected sample, analyzed for absolute and relative frequency, used to test hypotheses (using parametric and non-parametric tests) and examined using multi-dimensional statistics.

In each organisation, we only contacted one respondent. The respondent who filled out the questionnaire on behalf of the organisation had to be a manager (to whom at least one person reports), e.g. a human rights manager, the person who is in charge of HR management in the organisation, a line manager, company owner or another person on the middle and higher levels of management in the organisation.

The questionnaire was distributed over the internet using an online tool; respondents received e-mails asking them to fill in the questionnaire on the provided link. Online questionnaires and tools creating these questionnaires are currently used not only by individuals, but also for surveys implemented by organisations. The online questionnaire also included a glossary of terms used in the questionnaire, an introduction letter and a note of thanks for taking part in the survey. Each questionnaire also provided information about how the research is performed and how its results will be used.

Following the recommendations of Hendl (2012) and Hebák (2015), the evaluation of the results employed several tools used in descriptive statistics, namely absolute and relative frequency as well as the $\chi 2$ test; if the calculated p-value was below the significance threshold $\alpha = 0.05$, the null hypothesis was rejected. Strength of the correlation was then determined using Cramér's V and interpreted in accordance with the categories described by De Vaus (2014).

Hendl (2012) states that in research, it is common to encounter two (or more) values of variables that have to be analysed to determine whether an observed phenomenon occurs under the given conditions or not, and the tool used for this is logistic regression. Logistic regression is based on the similar principle of discrimination analysis (Tabachnick, Fidell, 2013) which can be used to predict assignment to a specific group based on a set of variables. According to Meloun and Militký (2012), this method predicts the probability of a certain event that may or may not happen; logistic regression is a suitable method in cases when the dependent variable is qualitative in character.

The dependent variable is, according to Hendl (2012) always binary: its value is 1 if the observed event occurs and otherwise zero. Hendl also says the ratios express the number of positive results in case of repeated measurements with the same value of independent variable x; the number of measurements

for each ratio should be roughly the same. Logistic regression is typically used to model the probability of a certain event depending on the value of a continuous variable. It is assumed that a random variable has a binomic distribution with parameter π that corresponds to the probability of result 1 and changes monotonically with the value of the independent variable. The resulting model is an estimate of this parameter depending on x. The logistic model has very broad use across various fields.

The basic formula for the logistic regression model as given by Meloun and Militký (2012) is:

$$\ln (L(1)/L(0)) = b(0) + b(1)x(1) + b(2)x(3) + \ldots + b(p)x(p) \quad (1)$$

where the coefficients b(i) can be interpreted as regression coefficients. The expression ln (L (1)/L (0)) is known as the logit of L and shows that the logit of value L can be expressed as a weighted sum of the values of independent variables. The logit of value L is a logarithm of the probability of the analysed phenomenon (Hendl, 2012) and the equivalent equation is:

$$\pi_i = 〚\text{logit}〛^{(-1)} (n_i) = e^{(n_i)}/1+e^{(n_i)}. \quad (2)$$

The test of the null hypothesis of model validity according to Hendl (2012) compares the estimated and identified frequencies using Pearson's Chi-squared statistics. The prerequisite for this is having at least 5 observations for each combination, which was met in our research.

3 Research Results

This chapter presents the results of the discrimination analysis that aimed to determine which variables (characteristics) are typical for organisations that currently apply or do not apply age management. The overview in Tab. 1 shows the averages and standard deviations for variables that may impact the application of age management.

Application of age management		Average	Standard deviation
Yes	Sector of the economy	2.51	0.759
	Size of the organisation	1.81	0.868
	Majority ownership	1.29	0.456
	Ratio of women and men	2.13	0.807
	Annual Turnover Rate	1.67	0.960
	Most often fluctuating category of employees by age	1.65	0.825
No	Sector of the economy	2.36	0.812
	Size of the organisation	1.63	0.769
	Majority ownership	1.19	0.391
	Ratio of women and men	2.20	0.870
	Annual Turnover Rate	1.65	0.986
	Most often fluctuating category of employees by age	1.53	0.833
Total	Sector of the economy	2.40	0.799
	Size of the organisation	1.68	0.803
	Majority ownership	1.22	0.414
	Ratio of women and men	2.18	0.852
	Annual Turnover Rate	1.66	0.978
	Most often fluctuating category of employees by age	1.56	0.832

Table 1 - Summary statistics of individual characteristics (own survey)

Correlation and covariation results confirm that discrimination analysis is applicable to the selected qualitative features. The correlation coefficients range from 0.101 to 0.429 (direct correlation), representing a weaker to medium correlation. This enables us to perform Box's test of covariance matrices. Box's test forces us to reject the null hypothesis even for very small differences in covariance matrices that would not necessarily impact further results. The prerequisite for this test is a multi-dimensional normality of the distribution, which was met in our research. The value of Box's test is 30.665 with a correlation value of

0.088. Since 0.088 is higher than the significance threshold 0.05, we can conclude that correlation was not disproved, and the null hypothesis is rejected (the data is independently distributed).

The next step in the analysis of variability was Wilcoxon's test to determine if the implementation of age management depends on selected organisation variables. The calculated value of this multi-dimensional analysis of distribution test was 0.017, i.e. less than the significance threshold 0.05. It can be concluded, therefore, that the attributes have a statistically significant impact on whether the organisation engages in age management.

Tab. 2 presents the results of the test of equality of expected value groups (organisations applying age management and organisations not applying age management). These are the results of one-dimensional statistics. Where the test result is below the significance threshold 0.05, the attribute is statistically significant and can be used to differentiate between organisations who apply age management and those who do not. The results show that significant factors influencing the application of age management include the sector in which the company operates (0.040), size of the organisation (0.013) and majority ownership (0.007).

Characteristics	**Wilcoxon's Lambda**	**Test of the significance**
Sector of the economy	0.992	0.040
Size of the organisation	0.989	0.013
Majority ownership	0.987	0.007
Ratio of women and men	0.999	0.413
Annual Turnover Rate	1.000	0.838
Most often fluctuating category of employees by age	0.996	0.132

Table 2 - Test of the significance of individual characteristics (own survey)

We also calculated the parameters of classification functions and checked the correct assignment of organisations into 2 groups (those who apply age management and those who do not). From the results, it can be concluded that the tested characteristics influence whether an organisation engages in age management or not from 59.9%. To summarize and generalize the characteristics in the selected sample, we applied an econometric model using a linear and logit function. The results of the logit and linear models were nearly identical. This paper, however, only presents the results of the logit model. Since the research uses a dependent binary variable, the logit model is more suitable for the presentation of results because it uses the method of maximal credibility, its results are more accurate, and its interpretation corresponds to the probability of occurrence, i.e. 0 to 100%. The results presented below are generalized to the selection sample of organisations within their respective field.

In the research, we calculated the coefficients of partial logit functions and the probability of application of age management for the individual significant variables, namely sector of the economy, size of the organisation and majority ownership.

After evaluating the results, we can conclude that the probability of application of age management in the primary sector is 23.8%, in the secondary sector 24.3% and in the tertiary sector 32.8%. In terms of differences between the sectors, the secondary sector is 0.4% more likely to engage in age management than the primary sector and the tertiary sector is 8.5% more likely than the primary sector. In large organisations, the probability of application of age management is 41%; in small organisations the figure is 27% and in medium-sized 25%. Large organisations have a 14% higher probability to apply age management than small organisations. Medium-sized organisations however are less likely to apply age management than small organisations, specifically by 1.7%, because the resulting parameter was negative. In terms of significance, the parameter of the effect of medium-sized organisations is statistically insignificant, i.e. zero; we can therefore conclude that there is no difference in the probability of application of age management in small and medium-sized organisations. There is, however, a significant difference compared to large organisations. The results further show that international organisations apply age management more often and are 12.15% more likely to engage in age management than Czech organisations. Most organisations that apply age management are found in Prague.

The results also show that the largest probability of the application of age management is found in organisations that employ on average 31 to 40% of employees in the 50+ age category. The probability of

application of age management in this group is 46.15%. In organisations with 21 to 30% of employees aged 50+, the probability is 40.63%; in the 0–5% category it is 19.19%, i.e. 21.44% higher than in organisations that have less than 5% of employees in the 50+ age category.

Coefficients	B	S. E.	Wald	f	Sig.	Exp(B)
Secondary sector	0.013	0.331	0.001	1	0.970	1.013
Tertiary sector	0.476	0.282	2.850	1	0.091	1.610
Medium-sized organisation	-0.257	0.247	1.082	1	0.298	0.774
Large organisation	0.108	0.278	0.152	1	0.697	1.114
International organisation	0.472	0.259	3.312	1	0.069	1.603
6–10% 50+ employees	0.546	0.293	3.478	1	0.062	1.727
11–15% 50+ employees	1.023	0.334	9.355	1	0.002	2.782
16–20% 50+ employees	0.907	0.338	7.220	1	0.007	2.478
21–30% 50+ employees	1.175	0.338	12.124	1	0.000	3.239
31–40% 50+ employees	1.440	0.459	9.858	1	0.002	4.222
41–50% 50+ employees	0.602	0.567	1.127	1	0.288	1.825
51% and more 50+ employees	0.875	0.541	2.615	1	0.106	2.398
Seat of organisation (Prague)	0.141	0.215	0.431	1	0.512	1.152
Constant	-1.961	0.316	38.439	1	0.000	0.141

Table 3 - Calculation of coefficients of the summary logit function (own survey)

Based on the obtained results, we can conclude that the summary logit function can be expressed by the following equation:

Yt = -1,961 + 0,013x1i + 0,476x2i - 0,257x3i + 0,108x4i + 0,472x5i + 0,546x6i + 1,023x7i + 0,907x8i + 1,175x9i + 1,440x10i + 0,602x11i + 0,875x12i + 0,141x13i + ei

The final equation, including a full declaration of variables, can be used to determine the probability of various scenarios. For example:

- Medium-sized organisations with Czech majority ownership active in the tertiary sector with 51 and more percent of employees in the 50+ category have a 32.62% probability of applying age management.
- The probability of application of age management in international organisations is 39.17%.
- Large international organisations in the primary sector that employ between 21 and 30% of employees aged 50+ have a 44.88% probability of applying age management.
- Large international organisations in the tertiary sector with more than 21% of 50+ employees have a probability of 56.73%.

The proposed model is a tool for evaluating the variables that influence the application of age management. Our objective was not to create a model with a maximum error of 0.01, but a broader model that would capture all factors, which is why it also includes the region where the organisation is headquartered. Regression models were used to estimate the behaviour of the dependent variable and specifically which variables influence the application of age management in organisations. If any of the analysed variables is statistically insignificant (based on Waldo's statistics mentioned above), the factors can be removed from the model. Rodríguez (2016) however considers this step to be risky, so it is better to drop even less significant variables from the model. Because there were no proven strong correlations between variables and because simulations were created, the proposed model works with all variables.

Based on the obtained data, it can be summarized that age management is more often applied in large organisations that have a higher proportion of employees in the 50+ category. It can be therefore concluded that the size of the organisation based on the number of employees is the key criterion that influences the application of age management.

4 Discussion

Research by Principi et al. (2015), Ciutiené, Railaité (2015) and Bejkovský (2012) emphasizes the issue of current demographic developments and the necessity of applying age management on the organisational level. It can be summarized that on the one hand, birth rates in Europe are on the decline

and people live longer (due to better healthcare), but on the other the retirement of experienced staff and lack of experienced workforce is causing and will cause economic and social issues (Levy, 2011; Marcaletti, 2014) which need to be understood and resolved in organisations already today; one of the available options is age management. Wiktorowicz (2013) goes so far to identify the ageing of the population and the inclusion of people in the 50+ category on the labour market to be one of the main challenges of modern Europe.

This contrasts with the current trend in which it's mainly the young employees who are considered to be talented, efficient and flexible. The challenge for employers lies in the utilization of the potential of employees of various categories. Employers who want to utilize the potential of their staff in a longer time period must come up with new models of work that will be attractive for both parties (Joniaková and Blšťáková, 2015; Froehlich, Beausaert, Segers, 2015). Kulik, Ryan, Harper, George (2014) add that organisations must implement new creative methods to be able to attract, motivate and maintain an ageing workforce. If organisations respond to the changed needs of their employees and adopt corresponding measures in human resources management, they will also become more attractive as employers on the labor market.

According to Wiktorowicz (2013), it is therefore necessary to establish age management as part of the strategy of human resources management in the organisation while emphasizing the importance of keeping the continuity of knowledge between 50+ employees and their colleagues in order to maintain the organisation's knowledge base even in cases when individual work productivity drops or employees retire. The future lies in the employment of people with key knowledge also in retirement age through agreements to perform a job.

Our results prove the importance of organisational characteristics influencing age management in organisations. These characteristics must be reflected when setting up the strategy of human resource management to successfully eliminate age stereotypes and prejudice in accordance with the ideas of McNair, Flynn (2005) and Collien, Sieben, Müller-Camen (2016).

5 Conclusion

The results of the quantitative research show that the application of age management is mainly influenced by the sector in which the company operates (0.040), size of the organisation (0.013) and majority ownership (0.007). These tested characteristics influence whether an organisation engages in age management or not from 59.9%. It can be summarized that the probability of application of age management in the primary sector is 23.8%, in the secondary sector 24.3% and in the tertiary sector 32.8%. In large organisations, the probability of application of age management is 41%; in small organisations the figure is 27% and in medium-sized 25%. International organisations apply age management more often and are 12.15% more likely to engage in age management than Czech organisations. The best organisations from all successful businesses are those that are attractive and active in caring for their employees and try to create the best possible conditions in the workplace and outside. The success of an organisation largely depends on the satisfaction of its employees. Such organisations are able to respond to the needs of the internal and external environment, are transparent and adapt to changes in demographic development.

6 Limitation and Future Research Direction

Research limitation can be seen in its focus only on the Czech organisations, but the identified factors influence all organisations in any country. We can conclude that age management is a very promising tool for the development of organisations of all sizes in all sectors. Age management has the potential to become a tool for developing the employer's brand; the analysis of the impact of application of age management on an employer's brand could become the subject of further research.

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