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Relationship between Selection, Optimization and Compensation and the Work Ability of Nurses over Fifty Years of Age

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Background and purpose: The raising of the retirement age in the field of nursing care increases the need for successful aging strategies in the work environment. The purpose of this paper is to analyse the application of selection, optimization and compensation and their correlation with the working ability of nurses aged fifty and over in Slovenia.

Design/Methodology/Approach: The study encompasses 433 nurses over the age of 50 (M = 53.75±2.40 years) working in 13 hospitals across Slovenia. Two measurement instruments used in the field of nursing were adapted, the model of Selection, Optimization and Compensation (SOC) and the Work Ability Index (WAI). Data was processed using descriptive statistical methodology. The correlation between statistical variables was calculated using Spearman's correlation coefficients. For a description of the functional relationship between SOC use and calendar age, linear and potential regression functions were used.

Results: We found out that the use of SOC is slightly growing with the calendar age of the nurses. The most used SOC element is "selection". Calculated WAI for nurses is at the lower end of the classification category "good" (M = 36.98±6.46) There is a positive correlation between SOC and WAI (rs = 0.23), causality was not studied.

Conclusions: Increased use of SOC can lead to better work ability by nurses over fifty. Therefore, in the future, nurses will need to be trained and motivated to use SOC strategies.

Keywords: *Nursing; work ability index; selection, optimization and compensation; successful aging.*

1 Introduction

Society ages and the population of the elderly continues to grow. Also, the retirement age is growing. The motivation for our study was to support hospital nursing management by ensuring work ability and successful aging of nurses over 50 years of age.

Models of successful aging are gaining in popularity. One of the main challenges of an aging society is to maintain quality of life, despite the inevitable changes that occur in the lives of older people (Tovel and Carmel 2014, 255). Western countries respond to an increased proportion of elderly in their population by raising retirement ages. As a result, the proportion of older employees will continue to increase across all professions.

In nursing, the long-term trend towards a shortfall of nursing care providers has been apparent for a long time, for which reason the profession is unable to serve all the needs of the population (WHO, 2017). The reasons for the lack of nursing staff are more and remain, inter alia, a consequence of the lack of young people choosing this profession, the exodus of professionals due to better working conditions and earnings elsewhere, as well as migration and retirement (WHO, 2017). Healthcare is an area charac-

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terized by an unfavorable working environment and conditions, such as psychosocial stress, shift work and manual load management (Sandeva and Koleva, 2016, 750).

Many authors point to the need for the implementation of strategies that aim to maintain nurses in working environments for as long as possible. Such is achievable through the provision of working environments in which an individual can work easily, qualitatively and professionally until retirement age, or even longer (Long and Griffiths, 2013, 20; Rozman and Tominc, 2014, 9; Maurits et al., 2015, 9).

One of such tools is the original selection, optimization and compensation (hereafter SOC) model introduced by Baltes and Baltes (1990). It was especially adapted and tested for nurses as the "SOC-in-nursing-scale" by (Müller et al., 2013), and it is the first known research of the association between SOC in nursing and the work ability of nurses.

The "SOC-in-nursing-scale" tool developed by (Müller et al., 2013) is interesting to the Slovenian environment as well, as there are no similar tools. The instrument is short, contains nine items, three for each category (selection, optimization and compensation), and it is easy to use. In combination with the Work Ability Index (hereafter WAI), it can give a complex picture of the state of the work environment. That is why we have decided to use "SOC-in-nursing-scale" in the hospital nursing environment in Slovenia.

The purpose of this study is to research nurses aged fifty and over in Slovenian hospitals. According to our knowledge, the research of this group has not been covered in academic journals. In this paper we focus on three main topics: application of the adapted SOC model from Müller et al. (2013), calculation of the WAI, and finally study of the correlation between SOC and the WAI for nurses over fifty years of age. The following three research questions specify the aim of the paper:

- Are there differences in the mean value of SOC results between our research and the research of Müller et al. (2013)?
- Which element of the SOC is most commonly used by nurses fifty and over in Slovenia?
- Is SOC use by nurses fifty and over in Slovenia dependent on calendar age?
- Does SOC use by nurses fifty and over in Slovenia correlate with WAI assessment?

2 Literature Review

2.1 Definition of successful aging

Gerontologists have long agreed that aging does not occur on a specific date or at a certain age, the birth of the first grandchild, or in accordance with the statutory criteria for retirement (Nimrod and Ben-Shem, 2015, 814). As with age itself, successful aging does not have a single definition. One of the first definitions of successful aging is "adding life to the years" in the final period of human existence, with Havighurst (1961, 8) contemplating that contented individuals are those who enjoy life and are happy with it. Rowe and Kahn (1997, 433) define successful aging using three elements: low probability of illness and disease-related disability, high cognitive and physical functional ability, together with active involvement in life, with the greatest emphasis on the latter. Britton et al. (2008, 1102) assigned the factors of successful aging into four groups: socioeconomic situation, early life factors, healthy lifestyle and psychosocial factors. They found that the socioeconomic situation in middle age had a major impact on entry into old age without major diseases and with good functional ability. Lee et al. (2011, 210) developed four factor models of successful aging, consisting of physical, psychological and social support, together with leisure activities. The absence of chronic disease, functional independence and satisfaction with life were the main components of the model of successful aging, Gureje et al. (2014, 836). Martin et al. (2015, 163) noted that flexibility, social support and spirituality/religiosity are of great help in the successful aging of individuals and their families. Lin et al. (2016, 1) believe that one of the factors for achieving successful aging is maintaining a high level of physical fitness. Otherwise, Lin et al. (2016, 4) associate successful aging with complete independence in daily activities, the absence of cognitive impairment and symptoms of depression, together with satisfactory social activities.

Many seniors report successful aging, regardless of objective health status. Tkatch et al. (2017, 485) thus find that in this context of successful aging, the individual's perception of health is important, is not just the number of illnesses they are afflicted with. Parish et al. (2019, 23) find that culture, knowledge, and stereotypes about aging influence perceptions of aging. Adults choose individual priorities that subconsciously determine which aspects of aging are under control. When they perceive that they can control an individual aspect of aging, and when it is important to them, they adjust their behavior to achieve the goal. Conversely, when they believe that the aging aspect cannot be controlled or is irrelevant to them, they seek to accept that fact.

Research shows that some factors for successful aging

can be influenced by an individual's behavior. The main objective of Bosnes et al. (2019, 1) was to investigate the impact of middle-aged factors on successful aging beyond 20 years, and they found that middle-aged lifestyle (smoking, physical activity, alcohol consumption, obesity and social support) influences successful ageing. Non-smoking and good social support were the strongest predictors of successful aging in their research. Gopinath et al. (2018, 1) examined the temporal association between physical activity and successful aging. Higher levels of physical activity have been found to have an impact on successful aging, as they increase the likelihood of surviving an additional 10 years without chronic illness, cognitive and functional impairment.

Most of these definitions of successful aging refer to those individuals who are no longer in employment. The basic variables of successful aging in the workplace, which were studied by Cheung and Wu (2012, 449), were flexibility and health, a positive attitude, personal safety, as well as career growth with goal orientation. Of course, a strategy for successful aging is also an option. This has been specifically adapted for healthcare providers by Müller et al. (2013) and is based on the model of Selection, Optimization and Compensation of Baltes and Baltes (1990). The SOC model allows individuals to control their goals despite - or even because - of impairments and increased vulnerabilities (Baltes and Carstensen 1996, 405).

2.2 Selection, Optimization and Compensation (SOC)

Baltes (1997, 371) speaks of selection, optimization and compensation as the basis of a development theory that is not unique to the elderly, but at the same time is inextricably linked to every developmental process.

Baltes and Carstensen (1996) describe the selection as active or passive, internal or external, planned or automatic. In aging, selection pertains to the consequences of increasing life restrictions or to the expectations of certain personal and environmental changes, which are often less relevant in old age. Selection thus allows an individual to circumvent a specific field entirely or simply to limit tasks and objectives within a particular area. It can be proactive or reactive. It may include a change of environment (relocation), active behavioral changes (reduction in the number of obligations) or passive adaptation (avoiding certain activities, leaving others accountable). Proactivity means that the current operation is monitored, and thus, in due course, the anticipated changes and potential future losses are adequately prepared for. A reactive selection is one that is unpredictable, and only sudden changes to the individual enforce such a choice. According to Baltes and Carstensen (1996), optimization refers to the enrichment and increase of resources, and thus to improving functionality and flexibility in selected areas of life. Optimization can appear in existing areas or involve investments in new areas and objectives. Baltes and Carstensen (1996) also provide an explanation of a third option represented by restitution and the choice to maintain existing objectives through the application of new assets used to compensate for deficiencies, thus preserving the pre-existing state through optimizing the new one.

The application of the SOC model is also of interest in the nursing environment, as evidenced by several studies (Müller et al., 2012; Müller et al., 2013; Weigl et al., 2013; von Bonsdorff et al., 2014; Müller et al., 2015; Baethge et al., 2016; Moghimi et al., 2017). Weigl et al. (2013) investigated direct and interactive effects of age in health care workers (n = 173), job control, and the use of SOC strategies in predicting work ability. They found out that a negative relationship between age and work ability was weakest for employees with high job control and high use of SOC strategies. The research of Weigl et al. (2013) suggests that the use of successful aging strategies and enhanced control at work are conducive to maintaining the work ability of aging employees. Their findings indicate that job control is positively correlated with work ability. Results of the meta-analysis by Moghimi et al. (2017) show that SOC strategy use is positively related to age, job autonomy, self-reported job performance, non-self-reported job performance, job satisfaction, and job engagement, whereas SOC strategy use is not significantly related to job tenure, job demands, and job strain. The study by Weber et al. (2019) examines the relationship between leucocyte telomere length (LTL), a potential biomarker for biological aging, and SOC and learning opportunities as strategies involving efficient management and resource gain at work. In a cross-sectional study, 141 blood samples were collected from experts in geriatric care for LTL measurement with a quantitative real-time polymerase reaction. Likewise, all participants were asked, with standardized questionnaires, to evaluate their learning opportunities at work and use of SOC strategies. Weber et al. (2019) find that a mismatch between SOC and learning opportunities can negatively impact successful aging.

Research by Müller et al. (2012, 5137) is based on the findings of other studies, namely that the working ability of nurses decreases with age. In a study involving nurses (n = 438, on average 38.5 years old), among others, an SOC model was applied for optimization in relation to the support of work-related ability.

The relationship between SOC, organizational equity, age and working ability of employees (n = 605, on average 43.7 years old) was studied by von Bonsdorff et al. (2014, 326) at University Hospital in Finland. In a survey of nursing care providers (n = 136) at German hospitals, Baethge et al. (2016), ascertained whether selective optimization with compensation is appropriate for individual health care professionals who wish to maintain their performance under a high workload. Müller et al. (2015) conducted a controlled trial with the help of nursing providers (n =

70), by way of which they attempted to influence work ability through SOC training. This training was primarily intended to acquaint nurses with the SOC model as well as stimulate the development of individual strategies by way of which they might actively address their own work ability. This was, according to the authors, the first such experiment.

2.3 Work Ability Index (WAI)

Work ability is a precondition for employees remaining healthy as well as their ability to stay in the workplace until retirement age (Müller et al., 2013, 1640). Ilmarinen (2012, 7) also points to the fact that the higher the working ability is upon retirement, the higher the quality of life is later on. Assessment of working ability detects a worker's risk factors at an early stage, thus permitting preventive measures to be formulated and implemented in a timely fashion. Accordingly, the assessment of work ability contributes to the preservation, restoration and support of working ability (Čeledová et al., 2014, 291). It, therefore, enables the early detection of those employees who have difficulties in meeting requirements arising from work. With the prolongation of retirement age, this is very important in the case of older employees in particular (Carel et al., 2013, 588).

In the field of nursing, there are numerous studies examining the association of WAI with various factors (Table 1).

Table 1: Results from previous WAI nurse research

Author Year Country	Sample	Factors	Results WAI
Golubic et al. 2009 Croatia	n = 1.086	Work-related stress, education	380 (35%) WAI<37 706 (65%) WAI≥37
Geukes et al., 2011 Netherlands	n = 208	Menopausal symptoms	M±SD WAI 38.69±6.16
Milosevic et al. 2011 Croatia	n = 1.212	Quality of life	M±SD WAI 38.3±6.1
Knezevic et al. 2011 Croatia	n = 60 (midwives) n = 98 (pediatric nurses)	Work-related stress	M=40.0 (midwives) M=37.5 (pediatric nurses)
Habibi et al. 2012 Iran	n = 228	Physical work capacity	M±SD WAI 38.25±4.4
Derycke et al. 2012 Belgium	n = 1.531	Turnover intention	M±SD WAI 40.3±4.8
Magnago et al. 2012, Brazil	n = 498	Intensity of musculoskeletal pain	poor 5.7 (n=29) moderate 37.6% (n=187) good 41.4% (n=206) excellent 15.3 (n=76)
Monteiro et al. 2012 Brazil	n = 570	Health and lifestyle	M±SD WAI 39.3±5.3
Sorić et al. 2013 Croatia	n = 1.124	Shift work and quality of life	Median WAI 39 (34–43)

Table 1: Results from previous WAI nurse research (continued)

Fischer in Martinez 2013 Brazil	n = 514	Working conditions and work injuries	M±SD WAI 42.3±4.5
Prochnow et al. 2013 Brazil	n = 498	Psychological demands and control over the work	45.8% female workers and 50.9% aged ≥47 years presented reduced work ability ($p<0.05$)
Carel et al. 2013 Israel	n = 515	Sociodemographic factors and illness factors	M±SD WAI 41.9±5.1
Müller et al. 2013 Germany	n = 438	SOC (selection, optimization and compensation)	M±SD (1st item of the whole WAI) 7.72±1.60
Kordi et al. 2014 Iran	n = 123	Occupational stress	M±SD WAI 38.81±0.05
Čeledová et al. 2014 Czech Republic	n = 53	A comparison WAI results with development company	M±SD WAI 36.3±6.1
Nowrouzi et al. 2015 Canada	n = 111	Workplace system factors	21 (29%) WAI<37 51 (70.8%) WAI≥37
Jakobsen et al. 2015 Denmark	n = 111 (physical exercise at work) n = 89 (physical exercise at home)	Physical exercise at the workplace	M (WAI)=43.1 M (WAI) physical exercise: at work=42.8±4.6 at home=43.3±4.2
da Silva et al. 2016 Brazil	n = 100	Fatigue	M±SD WAI 39.4±6.0
Sandeva and Koleva, 2016 Bulgaria	n = 63	Psychological Well-being	M±SD WAI 40.8±4.8
Rostamabadi et al. 2017 Iran	n = 214	Individual characterizations, workload, fatigue, and diseases	M±SD WAI 39,80 ± 5.0
Converso et al. 2018 Italy	n = 333	Job and personal resources	M±SD WAI 38,27 ± 5,67.

Note: n – numerus; WAI – Work Ability Index assessment; M – arithmetical mean value; SD – standard deviation.

Ability in the workplace is assessed using the Work Ability Index developed in the 1980s by Tuomi et al. (1998) at the Finnish Institute of Occupational Health. This instrument is already being used in Slovenia by The University Rehabilitation Institute, Republic of Slovenia, which acquired the rights for non-commercial use (Tuomi et al., 2005).

3 Methodology

3.1 Data and sample

A quantitative research method was used in an empirical study to determine the association between the use of the SOC model and the WAI score by nurses aged 50 and over in secondary hospitals in Slovenia. According to the NIJZ (2018), in 2016, a total of 6.881 nurses of different educational levels were employed in the secondary hospitals. We wanted to include in our research all 21 hospitals (general

and special) at a secondary level across Slovenia, but only 13 of them decided to participate in this research project, which was conducted between April and December 2016. Participation in the survey was voluntary, and a pre-condition for inclusion was that the individual was at least 50 years of age in 2016. We distributed 910 questionnaires. The response rate was 47.6%. The sample in our study thus consisted of 433 nurses 50 years and older. Female nurses (94.0%) predominated, and participants had an average age of 53.75±2.40 years and career length of 33.62±3.29 years. Few survey participants had 2nd cycle academic education, 17.1% had 1st cycle academic education, 6.5% had a higher vocational education, while the majority (74.6%) had secondary education followed by nursing careers (Table 2).

Table 2: Description of the study sample (n=433)

Demographic data		f	f (%)
Gender	Female	407	94.0
	Male	26	6.0
Age	50	44	10.2
	51	47	10.9
	52	50	11.5
	53	65	15.0
	54	63	14.5
	55	57	13.2
	56	48	11.1
	57	30	6.9
	58	17	3.9
	59	8	1.8
	60	4	0.9
Education level	Vocational upper secondary education	3	0.7
	Technical upper secondary education	323	74.6
	Higher vocational education (1st cycle professional education)	28	6.5
	1st cycle academic education	74	17.1
	2nd cycle academic education	5	1.2

Note: n – numerus; WAI – Work Ability Index assessment; M – arithmetical mean value; SD – standard deviation.

3.2 Research instruments

Two measurement instruments were used in the study.

The first was "Selection, Optimization, Compensation (SOC)-in-nursing-scale" devised by (Müller et al., 2013). The questionnaire, translated into Slovenian language by an official translator, comprised nine variables. In relation to each question, individual responses were measured according to the 5-point Likert scale. Participating nurses chose from the following predetermined responses: 1 – "Entirely disagree", 2 – "Disagree", 3 – "Neither disagree nor agree", 4 – "Agree", 5 – "Entirely agree" (Table 4).

The second instrument (Appendix), designed to measure work ability (Tuomi, et al., 2005), is a shortened version enumerating fourteen groups of diseases, which differs in the third item of the questionnaire and the method of scoring (WAI-Netzwerk Deutschland, 2015a; WAI-Netzwerk Deutschland, 2015b). The result is an assessment or index of work ability, derived from scores ranging from 7 to 49 points (Table 3) in which decimals are rounded up. The overall self-assessment score of work ability is thence classified into one of four categories "poor" (7 to 27 points), "moderate" (28 to 36 points), "good" (37 to 43 points) and "excellent" (44 to 49 points).

Table 3: Items covered by the WAI, the number of questions used to evaluate each item, and the scoring of the responses (short version of WAI)

Items		Number of questions	Scoring of the responses
1	Current work ability compared to the best work ability	1	0-10 points (value circled in the questionnaire)
2	Work ability in relation to demands for work	2	score weighted according to the nature of the work*
3	Diagnosed diseases (only diseases diagnosed by a physician are counted)	1 (list of 14 disease groups)	7 points = no disease 5 points = 1disease 3 points = 2 diseases 3 points = 3 diseases 1 point = 4 diseases 1 point = 5 and more diseases
4	Estimated work impairment due do diseases	1	1-6 points (value circled in the questionnaire; the worst value should be chosen)
5	Sick leave during the past year (12 months)	1	1-5 points (value circled in the questionnaire)
6	Own prognosis of work ability two years from now	1	1, 4 or 7 points (value circled in the questionnaire)
7	Mental resources (item 7 refers to the worker's life in general, both at work and during leisure time)	3	The points of the question series are added together, and the sum is modified as follows: sum 0–3 = 1 point sum 4–6 = 2 points sum 7–9 = 3 points sum 10–12= 4 points

Note: * weighted in accordance with instructions (Tuomi et al., 1998)

3.3 Statistical analyses

Consent to carry out this research was obtained from the management of the participating hospitals. The survey was conducted anonymously, and participation was voluntary.

Depending upon the decision of the individual hospital, questionnaires were dispatched and received in person or by mail in a sealed envelope. Data from the questionnaires was processed using IBM SPSS ver. 22.0. The results are indicated and assessed in a series of tables and graphs.

Descriptive statistics were used to illustrate the comparison of SOC strategies as per Müller et al. (2013), and likewise, the results have been presented as the arithmetical mean of the responses (M) together with the standard deviation (SD).

The correlation between the mean of the SOC results of our research and that of Müller et al. (2013) was calculated using the Spearman's correlation coefficient (rs) of the arithmetical mean values of the SOC items presented in Table 4. The method used in our research was identical to Müller et al. (2013, 1632, paragraph 6) methodology. Items have the same meaning, and the levels of the values are the same as Müller et al. (2013, 1636, Table 3).

To calculate the relationship between the use of SOC and WAI in our study, a Spearman's correlation coefficient was also applied.

4 Results

The results in Table 4 provide the answer to the first research question: "Are there differences in the mean value of SOC results between our research and the research of Müller et al. (2013)?" The arithmetical mean value (M) and the standard deviation (SD) were calculated in relation to the answers provided.

Table 4: Items of SOC model applied in the workplace by nurses over fifty working in Slovenian hospitals and nurses in research of Müller et al. (2013)

SOC items	Our research, 2016 (n=433)		Müller et al., 2013 (n=438)	
	M	SD	M	SD
At work I always carry out my most important tasks first (S)	4.17	0.71	4.23	0.64
Also, in stressful work situations, I perform one task after another (S)	3.88	0.80	3.62	0.89
I concentrate on the most important tasks to do my job well (S)	4.18	0.62	4.15	0.64
I do exercises to accomplish the physical demands in nursing (O)	3.11	0.99	3.57	1.04
I keep myself constantly informed about the current professional knowledge in nursing (O)	3.73	0.70	3.31	0.93
I deliberately use back-friendly working techniques (O)	3.42	0.81	3.30	0.93
I ask for help to accomplish heavy physical tasks (C)	3.72	0.86	3.97	0.88
I use external aids to accomplish heavy physical tasks (C)	2.44	0.98	3.25	1.21
I organize my work in a way that allows me to counterbalance one-sided physical stressors (C)	3.38	0.88	3.12	0.93

Note: S – Selection; O – Optimization; C – Compensation; M – arithmetical mean value; SD – standard deviation.

Figure 1: Comparison of nine SOC items of the study by Müller et al. (2013) and our own study

Our study also intended to ascertain whether the use of the SOC model in nursing care alters with age. The results displayed as the arithmetical mean value (M) and standard deviation (SD) for the total SOC model estimate and each individual SOC model variable are shown in Table 5.

Table 5: Application of SOC strategies by age

Age	M soc	SD soc	M s	SD s	M o	SD o	M c	SD c
50	3.51	0.44	3.86	0.57	3.49	0.68	3.17	0.58
51	3.60	0.54	4.00	0.64	3.51	0.66	3.29	0.84
52	3.52	0.49	4.13	0.59	3.39	0.65	3.03	0.78
53	3.58	0.45	4.23	0.49	3.36	0.60	3.16	0.70
54	3.50	0.48	4.03	0.61	3.34	0.61	3.13	0.60
55	3.57	0.48	4.15	0.61	3.39	0.63	3.16	0.68
56	3.48	0.45	3.98	0.63	3.35	0.66	3.13	0.70
57	3.56	0.38	4.01	0.57	3.40	0.48	3.27	0.48
58	3.80	0.42	4.31	0.49	3.65	0.63	3.40	0.51
59	3.74	0.35	4.25	0.56	3.75	0.61	3.21	0.75
60	4.00	0.55	4.17	0.33	3.92	0.96	3.92	0.50
Average	**3.62**	**0.47**	**4.10**	**0.59**	**3.50**	**0.63**	**3.26**	**0.68**

Note: M - arithmetical mean value; SD - Standard deviation; SOC – Selection, Optimisation, Compensation model; S – Selection; O – Optimisation; C - Compensation.

The results, in the form of arithmetical mean values (M), are displayed graphically in Figure 2 and reveal the relationship of individual SOC components and SOC as a whole, by nurses aged 50-60 in Slovenia.

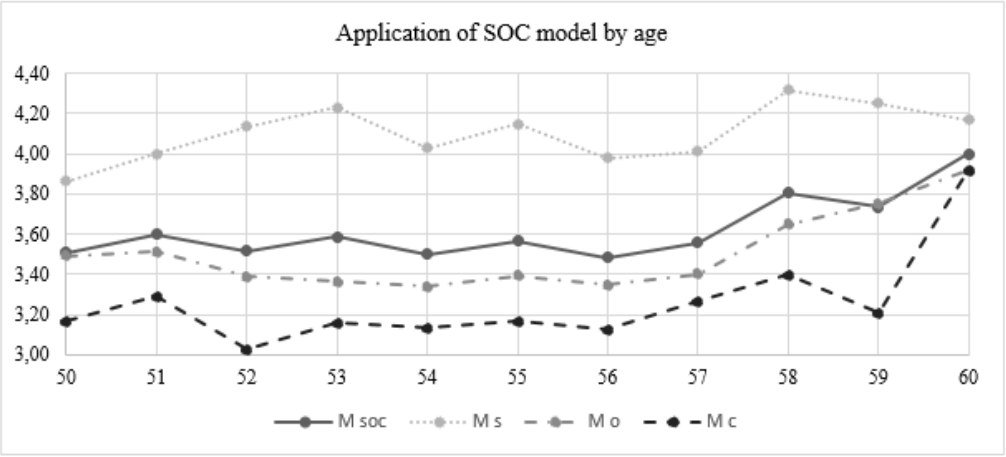

Figure 2: Results of the application of SOC by Slovenian nurses aged between fifty and sixty

Note: M – arithmetical mean value; SOC – Selection, Optimisation, Compensation; S – Selection; O – Optimisation; C - Compensation.

To analyze the functional relation between the use of SOC (dependent value, denoted by Y) and calendar age (independent value, denoted by X), we used the calculated SOC values of all respondents and analyzed their linear and potential regression function (Figure 3).

Table 6 presents the calculated coefficients of the regression functions and a standard error of the estimate values. It was established that both regression functions have the same standard deviation from the SOC values, and therefore their quality of approximation of the original is equal. We conclude that in our research, the use of SOC is slightly growing with the calendar age of the nurse by the slope a = 0.0044. This coefficient can't be generalized (p = 0.64).

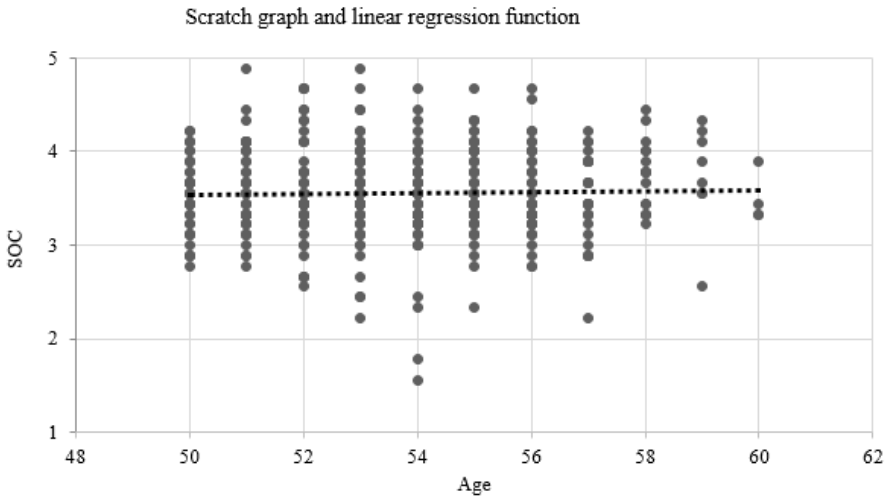

Figure 3: Use of SOC in relation to Age (in years) of nurses aged over fifty

Table 6: Determination of regression function values

Type of function	Coefficients of the regression model		Std. Error of the Estimate
	a	b	
Linear regression model: Y = aX+b	0.0044	3.3205	0.4678
Potential regression model: $Y = aX^b$	2.741941	0.06542	0.4678

The last research question of the study was to relate SOC model use and WAI by nurses over fifty years of age in Slovenia. Calculated WAI according to Table 2 by nurses in our study is fairly low: the average is classified as borderline "good" to "moderate" (M = 36.98±6.46 and Me = 38). The relationship between SOC model use arithmetical mean values (M) and WAI assessment of Slovenian nurses aged fifty to sixty is presented graphically in Figure 4.

The Spearman correlation coefficient (rs) of the SOC and WAI variables (rs = 0.23) of all respondents was calculated. Our research confirms that the SOC and WAI correlation is positive and monotonic. According to Sheskin (2004, 956), the correlation is considered to be weak. Work ability of nurses increases with their application of SOC strategies.

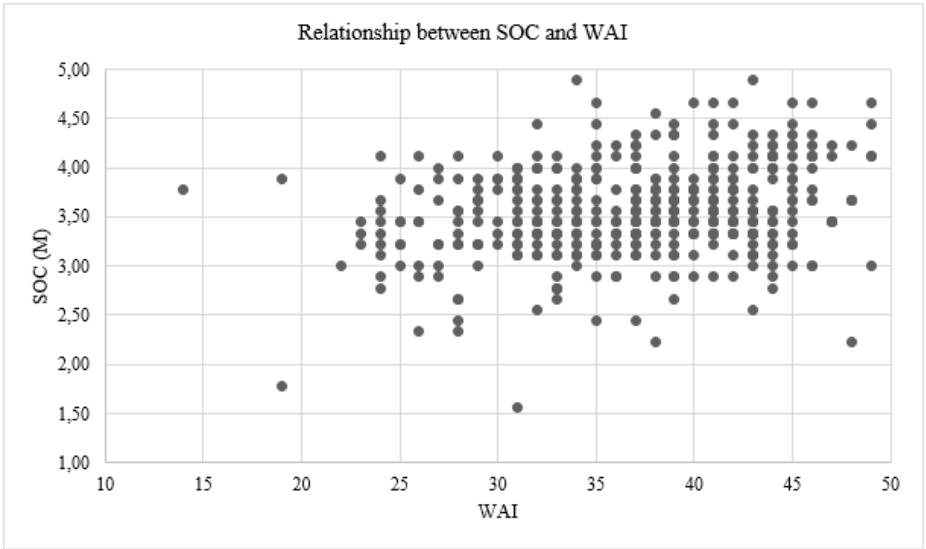

Figure 4: The relationship between SOC (M) and WAI assessment

5 Discussion and conclusions

Depending upon demographic indicators, it appears likely that much attention shall be devoted to the creation and application of strategies intended to manage the aging of health sector employees in order to ensure that they qualitatively and effectively carry out their vocation to retirement. Indeed, in order to ensure the future full provision of health care services, such strategies shall be essential in the prevention of early retirement and enable nurses to remain in the workplace even after reaching retirement age.

The first objective of our study was to apply the "SOC-in-nursing-scale" in our environment and compare the results with Müller et al. (2013). Indeed, the findings are similar, and there exists a strong correlation between the two sets of results. A difference between our study and the research carried out by Müller (2013) is the age differential in the study groups. Our study encompassed nurses aged between fifty and sixty (M = 53.75), while the age of respondents in Müller et al. (2013) ranged between 21 and 63 years (M = 38.5).

We were also interested to find out which element of the SOC is most commonly used by nurses fifty and over in Slovenia. Participants in our study make the most use of selection and compensation the least. We found out that the use of SOC significantly increases at the age of 58 and is highest at 60 years of age. The element of SOC mostly used by nursing care providers in our study is "selection," which achieves a peak at 58 years. The use of "optimization" is somewhat higher at 51 years, then falls slightly and rises considerably at 58 before peaking at 60 years. "Compensation" is the least used SOC element in our study; its use is lowest at 52 years, but increases significantly at 58 years, then falls at 59 years before rising abruptly at 60 years. It was established that the participants in our research were heavily focused on carrying out their work. The vast majority focused on the "selection" of the most important tasks, as well as carrying out the most important tasks first; in stressful situations, they performed one task after another. This group of claims was also the highest-rated. The second group of claims pertained to individual optimization in achieving goals. Most participants in the study indicated that their professional education was ongoing and that they consciously employed techniques of compensation to protect the spine as well as undertook regular physical exercise. The final three assertions pertaining to physical tasks revealed that participants in the survey most often asked for help in performing heavy labor, organized their work in such a way that the physical burden is evenly distributed and mitigated the accomplishment of heavy physical tasks. The statement: "I use external aids to accomplish heavy physical tasks," was rated most poorly by the participants in this study. The last three compensation-related items in our survey were the lowest-scored strategies of the SOC strategy, which is alarming.

Müller et al. (2013, 1636) established that the application of the adapted SOC model exerts a positive impact on the work ability of nurses (the positive relationship between optimization/ compensation in nursing and work ability was stronger by older nurses). Also, we find a positive monotonic relationship between the use of SOC strategies and WAI assessment. In our study, we find a lower average WAI score (M = 36.98±6.46) than in the studies of others; in our case, there was also a higher average age of the study's participants (Table 3). It is important to note that Müller et al. (2013) did not use the overall WAI

in their study, but the assessment of current work ability (grade 0 to 10) instead, which is the first point of the WAI measurement instrument (where M = 7.72±1.60), and is also an objective indicator of work ability. Other authors similarly note the correlation between current assessments of working ability and a complete assessment of WAI (El Fassi et al., 2013; Mokarami et al., 2016).

SOC has also been researched by other authors. von Bonsdorff et al. (2014, 326) established that the application of the SOC model influenced the relationship between organizational equity and working ability, thus an elevated presence of organizational equity promotes the use of SOC and thus helps employees maintain their working ability in the latter stages of their career. Baethge et al. (2016) ascertained the efficacy of selective optimization through the implementation of compensatory practices in the workplace by health care providers subject to heavy workloads. However, Müller et al. (2015) who tried to influence working ability through SOC training, did not ascertain any statistically significant influence of such training on the work ability of nursing staff.

Given that the respondents in our study were least concerned with "compensation," we suggest exploring options in working environments to improve ergonomic working conditions and to obtain enough working aids. It is also important to assemble work teams that are multi-generational. According to Rožman et al. (2017), it is important for managers to be aware of the age diversity of their employees and their needs.

Older nurses often have certain deficits associated with physical health and degenerative changes, while younger ones lack experience. Cooperation and support are certainly effective compensation mechanisms for nursing work. In this context, it is necessary to promote this important aspect of compensation in the work teams.

Research by Rožman et al. (2017), which found differences in burnout symptoms between younger (18 to 49 years) and older (50 to 65 years) employees in different Slovenian work organizations (n = 400), showed that older employees are more susceptible to physical symptoms of burnout. The authors also point out that reduced work capacity is associated with high physical workloads. Older employees need to be provided with the necessary adjustments to the work environment due to early retirement or work disability.

Nursing work is physically and mentally demanding and using SOC strategies could allow employees to have fewer problems related to the psychophysical factors of work. As a result, work outcomes are also better. Therefore, the use of SOC strategies in work environments needs to be promoted. It is important for management to recognize the benefits of using selection, optimization and compensation and to motivate their employees to take advantage of these opportunities in their work. Nurses need to be acquainted with SOC strategies and taught to use them.

Rožman et al. (2019) emphasize that working conditions need to be adapted to all employees and jobs should be developed according to the age diversity of employees, with the workload adapted to all age groups, since not all employees experience job characteristics in the same way.

Very important is that nursing management should be aware that SOC strategies work well in a supportive environment introduced by management. Older people generally have sufficient resources and reserves to optimize, but they often encounter an overly protective or restrictive working environment that inhibits such optimization. There is no doubt that the optimization process is conditioned by the promotion and improvement of environmental conditions (Baltes and Carstensen 1996, 412). Consequently, it is necessary to plan and implement healthy environments for nurses in the latter stages of their careers, to prepare ergonomic assessments of the working environment, and to identify the gaps between the requirements of the workplace and the capacities of an individual worker (Randolph 2013, 548). All such measures impact the work ability of employees.

Our study, which included nurses over fifty years old working in Slovenian hospitals, found that the use of SOC strategies and WAI assessment were positively correlated. The need to employ SOC strategies increases significantly at the age of 58 years and it grows to the age of 60. Given that the retirement age is increasing and will reach 65 years for both genders in the near future, the need for adaptation of the work environment will be further intensified in hospital care.

The assessment of work ability in our research indicates the need for such measures and the implementation of successful aging strategies for nurses in the workplace.

Nursing management must be aware, that through creating successful aging strategies, we will contribute to the successful aging of nurses. Intuitively, SOC strategies are applied in every circumstance across all ages and at every stage of life. Presented SOC strategies are just a proposal that can be used to design work regimes in nursing care to improve the WAI and to provide successful aging. For management in nursing care, it is essential that individual working units formulate their own selection, optimization and compensation strategies that are structured to the work demands and age structure of the employees.

It is also necessary to develop tools for evaluating the impact of these strategies. The WAI provides one option for evaluating the effectiveness of future measures introduced into the nursing care environment in order to make it easier for older nurses to continue to achieve their personal and professional goals.

According to the Nursing Chamber of Slovenia, in January 2017, one-third[1] of Slovenian nurses have already reached the age of 50; strategies for successful aging in

[1] Data from the register was obtained by e-mail from the Nursing Chamber of Slovenia in February 2017.

nursing settings have not been implemented yet. There is also a lack of research in this field of nursing in Slovenia.

Based on the measured index of work ability in our research, it can be concluded that concrete measures in terms of improved working conditions and organizational factors should be taken immediately. Nurses 50 years and older in Slovenia need the possibility to do "selection," "optimization" and "compensation," and this is what nursing management has to offer.

Our research is just one option and a starting point for further research. For a broader view of the nursing situation, research should be extended to the primary and tertiary levels of healthcare and determine whether our results are valid on these two healthcare levels.

Further research is needed to show what specifically nurses of 50 years and over in Slovenia need, where are they most at risk and what measures should be taken. Only based on concrete results will it be possible to devise appropriate strategies for successful aging that will suit our actual nursing environment.

This research was limited to the nurses aged over fifty who provide nursing care in secondary hospitals. Although the number of responses is high (n = 433), the response rate was only 47.6%. A significant drawback of the survey was the low number of respondents over the age of 57, which made statistical inference difficult. The research was designed as a cross-sectional study therefore it cannot provide a longitudinal view to the subject of the research. In the future, a longitudinal study would be welcome to study SOC strategies and its effect on the work ability of nurses over fifty.

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Odnos med uporabo izbire, optimizacije in kompenzacije in delovne sposobnosti izvajalcev zdravstvene nege starih 50 let in več

Ozadje in namen: Z dvigom upokojitvene starosti se potrebe po strategijah uspešnega staranja v delovnih okoljih na področju zdravstvene nege povečujejo. Namen prispevka je predstaviti odnos uporabe izbire, optimizacije in kompenzacije na delovno zmožnost izvajalcev zdravstvene nege starih 50 let in več, v Sloveniji.
Oblikovanje / metodologija / pristop: V raziskavo je bilo vključenih 433 izvajalcev zdravstvene nege, starih 50 let in več (M = 53.75±2.40 let), iz 13 bolnišnic v Sloveniji. Uporabljena sta bila dva merska instrumenta in sicer za področje zdravstvene nege prilagojen model izbire, optimizacije in kompenzacije (SOC) in instrument za merjenje indeksa delovne sposobnosti (WAI). Podatki so bili obdelani z metodami opisne statistike. Povezanost statističnih spremenljivk smo merili s Spearmanovim korelcijskim koeficientom. Funkcijski odnos med uporabo SOC in starostjo smo izrazili z linearno in potenčno regresijsko funkcijo.
Rezultati: Ugotovili smo, da uporaba SOC s starostjo rahlo narašča. Največkrat uporabljen element SOC je »izbira«. Izračunan WAI pri izvajalcih zdravstvene nege je na spodnji meji kategorije »dobro« (M=36.98±6.46; Me=38). Obstaja pozitivna monotona povezanost med SOC in WAI (rs=0.23), vzročne povezanosti nismo ugotavljali.
Zaključki: Večja uporaba SOC-a lahko vodi k boljši delovni sposobnosti izvajalcev zdravstvene nege starih 50 let in več. Zato bi management zdravstvene nege v prihodnosti moral vzpostaviti pogoje za uporabo strategij SOC ter izvajalce zdravstvene nege usposobiti in motivirati za uporabo le-teh.

Ključne besede: zdravstvena nega, indeks delovne sposobnosti, izbira, optimizacija in kompenzacija, uspešno staranje.

Appendix

Work Ability Index (WAI) questionnaire short version

Q1 Current work ability compared to the best work ability
Assume that your work ability at its best has a value of 10 points. How many points would you give your current work ability? (0 means that you cannot currently work at all)

Q2 Work ability in relation to demands for work
"How do you rate your current work ability with respect to the **physical** demands of your work?"
- very good (5 points)
- rather good (4 points)
- moderate (3 points)
- rather poor (2 points)
- very poor (1 point)

"How do you rate your current work ability with respect to the mental demands of your work?"
- very good (5 points)
- rather good (4 points)
- moderate (3 points)
- rather poor (2 points)
- very poor (1 point)

Q3 Diagnosed diseases (only diseases diagnosed by a physician are counted).
List of 14 disease groups:
- Injury from accidents
- Musculoskeletal diseases
- Cardiovascular diseases
- Respiratory disease
- Mental disorder
- Neurological and sensory disease
- Digestive disease
- Genitourinary disease
- Skin diseases
- Tumour
- Endocrine and metabolic diseases
- Blood diseases
- Birth defects
- Other disorder or disease (what?)

Q4 Estimated work impairment due do diseases
- Is your illness or injury a hindrance to your current job?
- There is no hindrance/I have no diseases (6 points)
- I am able to do my job, but it causes some symptoms (5 points)
- I must sometimes slow down my work pace or change my work methods (4 points)
- I must often slow down my work pace or change my work methods (3 points)
- Because of my disease, I feel I am able to do only part-time work (2 points)
- In my opinion, I am entirely unable to work (1 point)

Q5 Sick leave during the past year (12 months)
- none at all (5 points)
- at the most 9 days (4 points)
- 10-24 days (3 points)
- 25-99 days (2 points)
- 100-356 days (1 point)

Q6 Own prognosis of work ability two years from now

"Do you believe that – from the standpoint of your health – you will be able to do your current job two years from now?"

- unlikely (1 point)
- no certain (4 points)
- relatively certain (7 points)

Q7 Mental resources

"Have you recently been able to enjoy your regular daily activities?"

- often (4 points)
- rather often (3 points)
- sometimes (2 points)
- rather seldom (1 point)
- never (0 points)

"Have you recently been active and alert?"

- often (4 points)
- rather often (3 points)
- sometimes (2 points)
- rather seldom (1 point)
- never (0 points)

"Have you recently felt yourself to be full of hope for the future?"

- continuously (4 points)
- rather often (3 points)
- sometimes (2 points)
- rather seldom (1 point)
- never (0 points)

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Analysis of Internally Generated Goodwill Indicators: A Case Study of the Slovak Republic

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Background and purpose: Knowing key indicators of goodwill value can contribute to its effective management and growth of the market value of the enterprise. The purpose of this research is to identify individual goodwill indicators. The paper aim is to obtain potential indicators of enterprise goodwill under the conditions of the Slovak Republic.
Design/Methodology/Approach: Paper data included 11,483 financial statements of Slovak enterprises in 2017. The value of residual enterprise income represents the value of goodwill. Input data for the identification of goodwill indicators represented 15 financial-economic variables. Outliers in data were searched and removed through an interquartile range. Multicollinearity among input variables, by the coefficient of determination and variance inflation factor, was also analysed. A statistically significant correlation between goodwill and its potential indicator were tested by the significance test of the Pearson correlation coefficient and correlation matrixes.
Results: Research results reveal the existence of a statistically significant correlation between goodwill and 8 input variables, which represent its potential vital indicators.
Conclusion: Paper findings bring new possibilities for goodwill management, which may create an essential competitive advantage of a company. For the scientific community, the findings represent sources of potential goodwill indicators which can be used for the creation of the new model of goodwill valuation in future research.

Keywords: *Goodwill; Residual income; Key indicators; Correlation*

1 Introduction

In general, goodwill has often defined as the enterprise reputation, image, right name, prestige, as well as the brand. It is reflected in the relationship between enterprise and other market participants and enterprise perception in the eyes of its customers. Traditionally, we distinguish between two types of goodwill: namely, purchased goodwill and internally generated goodwill. Purchased goodwill is the difference between the value paid for an enterprise as a going concern and the sum of its assets less the sum of its liabilities, each item of which has been separately identified and valued. It appears as a result of mergers and acquisition and its valuation is regulated by IFRS 3 Business Combination. On the other hand, internally generated goodwill is an asset that can significantly contribute to the business success of companies. Its value may be very high, although it is not visible directly in the financial statements. It can be defined as the potential intangible asset of the enterprise and it is expected that future economic future benefits, attributable to the asset, will flow to the enterprise. Its accounting is regulated by the International Accounting Standard 38 Intangible Assets (IAS 38). Ac-

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cording to IAS 38 internally generated goodwill cannot be recognized as an asset because it does not represent enterprise´s resource that meet all listed criteria: (i) identification; (ii) control; (iii) measurable (Stefanovic et al., 2014). Internally generated goodwill will be the main subject of interest in the paper, hereinafter referred as to "Goodwill". Enterprise with goodwill has more satisfied and loyal customers and employees. Its suppliers are more willing to cooperate, as well as its investors are more tolerant and willing to finance business development. "Goodwill has created for years, but it can be destroyed almost every day." (Casson, 1997).

Goodwill, as an economic phenomenon has attracted the attention of economic experts since the nineteenth century. During years have been created various methods for its valuation and quantification. This study primary works with the residual income valuation method. The issue enterprise goodwill is an interdisciplinary question; indicators of goodwill creation can be found in financial management, economics, law, marketing, sociologist, etc. However, knowledge and understanding of enterprise goodwill indicators and valuation is still a managerial challenge. Their identification can lead to its effective creation and management, and ultimately to be a powerful tool in the competitive struggle.

The topicality of this issue confirms the number of papers published in the database Web of Science (more than 70 papers about goodwill valuation, measurement) or database Scopus (more than 50 papers). Importance of this issue proves an amount of authors, e.g. Lord Eldon (1842), Leake (1921), Nelson (1953), Hughes (1982), Feltham and Ohlson (1995), Lonergan (1995), Canibano et al. (2000), Fernandez (2002), Curtis and Fargher (2003), Begley et al. (2006), Bean (2011), Herz (2011). Recency of this issue proves and amount of current papers, e.g. Kariuki et al. (2013), Reilly (2015), Tsai (2012), Kimbro and Xu (2016), Kliestik et al. (2018), Sadaf et al. (2019).

The body of paper consist of (i) literature review of enterprise goodwill development; (ii) methodology; (iii) results; and (iv) discussion, including limitations and extensions for future research. Research on possible indicators of enterprise goodwill, their analysis, selection, quantification, etc. represents a complicated and time-consuming process that requires a carefully compiled data sample.

2 Literature review

The enterprise goodwill has represented as an essential and interdisciplinary topic for corporate finance in the economic community since the 19th century. Over the years have been created several approaches to the definition of enterprise goodwill. The first approach was "law direction" – in the beginning, goodwill described as a part of lawsuits. The second approach was "economic direction". This approach prevails to the present day. Goodwill has attracted several scientists from various disciplines over the years. The review of selected goodwill definitions captured in Table 1.

Table 1: Summary of selected previous research – goodwill definition

Author	Year	Definition
Lord Eldon	1842	The good-will, which has been the subject of sale is nothing more than the probability that the old customers will resort to the old place.
Lord Macnaghten	1845	Goodwill is composed of a variety of elements. It differs in its composition in different trades and different businesses in the same trade. One element may preponderate here and another element here.
Lord Macnaughton	1901	What is goodwill? It is a thing straightforward to describe, challenging to define. Goodwill is the benefit and advantage of the proper name, reputation, and connection of a business.
Lord Justice Lindely	1901	Goodwill, as a part of company assets, does not make sense. It only makes sense if it connected with some business. It means term goodwill includes everything that adds value to enterprise from various reasons, e.g. place, reputation, image, relationships, customer´s loyalty, etc.
Paton	1922	Goodwill represents intangible assets, and its value represents the difference between the total value of the enterprise and the sum of every physical enterprise assets. Goodwill represents the enterprise ability to create abnormal earnings.
Yang	1927	Goodwill represents the current value of expected future earnings of an established enterprise, which the new company would not achieve.
Catlett et al.	1968	Goodwill is abnormal earnings capacity.
Tearney	1973	Goodwill is an item which includes many other intangible items.

Table 1: Summary of selected previous research – goodwill definition (continued)

Hughes	1982	The debate around goodwill was possible because even though the origin of goodwill can be determined, its nature will always be prone to interpretation.
Peasnell	1982	Goodwill is the amount of value that a good corporate reputation adds to its overall value.
Shenkar and YuchtmanYaar	1997	Reputation, image, prestige, and goodwill are concepts used by different disciplines, e.g., economics, marketing, sociology, and accounting, to denote the general standing of organizations among their counterparts.
Arnold	1992	Goodwill is a problem that will not go away.
Casson	1977	Goodwill is like a health – unappreciated wealth that everyone wants to have, but few are willing to make efforts to preserve it.
Maly	2002	Goodwill represents the excellent reputation of enterprise for its business partners, financial institutions, the public and customers in domestic country and also in abroad.
Zelenka	2006	Goodwill is an enterprise reputation.
Bloom	2008	There is a great controversy in detecting what is goodwill and what is it composed of because it is used interdisciplinary.
Goodman	2016	None of us can buy goodwill; we must earn it.
Charlynne et al.	2018	Goodwill is an interdisciplinary question and intangible assets.

The issue of enterprise goodwill was also discussed by the authors Vojtovic (2016); Slavik and Zagorsek (2016); Cygler and Sroka (2017); Siekelova (2017); Dvorsky et al. (2017); Kliestik et al. (2018); Sadaf et al. (2019).

Generally, one problem is the definition and content of the term goodwill itself. On the other hand, in practice exists another problem – quantification of its value. Economic experts from all the world have suggested several possibilities of its quantification. These methods include for example the super-profits theory of goodwill described by Leake (1921); the momentum theory of goodwill described by Nelson (1953); components goodwill analyse described by Lonergan (1995) or residual income valuation described by Preinreich (1936).

This study works with the application of the residual income valuation method to evaluate enterprise goodwill. Preinreich described residual income valuation theory in 1936. Later, renewed attention paid to the residual income, as to an economic profit (Nauroth, 2002; Emerling and Wojcik-Jurkiewicz, 2018) or abnormal earnings (Ohlson, 1995). Based on their idea of residual income was created Residual Income Valuation Models. One of them is the model, which was created by Feltham and Ohlson in 1995. In their model, they supposed that the value of the enterprise is formed by the sum of the book value of the enterprise equity and the present value of expected future residual income. It is residual income, which creates the difference between the market value of the enterprise and the book value of the enterprise. Residual income represents the source of difference between the market value of the enterprise and the book value of the enterprise. Subsequently, the value of residual income should equal to the enterprise goodwill.

3 Hypothesis

The purpose of this research is to identify individual goodwill indicators. The paper aim is to obtain potential indicators of enterprise goodwill under the conditions of the Slovak Republic. Fulfilling the prerequisite and objective of this article also entails the formulation of the primary hypothesis:

H: There is not a significant relationship between individual indicator and goodwill.

This hypothesis is tested for all of the individual potential goodwill indicators which are chosen for this research and purpose. In total is it 15 hypotheses.

4 Methodology

4.1 Enterprise goodwill valuation

Residual income represents income, which enterprise created over the level of the income required by its owners. Determination of required income for owners is necessary. According to the residual income theory by Feltham and Ohlson (1995), the required income for owners is equal to the cost of equity. Disadvantages are special barriers in the process of their quantification, especially under the condition of the inefficient capital market, as well as in Slovak Republic. Quantification of residual income has the following form:

$$RI = NI - equity\ charge \quad (1)$$

Where

RI	residual income
NI	net income

The determination of equity charge represents the key calculation of the residual income. Due to the fact, equity charge is the product of the book value of equity and its cost. This fact depicted in the following equation:

$$equity\ charge = r_E * BV_E \quad (2)$$

Where

r_E	cost of equity
BVE	book value of equity

The cost of equity is calculated by CAMP with country risk premium (CRP). According to Damodaran (http://pages.stern.nyu.edu/~adamodar/):

$$r_e = r_{fUSA} + \beta * ERP_{USA} + CRP \quad (3)$$

Where

r_{fUSA} risk-free rate; yield of bonds that calculate the risk premium of the market, i.e. the yield of US 10-year government bonds according to Damodaran website

ERP equity risk premium (R_m - r_f); R_m represents S&P500 according to Damodaran website

β beta for emerging markets according to Damodaran website

CRP risk premium for other markets according to Damodaran website.

4.2 Data and sample

The sample for the identification of significant indicators of enterprise goodwill creation consisted of financial statements of Slovak enterprises in 2017. These data obtained from the Amadeus database system[1] – a comprehensive European database on public and private companies; available at https://amadeus.bvdinfo.com/. Relevant sample for our research of enterprise goodwill consisted of 11,483 financial statements of Slovak enterprises in 2017. Sample creation contained 2 conditions: (i) limited companies; (ii) domestic ownership. The representation of the individual Slovak regions in the sample uninformed – approximately 10% for each region. The sample also diversified to companies with various SK NACE classification. Thanks to these conditions were created robust data sample which can provide general results (for all regions and all sectors). Working data included 11,483 financial statements of Slovak enterprises in 2017. Input data for the identification of goodwill indicators represented 15 financial-economic variables.

4.3 Data analysis

Paper main aim was to obtain potential indicators of enterprise goodwill under the conditions of the Slovak Republic. For their identification were used several methods in the section of the data analysis. The detection of outliers was done by interquartile range. The detection of multicollinearity between variables (potential indicators of enterprise goodwill) was tested by the coefficient of determination and variance inflation factor. Finally, the detection of correlation between residual income and potential indicators of its creation was tested by correlation matrixes for all variables and the test of significance of the Pearson correlation coefficient. All statistics test was tested at the significance level α=0.05.

Discriminant validity was assessed by using two methods: First,(Fornell & Larcker, 1981) method. He suggested that to support for discriminant validity if the square root of the AVE for a latent construct is greater than the correlation values among all the latent variables. Table (5) shows that the square root of the AVE values of all the constructs is greater than the inter-construct correlations which supports the discriminant validity of the constructs. Second, (Hair et al., 2010) he suggests if AVE for a latent construct is larger than the maximum shared variance with other latent constructs that indicates discriminant validity can be maintained Thus, the measurement model indicates a good construct validity and desirable psychometric properties.

[1] Amadeus is a database of the comparable financial and business information on Europe's largest 520,000 public and private companies by total assets. 43 countries are covered. Amadeus is published by Bureau van Dijk/Moody's Analytics. Amadeus provides standardised annual accounts (consolidated and unconsolidated), financial ratios, sectoral activities and ownership data. The database is suitable for research on competitiveness, economic integration, applied microeconomics, business cycles, economic geography and corporate finance. Amadeus is updated weekly, providing standardised annual accounts with up to ten years archive. EUI users can access Amadeus campus-wide via this Catalogue record (two simultaneous users). There is no off-campus access.

5 Results

5.1 Goodwill indicators

Potential indicators of enterprise goodwill creation (obtained from the robust analysis of domestic and foreign scientific literature dealing with the value of enterprise and goodwill. These indicators are grouped in the three categories: (i) financial-economic analysis; (ii) analysis of financial statements; and (iii) other. Category (i) includes financial ratios from enterprise liquidity, profitability, activity and indebtedness. These indicators represent the level of enterprise financial health. The causality between enterprise financial ratios and goodwill was examined by authors Curtis & Fargher, 2003 examined the causality between enterprise financial ratios and goodwill; Begley et al., 2006; Maleki et al., 2010; Jakubec et al., 2011; Sponte, 2018. Category (ii) includes indicators from enterprise financial statements; they focused on intangible assets and specific cost, e.g. marketing cost. The causality between enterprise status indicators and goodwill was separately examined and recommended by authors Courtis, 1983; Kohlbeck & Warfield, 2002; Siekelova, 2017; Nica et al., 2017; Olah et al., 2019. Last category (iii) includes other indicators. Finally, the following 15 variables were selected into this paper (Table 2); the last column represents their quantification.

Table 2: Potential indicators of enterprise goodwill

Variable	Mark	Calculation
cash ratio	CR	(cash + cash equivalents)/current liabilities
debt-equity ratio	DER	equity/total liabilities
the turnover ratio from short-term payables	TUR	(short-term payables from business/costs)*365
return on equity	ROE	earnings after taxes/equity
net income previous year	NIP	earnings after taxes from the previous year from the balance sheet
retained earnings prior years	RE	retained earnings from previous year from the balance sheet
valuable rights	VR	valuable rights from the balance sheet
research and development costs*	R&D	research and development costs from the balance sheet
marketing costs*	MC	(15 % * service costs from the income statement)
staff training costs*	SC	(10% * service costs from the income statement)
investments into the plant*	INP	(annual change from the balance sheet (brutto))
investments into the equipment*	INE	(annual change from the balance sheet (brutto))
investments into the property (buildings)*	INB	(annual change from the balance sheet (brutto))
age of enterprise	AE	time since the enterprise establishment to 2015
market share	MS	sales from operating activities/sales from operating activities in the industry

*Note: necessary to take into account the time effect of the variable to the residual income (goodwill), e.g. for marketing costs assumed the effect of two years and so on.

**Note: for or all variables were set up recommended values – what are the values the indicators of residual income (goodwill) should achieve to be considered as potential indicators of its production. Most variables should be higher than zero, except cash ratio (<0.2-0.8>), debt-equity ratio (≥ 0.04) and turnover ratio from short-term payables (≤ 60), in accordance with (Kohlbeck & Warfield, 2002; Podolna, 2008; Bean, 2011; Rajnoha & Lesnikova, 2016; Da Silva et al., 2015; Szkutnik & Szkutnik, 2018; Valaskova et al., 2018; Fanelli & Ryden, 2018).

5.2 Data analysis

For the identification of potential indicators of enterprise goodwill we used several methods presented in the section of the data analysis. The detection of outliers was done by interquartile range. The detection of multicollinearity between variables (potential indicators of enterprise goodwill) was tested by the coefficient of determination and variance inflation factor. Finally, the detection of correlation between residual income and potential indicators of its creation was tested by correlation matrixes for all variables and the test of significance of the Pearson correlation coefficient. Table 3 (Appendix) shows the value of descriptive statistics in data.

Outliers detection and missing data

Detection of outliers contained searching for outliers, missing values and economic consequences. Enterprises with a negative residual income had to be removed from the database as well as enterprises with missing values and finally, outliers of individual model indicators. Table 4 (Appendix) shows the number of removed enterprises from further research. Overall, 2,478 outliers and missing data removed from the database. Finally, the database for searching for potential indicators of enterprise goodwill contained 9,005 enterprises (11,483 original data - 2,478 outliers and missing data).

Multicollinearity detection

Tables 5 and 6 (Appendix) show the results of the test of multicollinearity between all potential goodwill indicators. Table 5 shows the correlation matrix of all goodwill indicators. Finally, the values of the coefficient of determination R^2 and variance inflation factor VIF were calculated based on the results of correlation and inverse matrixes (Table 6).

The multicollinearity test showed that absolute multicollinearity is found between the MC and SC variables (the value of R^2 is equal to 1, and the value of VIF approaches infinity). As in the methodology, the simplest solution is removing one of the two variables between which the dependency exists. In this research was removed variable SC - staff training costs. It was removed because it can be assumed the higher correlation between enterprise goodwill and marketing costs. Subsequently, the test of multicollinearity was repeated. The results of the retest are shown in Tables 7 and 8 (Appendix). The second test of multicollinearity did not show the existence of multicollinearity among any input variables.

Detection of correlation

Based on the results of the correlation matrixes (Appendix, Table 9), it may be stated the existence of direct linear dependence between residual income and all potential indicators of its creation. However, the tightness of this dependency is diverse. There is a weak linear relationship between the variable residual income and variables CR, DER, TUR, VR, MC, INP, INB, EA and MS. There is a medium linear relationship between the variable residual income and variables ROE, NIP, RE and INE. Based on the results of correlation matrixes, the existence of a strong relationship of none of the input variables has not been confirmed.

Table 10 (Appendix) shows a summary results of the statistical testing of significance of correlation coefficient for all input variables. This test shows whether there is or there is not a statistically significant relationship between variables, which means between residual income and potential indicators of its creation.

Based on the data shown in the Table 10 can be noted that the value of test statistic is lower than the critical value for CR, DER, TUR, INP and AE. In accordance with the level significance $\alpha = 0.05$ the null hypothesis was accepted, and there was not the dependence between them and residual income. For variables ROE, NIP, RE, VR, MC, INB, INE and MS was the value of test statistic higher than the critical value, at the significance level $\alpha=0.05$ the null hypothesis was rejected, indicating there was the statistical significant dependence between them and residual income.

These facts and results of test statistics create a basis for future research in the area of the creation of an econometric model of enterprise goodwill quantification. Quantification of the dependent variable and independent variables, detection of outliers and multicollinearity test are basic assumptions for regression analysis, among others. Especially, for future research and creation of an econometric model of enterprise goodwill quantification regression analysis can be used. The advantage of correlation matrixes results for future econometric model is confirmation of existence of potential sources of enterprise goodwill creation, represent by medium linear relationship between individual indicators and residual income. On the other hand, the disadvantage of correlation analysis is the number indicators with weak linear relationship between them and residual income. However, we can assume that these variables will be removed by regression analysis itself. For future econometric model and regression analysis multicollinearity analysis is very important. An existence of milticollinearity between input variables could lead to incorrect results and misinterpretation. Our research highlights potential existence of multicollinearity between variables as marketing costs, staff training costs or maybe R&D costs, it depends on basis of their calculation. In this case is necessary to consider the contribution of individual indicators to overall value of enterprise goodwill and accept suitable decision about their future role in econometric model and goodwill creation as a whole.

6 Discussion

Paper main aim was to obtain potential indicators of enterprise goodwill under the conditions of the Slovak Republic. Our research demonstrated the existence of a significant relationship between enterprise goodwill and some ratios which can be considered as its indicators. Various authors separately examined the causality between enterprise goodwill and financial ratios, status indicators and another ratio.

Paper research showed as statistical significant goodwill indicators: return on equity, net income previous years, retained earnings prior years, valuable rights, marketing costs, investments into the property, investments into the equipment and market share. These findings are partly consistent with the conclusion of Da Silva et al. (2015) where researched the linear correlation between the variables such as assets, equity, net income, income before a financial transaction, the consolidated profit and loss and indices such as ROE. Similarly, Tsai et al. (2012) consider investing, advertising, research and development as significant indicators of enterprise goodwill. Our research confirmed the existence of significant causality between goodwill and advertising/marketing costs.

Our research brought the space for research extension. Future research may be focused on the application of the multiple linear regression analysis to these data. Where residual income will represent the dependent variable and indicators/potential sources of its value will represent independent variables. This test could bring the new model for goodwill valuation and prediction.

This research has various limitations. It is crucial to highlight the impact of various possibilities to calculate individual variables on the final calculations. These possibilities represent limitations as well as possible extensions of this research. The calculation of the cost of equity has a significant impact on the calculation of the value of residual income according to the Feltham-Ohlson model (1995). The cost of equity was calculated according to the capital asset pricing model (similarly to Da et al., 2012 or Feltham-Ohlson, 1995). Methods for quantification of the cost of equity represents another limitation of this research. The presented study tried to determine potential indicators of enterprise goodwill in the Slovak conditions. Therefore, the main limitations were in the selected goodwill indicators used as independent variables. The selection of other variables could have led to different results, which can be a subject of analysis in future studies. Prerequisite values of input variables give another significant limitation. These were specified according to the provided literature review and respecting specifics of the Slovak environment, but not so strict determination of values of indicators can provide different results. The last limitation is represented by used data. The results cannot be generalized yet because of used data only from the Slovak Republic.

The findings presented in this study have opened a space for a more in-depth insight into the dimensions of the goodwill evaluation in the Slovak enterprises that absent in the scientific studies not only in specific conditions of Slovakia but also worldwide, particularly for its methodological difficulty and data limitations. The issue of enterprise goodwill is an interdisciplinary task and managerial challenge. Searching for potential indicators of goodwill can lead to its effective creation and management, and ultimately to be a powerful tool in the competitive struggle. So there was a need to found out the possible indicators of its creation in Slovak enterprises through which can help enterprise management increase its value.

7 Conclusion

The market economy brings a situation where the market value of the enterprise is higher than the book value of the enterprise. This difference is known as enterprise goodwill. The value of enterprise goodwill adds value to the enterprise in the market. The management of critical indicators of enterprise goodwill still represents a managerial challenge. Although the enterprise goodwill has represented as an essential and interdisciplinary topic for corporate finance in the economic community since the 19th century, it is still a relatively unknown area. Knowing goodwill value key indicators can contribute to its effective management and growth of the market value of the enterprise.

Research theoretical findings bring a review of the scientific literature development for issue of goodwill. Subsequently, the possibility of goodwill quantification focused on residual income valuation.

Besides the theoretical implications, this study provides practical implications. The purpose of this research was to identify individual goodwill indicators. The paper aim was to obtain potential indicators of enterprise goodwill under the conditions of the Slovak Republic. Tested hypothesis: There is a statistically significant relationship between indicator and goodwill, confirmed the existence of a statistically significant correlation between goodwill and 8 input variables, which represent its potential key indicators. Research aim and purpose have fulfilled.

Paper findings bring new possibilities for its management and may create an important competitive advantage. For the scientific community, the findings represent sources of potential goodwill indicators which can be used for the creation of the new model of goodwill valuation in future research. Paper research brought the space for research extension. Future research may be focused on the application of the multiple linear regression analysis to these data. Where residual income will represent the dependent variable and indicators/potential sources of its value will represent independent variables. This test could bring the new model for goodwill valuation and prediction.

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Analiza interno ustvarjenih kazalnikov dobrega imena: Študija primera Slovaške republike

Ozadje in namen: Poznavanje ključnih kazalnikov vrednosti dobrega imena lahko prispeva k učinkovitemu upravljanju dobrega imena in rasti tržne vrednosti podjetja. Namen te raziskave je prepoznati posamezne kazalnike dobrega imena. Cilj prispevka je pridobiti potencialne kazalnike dobrega imena za podjetja pod pogoji Slovaške republike.
Oblikovanje / metodologija / pristop: Podatki, ki smo jih analizirali v članku so vključevali 11.483 računovodskih izkazov slovaških podjetij iz leta 2017. Vrednost preostalega dohodka podjetja predstavlja vrednost dobrega imena. Vhodni podatki za identifikacijo kazalnikov dobrega imena so 15 finančno-ekonomskih spremenljivk. Analizirali smo tudi multikolinearnost med vhodnimi spremenljivkami s koeficientom določitve in faktorjem inflacije. Statistično pomembna korelacija med dobrim imenom in njegovim potencialnim kazalnikom je bila preizkušena s testom značilnosti koeficienta Pearsonove korelacije in korelacijskih matrik.
Rezultati: Obstaja statistično pomembna korelacija med dobrim imenom in 8 vhodnimi spremenljivkami, ki predstavljajo njegove potencialne vitalne kazalnike.
Zaključki: Ugotovitve iz članka prinašajo nove možnosti za upravljanje dobrega imena in lahko bistveno pripomorejo bistveno h konkurenčni prednosti podjetja. Za znanstveno skupnost ugotovitve predstavljajo vire potencialnih kazalcev dobrega imena, ki jih je mogoče uporabiti za oblikovanje novega modela vrednotenja dobrega imena v prihodnjih raziskavah.

Ključne besede: dobro ime; preostali dohodek; ključni kazalci; korelacija.

Appendix: List of Measurement Items

Table 3: Descriptive statistic in data

	Mean	StE	Med	StDev	SVar	Range	Min	Max
CR	0.46	0.01	0.44	0.17	0.03	0.60	0.20	0.80
DER	1.88	0.52	0.77	13.21	174.5	329.9	0.04	329.9
TUR	20.33	0.67	16.78	16.97	287.8	59.64	0.00	59.64
ROE	0.42	0.03	0.30	0.73	0.54	15.11	0.00	15.11
NIP	59,448.2	7,656.06	8,822.75	193,078.5	3.73E+10	2,226,686.5	0.00	2,226,686,5
RE	130,151.1	24,385.3	0.00	614,975.0	3.78E+11	12,099,487	0.00	12,099,487
VR	748.28	420.53	0.00	10,605.4	1.12E+8	186,4	0.00	186,4
R&D	80.48	80.48	0.00	2,029.58	4,119,185.31	51,1	0.00	51,1
MC	32,752	4,622.7	5,945.5	116,580.3	13,590,983,369	1,957,849.9	0.23	1,957,850.1
SC	21,834	3,081.8	3,963.7	77,720.2	6,040,437,053.1	1,305,233.3	0.15	1,305,233.4
INP	178.89	61.27	0.00	1,545.09	2,387,315.9	22,393.2	0.00	22,393.2
INE	10,620,6	1,597.8	0.00	40,296	1,623,767,606.8	376,923	0.00	376,923
INB	86,310.63	12,123.1	13,280.3	305,733.9	93,473,229,651.5	4,908,964,8	0,00	4,908,964,8
AC	12.47	0.19	11.00	4.87	23.72	18.00	7.00	25.00
MS	0.01	0.00	0.00	0.07	0.01	1.00	0.00	1.00
RI	92,753.1	10,632.5	16,829.2	268,143.6	71,901,037,863.7	3,815,511.4	39.3	3,815,550.7

Source: calculation by authors

Table 4: Detection of outliers and missing data

Indicator	Outliers and Missing data
RI	1,369
CR	185
DER	35
TUR	66
ROE	209
NIP	64
RE	30
VR	78
R&D	49
MC	101
SC	2
INP	70
INE	37
INB	83
AE	6
MS	94
Total	2,478
Adjusted Sample	**9,005**

Source: calculation by authors

Table 5: Correlation matrix

Variables	CR	DER	TUR	ROE	NIP	RE	VR	MC	SC	INP	INE	INB	AE	MS
CR	**1.000**	0.024	-0.068	0.051	-0.026	-0.094	-0.017	-0.093	-0.093	-0.033	-0.111	-0.099	0.004	-0.066
DER	0.024	**1.000**	-0.194	-0.204	0.112	0.182	0.022	-0.092	-0.092	-0.034	-0.006	0.001	-0.006	-0.011
TUR	-0.068	-0.194	**1.000**	0.022	0.000	0.121	0.020	0.196	0.196	-0.038	0.114	0.073	0.053	-0.021
ROE	0.051	-0.204	0.022	**1.000**	0.201	-0.235	0.011	0.069	0.069	-0.028	-0.116	-0.030	-0.064	-0.020
NIP	-0.026	0.112	0.000	0.201	**1.000**	0.454	0.037	0.208	0.208	0.003	0.163	0.342	0.084	0.165
RE	-0.094	0.182	0.121	-0.235	0.454	**1.000**	0.110	0.207	0.207	0.052	0.393	0.441	0.163	0.260
VR	-0.017	0.022	0.020	0.011	0.037	0.110	**1.000**	0.110	0.110	-0.012	0.182	0.017	-0.017	-0.020
MC	-0.093	-0.092	0.196	0.069	0.208	0.207	0.110	**1.000**	1.000	0.019	0.015	0.294	0.078	0.129
SC	-0.093	-0.092	0.196	0.069	0.208	0.207	0.110	1.000	**1.000**	0.019	0.015	0.294	0.078	0.129
INP	-0.033	-0.034	-0.038	-0.028	0.003	0.052	-0.012	0.019	0.019	**1.000**	0.143	0.187	0.045	0.103
INE	-0.111	-0.006	0.114	-0.116	0.163	0.393	0.182	0.015	0.015	0.143	**1.000**	0.310	0.244	0.039
INB	-0.099	0.001	0.073	-0.030	0.342	0.441	0.017	0.294	0.294	0.187	0.310	**1.000**	0.168	0.215
AE	0.004	-0.006	0.053	-0.064	0.084	0.163	-0.017	0.078	0.078	0.045	0.244	0.168	**1.000**	-0.040
MS	-0.066	-0.011	-0.021	-0.020	0.165	0.260	-0.020	0.129	0.129	0.103	0.039	0.215	-0.040	**1.000**

Source: calculation by authors

Table 6: Test statistic of multicollinearity

Statistic	CR	DER	TUR	ROE	NIP	RE	VR	MC	SC	INP	INE	INB	AE	MS
R^2	0.030	0.134	0.106	0.214	0.344	0.481	0.063	1.000	1.000	0.061	0.271	0.319	0.087	0.113
VIF	1.031	1.154	1.119	1.273	1.524	1.927	1.067	-	-	1.065	1.372	1.468	1.095	1.128

Source: calculation by authors

Table 7: Adjusted correlation matrix

Variables	CR	DER	TUR	ROE	NIP	RE	VR	MC	INP	INE	INB	AE	MS
CR	**1.000**	0.024	-0.068	0.051	-0.026	-0.094	-0.017	-0.093	-0.033	-0.111	-0.099	0.004	-0.066
DER	0.024	**1.000**	-0.194	-0.204	0.112	0.182	0.022	-0.092	-0.034	-0.006	0.001	-0.006	-0.011
TUR	-0.068	-0.194	**1.000**	0.022	0.000	0.121	0.020	0.196	-0.038	0.114	0.073	0.053	-0.021
ROE	0.051	-0.204	0.022	**1.000**	0.201	-0.235	0.011	0.069	-0.028	-0.116	-0.030	-0.064	-0.020
NIP	-0.026	0.112	0.000	0.201	**1.000**	0.454	0.037	0.208	0.003	0.163	0.342	0.084	0.165
RE	-0.094	0.182	0.121	-0.235	0.454	**1.000**	0.110	0.207	0.052	0.393	0.441	0.163	0.260
VR	-0.017	0.022	0.020	0.011	0.037	0.110	**1.000**	0.110	-0.012	0.182	0.017	-0.017	-0.020
MC	-0.093	-0.092	0.196	0.069	0.208	0.207	0.110	**1.000**	0.019	0.015	0.294	0.078	0.129
INP	-0.033	-0.034	-0.038	-0.028	0.003	0.052	-0.012	0.019	**1.000**	0.143	0.187	0.045	0.103
INE	-0.111	-0.006	0.114	-0.116	0.163	0.393	0.182	0.015	0.143	**1.000**	0.310	0.244	0.039
INB	-0.099	0.001	0.073	-0.030	0.342	0.441	0.017	0.294	0.187	0.310	**1.000**	0.168	0.215
AE	0.004	-0.006	0.053	-0.064	0.084	0.163	-0.017	0.078	0.045	0.244	0.168	**1.000**	-0.040
MS	-0.066	-0.011	-0.021	-0.020	0.165	0.260	-0.020	0.129	0.103	0.039	0.215	-0.040	**1.000**

Source: calculation by authors

Table 8: Adjusted test statistic of multicollinearity

Statistic	CR	DER	TUR	ROE	NIP	RE	VR	MC	INP	INE	INB	AE	MS
R^2	0.030	0.134	0.106	0.214	0.344	0.481	0.063	0.177	0.061	0.271	0.319	0.087	0.113
VIF	1.031	1.154	1.119	1.273	1.524	1.927	1.067	1.215	1.065	1.372	1.468	1.095	1.128

Source: calculation by authors

Table 9: Correlation matrixes

Variables	RI	CR
RI	1	0.003
CR	0.003	1

Variables	RI	DER
RI	1	0.064
DER	0.064	1

Variables	RI	TUR
RI	1	0.026
TUR	0.026	1

Variables	RI	ROE
RI	1	0.322
ROE	0.322	1

Variables	RI	NIP
RI	1	0.790
NIP	0.790	1

Variables	RI	RE
RI	1	0.404
RE	0.404	1

Variables	RI	VR
RI	1	0.169
VR	0.169	1

Variables	RI	MC
RI	1	0.292
MC	0.292	1

Variables	RI	INP
RI	1	0.056
INP	0.056	1

Variables	RI	INE
RI	1	0.170
INE	0.170	1

Variables	RI	INB
RI	1	0.344
INB	0.344	1

Variables	RI	AE
RI	1	0.074
AE	0.074	1

Variables	RI	MS
RI	1	0.128
MS	0.128	1

Source: calculation by authors

Table 10: The test statistic of significant correlation

Variable	T (test statistic)	T_{crit} (critical value)	p-value (two-tailed)	alpha
CR	0.054995	1.965013	0.956	0.05
DER	1.396096	1.965013	0.163	0.05
TUR	0.57502	1.965013	0.566	0.05
ROE	7.387359	1.965013	< 0.0001	0.05
NIP	27.93862	1.965013	< 0.0001	0.05
RE	9.585949	1.965013	< 0.0001	0.05
VR	3.725166	1.965013	< 0.0001	0.05
MC	6.617913	1.965013	< 0.0001	0.05
SC	1.223255	1.965013	0.222	0.05
INP	3.732676	1.965013	< 0.0001	0.05
INE	7.947842	1.965013	< 0.0001	0.05
INB	1.616102	1.965013	0.107	0.05
AE	2.811178	1.965013	< 0.0001	0.05

Source: calculation by authors

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Application of the Project Management Methodology Formation's Method

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Background and Purpose: The selection of a "right" project management methodology for a particular project represents a problem of great importance. Its solution affects crucial project parameters like cost, duration, product quality, and the project's success in general. The purpose of this study is to present a method for the formation of the project management methodology and illustrate its applicability on a software development project's example.
Design/Methodology/Approach: In this study, we describe the method of project management methodology formation that allows the forming of a specialized methodology for any IT project considering the fuzziness of information about the project, its environment, and existing expert's recommendations. The method involves 1) collecting baseline information using a questionnaire, 2) calculating weighted Hamming and Euclidean distances, 3) solving a three-criterion optimization problem using a minimax approach with fuzzy input data.
Results: All six stages of the project management methodology formation's method (project evaluation, basis selection, alternative methodologies formation, methodology selection, methodology application, and methodology tailoring) were applied to form a specialized project management methodology for an IT project to increase the possibility of its success. The most appropriate alternative based on DSDM was selected and applied to manage the project.
Conclusions: The given method allows the forming of a specialized project management methodology based on the components of Generalized Body of Knowledge for any IT project considering specific conditions of the project and its environment.

Keywords: *Methodology, Project management, Formation, Application, Method.*

1 Introduction

With the growth of competition in the global market and rapid changes in applied technologies, project management is becoming one of the most sought-after areas of management. Dozens of project management guides, standards, and methodologies have been created. Their main strengths are 1) the systematic character, 2) the use of computer science achievements, 3) the application of process-oriented approaches, 3) the use of various information collecting and processing methods, and 4) the use of decision-making support methods. Due to the large number of existing developments in this area, the choice of a management methodology for a specific project, represents a complex task. Its solution affects crucial project parameters like cost, duration, product quality, and the project's success in general. The chosen methodology impacts the agility of an enterprise, as well as its further development possibilities (Kryvinska, 2012).

The purpose of the study is to propose a method for the project management methodology formation and illustrate its applicability on a software development project's example.

The study has the following structure:
1. Introduction. The section describes the motivation of the study, its aim, and its structure.
2. Literature Review. The section provides a review and analysis of the latest publications dedicated to project management methodology selection and formation.
3. The Project Management Methodology Formation's

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Method. The section contains information about Project Management Methodology Formation's Method: its information support, main stages, and their descriptions.
4. Application of the Project Management Methodology Formation's Method to a Software Development Project. The section illustrates an example of a practical application of the method described in Section 3 to a software development project.

2 Literature Review

While project performance has been increasing globally (in 2018, nearly 70% of projects met their original goals and nearly 60% were completed within the original budget compared to 62% and 50% respectively in 2016 according to PMI), the project failure rate is still high.

According to an Harvard Business Review survey, the average IT project overran its budget by 27% and at least one in six IT projects turns into a "black swan" with a cost overrun of 200% and a schedule overrun of 70% (Harvard Business Review, 2011).

A PricewaterhouseCoopers (PwC) studied 10,640 projects and found that only 2.5% of companies complete their projects 100% successfully. The rest projects either failed to meet some of the aims or missed the original budget or deadlines (Gallup, 2012).

According to PwC (PricewaterhouseCoopers, 2012), the usage of project management methodologies improves project performance. So organizations that use a methodology comparing to organizations that don't, more often meet budget (38% vs. 31%), stay on schedule (28% vs. 21%), meet scope (71% vs. 61%), meet quality standards (68% vs. 60%), meet expected benefits (60% vs. 51%).

An author of (Whitaker, 2014) showed the results of a survey of 202 project management specialists from 15 sectors of the economy. Among the respondents, 42% were organizations that do not have a project management methodology. These respondents noted that their projects were successful in 67% of cases. Respondents who use mostly tailored project management methodology (37% of respondents) reported that projects succeed in 73% of cases. Those who use a fully tailored project management methodology (7% of respondents) indicated that projects were successful in 82% of cases. Among those who do not have a project management methodology, 29% do not know how to build a methodology.

The task of the project management methodology selection is the subject of various studies. For example, the study (Bushuev & Neizvestnyy, 2013) present a genome model for the project, program, and portfolio management methodologies. It gives a formal description of the genome as a system of knowledge about these methodologies and defines the methodology in the genome using an object-oriented approach. The methodologies database structure allows the storing of all project management methodologies in a single system and format.

The results of a study (Joslin & Müller, 2015) indicate the importance of having a comprehensive project management methodology and the experience of its tailoring as factors of project success.

The authors (Joslin & Müller, 2016) have shown that there is a connection between the elements of a project management methodology and the characteristics by which the project's success is evaluated. The methodology's elements have the highest impact on the time, cost and scope of the project.

The study (Čelesnik, Radujković, & Vrečko, 2018) demonstrates the impact of the applied project management methodology on solving company problems in a crisis. In (Rehman & Hussain, 2007), five project management methodologies: Agile Development Methods, MSF, PRINCE2, RUP, ITIL were compared with PMBOK Guide (PMI, 2004). As a result of the comparison, the authors noted that the main criteria for choosing the methodology should include the following: work experience, experts' opinions, state regulation, stakeholders' and client's preferences, and the client location.

The authors of (Boehm & Turner, 2004) have suggested a risk-based approach to balance Agile and Plan-driven methodologies. They identified five dimensions, which from their perspective are crucial in describing an organization or a project in Agile and Plan-driven characteristics. Among these dimensions are size, criticality, dynamism, personnel, and culture. The graphical representation of an organization or a project promotes the definition of its environment and, following, the application of the risk-based approach described in the paper for a balanced development strategy construction.

The results of (Conforto, et al., 2014) indicate that besides software development, Agile Project Management can be adopted by other industries, but there should be some enablers for its implementation. These enablers relate to the experience of project teams and project managers, project teams size and location, the involvement of customer/stakeholders in the project planning, etc.

In (PMI, 2017b), the Model for Suitability of Agile Approach is proposed. This model demands the survey of a project team on nine issues concerning the cultural context of the project, the project team, and the project itself. Depending on the answers, the model recommends the usage of Agile, predictive or hybrid approach.

The authors (Kononenko & Lutsenko, 2018) proposed the method of a specialized methodology formation for a specific project. The method considers the unique characteristics of every project, its parameters, and parameters of its environment. However, the authors have not illustrated how the given method could be put into practice.

The aim of the study is to demonstrate how the method of project management methodology formation (Kononenko & Lutsenko, 2018) could be applied to a project to form the most appropriate management methodology for

its conditions. We will illustrate and evaluate the applicability of the method on a small-size software development project's example.

3 The Project Management Methodology Formation's Method

There are various project management standards, guides, and methodologies. But for now, there is no unity in the scientific world about a 'project management methodology' definition. In this regard, we have analyzed existing versions of its definition and have considered the following (Kononenko, Aghaee, & Lutsenko, 2016): the project management methodology is a certain and documented system of principles, rules, processes, practices, life cycle, organizational structure, prescribed roles that provide the project management.

To form such methodology for specific conditions of a particular project, we will apply the project management methodology formation's method (Kononenko & Lutsenko, 2018b). The method can also be applied to a group of projects or to all projects of an organization under specific conditions which will be described later in the section. The method implies the usage of Generalized Body of Knowledge on Project Management (GBOK), which contains information from the commonly known project management standards, methodologies, and guides (Kononenko & Lutsenko, 2018a). Particularly, it includes information from PMBOK guide (PMI, 2018a), ISO21500 standard (ISO, 2012), PRINCE2 method (OGC, 2017), SWEBOK guide (IEEE, 2014), Scrum (SCRUMstudy, 2016), Kanban (Anderson, 2010), XP (Beck, 2004), DSDM (Agile Business Consortium, 2014), and FDD (Gorakavi, 2009) agile methodologies, as well as information gathered from the specialists' propositions. Figure 1 illustrates the structure of GBOK.

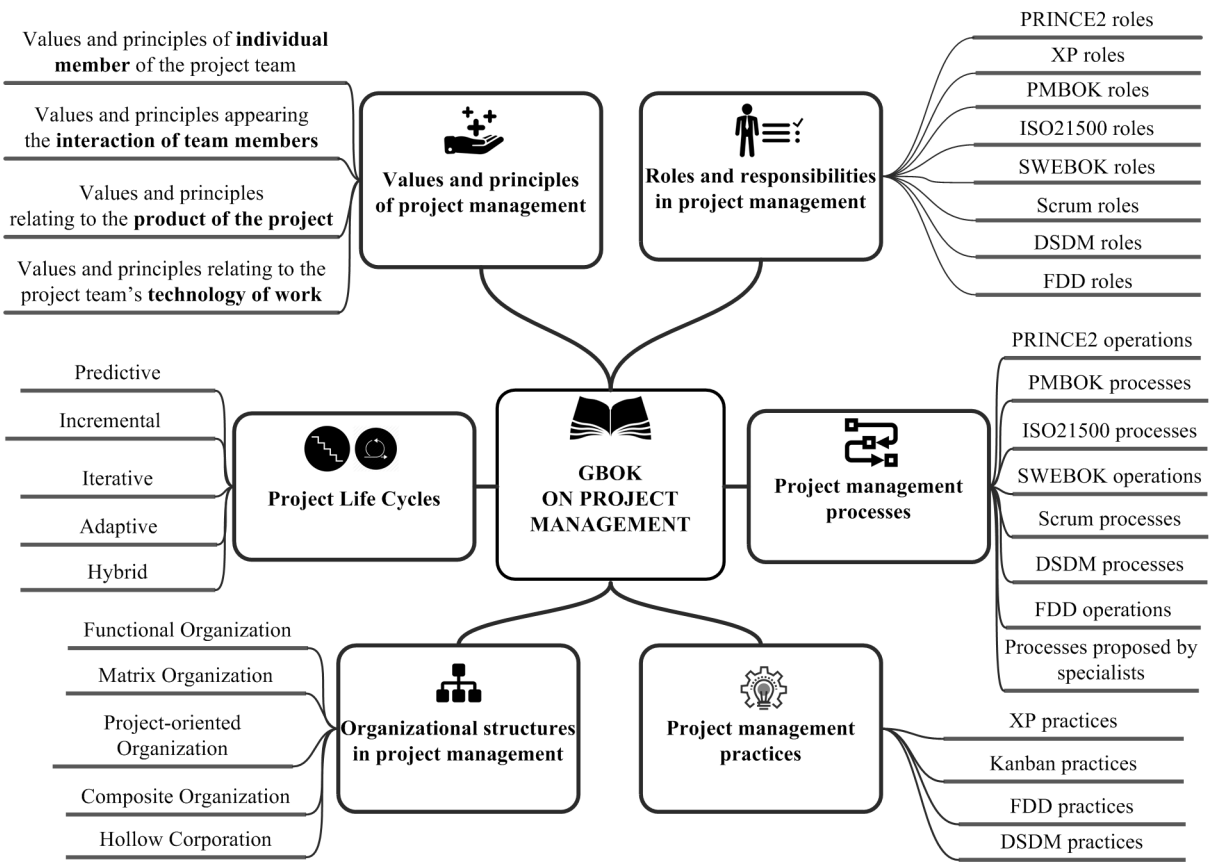

Figure 1: The GBoK structure (Kononenko & Lutsenko, 2018b)

The application of the project management methodology formation's method implies the fulfillment of the following stages.

1) Evaluate the project
Fill in the questionnaire about the project and its environment. The questionnaire is described in (Kononenko & Lutsenko, 2018b). It includes questions about the size of the project team, its competence, customer's experience of working with this team, project manager's responsibilities, the main requirements to the project, and the risk events occurrence probability. It is advisable to involve project stakeholders in filling the questionnaire.

2) Select the basis
Select a primary approach to project management using the method given in (Kononenko & Lutsenko, 2017). The method allows selecting the most suitable approach from the generally known standards, guides, and methodologies (PMBOK, PRINCE2, SWEBOK, Scrum, XP, and Kanban). Use the selected approach as a basis for further specialized methodology formation.

3) Form alternative methodologies
Set several specialized methodology alternatives. Modify the primary approach or create your basis using principles, rules, processes, practices, life cycles, and organizational structures represented in GBOK. Distribute roles and responsibilities in the project and define connections between processes and other components. Delete or modify components if appropriate. It is advisable to involve an expert to form alternatives properly.

4) Select methodology
Select the most appropriate methodology from alternatives created on the previous stage. For the selection, use the method of three-criterion optimization described in (Kononenko, Aghaee & Lutsenko, 2016). The method allows selecting the best methodology by the management activities laboriousness and cost, as well as the risks associated with the implementation of the methodology.

5) Apply methodology
Apply the selected specialized methodology to the project management.

6) Tailor methodology
During the project implementation, tailor the project management methodology components and links between them periodically. For the tailoring, use the following criteria: the management activities laboriousness, the management activities cost, and the risks associated with the methodology implementation.

The complex collection of relevant project data in the pre-initialization phase could be time and cost consuming. But these expenses are justified for large, complex, expensive, and responsible projects. According to the statistics, large projects (more than $10 million) have a higher failure rate (38%) than small projects (4%) (The Standish Group, 2013). The dependency between the project size and failure rate is also mentioned in Gartner's research (Gartner, 2012): "An IT project with a budget over $1M is 50% more likely to fail than one with a budget below $350,000. For such large IT projects, functionality issues and schedule overruns are the top two causes of failure (at 22% and 28% respectively)". That is why the application of the method to a large project to increase the probability of its success is reasonable.

The method also can be applied to a group of projects or all projects of an organization. In this case, the diversity of all projects of the organization should be considered (IT projects, marketing projects, production projects, etc.). It is advisable to define groups of projects that are to be managed with one methodology. Such groups could be defined on Stage 2 of the method: if the basic methodologies for several projects are the same, the projects can be united into a group.

The method can be applied to any projects, but it should be taken into account that some of the approaches included in GBOK apply only to IT projects (SWEBOK, XP, FDD).

4 Application of the Project Management Methodology Formation's Method to a Software Development Project

Let us illustrate the proposed method application. As an example, we will consider a software development project. The project product is a web application for the synthesis of the project management guide PMGuide. The expected duration of the project is 1.5 months. Project management cost should not exceed $ 1,750.

4.1 Project evaluation

On the first stage of the method, stakeholders evaluate the project by filling a special questionnaire (Kononenko & Lutsenko, 2017).

Each question of the questionnaire represents a project parameter $X_k, k = \overline{1,K}$ (e.g. 'Number of people involved in the project' is the first parameter of a project evaluation - x_1, 'Customer's experience of working with this project team' is the second parameter - x_2 etc.). The total number of parameters is K=23.

Every parameter has four values $X_k = \{x_{1k}, x_{2k}, ..., x_{4k}\}$ that correspond with possible situations in a project. For

example, the project parameter 'Number of people involved in the project' can be: 'More than 100 people' (x_{11} = 1), 'From 30 to 100 people' (x_{21} = 2), 'From 10 to 30' (x_{31} = 3), and 'Less than 10 people' (x_{41} = 4).

Stakeholders evaluate the project using given parameters by mapping the project to parameters values using a membership function (Kononenko & Lutsenko, 2017). The project evaluation $B = \{B_1, B_2, ..., B_K\}$ represents a fuzzy set where $B_k = \{\langle x_{1k}, \mu_{B_k}(x_{1k})\rangle, \langle x_{2k}, \mu_{B_k}(x_{2k})\rangle, ..., \langle x_k, \mu_{B_k}(x_k)\rangle\}$.

Membership function $\mu_{B_k}(x_k), i = \overline{1,I}$ defines how the project is mapped to the i-th situation of the k-th questionnaire parameter.

If one of the parameter's possible situations entirely meets the project and three others are not suitable, the value of membership function for the suitable situation equals 1 and for three others it equals 0. For example, the evaluation $B_2 = \{\langle 1,0\rangle, \langle 2,0\rangle, \langle 3,1\rangle, \langle 4,0\rangle\}$ means that the project customer has never worked with any member of the project team but a team leader.

If one possible situation cannot fully describe the project conditions, the membership function value will show the compliance degree between the project and all parameter's possible situations. For example, the evaluation $B_3 = \{\langle 1,0\rangle, \langle 2,0.5\rangle, \langle 3,0.5\rangle, \langle 4,0\rangle\}$ demonstrates the case when the project's conditions cannot be described by one possible situation of the parameter 'Work experience in the given field'. This evaluation shows that half of the project team has less than 2 years of work experience while the other half has been working in the given field from 2 to 5 years.

The PMGuide development project evaluation gained from its main stakeholders is shown in Table 1.

Table 1: Project evaluation (B)

Parameter, X_k	Possible situation, $i = \overline{1,4}$	Parameter value, x_{ik}	Membership function, $\mu_{B_k}(x_k)$
Number of people involved in the project			
Number of people involved in the project, X_1	More than 100	1	0
	From 30 to 100	2	0
	From 10 to 30	3	0
	Less than 10	4	1
Customer's experience of working with this project team			
Customer's experience of working with this project team, X_2	Has never worked with this team	1	0
	Worked with some members of the team	2	0
	Worked with the project team leader	3	1
	One or more common projects with the whole project team	4	0
Evaluation of the Project Team's Competence by the Project Manager			
Work experience in the given field, X_3	No work experience	1	0
	Less than 2 years of work experience	2	0.5
	From 2 to 5 years of work experience	3	0.5
	More than 5 years of work experience	4	0

Table 1: Project evaluation (B) (continued)

Parameter, X_k	Possible situation, $i=\overline{1,4}$	Parameter value, x_{ik}	Membership function, $\mu_{B_k}(x_k)$
Understanding of requirements, adapting ability, initiative, X_4	Almost do not understand the requirements; require frequent explanations and constant control	1	0
	Understand the requirements, can follow them, but require regular control	2	0.5
	Understand the requirements, can follow them, do not require regular control	3	0.5
	Have a good understanding of the requirements; can follow them without regular control; can suggest better alternatives	4	0
Cooperation experience, X_5	Have never worked together	1	0.33
	Worked together on the creation of a product but in the different field	2	0
	Worked together on the creation of one product in a field of interest	3	0.67
	Worked together on the creation of several products in the field of interest	4	0
Knowledge of applied tools and methods, X_6	Tools and methods, applied in the given project, have never been used before and are unknown to the team	1	0
	Tools and methods, applied in the project, are known to the team but have never been used before	2	0
	Tools and methods, used in the project, are known to the team but are rarely used	3	0
	Tools and methods are known to the team and have been widely used before	4	1
Learning ability, X_7	It is hard for the team to learn new knowledge and technologies, and to adjust to changes	1	0
	For some members of the team, it is hard to learn new information and technologies, but the team can adjust to changes	2	1
	Easily absorb new knowledge, can adjust to changes	3	0
	The team can easily absorb information, always tries to learn something new; can well adjust to the changes	4	0
Team's ability to clearly formulate and openly express ideas, X_8	Can't clearly formulate ideas and rarely express them	1	0
	Can clearly formulate their ideas but rarely express them	2	0.17
	Can clearly formulate their ideas and openly express them	3	0.66
	Can clearly formulate, openly express and justify their ideas	4	0.17
Ability to admit mistakes, X_9	Don't admit their mistakes and can't learn from them	1	0
	Rarely admit their mistakes but try to never make them again	2	0
	Openly admit their mistakes and try to never make them again	3	1
	Openly admit their mistakes and always learn from them	4	0

Table 1: Project evaluation (B) (continued)

Parameter, X_k	Possible situation, $i=\overline{1,4}$	Parameter value, x_{ik}	Membership function, $\mu_{B_k}(x_k)$
Ability to admit mistakes, X_9	Don't admit their mistakes and can't learn from them	1	0
	Rarely admit their mistakes but try to never make them again	2	0
	Openly admit their mistakes and try to never make them again	3	1
	Openly admit their mistakes and always learn from them	4	0
Team's ability to work effectively in conditions of freedom or full regulation, X_{10}	Work effectively in conditions of full regulation	1	0
	Work effectively mostly in conditions of regulation	2	0
	Work effectively mostly in conditions of freedom	3	1
	Work effectively in conditions of full freedom	4	0
Reporting			
Means of communication, X_{11}	Written reports. Formal documentation	1	0
	Online texting (ICQ, E-mail)	2	0
	Voice communication (telephone connection, Internet-conference)	3	0
	Direct communication (meetings, video conferences)	4	1
The frequency of reporting to the Customer, X_{12}	Reports on every activity	1	0
	Reports on completing the blocks of work	2	0
	Reports on the readiness of a project product component	3	1
	Reports about project finish	4	0
Understanding the scope of works, X_{13}	There is a full list of works; further alternation is impossible	1	0
	There is a detailed list of works, further alternation is possible	2	0
	There is an approximate list of project works	3	1
	The team understands the project goal and several ways for its achievement	4	0
Project Manager's Responsibility and Main Requirements to the Project			
Consequences in case of unsatisfactory project outcome, X_{14}	The threat to human life	1	0
	Loss of irreplaceable sum of money	2	0
	Loss of a significant sum of money	3	1
	Loss of insignificant sum of money/ reputational loss	4	0
Project cost, X_{15}	More than 1 million $	1	0
	From 300 thousand to 1 million $	2	0
	From 100 to 300 thousand $	3	0
	Less than 100 thousand $	4	1
Requirements to the project quality, X_{16}	Highest international requirements	1	0
	International requirements	2	0
	National requirements	3	0
	Local requirements	4	1
Requirements to the realization period of the project, X_{17}	The period is unlimited	1	0
	Not very urgent	2	1
	Urgent	3	0
	Very urgent	4	0

Table 1: Project evaluation (B) (continued)

Parameter, X_k	Possible situation, $i=\overline{1,4}$	Parameter value, x_{ik}	Membership function, $\mu_{B_k}(x_k)$
Requirements to the precise compliance with a deadline, X_{18}	The deadline should be strictly met	1	0
	Insignificant deviation from the deadline is allowed	2	1
	Considerable deviation from the deadline is allowed	3	0
	Compliance with the deadline is not strictly required	4	0
Requirements change percent /month, X_{19}	Less than 7%	1	0
	From 7 to 25%	2	0
	From 25 to 45%	3	0.5
	More than 45%	4	0.5
	Risk Events Probability		
The probability of occurrence of risk events associated with the object architecture, technologies, and processes of its creation, quality indicators, X_{20}	Risk events are not likely to occur [0,0.1]	1	0
	Risk events might occur (0.1,0.5]	2	1
	Risk events are highly likely to occur (0.5,0.75]	3	0
	Risk events will most probably occur (0.75,1]	4	0
The probability of external risk events occurrence (disruption of work by contractors, unfavorable political/ economic situation in the country, market changes, etc.), X_{21}	Risk events are not likely to occur [0,0.1]	1	1
	Risk events might occur (0.1,0.5]	2	0
	Risk events are highly likely to occur (0.5,0.75]	3	0
	Risk events will most probably occur (0.75,1]	4	0
The probability of organizational risk events occurrence (disruption of funding, delivery of resources, inaccurate prioritizing, etc.), X_{22}	Risk events are not likely to occur [0,0.1]	1	0
	Risk events might occur (0.1,0.5]	2	1
	Risk events are highly likely to occur (0.5,0.75]	3	0
	Risk events will most probably occur (0.75,1]	4	0
The probability of managerial risk events occurrence (inefficient planning, controlling, communication problems, etc.), X_{23}	Risk events are not likely to occur [0,0.1]	1	0
	Risk events might occur (0.1,0.5]	2	0
	Risk events are highly likely to occur (0.5,0.75]	3	1
	Risk events will most probably occur (0.75,1]	4	0

4.2 Basis selection

For an expert, it can be easier to form the methodology using some approach as a basis than create it all by himself. The method stage 'Select the basis' is optional but, at least, it allows defining what type of methodology is more appropriate for the project (whether it should be some heavy-weighted plan-driven methodology or a flexible agile, or a hybrid of such methodologies is more beneficial).

Using the project evaluation gained on the previous stage and the method given in (Kononenko & Lutsenko, 2017) we can select a project management approach that fits the project the most.

Each approach was previously evaluated by its applicability to the situations described in the questionnaire (Table 1) (Kononenko & Lutsenko, 2017). The degree of compliance between the approach and a specific situation is fuzzy. That is why we used fuzzy sets for its description.

We will consider the applicability of the r-th approach to each situation of the k-th parameter $X_k = \{x_{1k}, x_{2k}, ..., x_k\}$ as a fuzzy set $A_k, k = \overline{1, K}$,

$$A_k = \left\{\left\langle x_{1k}, \mu_{A_k}(x_{1k})\right\rangle, \left\langle x_{2k}, \mu_{A_k}(x_{2k})\right\rangle, ..., \left\langle x_k, \mu_{A_k}(x_k)\right\rangle\right\}$$

The membership function $\mu_{A_k}(x_k), i = \overline{1, I}$ defines how the r-th approach is mapped to the i-th situation of the k-th questionnaire parameter. The membership functions of all considered approaches are defined by experts in (Kononenko & Lutsenko, 2017). Figure 2 illustrates an example of the SCRUM membership function graphical representation for the first questionnaire parameter.

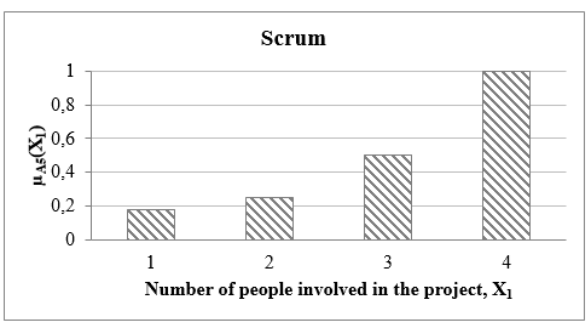

Figure 2: Scrum membership function (parameter x_1)

A project management approach A_r, $r = \overline{1, R}$ is characterized by its applicability to each situation of all parameters (i.e. $A_r = \{A_{r1}, A_{r2}, ..., A_K\}$).

The best approach for the project is the closest one. It means that to find the most appropriate approach to managing a project we should calculate fuzzy distances from the project evaluation B to all alternative approaches A_r, $r = \overline{1, R}$. Calculating total distances, we will take into consideration that the distance between the project evaluation B and an approach A_r, $r = \overline{1, R}$ for the i-th value of the k-th parameter is:

$$d_k(A_r, B) = \begin{cases} 0, \text{ if } \left(\mu_{A_k}(x_{ik}) - \mu_{B_k}(x_{ik})\right) \geq 0 \\ \left(\mu_{A_k}(x_{ik}) - \mu_{B_k}(x_{ik})\right), \text{ else.} \end{cases}$$

In this case, if the value of the membership function for the approach is superior to the value of the membership function for the project or equal to it, the distance between these two coordinates should be considered as zero. In other words, the membership function for the project is covered by the membership function for the approach or, else, the approach is fully consistent with the project.

Formulas for calculation of total Hamming and total Euclidean distances, as well as results of the calculation, are shown in Table 2. The approaches membership functions and project parameters weight coefficients were described in (Kononenko & Lutsenko, 2017)

The minimum distance both for Hamming and Euclidean methods is reached for Scrum project management methodology. So, Scrum methodology is recommended as a basis for the further methodology formation. Other closest methodologies are XP and Kanban. These results indicate that for the given project agile project management methodologies are more suitable than plan-driven approaches (PMBOK, ISO21500, PRINCE2, and SWEBOK).

4.3 Alternative methodologies formation

An expert has formed two alternative specialized methodologies for the PMGuide software development project. An expert here is a person who has a comprehensive knowledge of methodologies included in GBOK.

The first methodology was created by modification of Scrum project management methodology (the primary approach).

For the second alternative, an expert has selected DSDM as a basis (other famous methodology from the agile family) and supplemented it by components from PRINCE2 and Scrum methodologies.

Both specialized methodologies have their composition of project management values and principles, project life cycle, organizational structure, roles and responsibilities, processes, and practices (Table 3).

Table 2: Calculation of the total weighted Hamming and Euclidean distances

Approach	Hamming distance $d_\alpha(A_r,B)=\sum_{k=1}^{K}\alpha_k\sum_{i=1}^{I}\left\|d_k(A_r,B)\right\|$	Euclidean distance $e_\alpha(A_r,B)=\sum_{k=1}^{K}\alpha_k\sqrt{\sum_{i=1}^{I}(d_k(A_r,B))^2}$
PMBOK, A_1	0.608	0.588
ISO21500, A_2	0.608	0.588
PRINCE2, A_3	0.663	0.643
SWEBOK, A_4	0.578	0.558
Scrum, A_5	0.139	0.139
XP, A_6	0.295	0.292
Kanban, A_7	0.365	0.340

Table 3: Alternative specialized project management methodologies

The first methodology	The second methodology
Values and principles in project management	
• Individuals and interactions over processes and tools • Working software over comprehensive documentation • Customer collaboration over contract negotiation • Responding to change over following a plan	
• Empirical Process Control • Self-organization • Collaboration • Value-based Prioritization • Time-boxing • Iterative Development	• Focus on the business need • Deliver on time • Collaborate • Never compromise quality • Build incrementally from firm foundations • Develop iteratively • Communicate continuously and clearly • Demonstrate control

Table 3: Alternative specialized project management methodologies (continued)

The first methodology	The second methodology
Project life cycle	
Adaptive	Hybrid
Organizational structure in project management	
Project-oriented organizational structure	
Roles and responsibilities in project management	
• Scrum Master • Product Owner • Scrum Team	• Business Sponsor • Business Visionary • Business Ambassador • Technical Coordinator • Solution Developer • Solution Tester • Project Manager • Team Leader • Business Analyst
Project management processes	
• Develop Epic(s) • Create Prioritized Product Backlog • Conduct Release Planning • Create User Stories • Approve, Estimate, and Commit User Stories • Create Tasks • Estimate Tasks • Create Sprint Backlog • Conduct Daily Standup • Groom Prioritized Product Backlog • Demonstrate and Validate Sprint • Retrospect Sprint • Ship Deliverables • Retrospect Project	• Capture previous lessons • Prepare the outline Business Case • Producing the Business Case • Producing the Prioritized Requirement List • Producing the Solution Architecture Definition • Producing the Development Approach Definition • Producing the delivery plan • Creating the Timebox Plan • Revisiting the Prioritized Requirements List • Review of the Business Case • Timebox Review Record • Project Review Report • Benefits Assessment • Conduct Daily Standup
Project management practices	
• The Facilitated Workshop • MoSCoW prioritization • Iterative development • Timeboxing • Inspections	

Values and principles in project management. The four core values of Agile manifesto underlie both the first and the second alternative methodologies. Beside them, the first methodology has in its foundation six Scrum principles, while the second one relies on eight principles of DSDM methodology (Table 3).

Project life cycle. The first methodology assumes an adaptive project life cycle implementation. This project life cycle is the most consistent with Scrum methodology. For the second methodology, an expert has selected the hybrid project life cycle that implies the simultaneous usage of adaptive and predictive approaches during a project life cycle (PMI, 2018). This option is typical for the situation when the team gradually moves to agile methodologies and uses some of their best practices (e.g., short iterations, daily meetings, and retrospectives) but other aspects of the project, such as preliminary assessment, job assignment, and tracking progress, are still performed according to predictive approaches.

Organizational structure in project management. For both methodologies the project-oriented organizational structure is advisable. This structure fits the best selected agile values and principles, and project life cycles.

Roles and responsibilities in project management. The first methodology assumes the application of Scrum roles and responsibilities. The second methodology prescribes to team members the DSDM roles and responsibilities (Table 3).

Project management processes. For the first methodology, an expert has selected 14 processes of Scrum methodology (SBoK version). The second methodology has been formed using processes of DSDM, PRINCE2 and Scrum methodologies. Table 3 shows complete lists of methodologies processes.

Project management practices. Both methodologies involve the same set of DSDM and FDD project management practices (Table 3).

4.4 Methodology selection

4.4.1 The first methodology estimation

TThe methodology estimation assumes the definition of three core measures associated with its implementation::

- project management laboriousness;
- project management cost;
- project management risks.

For the first two measures calculation, it is necessary to define all project management processes performers, their hourly rates, and, approximately, how long they might be involved in the processes' execution.

Table 4 performs all team members, needed for the first methodology implementation, and their hourly rates. The role and responsibilities of Product Owner are delegated to the Customer representative.

Table 5 lists the selected management processes, their planned performers and approximate laboriousness estimates. According to the method of methodology synthesis (Kononenko, Aghaee, & Lutsenko, 2016), the laboriousness is represented in the form of triangular fuzzy values. A cost per performer estimate represents the multiplication of the performer laboriousness estimate by his hourly rate.

The total process laboriousness equals the sum of all its performers' laboriousness estimates. The process cost equals the sum of all its costs per performers' estimates.

The total project management laboriousness represents the total of all processes laboriousness, while its total cost equals the sum of all processes costs, respectively.

The project management laboriousness for the first methodology equals <226.5, 295.5, 339.5> man-hours, its cost – $<1006.25, 1311.75, 1507.25>.

The scale for evaluating the consequences of the risk events occurrence is given in Table 6. Risk events associated with the methodology application, as well as their assessments are presented in Table 7.

Table 4: Project team members' roles and hourly rates (the first methodology)

Team member	Hourly rate*, $/hour
Product Owner	4
Scrum Master	6
Development team	
Middle Developer	7
Junior Developer	4
QA	3
Designer	2.5

**Hourly rates are common for Ukraine considering the position and experience of the specialist as of December 2018. Source: https://jobs.dou.ua/salaries*

Table 5: Project management laboriousness and cost estimation (the first methodology)

Process	Performer		Laboriousness estimate, T, man-hours	Hourly rate, $/hour	Cost estimate (T*Hourly rate), C, $.
8.4 Develop Epic(s)	Product Owner		<2, 4, 4>	4	<8, 16, 16>
	Scrum Master		<1, 1.5, 2>	6	<6, 9, 12>
	Middle Developer		<1, 1.5, 2>	7	<7, 10.5, 14>
	Junior Developer		<1, 1.5, 2>	4	<4, 6, 8>
	QA		<1, 1.5, 2>	3	<3, 4.5, 6>
	Designer		<1, 1.5, 2>	2.5	<2.5, 3.75, 5>
		Total	**<7, 11.5, 14>**	-	**<30.5, 49.75, 61>**
8.5 Create Prioritized Product Backlog	Product Owner		<2, 2, 3>	4	<8, 8, 12>
	Scrum Master		<2, 2, 3>	6	<12, 12, 18>
	Middle Developer		<2, 2, 3>	7	<14, 14, 21>
	Junior Developer		<2, 2, 3>	4	<8, 8, 12>
	QA		<2, 2, 3>	3	<6, 6, 9>
	Designer		<2, 2, 3>	2.5	<5, 5, 7.5>
		Total	**<12, 12, 18>**	**-**	**<53, 53, 79.5>**
8.6 Conduct Release Planning	Product Owner		<1, 1.5, 2>	4	<4, 6, 8>
	Scrum Master		<1, 1.5, 2>	6	<6, 9, 12>
	Middle Developer		<1, 1.5, 2>	7	<7, 10.5, 14>
	Junior Developer		<1, 1.5, 2>	4	<4, 6, 8>
	QA		<1, 1.5, 2>	3	<3, 4.5, 6>
	Designer		<1, 1.5, 2>	2.5	<2.5, 3.75, 5>
		Total	**<6, 9, 12>**	**-**	**<26.5, 39.75, 53>**
9.1 Create User Stories	Product Owner		<6, 8, 8>	4	<24, 32, 32>
	Scrum Master		<6, 8, 8>	6	<36, 48, 48>
	Middle Developer		<6, 8, 8>	7	<42, 56, 56>
	Junior Developer		<6, 8, 8>	4	<24, 32, 32>
	QA		<6, 8, 8>	3	<18, 24, 24>
	Designer		<6, 8, 8>	2.5	<15, 20, 20>
		Total	**<36, 48, 48>**	**-**	**<159, 212, 212>**

Table 5: Project management laboriousness and cost estimation (the first methodology) (continued)

9.2 Approve, Estimate, and Commit User Stories	Product Owner	<1.5, 1.5, 2.5>	4	<6, 6, 10>
	Scrum Master	<1.5, 1.5, 2.5>	6	<6, 9, 15>
	Middle Developer	<1.5, 1.5, 2.5>	7	<10.5, 10.5, 17.5>
	Junior Developer	<1.5, 1.5, 2.5>	4	<6, 6, 10>
	QA	<1.5, 1.5, 2.5>	3	<4.5, 4.5, 7.5>
	Designer	<1.5, 1.5, 2.5>	2.5	<3.75, 3.75, 6.25>
	Total	**<9, 9, 15>**	-	**<39.75, 39.75, 66.25>**
9.3 Create Tasks	Product Owner	<3, 4.5, 6>	4	<12, 18, 24>
	Scrum Master	<3, 4.5, 6>	6	<18, 27, 36>
	Middle Developer	<3, 4.5, 6>	7	<21, 31.5, 42>
	Junior Developer	<3, 4.5, 6>	4	<12, 18, 24>
	QA	<3, 4.5, 6>	3	<9, 13.5, 18>
	Designer	<3, 4.5, 6>	2.5	<7.5, 11.25, 15>
	Total	**<18, 27, 36>**	**-**	**<79.5, 119.25, 159>**
9.4 Estimate Tasks	Product Owner	<1.5, 2, 2.5>	4	<6, 8, 10>
	Scrum Master	<1.5, 2, 2.5>	6	<9, 12, 15>
	Middle Developer	<1.5, 2, 2.5>	7	<10.5, 14, 17.5>
	Junior Developer	<1.5, 2, 2.5>	4	<6, 8, 10>
	QA	<1.5, 2, 2.5>	3	<4.5, 6, 7.5>
	Designer	<1.5, 2, 2.5>	2.5	<3.75, 5, 6.25>
	Total	**<9, 12, 15>**	**-**	**<39.75, 53, 66.25>**
9.5 Create Sprint Back-log	Product Owner	<3, 4.5, 4.5>	4	<12, 18, 18>
	Scrum Master	<3, 4.5, 4.5>	6	<18, 27, 27>
	Middle Developer	<3, 4.5, 4.5>	7	<21, 31.5, 31.5>
	Junior Developer	<3, 4.5, 4.5>	4	<12, 18, 18>
	QA	<3, 4.5, 4.5>	3	<9, 13.5, 13.5>
	Designer	<3, 4.5, 4.5>	2.5	<7.5, 11.25, 11.25>
	Total	**<18, 27, 27>**	**-**	**<79.5, 119.25, 119.25>**
10.2 Conduct Daily Standup	Scrum Master	<7.5, 8, 8.5>	6	<45, 48, 51>
	Middle Developer	<7.5, 8, 8.5>	7	<52.5, 56, 59.5>
	Junior Developer	<7.5, 8, 8.5>	4	<30, 32, 34>
	QA	<7.5, 8, 8.5>	3	<22.5, 34, 25.5>
	Designer	<7.5, 8, 8.5>	2.5	<18.75, 20, 21.25>
	Total	**<37.5, 40, 42.5>**	**-**	**<168.75, 180, 191.25>**
10.3 Groom Prioritized Product Backlog	Product Owner	<4, 6, 8>	4	<16, 24, 32>
	Scrum Master	<1.5, 2, 3>	6	<9, 12, 18>
	Middle Developer	<1.5, 2, 3>	7	<10.5, 14, 21>
	Junior Developer	<1.5, 2, 3>	4	<6, 8, 12>
	QA	<1.5, 2, 3>	3	<4.5, 6, 9>
	Designer	<1.5, 2, 3>	2.5	<3.75, 5, 7.5>
	Total	**<11.5, 16, 23>**	**-**	**<49.75, 69, 99.5>**

Table 5: Project management laboriousness and cost estimation (the first methodology) (continued)

11.2 Demonstrate and Validate Sprint	Product Owner	<4.5, 6, 6>	4	<18, 24, 24>
	Scrum Master	<4.5, 6, 6>	6	<27, 36, 36>
	Middle Developer	<4.5, 6, 6>	7	<31.5, 42, 42>
	Junior Developer	<4.5, 6, 6>	4	<18, 24, 24>
	QA	<4.5, 6, 6>	3	<13.5, 18, 18>
	Designer	<4.5, 6, 6>	2.5	<11.25, 15, 15>
	Total	**<27, 36, 36>**	**-**	**<119.25, 159, 159>**
11.3 Retrospect Sprint	Scrum Master	<4.5, 6, 6>	6	<27, 36, 36>
	Middle Developer	<4.5, 6, 6>	7	<31.5, 42, 42>
	Junior Developer	<4.5, 6, 6>	4	<18, 24, 24>
	QA	<4.5, 6, 6>	3	<13.5, 18, 18>
	Designer	<4.5, 6, 6>	2.5	<11.25, 15, 15>
	Total	**<22.5, 30, 30>**	**-**	**<101.25, 135, 135>**
12.1 Ship Deliverables	Product Owner	<2, 3, 4>	4	<8, 12, 16>
	Scrum Master	<2, 3, 4>	6	<12, 18, 24>
	Total	**<4, 6, 8>**	**-**	**<20, 30, 40>**
12.2 Retrospect Project	Product Owner	<1.5, 2, 2.5>	4	<6, 8, 10>
	Scrum Master	<1.5, 2, 2.5>	6	<9, 12, 15>
	Middle Developer	<1.5, 2, 2.5>	7	<10.5, 14, 17.5>
	Junior Developer	<1.5, 2, 2.5>	4	<6, 8, 10>
	QA	<1.5, 2, 2.5>	3	<4.5, 6, 7.5>
	Designer	<1.5, 2, 2.5>	2.5	<3.75, 5, 6.25>
	Total	**<9, 12, 15>**	**-**	**<39.75, 53, 66.25>**
	Methodology total	***<226.5, 295.5, 339.5>***	**-**	***<1006.25, 1311.75, 1507.25>***

Table 6: Evaluation of risk events consequences

Negative consequences	Points
Impacts that lead to the termination or complete failure of the project	10
Impacts that lead to extremely significant project delays, budget overruns, deterioration of the project product quality	8-9
Impacts that lead to significant project delays, budget overruns, deterioration of the project product quality	6-7
Impacts that lead to not very significant project delays, budget overruns, deterioration of the project product quality	4-5
Impacts that lead to slightly noticeable delays in the project, budget overrun, deterioration of the project product quality	2-3
Negative effects are almost invisible	1
No negative effects	0

Table 7: The assessment of risks associated with the first methodology application

Risk event	The occurrence probability, P	The occurrence consequences, C, points	Risk assessment, R = P*C, points
Project participants do not accept Scrum values and principles	<0.05, 0.05, 0.05>	<7, 8, 8>	<0.35, 0.4, 0.4>
Team members don't understand/accept roles and responsibilities prescribed them by Scrum methodology	<0.1, 0.1, 0.1>	<7, 8, 8>	<0.7, 0.8, 0.8>
The lack of Customer's work experience as Product Owner	<0.2, 0.2, 0.2>	<5, 5, 6>	<1, 1, 1.2>
Contradictions between the standards and regulations of the contracting and / or executing organization(s) and the methodology	<0.05, 0.1, 0.15>	<5, 6, 8>	<0.25, 0.6, 1.2>
The Product Owner involvement in the project is insufficient for an optimal solution development	<0.4, 0.4, 0.4>	<7, 8, 8>	<2.8, 3.2, 3.2>
Project team self-organization and self-coordination are insufficient to work effectively according Scrum	<0.3, 0.3, 0.3>	<7, 8, 8>	<2.1, 2.4, 2.4>
Wrong prioritization of the product backlog	<0.35, 0.35, 0.35>	<5, 5, 6>	<1.75, 1.75, 2.1>
Ineffective sprint planning	<0.4, 0.4, 0.4>	<5, 6, 7>	<2, 2.4, 2.8>
The product inefficiency as a result of poor pre-project research and planning	<0.5, 0.5, 0.5>	<7, 8, 9>	<3.5, 4, 4.5>
Total risk assessment			**<14.45,16.55,18.6>**

The first methodology risks assessment equals <14.45, 16.55, 18.6>.

Table 8: Project team members' roles and hourly rates (the second methodology)

Project team member	Hourly rate, $/hour
Business Ambassador (Business Visionary)	4
Project Manager (Team Leader)	6
Development team	
Middle Developer (Technical Coordinator, Solution Developer)	7
Junior Developer (Solution Developer)	4
QA (Business Analyst, Solution Tester)	5
Designer	2.5

4.4.2 The second methodology estimation

The second methodology prescribes its roles to project participants. Table 8 shows which roles and hourly rates were assigned to team members. The project customer performs the role of Business Sponsor; the customer representative fulfills Business Ambassador and Business Visionary roles.

Table 9 lists the second methodology's management processes, their performers, laboriousness, and cost.

Table 9: Project management laboriousness and cost estimation (the second methodology)

Process	Performer	Laboriousness, T, man-hours	Hourly rate, $/hour	Cost (T*Hourly rate), C, $
12.4.2 Capture previous lessons (PRINCE2)	Project Manager	<1.5, 2, 2.5>	6	<9, 12, 15>
	Middle Developer	<1.5, 2, 2.5>	7	<10.5, 14, 17.5>
	Junior Developer	<1.5, 2, 2.5>	4	<6, 8, 10>
	QA	<1.5, 2, 2.5>	5	<7.5, 10, 12.5>
	Designer	<1.5, 2, 2.5>	2.5	<3.75, 5, 6.25>
	Total	**<7.5, 10, 12.5>**	-	**<36.75, 49, 61.25>**
12.4.4 Prepare the outline Business Case (PRINCE2)	QA	<2, 4, 5>	5	<10, 20, 25>
	Business Ambassador	<0.5, 1, 1.5>	4	<2, 4, 6>
	Total	**<2.5, 5, 6.5>**	**-**	**<12, 24, 31>**
8.2.2 Producing the Business Case (DSDM)	QA	<4, 6, 6>	5	<20, 30, 30>
	Business Ambassador	<2, 4, 4>	4	<8, 16, 16>
	Total	**<6, 10, 10>**	**-**	**<28, 46, 46>**
8.2.3 Producing the Prioritized Requirement List (DSDM)	QA	<4, 4, 5>	5	<20, 20, 25>
	Business Ambassador	<4, 4, 5>	4	<16, 16, 20>
	Total	**<8, 8, 10>**	**-**	**<36, 36, 45>**
8.2.4 Producing the Solution Architecture Definition (DSDM)	QA	<2, 4, 4>	5	<10, 20, 20>
	Business Ambassador	<0.5, 1, 1.5>	4	<2, 4, 6>
	Middle Developer	<3, 4, 6>	7	<21, 28, 42>
	Total	**<5.5, 9, 11.5>**	-	**<33, 52, 68>**
8.2.5 Producing the Development Approach Definition (DSDM)	Middle Developer	<2, 3, 4>	7	<14, 21, 28>
	Project Manager	<0.5, 0.5, 1>	6	<3, 3, 6>
	Total	**<2.5, 3.5, 5>**	**-**	**<17, 24, 34>**
8.2.6 Producing the delivery plan (DSDM)	Project Manager	<2, 2, 3>	6	<12, 12, 18>
	Business Ambassador	<0.5, 0.5, 1>	4	<2, 2, 4>
	Middle Developer	<0.5, 0.5, 1>	7	<3.5, 3.5, 7>
	Total	**<3, 3, 5>**	-	**<17.5, 17.5, 29>**

Table 9: Project management laboriousness and cost estimation (the second methodology) (continued)

Process	Performer	Laboriousness, T, man-hours	Hourly rate, $/hour	Cost (T*Hourly rate), C, $
8.2.11 Creating the Timebox Plan (DSDM)	Business Ambassador	<6, 8, 9>	4	<24, 32, 36>
	Project Manager	<6, 8, 9>	6	<36, 48, 54>
	Middle Developer	<6, 8, 9>	7	<42, 56, 63>
	Junior Developer	<6, 8, 9>	4	<24, 32,36>
	QA	<6, 8, 9>	5	<30, 40, 45>
	Designer	<6, 8, 9>	2.5	<15, 20, 22.5>
	Total	**<36, 48, 54>**	-	**<171, 228, 256.5>**
8.2.3 Revisiting the Prioritized Requirements List (DSDM)	Business Ambassador	<6, 9, 12>	4	<24, 36, 48>
	Project Manager	<12, 15, 18>	6	<72, 90, 108>
	Middle Developer	<12, 15, 18>	7	<84, 105, 126>
	Junior Developer	<12, 15, 18>	4	<48, 60, 72>
	QA	<12, 15, 18>	5	<60, 75, 90>
	Designer	<12, 15, 18>	2.5	<30, 37.5, 45>
	Total	**<66, 84, 102>**	-	**<318, 403.5, 489>**
8.2.2 Review of the Business Case (DSDM)	QA	<6, 6, 8>	5	<30, 30, 40>
	Business Ambassador	<2, 4, 4>	4	<8, 16, 16>
	Total	**<8, 12, 12>**	-	**<38, 46, 56>**
8.2.12 Timebox Review Record (DSDM)	Business Ambassador	<4.5, 6, 9>	4	<18, 24, 36>
	Project Manager	<4.5, 6, 9>	6	<27, 36, 54>
	Middle Developer	<4.5, 6, 9>	7	<31.5, 42, 63>
	Junior Developer	<4.5, 6, 9>	4	<18, 24, 36>
	QA	<4.5, 6, 9>	5	<22.5, 30, 45>
	Designer	<4.5, 6, 9>	2.5	<11.25, 15, 22.5>
	Total	**<27, 36, 54>**	-	**<128.25, 171, 256.5>**
8.2.13 Project Review Report (DSDM)	Business Ambassador	<1, 2, 3>	4	<4, 8, 12>
	Project Manager	<1, 2, 3>	6	<6, 12, 18>
	Middle Developer	<1, 2, 3>	7	<7, 14, 21>
	Junior Developer	<1, 2, 3>	4	<4, 8, 12>
	QA	<1, 2, 3>	5	<5, 10, 15>
	Designer	<1, 2, 3>	2.5	<2.5, 5, 7.5>
	Total	**<6, 12, 18>**	-	**<28.5, 57, 85.5>**
8.2.14 Benefits Assessment (DSDM)	QA	<2, 4, 4>	5	<10, 20, 20>
	Business Ambassador	<2, 4, 4>	4	<8, 16, 16>
	Total	**<4, 8, 8>**	-	**<18, 36, 36>**

Table 9: Project management laboriousness and cost estimation (the second methodology) (continued)

10.2 Conduct Daily Meetings (Scrum)	Project Manager	<7.5, 8, 8.5>	6	<45, 48, 51>
	Middle Developer	<7.5, 8, 8.5>	7	<52.5, 56, 59.5>
	Junior Developer	<7.5, 8, 8.5>	4	<30, 32, 34>
	QA	<7.5, 8, 8.5>	5	<37.5, 40, 42.5>
	Designer	<7.5, 8, 8.5>	2.5	<18.75, 20, 21.25>
	Total	**<37.5, 40, 45.5>**	**-**	**<183.75, 196, 208.25>**
Total for the methodology		***<219.5, 286.5, 351>***	**-**	***<1065.75, 1386, 1702>***

Table 10: The assessment of risks associated with the second methodology application

Risk event	The occurrence probability, P	The occurrence consequences, C (points)	Risk assessment, R = P*C
Project participants do not accept DSDM values and principles	<0.35, 0.4, 0.45>	<7, 8, 8>	<2.45, 3.2, 3.6>
Team members don't understand/accept roles and responsibilities prescribed them by DSDM	<0.35, 0.4, 0.45>	<7, 8, 8>	<2.45, 3.2, 3.6>
The lack of customer/ his representative work experience as Business Sponsor/Business Visionary	<0.2, 0.2, 0.2>	<5, 5, 6>	<1, 1, 1.2>
Contradictions between the standards and regulations of the contracting and / or executing organization(s) and the methodology	<0.1, 0.15, 0.2>	<5, 6, 8>	<0.5, 0.9, 1.6>
Business Sponsor/Business Visionary involvement in the project is insufficient for an optimal solution development	<0.15, 0.2, 0.2>	<7, 8, 8>	<1.05, 1.6, 1.6>
Project team self-organization and self-coordination are insufficient to work effectively according DSDM	<0.15, 0.2, 0.25>	<7, 8, 8>	<1.05, 1.6, 2>
Problems associated with assigning multiple DSDM roles to one team member	<0.5, 0.5, 0.57>	<5, 6, 6>	<2.5, 3, 3.42>
Total risk assessment			**<11, 14.5, 17.02>**

The project management laboriousness for the second methodology equals <219.5, 286.5, 351> man-hours, its cost – $<1065.75, 1386, 1702>.

Risk events associated with the methodology application, as well as their assessments are presented in Table 10.

Comparative charts in Figures 3-5 illustrate project management laboriousness and cost for both alternative methodologies, as well as project risks associated with their application.

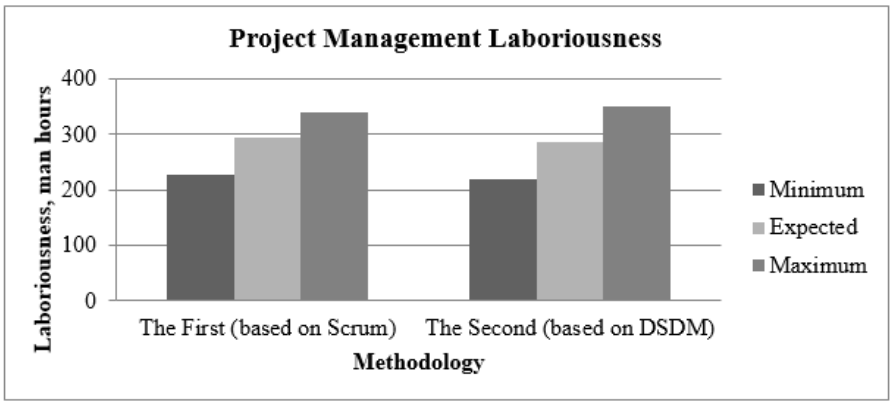

Figure 3: The project management laboriousness comparison

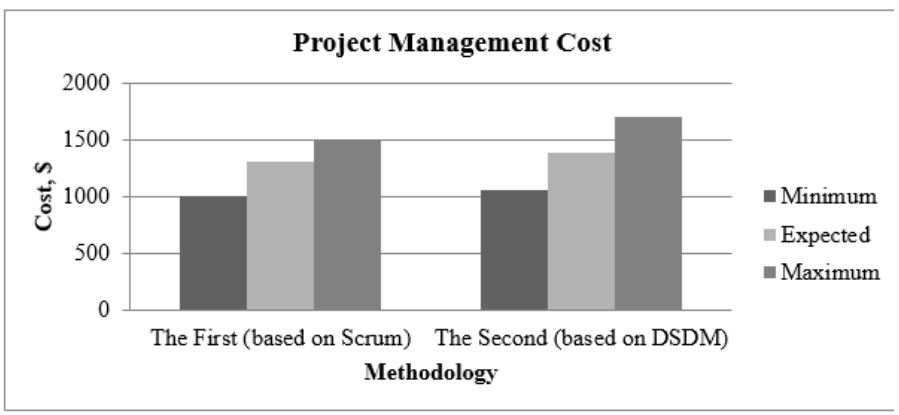

Figure 4: The project management cost comparison

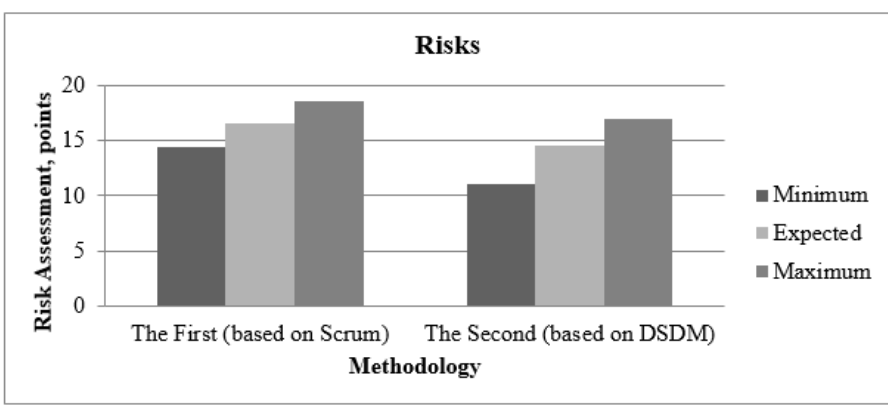

Figure 5: Risks assessments comparison

4.4.3 The first methodology estimation

On this stage we reveal which methodology is the most suitable for the project, using the mathematical model described in (Kononenko, Aghaee, & Lutsenko, 2016).

Target functions will take the form (1) – (3).

$$C(X) = \langle 1006.25, 1311.75, 1507.25\rangle x_1 + \langle 1065.75, 1386, 1702\rangle x_2 \to \min_X,$$
$$T(X) = \langle 226.5, 295.5, 339.5\rangle x_1 + \langle 219.5, 286.5, 351\rangle x_2 \to \min_X,$$
$$R(X) = \langle 14.45, 16.55, 18.6\rangle x_1 + \langle 11, 14.5, 17.02\rangle x_2 \to \min_X,$$

where $X = (x_1, x_2)$, $x_h = \{0,1\}$, $h = 1,2$, $\sum_{h=1}^{H} x_h = 1$,

$x_h = 1$, if h-th alternative is applied, $x_h = 0$ else.

The cost of project management should not exceed $1750. It means that the cost limit is $C^{per} = 1750$ $:

$$C(1,0) = \langle 1006.25, 1311.75, 1507.25\rangle < 1750,$$
$$C(0,1) = \langle 1065.75, 1386, 1702\rangle < 1750.$$

All alternative methodologies meet the limit.

The problem of one-criterion optimization for each target function should be solved to normalize target functions for their further comparison. But first, let us defuzzify obtained fuzzy values:

$$C^d(1,0) = \frac{1006.25 + 1311.75 + 1507.25}{3} = 1275.08.$$
$$C^d(0,1) = \frac{1065.75 + 1386 + 1702}{3} = 1384.58.$$
$$T^d(1,0) = \frac{226.5 + 295.5 + 339.5}{3} = 287.17.$$
$$T^d(0,1) = \frac{219.5 + 286.5 + 351}{3} = 285.67.$$
$$R^d(1,0) = \frac{14.45 + 16.55 + 18.6}{3} = 16.53.$$
$$R^d(0,1) = \frac{11 + 14.5 + 17.02}{3} = 14.17.$$

$C^d(X)$, $T^d(X)$, $R^d(X)$ - defuzzification values of the project management cost, laboriousness, and risks associated with the methodology applied.

The target functions minimum values will be equal to:

$$C^{opt} = \min\{1275.08, 1384.58\} = 1275.08.$$
$$T^{opt} = \min\{287.17, 285.67\} = 285.67.$$
$$R^{opt} = \min\{16.53, 14.17\} = 14.17.$$

Based on the results, we can calculate the target functions normalized values:

$$C^{norm}(1,0) = \frac{C^d(1,0) - C^{opt}}{C^{opt}} = \frac{1275.08 - 1275.08}{1275.08} = 0.$$
$$C^{norm}(0,1) = \frac{C^d(0,1) - C^{opt}}{C^{opt}} = \frac{1384.58 - 1275.08}{1275.08} = 0.086.$$
$$T^{norm}(1,0) = \frac{T^d(1,0) - T^{opt}}{T^{opt}} = \frac{287.17 - 285.67}{285.67} = 0.005.$$
$$T^{norm}(0,1) = \frac{T^d(0,1) - T^{opt}}{T^{opt}} = \frac{285.67 - 285.67}{285.67} = 0.$$
$$R^{norm}(1,0) = \frac{R^d(1,0) - R^{opt}}{R^{opt}} = \frac{16.53 - 14.17}{14.17} = 0.167.$$
$$R^{norm}(0,1) = \frac{R^d(0,1) - R^{opt}}{R^{opt}} = \frac{14.17 - 14.17}{14.17} = 0.$$

The minimax criterion:

$$X^{opt} = \arg\min \begin{Bmatrix} \max\{C^{norm}(1,0), T^{norm}(1,0), R^{norm}(1,0)\}, \\ \max\{C^{norm}(0,1), T^{norm}(0,1), R^{norm}(0,1)\} \end{Bmatrix} =$$

$$= \arg\min \begin{Bmatrix} \max\{0, 0.005, 0.167\}, \\ \max\{0.086; 0; 0\} \end{Bmatrix} = \arg\min\{0.167, 0.086\} = (0,1).$$

Thus, the second methodology, which represents a combination of DSDM, PRINCE2, and Scrum methodologies, is the most appropriate for the given project according to the minimax approach. In case of its application, the cost of project management is $<1065.75, 1386, 1702>, its laboriousness - <219.5, 286.5, 351> man-hours, and risks associated with its applying – <11.0, 14.5, 17.02>..

5 Conclusions

The results obtained in the paper show that it is important to consider specific conditions of the project and its environment solving the task of the methodology selection to improve the project performance. It is necessary to take into account that each ready-made project management methodology has its specific strengths and weaknesses, and as usual can't cover all project needs. That is why any methodology selected must be tailored to fit the project or the specialized methodology should be created.

It should be noted that an ideal methodology does not exist. The environment is constantly changing and the methodology, which was the best in some conditions, will begin to show flaws in others. However, for quasi-stationary conditions, you can choose the best option among all possible in the sense of multi-criteria choice. The Project Management Methodology Formation's Method proposed in the paper allows us to solve both tasks: 1) the ready-made methodology selection, 2) the specialized methodology formation. The ready-made methodology selection task can be easily solved by any project manager on the pre-initiating project phase using the method described. It doesn't require any specific knowledge or investiga-

tions. A project manager should only evaluate his project using questionnaires proposed and analyze the results of the method application. The specialized methodology formation task requires the person who applies the method a deep understanding of methodologies gathered in GBOK and their components. That is why these stages of the method are more suited for consulting companies and for expensive and responsible projects (for the cases when it is reasonable to involve experts).

A limitation of the method is that it is designed for the analysis of individual projects, rather than a set of projects simultaneously.

The method was applied to a project dedicated to PMGuide web application development. Scrum was defined as a basic methodology for the project as a result of the project evaluation on a special questionnaire. Then, two alternative methodologies were created and evaluated by an expert: 1) based on Scrum; 2) based on DSDM. Both methodologies are Agile. The second alternative turns out to be more expensive and labor-intensive but less risky. It was a risk that was crucial in decision-making. The pre-project phase is of great importance for the considered project and comprehensive documentation created on this stage became the main advantage of DSDM compared to Scrum.The complexity of calculations and the usage of expert evaluations can be considered as the main limitations of the proposed method. It is proposed to use the criteria of laboriousness, cost, and risks to select or form a methodology. Solving the problem, it is also necessary to take into account the influence of methodology on the quality of the project product, on economic, social, technological effects, environmental impact and possibly other effects (political, military and others). The concept of risk allows reflecting the potential problems with these effects and simplifies the task.

Therefore, a significant dependence of the results on the accuracy of the labor input, management costs, and risk estimates is considered as a disadvantage of the method.

That is why the further areas of work are 1) software development (to perform all calculations automatically with a specialized web application), 2) the experts' selection method creation (to be sure that all experts evaluations used are verified).

The complex collection of relevant project data in the pre-initialization phase could be time and cost consuming. But these expenses are justified for large, complex, expensive, and responsible projects.

The project was managed using the formed methodology. The result of the project (PMGuide web application) meets all requirements; the project is performed according to its initial time and costs limitations. The given method can be applied to form a project management methodology for any IT project.

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Pristopi k oblikovanju metodologije vodenja projektov

Ozadje in namen: Izbira „prave“ metodologije vodenja projektov je za konkretni projekt zelo pomembna. Metodologija vodenja vpliva na ključne parametre projekta, kot so stroški, trajanje, kakovost izdelka in uspeh projekta na splošno. Namen te študije je predstaviti metodo za oblikovanje metodologije vodenja projektov in prikazati njeno uporabnost na primeru projekta za razvoj programske opreme.
Oblikovanje / metodologija / pristop: V tej študiji predstavimo način oblikovanja metodologije vodenja projektov, ki omogoča oblikovanje specializirane metodologije za kateri koli IT projekt ob upoštevanju nejasnosti informacij o projektu, njegovem okolju in obstoječih priporočil strokovnjakov. Metoda vključuje 1) zbiranje izhodiščnih informacij s pomočjo vprašalnika, 2) izračunavanje uteženih Hammingov in evklidskih razdalj, 3) reševanje problema s tremi kriteriji optimizacije z uporabo pristopa minimax z mehkimi vhodnimi podatki.
Rezultati: Za oblikovanje specializirane metodologije upravljanja projektov za IT-projekt je bilo uporabljenih vseh šest stopenj metode oblikovanja projektne metodologije (evalvacija projektov, izbira osnove, oblikovanje alternativnih metodologij, izbira metodologije, uporaba metodologije in krojenje metodologije). Za upravljanje projekta je bila izbrana in uporabljena najustreznejša alternativa, ki temelji na DSDM.
Zaključki: Dana metoda omogoča oblikovanje specializirane metodologije upravljanja projektov, ki temelji na sestavnih delih splošnega znanja za kateri koli IT projekt ob upoštevanju posebnih pogojev projekta in njegovega okolja.

Ključne besede: metodologija, vodenje projektov, formacija, uporaba, metoda

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Perceived Organizational Support, Alternative Job Opportunity, Organizational Commitment, Job Satisfaction and Turnover Intention: A Moderated-mediated Model

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Background and Purpose: This article tested a structural model that examines the mediating role of organizational commitment on the link between perceived organizational support, perceived alternative job opportunities, and turnover intention, and the moderating role of job satisfaction on the proposed relationships.
Methodology: Using convenience sampling technique, a self-administered survey was conducted on a pool of Jordanian small and medium sized enterprises (SMEs). The obtained data (n=270) were analyzed with contemporary variance-based structural equation modelling (PLS-SEM) software SmartPLS v3.
Results: Findings revealed that organizational commitment mediates the association between perceived organizational support and turnover intention, perceived alternative job opportunities and turnover intention. In addition, job satisfaction did not moderate the associations between organizational support, perceived alternative job opportunity and organizational commitment.
Conclusion: The present study is among the first to show the mediating mechanism of organizational commitment on the link between perceived organizational support, perceived alternative job opportunity and turnover intention. Theoretical and practical implications are drawn, before pointing to potential future research directions that build on the evidence-based positions argued for in this study.

Keywords: *Organizational Commitment, Employees, Turnover Intention*

1 Introduction

Previous work has shown that efficiency and performance of SME's are contingent upon HRM's nurturing support and contribution (Samad, 2006). The financial meltdown adversely affected the world job markets. For instance, employment patterns and turnover have been negatively affected in many organizations (Ardic, Mylenko, & Saltane, 2011). A major managerial headache is are my employees willing to leave when s/he finds a better alternative? Perceived alternative job opportunity entails the belief of availability of alternate job opportunity or the propensity to find a better job elsewhere (Mobley, 1977; Price & Mueller, 1986). SMEs are faced with high turnover and reten-

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tion challenges, that comes with enormous financial and non-financial costs (Bhatnagar, 2014); accrued through added costs of employing new employees, training, developing, mentoring etc. Several antecedents of turnover intention have been examined and investigated by prior studies. For example, perceived organizational support (POS) and supervisor support (Eisenberger et al., 2002; Madden, Mathias, & Madden, 2015); management and leadership (Abubakar et al., 2018b; Elçi et al., 2012) and organizational justice (Kim et al., 2017). Other research stream has linked variables such as job satisfaction and organizational commitment to greater levels of employee retention and lower levels of turnover (Mosadeghrad, Ferlie, & Rosenberg, 2011).

Despite the number of studies highlighting the importance of retaining employee, the level of employee turnover is still high (Abubakar et al., 2018b; Islam, Ali & Ahmed, 2018). The literature review showed a scarcity of empirical studies addressing high turnover in Arabian SMEs. Past research investigated few antecedents of turnover intention with divergent variables, inconsistent and inconclusive results. For instance, Jang and Kandampully (2018) found that commitment fully mediate the link between servant leadership and turnover intention among restaurants employees. Other scholars who found organizational commitment to function as a mediator recommend further inquiries in other contexts as well as consideration of job satisfaction (Terason, 2018; Yousaf, Sanders & Yustantio, 2018). Subsequently, Berberoglu (2018) revealed that organizational climate is antecedent for commitment. Building on this line of reasoning, we scrutinize how POS and perceived alternative job opportunities create a climate for enhanced or lower organizational commitments. Jehanzeb and Mohanty (2018) showed that job satisfaction is strongly associated with commitment, they urged future scholars to examine how support may shape this association. In response to this research call, this article developed an integrative model that considers several factors and mechanisms associated with turnover.

The contribution of this paper is fivefold: One, this paper expounds the steps in which POS manifests organizational commitment which later hinders or lowers turnover intention. Two, this paper further expounds the steps in which perceived alternative job opportunity manifests low organizational commitment which later fosters turnover intention. Three, apart from the mediating role of organizational commitment noted above. The present inquiry examines the moderating role of job satisfaction on the link between POS and organizational commitment to understand how turnover intention varnishes. Four, the present inquiry also examines the moderating role of job satisfaction on the link between perceived alternative job opportunity and organizational commitment to explain how turnover intention emerge. Five, this work interrogates findings from the Western context by providing fresh insights from the Arabian context.

2 Literature Review

Perceived organizational support (POS) - "is the degree to which an employee perceives his/her employer to be concerned with his/her well-being and to value his/her contributions to the organization" (Eisenberger et al., 1990, 1997). Rhoades and Eisenberger's (2002) systematic literature review revealed that POS is associated with supervisor support, fair job and organizational procedures, which in turn lead to positive outcomes for both the individual and the organization e.g., increased commitment, performance, and reduced withdrawal behaviors. In this view, POS can boost organizational commitment and subsequently diminish turnover intention.

Perceived alternative job opportunities - "denotes the perception of the availability of alternative jobs in the organization's environment" (Price & Mueller, 1986). The conceptual and operational definitions of perceived alternative job opportunities are ambiguous. The quality of alternatives to present job (Farrell & Rusbult, 1981); the propensity of locating acceptable job alternatives (Mobley, 1977) and/or availability of alternative job opportunities (Steers & Mowday, 1981). Nonetheless perceived alternative job opportunities precede an actual search for and evaluation of specific alternatives. In this sense, personal employee attribute e.g., education, skills, hope, resilience, engagement and satisfaction with job play a vital role in shaping these perceptions.

Job satisfaction is the pleasant emotional state resulting from an individual's appreciation of their own job experience (Locke, 1976). It can also be viewed as the attitude of employees toward their jobs, organizational, social and physical work atmosphere and the earned rewards (Yousef, 2017). Job satisfaction has several outcomes ranging from organizational health identification, societal well-being, and functions as an indicator of organizational behavior. Tandung et al. (2016) reported that job satisfaction plays a critical role in the attracting and retaining of employees within an organization. Mathieu et al. (2016) and Yousef (2017) nominated satisfaction as a key determinant for organizational commitment among incumbent employees.

Organizational commitment is a psychological state that "(a) characterizes the employee's relationship with the organization, and (b) has implications for the decision to continue membership in the organization" (Meyer & Allen, 1991, p.67). It denotes the strength of employee's identification with and involvement with the hiring organization. Organizational commitment is conceptualized as a tripartite construct namely: (1) affective commitment - participation in, identification with and emotional attachment to the hiring organization; (2) continuance commitment - where employees strategically calculate the economic worth of staying in the company (i.e., cost of leaving versus cost of staying) and will choose to stay if it was financially more rewarding and (3) normative com-

mitment - that is perceived as an obligation by the employee to stay (Meyer & Allen, 1991). Jang and Kandampully (2018) highlighted that commitment is a key determinant for intention to stay or intention to quit among incumbent employees.

Turnover intention is the probability that incumbent worker(s) will eventually leave their job within a certain period. Tett and Meyer (1993) added that it is the employees' voluntary retraction from the organization and profession. Turnover intention has been widely investigated and has emerged as an important and viable predictor of actual turnover (Li et al., 2019; Mobley, 1977). There are varieties of predictors of turnover intention spanning from individual, team and organizational factors (Van der Heijden et al., 2018). In this vein, the present study will examine the nexus the following variables: POS, perceived alternative job opportunities, job satisfaction, organizational commitment and turnover intention.

2.1 Perceived Organizational Support, Organizational Commitment and Turnover Intention

POS denotes workers evaluation of self-value by the hiring organization. The concept stresses employees perception by describing their beliefs and values, worthiness of their organizational contributions and overall well-being (Eisenberger et al., 2002). For example, fair distribution of incentives to high-performers has been shown to influence POS (Pohler & Schmidt, 2016). In addition, these incentives increase the level of POS if they are regulated by internal processes of the hiring organization as oppose to those enforced by external bodies such as unions or government regulators (Dawley et al., 2008). Several empirical evidences have linked POS to greater level of well-being, increased commitment, positivity, work engagement (Chiang, Han, & Chuang, 2011; Tang et al., 2017) and lower turnover intention (Chaudhary et al., 2015). POS has the tendency to invoke a desire for reciprocity from employees towards their hiring organization. Building on these, the present study theorize that POS can be associated with higher levels of organizational commitment which in turn results in lower turnover intentions. Based on the extant discussions, theoretical and empirical evidences, the following hypothesis is proposed:

H1: Organizational commitment will mediate the relationship between perceived organizational support and turnover intention

2.2 Perceived Alternative Job Opportunities, Organizational Commitment and Turnover Intention

According to March and Simon (1958), under all conditions, "the viable and most accurate predictor of turnover is the state of the economy when jobs are plentiful, voluntary movement is high; when jobs are scarce, voluntary turnover is small". Turnover and alternative job opportunities represent recurrent themes in the literature. A vast number of empirical evidences show that availability of alternative jobs influences turnover intention (Nawaz & Pangil, 2016). This association can either be direct (Anuradha et al., 2017) or indirect (Huang & Su, 2016). Some scholars (i.e., Dardar et al., 2012; Ing-San & Jyh-Huei 2006; Rahman et al., 2008) contend that positive correlativity exist; while others (i.e., Khatri et al., 2001) contend that a negative correlativity exist A different stream of research shows a link between perceived alternative opportunities and organizational commitment (Feather & Rauter, 2004). Building on these, the present study theorize that perceived alternative job opportunities can be associated with lower levels of organizational commitment which in turn results in higher turnover intentions. Based on the extant discussions, theoretical and empirical evidences, the following hypothesis is proposed:

H2: Organizational commitment will mediate the relationship between Perceived alternative job opportunities and turnover intention

2.3 Moderating role of job satisfaction

Employees seek employment and enter organizations with specific hopes and needs (i.e., money, comfort, personal growth, learning etc.). When reality matches expectation employees tend to be satisfied with his/her job. Thus, satisfaction embodies work-related attitudes of employees (Chaudhary, Bidlan, & Darolia, 2015). Further, the degree of job satisfaction is a commonly theorized predictor of employee turnover (Luz et al., 2018; Nawaz & Pangil, 2016). POS was linked with high organizational commitment (Eisenberger, Fasolo & Davis-LaMastro, 1990) and job satisfaction (Eisenberger et al., 1997). Organizational commitment exerted a significant effect on turnover intention (Jehanzeb et al., 2013; Joo, 2010; Mathieu et al., 2016). Pohler and Schmidt (2016) also linked commitment and satisfaction. The link between organizational commitment and job satisfaction has been widely acknowledged (Gebremichael & Rao, 2013; Kirk-Brown & Van Dijk, 2016; Top & Gider, 2013). What is missing is the interactive association between the two variables. An attempt by Lartey et al. (2019) found that POS moderated the relationship between deep acting and organizational commitment

but not between deep acting and job satisfaction; they attributed this inconsistency with their study approach and positioning of variables. In this view, it will be interesting to observe the interaction between POS and job satisfaction. Building on hypothesis 1, predicting that high POS can result in higher levels of organizational commitments which reduces turnover intention. We further contend that job satisfaction can strengthen these association, such that higher levels of job satisfaction would strengthen the effect of POS on organizational commitments, thus reduces turnover intention. Based on the extant discussions, theoretical and empirical evidences, the following hypothesis is proposed:

H3: Organizational commitment will mediate the relationship between perceived organizational support and turnover intention, and the association will be stronger when job satisfaction is high.

Perceptions and expectations of alternative job opportunities are influenced by the labor market. Griffeth and Hom (1988) argued that perceived alternative job opportunities cannot explain turnover intention independently, highlighting that other mechanisms are involve. Mushtaq, Amjad and Saeed (2014) claimed that low perceived alternative job opportunities can result in higher level of job satisfaction and vice versa. Employees often compare the costs and benefits between current and alternative jobs (Mobley, 1977; Price, 2001). Research findings show that employee intention to stay is associated with perceived alternative job opportunities and job satisfaction (Mushtaq et al., 2014). According to Philippaers, De Cuyper and Forrier (2019), "employees who feel they can readily obtain a better job may also feel that they cannot obtain those better outcomes in their current job and organization, and/or that their personal needs are not met" (p.1311). In similar fashion, Acikgoz, Sumer and Sumer (2016) noted that employable workers with low affective commitment are more likely to have turnover intentions. Others argued that perceived alternatives job opportunities are not associated with favorable organizational outcomes such as commitment (Feng & Angeline, 2010). Empirical evidence illustrating the association between perceived alternative job opportunities and commitment is lacking and the interactive nature of job satisfaction can provide further insights. The present study contends that employees' attitude towards their job (i.e., job satisfaction) may diminish the effect of perceived alternative job opportunities on organizational commitments, which may subsequently reduce the level of turnover intention. Based on the extant discussions, theoretical and empirical evidences, the following hypothesis is proposed:

H4: Organizational commitment will mediate the relationship between Perceived alternative job opportunities and turnover intention, and the association will be weaker when job satisfaction is high.

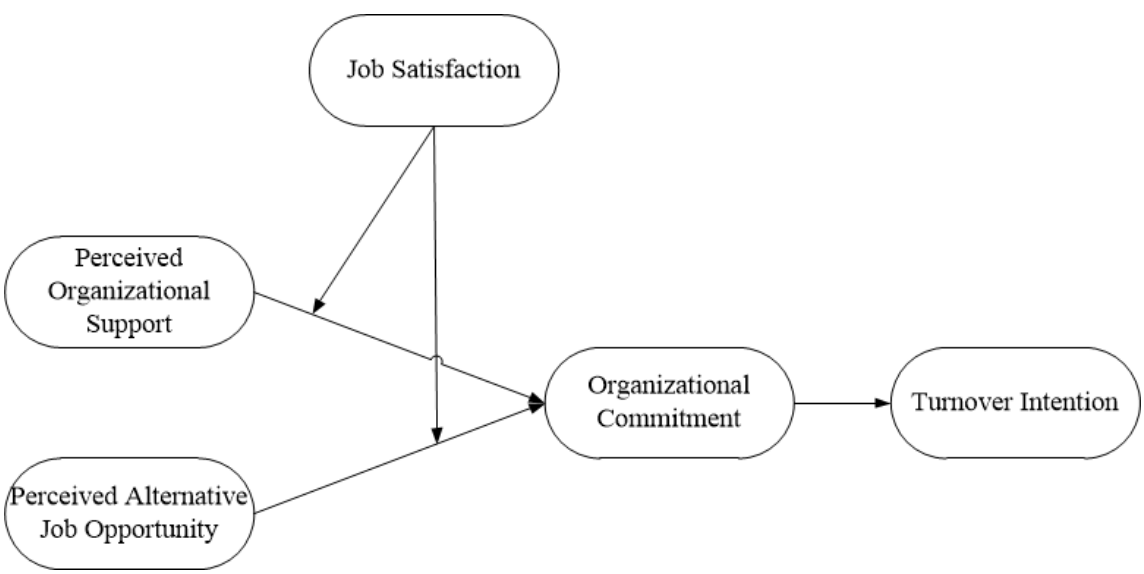

Figure 1: Study Model

3 Materials and methods

3.1 Research context

According to the Jordanian Ministry of Industry and Trade (2010), SMEs constitutes about 98.7% of the total industrial establishments and employs 2/3 of the country labor force. SMEs are viewed as the engine driving Jordanian industrial innovation, technological progress and economic growth because they account for more than 1/3 of the total GDP. Accordingly, the ministry classifies SMEs based on the table below. This classification depends on the number of workers and capital investment as shown in Table 1.

This article focuses on Jordanian SMEs working in the Qualifying Industrial Zone (QIZs). Table 2 presents the number of companies, investment and their respective number of employees.

Table 1: Jordanian SMEs Classification

Type of Enterprises	No. of employees	Investment Capital
Micro-enterprises	1-9	Less than 30000JD
Small-enterprises	10-49	≤30000JD
Medium-enterprise	50-249	≤30000JD

Source: Ministry of Industrial & Trade (2010)

Table 2: The Study Population- QIZ

QIZ	**Date of Estab.**	**No. of Companies**	**No. of Employees**	**Total Investment Capital Volume (Million JD)**
"Abdullah II Ibn Al-Hussein Industrial Estate-Amman"	1984	467	15,675	1395
"Al-Hassan Industrial Estate- QIZ-Irbid"	1991	154	13,478	185,93
"Aqaba International Industrial Estate (AIIE)"	2004	121	9,712	426
"Al Muwaqar Industrial Estate (MIE)"	2014	90	3,200	470
"Al-Hussein Bin Abdullah II Industrial Estate - QIZ - Al-Karak"	2000	15	4,580	47
Total	-	572	23,190	1,912

Source: Jordan Industrial Estates Company (JIEC) - (2019)- https://www.jiec.com/en/who-are-we/

3.2 Sampling and data collection

A total of 400 survey packets were distributed using convenience sampling technique to Jordanian SMEs workers in QIZ three main regions of Amman, Irbid, and Al-Karak. The participants were employees, and those in managerial positions were not included. The survey items were in English and back-translated to Arabic by translators. Then permission was taken from the top management. The cover page of the survey assured the respondents of their confidentiality and anonymity to reduce the threat of social desirability bias, the participants were told that there are no right or wrong answers, and that they should answer as honest as possible, and that participation is completely voluntary, which means they can discontinue at any time. At the end 270 valid survey packets were obtained and used for analyses.

3.3 Instruments

Perceived organizations support (POS) was operationalized with a 6-items scale adapted from (Eisenberger et al., 1990, 1997) work. ***Perceived alternatives opportunity*** was operationalized with a 3-items scale adapted from (Price & Mueller, 1986) work. ***Organizational commitment*** was operationalized with a 13-items scale adapted from (Ziauddin et al., 2010) work. ***Job satisfaction*** was operationalized with a 5-items scale adapted from (Odon et al., 1990) work. ***Turnover intention*** was operationalized with a 3-items scale adapted from (Mobley, 1977) work. The measurement scale was anchored on a 5-point Likert scale spanning from 1-strongly disagree to 5-strongly agree. The extraneous variables obtained include gender, age, education, income and organizational tenure. Sample of scale items are presented in the Appendix section.

4 Data analysis and results

4.1 Demographic data

The obtained data comprise of 64.8% female and 35.2% male participants. About 58.1% of participants are between 18 and 30 years old; 31.9% are between 31 and 40 years old and the rest are above 40 years. An overwhelming number of the participants 84.8% have bachelor's degree; 8.5% have postgraduate degrees and the rest are either high school certificate or diploma holders. In terms of monthly income, 39.3% are earning between 601 and 800 Jordanian Dinar; 37.8% between 401 and 600 Jordanian Dinar; 12,2% between 200 and 400 Jordanian Dinar, and the rest are earning more than 800 Jordanian Dinar monthly. About 42.2% of the participants have organizational tenure between 4 and 7 years; 29.3% have organizational tenure between 1 and 3 years and the rest have organizational tenure above 7 years.

4.2 Hypothesized model

The present study deploys a variance-based structural equation modeling (PLS-SEM). Smart PLS version 3 was utilized to test the hypothesized model. The measurement model was evaluated and tested for construct reliability and convergent validity. Indicators such as standardized factor loadings and t-values, Cronbach alpha (α), composite reliability (CR), and average variance extracted (AVE) were assessed. Alpha and CR value exceeded the threshold value of 0.7; most of the factor loadings were statistically significant and exceeded the threshold of 0.7 (Jahmani et al., 2018). The average variance extracted (AVE) exceeded the threshold value of 0.5 (Hair et al., 2010). Thus, we concluded that scale reliability and construct convergent validity have been established. Heterotrait-monotrait (HTMT) ratio and The Fornell–Larcker criterion were assessed to establish divergent validity of the constructs under investigation. HTMT-ratios of the correlation were below threshold of .90 (Henseler et al., 2015). The square roots of the AVE scores are higher than the correlations coefficients between the constructs (Fornell & Larcker, 1981). Thus, we concluded that construct divergent validity has been established. See Table 3.

Table 3: Reliability, convergent and divergent validity

Instruments	1	2	3	4	5	α	CR	AVE	R^2
1. Perceived organizational support	.80	-.33	.11	.79	-.45	.89	.92	.64	
2. Perceived alternatives job opportunities	.41	.80	.01	-.45	.42	.72	.84	.64	
3. Job Satisfaction	.12	.06	.75	.13	.08	.76	.84	.56	
4. Organizational commitment	.88	.56	.13	.74	-.38	.91	.93	.54	.69
5. Turnover Intention	.55	.58	.10	.46	.81	.73	.85	.65	.15

Note: * deleted items; CR, composite reliability ; AVE, average variance extracted ; α, Cronbach's alpha ; Heterotrait-monotrait (HTMT) ratios are below the diagonal; Values above the diagonal in bold are squared inter-construct correlations for Fornell–Larcker criterion

Table 4: Indirect and interaction effects

		β	t	ρ
Direct effects				
Perceived organizational support	-> Organizational commitment	.71	14.94	.000
Perceived alternatives job opportunities	-> Organizational commitment	-.23	4.51	.000
Job satisfaction	-> Organizational commitment	.04	1.07	.284
Organizational commitment	-> Turnover intention	-.38	6.64	.000
Indirect effects				
Perceived organizational support -> Organizational commitment -> Turnover intention		-.27	6.71	.000
Perceived alternatives job opportunities -> Organizational commitment -> Turnover intention		.09	3.28	.001
Interaction effects				
Perceived organizational support * Job satisfaction -> Organizational commitment -> Turnover intention		.02	0.32	.747
perceived alternatives job opportunities * Job satisfaction -> Organizational commitment -> Turnover intention		.01	1.17	.242

Note: β, beta value; ρ, p-value; t, t-value

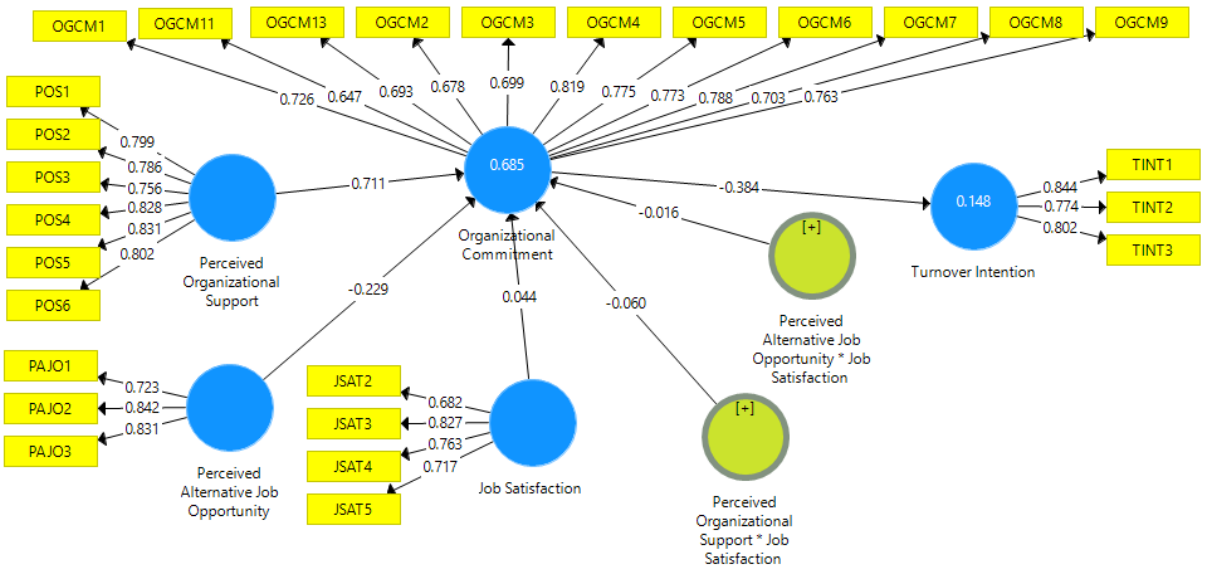

Figure 2: Factor loadings, beta coefficients and r-square values. See Appendix for explanation of measurement items.

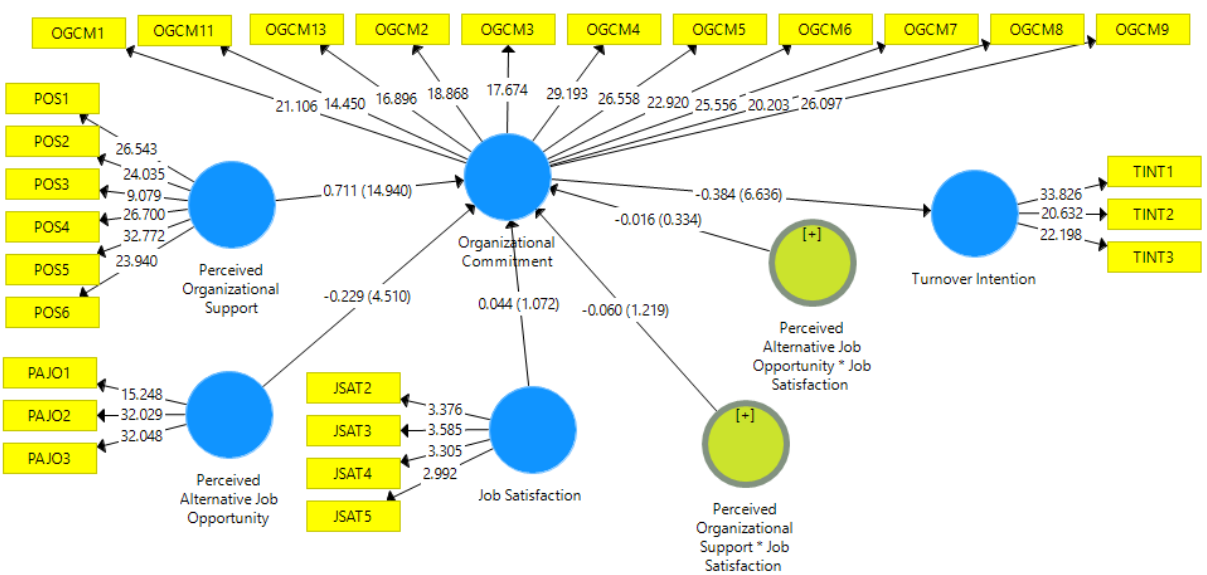

Figure 3: Beta coefficients and t-values. See Appendix for explanation of measurement items.

4.3 Hypotheses testing

We test for the presence of multi-collinearity, the outer model (each scale item) and inner model (research variables) exhibited accepted Variance Inflation Factor (VIF) values less than 5 (Hair et al., 2010). Thus, confirming the absence of multi-collinearity. Henceforth, we examine the structural model using variance-based structural equation modeling (PLS-SEM). Our analysis with PLS-SEM generated interesting results, where POS has a significant and positive direct effect on organizational commitment (β = .71, ρ < .000). Perceived alternatives job opportunities have a significant and negative direct effect on organizational commitment (β = -.23, ρ < .000). Job satisfaction has a nonsignificant effect on organizational commitment (β = .04, ρ = .284). POS and perceived alternatives job opportunities collectively explains 69% of the variance in organizational commitment (based on R2). Organizational commitment has a significant and negative direct effect on turnover intention (β = -.38, ρ < .000) and explains 15% of the variance in turnover intention (based on R2).

The indirect effect predicted in H1 was significant (β = -.27, ρ < .000), and a bias corrected confidence interval with a resample of n=5,000 produced the following intervals (Bias=-.003; 2.5% = -.350; 97.5% = -.194). That is, organizational commitment mediates the association between POS and turnover intention. The indirect effect predicted in H2 was also significant (β = .09, ρ < .001) with the following intervals (Bias=.003; 2.5% = .045; 97.5% = .147). That is, organizational commitment mediates the association between perceived alternatives job opportunities and turnover intention exists. These result show that a full mediation exists. Thus, **H1 and H2 received empirical support** (see Table 4, Figure 2 and Figure 3).

The present study also hypothesizes the moderating role of job satisfaction, which resulted to a moderated-mediated structural model. First, job satisfaction did not moderate the mediating role of organizational commitment on the association between POS and turnover intention (β = .02, ρ = .747), and a bias corrected confidence interval with a resample of n=5,000 produced the following intervals (Bias= -.002; 2.5% = -.025; 97.5% = -.056). Second, job satisfaction did not moderate the mediating role of organizational commitment on the association between perceived alternatives job opportunities and turnover intention (β = .01, ρ = .242), and a bias corrected confidence interval with a resample of n=5,000 produced the following intervals (Bias=.000; 2.5% = -.036; 97.5% = -.039). Thus, **H3 and H4 did not received empirical support** (see Table 4, Figure 2 and Figure 3).

5 Discussion

Interpersonal and organizational work experiences can result in negative and positive perceptions among employees. Understanding the mechanisms through which employees develops high organizational commitment and low turnover intention are important preventive measures. This proactive approach can be useful in managing costly employee entry and exit phenomenon (Abubakar et al., 2018b; Berberoglu, 2018; Yousaf et al., 2018) especially in SMEs. Much remains to be discovered about the multi-variate association of job satisfaction with POS, perceived alternatives job opportunities, organizational commitment and turnover intention. In particular, an unexamined possibility is how job satisfaction can alter the associations between the above said variables. The present work tests an integrative model scrutinizing the mechanism by which organizational commitment mediates the link between POS, perceived alternatives job opportunities and turnover intention; and the potential moderating role of job satisfaction. This yields four important results as follows:

First, the finding supports our overarching proposition that organizational commitment will mediate the link between POS and turnover intention. Prior findings also revealed that POS is associated with greater levels of organizational commitment (Eisenberger et al., 1990) and lower levels of turnover intention (Madden et al., 2015). POS was negative associated with turnover in Kang, Kim and Han (2018) study. A study in the Indonesian restaurant industry showed that organizational commitment mediated the relationship between HRM practices and turnover intentions (Yousaf et al., 2018). Similarly, Feng and Angeline (2010) found that organizational commitment mediate the link between POS and turnover intention. Thus, our study corroborates existing assertions in an Arabian perspective by showing how positive organizational resource (POS) serves as a protective factor toward developing turnover intention.

Second, the finding supports our overarching proposition that organizational commitment will mediate the link between perceived alternatives job opportunities and turnover intention. Existing empirical evidences show that perceived alternatives job opportunities have a negative correlativity with organizational commitment (Rahman, et al., 2008) and positive correlativity with turnover intention (Dardar et al., 2012; Rahman, et al., 2008). In this sense, workers who are employable are less likely to be committed to the hiring organization and are more likely to engage in turnover behavior (Acikgoz et al., 2016; Philippaers et al., 2019). This study shows that organizational commitment is the mechanisms through which perceived alternatives job opportunities use to reduce turnover intention. Implying that lack of resources in one's organization and its presence in another organization serves as a push factor

toward turnover intention.

Third, the study results indicate that organizational commitment is a mediator between POS and turnover intention, and that the relationship is not stronger when employee job satisfaction is high. The present finding contradicts what scholars highlighted, that POS and job satisfaction have negative impacts on turnover intention (Eisenberger et al., 1990; Samad, 2006; Terason, 2018) and positive impact on organizational commitment (Eisenberger et al., 2002; Kang et al., 2018). Similar findings were reported by Lartey et al. (2019) who observed the variables inversely, where POS failed to moderate the relationship between deep acting and job satisfaction. Our outcome adds to the inconsistent findings in the literature, we attributed this to our approach and context, more research is needed to uncover why such association exist.

Fourth, we theorize that organizational commitment will mediate the association between perceived alternatives job opportunities and turnover intention, and that the relationship is weaker if job satisfaction is high. The present finding did not support our proposition. This result further contributes to the ambiguous role of perceived alternatives job opportunities on commitment and turnover intention for satisfied employees. Past research shows that perceived alternatives job opportunities lowers organizational commitment (Rahman, et al., 2008) and strengthens turnover intention (Dardar et al., 2012; Ing-San & Jyh-Huei, 2006; Khatri et al., 2001). Job satisfaction has been shown to boosts organizational commitments and lowers turnover intention (Islam et al., 2018; Jehanzeb & Mohanty, 2018). A plausible reason for this might be that employees who perceived themselves to be employable are constantly changing and adjusting their relationships with the hiring organizations (Hahn & Kim, 2018). Age might be another factor because majority of surveyed sample are less than 40 years, these age groups are less loyal to employers (Abubakar et al., 2020; Acikgoz et al., 2016; Yuen, 2016). Building on this evidence, we conclude that both satisfied and non-satisfied employees are more likely to be less commitment and may further develop turnover intention when perceived alternatives job opportunities are high. More research is needed to uncover why such association exist

5.1 Theoretical and Practical Implications

Contemporary researches have stressed the criticality of POS and perceived alternatives job opportunities, relatively limited attention has been paid to the combinatory and underlying process through which they increase or decrease organizational commitment and subsequently turnover intention. To fill this void, this article examines the mediatory role of organizational commitment and moderator role of job satisfaction using SMEs employees. The theoretical contributions of this study stems from unveiling POS capacity to foster commitment to organization which diminishes intention to leave, and on the other hand, we show how perceived alternatives job opportunities inhibits commitment towards the hiring organization, suggesting that employees are less committed to their organizations when perceived alternatives job opportunities are high irrespective of their job satisfaction level.

Practically, this article recommends that top management should foster POS climate and other related mechanisms to keep employees' commitment, since perceived alternatives job opportunities is somehow out of their control. Lucrative rewards, compensations, recognition and appraisals systems can help retain employees despite the presence of alternatives. Managers are advised to initiate and implement policies that elicit concerns for employee well-being and valuing their contributions to enhance their POS. The present outcome warrant practitioners to engage in open communication with their employees about expected benefits, this strategy may impede a misfit between practices and employees' needs and preferences. Technically, this can reduce the negative effects of perceived alternatives job opportunities on commitment.

5.2 Limitations and Future Research

This paper has several limitations that worth mentioning. One, the cross-sectional nature of the data inhibits our ability to draw concrete conclusions on causal inference and examine how the study variables play out along a timeline. Upcoming studies may consider adopting a time-lag design. Two, the self-report responses may have profound effects on the estimations through social desirability bias, thus upcoming studies may collect data from multiple data sources. Three, this study context Jordanian SMEs limits our ability to generalize the results. Future research should replicate the same model but in different settings. Lastly, although we control for common method bias (CMB) suing procedural approaches, future study can utilize methods such as Fuzzy sets, machine learning and artificial intelligence techniques (i.e., Abubakar, 2018; Abubakar et al., 2018a; 2019) to evade the threats of CMB.

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Zaznana organizacijska podpora, alternativne zaposlitvene priložnosti, organizacijska zavzetost, zadovoljstvo na delovnem mestu in namen zamenjati zaposlitev: moderiran model

Ozadje in namen: V članku smo evalvirali strukturni model, ki opredeljuje posredni vpliv organizacijske zavezanosti na povezavo med zaznano organizacijsko podporo, zaznanimi alternativnimi možnostmi za zaposlitev in namero o zamenjavi zaposlitve ter posredniško vlogo zadovoljstva z delom.
Zasnova / metodologija / pristop: Z vprašalnikom smo zbrali podatke med jordanskimi malimi in srednje velikimi podjetji (MSP). Pridobljene podatke (n = 270) smo analizirali s sodobnim programom za modeliranje strukturnih enačb (PLS-SEM) SmartPLS v3.
Rezultati: Rezultati naše analize so pokazali, da organizacijska zavzetost posreduje povezavo med zaznano organizacijsko podporo in namenom za zamenjavo zaposlitve, zaznanimi alternativnimi možnostmi za zaposlitev in namenom o zamenjavi zaposlitve. Poleg tega zadovoljstvo z delovnim mestom ne vpliva na povezavo med organizacijsko podporo, zaznano alternativno možnostjo zaposlitve in organizacijsko zavzetostjo.
Zaključki: Študija je med prvimi, ki prikazuje posredni vpliv organizacijske zavezanosti na povezavi med zaznano organizacijsko podporo, zaznano alternativno možnostjo zaposlitve in namero o zamenjavi zaposlitve. Analizirani so teoretični in praktični vplivi, nakazane so na potencialne prihodnje raziskovalne usmeritve, ki temeljijo na ugotovitvah, ki so bila argumentirane v tej študiji.

Ključne besede: organizacijska zavzetost, zaposleni, namen zamenjati zaposlitev

Appendix: List of Measurement Items

Perceived Organizational Support
POS1- “I feel treated fairly”
POS2- “I think the firm gives sufficient consideration to the needs, desires, and demands of the personal lives of its employees”
POS3- “I feel that high performance is rewarded in this organization”
POS4- “This organization forgave my honest mistake”
POS5- “This organization cares about my general satisfaction”
POS6- “My company strongly considers my goals and values”

Perceived Alternatives Job Opportunities
PAJO1- “If I quit my current job, the chances that I would be able to find another job which is as good as, or better than my present one is low”
PAJO2- “If I have to leave this job, I would not have another job as good as this one within a little time”
PAJO3- “It would be not easy to find acceptable alternative employment”

Job Satisfaction
JSAT1- “I feel fairly well satisfied with my job”
JSAT2- “I have trust that the organization retained the qualified employees”
JSAT3- “My job is usually worthwhile”
JSAT4- “I find real enjoyment in my job”
JSAT5- “Most days I am enthusiastic about my job”

Organizational Commitment
Affective Commitment
OGCM1- “I would be very happy to spend the rest of my career in this organization”
OGCM2- “I really feel as if this organization’s problems are my own”
OGCM3- “I feel like " part of the family" at my organization”
OGCM4- “I do not feel a strong sense of "belonging" to this organization”
Continuance Commitment
OGCM5- “It would be very hard for me to leave this organization right now, even if I wanted to”
OGCM6- “Right now, staying with this organization is a matter of necessity as much as desire”
OGCM7- “I feel that I have too few options to consider leaving this job”
OGCM8- “Too much of my life would be disrupted if I decided I wanted to leave my organization right now”
Normative Commitment
OGCM9- “I would feel guilty if I left my organization now”
OGCM10- “This organization deserve my loyalty”
OGCM11- “I owe a great deal to my organization”
OGCM12- “I would not to leave my organization right now because I have a sense of obligation to the people in it”
OGCM13- “Even if it were to my advantage, I do not feel it would be right to leave my organization now”

Turnover Intention
TINT1- “I don’t think about quitting this organization”
TINT2- “I would not likely search for a position with another employer”
TINT3- “It is not likely that I will leave this organization the next year”

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Age Management: What Can we Learn from High-End Luxury Fashion Designer with More than 50 Years of Working Experience?

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Background and Purpose: While the world population is aging, the aim of this study is to bring new knowledge into age management research by investigating the most important factors that encourage older employees to remain in the labour market longer, also after meeting the official retirement age, based on an in-depth qualitative case study of the high-end luxury fashion designer with more than 50 years of working experience.
Design/Methodology/Approach: We conducted an inductive case study in fashion industry. Specifically, our case study is build based on the content analysis of secondary data as well as an in-depth interview with the general manager in the fashion and high-end luxury industry in Slovenia.
Results: The proposed conceptual model shows key facets, as assigned overarching categories, namely-vitality, intrinsic motivation, adapting, lifelong learning, and positive emotions and therefore contributes to the age management phenomena. Within the presented case study, we found out that the selected facets are the most important factors for the encouragement to remain in the labor market and to ensure flexible retirement processes in dealing with the challenges of an aging population and workforce.
Conclusion: Our study contributes to the theory and practice of age management by narrowing our focus on the best practice from selected high-end luxury fashion industry designer in Slovenia. What can we learn from high-end luxury fashion designer with more than 50 years of working experience? As the presented case study cannot be generalized to population, the presented case contributes to the field of age management and empowers people to rethink and stay active after meeting the official retirement age.

Keywords: *Adult learning; Older workers; Retirement; Age management; Fashion industry; Intrinsic motivation; Vitality; Slovenia*

1 Introduction

European age structures are changing due to decreased fertility rate and increased life expectancy, which are altogether reflected in a decline of the younger population on one hand and rapid growth of the older population (65+) on the other hand. In addition, according to Eurostat (2019b), at the end of 2018, in EU-28, there was a total of 512 million people, thereof 45+ aged 47,33% and 40,10% of people aged 50+. This represents a challenge to the sustainability of the existing pension system, which is also evident in increasing official retirement age throughout European Member states. Therefore, Europeans will have to work longer to achieve full retirement age.

However, not all Europeans are willing, or capable to work longer. It is well documented that with aging, several human functions decline, as for example human cognitive functions (Prakash et al, 2009), physical (motor) capacities (Lindberg et al., 2009) and humans encounter

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more visual problems (Bucur et al., 2005). In this article, we are focused on human willingness to work longer. By conducting a qualitative design, namely a business case study of Slovenian high-end fashion industry designer, we are deepening our understanding regarding the key factors that affect human willingness to work longer. Concretely, the research question we aim to answer is "*What is/are the most important factor(s) of an older employee for the encouragement to remain in the labor market longer, after meeting the official retirement age?*".

We structure our paper as follows. First, we focus on the literature review, where the first part is dedicated to understanding the aging and age management in the EU and Slovenia, meanwhile, the second part is focused on the fashion and high-end industries in the EU, in order for a reader to understand its importance. After the literature review, we present the methodology applied, with the sub-chapters on study design, data collection, and content analysis. Within the results section, we firstly present the case study context, which is needed to fully understand the second sub-chapter, namely the presented case study of Slovenian fashion industry designer, enriched with several in-depth quotations. Lastly, we focus on discussion and conclusion, where case study conceptual model is presented, followed by concrete theoretical contributions, practical implications as well as study limitations.

2 Literature Review

2.1 Age management

Bloom et al. (2015) predict that until 2030, every country will experience the aging of the population. In the past six decades, countries all over the world had to deal with only a modest increase in the share of people aged 60 years and older, from 8.0% to 10.0%. Authors Howdon and Rice (2018) express the concern that existing demographic pressures that are a consequence of population aging could result in a significant rise in public expenditures to unsustainable levels under existing financing arrangements and would thus represent a serious issue for national economies (Bloom et al., 2015). Population aging in the future will definitely and naturally require changes to existing labor (Bogataj, McDonnell & Bogataj, 2015; 2016). Žnidaršič and Dimovski (2010) argue that one of the most discussed policy options is to encourage older workers to work longer, even after the age of 65. Nowadays the perception of the majority of workforce member over the age of 55 is changing as they do not expect to retire until well after the historically determined retirement age (Dimovski et al., 2019). When discussing longer participation of older workforce on the labor market, Slovenia is particularly problematic as it is among the countries with the lowest employment rate of the age cohort 55+ years among employees. The actual employment rate of 55+ years is 16.1%, which is 3.7 percentage points below the share of the EU. According to publicly available data of Eurostat (2019a) for the third quarter of the year 2018, the highest share of employees in the 55+ age cohort is in Germany and is equal to 23.8% and the lowest share is in Luxemburg, where the 55+ age cohort share is equal to 10.5%.

The concept of age management deals with various organizational activities that aim to uphold labor supply, tackle the challenges of different generations, retain valuable knowledge of individuals when they retire, maintain the productivity of older workers and organize the whole retirement process (Grima, 2011; Brooke and Taylor, 2005). Dimovski and Žnidaršič (2006) add that age management could also be understood as an application of the science of aging into practice with the goal of helping people improve the quality of their lives in the aging process. Ilmarinen (2012) explains age management as an approach in organizations with eight main characteristics. First, it is aimed to support knowledge and awareness on the general topic of population aging. Second, it promotes fair attitudes towards older employees. Third, he highlights its importance as a core task and responsibility of managers and supervisors. Fourth, he emphasizes the importance of integrating age management into human resource policy. Fifth, it promotes the ability of everyone to work and to increase the productivity of all workers and sixth, it encourages lifelong learning. Seventh, it endorses the necessity of such a working environment that takes into account also the needs of older workers and last, it is of paramount importance to enable a safe and dignified transition to retirement. In a nutshell, Luz, Leite and Alvarelhao (2019) define age management as the integration of specific (human resource) management measures that are intended to face the challenge of population ageing, where the goal is to allow each and every individual to remain active and healthy (Žnidaršič & Dimovski, 2009a; 2009b), regardless of their age. Whereas Walker (2005) defines five practices under the age management concept as a whole, namely recruitment (including exit at the end of the working career), training, development, and promotions, flexible working practice, ergonomics and job design (Bogataj et al., 2017; Bogataj et al., 2019; Calzavara et al., 2019) to avoid negative stress (Rožman, Griekevich, & Tominc, 2019; F, 2008), learning and technology (Janežič, Dimovski & Hodošček, 2018; Arh, Blažič & Dimovski, 2012), and changing attitudes towards ageing workers.

In general, according to Hedge, Borman Lammlein (2006), there is a typical perception that the closer an older worker is to retirement, the less motivation he/she has to be excellent in their job. On the contrary, Kanfer and Ackerman (2004) argue that older workers' motivation must be examined in the context of lifespan development theory, where the aging process is understood as a dynamic interaction between different gains and losses. The authors go

on to conclude, that based on theoretical understanding of adult development, there is no reason to strictly follow the perception that job motivation can only decline with age. They propose that job motivation of older workers can be understood as a combination of both the nature of their work and the criteria that determine how their performance is assessed. Moreover, Boumans, De Jong and Janssen (2011) prove that older workers are more driven by intrinsic rewards of their work (i.e. a challenging job task) and to a higher level than their younger colleagues. Similarly, van den Berg (2011) suggests that if an individual is under the impression that his/her job is internally rewarding, he/she is more likely to continue working after he/she already reaches the proposed retirement age.

Van der Heijden et al. (2009) posit that barriers older workers face having been discussed in-depth, however, less is known about what makes them prosper and what keeps them to want to continue working beyond the legal retirement age. Hennekam (2017) discusses thriving, consisting of both vitality and learning as a promising concept in the management literature, aimed at explaining why older workers want to remain active participants in the labor market. In the era of population aging, gaining additional insight into what helps older workers excel at their job, might positively influence their labor participation rates and endorse their will to extend their professional career. Hennekam (2017) further suggests that a positive relationship between thriving and self-perceived employability exists. Employability is an integral concept for individuals since every single employee nowadays is more and more responsible for their own career path and to maintain his/her job security (Van der Heijden & Bakker, 2011). Moreover, it is especially important to older workers as they are typically the first category of workers to be seen as redundant and often their skills are labeled as outdated (Van den Broeck et al., 2014). Previous research already established that self-perceived employability leads to better performance, more professional development, better health (Berntson & Marklund, 2007) and higher wellbeing at work (De Cuyper et al., 2008), which are all important factors that enhance the possibility for older workers to remain active participants on the labor market.

Older workers may also be valuable in the role of mentors as Kram and Hall (1989) suggest that older employees are more inclined to help others through mentoring activities. Similarly, Ardichvili, Page, and Wentling (2003) posit that older employees were indeed motivated to participate in knowledge sharing activities and mentoring new colleagues, due to their need to give something back to the organization. Heisler and Bandow (2018) propose that one of the possible methods to engage older workers is to support them leveraging their existing knowledge and experience for mentoring and developing knowledge transfer initiatives. Moreover, positioning older workers as mentors to their younger colleagues is another possible solution to promote their task significance and to further accelerate the knowledge transfer process. Authors Lundberg and Marshallsay (2007) claim that older workers themselves typically argue that the most effective training methods are in-service, in-house, one-on-one and practically oriented training methodologies, preferably establishing older workers as role models and mentors.

Vasconcelos (2018) endorses the opinion that older workers can be seen as valuable organizational assets. Moreover, their knowledge and expertise are part of organizational wisdom capital that requires careful attention from organizations and their managers in terms of appropriate incentives and training in order for them to remain productive within the organization. Older workers typically possess meaningful knowledge and extremely important experience that enables organizations to perform better and even attract new young talents. Vasconcelos (2018) further reports that in his research participants acknowledged knowledge and experience as one of the most important benefits of older workers. Similarly, the European Foundation for the Improvement of Living and Working Conditions (2006) reports that many organizations already realize that professional and social skills of older employees accumulated through their working career represent a special asset. The younger generation cannot completely match such skills and experience and any organizational attempt to build up younger colleagues could produce significant additional costs and extensive education and training. Numerous older workers possess qualities such as accuracy, reliability and the ability to properly communicate. The premature loss of such skills and consequent failure to replace them could represent a big economic risk for almost any organization. Practical experience and research indicate that older employees that are properly integrated into the organization are in practice still highly productive. Moreover, experienced older workers are also the potential resource to fill the gap in personnel in specific fields that have become unattractive for the younger generation in recent years (European Foundation for the Improvement of Living and Working Conditions, 2006).

Population aging also intervenes in the field of relationships between generations and influences several fields in the socio-economical, political and cultural life. Consequently, there is a need to create stronger intergenerational ties and reduce age segregation. According to Veingerl Čič and Šarotar Žižek (2017), intergenerational cooperation and generational management at work are becoming practically a necessity in organizations if they want to retain the knowledge and experience of older generations and at the same time acquire and retain talented young colleagues. In organizations, intergenerational cooperation can also be done by working closely together, where an older and younger person are able to enhance their understanding of the dynamics and characteristics of intergenerational relations (Sibinski, Sipa & Gorzen-Mitka, 2016). To conclude, Crumpacker and Crumpacker (2007) posit that intergenerational management is gaining in importance and recogni-

tion as nowadays the workforce is more diverse than ever, especially in terms of age, race, gender, and ethnicity.

2.2 Fashion and high-end industries in the EU

The fashion and high-end industries represent European cultural heritage and expertise with 5 million people directly employed in the fashion value chain and over 1 million people employed in the high-end industries. These activities provide an important contribution to the EU economy (European Commission, 2019). The fashion and high-end industries are one of the most creative sectors in Europe, as they are present in the everyday life of millions of people and act as ambassadors of European values, such as culture, creativity, innovation, and craftsmanship of each particular country. Fashion and high-end industries form complex and interweaved business value chains from the design and manufacturing of fashion goods, for example as textiles, clothing, footwear, leather, jewellery, and other high-end goods. Despite the economic crisis, the fashion industry has managed to defend their position in the global market, according to European Commission (2019) report, this is mainly due to a move towards innovative, high added-value products and services, niche markets, and new business models. The fashion and high-end sector grew faster than the rest of the European economy during the crisis, recording double-digit growth in 2010 and 2011. It employs over 1 million people, exports over 60% of their production outside Europe, and accounts for 10% of all EU exports. Strengthening the long-term competitiveness of fashion and high-end industries of EU countries is part of the broader European Commission strategy for the re-industrialization of Europe, where this strategy outlines to increase the proportion of GDP generated by manufacturing to 20% by 2020. Furthermore, trends in fashion and high-end industries in the EU show that increasing life expectancy together with falling birth rates influences the rapid aging of the workforce. Older workers, workers that are at or approaching the official retirement age, are the fastest-growing category of the workforce and one of the fastest-growing groups (Cappelli, 2014) in the overall Slovenian and European populations. Similarly, Cappelli (2014) outlines that the percentage of the population aged 65+, who are at serious risk of mortality or life-threatening illness, will grow by about 16% until 2035, which means that there will also be a huge cohort of healthy individuals in that age group who want and need to work.

However, the fashion and high-end sectors face several challenges, including the increased prevalence of counterfeit goods, increasing shortages of skilled workers, and difficulties for fashion small and medium-sized enterprises to access finance. Due to pressures for change arising from trade liberalization, increasing external competition, consumer developments, technological advances, changes in production costs and environmental issues, these industries must continuously reinvent their business models (European Commission, 2019). According to the EC report, fashion companies are most often micro-enterprises with less than 10 employees, where we can find the highest concentration of fashion industry in Italy, Spain, Greece, Portugal, as well as newer EU countries, for example in Poland, Romania, Bulgaria, Hungary. The countries with the largest number of fashion distribution and retail companies are Italy, France, Poland, Germany, and the United Kingdom. European high-end fashion industry has a worldwide reputation, and 62% of all goods manufactured by European high-end brands are sold outside Europe. The value of European high-end exports is estimated at EUR 260 billion – about 10% of all EU exports.

According to Statista report (Statista, 2019), the revenue in the bags and accessories segment in EU amounts to 15,726 million USD in 2019, where the revenue growth is expected to show an annual growth rate of 8.6%, resulting in a market volume of USD $21,882 million by 2023 (Figure 1). In the year 2017 a share of 26.6% of users is 25-34 years old in the EU fashion market (Figures 2 and 3).

According to our knowledge, no evidence exists on scientific contributions of age management practices in the fashion industry. Therefore, based on the above literature review, we designed our research question as follows:

R1: "What is/are the most important factor(s) of an older employee for the encouragement to remain in the labor market longer, after meeting the official retirement age?"

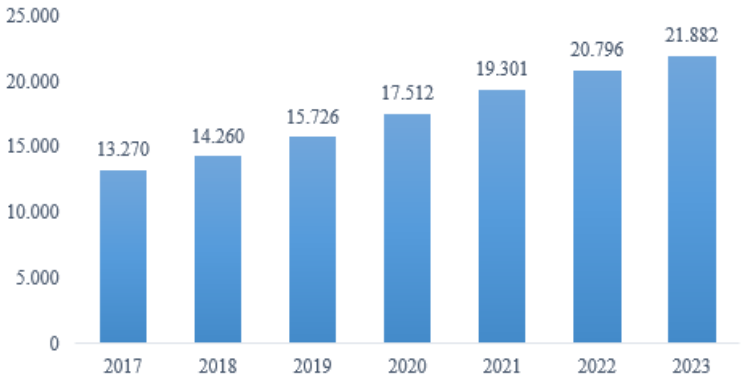

Figure 1: Revenue in the Bags & Accessories fashion segment in EU in 2019 in million USD
Source: Adapted from Statista (2019).

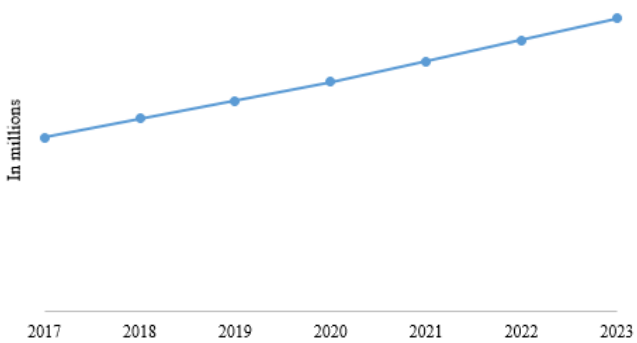

Figure 2: Amount of sales in the Bags & Accessories fashion segment in EU in 2019 in million USD
Source: Adapted from Statista (2019).

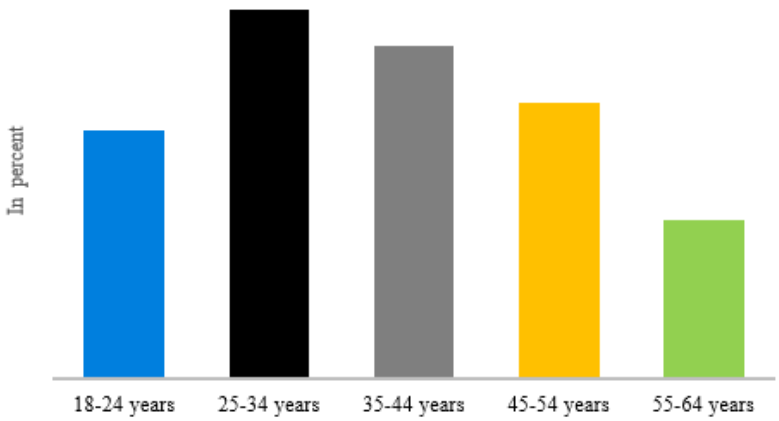

Figure 3: Amount of sales by age in the Bags & Accessories segment in EU in 2019 in percentage
Source: Adapted from Statista (2019).

3 Methodology

3.1 Study design

Our case study empirically accesses age management concepts in Slovenia by offering inductive research and broader assessment of business impact in age management in Slovenia. Overall, our study sought to answer the following overarching research question: "What is/are the most important factor(s) of an older employee for the encouragement to remain in the labor market longer, after meeting the official retirement age?" More specifically, we sought to deepen the knowledge about age management impact and relative trend of aging in Europe. The single-case method is selected, as according to Yin (2003), even one case could be enough to generalize to theory. By conducting the business case from the fashion industry, we analyzed responses and experiences on age management best practices. The case from the high-end fashion industry has been selected for several reasons. First, according to our knowledge, there has been no scientific research yet, connecting high-end fashion industry and age management. Second, the high-end fashion industry is of high importance for the EU economy. Third, we have contacted the selected designer, one of the most recognized, if not the most recognized one in Slovenia, an EU member state, who was willing to collaborate on the study. It enabled us to collect in-depth, content-rich primary data to get an insight into our research question. It is a family-owned business, therefore, we have done the interview with the designer itself. The findings are presented based on the content analysis and qualitative research design, where the in-depth interview was employed with the general manager and business owner with more than 50-years of work experience in fashion and high-end luxury industry in Slovenia.

3.2 Data collection

The inductive case of the Slovenian high-end luxury fashion designer was conducted by analyzing primary data collected with the structured, in-depth qualitative interview and secondary data, collected from multiple sources for the purpose of triangulation. The inductive content analysis allows recognizing parts of the whole, connected to certain phenomena and its attributes (Peterlin et al., 2018). We conducted a search of the secondary archive in the period of 2016-2019 to obtain proof quotations reflecting Slovenian fashion industry designer attitudes toward work. Specifically, we did an online search, including Science Direct, Web of Knowledge, as well as relevant newspapers, magazines, and relevant internet webpages. These proofs were used to share information and represent a rich source of age management triangulation in the high-end luxury industry. In short, based on these research procedures, we are confident that 36 proof citations included in our research are the most relevant to support our research question. Furthermore, collected data were triangulated and evaluated for possible biases before inclusion in the analysis, as suggested by Charmaz (2011). To increase the reliability and validity of our qualitative assessment we triangulated primary data by theoretical triangulation through rich data contexts for understanding and interpreting quotations on age management phenomena in the case of the fashion industry in Slovenia.

3.3 Content analysis

We structured our analysis on age management by employing the method of a case study (Yin, 2003). In order to build a case study of high quality, the case study protocol was employed (Yin, 2003). Case study protocol included analyzing (1) the context of the case study on age management perspective in the high-end fashion industry in Slovenia, (2) ageing and age management in processes of ageing of Europe in the studied case, (3) intrinsic motivation of an older employees in the studied case, and (4) moderating effects of an ageing of population in Slovenia from specific implications from fashion industry. To analyze the collected data, content analysis is performed. The findings are presented in the form of assigned quotations from secondary sources as well as from primary in-depth interviews with the owner of the fashion store with more than 50-years of work experience in the high-end luxury fashion industry, in order to present the content-rich context.

4 Results

4.1 The practice of Slovenian fashion industry designer

We described results following the sequence of our research question: "*What is/are the most important factor(s) of an older employee for the encouragement to remain in the labor market longer, after meeting the official retirement age?*" To answer our research question, we first identified 31 proof quotations (Table 1) reflecting Slovenian fashion industry designer attitudes toward work and productivity. Results, regarding citing proof quotations, show that intrinsic motivation of an older employee is the most important for the encouragement to remain in the labor market longer, after meeting the official retirement age. They also have to stay healthy to perform work tasks, be positive and open to adult, lifelong learning. Results show

that the future perspective of age management evaluation model, based on the practice of Slovenian fashion industry designer, should seek to empower employees' intrinsic motivation with the design and flexibility of adult learning programmers, as declared in recent OECD report on skills strategy implementation guidance for Slovenia of adult learning (OECD, 2018). Following the OECD (2018) diagnostic report the importance of improving adults' skills and effectively governing skills policy is of crucial importance for Slovenia to strengthen the overall conditions in adult learning and to address specific challenges in adult learning. Slovenia has developed an ambitious vision of learning for and throughout life. Lifelong learning is central to Slovenia's Development Strategy 2030 (OECD, 2018), where the strategy adopts a target of increasing participation in adult learning from 11,6% in 2016 to 19% by 2030. Motivating more adults to learn and employers to invest in training will be essential for achieving Slovenia's goal of raising participation in adult learning, as about half of Slovenia's adults (48%) do not participate and do not want to participate in education and training (OECD, 2018). Motivation to learn is lowest among low-skill adults in Slovenia, where 57% of low proficiency adults in numeracy of literacy not participate, and no not want to participate in education and training. The EU recognizes promotion and raising awareness of adult learning as a priority, and has developed associated guidance and tools.

4.2 The business case study on age management of Slovenian fashion industry designer[1]

"Ms. Marjeta Grošelj is a Slovenian designer of women's handbags. She celebrates her 50th anniversary of work in the fashion industry. Her handmade handbags […] can be distinguished by their originality, exclusivity, durability and aesthetic perfection because they are made from the finest materials" (2TM, 2016).

Ms. Marjeta Grošelj opened her store 53 years ago when she was 21. Since her youth, she was involved in fashion design, as her father and his brother owned Toko store, which produced leather goods (Pro Plus, 2016; Arsovski, 2016, Kontrec, n.d.), where she also collected her first working experiences during summer holidays (Delo, 2016; Arsovski, 2016, Kontrec, n.d.). Her parents were her role models, they were quite strict, however also very advanced (Pro Plus, 2016), and discipline, hard work without shortcuts and honesty were key values (Miše Miklavčič, 2018; Delo, 2016). The longitudinal visualization of business model development of Ms. Marjeta Grošelj, the Slovenian designer of high-end luxury women's handbags, is presented in Figure 4. All photos are received in second qualitative iteration with by Ms. Marjeta Grošelj, on October 19, 2019, where she, as the original owner of the photos, licensed the use of the images to the authors of this study for the purpose of scientific research and dissemination within this journal.

She studied at High school for design, where she also designed her first handbag (Arsovski, 2016, Pro Plus, 2016, Lovenjak, 2017). After high school, she participated in additional courses in London. When she started, it was difficult to get materials from abroad, but she managed to find creative solutions and her handbags stood out (Arsovski, 2016, Pro Plus, 2016, Kontrec, n.d.). She never takes orders for handbags, as she would lose her freedom and creativity to design it, and she does not reproduce her handbags, as each is unique (Pro Plus, 2016, Delo, 2016, Lovenjak, 2017, Grbin, n.d.). For her, it does not matter how much time a handbag production takes, what matters is whether she is satisfied with her final product. Her production is boutique, with emphasis on a personal touch and she wants to keep it that way.

Her handmade handbags can be distinguished by their originality, exclusivity, durability and aesthetic perfection because they are made from the finest materials. Marjeta Grošelj is rightly called an icon of fashion design in Slovenia (Education in Slovenia, 2016). She considers design as a true art. She does not only sell bags, rather, in her store, they have discussions about fashion (Lovenjak, 2017) and she also advises her customers, or as she calls them, her "guests" (Arsovski, 2016), and it might also happen that she discourages buying if she does not see perfect fit. It is more about the relationship, meeting people and artistic approach than classical sale (Pro Plus, 2016, Kontrec, n.d.). To the 50th anniversary of Marjeta Grošelj's career, the organizers of the Mercedes Benz Fashion Week have prepared an exhibition called "50 Years of Victories", where a selection of the best handbags by the world-famous Slovenian designer was presented (Education in Slovenia, 2016). During her professional career, Ms. Marjeta Grošelj received several awards, among others also a lifetime reward at autumn fashion week in 2013 (Pro Plus, 2016).

[1] Authors express gratitude to Ms. Marjeta Grošelj, for her valuable time and openness to science research.

1963 - 1980	*1980-2000*	*2000-2010*	*2010-2019*
 Brand logo, at the Tavčarjeva street in Ljubljana, Slovenia; the store is at the same location for more than 50 years  Ms. Grošelj in London, 1963, with her first brand designed bag  Ms. Grošelj in 1960s, at the opening of her brand store at Tavčarjeva street	Ms. Marjeta Grošelj with the high-end luxury leather bags  	  Ms. Marjeta Grošelj receiving Elle fashion award	Ms. Marjeta Grošelj receiving lifetime achievement award for her 50+ career in the luxury fashion industry at Mercedes--Benz fashion week in Slovenia 

Figure 4: Longitudinal visualization of the business model of Ms. Marjeta Grošelj, the Slovenian designer of high-end luxury women's handbags

Table 1: Analysis of proof quotations reflecting Slovenian fashion industry designer attitudes toward work

Number:	*Selected quotations*	*Assigned code/ category*
Quotation 1	*"How many bags she designed in all of these years, she does not know, nevertheless she remembers everyone. She does not have her favorite. They are all like her children. In every is a part of her."* (Pro Plus, 2016)	*Intrinsic motivation*
Quotation 2	*"She is constantly monitoring the fashion trends. From the very beginning, her handbags are made of the best possible material. From the worse she could not do it, therefore she has no low-priced lines. That's the way she is. When she gets inspiration for the handbag, she sketches it quickly and then develops it further. First, she focuses on design - which is the most important to her - then to practicality."* (Pro Plus, 2016)	*Intrinsic motivation*
Quotation 3	*"The appropriate material is the key to creating a handbag from the paper. She acquires material on fairs, where she also always explores what would be different, newer. She selects the material visually and by touching it. She must feel it."* (Pro Plus, 2016)	*Intrinsic motivation*
Quotation 4	*"Her handbags are fashionable, yet also durable. Like her store on Tavčarjeva Street 4, which has been in the same location for 50 years. She opened it when 21 years old. She also creates in the store. Everyday. This is her life. Even when she will not be working anymore, she says she will be there."* (Pro Plus, 2016)	*Intrinsic motivation*
Quotation 5	*"It is more about the relationship, socializing and an artistic approach than about the classical sales."* (Pro Plus, 2016)	*Intrinsic motivation*
Quotation 6	*"She begins her day with physical exercise, then she comes to her store. First, she goes to the studio, which is behind the shop where she sketches. It is also where she is when there is no customer. Between 12.30 and 15.30, she closes the store. When her three sons were smaller, she always came home at that time and cooked for them and when they were babies she breastfed them. Matej says that because they saw her three times a day - they did not even feel that she was not with them, even though she worked whole days. She returned to work six weeks after giving birth, while her mother, aunt, and other family members took care of the children at the time of her absence. From 15:30 to 19:00 she returns to the store and in the evening a gym or something else follows. Many times she also creates something in the evening. Matej says she can never be still. She admits she would feel terrible without work. Designing is not just her work. It's a lot more than just that. She enjoys in this business. She lives with it. It is also her hobby, her air. If she wouldn't have that, she might not existed anymore, says the designer."* (Pro Plus, 2016)	*Vitality* *Intrinsic motivation*
Quotation 7	*"She has no inheritor (yet). She does not even think about it, because she feels like she will be able to do it for another 50 years."* (Pro Plus, 2016)	*Intrinsic motivation*
Quotation 8	*"Also this year, the designer will spend her vacation at the same place she is going for years. But also there she is not resting. She cooks and makes plans for new handbags. And the latter is all that she wants to do."* (Pro Plus, 2016)	*Intrinsic motivation*

Table 1: Analysis of proof quotations reflecting Slovenian fashion industry designer attitudes toward work (continued)

Quotation 9	*"Marjeta Grošelj is regarded as an icon of Slovenian fashion design, and during her long career, she received several international awards for her work. Nowadays, Marjeta Grošelj handbags are a well-established brand, a synonym for quality and creativity, which in many of the outstanding works is already perceived as the artistic creation."* (Miše Miklavčič, 2018)	*Intrinsic motivation*
Quotation 10	*"Creating something new made me happy, if I did not start with handbags, I would find something else creative. But when I started, it became the style of my life which I live also today. Although I must admit, as a child, even more than a love to design, I remembered the values of the parents who believed and taught that only honesty and hard work without shortcuts bring results"* (Miše Miklavčič, 2018)	*Intrinsic motivation*
Quotation 11	*"*» This is my second home. At this address, my roots are firmly rooted. Apart from the family, this is a space that means a lot to me. It›s my second world where I still spend a lot of time. There were always ideas born here. This is a space of positive energy and a space in which I met many people,« says the host. »If you believe it or not, after fifty years, I›m still happy to come back every day. I *am pleased that I can still do this, in which I sincerely enjoy.«"* (Delo, 2016)	*Intrinsic motivation*
Quotation 12	*"As children, we helped during every vacation. I gained a lot of knowledge there and became a master in different fields. Although I was thinking differently as a 15-year-old girl working in a factory, out of love for fashion and design, a great love for handbags was born. And this love still works today"* (Delo, 2016)	*Intrinsic motivation*
Quotation 13	*"As I do not want to go to mass production, and my production is boutique, I never really wanted to export to a foreign market. All these unique pieces would lose their distinctive value"* (Delo, 2016)	*Intrinsic motivation*
Quotation 14	*"... I actually live day and night with handbags, and in the workshop, I am also present when the product is made"* (Delo, 2016)	*Intrinsic motivation*
Quotation 15	*"You can never think what is hard and what isn't. Simply, you have to do all that is in your power."* (Arsovski, 2016)	*Intrinsic motivation*
Quotation 16	*"*»Designing and making handbags is my life«, says proudly the designer who bets on carefully selected materials and precision in fabrication*"* (Arsovski, 2016)	*Intrinsic motivation*
Quotation 17	*"For over 50 years, Marjeta Grošelj has been transforming the Slovenian fashion industry with her exceptional vision of the design"* (Arsovski, 2016)	*Intrinsic motivation*
Quotation 18	*"The times may change, but the work in the Marjeta Grošelj showroom is as it was five decades ago. A warm smile awaits you at the sales desk, and the designer will take the time for each customer and take her through the world of handbags with a unique approach."* (Arsovski, 2016)	*Intrinsic motivation*
Quotation 19	*"I believe that things do not happen on their own and that your work should be devised in the direction of what makes you happy and fulfilled."* (Grošelj, in Lovenjak, 2017)	*Intrinsic motivation*
Quotation 20	*"I have never thought much about business success, but primarily that I can create and do something that pleases me and, on the other hand, that people like."* (Grošelj, in Lovenjak, 2017)	*Intrinsic motivation*

Table 1: Analysis of proof quotations reflecting Slovenian fashion industry designer attitudes toward work (continued)

Quotation 21	*"On my question of whether she had ever thought about retirement, she is quiet for a while, and then sovereign says, »Ask me when I will not be able to move.«"* (Lovenjak, 2017)	*Intrinsic motivation*
Quotation 22	*"In the conversation, I find out that she regularly goes to yoga and aerobics, and occasionally to the fitness. »You know, vitality is important at a later age. By doing so, you can greatly contribute to your health, which is invaluable. Elegance is not only about clothing, it is also about the behavior, about walking, movement. If you are all stiff, it doesn't matter how you dress, but you probably will not feel your best.« "* (Lovenjak, 2017)	*Vitality*
Quotation 23	*"When I ask her about her age, she says without reservation that she has 72 years. »You know, I do not feel that old at all. Years do not mean anything to me. Someone can be old at forty if he feels so. My advice is movement. Of course, if you're healthy. You need to take care of your body. This is also a very good antidepressant.« She adds: »Internal balance, a lot of positive energy and a little of the stress.« And a lot of laughing? »Of course.« In conclusions: »Laugh has healing effects and above all, it costs nothing.«"* (Lovenjak, 2017)	*Vitality* *Positive emotions*
Quotation 24	*"She opened her store on Tavčarjeva street in the center of Ljubljana at the age of only 21, and although in September, she celebrated 45 years of operation, she doesn't want even to hear about the retirement. On the contrary, she says she will work as long as she will be able to."* (Kontrec, n.d.)	*Intrinsic motivation*
Quotation 25	*"She says she sees the key to her success in living for her work."* (Kontrec, n.d.)	*Intrinsic motivation*
Quotation 26	*"If we had stores all over the world, this would not have been possible. I do almost everything in the store - I am a designer, a consultant, I create, I clean so that I never get bored when I'm there all day."* (Kontrec, n.d.)	*Intrinsic motivation*
Quotation 27	*"Nevertheless, she never gets tired of her work, which is precisely why she doesn't want to even hear a word retirement."* (Kontrec, n.d.)	*Intrinsic motivation*
Quotation 28	*"Then what would I do with all the ideas I have in my head? (laughter) I will work until I can physically manage it, but even then I can work from home. I could say that my work is a kind of addiction, without which I cannot imagine my everyday life, I simply enjoy it."* (Kontrec, n.d.)	*Intrinsic motivation*
Quotation 29	*"We always like to remember a nice era and beautiful things, for which I am grateful. This is my breathing, it's my life. If you do something you do not enjoy, it is difficult to achieve fifty years of career. I live with this and enjoy it."* (Grošelj, in Grbin, n.d.)	*Intrinsic motivation*
Quotation 30	*"Once you accept that life is continuous learning, you are able to deal with all situations and you look at all challenges as an opportunity for growth. In short, no (laughter). It's my life, I did not think about quitting."* (Grošelj, in Grbin, n.d.)	*Lifelong learning* *Intrinsic motivation*
Quotation 31	*"Marjeta Grošelj is not going to retire. She says that she will continue designing handbags for as long as her health permits because she has more than enough ideas. »The ingenuity knows no end. The work becomes easier with years, because the more you know, the more you trust yourself.«"* (2TM, 2016)	*Vitality* *Intrinsic motivation*

Table 2: Analysis of an in-depth interview with Ms. Marjeta Grošelj on age-management

Number	*Primary data*	*Assigned code/ category*
Question 1: Your unique bags have an enviable, over 50-years tradition. What is making you stay in your business, designing unique bags, although you have already met the retirement conditions?	*"Surely vitality! Of course, passion and love of design are defining my lifestyle, but creating without vitality would not be possible - let alone fun. In some respects, I feel significantly better today than 15 years ago. When, for example, I get up in the morning, backbone does not hurt me anymore, for which I can thank regular yoga and aerobics classes. It is important that vitality also becomes a lifestyle - that it becomes a habit, a routine, something without which it is difficult to live for us. As long as we are alive, we have a duty and an opportunity, as much it is, of course, in our power, to care for our own quality - that's why old ages are more pleasant. Let me add that regarding vitality, I am not thinking only of the physical condition, but also of the vitality of the mind. With the accessibility and progress of technology, the world is changing rapidly, and if you do not follow the trends, you are out quickly. That is why I like to follow and listen to the younger generations, who have been born with new technology and have a fresh, unburdened view of the world - they know their world and have the energy that is not yet limited by seriousness and social expectations that can hinder their passion and creativity."* (Grošelj, 2019)	*Vitality*
Question 2: Designing handbags is what motivates and impresses you all the way from your childhood, from a family tradition. Europe is on the era of extending working lives. What do you consider important to motivate older employees to stay in the labor market for a longer period of time? What is it that gives you such a momentum for creation?	*If you do not want your work to be a burden, you have to find out what you are doing with passion, with all your heart, and what in fact represents your hobby, which makes you learn and stay up--to-date. Then, too, stress is more positive, and this kind of work can certainly be done for a longer time period. Again, we must not forget the vitality - if we are burned, if we are afraid we will lose our job, if we insist working, because we may be afraid of low pension income, or if a cooperation with the younger is stressful, then we certainly are not happy in the workplace and we do not create enough added value in the environment in which we operate. We, the elderly need to acknowledge, understand and admit that the world is moving forward, and that despite our knowledge and experiences, we must be prepared to gain new knowledge and listen to younger, if we want to keep up with our pace. We have to be prepared to think "naughty", without prejudice, and not relying solely on our past experiences. We need to find an intrinsic motivation for this. I personally do not feel old, and I'm working on it to feel that way as long as possible. I believe that if we do not know how to motivate ourselves intrinsically, also external motivation in the form of various incentives, whether in the form of targeted education, financial allowances, etc., does not help much. By extending the working life, vitality is even more important than before.*	*Intrinsic motivation* *Positive emotions* *Vitality* *Lifelong learning*

Table 2: Analysis of an in-depth interview with Ms. Marjeta Grošelj on age-management (continued)

Question 3: How you feel the development of technologies, e.g. the way of designing bags or your work, in your business in the luxury leather goods/bags industry? How did you adjust to it?	*My best technology has been and still are people. My employees are the masters of their craft - every stitch, every hammer blow, and every bending of leather reflects the knowledge and uniqueness of each one. I am proud that after the rapid introduction of massiveness, the market is returning to its basics, and also appreciates artistic creation - the uniqueness with the soul, where there is not focus on quantities, but the quality and longevity, behind which stands a human of many talents and experiences. Although the crafts work in many areas is going to extinct, in the future, those who will be successfully preserved, or the ones who will preserve the tradition, knowledge of previous generations and add their own touch, will be extremely sought after and revered due to rarity.* *I am adapting to changing circumstances through the way I work, by staying faithful to myself. I do not deviate from some of the principles: the quality of the work done, the fair attitude towards the employees and the payment of their work, the cultivation of long-term relationships and the building of entrepreneurship through creativity, and not the other way around.*	*Intrinsic motivation*
Question 4: In your opinion, how has the labor market changed, in respect of your experiences in the high–end fashion industry for more than 50 years of work experience (duration of employment, availability of jobs, ...)?	*There are plenty of changes, but if we are honest, it's natural - ask for example people with a long enough "beard", about the selection of products in stores 50 years ago, about the TVs, how many programs were broadcasted, what it meant to go abroad and how many and what types of cars were driven on the roads at the time. In the past, people have been able to spend their whole working period in the same job, but today the probability of doing so is much smaller - I'm trying that my employees would want to achieve their full retirement age with me and I'm happy that in over 50 years the vast majority of my employees really stayed up to "pension". Otherwise - regardless of age, we have to adapt to trends, as it is not working in the opposite direction. We are again talking about the flexibility and willingness to learn and change the deep-rooted mental maps. Regarding the availability of employment, it is always so that you are employable if the market needs your knowledge and experiences and if you are able to demonstrate it at the right time and in the right way.*	*Adapting, lifelong learning*

Table 2: Analysis of an in-depth interview with Ms. Marjeta Grošelj on age-management (continued)

Question 5: The design of your bags is not just your work, but the way you live, as you say, this is the air that you breathe. Where do you see the benefits of older employees for the company, business? How can those be better used by the companies?	*The elderly usually have a lot of knowledge and even more experiences. In the appropriate way, they can be excellent mentors to young people - not so much (of course also) at the business, as at the life, experience level. They can do a lot with mentoring, they can also accelerate progress, as the younger ones with proper work with a mentor do not repeat the same mistakes, and consequently, they learn more quickly and have a better basis for discovering new skills. Such intergenerational solidarity, if I can name it like this, is undoubtedly beneficial to society and businesses. In addition, the elderly may also be appreciated experts themselves, and it would be at least unfair to forget to note the added value of the elderly in the work process. Only, they should not lose their vital energy. Although it is good to be aware that in time, roles are changing - it is advisable for older experts to focus more on the role of counselors for young people, and those, who still have a lot of energy and fewer scars, should create, on the wings of experiences and "shortcuts", for future generations. In companies, this could be formalized, in order to raise the awareness of the importance of mentoring and, at the same time, the value of the elderly. Considering the fact that, on average, we live longer and the share of the elderly in society is increasing, which poses more burden on national finances, it would be reasonable to consider the national program, the package of systemic measures by decision-makers, to take care of active ageing at the various levels, the one that contributes and is not primarily a "burden" (e.g. health prevention, encouraging entrepreneurial thinking, educational programs/ qualifications of the elderly with respect to the profession by involving younger "working" mentors, the possibility of working after the retirement, etc.).*	*Lifelong learning, knowledge transfer* *Vitality*

5 Findings and conclusion

5.1 Case study conceptual model development – best practice case of Ms. Marjeta Grošelj, high-end fashion designer on age management

Our findings section is organized to correspond to Table 1 and Table 2, which depict the content analysis model that emerged from collected secondary data and an in-depth interview with Ms. Marjeta Grošelj on age-management practice and experience. Based on the content analysis of data collected on the high-end fashion designer, Ms. Marjeta Grošelj, we develop the conceptual model (as presented in Figure 5) that describes her business model. The conceptual model provides insights from single case analysis and cannot be generalized to the population. The conceptual model shows key facets, as assigned overarching categories, namely-vitality, intrinsic motivation, adapting, lifelong learning, and positive emotions, of how Ms. Marjeta Grošelj, a business owner in high-end fashion industry intertwines her success and therefore a contribution to an age management phenomena. Specifically, our case study outlines, that Mr. Marjeta Grošelj expressed positive discrete emotions and organizational behavior facets, such as positive emotion, vitality, intrinsic motivation, and lifelong learning, as factors that helped her to be engaged in her job as well as willing to remain in the labor market longer, also after meeting the official retirement age. We also see the overlaps of the presented phenomena illustrating the interplay and/or simultaneity of lifelong experiences of the family owner, Ms. Grošelj that contributed to her age management paradigm. Findings of our case study are in line with recommendations posited by Shu (2015) that intrinsic motivation fosters the positive relationship between leadership and work engagement and consequently to age management.

Based on collected and analyzed data, we developed the conceptual model of her lifelong approach and her experiences on age management phenomena by isolating overarching facets for managing the complexity of longer living in everyday life. With our case, we contributed to the age management concept by presenting the in-depth qualitative case study with Ms. Marjeta Grošelj. Our findings are in line with recommendation cited by Businesseurocape report (2012) that states that among the most effective ways of enabling the extension of working lives and supporting internal and external flexibility for workers is through policies which maintain employability and adaptability, outlining three key facets: (1) Maintaining high levels of intrinsic motivation; (2) Safeguarding health and safety at the workplace, and (3) ensuring productivity and adaptability by updating skills throughout an individual's working career. Intrinsic motivation takes a hedonic perspective by emphasizing pleasure and enjoyment as drivers of effort, whereas prosocial motivation takes a eudaimonic perspective by emphasizing meaning and purpose as drivers of effort (Kahn, 1990). For intrinsically motivated individuals, the effort is based on interest and enjoyment; for prosocially motivated individuals, effort is based on a desire to benefit others (Grant, 2008). When intrinsic motivation is high, prosocial motivation is characterized by identified regulation: employees feel that completing their tasks is beneficial to their own self-selected goals, as they enjoy the process of working and value the outcome of helping others. In the absence of intrinsic motivation, however, prosocial motivation may not be sufficient to enhance persistence, performance, and productivity (Grant, 2008).

5.2 Theoretical contributions

We believe that our steps, presented in the single case study, towards active aging and empowered lifelong learning will be followed by further theoretical and empirical work. The theoretical contributions of the present study are multidimensional. First, our findings show important theoretical implications for researchers, studying age management phenomena in the age of aging of the European population, based on our inductive business case study of Slovenian luxury fashion designer, Ms. Grošelj.

Second, the key theoretical contributions are to be found in the conducted unique business interview itself, which adds to the literature of the age management best practices. Our study contributes to the theory of age management by narrowing our focus on the best practice from selected fashion industry designer in Slovenia.

The third theoretical contribution is to be found in the connection of the age management and the employee's perspective as our case is singe case unit and cannot be generalized, but we the presented employee perspective, analyzed at individual level, contributed to theory presenting individual level cases on human resource policies in the contemporary aging society. The presented business case from the high-end fashion industry overcomes the perceptions and limitations of the existing age management practices of older workers by expanding its scope from the luxury and high-end industry. We, therefore, contribute to the emerging debate on aging in Europe, by showing the single best practice example from luxury high-end industry in Slovenia. Our case presented contributes to the age management approaches, presenting a positive life story that can contribute to further cases and empirical investigations, as employees stay longer in their jobs and therefore become self-convinced, transfer knowledge and skills for their own benefit, organization, and society.

Public agencies and providers could engage end-users

more systematically in the design of adult learning services to ensure they better meet users' needs and help improve participation in adult learning in the age of aging of Europe. With our good practice on age management in the Slovenian fashion industry, we have examined the critical issue of adult learning and motivation of older employees after meeting the retirement age. Hence, this case mirrors what organizations face in the age of aging of the population in Europe due to the demographic trends as they grapple with the age/employment paradox. Our good practice business case study shows deeper insight into age management paradox in Slovenia, based on the presented single life story of successful Slovenian luxury designer. Our study contributes by demonstrating how age management at the business/organizational level is managed by Ms. Marjeta Grošelj, outlining positive emotions, intrinsic motivation, lifelong learning, and vitality as overarching facets.

5.3 Practical implications

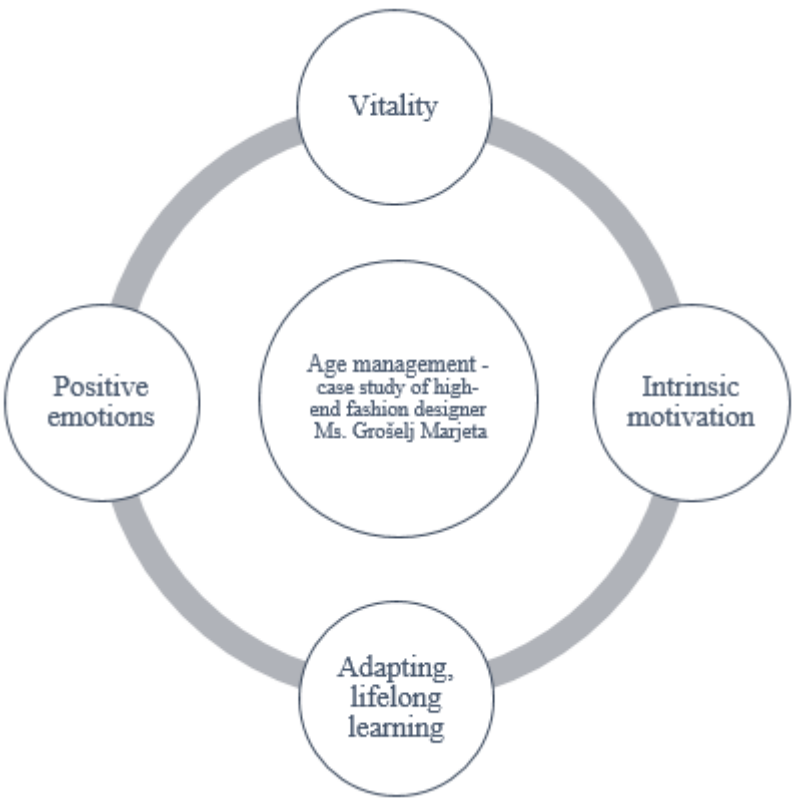

Figure 5: Conceptual model of age management in the high-end fashion industry from best practice case of Ms. Marjeta Grošelj, fashion designer

What can we learn from high-end luxury fashion designer with more than 50 years of working experience? As presented case study cannot be generalized, we hope that a lifelong approach of presented case would contribute and empower people to rethink and continue to stay active after meeting the retirement age, as well as show managers what facets to consider when dealing with age management issues. Interestingly, we noted a similarity in our case study research to the implications articulated in the practical guidance in employers' age management strategies of European Centre for the Development of Vocational Training (2015), regarding the lifelong approach that needs to be promoted, aiming at preventive age management for workers of all age groups and guidance embedded in organization work processes. As people get older and more experienced, acquiring knowledge and skills, they increase their potential: as active contributors to the development of organizations, to the knowledge exchange between generations of workers, as mediators in innovation processes, and as participants in leadership processes. We see this as

a major challenge for practice, to accumulate this potential of an older population, the experience of people needs to be visible and interpreted into a language which communicates to the skills needs of organizations and the qualification systems of society.

5.4 Limitations and avenues for further research

While we believe the presented case study has an important contribution in exploring the phenomena of age management factors in an aging society, it has two important limitations. First, our case study utilizes a single industry context from the Slovene high-end fashion industry and therefore cannot be generalized. We, therefore, encourage future researches to assess the validity and reliability of our findings in other industries and countries. Second, there is the chance that the findings of our case from Slovene high-end fashion industry are influenced by industry-specific factors. Within this study, we do not and indeed we cannot present the complete business history of Ms. Marjeta Grošelj success and her contribution to the high-end fashion industry, however, presented the story on age management raise recommendations, new ideas, as well as encourages others to learn from successful life-story of Ms. Marjeta Grošelj.

While we believe our study has important contributions, it has some limitations. It is an inductive qualitative study, analyzed by primary and secondary qualitative data of Slovenian designer of women's handbags, therefore the results cannot be generalized to the whole population, despite offering the venue for further research at organizational, inter-organizational and wider EU level. Future work will need to address above mentioned multi-level implications - individual, organizational and society level - as the European active population is aging, and we are of opinion that our findings can provide a useful groundwork. As Slovenia lacks a systematic approach for government, employers and individuals to appropriately share the cost of skills development of adult learning in addressing age-related issues in lifelong career development (OECD, 2018), we, therefore, urge future research to carefully consider sustainable financing mix for adult learning, with more targeted support for those adults, and enterprises, which stand to benefit the most from training but lack capacity to pay, should be a priority for Slovenia. Another limitation of our study is that our study presents motivation and aspiration of a self-employed business owner and age management concept as an element of human resource management, we were only able to present the perspective of a self-employed business owner. Therefore, future research should also examine older employees who work for others in the context of the age management paradigm.

Additionally, further integration of these perspectives should help researchers to develop better models that can help these people in the era of aging of population and researchers to jumpstart many other avenues for theoretical and empirical inquiry. To conclude: Ms. Marjeta Grošelj, the Slovenian luxury designer with 50 years in the world of high-end fashion, is not going to retire. She says that she will continue designing handbags for as long as her health permits because she has more than enough ideas. "*The ingenuity knows no end. The work becomes easier with years, because the more you know, the more you trust yourself,* " said Ms. Marjeta Grošelj (Education in Slovenia, 2016).

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Management starejših: Kaj se lahko naučimo od modne oblikovalke v panogi prestižnih luksuznih usnjenih torb z več kot 50-letnimi delovnimi izkušnjami?

Ozadje in namen: Medtem, ko se svetovna populacija stara, je cilj te študije vključiti nova znanja na področju managementa starejših, na način da se preučijo najpomembnejši dejavniki, ki starejše zaposlene spodbujajo, da ostanejo dlje na trgu dela, tudi po izpolnitvi uradne upokojitvene starosti. Raziskava temelji na poglobljeni kvalitativni študiji primera z modno oblikovalko prestižnih usnjenih torb z več kot 50-letnimi delovnimi izkušnjami v panogi luksuznih izdelkov.
Zasnova / metodologija / pristop: Izvedli smo induktivno študijo primera v modni industriji luksuznega oblikovana. Naša študija primera temelji na vsebinski analizi sekundarnih podatkov in na poglobljenem intervjuju z direktorico podjetja iz panoge luksuzne modne industrije v Sloveniji.
Rezultati: Predlagani konceptualni model prikazuje ključne vidike kot prevladujoče koncepte, in sicer vitalnost, intrinzično motivacijo, prilagodljivo, vseživljenjsko učenje in pozitivna čustva, ki pomembno prispevajo k managementu starosti na primer preučevane študije primera. V predstavljeni študiji primera smo ugotovili, da so izbrani vidiki najpomembnejši dejavniki za spodbudo za ohranitev na trgu dela in za zagotovitev prožnih upokojitvenih procesov pri soočanju z izzivi staranja prebivalstva in delovne sile.
Zaključki: Naša študija prispeva tako k teoriji in praksi managementa starejših, saj zoži pozornost na najboljše prakse izbrane vrhunske modne oblikovalke iz Slovenije na primeru panoge prestižnih usnjenih torb. Kaj se lahko naučimo od modne oblikovalke v panogi prestižnih luksuznih usnjenih torb z več kot 50-letnimi delovnimi izkušnjami? Ker predstavljene študije primera ni mogoče posplošiti na populacijo, predstavljeni primer prispeva k področju managementa starosti in prebivalstvo opolnomoči, da v luči demografskega staranja Evrope razmislijo in ostanejo delovno aktivni tudi po izpolnitvi uradne upokojitvene starost.

Ključne besede: učenje odraslih; starejši delavci; upokojitev, management starosti, modna industrija, intrinzična motivacija; vitalnost; Slovenija.

AUTHOR GUIDELINES / NAVODILA AVTORJEM

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CONTENTS - 4/2019

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