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Original scientific paper

<https://doi.org/10.31784/zvr.11.1.4>

Received: 15. 12. 2022.

Accepted: 14. 3. 2023.

IMPACT OF THE MAIN WORKPLACE COMPONENTS ON EMPLOYEE SATISFACTION AND PERFORMANCE IN THE CONTEXT OF DIGITALIZATION

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ABSTRACT

In the time of digitalization within the framework of the fourth technological revolution, it is necessary to return the human being to the first place in the science of management. Men and women as the performers of activities should be on the pedestal of all modern processes that take place in society and business, to avoid the problem in which the society was "trapped", during the previous industrial revolutions. The application of information technology in general and artificial intelligence in particular affects the design and content of the main components of job design, which inevitably leads to a reflection on the satisfaction and performance of employees at the workplace. The paper aims to explore the impact of specific workplace components on employee satisfaction and performance, further recognizing which components contribute the most in the context of digitalization and 4IR. From Hackman and Oldham's job design theory and Mintzberg's organizational structure framework, we propose and test a research framework that investigated the impact of technical system, work assignment and worker features on employee satisfaction and performance in a contemporary context. The research was conducted in Bosnia and Herzegovina on a random sample of 125 respondents from public and private sector organizations, different industries and companies' sizes. The analysis was realized through hierarchical multiple linear regression model and the key findings revealed that the task and knowledge characteristics of artificial intelligence-enabled jobs are vitally important for inducing innovative work behaviour among employees.

Key words: Digitalization, Technical System, Work Assignment, Worker Features, Satisfaction and Performance

1. INTRODUCTION

Within contemporary contours of post-industrial society, it is important to understand and establish specific cause-effect relationships between different organisational components in order to upgrade overall organisational effectiveness and efficiency. Through scientific and practical observation those components are considered as latent variables with the aim of simpler modelling and establishing relationships between them and making business decisions of an anticipatory nature. Establishing these systems and models is exert using deliberating of different interconnection between components and perspectives of modern management and structuring concepts. This process inevitably consider human resource management elements, that mandatory include quality of working life and workplaces shaping issues. Now days in reflection of different organizational issues that include learning and growth perspective, internal processes perspective and their relations with clients perspective and finance perspective in line with strategy implementation, organisations take in consideration sustainable development perspective in companies. These segments mould the causal leadership chain, which refers to the managerial capacity that generates organizational knowledge, through which the business model will induce a high level of satisfaction for clients and other stakeholders. Thus, leadership style and organizational policy are important factors that can influence the employee work satisfaction (Saleem, 2015). It is clear that modern leaders, for the above reasons, should know how to frame the workplace through this process, and they apply their leadership style and ensure a higher level of employee satisfaction and performance, and consequently better results for the entire organization. There are features that have been extensively studied from a contingency theoretical point of view (Whittington et al., 2017) directing this research that considers the change of the main element of the organizational structure in the context of digitalization and 4IR. Through an empirical study that was conducted, we have intention to clear the doubts how to understand and use in practice the models and contents of theoretical frameworks related to the recognition of the key components of job design, and their impact on the satisfaction and performance of employees within contemporary context.

As the nomenclature of job content has never been completed, within management and organization theory and practice are recognized several dozens of particles that describe the job or workplace main components. This area is taking into account the description of the workplace tasks, the description of the technology used, the description of the key goals and results, the description of the physical and social environment at work and features of employees. All these particles should be considered in the job analysis process. That process should result in a clear job description document, which can be task-oriented, performer-oriented, and oriented toward job goals, as well as job specialization and job standardization dimensionality. Such findings are understandable as higher specialization often leads to more formal work practices and a stronger focus on inter-unit collaboration increases overall process time efficiency (Hernaus et al., 2013). This process is very dynamic because the intensity of various changes that affect the content and design of each workplace in organizations (both private and state owned) is inevitable.

Various changes that continuously occur in the environment are an important reason for redefining professional jobs, as well as the jobs of all other organizational parts and levels within

all types of organisations. It can be said that 4IR not only changes the content of every job in all types of organizations, from the aspect of the technical system, the layout of the workplace, the required characteristics of the executor, but yet design the parameters related to specialization, standardization and training, and indoctrination certainly. Another possible explanation is based on the assumption that companies that have adopted big data analytics may prefer to hire data scientists for data analysis tasks instead of training company controllers to take on new tasks (Oesterreich et al., 2019). Moreover, if exposure to this transformation is not the same depending on the nature of jobs or skill levels, even skilled jobs could experience profound changes in the years to come (Marmier et al., 2021). Aforementioned indicate the practical significance of theoretical frameworks to ensure a harmony between the key components of the organization in order to achieve its key strategic goals and thereby gains strategic importance for those issues. Through introduction of the key components of workplace design according to Mintzberg's theoretical framework into the general job design framework of Hackman and Oldham, three components are clearly recognized: the technical system, the workplace assignment and the work executor features and should be viewed as special constructs in relation and influence on employee satisfaction and performance. This paper aims to explore the influence of workplace components to employee satisfaction and working performances distinguishing contribution of all components within digitalization and 4IR context. Based on Hackman and Oldham's job design theory and Mintzberg's organisational structure framework we propose and test the research framework that investigates the influence of technical system, work assignments and employee features on employee satisfaction and working performances within contemporary digitalization and 4IR context.

This article, at the first segment, form theoretical platform based on an integral research model through a clear review of literature in the field of shaping the key components of work through the prism of the influence of contemporary 4IR range, therefore digitization and application of information technologies at work. The introductory part is clearly given contours to recognize key components for the design of individual workplace, with the clear recognition of the need to measure the effectiveness of employees in the contemporary context of business, considering both performance and behaviour of employees in the integral context. Within the next part, the paper shows the methodological frame based on earlier theoretical observations with the focus on designing a specific model and hypotheses for empirical research. The key constructs of the model are recognized are three components of the workplace as an independent variables, while the fourth component is recognized as a dependent variable of the model. Employee attitudes to technical system of the workplace, employee attitudes to work assignment and worker's (executor's) features have been recognized as the first-order construct, therefore variables and they represent the independent variables in the hierarchy regression model. Further, employee satisfaction and working performances as second-order construct is a dependent variable in the model. Next segment of the paper is focused in a brief overview of the research sample characteristics with key indications related to the research sample description and the main characteristics of the model variables with indications related to reliability of measurement tool. The following segment is oriented to the presentation and interpretation of the obtained results through testing the defined research hypotheses with the interpretation of the relationship between individual variables. At

the end of the paper, the main conclusions are presented, with recognizing the basic limitations of the research and a brief overview of open questions that may be the subject of further research in this field.

2. LITERATURE REVIEW

Human being, as a key component of every workplace, in symbiosis with technical workplace components, realizes the work assignment and thus remains in the focus of social science research especially in organisation and management. Therefore, decision makers need to search for the fine-grained dynamics among the changing nature of work, versatile organizational requirements, specific personal traits as well as inherent generational patterns of work and behaviour (Hernaus and Pološki Vokić, 2014). In this regard, it is necessary to take into account that the characteristics of the work and the content of the work, under the influence of 4IR and intensive digitalization are continuously and agilely changing and we need to update our knowledge related to the phenomenology in accordance with these influences and understanding how job characteristics framework could be adjusted within the 4IR and digitalization of all organizations, and how the updated elements affect employee satisfaction and performances. Creation of updated conceptual framework starts with upgrading the Hackman and Oldham standard model of job characteristics and satisfaction of workers in a broader context and take into account autonomy, diversity of skills, task importance, task identity and feedback as starting components (Ali et al., 2014). In contemporary digitalization context, this concept needs significant upgrading through creation of certain contemporary constructs that are much more complex and adjusted with considering combination with Henry Mintzberg's framework of organisational structure and workplaces. It is possible to test and establish different relationships between variables in the model by detecting their positions within it. In addition, it is necessary to consider and combine key elements and parameters of workplace design considering the workplace task, technical system and features of work executor including descriptive design parameters such as specialization, standardization and training and indoctrination in order to obtain an overall picture of advanced research model and its constructs.

Regardless of the choice of model or the fact that it is used individually or in combination, the importance of the characteristics of the executor should be considered, as to the general logic of organizational research, the organization in the macro context and the characteristics of the executor in the micro context, represents a medium through which business goals should be achieved. This "delivers" an important platform for research, but with limitations in terms of the complexity of human nature. Considering the previous limitations, we focus on the importance of (1) elucidating the mechanism underlying the relationship between job characteristics and job performance, as well as (2) expanding the number of studied job characteristics and the role of worker's dispositional variables such as values and interests (Peiró et al., 2020). The effect of the personal fit to organisation could also be in prospect with the assumption that organizations are more decisive in spending their valuable resources, in terms of investing in the training and development of its members who represent values that are in line with the values and culture of the organization (Kaur and Kang, 2021). Job characteristics and employee characteristics should be

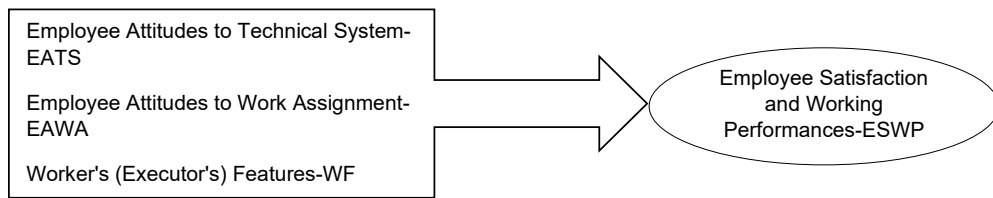
complementary but employee behaviour should fit into the overall organizational culture which again cannot be achieved without considering key elements and parameters of workplace design and examining the relationship between them.

Consequently, senior managers and human resources managers should procedurally standardize clear steps of mentoring and coaching of new incomers to obtain a faster process of orientation and socialization at work so that their assumed digital competences could be more efficiently transformed into useful activities and innovations at the workplace (Rahimić et al., 2022). The results generally support the Job Characteristics Model's predictions that task variety and worker autonomy are positively associated with labour productivity and product quality, and that autonomy is positively associated with worker satisfaction. In contrast to previous studies, it was found that results for task variety are stronger connected to the performance-related outcomes than for worker satisfaction (DeVaro et al., 2007). The essence of the relationship between job satisfaction and performance at work should have a certain sequence, which according to logic itself says that with the growth of satisfaction, the performance of employees at work should increase causally and jointly. Still, there are some controversially organisational issues, it was not confirmed that performance grows based on changes in technical system and job characteristics and that there are no positive changes in terms of job satisfaction. The organizational context could contribute to the reduction of employee new technology acceptance aversion, which is reflected in the wrong perceived substitution effect instead accepting complementary effect assumption, which negatively affects the willingness of employees to adopt new technologies. New practices, instead, could contribute to the improvement of employees work effectiveness through their understanding the contribution of technology as a complementary extension that raises their performance and not as a substitute that could cause them to lose their jobs (Rahimić et al., 2022).

3. METHODOLOGICAL FRAMEWORK

According to the problem framework postulated above, the most important aim of this research is to test and explain relations between main workplace components within hyper changeable organisational context. The satisfaction of management and employees is the main prerequisite for better task and operation performing, and strategy implementation of any organisation. Adapted and redefined integral conceptual framework that simultaneously take in consideration Oldham and Hackman theory and Mintzberg's concept of organisational structures shape, in combination is applied. The adapted and simplified general ICT Model Based on the Transactional Model of Stress and the Job Demands–Resources, which observes all positive and negative aspects of the use of ICT tools indirectly through organizational and individual characteristics, can be taken as the wider theoretical framework of the conducted research (Day et al., 2010). The main latent variables, as first order constructs, or predictors in this model, are three main components of any workplace such as technical system for task execution, structure of work assignment and employee features within digitalization context in Bosnia and Herzegovina.

Figure 1. Conceptual framework of the research



Source: Authors

Figure 1. represents basic research conceptual framework which is assuming and graphically sketching relations and positions of three earlier explained independent variables aiming to determine their influence on satisfaction and performances of managers and employees as a fourth dependent variable.

According to the conceptual research framework, the research hypothetical outlines are following:

H1. There is a significant influence of technical system, work assignment and worker features on employee satisfaction and working performances.

H2. The additional influence intensity of technical system, work assignment and worker features on employee satisfaction and working performances differ significantly.

All segments of the questionnaire were developed and adjusted by using valid scales for any construct measurement. The variables in the survey questionnaire were measured using seven-point Likert type scale format where 7 = strongly agree, 1 = strongly disagree, unless otherwise signified (Singh et al., 2021). Performing the pioneering research within this area, tools, therefore measurement scales, are developed for measurement of the perceived impact of information technology on work according to the employees' attitudes and perception to different aspects of the job. The segments of the composition have been considered four components that include task productivity, task innovation, customer satisfaction and management control and each of them are first order constructs based on three manifest variables (Torkzadeh and Doll, 1999). All later developed and used scales in this area contain as minimum some of the items that are pioneering to measure these components, but through recent research, the same scales are extended, adopted and refined for better fitting to contemporary social and business context and fulfilling new practical research requirements.

The construct related to the issues of the technical system refers to the influence of using the business and technological innovations within digitalization context as an ever-growing application toolkit for the workplace activities better execution. This construct focuses on the inclusion of human-machine interaction at work, user-friendly option and speed of acceptance for new technology, flexible tools available to employees' performance and other high important additional questions in this area. Contemporary authors observe these issues, which take into account the organization's capacity for the transfer and application of new technologies into the operational business system. The competences of employees are aimed to use innovative technological solutions, issues of possible automation of certain work segments, and issues of using

collaborative robots at the workplaces and many additional contemporary issues related for the complementarity of human resources and technology based on 4IR achievements (Fletcher et al., 2020). Since it is a complex construct, through its reflective context, an adapted scale was used for measuring the usefulness of a technical system at work - the System Usability Scale-SUS - originally developed by John Brooke (Sheu et al., 2017). In the time of trends that promote the internet of things, the internet of body and finally the internet of everything. It is very important to see the technological system as a component of the workplace and to see it as an extension related to the total potential and capacity of the work executor and take in consideration issues connected with a definite tasks automation.

Construct related to the work assignments and activities at the workplace implies usage of survey that includes the issues of the job complexity and task execution difficulties, experiences and practical training required to perform the job, the self-assessment of job performance, clear assignment structure, as well as the worker's specific preferences according to the way of working (Ou and Pan, 2021). This construct uses the adapted integrated content of the WDQ scale (Work Design Questionnaire-WDQ) and treats issues related to job variety, authority and control at work, necessary knowledge to perform work and other important issues (Bargsted et al., 2019). It is clear that within the frame of this construct, things must be viewed through the prism of the new working conditions for the executors, because they relate to the issue of the quality of work implementation, the scope of work, freedom, apropos autonomy of work execution. Furthermore, this construct is leaning on issues related to the variety of work, where the understanding of the above the appearance and perception of executors regarding the same in the contemporary conditions of digitization and 4IR has changed significantly.

The third construct, employee features, as the third independent variable in the proposed research framework focus on the performer's characteristics, displayed by a scale based on the TPQ-The Traits Personality Questionnaire. This scale is adapted and simplified for application within the explained research model, aiming to examine the impact of this construct on employee satisfaction and performance as independent component-construct in a multiple regression model (Ghani et al., 2016). The characteristics of all executors definitely change in the new organizational context, and they are especially intensively changed in the case of newly recruited human resources in different organisations. The key items that determine the five integral particles related to issues of creativity, imagination and development of new ideas, issues of readiness, task focusing and organization competencies, issues related to openness and benevolence, as well as questions related to empathy and emotions towards people, and questions related to mood and stress.

Within the modern human resources management and especially, performance management context, it is not enough to measure only pure employee performances without taking in consideration their satisfaction that strong relate behaviour in organisation. Within that context it is an inevitable component of integral worker performances, and because of that researcher are binding these elements for better interpretation and decision making. To assess satisfaction in this research are used particles that take into account issues related to the improvement of employee satisfaction through the digitalization process, issues of the intensity of preference of the current job in the upcoming period in the context of digitalization, and issues related to the

general increase of satisfaction through better work performing with the use of digital tools, along with a statement about the absence of desire for leaving the organization within which executor currently operates (García-Rodríguez et al., 2020). Designing the content of the main components of the workplace is in order to improve current employee performance in terms of a lower degree of absenteeism, a better relationship between older and younger employees, a combination of tasks in the job description that employees perform. Furthermore, contemporary designing taking in consideration that the amount of work that can be done additionally with the use of new technologies can grow up, with eliminating risky workers behaviours that can cause damage for organisations. Considering the positive impact of job tenure on job performance it is suggested that the government should not make policies on early retirement of the old employees, but support them to work for longer. In evaluation of the employees senior ones should have an advantage to the junior ones regarding their higher job performance or the government can create important incentives on job tenure in order to increase their intent to remain in the organization (Yozgat et al., 2013). The above indicates the possibility of using the modified IWPQ scale, thus (Individual Worker Performances Questionnaire-IWPQ), to measure the integral performance of employees as the dependent variable, thus the fourth construct in the model, that include the main segments and issues of their satisfaction in the context adjusted to the new environmental conditions based on digitalization and 4IR.

4. EMPIRICAL DATA DESCRIPTION

The research was done between March and September 2021 utilizing the Google Analytics Solutions package. During this period, 132 respondents filled in the questionnaire, with 125 questionnaires fully completed. Software package SPSS was used to perform descriptive statistics, reliability analysis, correlation analysis, multiple regression analysis and hierarchical multiple regression analysis. The sample consists of 125 randomly selected respondents from different companies, performing both management tasks on different hierarchical organizational levels and operational executive tasks as employees. The detailed systematic presentation of demographic data features can be seen in Table 1.

Table 1. General demographic characteristics of respondents

Variables		Frequency	Percentage
Gender	Male	43	34.4%
	Female	82	65.6%
Age	18 - 30	18	14.4%
	31 - 40	41	32.8%
	41 - 50	47	37.6%
	51-65	19	15.2%
	Over 65	0	0%
Education Degree	High school	2	1.6%
	Bachelor degree	56	44.8%
	Master degree	45	36%
	PhD	22	17.6%

Managerial Position at the current company	Top manager	19	15.2%
	Middle level manager	30	24%
	First line supervisor	18	14.4%
	Employee	58	46.4%
Years Working at the current company	1 - 2	9	7.2%
	3 - 5	14	11.2%
	6 - 10	18	14.4%
	11 - 20	58	46.4%
	Over 21	26	20.8%

Source: Authors

Cronbach's Alpha coefficient calculation, for each particle is enough high and as well as total value for each construct/section integrally observed and is equal or over 0.80, which indicates a high level of reliability of the questions, as shown in Table 2.

Table 2. Cronbach Alpha coefficients for each construct/variable

Construct/Section:	Cronbach's Alpha
EATS	0.89
EAWA	0.885
WF	0.8
ESWP	0.887

Source: Authors

The data, with regard to their distribution, were evaluated in order to determine the types of tests that will be used in testing the null and research hypothesis and they fulfilled preconditions of normality.

5. RESULTS AND DISCUSSION

Data analysis (Table 3.) through multiple regression analysis shows that there are statistically significant regressions between EATS and ESWP (.317) and EAWA with ESWP (.381), while relation between WF and ESWP (.169) was not significant, because the p value is slightly above 0.05 and it makes 0.051. T test shows that partial regression coefficients of all predictors are above .10 and that first two (EATS and EAWA) are significant, but the WF is not and it is at the limit of acceptability, because its sig = .051 and its Confidence Interval includes null.

Table 3. Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B		Collinearity Statistics		
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF	
1	(Constant)	.561	.257		2.183	.031	.052	1.070		
	EATS	.317	.072	.351	4.383	.000	.174	.461	.312	3.208
	EAWA	.381	.084	.420	4.512	.000	.214	.548	.230	4.339
	WF	.169	.086	.159	1.975	.051	.000	.339	.308	3.251

a. Dependent Variable: ESWP

Source: Authors

Through simple linear regressions all independent variables incorporated in this model are separately observed, clear relationships can be seen that indicate a strong individual connection, that is, the prediction of the criterion variable based on changes in the variances of the predictor variables through the determination coefficients R Square which in this case amounts respectively 0.662; 0.701 and 0.587 while the Adjusted R Square values are respectively lower 0.659; 0.699 and 0.584 and all proved to be statistically significant in this simplified analysis. Using unstandardized coefficients of determination of the isolated simple regression models for each predictor variable separately are respectively expressed by regression equations for each predictor variable and they are respectively as follow $ESWP = 1.175 + .737 \text{ EATS}$; $ESWP = 1.182 + .760 \text{ EAWA}$ and $ESWP = .813 + .816 \text{ WF}$. After involving all predictors simultaneously in one integral model of multiple regression, the coefficients of determination are reduced for each predictor and they respectively amount up to 0.317; 0.381 and 0.169 with the fact that the last coefficient is at the limit of significance 0,051 and its confidence interval includes zero. Regardless of the above statistical calculations and indicators, it is not always good to exclude from the model a predictor whose coefficient of determination is high enough, even if the above relationship is not significant, so in this case it can remain in the model, but for this reason, its additional influence should be tested through a hierarchical multiple regression model and then decided on its status. From the statistics output it could be read that the value of the multiple regression coefficient = .759, and the adjusted multiple regression coefficient is somewhat lower, and its value is 0.753 and it means that slightly more than 75% individual differences of respondents' satisfaction and performances within some work position we can predict on the basis of linear combination of the three predictors variables in this model.

The first hypothesis, which assumes that there is a high and significant influence of EATS, ESWP and WF on ESWP, where the influence of all predictor variables is simultaneously observed in the multiple regression model, is statistically defined through the null and research hypothesis. The null hypothesis assumes that the coefficient of multiple determination is zero and the research hypothesis assumes that the coefficient of multiple determination is different from zero ($H_0: R^2 = 0; H_1: R^2 \neq 0$), while the first hypothesis takes the role as a research hypothesis in the statistical setting. By observing the entire population from which the random sample was

derived, the null hypotheses can be statistically set as follows ($H_{0(j)}: \beta_j = 0, j = 1, 2, \dots, m$). The first hypothesis also creates the research hypothesis which claims that there is an influence of predictor variables on the criterion variable and that the partial coefficients of determination are different from zero, in this specific case they are positive, so that the multiple regression equation can be statistically expressed as follows: $ESWP = .561 + .317EATS + .381EAWA + .169WF$. The assumption that there is no connection between the independent variables and dependent variable in this multiple regression model can be rejected, so that the research hypothesis that claims the opposite takes as confirmed. By reading the Collinearity Statistics values from the, it is clearly seen that the tolerance threshold is greater than 0.10 and its reciprocal value, which represents the variance inflation factor, is less than 10 for each predictor in the model, it can be concluded that none of the predictors are redundant and that the set model can be taken as statistically relevant. The above data show that the change in the criterion variable can be explained by changes in the predictor variables, using their linear combination. The other prerequisites for the multiple regression model are fulfilled, it should be emphasized that the residuals have a normal distribution like the whole variables in this model, while the standard errors of the residuals are annulled on average where the arithmetic mean of the residuals is equal to zero and the variance is constant, so that the linearity condition of the regression model is fulfilled.

Table 4. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.813 ^a	.662	.659	.70591	.662	240.520	1	123	.000
2	.867 ^b	.751	.747	.60822	.089	43.683	1	122	.000
3	.871 ^c	.759	.753	.60112	.008	3.901	1	121	.051

- a. Predictors: (Constant), EATS
 b. Predictors: (Constant), EATS, EAWA
 c. Predictors: (Constant), EATS, EWA, WF
 d. Dependent Variable: ESWP

Source: Authors

Through deeper additional analysis by using hierarchical multiple regression model, it is possible to do a more precise analysis and it has identical outputs even if the first and second independent variables in integral third model are replaced. When reading the third model (Table 4), the changes can be clearly seen, and that is, the additional contributions of the inclusion of certain additional constructs in the model, and the changes and impacts that are recognized through their inclusion. Model one shows a situation in which only the influence of the first predictor (EATS) variable on the criterion variable (ESWP) is taken into account, while the other two predictor variables are kept constant.

The second model takes into account the dynamics that imply the expression of the additional contribution of the influence of the second variable (EAWA), which is subsequently included as an additional predictor to the first, on the criterion variable in model where it can be read that

the additional influence of the second variable is statistically significant and sufficiently high at the level of .089 (R Square change (2)= .089) which means that the subsequently included second predictor generates a significant additional impact on the criterion variable and it is approximately 9%. In model two, the third predictor (WF) is kept constant, so that the second predictor that is subsequently included and with regard to the read value, can be taken as statistically and essentially relevant and included in the multiple regression model as essential because it generates a significant additional regression effect on criterion variable.

The third model implies that the third predictor is also included to the second model, where the additional influence of it on the criterion variable is tested. In this case, the contribution of the third predictor to the impact on the changes of the criterion variable is very low and is lower than one, while its significance is still statistically questionable because the p value is above the limit of 0.05, so the third predictor can be excluded from the multiple regression model statistically. In this way, the second research hypothesis in this research which stands that there are evident differences of additional impact of predictors (independent variables in this model) on the criterion, or dependent, variable in this model, is approved and the model statistically fulfilled all other preconditions for making scientific conclusions based on hierarchical multiple regression model.

Within this type of research, researches were very often focused, on the integral observation of the impact of job design elements and job content elements in general, on employee job satisfaction or employee performance (Jiang et al., 2020). Some of those researches were focused on the combination of content and job design theoretical framework, and their goal was to identify adequate and acceptable logical frameworks and practical application aspects of work enriched with artificial intelligence in order to measure the impact of the aforementioned elements on job enrichment and innovative behaviour of employees (Sun, Teng, 2017). The key findings were that the work assignments and knowledge worker characteristics according to the artificial intelligence-enabled jobs are vitally important for inducing innovative work behaviour among employees of high-tech firms (Verma and Singh, 2022). Within the framework of the conducted research, the similar relations are confirmed, but the job design was observed through several separate components with the aim of testing the impact of each of the components on the satisfaction and performance of employees through a multiple hierarchical linear regression model within digitalization context. Using this approach certain separate segments of job design and job content, within special developed research conceptual framework were segmented as predictor variables, which give a clearer picture which components must be priority managed with the aim of obtaining a higher level of employee satisfaction and performance.

Additionally, questioning the impact of the intensification of the ICT using to the mental health of the respondents, where the this phenomenon integrally shows a negative impact on the health of the respondents, while in certain segments of the sample towards complexity and work requirements shows differentiated levels of negative effects. Otherwise, the use of ICT and respondents work abilities is not demonstrated that the use of ICT generally negatively affects respondents' work capacity but noticed slightly positive influences (Borle et al., 2021). When observing the ICT use category, in our work through the observation of the technical system, it is clearly observed in the compatibility of obtained results, with the fact that in our work is showed

a more intense positive impact that can be tied to the fact that the employees consider that the use of ICT technology is significantly facilitating their operational work. In our research, certain deeper relations have been investigated and the findings contribute earlier research, where it has been shown that older age respondents show a higher degree of recognition of ICT technology using possibility and opportunity at the workplace compared to the younger. The basic reason for this result can be sought in the fact that older employees know the job better and they have more seriously approach to the work and the intensity of the difference increases with the level of the education in favour of older employees.

Within specific studies, a relationship between intensity of ICT tools using and dissatisfaction at work is shown that approximately 10.6% of the variance in employees' job dissatisfaction is explained by the independent variables connected with the intensification of ICT tools using. The results of specific research show that the lower the employees' digital self-efficacy, the more dissatisfied they are in their jobs as digital work intensification increases (Busse et al., 2022). The subject work has confirmed that the phenomenon of burning out employees even the time of the digital revolution leads to a higher level of stress of employees and, consequently, a higher level of dissatisfaction with work. On the other hand, the work showed that with the increase in the level of employees' digital self-efficacy reduces the level of dissatisfaction in relation with more intense use of ICT tools. That fact is in agreement with our work that has shown that a clearer job assignment description increases the work satisfaction of employees in era of intensification of ICT tools application. Furthermore, our findings showed that the aforementioned intensity of positive influence is increasing with the level of education, thus technical skills and level of digital literacy of the respondents, which is in agreement with the level of the employees' digital self-efficacy impact.

Research findings suggest that daily work-related ICT use (but not personal ICT use) is slightly positively linked to work strain and distress via three job conditions: job pacing, level of interruptions and level of multitasking. In other words, the reason that daily work-related ICT use is associated with higher levels of work strain is because this use promotes greater speed, interruptions and multitasking on the job. Further, many jobs differ in the level of discretion workers have over the content or execution of their work, and low levels of job autonomy are linked to worse outcomes for employees. Respondents tended to report lower levels of job insecurity with higher levels of job autonomy and complexity (Chesley, 2014). In contrast to the first segment of above research findings, our research is reflected in the fact that all the tested constructs are of a complex nature and are defined on the basis of valid scales where a positive impact on employee satisfaction and performance is shown, generated through the use of ICT in a workplace. Regardless of the above, in the second segment of subject research, through additional in-depth analysis, a positive connection can be seen between the use of ICT tools at work, the complexity of work, autonomy at work, a higher degree of security and stability in a workplace and higher pay grades, which to a certain extent still indicates certain positive effects if the analysis of other isolated variables taken into account.

There are additional studies (Day et al., 2012) and they are aimed at pointing out the negative effects of the intensification of the use of ICT tools on employee satisfaction, that is, the positive impact on workload and strain at work and the constructs of the above variables are precisely

defined in this direction through their items. As part of the above-mentioned research, scales are being developed that measure attitudes related to the increase in workload by using technology, a longer daily period of work both at work and from home, and that increasing the use of the internet increases the workload of employees, which in some cases of inadequate use of time and technology can exist. On the other hand, conducted research shows that when testing the impact of the use of ICT tools in some segments, they have a positive and in others a negative impact on employee satisfaction, therefore well-being and performance, which leaves room for additional deeper analyses and different conclusions depending on what categories are taken as predictors and which work segments are observed. In addition (Jiang, 2014), a new finding in the field is that employees' knowledge sharing orientation was able to mediate the influence of ICT on employees' positive outcomes. For ICT utilization, its indirect effects on job satisfaction and work effectiveness via knowledge sharing orientation accounted for approximately one third of the total effects. The essence of the aforementioned research is focused on work overload, where the cause of it is recognized as the intensification of the use of ICT tools, which in the end often cannot be directly linked and need deeper understanding. In the case that additional mediating variables are introduced into the models, the interpretation of the results will be quite different, because the positive effect of the intensification of the use of ICT tools at a workplace could be recognized. In the aforementioned sense, the earlier researches do not exclude findings that indicate the existence of certain segments of employee satisfaction through better process control, more independence in the implementation of work, better communication, higher level of flexibility, thus adaptability and better implementation of work, which positively affects efficiency and leads to a higher level of satisfaction of each employee.

6. CONCLUSION

Employees in modern business conditions, especially the category of employees belonging to the knowledge workers segment, accept the introduction of technological improvements and innovations in a workplace as an opportunity for fast acceptance and application of different knowledge, more effective and efficient work execution, more expedient exchange and communication of work outputs, knowledge and ideas, easier planning of time and activities. Therefore employees acquire prerequisites for accelerating creativity through more challenging and interesting tasks, which generates a higher level of their performance and satisfaction, while contributing to the development of the entire organization (Čizmić et al., 2022). Through this research, the key premises of earlier research were confirmed, which are related to the assumptions that better design settings and job ergonomics lead to better employee performance, while highlighting certain peculiarities based on the component segmentation of the content elements of job design. This study investigates the adoption of sustainable workforce management in construction, based on an understanding of the factors that influence worker burnout and unsafe ergonomic behaviour, as well as productivity performance (Lee et al., 2020). Our research gives a clear indication that when high-quality human resources strategy is designed, and the contents and job descriptions are clearly defined, the projection of an adequate technological system leaning on 4IR and digitization in a workplace will generate an adequate recruitment system, which leads to the acceptable characteristics of the employees - thus they have a certain

but not sufficiently expressed direct additional, but they probably have indirect, contribution to dependent variable of the model. Additional contribution of this study is indication for more nuanced understanding of how different domains of use ICT-based tools in workplace influence employee outcomes and while reducing the potential for worker strain and distress through clear describe work assignments and workers development in context of digital skills. The contribution of this study is twofold since it, primarily expands job design theory with specific contemporary changes and secondly, and it wideness the knowledge about employees' attitudes to the technical system, workplace assignments and worker features within digitalization and 4IR context and their impact on worker satisfaction and performances. Satisfaction and behaviour of human resources in modern conditions of 4IR and digitalization cannot be separated as categories for the reason that an unsatisfied person cannot produce a satisfied client, and the key performances of every individual and organization are to ensure long-term client satisfaction through a partner relationship using support of new technological advances. In modern conditions, the performance of human resources is first of all observed as the determinants of their behaviour, which are of a qualitative nature, but they can be quantified through certain scales that include questions related to openness, willingness to cooperate, questions of neuroticism, issues politeness, while certain elements related to quantitative aspects that include the standardization of work could be take in consideration as a consequence. In this connection, this research put all the mentioned questions in the context of the fourth technological revolution and digitization with the aim of finding additional ways of raising the performance of human resources in a post-industrial society through improvements in their behaviour.

Just as the goal of management at the beginning of the last century was to improve the performance of blue-collar workers, today at the third decade of the twenty-first century for management remains a key task to raise performance of knowledge workers and experts in post-industrial society, but in this case the focus is on qualitative aspects related to behaviour. The mentioned process, regardless of the large number of researchers in this field, is still at the beginning and it is necessary to take care that this process must be understood and cultivated systematically, because a particular approach is not enough, and could lead to overall social dystopia and acceleration of the social differences that could escalate in negative manner. Within contemporary process of developing societies and companies, modern technology can be useful as a product of the fourth technological revolution and digitization, but all of the above must be viewed integrally, putting the focus back on human and their behaviour, since misapplication of technology can lead to negative consequences and that are lessons we learned through history. In this regard, the use of new technologies should be viewed as extension toolkit for functional use with the aim of promoting balanced application and positive patterns of behaviour, which make people more satisfied and efficient wherever they work.

Limitations related to the subject of the paper are primarily related to the absence of the segmentation of the research population according to certain occupations where some deviation of the gained results could be expected with the possibility of generating more precise research findings and practical recommendations. On the other hand, the introduction of certain dimensions of the demographic type in research model as a moderator could generate the

distinction of individual independent variables impact to the dependent variable through the extension of the moderating influence of certain demographic characteristics of the respondents to relation between variables of the model that has been used in this research. An additional limitation of this research can be related to the absence of longitudinal observations that would be applied to a specific sample over longer period of the time. The above-mentioned research, which would be able, by itself significantly more complex due to the temporal and cyclical dimension, to show certain movements through the time in relations between variables that were demonstrated through this research conducted in one time sequence.

Job design will continue to be a very important issue for both researchers and management practitioners, as workplace is the basic component of every organizational structure, while the key subcomponent of every workplace is the person performing the job. In this regard, the management of human resources, from both the macro and micro levels, should be the priority of every economy and every company, because without high-quality human resource management, there can be neither high-quality economic and social development of a national economy, nor the development of different types of business systems and organizations. A good understanding of the problem could potentially lead to higher levels of alignment of HRM policies and job design practices that should ultimately result in higher levels of employee performance (Hernaus and Pološki Vokić, 2014). Even within contemporary intense digitalization process, workplace design and human resource management remain dominant for the research and practical component of any organisation, as main precondition for achieving better individual and organisational performances and will always be considered for new research proposals. Thus, regardless to the statistically generated indicators through the analysis using a hierarchical multiple regression model, it could be wise to think about a possible different position of the third additional predictor variable, thus worker features, and try to observe it as possible mediation variable. This suspicion can be justified since it exists with high level of significant impact of this construct to the criterion variable within isolated simple model of linear regression which is statistically significant and it could be in focus for some further additional researching and testing process.

As a recommendation for further research in this scientific field, the model could be upgraded in such a way that two signified regression relationships are being observed through understanding the third variable as a mediator between the first two independent variables and the dependent variable. In this way, new cognitions could be created on relations between the intensity of the use of modern technologies at work and the effectiveness of employees through the intermediary effects of the employees' characteristics as a mediational variable in the new improved model. Similarly, the research could be redesigned by observing the relation between the work assignment and the effectiveness of employees, through the mediation of their characteristics, which could also lead to additional insights that can be practically used in business decision making in the field of human resources management. Further research in this field could be concentrated on a specific segment of workplaces that are covered with collaborative robots conceptual framework with creating the new research models to test specific influence this complementary extension of the workers tools on relation between different variables within job design field. As an additional challenge for further research, learning culture in the organization or knowledge management with

clearly defined segments could be introduced as mediating variables. Using this mediator within model could give additional cognitions of the impact of ICT tools on employee satisfaction and performance through key workplace components as independent variables in model. Additional research could be focused on the issues of avoiding the abuse of ICT tools at work, introducing unnecessarily employee exaggerate control, privacy protection issues, eliminating anxiety and some other phenomena of the modern age that can actually be largely eliminated through knowledge management and learning culture.

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Izvorni znanstveni rad

<https://doi.org/10.31784/zvr.11.1.4>

Datum primitka rada: 15. 12. 2022.

Datum prihvatanja rada: 14. 3. 2023.

UTJECAJ GLAVNIH KOMPONENTI RADNOG MJESTA NA ZADOVOLJSTVO I UČINAK ZAPOSLENIKA U KONTEKSTU DIGITALIZACIJE

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SAŽETAK

U doba digitalizacije u okviru četvrte tehnološke revolucije potrebno je ponovno postaviti ljudsko biće na pijedestal u području menadžmenta. Muškarci i žene kao nosioci aktivnosti trebaju biti na pijedestalu svih suvremenih procesa koji se odvijaju u društvu i poslovanju, kako bi se izbjegao problem u kojem je društvo bilo „zarobljeno“ tijekom prethodnih industrijskih revolucija. Primjena informacijske tehnologije uopće, a posebice umjetne inteligencije, utječe na dizajn i sadržaj glavnih komponenti dizajna posla, što neminovno dovodi do refleksije na zadovoljstvo i učinak zaposlenih na radnom mjestu. Cilj rada jest istražiti utjecaj specifičnih komponenti radnog mjesta na zadovoljstvo i učinak zaposlenih, dodatno prepoznajući koje komponente im najviše doprinose u kontekstu digitalizacije i 4IR-a. Iz teorije dizajna poslova Hackmana i Oldhama i Mintzbergovog okvira organizacijske strukture, predlažemo i testiramo istraživački okvir koji procjenjuje utjecaj tehničkog sustava, radnog zadatka i karakteristika zaposlenika na zadovoljstvo i učinak zaposlenih u suvremenom kontekstu. Istraživanje je provedeno u Bosni i Hercegovini na slučajnom uzorku od 125 ispitanika iz organizacija javnog i privatnog sektora, različitih industrija i veličina poduzeća. Analiza je realizirana kroz hijerarhijski model višestruke linearne regresije, a ključni nalazi su otkrili da su karakteristike zadataka i znanja o umjetnoj inteligenciji od vitalnog značaja za poticanje inovativnog ponašanja među zaposlenima.

Ključne riječi: digitalizacija, tehnički sustav, radni zadatak, karakteristike zaposlenika, zadovoljstvo i učinak