ORGANIZACIJA

Journal of Management, Informatics and Human Resources

Revija za management, informatiko in kadre

Organizacija (Journal of Management, Informatics and Human Resources) is an interdisciplinary peer-reviewed journal which is open to contributions of high quality, from any perspective relevant to the organizational phenomena.

The journal is designed to encourage interest in all matters relating to organizational sciences and is intended to appeal to both the academic and professional community. In particular, journal publishes original articles that advance the empirical, theoretical, and methodological understanding of the theories and concepts of management and organization. The journal welcomes contributions from other scientific disciplines that encourage new conceptualizations in organizational theory and management practice.

We welcome different perspectives of analysis, including the organizations of various sizes and from various branches, units that constitute organizations, and the networks in which organizations are embedded.

Topics are drawn, but not limited to the following areas:

- organizational theory, management, development, and organizational behaviour;
- human resources management (such as organization & employee development, leadership, value creation through HRM, workplace phenomena etc.);
- managerial and entrepreneurial aspects of education;
- business information systems (such as digital business, decision support systems, business analytics etc.);
- enterprise engineering (e.g., organizational design, business process management, enterprise transformation paradigms etc.);
- papers that analyse and seek to improve organizational performance.

Organizacija (Revija za management, informatiko in človeške vire) je interdisciplinarna recenzirana revija, ki objavlja visoko kakovostne prispevke z vseh vidikov, ki so pomembni za organizacijske procese in strukture.

Revija je zasnovana tako, da spodbuja zanimanje za različne vidike v zvezi z organizacijskimi vedami in je namenjena tako akademski kot strokovni skupnosti. Revija objavlja izvirne članke, ki spodbujajo empirično, teoretično in metodološko razumevanje teorij in konceptov managementa in organizacije. Pozdravljamo tudi prispevke iz drugih znanstvenih disciplin, ki spodbujajo nove koncepte v organizacijski teoriji in praksi. Objavljamo članke, ki analizirajo organiziranost z različnih vidikov, so usmerjeni na organizacije različnih velikosti in iz različnih sektorjev, na enote, ki sestavljajo organizacije, in na mreže, v katere so organizacije vpete.

Teme so pokrivajo predvsem naslednja področja:

- organizacijska teorija, upravljanje, razvoj in organizacijsko vedenje;
- management človeških virov (kot so organizacija in razvoj zaposlenih, vodenje, ustvarjanje vrednosti s pomočjo človeških virov, organizacijski pojavi na delovnem mestu itd.);
- vodstveni in podjetniški vidiki izobraževanja;
- poslovni informacijski sistemi (kot so digitalno poslovanje, sistemi za podporo odločanju, poslovna analitika itd.);
- podjetniški inženiring (npr. organizacijsko oblikovanje, upravljanje poslovnih procesov, paradigme preoblikovanja podjetij itd.);
- članki, ki analizirajo organizacijsko uspešnost in prizadevanja za izboljšanje le-te.

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Drivers and Constraints of Employee Satisfaction with Remote Work: An Empirical Analysis

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Background/Purpose: The Covid 19 epidemic has forced many organizations to move to remote work (RW), and this trend is expected to continue even later in the post-epidemic period. Employees of the organization are at the heart of this transi-tion to RW, so identifying the factors that affect employee satisfaction with RW is very important for organizations to increase employee commitment and motivation. Therefore, the main objective of this study was to identify and prioritize the factors affecting employee satisfaction with RW using an innovative method.

Method: In the first phase of this study, a conceptual research model was designed inspired by literature. In the next phase, the proposed conceptual model of this re-search was tested using structural equation modeling (SEM). Then, using the artifi-cial neural network model, the importance of each of the model variables in pre-dicting employee satisfaction with RW was identified.

Results: The findings of this article ultimately disclosed that work-life balance, in-stitutional and technological support, job satisfaction, and perceived limited com-munication are, respectively, are elements that affect employee satisfaction with RW. The first three factors are drivers of employee satisfaction and the last factor (i.e., perceived limited communication) is the constraint of employee satisfaction with RW because it had a statistically significant negative effect on employee satis-faction with RW.

Conclusion: This study revealed that organizations should focus on the processes and strategies to improve em-ployees' work-life balance, provide institutional and technological support during remote work, and increase job sat-isfaction in order to increase the satisfaction level of their employees in the remote work. On the other hand, it was found that perceived limited communication is an effective factor that causes a decrease in the level of satisfaction of employees in remote work.

Keywords: Remote work, Employee satisfaction, Structural equation modeling, Multilayer per-ceptron, Artificial intelligence, Artificial neurol network, Covid 19 pandemic

1 Introduction

The coronavirus disease (COVID-19) pandemic has had a significant impact on individuals, organizations, and society. It has wreaked havoc on people's lives, re-sulting in job and personal losses, career shifts, and physical and mental health concerns. Conventional techniques be-coming unsustainable and unfeasible, busi-nesses have been compelled to pivot and reallocate resources toward creative modes of operation. Apart from the implementa-tion of long-term and periodic lockdowns, as well as the reorganization of employment and work (Stevano et al., 2021), these changes have also hindered the flow of prod-

ucts and services and harmed commerce and service exchange (Maliszewska et al., 2020). As a result of the pandemic, workplace norms have shifted, and firms have been obliged to adapt their operations to the new environment. One example of this type of adaptation is the transition to remote work (Béland et al., 2020; Brynjolfsson et al., 2020; Makó & Illéssy, 2020; Manojkumar et al., 2021). Remote work is a work arrangement allow-ing employees to operate from anywhere and at any time using telecom-munica-tions, mobile devices, and computer-based technologies (Ferreira, 2011; Neirotti et al., 2013). Companies are starting to refer to remote work as a set of organization-al interventions aimed at fully unleashing their employees' innovation potential by giving them more autonomy over where they work, when they work, and what tools they use, in exchange for a strong commitment to achieving corporate goals in these fast-paced environments.

The transition to remote requires not just organization-al preparation in terms of infrastructure and practicality, but also personnel willingness to embrace this trans-for-mation. Because employees are a critical component of this equation since they are at the forefront of the tran-sition (Makó, 2005). While the focus of the current re-search is on companies' preparedness to shift to remote work. Franken et al. (2021), for example, investigate the impact of remote working on organizational perfor-mance and employee well-being. Eberhard et al. (2017) explore the skills required by workers to prepare them for the RW, while Raguseo et al. (2016) propose a model for organi-zations to prepare for RW, through which enterprises may boost labor productivity. Another trend in the literature is studies that examine employee job satisfaction in remote work. In these studies, either the effect of remote work on job satisfaction has been investigated (e.g., Grant, 2021 and Ţălnar-Naghi, 2021) or the factors affecting job sat-isfaction in remote work have been identified (e.g., Karu-na-rathne, 2021 and Bulińska-Stangrecka and Bagieńska, 2021). However, we found no study that examines the fac-tors that affect employee satisfaction with remote work. In order to address this literary gap, the present study was conducted to first exam-ine the factors influencing (both drivers and constraints) employee satisfaction with remote work.

Although the Covid 19 Pandemic forces remote work (Wang et al., 2021), re-searching the variables driving affecting employee satisfaction with RW may help enter-prises enhance work quality, work organization and labor productivity. With a thorough analysis of the literature, the current study develops an original model for predicting employee satisfaction with RW. To put the suggested mod-el to the test, this study uses structural equation modeling (SEM). In the next phase of this study, an artificial neural network (ANN) is utilized to determine the importance of each model variable to predict employee satisfaction.

In the continuation of this article, the related literature has been reviewed and the conceptual model of this article has been developed in Section 2. In Section 3, the research methodology is described. Sections 4 and 5 are devoted to the results and discussion on them. Finally, the conclusion of this article is presented in Section 6.

2 Research Background

There is a lot of research in the literature that studies different aspects of remote work. Following the outbreak of the Covid 19 pandemic, most countries put tele-work-ing on their agenda, which led to more studies on remote work. A simple search for the keyword remote work in the title, abstract, and keywords of the arti-cles in the Scopus database disclosed how the trend of publishing articles on the subject of remote work has increased exponentially in the last two years, so that 412 of the 817 articles published between 1970 and 2022 were published in 2021. This is while searching for other synonyms such as telework, work from home, smart work, etc. will surely lead to more results. A review of the literature in the field of em-ploy-ee satisfaction with remote work illustrates that most of these studies have been done on evaluating employee job satisfaction. Ţălnar-Naghi (2021) compares, for instance, employee job satisfaction with remote work before and af-ter the Covid 19 pandemic in Romania. They show that the job satisfaction of employees over 40 years of remote work in the pandemic period has increased significantly. Grant (2021) provides evidence that remote work increases em-ployee job satisfaction. There are also studies in the liter-ature that have identified the factors that affect em-ployee job satisfaction in remote work. Karunarathne (2021) be-lieves, for example, that the supervisor's perceived trust in remote work increases employee job satis-faction, or Bu-lińska-Stangrecka & Bagieńska (2021) provide empirical evidence that the relationship between employees is one of the factors influencing job satisfaction in remote work. In addition, there are studies in the literature that examine the productivity (e.g., Baker et al., 2007 and Van Der Voordt, 2004), employee perfor-mance (e.g., Nugroho, 2021), and employee well-being (e.g., Franken et al., 2021; Rožman et al., 2019) in the remote work, however, there is no study that investigates antecedents of employee satisfaction with remote work (not job satisfaction or satis-faction from the job). Therefore, the present study intends to answer the following research question:

What are the driving forces and constraints of employ-ee satisfaction with remote work?

2.1 Conceptual Model of the study

New technologies, along with the coronavirus pan-demic, have led organizations to digitize, and this tran-sition to digitalization is inevitable for many businesses. This transition has created new working conditions and
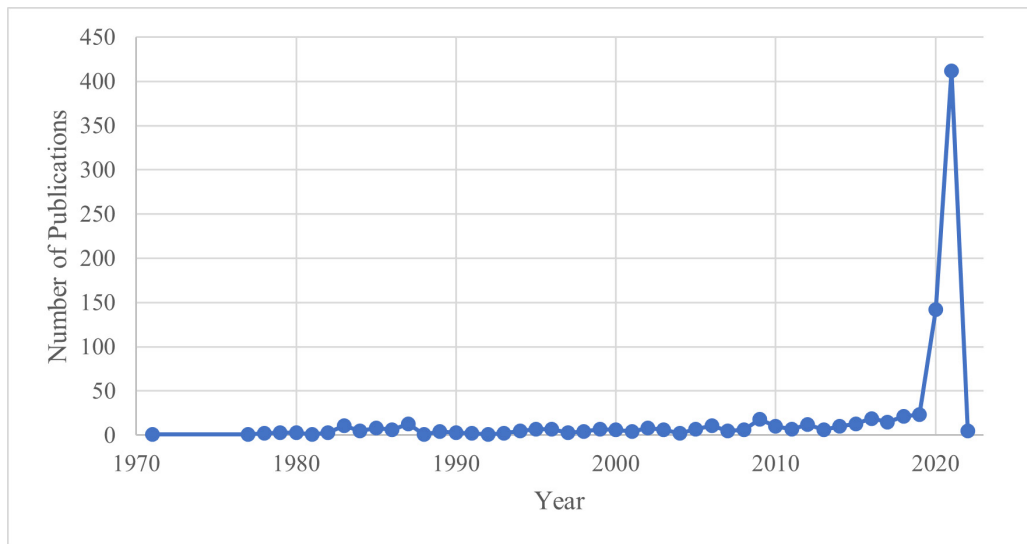
Figure 1: Trend of publications in the Scopus database on remote work in 1970-2022

norms in organizations and posed serious challenges to the management of organizational behavior. One of the most important issues of organizational behavior is employee satisfaction, which apparently with the changes in the structure of today's organizations, past theories of organizational behavior management as well as employee satisfaction also need to be re-tested. In addition to their professional roles in the organization, employees also have roles and responsibilities in their personal lives (for example, as a spouse, parent, etc.). The conflict between these two roles can affect a person's performance in both of these roles. Therefore, role management in research literature has been considered by many researchers. Balancing work-life helps the person to function effectively both at work and in one's personal life. Organizations are also looking for conditions that can help the individual to balance their work-life. Franken et al. (2021) provide evidences that remote work builds work-life balance that results in improvement in quality of life and employee well-being. In remote work, employ-ees may spend more time with family, get emotional support, and experience less work-related stress (Franken et al., 2021). On the other side, Malik et al. (2016) ex-press that remote work promotes employee flexibility and productivity, which eventually results in increased employee satisfaction. In other words, remote work creates work-life balance (Franken et al., 2021; Grant, 2021; Stevens, 2017), and this balance is expected to increase employee satisfaction. Accordingly, work-life bal-ance is considered as a drivers of employee satisfaction and the first hypothesis of this study is formulated as follows:

H1: Work-life balance has a positive and significant effect on employee satisfaction with remote work.

When it comes to workplace attitudes, job satisfaction is one of the most often studied (Illéssy et al., 2021). Kayaalp et al. (2021) state that Locke in 1976 defined job satisfaction as "pleasurable or positive emotional state resulting from the appraisal of one's job or job experienc-es". It is widely accepted that job satisfaction is a critical component in both individual and organizational success (Elayan et al., 2023). One of the topics that has been widely covered in the remote work literature is employee job satisfaction. Ţălnar-Naghi (2021) show that the job satisfaction of employees over 40 years of remote work in the covid 19 pandemic period has increased significantly. Grant (2021) provides evidence that remote work increases employee job satisfac-tion. Therefore, it can be concluded that if employees are satisfied with their duties and jobs, it can lead to their satisfaction with remote work. Subsequently, job satis-faction is also considered as a driving force of employee satisfaction and the second hypothesis of this study is written as follows:

H2: Job satisfaction has a positive and significant ef-fect on employee satisfaction with re-mote work.

Employee resistance to change is one of the main challenges for organizations in the transition to remote work (Hu, 2020) while the support of organizations can elim-inate this resistance and facilitate remote work adoption (Alnaimi & Rjoub, 2021; Rainey & Chun, 2005). Remote work may pose challenges and ambiguities for employees. These ambiguities can be resulted from the use of new technologies, devices, software, or in general, ambiguities that arise due to the dynamics of the work itself. There-fore, organizational support can play an important role in facili-tating the process. Eom et al. (2016) stress the im-portance of institutional and tech-nological support in re-

mote work and consider this variable in their study. Thus, this study also considers institutional and technological support as a driving force of employee satisfaction with remote work and writes the third hypothesis as fol-lows.

H3: Institutional and technological support has a pos-itive and significant effect on em-ployee satisfaction with remote work.

Informal networks in the organization are in some cas-es more powerful than the formal organizational structure, therefore, informal communication among people within the organization is the focus of many researchers in the field of organizational behavior. In addition to the politi-cal behavior between employees, these informal relation-ships create friendly relations among the employees and create the oppor-tunity for socialization with people who are socially in their class. While the possi-bility of in per-son social interaction of employees with colleagues and customers in remote work is minimized. Toscano and Zap-pala (2020) claim that social isolation has a direct negative effect on employee satisfaction with remote work, both directly and through stress. Perceived limited communica-tion is frequently named as a bar-rier to employee remote work adoption, in the literature (Mokhtarian & Salomon, 1997; Pérez et al., 2002). Hence, this factor is considered as a constraints for employ-ee satisfaction with remote work and accordingly the fourth hypothesis of this study is designed as follows:

H4: Perceived limited communication has a negative and significant effect on employee satisfaction with remote work.

Eom et al. (2016) develop a model that evaluates the factors that influence the South Korean government's de-cision to accept remote work. In this model, they be-lieve that the costs that a person expects to incur from remote work (costs such as commuting and business trip costs) influence their decision to accept remote work. In other words, if the cost of remote work is lower, they will wel-come remote work, and vice versa, if the perceived cost of remote work is higher, the employee will re-sist to accept it. In general, in the behavioral intention theory literature, perceived costs are considered as a variable affecting an in-dividual's behavioral intention (An-as alsoud et al., 2021). Remote work is expected to impose costs on employees, such as the cost of equipment and the provision of technol-ogies and devices needed to perform task duties in an off-the-job environment. Hence and according to the re-search literature, in the present study, perceived cost is considered as a deterrent to employee satisfaction with remote work and the corresponding hypothesis is writ-ten as follows:

H5: Perceived cost has a negative and significant ef-fect on employee satisfaction with re-mote work.

In accordance with the hypotheses presented, the pro-posed conceptual research model of this study for the an-tecedents of employee satisfaction with remote work is presented in Figure 2. Since work-life balance, job satis-faction, institutional and technological support were hy-pothesized, based on the literature, to have a positive im-pact on the employee satisfaction with remote work, they are labeled as the driv-ers of the employee satisfaction with remote work. Besides, it is expected that per-ceived limited communication and perceived cost have a negative impact on the employee satisfaction with remote work. They were considered as constraints of employee satisfac-tion with remote work in this study.
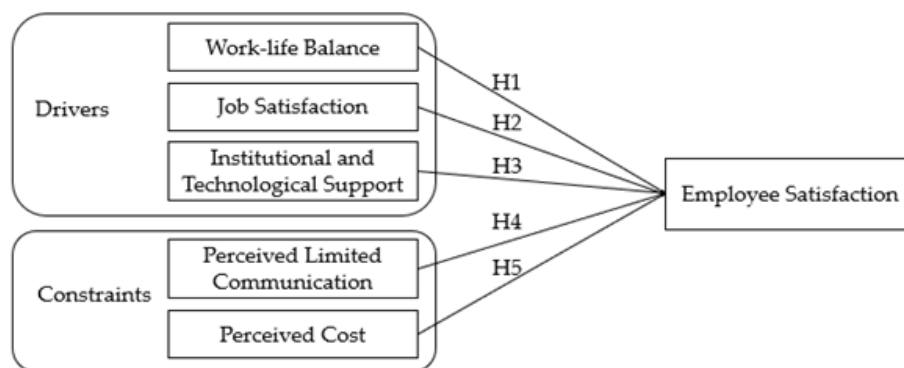

Figure 2: The conceptual model of the study

3 Materials and Methods

3.1 Data collection

Based on the variables of the proposed conceptual model of this research, a questionnaire was designed and distributed through e-mail among knowledge-based companies in Tehran. To begin collecting data, a list of KBOs was taken from the Centers of Knowledge-Based Companies in Tehran[1], Iran, which in-dicated that Iran has a total of 6359 KBOs, 3355 of which are located in Tehran. A preliminary consent to participate in this study was obtained by contacting the managers of all KBOs functioning in Tehran. Companies who consented to partici-pate in the research were requested to share the online link to the prepared ques-tionnaire, which was emailed to them, with their workers and to encourage them to complete it. Data collection was done in the summer of 2022, from July to Septem-ber. 432 businesses volunteered to participate in the survey, however only 268 of the online questionnaires were completed, with 234 being complete and useable. 65.4% of the participants were male and the rest 34.6% of them were female. The other de-mographic characteristics of the participants in this research are presented in Table 1.

3.2 Data analysis methods

Three steps of data analysis were used in this investi-gation. To begin, confirma-tive factor analysis was used to determine the convergent and discriminant validity, composite reliability, and Cronbach's alpha index of the hypothesized study model. In the second stage of this in-vestigation, structural equation modeling (SEM) using maximum likelihood estimation was employed to assess hypotheses. In the third step, we employed multilayer per-ceptron (MLP), which is an artificial neural net-work mod-el, to confirm the strength of independent factors' effect on dependent variables whose significance was confirmed using SEM analysis (Vărzaru & Bocean, 2021). Since, the performance of ANN models is higher than standard linear statisti-cal approaches such as Multiple Regression Analysis (MRE) in both discovering nonlinear interactions and determining causal linkages, MLP used to model an-te-cedents of employee satisfaction with RW.

Structural Equation Modeling (SEM) and Artificial Neural Networks (ANN) are two popular techniques in data analysis. SEM is a statistical modeling technique that is used to analyze complex relationships between varia-bles, while ANN is a machine learning technique that is used to identify patterns in data. In recent years, there has been a growing interest in combining these two tech-niques, resulting in the SEM-ANN approach.

In fact, SEM is limited in its ability to identify pat-terns in data. While SEM can model complex relationships between variables (Alfarajat, et al., 2021), it may not be able to identify nonlinear relationships or interactions between variables that are not explicitly modeled. ANN, on the other hand, is highly effective in identifying such patterns and interactions, which can lead to more accurate predictions (Nosratabadi, et al., 2022). In addition, SEM-ANN can help address some of the limitations of ANN. While ANN is highly effective in identifying patterns, it may not provide a clear understanding of the underlying relationships between variables. SEM can help provide a more interpretable model that can help identify the under-lying rela-tionships and mechanisms (Kayed, et al. 2022). Overall, the SEM-ANN approach is performed to combine the strengths of SEM and ANN and overcome their limi-ta-tions. SEM provides a framework for modeling complex relationships between var-iables, while ANN is effective in identifying patterns and interactions in data. By combining these two techniques, researchers can develop more accu-rate and inter-pretable models that can help explain the un-derlying mechanisms and make better predictions.

In our study, we also adopted the SEM-ANN approach to analyze our data. Following prior studies, we used a feed-forward-back-propagation multilayer per-ceptron (MLP) with a sigmoid activation function in the hidden and output layers. We also employed a tenfold cross-validation procedure with a 90% training sample and a 10% testing sample. As a standard neutral network, MLP consists of three hi-erarchical layers: an input layer, one or more hid-den layers, and an output layer. The number of hidden lay-ers is determined by the complexity of the problem. One hidden layer was employed in this study. The input layer comprises neurons with a total number equal to the mod-el's input variables. The factors in this research that were verified to have an influence on employee satisfaction with RW during the SEM analysis phase are considered as input variables (or input neurons). The num-ber of neurons in the output layer is equal to the number of model dependent vari-ables, in this case, employee satisfaction with RW is the lone neuron in the MLP model output layer. In order to select the number of neurons in the hidden layer, the model was repeated three times and each time with a different number of neurons in the hidden layer. The performance of the model was compared with 2, 3, and 4 neu-rons in the hidden layer, respectively, and the network with the lowest error rate was selected. The Root Mean Square of Error

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[1] Centers of Knowledge-Based Companies in Tehran established by the Ministry of Industry, Mines, and Trade, the Tehran Center for Science and Technology Parks in 2004 aims to create a dynamic and supportive space for the growth and development of new and innovative companies (visit https://daneshbonyan.isti.ir).

Table 1: Demographic features of the sample

Age	Number	%	Position	Number	%
18-24	45	19.2	Top Manager	25	10.7
25-34	57	24.4	Middle Manager	53	22.6
35-44	96	41	Supervisor	43	18.4
<45	36	15.4	Employee	113	48.3

Table 2: Validity and reliability test results

Factors	Cronbach's alpha	CR	AVE
Work-life Balance	0.876	0.871	0.833
Job Satisfaction	0.862	0.822	0.87
Institutional and Technological Support	0.827	0.853	0.774
Perceived Limited Communication	0.783	0.839	0.783
Perceived Cost	0.828	0.824	0.8
Employee Satisfaction	0.854	0.873	0.901

Table 3: The matrix of intercorrelations

	WLB[1]	JS[2]	ITS[3]	PLC[4]	PC[5]	ESRW[6]
WLB	1					
JS	0.55	1				
ITS	0.32	0.65	1			
PLC	0.47	0.56	0.5	1		
PC	0.47	0.67	0.54	0.42	1	
ESRW	0.51	0.63	0.45	0.55	0.31	1

1 WLB: work-life balance
2 JS: job satisfaction
3 ITS: institutional and technological support
4 PLC: perceived limited communication
5 PC: perceived cost
6 ESRW: employee satisfaction with remote work

$$RMSE = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(A - P)^{2}} \tag{1}$$

(RMSE) was utilized to assess the pre-dictive ability of the networks. RMSE is measured by Equation 1. The sigmoid acti-vation function is used in both the hidden and output layers in this work, and all variables are normalized to the range (0,1) to save training time and improve pre-diction performance (Negnevitsky, 2005). To proposed model of the study the data were analyzed using AMOS 18 and to perform MLP, SPSS 20 was used.

4 Results

In SEM, the relationship between observable variables (i.e., questionnaire ques-tions) and hidden variables (i.e., the main research variables) is called the measure-ment model (Alwreikat & Rjoub, 2020). Table 2 shows that the measurement model of this study has acceptable reliability and validity because the value of Cronbach's alpha for all the variables is above 0.7 (Nunnally, 1975) and the CR value for all var-iables is above 0.7 (Bagozzi & Yi, 1988) and the AVE value for all variables is above 0.5 (Fornell & Larcker, 1981; Nathan et al., 2019).

Table 4: Model fit test results

Fit Metrics	The model's value
X2/df	1.27
GFI	0.831
AGFI	0.819

4.1 Hypotheses Test

In this study, the hypothesis test is the same as the testing the structural model in SEM (Yang, 2021). The structural model, which evaluates the relationships be-tween latent variables, is evaluated by three criteria of statistical estimation, the sig-nificance level of these estimates and the coefficient of determination ($R2$). The re-sults show that all three variables that are considered as drivers of employee satis-faction in remote work (i.e., work-life balance, job satisfaction, institutional and technological support) have a positive and significant effect on employee satisfac-tion and therefore the corresponding hypotheses are confirmed, because the esti-mates related to these hypotheses are significant with a confidence interval of at least 95%. However, the effect of only one of the two con-straints (i.e., perceived lim-ited communication) on employee satisfaction in remote work was confirmed.

The first hypothesis of this study (i.e., H1) confirmed the effect of work-life bal-ance variable on employee satis-faction (estimate=0.417, p<0.023). This means that remote work gives employees the flexibility to spend more time with family and friends while doing their job tasks, which also increases their level of satisfaction. The significance of the estimate related to the test of the second hypoth-esis (esti-mate=0.312, p<0.004) indicates that the third hypothesis of this study (i.e., H2) is also supported and indicates a positive and significant effect of job satisfac-tion on em-ployee satisfaction. This finding shows that job satisfaction is one of the main and influential elements on employee satisfaction. Testing the third hypothesis of this study (i.e., H3) shows that the institutional and technolog-ical support of organiza-tions during remote work is one of the factors affecting employee satisfaction be-cause this study provides quantitative empirical evidence to support this hypothe-sis (estimate=0.425, p<0.000).

The fourth hypothesis of the present study (i.e., H4) is also confirmed because the corresponding estimates are statistically significant (estimate=-0.356, p<0.035). This means that the present study provides evidence that there is a negative impact of perceived limited communication variable on employee satisfaction. However, in the pres-ent study, there is not enough evidence to support the fifth hypothesis (i.e., H5) that perceived costs affect signifi-cantly employee satisfaction (estimate=-0.330, p<0.072).

This could mean that while working remotely reduces the cost of com-muting to and from work, this reduction does not increase employee satisfaction. In other words, only the effect of one of the constraints (i.e., perceived limited commu-nication) on employee satisfaction was confirmed. A summary of the hypothesis test is given in Table 5. In addition, the findings show that these four variables (i.e., work-life balance, job satisfaction, and institutional and technological support, and perceived limited communica-tion) explain 73% of the changes in employee satisfac-tion (R2=0.73).

According to the results of quantitative analysis of the proposed conceptual model of the present study using em-pirical data, the proposed conceptual model of the study is modified and shown in Figure 3. In this model, it is shown that work-life balance, job satisfaction, and institutional and technological support are the drivers of employee sat-isfaction with remote work, while perceived limited com-munication is considered as a factor that prevents employ-ee satisfaction with remote work (that reduces employee satisfaction with remote work). While the sta-tistical analysis of the proposed model did not support the effect of perceived costs on employee satisfaction with remote work. The numbers on the arrows between the variables in Figure 3 are standardized estimates which are the same as presented in Table 5.

4.2 Neural network analysis

The main purpose of this study was to develop a model using artificial neural networks that can predict employee satisfaction with remote work. The output of the previous step was to identify drivers and constraints that affect em-ployee satisfac-tion with the remote work which are work-life balance, job satisfaction, and institu-tional and tech-nological support (as the drivers) and perceived limited communica-tion (as a constraint). At this stage, using the artificial neural network model, we try to identify the im-portance of each of these variables in determining chang-es in em-ployee satisfaction. MLP was used to develop a model for predicting employee sat-isfaction. The first step in the MLP model is to identify the optimal number of hid-den layer neurons. In the present study, the model was run three times and each time with the number of neurons, 2, 3, and 4, respectively, and then the error rate of each model

Table 5: Hypotheses test results

	Hypotheses	Estimates	P-value	Standardized estimates	Result
Drivers	H1: Work-life Balance→ Employee Satisfaction	0.472	0.023	0.417	Confirmed
	H2: Job Satisfaction→ Employee Satisfaction	0.298	0.004	0.312	Confirmed
	H3: Institutional and Technological Support→ Employee Satisfaction	0.473	0.000	0.425	Confirmed
Constraints	H4: Perceived Limited Communication→Employee Satisfaction	-0.392	0.035	-0.356	Confirmed
	H5: Perceived Cost→ Employee Satisfaction	-0.342	0.072	-0.330	Not confirmed
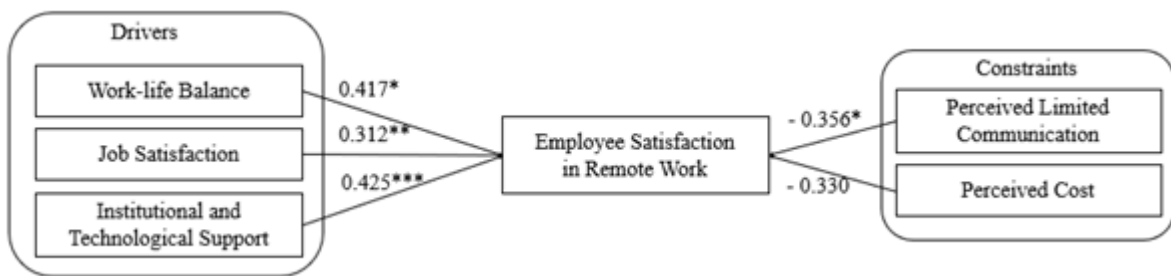
Figure 3: Test result of the proposed conceptual model of the pre-sent study

Table 6: RMSE for different numbers of neurons in the hidden layer

Factors	Neurons	RMSE	
		Training	Testing
Work-life Balance	**2**	**1315**	**1108**
Work-life Balance	3	3161	1529
Work-life Balance	4	1715	1410
Job Satisfaction	**2**	**1147**	**1953**
Job Satisfaction	3	2552	2269
Job Satisfaction	4	3124	2467
Institutional and Technological Support	**2**	**1575**	**1346**
Institutional and Technological Support	3	1677	1400
Institutional and Technological Support	4	3564	2621
Perceived Limited Communication	**2**	**1737**	**1465**
Perceived Limited Communication	3	3018	1613
Perceived Limited Communication	4	1749	1851

Table 7: Sensitivity analysis results

Factors	Normalized Importance
Work-life Balance	1,000
Institutional and Technological Support	0.642
Job Satisfaction	0.365
Perceived Limited Communication	0.259

was compared using RMSE. Table 6 shows that the proposed model of this study to predict employee satisfaction with 2 neurons in the hidden layer has the highest level of accuracy (i.e., the lowest error rate).

Variables whose effect on employee satisfaction was confirmed in the previous step (Which are work-life balance, job satisfaction, institutional and technological support, and perceived limited communication) are considered as MLP model in-puts. The MLP model used in this study has three levels including input layer with four neurons (that are four input variables), a hidden layer with two neurons, and an output layer with one neuron (that is the dependent variable which is the same as employee satisfaction).

The output of the MLP model is presented in Table 7. In this table, the variables are sorted based on their importance in determining the changes in employee satis-faction. Findings of this study illustrate that work-life balance has the greatest im-pact on determining employee satisfaction changes, followed by institutional and technological support, job satisfaction, and perceived limited communication are respectively effective in predicting employee satisfaction with remote work.

5 Discussions

A review of the literature led the present study to hypothesize that three ante-cedents as drivers of employee satisfaction with remote work are work-life balance, job satisfaction, and institutional and technological support. Findings of this study confirm the importance of the role of work-life balance in increasing employee sat-isfaction with remote work. The remote work allows employees to be more effective in playing their roles in personal life (Franken et al., 2021; Grant, 2021; Stevens, 2017) and on the other hand, this flexibility in the workplace has also increased their productivity (Malik et al., 2016), which ultimately leads to balance employees work-life (Franken et al., 2021; Grant, 2021; Stevens, 2017). Rani and Mariappan (2011) and Kim and Ryu (2017) have also shown that work-life balance increases employee satisfaction, and the findings of the present study are consistent with these findings. Confirmation of the second hypothesis of

the present study indicates that the level of job satisfaction of employees also affects their level of satisfaction with re-mote work. In other words, remote work has increased the employees' satis-faction with their work, which in turn has increased their satisfaction with the remote work, which is consistent with findings Grant (2021) and Țălnar-Naghi (2021). The findings also confirmed the importance of in-stitutional and technological support for remote work be-cause remote work affects work processes and poses new chal-lenges for employees in the way they perform tasks. The present study showed that if there is the necessary or-ganizational support to meet the challenge, it will increase employee satisfaction in remote work, which is in line with the findings of Eom et al. (2016).

On the other hand, in this study, perceived limited communication and per-ceived costs were considered as factors that have the potential to affect employee satisfac-tion with remote work and reduce employee satisfaction. The current study provides quantitative empirical evidenc-es illustrating that employees believe that remote work limits their socialization opportunities with their co-work-ers, and this reduces their satisfaction with remote work. In general, the importance of informal relationships and in-formal networks in organizations has been discussed in the or-ganizational behavior management literature, and this finding was predictable and in line with findings Mokhtar-ian and Salomon (1997) and Pérez et al. (1997). How-ever, the present study failed to provide evidence to support the fifth hypothesis, and this may be because most employees have the necessary equipment to work remotely (such as PC access, stable Internet, etc.). Therefore, they do not ex-pect re-mote work to impose a remarkable additional cost on them, as if remote work gives them the opportunity to be able to save money and time spent shuttling to work.

6 Conclusion and Implications of the Findings

Remote work is not new, but after the outbreak of the coronavirus, many organ-izations were forced to ex-perience remote work. This epidemic has brought many changes not only in the daily lives of human beings, but also in the way tasks are done in business, and it is ex-

pected that these changes will continue in the post-Covid period. One of these changes could be the continuation of RW (either fully or partially remote). The human resources of the organizations are at the fore-front of this transition to RW, so it is necessary to optimize the working conditions of RW in order to increase the commitment and motivation of employees. Therefore, the present study tried to identify the factors affecting employee satisfaction with remote work, to provide a predictive model that allows managers to manage the quality of work and increase work commitment and employee motivation. The findings of this study revealed that work-life balance, institutional and technological support, job satisfaction, and perceived limited communication are the most influ-ential factors on employee satisfaction with remote work, respectively. The findings of this study contribute to the RW literature as well as employee satisfaction. This study provides a basis for future research as well as guidance for KBO managers for remote work management, which are provided below.

6.1 Theoretical implications

The main contributions of this study are Figure 2 and Table 7. Figure 2 shows the conceptual model of the research in which the relationships expressed in it have been confirmed by quantitative empirical evidence and Table 7 shows the im-portance of each of the independent variables (i.e., driving forces and constraints of employee satisfaction) in determining the behavior of the dependent variable (i.e., employee satisfaction with remote work). This proposed conceptual model contrib-utes to the literature on employee satisfaction, organizational behavior man-age-ment, and remote work.

Another innovation of this research is the use of SME-ANN method to identify the factors that predict employee satisfaction with RW. In this method, first the fac-tors affecting employee satisfaction with RW were identified and then using the neural network model, their importance in predicting employee satisfaction was calculated. The findings of this study show that work-life balance, job satisfaction, institutional and technological support, and perceived limited communication are the factors that are effective in determining employee satisfaction with RW, respec-tive-ly. Confirmation of the first hypothesis (i.e., H1), which indicated the effect of work-life balance on employee sat-isfaction with RW, shows that RW has been able to create a balance between work and life, and this balance causes employee satis-faction with RW.

The second hypothesis of this study, which examined the effect of job satisfac-tion on employee satisfaction with RW, was also confirmed. This means that the more satisfied the employees are with their job, the higher their satisfac-tion with the remote work, and this factor as a motivating factor for employees' satisfaction with the remote work. It

is also confirmed that institutional and technological sup-port is another driver of employee satisfaction with RW (i.e., H3). This finding implies that if employees received the organization's support to deal with the dynamics of the tasks in the remote work, it increases their satisfaction with RW.

It was also found that perceived limited communication has a negative effect on employee satisfaction with re-mote work. This finding is also consistent with find-ings of Pérez et al. (2002), where he shows that perceived limited communication influences employees' decision to accept remote work. However, the present study failed to provide evidence that perceived costs can affect their satisfaction with re-mote work. This may be because the difference between the costs of remote work and work at workplace for the participants in this study was not large enough to affect their decision and their level of satisfaction.

6.2 Managerial implications

The Covid 19 Pandemic pushed most firms to move to remote work, and it is projected that many enterprises will continue to use remote work in some capacity. Identifying the drivers and constraints of employee satisfaction with RW may therefore give managers suggestions to better manage this transition. This research presents quantitative empirical evidence that work-life balance is a predictor of em-ployee satisfaction with RW. Employees are more flexible in remote work and in addition to being able to perform their duties, they can also take care of their family affairs. Receiving emotional support is one of the effective factors in accepting re-mote work by employees (Franken et al., 2021) and in this study, its effect on the satisfaction of remote work has been confirmed. It is also disclosed that job satisfac-tion is another driver of employee satisfaction and by increasing the job satisfaction of employees, organ-izations can also increase their satisfaction with RW.

Remote work requires not only the use of new devic-es, technologies, and soft-ware; there is also a need for managers and supervisors in the workplace who can help employees resolve ambiguities and problems created by task dynamics. This study provides evidence that the existence of institutional and technological sup-port in RW increases employee satisfaction with RW. It is also found that employ-ees' chances of communicating with cowork-ers and social interactions in general are reduced by RW, and if they cannot find a suitable alternative to meet their social needs (for example, with family and friends), they feel lonely and isolated, which influences their satisfaction with RW.

Conflicts of Interest: "The authors declare no conflict of interest."

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Gonila in omejitve zadovoljstva zaposlenih z delom na daljavo: Empirična analiza

Ozadje/namen: Epidemija Covid-19 je mnoge organizacije prisilila k opravljanju dela na daljavo, ta trend pa naj bi se nadaljeval tudi kasneje v obdobju po epidemiji. Zaposleni v organizaciji so v središču prehoda na delo na daljavo, zato je prepoznavanje dejavnikov, ki vplivajo na zadovoljstvo zaposlenih z delom na daljavo, zelo pomembno za organizacije. Glavni cilj raziskave je, z uporabo inovativne metode, identificirati in prednostno razvrstiti dejavnike, ki vplivajo na zadovoljstvo zaposlenih z delom na daljavo.

Metoda: V prvi fazi te študije je bil, s pomočjo literature, zasnovan konceptualni raziskovalni model. V naslednji fazi je bil predlagan konceptualni model raziskave, ki je bil testiran z modeliranjem strukturnih enačb. Nato smo, z uporabo modela umetne nevronske mreže, identificirali pomen vsake spremenljivke modela za napovedovanje zadovoljstva zaposlenih z delom na daljavo.

Rezultati: Ugotovitve raziskave so pokazale, da so ravnotežje med poklicnim in zasebnim življenjem, institucionalna in tehnološka podpora, zadovoljstvo pri delu in omejena komunikacija, dejavniki, ki vplivajo na zadovoljstvo zaposle-nih z delom na daljavo. Prvi trije dejavniki so dejavniki zadovoljstva zaposlenih, zadnji dejavnik (tj.

omejena komunikacija) je omejitev zadovoljstva zaposlenih z delom na daljavo, ki statistično značilno negativno vpliva na zadovoljstvo zaposlenih z delom na daljavo.

Zaključek: Ta študija je pokazala, da bi se morale organizacije osredotočiti na procese in strategije za izboljšanje ravnotežja med poklicnim in zasebnim življenjem zaposlenih, zagotavljanje institucionalnih in tehnološko podporo pri delu na daljavo ter povečati zadovoljstvo pri delu, da bi

dvignile stopnjo zadovoljstva svojih zaposlenih pri delu na daljavo. Zaznana omejena komunikacija je dejavnik, ki povzroča znižanje stopnje zadovoljstva zaposlenih pri delu na daljavo.

Ključne besede: *Delo na daljavo, Zadovoljstvo zaposlenih, Modeliranje strukturnih enačb, Večplastni perceptron, Umetna inteligenca, Umetna nevronska mreža, Pandemija Covid-19*

Corporate Social Responsibility Promotes Organisation Citizenship and Pro-Environmental Behaviours: The Employee's Perspective

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Background: Organisations in the contemporary workplace lack meaningful work and life, resulting in psychological and physical pain for workers. Employees seek organisations that align their daily work activities with society. Partially limited research exists on the relationship between corporate social responsibility (CSR) and employee work-related attitudes, especially with the mediating mechanism of employee work meaningfulness (EWM) and organisation identification (OID) in developing country contexts such as Pakistan. This study has used Social Learning Theory (SLT) and Social Identification Theory (SIT).
Methods: Data were collected through a sample of 154 employees in two waves from multiple sectors in Karachi, Pakistan, using non-probability, purposive sampling. The PLS-SEM, along with IBM-SPSS, was run for data analysis.
Results: The results demonstrated that Corporate social responsibility (CSR) has a significant positive relationship with employee work-related attitudes. CSR affects organisational citizenship behaviour (OCB) and pro-environmental behaviours (PEB) through the mediation mechanism of employee work meaningfulness (EWM) and organisational identification (OID).
Conclusion: This study contributes to the nascent literature by establishing that EWM and OID mediate the effect of CSR on OCB and PEB. Furthermore, this study utilizes two primary theoretical lenses and provides a novel contribution to the current literature. Finally, this study provides valuable insights to policymakers, businesses, and society.

Keywords: Work-Related Attitudes, Corporate Social Responsibility (CSR), Employee Work Meaningfulness (EWM), Organisational Citizenship Behaviour (OCB), Pro-Environmental Behaviours (PEB)

1 Introduction

In a 2020 survey by LinkedIn, 64% of respondents said that they would not work for a company that did not have strong social and environmental commitments. By demonstrating a commitment to Corporate Social Responsibility (CSR), businesses can differentiate themselves from competitors and attract talented employees who share their values. Given the current level of competitiveness and staff turnover, CSR is essential in all corporate sectors (Montani et al., 2020). Indeed, literature shows that CSR has a positive impact on employee work-related attitudes, such

as job satisfaction, organisational identification (OID) (de Roeck & Delobbe, 2012), organisational citizenship behaviour (OCB), and work engagement (Glavas & Piderit, 2014). Thus, employees who believe their firms are socially responsible are more likely to contribute positively to the environment.

Although a great deal of research has examined the macro-level impacts of CSR, only a few attempts have been made and partially limited attention has been paid to the micro-level impacts of CSR on the attitudes and behaviours of employees (Afsar et al., 2020b). Moreover, previous research on the association between CSR and OCB has been contradictory, with significant and negligible findings (Fu et al., 2014; Supanti & Butcher, 2019; Youn & Kim, 2022). Such inconsistencies imply that interactions are complicated and may be influenced by situational and mediating factors (Sen & Bhattacharya, 2018). However, the fundamental mechanisms that link CSR to OCB are still being researched to know their causes and intervening mechanisms.

Despite its significance, empirical results have also shown that employee attitudes and behaviour are improved when CSR initiatives are implemented (Tian & Robertson, 2019a). However, only partially limited research has examined how CSR influences pro-environmental behaviours (Cheema, Afsar, Al-Ghazali, et al., 2020). For this reason, this notable shortcoming brings an avenue for us to address this gap through the current study by examining the impact of CSR on the pro-environmental behaviour (PEB) of employees. In addition, considering the call for research to study the mediation mechanism of OID (de Roeck & Delobbe, 2012), this study attempts to provide a better understanding. Therefore, this study aims to assess OID as a mediating mechanism in the effect of CSR on OCB and PEB because employees who identify more strongly with their employer are more responsible for environmental issues.

Moreover, organisations are now facing the problem of modern workplaces, which have destroyed meaningful work and life, causing psychological and bodily suffering among people (Bailey et al., 2019). Employees increasingly seek meaningful work activities that allow them to show compassion to their coworkers and society. One's sense of self-worth and esteem is enhanced when one engages in meaningful employment that positively impacts the individual and the greater community (Steger, 2019). On account of the mounting demand for meaningful work (MW) and quality of work life (QWL) in today's stressful work environment, meaningfulness is projected as the central mechanism that propels CSR to produce prolific employee outcomes (Kim et al., 2018; Nazir & Islam, 2020a). Therefore, this study strives to fill the gap in existing literature by analyzing the micro-level relationship between CSR and employee work-related attitudes (Afsar et al., 2020b). the research setting of this study is Pakistan

– a third-world nation. The finding would help increase non-obligatory, discretionary, volunteer actions and citizen behaviours of workers at work (Tian & Robertson, 2019b). Specifically, this study tries to find the answer to the following questions: Is there any link between CSR, OCB, PEB, EWM, and OID? Do EWM and OID mediate the effect of CSR on OCB and PEB?

1.1 Need for the Study

This research contributes to the nascent literature by addressing important research gaps. Firstly, most CSR is primarily studied at the macro level (i.e., institutional or organisational outcomes) (Xu & Woo, 2022). However, there is minimal research adopting an individual level of CSR. For example, Onkila and Sarna (2021) conducted a systematic literature review which showed a lack of understanding of how employees can initiate and drive organisational sustainability changes. Also, previous studies primarily focused on top-down management approaches, portraying employees as mere implementers of organisation-level policies. Hence, there is a need for future research to explore questions such as the enabling factors for bottom-up actions by employees, the challenges associated with such activities, and the influences on employees' ability to act on CSR initiatives. Additionally, the author suggests examining successful narratives and stories related to bottom-up CSR action within organisations.

Importantly, it has also been suggested by Aguinis and Glavas (2019) to examine micro-foundations of CSR at the micro-level, especially to know the effect of CSR on employee-level outcomes. By responding abovementioned call, our research examines the role of CSR on employee work-related attitudes. Secondly, this study offers an empirical insight into the relationship between OCB and PEB by presenting a novel combination while mediation of EWM and OID (Nazir & Islam, 2020b). Cheema, Afsar, Al-Ghazali, et al. (2020) have also suggested that to generalise the findings, data from industries other than manufacturing should be collected. Thirdly, the link between CSR, OCB, and PEB, as well as the mediating role of EWM and OID, is an under-researched aspect in the existing literature. Finally, to explain a CSR, OCB, and PEB model, this study utilizes two primary theoretical lenses: social identity theory and social exchange theory, for novel contributions to the current literature.

2 Literature Review

2.1 Corporate Social Responsibility (CSR)

The roots of the social aspect of corporate conduct can be traced to the ancient Roman legal system, which was adopted by English Law and incorporated into academic, municipal, and religious institutions during the Middle Ages (Chaffee, 2017). In the 16th and 17th centuries, corporations were regarded as a tool for promoting social progress. Early on, the term "social responsibility" was used to describe private companies' obligations to society beyond just making money from selling their products (Davis, 1960). Later, in 1991, (Wood, 1991) defined three dimensions of CSR, including legitimacy (institutional level), public responsibility (organisational level), and managerial discretion (individual level). In the same year, (Carroll, 1991) incorporated the stakeholders' view of the CSR concept.

Previously, CSR research was mainly undertaken at the organisational level. More recently, micro–level studies to examine CSR effects have started and have been favourably associated with employee performance commitment, organisational citizenship behaviour (Islam et al., 2022), employee relationships, and engagement (Ali Ababneh et al., 2021). However, despite several studies at the micro-level, it is still unclear how and why CSR influences employees, 2008). One possible explanation for this could be that CSR is often consolidated and heavily reliant on evaluations carried out by individuals or organisations outside the company. For example, visible CSR initiatives (such as philanthropy and charity) may influence these rankings, but internal actions which are invisible to the public may be overlooked. Thus far, it is evident that the CSR topic is broad and challenging to define precisely (Islam et al., 2022). For this study, CSR will be operationalised as a business approach that involves a company's voluntary actions and initiatives to improve its social and environmental impact beyond legal and regulatory requirements (Marco-Lajara et al., 2022). This research will examine employee perceptions of an organisation's CSR initiatives in light of the above.

The recent literature shows that an organisation's CSR activities influence relationship quality (Y.-K. Lee et al., 2012), employee commitment (Mory et al., 2016), employee engagement (Farid et al., 2019), PEB (Cheema, Afsar, Al-Ghazali, et al., 2020), employee citizenship behaviour (Youn & Kim, 2022), and organisational performance (Luo & Qu, 2023; Ma et al., 2023). Moreover, the literature also shows the mediation of servant leadership (Murtaza et al., 2021), green practices (Suganthi, 2019), transformational leadership (Deng et al., 2022), EMW (Nazir & Islam, 2020a; Supanti & Butcher, 2019), OID (Brammer et al.,

2015; Cheema, Afsar, & Javed, 2020) in the relationship between CSR and PEB. Similarly, the literature also shows that affective commitment (Ahmad et al., 2020; Knezović & Smajić, 2022), organisational justice (Farid et al., 2019), job satisfaction (Kunda et al., 2019), EWM (Bailey et al., 2019), OID (Jones, 2010) in the relationship between CSR and PEB. Considering the literature discussed above, it can be observed that the effect of CSR on various variables has been assessed separately with different mechanisms in various contexts. However, a comprehensive model assessing competing mechanisms of EWM and OID to explain the effect of CSR on OCB and PEB is rare.

The existence of a company increasingly depends on its ability to adhere to environmental standards, promote regional development, and defend the rights of its employees (Ali Ababneh et al., 2021). CSR may be a prerequisite for economic progress. Thus, if social responsibility is accepted, both company and our society may achieve the benefits because CSR metrics primarily depend on external stakeholders' assessments. As a result, visible CSR initiatives (such as philanthropy and charity) may influence these rankings, whereas internal actions that are invisible to the public are often overlooked. Thus far, it is obvious that the CSR topic is broad and challenging to define precisely (Islam et al., 2022). This research will examine employee perceptions of an organisation's CSR initiatives in light of the above.

2.2 Underpinning Theory

This study uniquely uses Social Exchange Theory (Homans, 1958), Social Identity Theory (Tajfel & Turner, 2004) as an underpinning theoretical framework explaining the mechanism of the relationship of CSR with OCB and PEB. Routinely, previous studies have frequently used Social Exchange Theory (Shah et al., 2021; Supanti & Butcher, 2019), Social Identity Theory (Cheema, Afsar, Al-Ghazali, et al., 2020; Choi et al., 2020), ASA Theory (SCHNEIDER, 2010), Stakeholder Theory (Brown & Forster, 2013; Pfarrer, 2010) and Self-Determination Theory (Li et al., 2021; Nazir et al., 2021) to explain the outcomes of CSR for an organisation. Social exchange theory assumes that people are motivated by self-interest and that their behaviour is influenced by expecting positive results while avoiding negative ones (Homans, 1958). The theory has been applied in various fields, such as family studies (Nakonezny & Denton, 2008), organisational behaviour (Montani et al., 2020), and social work (Specht, 1986). Moreover, Social Identity Theory is a psychological theory that explains how individuals derive their sense of identity and self-esteem from their social group membership. This theory suggests creating shared goals and increasing intergroup contact fosters positive intergroup relations, reduces stereotypes and promotes mutual understanding (Tajfel &

Turner, 2004). The social identity theory has been influential in various fields, including organisational behaviour (He et al., 2019) and intercultural communication (Lauring, 2008).

2.3 Hypotheses Development

2.3.1 Corporate Social Responsibility and Organisational Citizenship Behaviour

CSR initiatives are designed to encourage a sustainable environment and meaningful social development. When employees think their employers are addressing environmental and social needs, they participate in OCBs for the environment, which CSR drives as a pro-environmental force (Afsar et al., 2020b). Thus, employees like to join socially responsible corporations, which act as an employee-perfect social group. It will change their identity from individual to group, motivating them to do activities that strengthen their and the organisation's position. Social exchange theory helps to understand the link between CSR and OCB (Bierstedt & Blau, 1965). Studies showed that companies that engage in CSR initiatives to improve the society and ecological environment motivate their workers to become more attached to their sustainability goals and show some volunteer behaviours other than their required job tasks (Cheema, Afsar, & Javed, 2020; Islam et al., 2022; Tourigny et al., 2019). Thus, CSR can act as a catalyst for three components of OCB among employees: eco-civic engagement (participation in corporate environmental programs), eco-initiatives (suggesting innovative ways to enhance the ecological environment), and eco-helping (inspiring and assisting colleagues in participating in green behaviours), based on these reasons, the following hypotheses are formed:

H1. Employees' perception of CSR positively influences their OCB.

2.3.2 Corporate Social Responsibility and Pro-Environmental Behaviours

CSR is becoming more significant in studying organisational behaviour and organisational psychology (Afsar et al., 2020a). Research shows that CSR influences employees' pro-environment activities, including presenting and implementing ideas aimed at minimizing the environmental impact of the organisation, generating green goods, recycling, and criticizing unsafe practices. Similarly, an individual's views on the CSR strategy of their firm affect their intent to engage in pro-environmental conduct. Additionally, CSR fosters the growth of personal pro-environmental values and their transformation into pro-environmental actions (Xu & Woo, 2022).

Employee relationships influence pro-environmental habits. Afsar and Umrani (2020a) suggest coworkers' socially responsible behaviour influences employees. When existing workers demonstrate and encourage pro-environmental actions, new employees react to social signals and participate in similar behaviours. On the other hand, when workers see their employer's lack of social responsibility, they will also refrain from the pro-environmental activity. This demonstrates that CSR activities promote PEB among employees in a supportive culture. Thus, this study hypothesized that:

H2. An organisation's CSR positively affects employees' PEB.

2.3.3 Work Meaningfulness as a Mediator

Meaningfulness refers to a phenomenon in which workers feel "important, helpful, and valuable—as if they contributed something and were not taken for granted" (Kahn, 1990). Meaningfulness is the new money for an organisation seeking enhancement in its bottom line. Work meaningfulness is classified into three forms in the literature depending on job orientation. First, employees feel work meaningfulness when their primary employment objective is achieved, i.e., materialistic physical rewards like job stability (Shanahan, 1987). Second, employees also feel work meaningfulness when their primary work focus is career-oriented, such as pursuing promotions.

Moreover, employees also experience EWM when their work exhibits a "calling" orientation when they believe. They are contributing to the betterment of the world (Aguinis & Glavas, 2019). Employees help organisations to perform better when they feel their job is meaningful (Aguinis & Glavas, 2019; Mirvis, 2012). Work design and performance management systems mostly collect and assess workers' first two job orientations: job and career, thus ignoring the "calling" (Xie et al., 2019). Management techniques trigger employee disengagement and disappointment by avoiding the emphasis on calling orientation (Lysova et al., 2019).

This research focuses on the calling orientation of meaningfulness. It posits that workers may derive meaning in addition to their job and career when they work for socially responsible firms that they believe are making a difference in their community. The literature on meaningfulness refers to this form of meaningfulness as "meaningfulness at work". Meaningfulness at work is a critical psychological process demonstrating how workers develop a sense of connection and belonging to a business (Nazir & Islam, 2020a). In other words, it is a subtle process that solidifies workers' social identification with their colleagues and the firm (Fletcher & Schofield, 2021). However, there is a dearth of knowledge on why and how it arises (Lysova et al., 2019). Even when job functions are not directly related to a humane cause, the CSR activities fulfil workers'

calling orientation since employees' experience meaningfulness at work' due to their firm's commitment to a greater social cause (Aguinis & Glavas, 2019). The "reciprocity" notion of the social exchange theory suggests that the employees return the same generous conduct toward the organisation if they perceive the corporation as fair, caring, and kind (Bierstedt & Blau, 1965). This connection culminates into trust, dedication, and commitment over time. In other words, members develop a strong connection with their organisation due to their improved attitudes (Montani et al., 2020). Hence, the most crucial mode of repayment to their organisation is a modification of their positive behavioural outcomes, such as OCB and PEB. Thus, we hypothesize that;

H3. EWM mediates the relationship between CSR and OCB.

H4. EWM mediates the relationship between CSR and PEB.

2.3.4 Organisational identification as a Mediator

OID is "an employee's perceived affinity for and experience sharing with an organisation to which he or she belongs and in which his or her identity is explained in terms of group characteristics" (Jones, 2010). The importance of organisational identity has been extensively established in the literature on CSR (Korschun et al., 2014). Moreover, CSR affects various workers' discretionary and non-obligatory actions through OID (Farooq et al., 2017). For example, firms nowadays want their employees to adopt sustainable and energy-conserving practices of improving the natural world and promoting environmental sustainability (Abbas et al., 2022).

According to the social identity approach, "incorporating personal beliefs with corporate principles strengthens the identity and self-concept of employees (Islam et al., 2022). The main concept behind social identity theory is that an individual's inclination to behave in a certain way for group identity is based on how much they associate themselves with that particular social group (Ellemers et

al., 1997). Individuals are more likely to feel a sense of belonging to an organisation when its ideals match their own (Cheema, Afsar, Al-Ghazali, et al., 2020), when individuals perceive their workplace unique, prestigious and responsible, their sentiments of respect, pride, and worthiness significantly result in innovative work behaviours and self-worth (Brammer et al., 2015).

Employees join organisations that strongly focus on environmental and social CSR activities. Workers with a deep connection with the business work more dedicatedly to enhance their positive self-image inside the firm (Jones, 2010). When individuals identify with an organisation, they tend to engage in beneficial behaviours for the organisation and its members. These acts may include assisting colleagues and other individuals within the organisation, contributing novel and innovative ideas to creative projects, protecting the company against external threats, and regularly sharing information with others (de Roeck & Delobbe, 2012; Farooq et al., 2017).

According to social identity theory, OID mediates CSR and PEB (Tajfel & Turner, 2004). Numerous studies have shown a link between OID and PEB. Sorour et al. (2021a) revealed a favourable effect of CSR on organisational identity. According to Jones (2010), organisational identity and CSR are linked, and this connection is mediated by employee pride. Similarly, CSR affects workers' attitudes and actions in proportion to how they perceive and assess them. As a result, workers' perceived CSR motivates them to engage in the pro-environmental activity. Existing literature shows that organisational identity mediates the relationship between CSR and pro-environmental activities. (Afsar et al., 2020b, Cheema et al. 2020). Hence, we propose the following hypotheses:

H5. OID mediates the relationship between CSR and OCB.

H6. OID mediates the relationship between CSR and PEB.

2.4 Conceptual Framework

Figure 1: Conceptual Framework

3 Method

3.1 Sample and Procedure

We employed purposive sampling techniques (Saunders et al., 2019) to collect. This study adheres to a previously stated research approach in CSR and employee relationships to get reliable findings and compare them to past studies. It uses a positivist approach, a quantitative research design, such as a survey, as the most suitable research method for this study to investigate the causation between predictor and criterion variables (Turker, 2008).

Data were collected from multiple sectors in Karachi, Pakistan, including the automobiles and textile industries, chemicals and fertilizers, fast-moving consumer goods, energy and petroleum, as they are the top five sectors in Pakistan. This was in line with the previous research on CSR conducted in different sectors and SMEs such as hotels, banking, retail, telecommunications and automobile (Ali Ababneh et al., 2021; Schlipfenbacher, 2021). Most of these organisations have implemented CSR initiatives to balance their negative impact on society and fulfil legal requirements.

This study employed two-wave purposive sampling techniques (Saunders et al., 2019). In the first wave, in September 2021, we distributed 200 questionnaires comprising CSR, OID, WM, and control variables. In the second wave, in October 2021, individuals responded to questions related to OCB and PEB. The questionnaire link was emailed to people working in the selected economic sectors in Karachi, Pakistan. The respondents filled out the questionnaires anonymously. In each wave, the participants were asked to provide their email addresses and create a code comprising their initials and birthday month. These codes were used to pair the responses collected in two waves. We received 154 responses at the end of the second wave (with a 78.5 % response rate). The two-wave data collection reduced the possibility of common methods and self-report bias (Jordan & Troth, 2020). The data collected was analysed using two steps: partial least squares, structured equation modeling (PLS-SEM). First, reliability and validity of the items and constructs in the model. Next, the proposed explanatory power and hypotheses were assessed (Hair et al., 2019).

3.2 Measurement Scales

All measurement scales in this study were adopted and adapted from existing literature (See Table 2). The items were rated on a 5-point Likert scale that ranged from 1 (strongly disagree) to 5 (strongly agree).

4 Results

4.1 Sample Profile

Data was collected from 154 respondents, with the majority of males found in the data (55.8%, n = 86 males and 44. %, n = 68 females). The sample was majority comprised of ages between 18 – 28 yrs. (72.1%, n = 111) then 29 – 39 yrs. (26.6%, n = 41), while none of the surveyed respondents was aged above 51 years. The majority of the participants held doctoral degrees (50.6%, n = 78), while 40.9% (n= 63) were having master's degree, 7.8% (n = 12) were having other degree and only 0.6% (n= 1) having bachelor's degree. Regarding the business sector, most of the respondents working in another sector with 60.4% (n = 93), secondly in FMCG with 26% (n = 40).

4.2 Common Method Bias

Since self-report cross-sectional data was used, we used Harmon's Single Factor test to assess common method bias (CMB). The findings showed that a single factor accounted for only 40% per cent of the variation, assuring the absence of CMB in the data (Jordan & Troth, 2020).

Table 1: Measurement Scales

Construct	Items	Source
Corporate Social Responsibility	6	Turker (2008)
Employee Work Meaningfulness	6	May et al. (2004)
Organisational Citizenship Behaviour	16	K. Lee and Allen (2002)
Pro-Environmental Behaviours	7	Robertson and Barling (2013)
organisational identification	6	de Roeck and Delobbe (2012)

4.3 Measurement Model

The measurement model assessment constitutes an assessment of item reliability, construct reliability, construct convergent validity, and construct discriminant validity. Cronbach alpha (Alpha) and composite reliability have been tested for construction reliability (CR). Cronbach's alpha and composite reliability is commonly used to measure reliability across interiors. The meaning must be more than 0.7 for both (Hair et al., 2019). The inter-item consistency is defined because the values for alpha and CR for all constructs are more than 0.7 in Table 3. The convergent validity of the constructs was assured as the AVE of all the constructs was above 0.5 (Hair et al., 2022). Table 3 shows all the items and constructs' reliability and convergent validity statistics.

To assess discriminant validity, the Fornell–Larcker criteria were used. This necessitated a comparison of AVE square-rooted values with inter-construct correlation. Table 4 shows that all the square-rooted values of AVE are higher than the corresponding inter-construct correlations. Therefore, it implies that all constructs have adequate discriminant validity (Hair et al., 2022).

Table 2: Assessment of Internal Consistency Reliability and Convergent Validity

Construct	Item	Loadings	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Corporate Social Responsibility			0.838	0.849	0.879	0.550
	CSR1	0.620				
	CSR2	0.751				
	CSR3	0.796				
	CSR4	0.751				
	CSR5	0.767				
	CSR6	0.751				
Employee Work MeaningfulnesS			0.961	0.962	0.968	0.836
	EWM1	0.872				
	EWM2	0.915				
	EWM3	0.930				
	EWM4	0.932				
	EWM5	0.932				
	EWM6	0.905				
Organisational Identification			0.898	0.907	0.922	0.664
	OID1	0.783				
	OID2	0.856				
	OID3	0.713				
	OID4	0.856				
	OID5	0.851				
	OID6	0.820				

Table 2: Assessment of Internal Consistency Reliability and Convergent Validity (continues)

Construct	Item	Loadings	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Organisational Citizenship Behaviour			0.943	0.952	0.950	0.547
	OCB1	0.632				
	OCB2	0.764				
	OCB3	0.730				
	OCB4	0.769				
	OCB5	0.854				
	OCB6	0.834				
	OCB7	0.823				
	OCB8	0.789				
	OCB9	0.780				
	OCB10	0.603				
	OCB11	0.702				
	OCB12	0.726				
	OCB13	0.754				
	OCB14	0.805				
	OCB15	0.500				
	OCB16	0.685				
Pro Environmental Behaviour			0.843	0.855	0.881	0.517
	PEB1	0.747				
	PEB2	0.766				
	PEB3	0.691				
	PEB4	0.566				
	PEB5	0.729				
	PEB6	0.716				
	PEB7	0.795				

4.4 Structural Equation Modelling: Hypothetical Analysis

The structural model assessment includes an assessment of collinearity, path coefficient significance, and in-sample predictive power (Hair et al., 2022).

4.4.1 Variance Inflation Factor

As shown in Table 5, VIF values are within the threshold, which says that VIF values should be close to 3 or lesser; in some scenarios, it can be up to 10 (Hair et al., 2019).

4.4.2 Coefficient of Determinations (R2) and Predictive Relevance (Q2)

The coefficient of determination (R2) reflects a model's explanatory power or in-sample prediction power (F. Hair Jr et al., 2014). Cohen (1988a) suggests R2 values of 0.26, 0.13, and 0.02 as large, medium, and small, respectively. As shown in Table 6, the findings reveal a large R2

Table 3: Assessment of Discriminant Validity

Constructs	Corporate Social Responsibility	Employee Work Meaningfulness	Organisational Citizenship Behaviour	Organisational Identification	Pro Environmental Behaviour
Corporate Social Responsibility (CSR)	**0.741**				
Employee Work Meaningfulness (EWM)	0.559	**0.915**			
Organisational Citizenship Behaviour (OCB)	0.674	0.624	**0.74**		
Organizational Identification (OID)	0.682	0.755	0.712	**0.815**	
Pro Environmental Behaviour (PEB)	0.609	0.614	0.687	0.585	**0.719**

Note(s): Diagonal values are the square root of AVE

Table 4: Collinearity Statistics

ConstructS	Employee Work Meaningfulness	Organisational Citizenship Behaviour	Organisational Identification	Pro Environmental Behaviour
Corporate Sociaal Responsibility (CSR)	2.703		2.703	
Employee Work Meaningfulness (EWM)		2.330		2.330
Organisational Identification (OID)		2.330		2.330

Table 5: R2 and Q2 value

Predictor Construct	R^2	Explanatory Power	Q^2
Employee Work Meaningfulness (EWM)	0.310	Moderate	0.273
Organisational Identification (OID)	0.582	Moderate	0.304
Organisational Citizenship Behaviour (OCB)	0.458	Moderate	0.268
Pro Environmental Behaviour (PEB)	0.482	Weak	0.196

(0.355) for EWM, OID R2 (0.485) and organisational citizenship behaviour R2 (0.524), while there is a medium R2 (0.411) for PEB. Q2 values were calculated through blindfolding to assess predictive relevance. Blindfolding is a sample reuse strategy that eliminates any dth data point in the measures of endogenous constructs (Hair et al., 2019). A Q2 value greater than zero suggests predictive relevance for a model's dependent constructs (Hair et al., 2019). Q2 of EWM (0.273), OID (0.304), organisational citizenship behaviour (0.268) and PEB (0.196) demonstrated acceptable predictive relevance.

4.4.3 Direct Effect path coefficients

To approximate the statistical importance of the parameter, the bootstrapping strategy (10,000 subsamples, one-tailed significance) was used. As seen in Table 7, the findings showed that CSR was strongly positively linked to organisational citizenship behaviour (β=0.346, t=3.429), and PEB (β=0.371, t=3.737). Therefore, H1 and H2, were supported.

4.4.4 Indirect Effect path coefficients

The hypothesis of a mediating effect of EWM and OID in the relationship between CSR, organisational citizenship behaviour and PEB were tested using mediation analysis. The indirect effects findings show that CSR has indirect

effect on organisational Citizenship Behaviour (β=0.097, t=1.702) through EWM ; hence, supported H3. While CSR has a significant indirect effect on organisational citizenship behaviour through OID (β=0.230, t=2.523), hence supported H5. Moreover, CSR has an indirect effect on PEB through employee work meaningfulness (β=0.203, t=3.633), but not through OID (β=0.037, t=0.445) hence, supported H4 and H6 as shown in Table 8.

5 Discussion

This study examined the effects of CSR on employee work-related attitudes with a mediating mechanism of EWM and organisation identification. As expected, H1 indicates that CSR is strongly positively linked to organisational citizenship behaviour. Hence our hypothesis H1 is supported. These results findings are consistent with the findings of previous studies (Afsar et al., 2020b; Islam et al., 2022; Jones, 2010), which implies that employees are more likely to engage in CSR activities when they observe that their organisation is fulfilling the social and environmental demand. Employees are more committed and show OCB towards the firms who work on improving society, ecological challenges, social issues, and protecting the natural environment. Employees who associate themselves with social groups will transform their identity from self-identity to collective identity, leading them to participate in activities that strengthen organisations and one's status.

Table 6: Results of hypotheses testing (direct effect)

	Path Coefficient	Standard Deviation	t-statistics	p-values	Decision
H1 - CSR -> OCB	0.346	0.101	3.429	0.000	Supported
H2 – CSR -> PEB	0.371	0.099	3.737	0.000	Supported

Note(s): p < 0.05 (Hair et al., 2017); CSR-Corporate Social Responsibility; EWM-Employee Work Meaningfulness; OID-Organisational Identification; OCB-Organisational Citizenship Behaviour; PEB-Pro Environmental Behaviour.

Table 7: Indirect Effect

	Path Coefficient	Standard Deviation	t-statistics	p-values	Decision
H3 - CSR->EWM->OCB	0.097	0.057	1.702	0.044	Supported
H4 - CSR->EWM-> PEB	0.203	0.056	3.633	0.000	Supported
H5 - CSR -> OID -> OCB	0.230	0.091	2.523	0.006	Supported
H6 - CSR -> OID -> PEB	0.037	0.084	0.445	0.328	Not Supported

Note(s): p < 0.05 (Hair et al., 2017); CSR-Corporate Social Responsibility; EWM-Employee Work Meaningfulness; OID-Organisational Identification; OCB-Organisational Citizenship Behaviour, PEB-Pro Environmental Behaviour
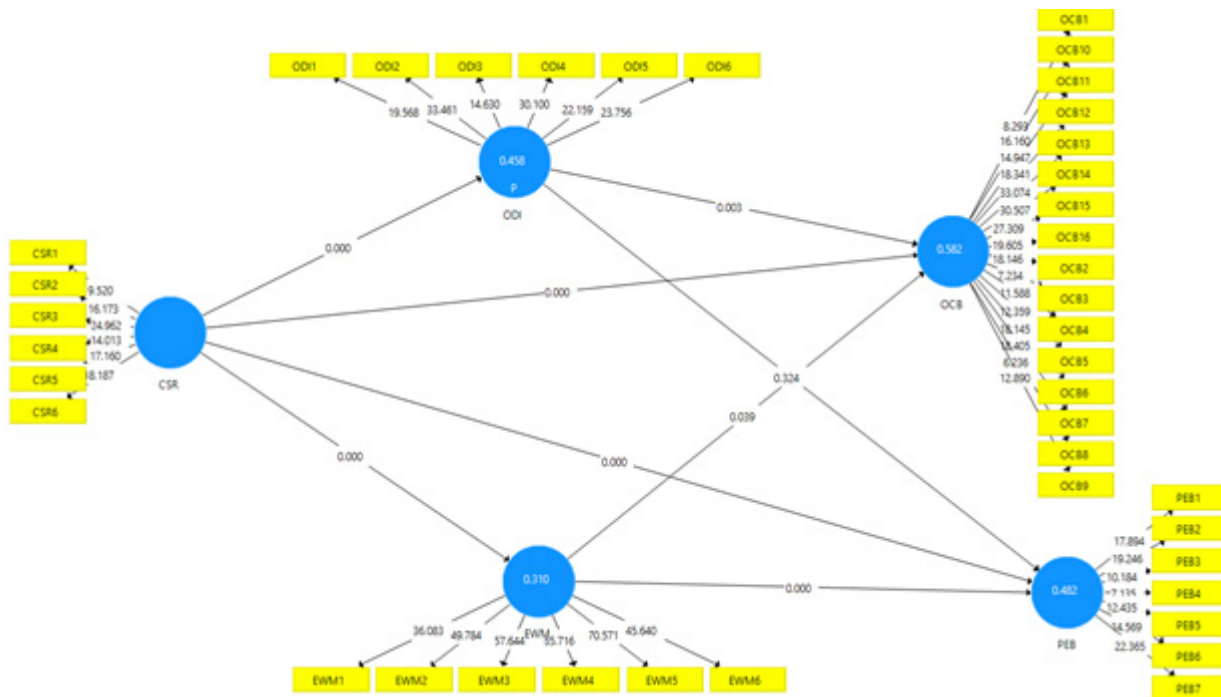
Figure 2: Structural Model (Extracted from SmartPLS 3.0)

The finding of H2 indicates a positive relationship between CSR and PEB. Thus our hypothesis H2 is supported. These findings are similar to the results of (Afsar et al., 2020b; Xu & Woo, 2022), which state that CSR fosters the growth of personal environmental values and their transformation into pro-environmental actions. In addition, it has been observed that if organisations demonstrate CSR and reward pro-environmental actions, new employees react to social signals and participate in similar behaviours. In addition, firms prioritising environmental and societal CSR efforts appeal to workers and are more inclined to affiliate with such organisations (Brammer et al., 2015; de Roeck & Delobbe, 2012).

The findings of H3 and H4 suggest that EWM mediates a positively significant relationship between CSR, OCBand PEB. These results are consistent with previous studies findings, which reported that CSR activities fulfil workers' calling orientation even when job functions are not directly related to a humane cause since employees experience' meaningfulness at work' due to their firm's commitment to a greater social cause. In addition, if employees feel their job is meaningful, it will help organisational performance. Also, one of the most important methods for employees to repay their organisation is to modify their views about the organisation and depict them through their attitudes, such as PEB. Thus, due to the improved attitude, employees feel a strong connection towards their organisa-

tion (Aguinis & Glavas, 2019).

Further, this study suggests that OID mediates a significant relationship between CSR and OCB (H5). This finding is in line with the existing literature that CSR affects a variety of workers' discretionary and no obligatory actions through OID (Farooq et al., 2017). However, OID does not significantly mediate the relationship between CSR and PEB (H6). Contrastingly, the previous literature shows a significant role of OID in the relationship between CSR and PEB (Afsar et al., 2020b; Cheema, Afsar, Al-Ghazali, et al., 2020). This difference in findings might seem to be because of the difference in the context of the two studies. Our study was conducted in the manufacturing sector, whereas previous studies showed a significant mediation of OID, which was conducted in the context of the service industry (hotel). Moreover, another conditional variable might be playing their role which needs to be studied in future research.

5.1 Theoretical and Managerial Implications

This study provides several theoretical insights and contributions to the current literature on employee perception of CSR and their work-related attitudes. First, the existing literature shows that CSR and PEB have a posi-

tive relationship (Afsar et al., 2020b; Xu & Woo, 2022). However, the literature rarely discusses how this effect is transmitted through work meaningfulness and OID (Afsar & Umrani, 2020b). This study contributes to the literature by providing an integrated view on the disseminated academic work of CSR, OID and EWM into one conceptual framework to eventually affect organisational citizenship behaviour and PEB of employees (Afsar et al., 2020b; de Roeck & Delobbe, 2012; Nazir & Islam, 2020b; Tian & Robertson, 2019b). This study also contributes to the body of knowledge on CSR literature by examining employee work-related attitudes at the micro-level (Aguinis & Glavas, 2019). Secondly, the results derived from this study support our theoretical arguments for social identity theory (Ellemers et al., 1997), and social exchange theory (Bierstedt & Blau, 1965). Secondly, this study also contributes contextually, as it is conducted in the manufacturing sector of Pakistan, which can be rarely seen in previous studies (Cheema, Afsar, Al-Ghazali, et al., 2020). It tests and validates Western CSR EWM, OID, OCB and PEB instruments in South Asian context.

The findings of this study have significant practical applications. Managers should design meaningful work for their employees by associating some CSR initiatives within their day-to-day tasks, which eventually enhance their OCBand PEB. Today organisations are paying a high significance to employee PEB because they cannot continue their environmental care and social concern without the cooperation of their employees. This study also highlights how to work meaningfulness generated through the CSR of an organisation also leads towards PEB among the employees. Similarly, OCB at the workplace may be encouraged by recognizing and rewarding pro-environmental beliefs and activities. If an individual is being evaluated, it should include the person's own environmental efforts, as well as his or her role in promoting other employees to adopt similar practices. To promote awareness of the organisation's CSR initiatives, employees could be requested to engage in CSR activities like picking up trash or installing sensor fountains for some of the poorest households in the company's neighbourhood. Employee work-related attitudes like OCB and PEB may be improved by training employees to be more environmentally conscious and encouraging them via role modelling (walk through stairs or print on both sides of the page). Additionally, workers should model such habits rather than only advocating for environmentally friendly practices. Employees should be encouraged to develop innovative ideas to reduce energy use and make a more environment-friendly workplace.

6   Conclusion

This study aimed at examining the effect of CSR on employee work-related attitudes. The mediating role of

EWM and OID between CSR and employee work-related attitudes was assessed. A sample size of 154 respondents was selected from multiple sectors in Karachi, Pakistan, for this study. In developing nations such as Pakistan, organisations pay little attention towards CSR concerning employee work-related attitudes. As a result, employees feel less committed towards the organisation because their daily job goals are not meaningfully aligned with society. Thus, it creates psychological and physical pain for the employees and the absence of voluntary behaviours such as organizational citizenship and PEB, which resulted in overall declined organisational performance. Therefore, meaningful employee work and OID are the key factors in developing positive work-related attitudes. This study tested the relationships in the literature and confirmed the association between the given variables. It also provides useful insights to businesses, policymakers and society.

6.1 Limitations and Future Research

The primary drawback of this research applies to the generalizability of the data. This analysis involves a small number of respondents employed at various organisations in Karachi. The analysis may be carried out in the future by collecting data from more respondents and from other sectors in order to provide a broader sample size and to collect more generalized data. Second, we only obtained multi-time data and conducted a causal analysis between pour variables due to the lack of time. There is a suggestion for future research that to verify the influence of CSR activities on organisational citizenship behaviour and PEB, multi-level and multi-source data would need to be obtained. Third, the researcher worked on the link of CSR with OCB and PEB. Future studies should focus on some other employee work-related attitudes such as green employee behaviour, green servant leadership, and turnover intention.

Further, the results in this study related to the mediating role of OID between CSR and PEB are inconsistent with the existing literature. This could be because of the difference in the context of the current study. However, more contextual and conditional factors should be studied in the later studies to assess the moderating effect that might interact with CSR to check different results on PEB. The study conclusion also serves as a roadmap for management in prioritizing synergistic CSR initiatives and projects that focus on improving their employees' morale, organisational citizenship, and PEB.

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Družbena odgovornost podjetij kot spodbuda organizacijskemu državljanskemu vedenju in okoljsko usmerjenem vedenju: Perspektiva zaposlenih

Ozadje: Organizacijam v sodobnem delovnem okolju primanjkuje smiselnosti pri delu, kar pri zaposlenih povzroča različne težave. Ti so namreč naklonjeni delu v organizacijah, ki svoje dnevne delovne aktivnosti usklajujejo z družbeno odgovornimi aktivnostmi. Obstajajo nekatere raziskave, narejene v državah v razvoju kot je Pakistan, ki ugotavljajo povezavo med družbeno odgovornostjo podjetij in odnosom zaposlenih do dela, zlasti s konceptom smiselnosti dela pri zaposlenih in identifikacijo zaposlenih z organizacijo. Ta študija je kot podlago uporabila teorijo socialnega učenja in teorijo socialne identitete.

Metode: Podatki so bili zbrani na vzorcu 154 zaposlenih iz več različnih sektorjev v Karačiju v Pakistanu z uporabo namenskega vzorčenja. Za analizo podatkov smo uporabili SPSS program ter strukturne enačbe.

Rezultati: Rezultati so pokazali, da družbena odgovornost podjetij statistično pozitivno korelira z odnosom zaposlenih do dela. Družbena odgovornost namreč vpliva na organizacijsko državljansko vedenje in okoljsko usmerjeno vedenje prek koncepta smiselnosti pri delu in identifikacijo zaposlenih z organizacijo.

Zaključek: Raziskava zapolnjuje vrzel v literaturi z ugotovitvijo, da smiselnost pri delu ter identifikacija zaposlenih z organizacijo vplivajo na družbeno odgovornost podjetja, organizacijsko državljansko vedenje in okoljsko usmerjeno vedenje zaposlenih . Poleg tega ta študija uporablja dve primarni teoretiki leče in ponuja nov prispevek k sodobni literaturi. Prav tako raziskava nudi dragocene vpoglede oblikovalcem politik, podjetjem in družbi.

Ključne besede: Odnos do dela, Družbena odgovornost podjetij, Delo zaposlenih, Smiselnost, Organizacijsko državljansko vedenje, Okolju usmerjeno vedenje

Appendix: List of Measurement Items

Corporate Social Responsibility

CSR1 Our company implement special programs to minimize its negative impact on the natural environment

CSR2 Our company targets sustainable growth, which considers future generations

CSR3 Our company pays attention to employees' workplace safety.

CSR4 Our company takes care of consumers' interests.

CSR5 Our company pays taxes to governments.

CSR6 Our company never does anything that may be contrary to its moral rules

Organisational Citizenship Behaviour

OCB1 Help others who have been absent.

OCB2 Willingly give my time to help others who have work-related problems.

OCB3 Adjust my work schedule to accommodate other employees' requests for time off.

OCB4 Go out of the way to make newer employees feel welcome in the work group.

OCB5 Show genuine concern and courtesy towards coworkers, even under the most trying business and personal situations.

OCB6 Give up time to help others who have work or non-work problems.

OCB7 Assist others with their duties.

OCB8 Share personal property with others to help their work.

OCB9 Attend functions that are not required but that help the organisational image.

OCB10 Keep up with developments in the organisation.

OCB11 Defend the organisation when other employees criticize it.

OCB12 Show pride when representing the organisation in public.

OCB13 Offer ideas to improve the functioning of the organisation.

OCB14 Express loyalty toward the organisation.

OCB15 Take action to protect the organisation from potential problems.

OCB16 Demonstrate concern about the image of the organisation.

Pro Environmental Behaviour

PEB1 I print double sided whenever possible effort to increase my organisation's environmental performance.

PEB2 I put compostable items in the compost bin.

PEB3 I put recyclable material (e.g. cans, paper, bottles, batteries) in the recycling bins.

PEB4 I bring reusable eating utensils to work (e.g. travel coffee mug, water bottle, reusable containers, reusable cutlery).

PEB5 I turn lights off when not in use.

PEB6 I take part in environmentally friendly programs (e.g. bike/walk to work day, bring your own local lunch day).

PEB7 I make suggestions about environmentally friendly practices to managers and/or environmental committees, in an effort to increase my organisation's environmental performance.

Employee Work-Meaningfulness

EWM1 The work I do on this job is very important to me.

EWM2 My job activities are personally meaningful to me.

EWM3 The work I do on this job is worthwhile.

EWM4 My job activities are significant to me.

EWM5 The work I do on this job is meaningful to me.

EWM6 I feel that the work I do on my job is valuable.

Organisational Identification

OID1 I always like to work with my partners and my supervisors.
OID2 Sometimes I felt it my personal goal to promote the value of my firm.
OID3 When someone criticizes my firm, I feel like a personal insult.
OD14 It would be great if I found some person believing that my firm was a good place to work in.
OD15 I like to work in my firm.
OID6 I felt it fantastic to share my goal with my supervisors.

Interdependence of Nursing Staff Work Engagement, Quality of Workplace Relationships and Patient Safety

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Background and Purpose: Quality within a healthcare system does not comprise only actions defined through certificates or required by law, standards and protocols; it is also defined by the well-being of healthcare workers on the one hand and patients on the other. The purpose paper is to analyse the link between the engagement of nurses and factors related to enhancing patient quality and safety.

Methods: The research involved 206 nursing employees from Slovenia's general hospitals. The questionnaire consists of four sections: employee engagement, the measure of self-efficacy, statements referring to various tools and methods that are used in nursing in daily work and that contribute to the quality of work, interpersonal relationships in the workplace between different professional groups within medical treatment, and attitude towards changes.

Results: Compared to other professions, nursing employees showed an above-average level of engagement. Younger respondents were more engaged in their work, and their self-efficacy level was higher. The frequency of using tools intended to enhance the quality of nursing correlates statistically typically and positively with self-efficacy, engagement and willingness to accept change. The analysed factors are interdependent. Engagement results from workplace interactions; employees who feel better in their workplace will be more oriented towards the future, be more open to innovation, and use various tools and approaches to enhance the work's quality.

Conclusion: Analysed concepts are closely connected and interdependent. The findings are essential for the successful and efficient management of hospitals and for ensuring patient quality and safety.

Keywords: Nursing, Patient, Engagement, Quality, Safety, Self-efficacy

1 Introduction

Every organisation strives to form and develop an environment where employees give their best, are engaged in their work and are committed to their organisation, contributing to its overall success in the process (Davala, 2019). Engaged employees have a sense of energetic and effective connection with their work activities and see themselves as able to deal with the demands of their jobs (Schaufeli, 2013). Healthcare is changing rapidly, which is why employee engagement is extremely important, as it will be the only way to meet the growing healthcare needs (Galuska, 2014); in addition, sustainable development of healthcare organisations depends on the performance of engaged healthcare workers in clinical improvements (Strömgren, Eriksson, Bergman & Dellve, 2016). In recent years, pub-

lic hospitals have had to cope with numerous challenges, including increasing competition and the exponential increase of demand in quantity and quality (Zweifel, 2016; De Simone, Planta & Cicotto, 2018).

Healthcare is a field with a high risk of unwanted events that occur due to illnesses and mistakes made in the treatment process. All this can lead to death, severe defects, complications and suffering for the patient. Although modern healthcare institutions have well-thought-out processes that ensure patient safety, healthcare still lags behind other activities that have introduced systemic safety processes as part of their operations (e.g. aviation). According to some assessments in settings with good traceability of mistakes made in healthcare, as much as 13.5% of patients experience a mistake being made in their medical treatment (the percentage of mistakes in systems with no systemic traceability is even higher). Forty-four per cent (44%) of these mistakes are preventable. Of these preventable mistakes, around 40 out of 1,000 cause serious harm to the patient (Hessels, Weaver, Wurmser, 2019). In 2016, it was estimated in the United States that mistakes relating to medical treatment are the third leading cause of death among patients, as 210,000–400,000 deaths annually relate to mistakes made in healthcare (Hessels et al. 2019). Naturally, Slovenia is not immune to mistakes in healthcare either. Andrej Robida, an expert in healthcare quality and safety, estimates that in Slovenia, every 300th patient dies due to a mistake, every 24th becomes additionally ill, and around 1,000 patients die per year due to a mistake made in medical treatment (Mekina, 2015). According to these estimates, mistakes rank fourth among causes of death, which indicates a major public health concern.

Regarding ensuring safe and high-quality patient treatment, priority handling of these mistakes is necessary, mainly because they are preventable. In preventing mistakes, it is necessary to start with the nature of work in healthcare, where team treatment of a patient and cooperation comprises the basis of functioning, which is why such a team approach is necessary also when judging the causes of mistakes, at the point where both the good and the bad happen to patients (Robida, 2009). Although enhancing the quality and safety of the medical treatment is the domain of all employees, directors of healthcare institutions carry the most significant responsibility. To sum up, the findings of research conducted thus far, the prevailing manner of carrying out healthcare practices will have to be changed into practices (a) that focus on the patient, where (b) evidence-supported medical practice is used consistently, where (c) the work would be carried out in multi-professional and multi-disciplinary teams, where (d) the quality of medical treatment would improve constantly, (e) mistakes in healthcare would decrease, and (f) mod-

ern information technology would be used more efficiently (Skela-Savič & Robida, 2012).

1.1 Quality and safety in health care

Access to high-quality medical care is a fundamental human right laid down in Slovenia in the Patients' Rights Act[1] (ZPacP, 2008). The right to quality and safe healthcare is recognised and valued in the entire territory of the European Union and must be provided to all inhabitants of Europe. Accordingly, patients have a right to expect that every effort is made to ensure their safety (Luxembourg Declaration on Patient Safety, 2005). While this applies to all patients, special care must be given to the most vulnerable groups of patients, such as children (Pajnkihar and Vrbnjak, 2016). Ensuring quality is one of the critical points of modern healthcare systems, including hospitals (Lobnikar and Maze, 2012), and can be measured in many ways, from clinical results to patient satisfaction with the healthcare service.

It should be noted that nursing employees, who have the most contact with patients, are the key link in the chain of quality healthcare services, as they make routine medical and healthcare services are rendered in a high-quality manner, that patients are appropriately monitored, that patient data are entered on time and correctly, that patients get the right medicine and that these are administered at the correct times, and that anxious patients are calmed down (Lobnikar and Maze, 2012). From the patient's perspective, the quality of medical care is based on good communication, coordination of the medical care, uninterrupted treatment, respect for patients' rights and ensuring safety, all of which significantly impact treatment outcomes. Quality medical care ensures treatment outcomes that align with current expertise (Robida et al., 2006). It means consistent achievement of treatment outcomes that are comparable with the standards or best practices while taking into account the following principles of healthcare quality: (a) effectiveness, (b) safety, (c) timeliness, (d) efficiency, (e) equity, (f) patient-centredness. The primary purpose of these principles is to decrease the unacceptable level of variances in treatment outcomes, ineffective or inefficient use of medical technologies, the high price of poor quality, user dissatisfaction, unequal access to health care services, and waiting periods (Robida et al., 2006). Quality in healthcare is not an end in itself; it is not something recognised with certificates or governed by law, standards or protocols; it is also what is felt as good by a healthcare worker (doctor, nurse) on the one hand and service user (patient, payer) on the other (Lobnikar and Zorić, 2020).

Freeney and Tiernan (2009) suggested that facilitators

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[1] Zakon o pacientovih pravicah (ZPacP) [Patients' Rights Act] (2008). Uradni list RS, št. 15/2008. http://pisrs.si/Pis.web/pregledPredpisa?id=ZAKO4281#

of and barriers to engagement centre around six areas of organisational life: workload, control, reward, fairness, community and values. De Simone, Planta and Cicotto (2018) analysed nurses' voluntary turnover as a phenomenon which affects their service quality. Self-efficacy, some agentic capacities (e.g. anticipation and self-regulation), job satisfaction, and work engagement affect nurses' turnover intention; job satisfaction exerted a more substantial effect on turnover intention. Authors (De Simone et al., 2918) found that patient satisfaction was positively correlated with nurses' job satisfaction, work engagement, self-efficacy, self-regulation and anticipation and negatively correlated with nurses' turnover intention. Eman and colleagues (2021), in their study on nurses' work engagement and its impact on job outcomes, report that more than half of nurses are dedicated to their work. They must have the needed resources, supportive environments, and adequate performance feedback to balance work demands and the personal feeling of 'fulfillment', resulting in reduced turnover rates. Contreras, Abid, Govers, and Saman Elahi (2021) explained the mediating role of possibilities for professional development on work engagement in nursing staff. According to their study results, support from colleagues and supervisors influences the work engagement of healthcare personnel.

1.2 Employee work engagement

Engagement is a relatively new concept of human resource management, signifying an employee's emotional, intellectual and cognitive commitment to the organisation that employs them. Smolej and Lobnikar (2017) find that studying work engagement is a concept of human resource management, which constitutes a combination of many organisational aspects, such as the employee's organisational obligation, satisfaction, organisational behaviour, motivation and the emotional involvement of employees in the company. Not only is work engagement important in and of itself, but it also affects the health of employees, their work results and their commitment to the organisation (for more on this, please see Smolej & Lobnikar, 2017). There is a strong relationship between employee engagement and organisational performance (Warshawsky et al., 2012). Employees who are engaged are more productive than their disengaged colleagues. The level of employee work engagement also affects the good financial standing of an organisation. In organisations where a higher level of employee work engagement was ascertained, the added value is higher than those with lower work engagement levels (Gallup, 2013).

Kahn (1990) presented the concept of personal engagement and disengagement three decades ago. He defined it as behaviour with which employees integrate into a work setting. Engaged employees are physically engaged, cog-

nitively alert and emotionally connected with the work. Maslach, Jackson, Leiter and Leiter (2010) describe engagement as the opposite of burnout. When burnout emerges, the feeling of connection with the organisation begins to fade. Energy turns to exhaustion, commitment to cynicism and efficiency to inefficiency. Schaufeli et al. (2002) perceive engagement as a positive and work-related condition characterised by vitality, commitment, and involvement. Employee engagement is therefore an asset, the importance of which should be clear to every good manager. Employees' mental well-being and engagement are central to achieving work results.

Antoinette Bargagliotti (2012) performed a concept analysis on work engagement in nursing since work engagement is the central issue for 21st-century professionals and specifically for registered nurses. Work engagement was defined as a positive, fulfilling state of mind about work characterised by vigour, dedication, and absorption. Trust (organizationally, managerially, and collegially) and autonomy are the antecedents of work engagement. The outcomes of nurses' work engagement are higher levels of contagious personal initiative, decreased hospital mortality rates and significantly higher financial profitability of organisations. Richardson and Storr (2010) and García-Sierra, Fernández-Castro, and Martínez-Zaragoza (2016) performed a literature review on the impact of nursing empowerment, leadership, and workplace collaboration. They all concluded that there is a gap concerning knowledge of the extent and nature of the role of nurses in patient safety improvement and that there is potential for improvement through nursing empowerment and the development of tools to strengthen and support nurses' influential role in ensuring patient safety and quality of work in hospitals. Keyko, Cummings, Yonge, and Wong (2016) systematically reviewed work engagement in professional nursing practice. Their findings indicate that a wide range of antecedents, at multiple levels, is related to registered nurses' work engagement. Positive outcomes of work engagement are valuable to both performance and the individual nurse. The Nursing Job Demands-Resources model offers nursing science a valuable beginning framework to understand the current evidence, further direct nursing research, and begin to guide practice and policy. The results offer opportunities for nurse leaders to promote work engagement in professional nurses through action on organisational-level resources. Also, Scott, Hogden, Taylor, and Mauldon (2022) and Ghazawy, Mahfouz, Mohammed, and Refaei (2021) performed a literature review on the impact of employee engagement and patient safety and job outcomes. The result of their study is that research into the impact of employee engagement on patient safety is in its early stages. As health service managers consider the best use of funding to support safe and high-quality care, evidence to support employee engagement's positive impact on patient safety may help to manage the fallout from the

COVID-19 pandemic. The importance and role of leaders in ensuring desired treatment results and suitable working conditions were also identified in work by Graban (2018), analysing the relationship between improving quality, patient safety, and employee engagement in lean hospitals. Parr, Teo, and Koziol-McLain (2021) described a model of leadership relationships, work engagement, and patient outcomes in their empirical study. The study's main outcome was that resonant leadership, a relational style, is a core antecedent of quality care and is positively associated with staff experience and patient outcomes. Resonant leadership improves staff work experience, patient safety, and patient satisfaction and therefore, nurse leaders should measure, foster, and develop resonant leadership in practice. Work-family conflict is an issue in nursing administration and management associated with reduced work effectiveness and patient safety. The results of this study by Labrague and Obeidat (2022) underscore the vital role of nurse managers' transformational leadership in sustaining work-family balance and, in turn, improving patient safety outcomes and enhancing job engagement among nurses. Ree and Wiig (2020) analysed the relationship between transformational leadership, patient safety culture, and work engagement in home care services. The transformational leadership model explained more than one-third of the variance in patient safety culture. They concluded that transformational leadership significantly impacts patient safety culture and work engagement in home care services, and employees' perceptions of job demands, available resources and engagement also affect patient safety culture.

The job demands theory is one of the most commonly used theories to explain work engagement, which assumes that a combination of work characteristics and personal resources anticipates work implementation through a commitment to work among employees (Bakker & Albrecht, 2018). According to the theory, different organisations can have different work settings, but the characteristics of these settings are always classified into job demands and job resources (Sun & Bunchapattanasakda, 2019). It combines two research approaches and explains that job demands and job resources have unique and, at the same time, multiple effects on job stress and motivation (Bakker & Demerouti, 2014). Job demands refer to those physical, psychological, social, or organisational aspects of the job that require sustained physical and/or mental effort and are therefore associated with certain physiological and/or psychological costs (e.g. burnout) (Demerouti et al., 2001). Examples of this are high job pressure and emotionally challenging interactions with clients (Bakker & Demerouti, 2014). Job resources refer to those physical, psychological, social or organisational aspects of the job that: are functional in achieving work goals, reduce job demands and the associated physiological and psychological costs, and stimulating personal growth, learning, and development (Bakker, 2011).

The job demands theory assumes that job demands and job resources trigger two quite independent processes: the health impairment process and the motivational process (Bakker & Demerouti, 2014). Employee health and well-being result from a balance between positive (resources) and negative (demands) job characteristics (Schaufeli & Taris, 2014). Job resources influence future work engagement, which, in turn, predicts organisational commitment; job demands predict burnout over time, which in turn predicts future depression (Schaufeli & Taris, 2014). Schaufeli (2013) states that resources promote engagement through vigour (energy), dedication (perseverance) and absorption (focus). Work engagement mediates the relationship between a job and personal resources on the one hand and positive outcomes on the other. This is called a motivational process. Schaufeli (2013) continues to explain that a negative process is also at play – the health impairment process, which is triggered by job demands that are determined through aspects of the job and require sustainable physical and psychological effort (work overload, time pressure, conflicting roles, excessive bureaucracy and formalities). High job demands require additional effort to achieve goals.

Personal resources were included in the job demands theory subsequently and can have the same impact as job resources, as they decrease the negative impacts of job demands. They signify a positive self-assessment related to resilience and refer to an individual's sense of their own ability to control and influence their environment. Personal resources partially mediate the relationship between job resources and work engagement (Bakker & Demerouti, 2014). They include self-efficacy, which represents an individual's assessment of their control over various demands or events in a particular setting by incorporating different activities that help them in the process (Xanthopoulou, Bakker, Demerouti, Schaufeli, 2007). A strong sense of self-efficacy encourages psychological adjustment to highly stressful events (Kilic & Simsek, 2019) by reducing exposure to stress and depression (Kowalczuk, Krajewska-Kułak & Sobolewski, 2020). When nursing staff feel higher self-efficacy, this positively affects their experiences at work (Gagné et al., 2019) because they feel fewer mental health problems (Hu et al., 2020). The greater the self-efficacy, the higher the work engagement, which contributes to greater openness to change (Lobnikar & Zorić, 2020).

According to the job demands theory, job resources affect motivation when job demands are high. In addition, motivation positively affects job implementation because it helps to direct goals and focus on work tasks, as engaged employees have the energy and enthusiasm necessary for good implementation (Bakker & Demerouti, 2017). Job resources, which fulfil the basic psychological needs for autonomy (to experience the option of choice and a sense of freedom), competence (successful tackling of challeng-

ing tasks and achievement of goals) and connectedness (the feeling of belonging with others), motivate and enable an individual to achieve work goals, which promotes work engagement (Deci & Ryan, 2008; Knight, Patterson, Dawson & Brown, 2017). The needs that arise from work mediate the relationship between resources and work engagement, thus supporting the job demands theory and the self-determination theory as the fundamental explanatory theories (Knight, Patterson, Dawson & Brown, 2017).

Nursing is a stressful and emotionally demanding profession (Othman, Ghazali & Ahmad, 2017). The engagement of nurses is necessary to ensure patient safety, positive medical outcomes and progress in nursing practice (Crenshaw & Yoder-Wise, 2013). It has long been known that employees who are satisfied in their roles achieve better results than those who are not. Some nurses are satisfied merely with working in a given situation and getting through a working day. They rarely participate in teams working on improving the practice or organisation, so it cannot be said that they are engaged in improving future results. Engaged employees are deeply committed and involved and invest in their work. Success requires work achievements, employee engagement and a culture that makes sense of that engagement (Vestal, 2012).

The paper aims to research the link between the level of nurses' engagement in their work setting and factors related to enhancing quality and safety for patients. The analysis aims to ascertain the level of engagement of nurses employed at one of the hospitals in Slovenia and determine which factors impact their engagement and to what extent. Above all, we wish to analyse whether the level of employee engagement in nursing affects the factors relating to improving quality and safety.

2 Description of the method used, sample and procedure

The research was conducted in 2019 on a sample of nursing employees at one of Slovenia's general hospitals. We obtained written consent from the healthcare institution to approve and implement the research. The survey was carried out anonymously, confidentially and voluntarily. We distributed 250 surveys among the nursing staff, 125 in internal and 125 in surgical departments. Two-hundred and six (206) surveys were returned, which constitutes a responsiveness rate of 82.4%. The sample was composed of 86% of women and 14% of men. Of these, 114 respondents were employed in the surgical department and 92 in the internal department. The average age of respondents was 39.9 years. The most significant number of respondents (34%) have less than ten years of service, most of whom have been employed at the current organisation since they started working. Fifty-one per cent (51%) of respondents have a secondary school education, 37% of them have higher education qualifications, followed by academic higher education (5%) and short-cycle vocational education (4%), while 2% of the respondents have a master's or a doctoral degree.

The questionnaire consists of four sections. The first section comprises 12 statements relating to employee engagement, representing the study's dependent variable. To measure engagement, we used an adapted questionnaire, which we put together based on questionnaire Q12 (Gallup, 2013; Smolej and Lobnikar, 2017). We used a five-point scale for measuring the level of engagement (1 – I strongly disagree, 5 – I strongly agree), while internal consistency of the questionnaire, measured with Cronbach α amounted to 0.846. In addition to engagement, we included other independent variables in the study. To measure self-efficacy, we used a questionnaire developed by Frlec (2008) based on a study by Bandura (1977). The scale contains 12 statements in three subsections, which the respondents assessed using the five-point scale (1 – I strongly disagree, 5 – I strongly agree). Internal consistency of this part of the questionnaire, measured with Cronbach α amounted to 0.758. In the third section, statements referred to various tools and methods that are used in nursing in daily work and that contribute to the quality of work. The frequency of using these tools was measured on a five-point scale (1 – never, 5 – frequently). We also assessed interpersonal relationships in the workplace between different professional groups or stakeholders within medical treatment (nurses, doctors, patients, and managers). The quality of contacts was measured using school grades from 1 (inadequate) to 5 (excellent). The Cronbach α score amounted to 0.751. The final substantive part of the questionnaire (six statements) referred to the attitude towards the introduction of changes. Respondents marked their opinions using a five-point scale (1 – I strongly disagree, 5 – I strongly agree), while internal consistency of this part of the questionnaire, measured with Cronbach α, amounted to 0.754. It can be concluded that all parts of the questionnaire were internally adequately reliable and consistent for use in further analysis.

Table 1: Nurses' work engagement

	minimum	maximum	Average	S.D.
Nurses' work engagement	1.00	4.92	3.20	.62

3 Results

Firstly, we present the results on nursing employee engagement (Table 1). We obtained the result by adding up the values of all 12 statements and dividing this number by the number of statements.

It is evident from the table that the nurses' work engagement is slightly above average (the average on the five-point scale is 3.5) and that the standard deviation is relatively small; in terms of work engagement, two-thirds of nurses fall within the 2.9 to 4.1 value range. Employees can be classified into three groups[2] in terms of engagement. Engaged employees are energetic employees who work passionately and feel a deep connection with the company in which they are employed. They are the source of innovation and help develop the company. They trust their colleagues and managers. Disengaged employees are "in part absent". They only do what is required of them. They are "half asleep" during their working time, and although they invest their time in the work, they bring no energy or passion to it. Actively disengaged employees are dissatisfied in their workplace and actively display their dissatisfaction. They underestimate the work carried out by their engaged colleagues, and have a detrimental effect on the engagement and satisfaction of customers (Reilly, 2014). Our research revealed that 40% of respondents are engaged, while 55% of them are disengaged. The share of actively disengaged employees in nursing is 5%. Gallup (2013) reports that, globally speaking, only 13% of employees are engaged in their work. Among the surveyed countries, New Zealand has one of the highest employee engagement rates, with the situation being similar in Australia, at 24%. Both countries, however, lag behind the United States, where the level of employee work engagement amounts to 30%. In the Slovenian Police, nearly a third of employees are actively disengaged, while the share of engaged employees is only slightly over 10% (Smolej & Lobnikar, 2017). Compared to these average values, the nursing respondents exhibit above-average work engagement.

Bandura (1997) defines self-efficacy as "an individual's belief in his or her capacity to organise and execute certain behaviours necessary to successfully cope with a particular situation". This means that an individual will avoid situations that exceed their abilities and will, at the same time, be more motivated to work in the field and situations where they will feel competent. That is why employees' attitudes to work and work challenges can be predicted based on their experience and beliefs regarding personal abilities. The actual efficiency of an individual is shown in using these abilities, as self-confidence plays a decisive role in utilising one's abilities. Below (Table 2), we present the analysis results of assessing the self-efficacy of nurses or nursing employees included in the survey.

The table shows that the reported self-efficacy of nurses is high, as the average is 3.6, with a slight standard deviation: as much as two-thirds of nurses rated their self-efficacy within a range of values between 3.1 and 4.1. Nurses report that they are highly trained and love doing their job. Regarding self-efficacy, 53% of respondents experience success in their work. The most important factor is individuals' beliefs about their own ability to control personal actions and events in their environment, i.e. about their self-efficacy. Seventy-four per cent (74%) of respondents are certain they are doing their job adequately.

In terms of introducing changes, we ascertained that the respondents' suggestions on workplace improvements are often taken into consideration (49%); in addition, as a team, they are aware of the necessity of introducing changes (55%), and they are willing to adopt quality standards (57%) that are important for their day-to-day work. The respondents know that changes are necessary in their line of work (68%), and they support changes that raise the quality of work. Forty-five per cent (45%) of respondents think the dynamic of introducing changes aimed at improving quality at the hospital is appropriate. They also report that they use various quality-related tools and methods in their day-to-day work. The hospital where the research was conducted uses clinical guidelines (58%), clinical pathways (63%), protocols, algorithms and other written instructions (74%), general standards of medical treatment (77%), special standards of medical treatment (65%), outcome indicators (48%) and other quality indicators (50%). The respondents reported that they are provided with education in the area of quality (55%); they conduct safety conversations (55%) and make safety rounds (44%), but not always and not everywhere. Deviations from the usual medical treatment are measured by 66% of the respondents, and the same percentage of respondents confirmed that they have a procedure in place for internal reporting on safety complications. According to 48% of respondents, if a safety complication occurs, confidential treatment of said security complication is ensured. Thirty-five per cent (35%) of respondents are aware that a register of reporting on safety complications exists and is kept at the institution of their employment. Safety complications are most often reported by nurses (72%) and occasionally by doctors (17%) and patients (12%).

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[2] There are no reasons why assessments in Slovenia should be significantly different from those in the rest of the world. For the purposes of our research, he sent us the scale and allowed us to use it, while emphasising that it needs to be used and interpreted carefully: actively disengaged (fewer than 30 points or an average score below 2.5), disengaged (31 to 44 points or an average score between 2.5 and 3.7) and engaged (45 points or more or an average score above 3.7). (Gruban, 2005; 2010)

Table 2: Descriptive statistics for nurses' self-efficacy

	Minimum	Maximum	Average	S.D.
Self-efficacy	1	4.92	3.6	0.49

Table 3: Correlation analysis between the factors analysed

		1	2	3	4
1. Engagement	r	1	.388**	.679**	.428**
	p		.000	.000	.000
2. Attitude towards change	r	.388**	1	.425**	.417**
	p	.000		.000	.000
3. Self-efficacy	r	.679**	.425**	1	.480**
	p	.000	.000		.000
4. Use of tools to enhance quality and ensure safety	r	.428**	.417**	.480**	1
	p	.000	.000	.000	
**. correlation typical at the 0.01 level					

Good work relationships are essential for the success of an organisation. According to the data obtained in our research, relationships between nurses are very good; this was the response of 97[3]% of respondents; the attitude of managers to nurses is likewise good (95%), as is the attitude of nurses to doctors (100%). The attitude of doctors to nurses (78%) and employees to patients (99%) was also assessed as good, the latter being essential and always regarded as a priority.

Below, we present findings from the correlation analysis of the above-described substantive sections. For correlation analysis (using the Pearson Correlation Coefficient), we included summary variables in the analysis, namely (a) the level of engagement, (b) attitude to changes, (c) self-efficacy, and (d) frequency of using tools to enhance quality and ensure safety. We calculated the last variable by adding the values of the frequency of using various tools and methods to ensure quality and safety. The results of the correlation analysis are shown in Table 3 below. The table shows that the frequency of using tools to enhance the quality of nursing and ensure patient safety correlates statistically and positively with self-efficacy, engagement and willingness to accept change. In addition, correlations are high with all three factors, which leads us to conclude that these concepts are closely interconnected. The greater the self-efficacy, the higher the work engagement, which contributes to greater openness to change. All this is typ-ical of environments where various tools to ensure work quality and safety are used more frequently.

We conducted a correlation analysis for these variables and included certain demographic variables. We found that engagement statistically typically and negatively correlated with the respondents' age and years of service ($r = -0.211$, $p = 0.002$; $r = -0.221$, $p = 0.002$), which means that older respondents, i.e. respondents with more years of service, were less engaged in their work; the same direction of correlation emerged in the connection between age and years of service and self-efficacy ($r = -0.150$, $p = 0.031$; $r = -0.173$, $p = 0.14$). We can conclude that younger respondents were more engaged in their work, and their self-efficacy level was higher. Age and years of service did not statistically typically correlate with the frequency of using tools to enhance quality and safety, nor was a correlation with these two demographic characteristics statistically typically connected with attitude towards change. For the variables presented in the table above, we also conducted an analysis of variance (ANOVA) pertaining to the level of the respondents' education, but we discovered no statistically typical differences between individual education groups; the respondents' education thus had no effect on the variables analysed.

We were also interested in how workplace relationships affect the variables included in the analysis. The results of the correlation analysis are shown in Table 4.

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[3] The values of answers 4 and 5 on the five-point scale have been added together.

Table 4: Correlation analysis between the factors analysed

		Relationships between nurses and colleagues	Attitude of managers to nurses	Attitude of doctors to nurses	Attitude of nurses to doctors	Attitude of employees to patients
Engagement	r	.349**	.526**	.423**	.336**	.310**
	p	.000	.000	.000	.000	.000
Attitude towards change	r	.262**	.372**	.120	.261**	.240**
	p	.000	.000	.087	.000	.001
Self-efficacy	r	.323**	.391**	.322**	.275**	.350**
	p	.000	.000	.000	.000	.000
Use of tools to enhance quality and ensure safety	r	.189**	.301**	.167*	.207**	.252**
	p	.006	.000	.017	.003	.000

The table shows that workplace relationships are a very important factor. The respondents who assessed workplace relationships as better, regardless of the relation (colleagues, managers, nurses – doctors), were more engaged in their work. Good relationships between nurses (both among colleagues and in the employee–manager relation) significantly impact willingness to adopt innovation in the workplace. Employees with a higher level of self-efficacy also assess workplace relationships as better; for our analysis, a significant result is that workplace relationships (regardless of the type) positively and statistically significantly correlate with the use of tools intended to enhance quality and ensure patient safety.

4 Discussion

Employees who are engaged display a high potential and play a vital role in planning the future of their organisation. Engaged employees exhibit high efficiency with their innovation, clear understanding of their role, emotional commitment and commitment to the organisation. Our research revealed that 40% of respondents are engaged, while 55% are disengaged. Those who are disengaged regard their work as an exchange of their time for payment, never work overtime, invest little effort, and display little passion or creativity. Those actively disengaged are the most harmful type of employees, and according to the results of our research, 5% of respondents fall into this group. They are dissatisfied and show their unhappiness through words, opinions and actions, undermining the work of others by constantly expressing their dissatisfaction.

In our research, 53% of respondents experience success in their work, while 74% are confident they are doing their job adequately. The higher the individual's self-efficacy, the greater the organisation's success.

Research results have shown that 86% of respondents believe that the results of their work indicate they are well-qualified for their job, 81% observe their colleagues with similar tasks, and 62% have a role model in their job. They pay attention to the mistakes made by their colleagues (62%) and receive a lot of high-quality information in their work (57%).

The respondents know what is expected of them in the workplace and that they have at their disposal everything they need to do their job well (53%), and they have the chance to do what they are good at on a daily basis (60%). Their direct superior care about them as a person (76%), and there are a lot of great colleagues at work (79%) who are genuinely committed to producing good and high-quality work (59%). Slightly poorer results are connected with the statement that the employees have at their disposal everything they need to do their job well (38% of respondents disagreed). Only 30% of respondents believe that someone in their organisation plans and encourages their development. Forty-seven per cent (47%) of respondents think that their opinion counts and is taken into consideration; 39% of respondents believe the importance of their work is mirrored in the organisation where they are employed, while 25% disagree with the statement. Fifty-seven per cent (57%) of respondents had an opportunity to learn and develop in the past six months.

We found that work engagement and willingness to provide quality work statistically typically and positively correlate with one another. We ascertained that engagement is the result of quality interactions (relationships) in the workplace and that employees who feel better in their workplace will be more oriented towards the future, will be more open to innovation and, above all, they will use various tools and approaches intended to enhance the quality of the work done by nursing staff more frequently in addition to being more committed to patient safety.

We encountered similar findings during a literature review; Bakker (2008) finds that performance depends on engagement, as engaged employees perform better than disengaged employees. Lobnikar (2015) finds that the share of engaged employees in Slovenia is average, but there are also a lot of those who are actively disengaged. We found that the nurses' work engagement statistically typically and positively correlates with the use of tools designed to enhance quality and safety (r = 0.428; p < 0.001). We also ascertained that workplace relationships statistically significantly and positively correlated with the nurses' engagement. It can therefore be established, through indirect correlations, that, in addition to work engagement (alongside self-efficacy), the quality of relationships significantly affects the willingness to use tools to ensure quality and safety in patient treatment.

Workplace relationships are a very important factor, which is confirmed by other research conducted in Slovenia thus far (Lobnikar & Cedilnik, 2017). The respondents who assessed workplace relationships as better, regardless of the relation (colleagues, managers, nurses – doctors), were more engaged in their work. Good relationships between nurses (both among colleagues and in the employee–manager relation) significantly impact the willingness to adopt innovation in the workplace. We also ascertained that workplace relationships statistically and positively correlate with engagement and willingness to introduce changes and use tools intended to ensure quality and patient safety. Warshawsky et al. (2012) also specify a strong correlation between employee work engagement and organisational performance. Essential is the information that job satisfaction relates to operating results that are relevant for the organisation (Seijts & Crim, 2006).

Another important research finding is that all types of relationships, both between colleagues and in the hierarchical chain, statistically correlate with engagement, willingness to introduce changes and use tools to ensure quality and patient safety. Relationships also have a positive effect on perceived self-efficacy. We can establish that relationships probably represent a central factor in strengthening employee engagement (Lobnikar & Cedilnik, 2017).

Research shows that job satisfaction strongly impacts performance (Kvas, 2008) and involves people who work at an organisation and people who study it (Lu et al., 2005). People are both the end goal and the means of an organisation. An organisation's task is to achieve goals through organised work and work processes. Another essential element of a work organisation is organisational climate, which is directly connected with employee satisfaction and impacts how a climate within an organisation is experienced (Lobnikar & Cedilnik, 2017).

When interpreting the research results, it is also necessary to understand the limitations arising from the size of the sample and the fact that the research was conducted in only one of the larger Slovenian general hospitals. Nevertheless, the research results are similar, as could be detected when reviewing the literature in the analysed field. To sum up, the analysed factors described in our study are interdependent. Engagement is the result of workplace interactions; the employees who feel better in their workplace will be more oriented towards the future, they will be more open to innovation, and, above all, they will use various tools and approaches intended to enhance the quality of the work done by the nursing staff more frequently in addition to being more committed to patient safety. We established that the greater the self-efficacy, the higher the work engagement, which contributes to greater openness to change. All this is typical of environments where various tools to ensure work quality and safety are used more frequently. The study revealed that relationships between the employees of the healthcare institution analysed are extremely important. The respondents who assessed workplace relationships as good were more engaged in their work. Good relationships between nurses (both among colleagues and in the employee–manager relation) have a significant impact on the willingness to adopt innovation in the workplace. Employees with high self-efficacy assess workplace relationships as better; for our analysis, a result that is especially important is that workplace relationships (regardless of the type) positively and statistically significantly correlate with the use of tools intended to enhance quality and ensure patient safety. It is, therefore, important to attend to quality and patient safety in the framework of managing processes within the team, as it was shown that adequate safety and quality could only be ensured by taking account of and managing the many interdependent factors we described in our analysis.

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Soodvisnost delovne zavzetosti zaposlenih v zdravstveni negi, kakovosti odnosov na delovnem mestu in varnosti pacientov

Izhodišča in namen: Kakovost v sistemu zdravstvenega varstva ne obsega le dejanj, opredeljenih s certifikati ali zahtevanih z zakonom, standardi in protokoli; opredeljuje pa ga tudi blaginja zdravstvenih delavcev na eni strani in bolnikov na drugi strani. Namen prispevka je analizirati povezavo med delovno zavzetostjo medicinskih sester in dejavniki, povezanimi s povečanjem kakovosti in varnosti pacientov.

Metoda: V raziskavi je sodelovalo 206 zaposlenih v zdravstveni negi slovenskih splošnih bolnišnic. Uporabljen vprašalnik je sestavljen iz štirih sklopov: delovne zavzetosti zaposlenih, samoučinkovitosti, uporabljene so bile trditve o različnih orodjih in metodah, ki prispevajo h kakovosti dela; ocenjevali smo tudi medosebne odnose med različnimi poklicnimi skupinami v zdravstveni obravnavi, zadnji del vprašalnika so tvorile trditve o uvajanju sprememb v organizaciji.

Rezultati: V primerjavi z drugimi poklici so zaposlene v zdravstveni negi izkazali nadpovprečno stopnjo delovne zavzetosti. Ugotovili smo, da so mlajši respondenti bolj zavzeti pri svojem delu, stopnja njihove samoučinkovitosti pa je višja. Pogostost uporabe orodij, namenjenih izboljšanju kakovosti zdravstvene nege, statistično značilno in pozitivno korelira s samoučinkovitostjo, zavzetostjo in pripravljenostjo na sprejemanje sprememb. Dejavniki, vključeni v raziskavo, so soodvisni. Zavzetost je rezultat interakcij na delovnem mestu; zaposleni, ki se bolje počutijo na svojem delovnem mestu, bodo bolj usmerjeni v prihodnost, bolj odprti za novosti, predvsem pa bodo pogosteje uporabljali različna orodja in pristope, namenjene krepitvi kakovosti dela zaposlenih v zdravstveni negi, obenem pa so bolj zavzeti za skrb za varnost pacientov.

Zaključek: Ugotovitve so bistvenega pomena za uspešno in učinkovito vodenje bolnišnic ter za zagotavljanje kakovosti in varnosti bolnikov.

Ključne besede: Zdravstvena nega, Pacienti, Delovna zavzetost, Kakovost, Varnost, Samoučinkovitost

Using Data Mining to Improve Decision-Making: Case Study of A Recommendation System Development

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Background and purpose: This study aims to provide a practical perspective on how data mining techniques are used in the home appliance after-sales services. Study investigates on how can a recommendation system help a customer service company that plans to use data mining to improve decision making during its digital transformation process. In addition, study provides a detailed outline on the process for developing and analyzing platforms to improve data analytics for such companies.

Methodology: Case study approach is used for evaluating the usability of recommendation systems based on data mining approach in the context of home appliance after-sales services. We selected the latest platforms based on their relevance to the recommender system and their applicability to the functionality of the data mining system as trends in the system design.

Results: Evaluation of the impact on decision making shows how the application of data mining techniques in organizations can increase efficiency. Evaluation of the time taken to resolve the complaint, as a key attribute of service quality that affects customer satisfaction, and the positive results achieved by the recommendation system are presented.

Conclusion: This paper increases the understanding of the benefits of the data mining approach in the context of recommender systems. The benefits of data mining, an important component of advanced analytics, lead to an increase in business productivity through predictive analytics. For future research, other attributes or factors useful for the recommender systems can be considered to improve the quality of the results.

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Keywords: Digital transformation, Data mining, Decision tree algorithm, Decision-making, Home appliances after-sales services

1 Introduction

Nowadays, the digital transformation of the enterprise has become very important as it affects various facets of the business as the potential for adopting innovative technologies grows, including Big Data analytics, social media, mobile technologies, the Internet of Things, and cloud technologies (Morakanyane, 2017; Mydyti and Kadriu, 2021c). Artificial intelligence and advanced analytics are robust digital technologies that drive business and information analytics, prediction, and business process monitoring (West and Allen, 2018).

The analytics systems and smart applications used by organizations demonstrate the importance of delivering results to improve decision making, productivity, and effectiveness (Bughin et al., 2017). Organizations are using technology to perform analytics, such as simple reports and a dashboard that present past performance reviews and investigation reports. (Bumblauskas et al., 2017). Organizations share a common goal of using digital technology to improve their decision-making capabilities as they continue their digital journey (Schwertner, 2017). Data mining, where statistics intersect with machine learning, will enable companies to reduce costs and improve the customer experience (Sima et al., 2020; Chen et al., 2015; Palmer et al., 2011), especially in the era of Big Data (Pejic-Bach et al., 2019).

Digitalization is driving huge improvements in aftermarket services. With prescriptive and predictive analytics, companies can reduce and optimize spending (Rudnick et al., 2020). Rapid technological development, high competitiveness, and increasing benefits mean that after-sales services are reshaping business traditions (Othman et al., 2020; Guzovski et al., 2022). The customer experience goes beyond the point of sale, with digital technologies transforming customer service strategies (Gimpel et al., 2018; Jintana et al., 2021; Phorncharoen, 2020) by leveraging various drivers for market analysis, such as sentiment analysis (Nguyen et al., 2021). Data mining is becoming increasingly relevant for SMEs (Pejić Bach et al., 2022; Topalović et al., 2020).

In the current business environment, digital transformation has emerged as a strategic imperative for organizations seeking better decision making. Organizations are increasingly using data mining to extract useful insights from big data so they can make informed, evidence-based decisions instead of making assumptions, resulting in a better customer experience. For companies to fully benefit from data mining, they can use the insights from data mining to create personalized customer experiences to improve customer satisfaction.

The data mining approach that establishes links between companies and customers has been identified as very important for this work. The research study aims to fill the knowledge gap on how customer service companies can effectively connect with their customers through a data mining approach. More specifically, the study aims to close the knowledge gap by proposing and providing a research methodology for building a recommendation system that can simplify decision making, provide accurate predictions, and help companies strengthen new experiences for their customers.

The results of this study will help companies improve their decision-making processes and adapt data mining approaches to digital transformation. The research questions posed in this study are:

*RQ1: How can a recommendation system help a cus-*tomer service company that plans to use data mining to improve decision making during its digital transformation process?

RQ2: What is the process for developing and analyzing platforms to improve data analytics for such companies?

The introduction is followed by the literature review, followed by the methodology for implementing the recommendation system, discussion of the results, conclusions of the research, and recommendations for future research. The methodology includes a case study approach in home appliance customer service, focusing on a selected company that provides repairs and installations. The research study uses a data mining approach and a recommendation system developed using the Python programming language. The system aims to predict product repairs based on user requirements and targets home appliance service users. The development of the system includes business observation, usability and API design. The main layers of the system are the application layer, the knowledge layer, and the source layer. The proposed model provides comprehensive prediction probability and is easy to understand and operate.

2 Literature Review

The researchers developed several perspectives on after-sales service for home appliances. The literature review conducted for the study includes an analysis of several key areas, including digital technologies, data mining technologies, algorithms, tools, and advanced analytics techniques. It also examines the various dimensions of digital transformation in the digital maturity model, customer service quality characteristics, and the benefits and challenges of applying data mining. This section discusses the relevant research that can effectively answer the research question of the study.

2.1 Home Appliances After-sales Services

Household appliance customers are demanding and require a comprehensive range of after-sales services. Home appliances are considered durable products that are expected to function for an extended period of time (Murali et al., 2018). After-sales services for home appliances are considered a highly profitable business that accounts for a larger portion of the business and company profits (Altekin et al., 2017). After-sales services are a key concept in the home appliance industry to build strong relationships with customers that improve performance and deliver reliable results. The authors highlight the impact that after-sales services have on customer satisfaction through research according to three different viewpoints (Wickramasinghe and Mathusinghe, 2016).
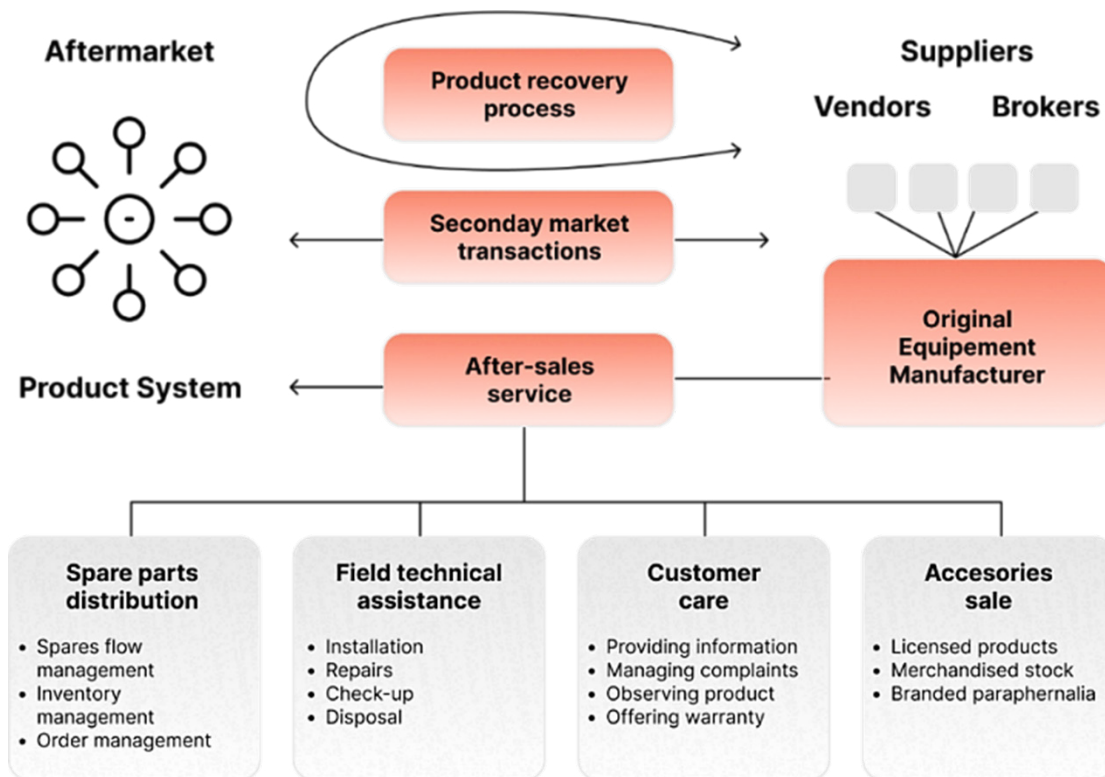
Figure 1: After-sales Service Business Processes

Figure 1 shows the main activities of after-sales service for home appliances, such as technical field service, spare parts sales, accessories sales, and after-sales service. These activities are important to ensure customer satisfaction and maintain the company's reputation in the market (Durugbo, 2020; Mydyti, 2022).

2.2 Key aspects of data mining approach along the business digital transformation journey

Digital transformation is viewed as the application of new technologies. Digital technologies enable significant operational improvements, such as improving customer experience, mitigating processes, or creating new models. The key drivers of digital transformation are digital capabilities and technologies. Digital technologies are essential to all efforts and provide business opportunities (Morakanyane, 2017; Orfanidis, 2018; Mydyti and Kadriu, 2021c).

Table 1 shows the main aspects of the impact of the data mining approach on the decision-making processes on the way to the digital transformation of the company.

The model for measuring progress-digital maturity-is based on the assessment of digital capabilities primarily within these common business dimensions such as customers, strategies, technologies, operations, organization, and culture (Valdez-de-Leon, 2016; Williams et al., 2019; Felch et al., 2019; Eremina et al., 2019; Deloitte, 2018; Mydyti and Kadriu, 2021a; Rogić et al., 2022).

Big Data analytics is one of the driving forces behind digital business transformation (Ziyadin et al., 2019; Wiesboeck and Hess, 2018; Hausberg et al., 2019; Schwertner, 2017; Telegescu, 2018; Mydyti and Kadriu, 2021a). The key techniques of Big Data and advanced analytics are data mining, machine learning, and natural language processing (Telegescu, 2018; Vivekananth and Baptist, 2015; Sadiku et al., 2018; Galetsi et al., 2020; Rehman et al., 2019; Prabhu et al., 2019; Mydyti and Kadriu, 2021a; Pejic-Bach et al., 2020a).

The most commonly used data mining techniques (Selihu et al., 2020) are clustering, classification, sequential analysis, regression, and association (Kaur and Dhiman, 2016; Mydyti and Kadriu, 2021a; Pejic-Bach et al., 2020b). In addition, Weka (Java), RapidMiner (Java), Orange (C++, Python, C), and R (C, Fortran, R) are considered important data mining tools (Kaur and Dhiman, 2016; Jovic et al., 2014; Dušanka et al., 2017; Mydyti and Kadriu, 2021a). Classification techniques include decision trees, k-nearest neighbors (KNN), random forest, Naïve

Table 1: Key aspects of the data mining approach impact the decision-making process

Key Aspects	Outcomes	References
Dimensions of digital transformation	Customers; Strategies; Technologies; Operations; Organization and culture	Valdez-de-Leon, 2016; Williams et al., 2019; Felch et al., 2019; Eremina et al., 2019; Deloitte, 2018; Mydyti and Kadriu, 2021a;
Digital transformation technologies	Big data analytics; Iot; Cloud; Mobile; Social networks	Ziyadin et al., 2019; Wiesböck and Hess, 2018; Hausberg et al., 2019; Schwertner, 2017; Telegescu, 2018; Mydyti and Kadriu, 2021a;
Advanced and big data analytics	Machine learning; Text mining (NLP); Data mining	Telegescu, 2018; Vivekananth and Baptist, 2015; Sadiku et al., 2018; Galetsi et al., 2020; Rehman et al., 2019; Prabhu et al., 2019; Mydyti and Kadriu, 2021a;
Data mining techniques	Classification; Clustering; Regression; Association; Sequential Analysis	Mydyti and Kadriu, 2021a; Kaur and Dhiman, 2016;
Data mining tools	Weka (Java), RapidMiner (Java), Orange (C++, Python, C) and R (C, Fortran, R)	Kaur and Dhiman, 2016; Jovic et al., 2014; Dušanka et al., 2017; Mydyti and Kadriu, 2021a;
Classification algorithms	Decision trees; Random forest; Naive bayes; Logistic regression; K-nearest neighbour (KNN)	Ragab et al., 2014; Jadhav and Channe, 2016; Mydyti and Kadriu, 2021b;
Benefits of applying data mining	Predictive analytics; Improves decision-making; Increases efficiency and business productivity; Enables Risk Mitigation; Enhances Customer Experience	Saeed, 2020; Mydyti and Kadriu, 2021a;
Challenges of applying data mining	Technology; Skills; Problem of poor data quality; Misuse of information/inaccurate information; Complexity of integration; Security and privacy;	Ikenna, 2014; Sharma et al., 2013; Zain et al., 2017;
Attributes of after-sales service quality	Consistency of service quality, options and variety of services, supply of required spare parts, delivery as promised, reasonable warranty policy, time taken to resolve the complaint, etc.	Murali et al., 2016; Ramya et al., 2019; Parasuraman et al., 1988; Golrizgashti et al., 2020

Source: Authors' work

Bayes, logistic regression, and so on (Ragab et al., 2014; Jadhav and Channe, 2016; Mydyti and Kadriu, 2021b).

Challenges of data mining applications include technology, capabilities, the problem of poor data quality, misuse/inaccurate information, integration complexity, and security and privacy (Ikenna, 2014; Sharma et al., 2013; Zain et al., 2017).

The benefits of data mining applications include predictive analytics, improved decision making, increased efficiency and business productivity, enabled risk mitigation, and improved customer experience, churn, and inventory forecasting (Saeed, 2020; Mydyti and Kadriu, 2021a; Pejić Bach et al., 2021; Selimi et al., 2019).

Service quality attributes, such as consistency of service quality, options and variety of services, delivery of required spare parts, delivery of promised services, adequate warranty policy, response to customer complaints, time taken to resolve the complaint, etc., are considered important in influencing customer satisfaction (Murali et al., 2016; Ramya et al., 2019; Parasuraman et al., 1988; Golrizgashti et al., 2020).

3 Methodology

In the framework of understanding companies in this field, as the case study, studied companies in the Kosovar market. The selected company is the largest in the region, which provides after-sales services for home appliances and electronic repairs for various appliances. In addition, the company provides services for the installation of appliances such as air conditioners, washing machines, dishwashers and so on.

The concept of the recommendation system is guided by several principles, such as a data mining approach and business observation, usability for the end user, and the interacting interface through the implementation of an API design - a system with machine learning concepts. The

web-based platform facilitates the process by using data and graphs to present the probabilities for predicting the repair of the product according to their requirements. The Python programming language was chosen for this application. During the development of the recommendation system, numerous meetings were held with the management to integrate the main business components and requirements into the model. The system was developed for the users of the home appliance customer service (decision makers).

The research focuses on the analysis and implementation of the recommendation system as part of the functionality of the data mining system that will be used to predict and digitize the manual data presentation processes for customer service activities.

The studies of the various researchers involved in the conceptual development of our recommendation system differ. For example, they provide a general architecture for collecting and analyzing data and an overview of how to implement an interface (Capozzoli et al., 2016), which then manages the flow of data into the classification algorithm (Lundkvist, 2014; Mydyti and Kadriu, 2021b). In addition, the authors introduce the informative dash-

boards in the application layer and the last layer in Figure 2, which provide useful information to different users and suggest actions or strategies that can be implemented. The main layers of the system architecture are the application, knowledge, and source layers (Capozzoli et al., 2016 and Mydyti, 2022).

Figure 3 shows the conceptual structure of the implementation and the functions of the proposed model (recommendation system) (Mydyti, 2022), providing an overview of the components of a recommender system, consisting of data preparation, feature extraction, training data, test data, model predictions, and the recommender system itself. Data preparation involves collecting and organizing the data, while feature extraction identifies the most important features for a predictive model. Training data, testing data, and model selection involve choosing the right machine learning algorithm. The prediction block applies the model to new data. the module provides the system user with comprehensive prediction probabilities, capabilities, and permissions. The recommendation system scheme is easy to understand, accessible, helpful and simple to use.
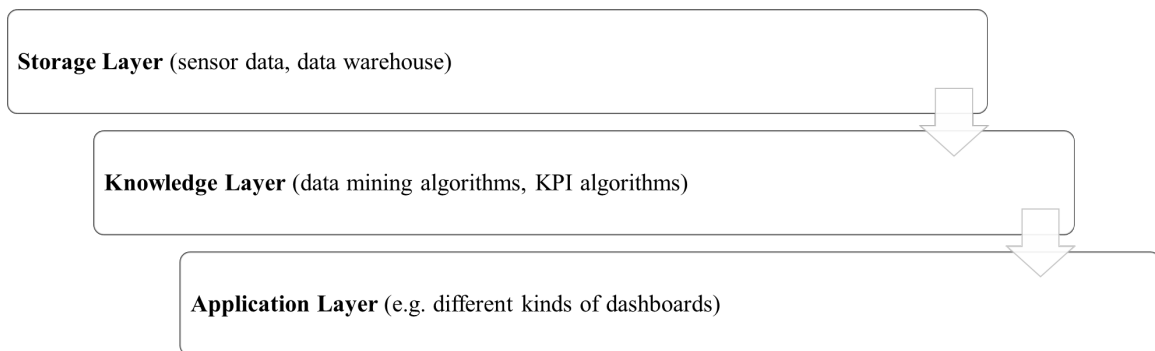

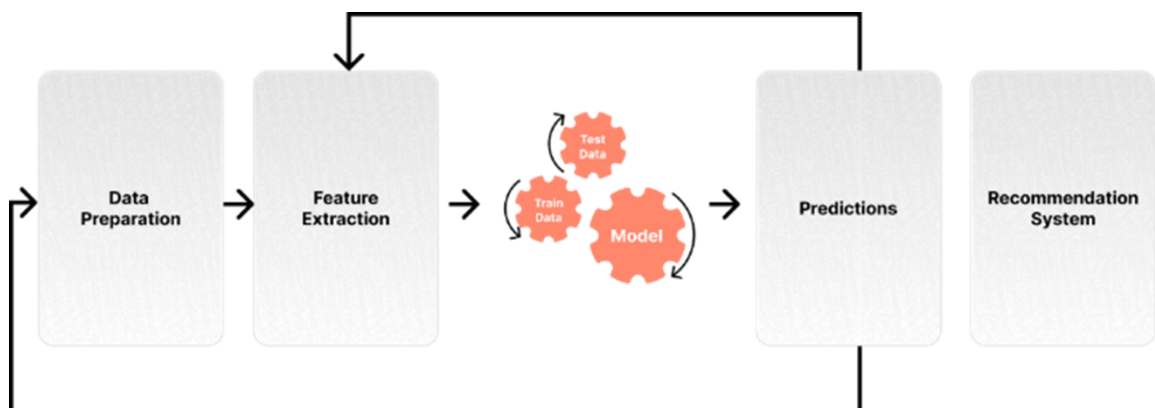Figure 2: A general architecture to collect, store and analyse data

Figure 3: Functionalities of the recommendation system - implementation module

4 Results

4.1 Recommendation System Architecture

A key requirement of home appliance customer service is the digitization of the manual data presentation process, where predictive results are presented in a way that is easy to interpret. This system will help decision makers and managers in the after-sales service business and will have a positive impact by improving efficiency due to predictive business analysis.

Storage layer. The data used in this study come from a database maintained by a company that provides customer service for home appliances. The size of the dataset used is approximately 55,000 cases. The dataset includes three attributes, brand, category, and weeks to repair, as well as a class attribute representing service time in weeks. The brand attribute is nominal and includes six different brands representing the manufacturer of the product, namely Brand One, Brand Two, Brand Three, Brand Four, Brand Five, and Brand Six. The Category attribute is also nominal and includes five different values representing the product category. These values are home appliances (MDA), small home appliances and personal care (SDAP), TV, heating, and air conditioning. The weeks to repair attribute is also nominal and takes four different values, 1, 2, 3, and 4, which correspond to the duration of the service in weeks. The class attribute "weeks to repair" represents the response and is also nominal.

The data cleaning process was performed for the performance of the dataset. Inconsistencies, inaccuracies, missing data, and outliers were identified and addressed. Brand, category, and weeks to repair were the remaining attributes used in the analysis, with weeks to repair being the response variable and class attribute. The dataset contained approximately 55,000 cases and was free of errors, inconsistencies, and outliers after the cleaning process, making it suitable for the recommendation system analysis. The resulting dataset was ready for recommendation system analysis, with the transformed and adjusted variables providing an accurate representation of the basic relationships between attributes

Table 2 outlines the main attributes required in the dataset.

Descriptive statistics were performed for the 'weeks to repair' attribute in the dataset. The mean of 'weeks to repair' is 1.28 weeks, with a standard deviation of 0.65 weeks. The median and mode are both one week, indicating that most services are provided within one week. In addition, the attributes of brand and category were analyzed. From the dataset, Brand One is the leading brand with 82.1% presence. After Brand One, Brand Two is present in 6% of the cases, Brand Three is present in 5.3% of the cases, and the remaining three brands account for 6.6% of the cases. Most of the cases in the dataset belong to the MDA category (83%), followed by SDAP (9%), TV (7.1%), heating (0.3%), and air conditioning (0.6%). These descriptive statistics provide a better understanding of the attribute distribution in the dataset and can be used for recommendation system analysis.

The model is evaluated in terms of its predictive accuracy. The model achieved an accuracy of 80.85 percent.

Knowledge layer. For our predictive research, the decision tree algorithm (J48) has proven to be the one that gives the best results. It can build a predictive model (Mydyti and Kadriu, 2021b). Python was selected as the most suitable programming language for the implementation of the recommender system. Since Python will be implemented shortly, the criterion parameter is used to obtain the best decision tree. The criterion parameter corresponds to the function of the quality of a partition in the selection of the Gini index or entropy.

A decision tree is viewed as a classifier represented as a recursive partitioning of the feature space into subspaces

Table 2: The structure of the dataset of recommendation system implementation

Attributes	Description	Values
Weeks to Repair	The duration of the service is measured in weeks from the time of the initial request.	1, 2, 3 and 4
Brand	A brand encompasses six distinct values and signifies the product's manufacturer.	Brand One, Brand Two, Brand Three, Brand Four, Brand Five, Brand Six
Category	The product category comprises five distinct values: domestic appliances (MDA), small domestic appliances and personal care (SDAP), TV, heating, and air conditioning.	Air Conditioning, Heating, MDA, SDAP, TV

Source: Authors' work

that form a basis for prediction. Decision tree algorithms build a tree based on a given data set and aim to obtain an optimal decision tree by reducing generalization error, nodes, or average depth (Rokach and Maimon, 2005).

Research authors define the Gini index as a contamination factor that calculates the differences between probability distributions above target attribute values (Rokach and Maimon, 2005; Tangirala, 2020). The Gini index is

$$Gini(y, S) = 1 - \sum_{c_j \in dom(y)} \left(\frac{|\delta_{y=c_j} S|}{|S|} \right)^2 \qquad (1)$$

defined by the formula shown in Equation Eq. 1, which is expressed as follows:

The training set is represented by S and the target feature is represented by y.

Information gain is a criterion based on impurities, as stated in the equation InformationGain Eq. 2, which im-

$$InformationGain(a_i, S) = Entropy(y, S) - \sum_{v_{i,j} \in dom(a_i)} \frac{|\delta_{a_i = v_{i,j}} S|}{|S|} Entropy(y, \delta_{a_i = v_{i,j}} S) \quad (2)$$

plements entropy as a measure of impurity (Rokach and Maimon, 2005).

The input feature set is represented by a_i, and the outcomes of discrete functions are represented by (v1, ..., vn).

$$Entropy(y, S) = \sum_{c_j \in dom(y)} - \left(\frac{|\delta_{y=c_j} S|}{|S|} \right) \log_2 \left(\frac{|\delta_{y=c_j} S|}{|S|} \right) \quad (3)$$

Information gain, as in equation Eq. 3, relies on entropy where:

The empirical result is that the information gain and the Gini index provide similar accuracy in classification. Moreover, the results show no significant differences in model performance using the Gini index and the information gain, regardless of whether the dataset is balanced or unbalanced (Rokach and Maimon, 2005; Tangirala, 2020).

The development of the recommendation system involves a series of clearly defined steps. First of all, the required libraries are imported. The next step is loading the data set. Next, the data is split into features and the target variable is identified. Fourth, the data is prepared for model building by splitting the data. Then, a decision tree classification model is created. Once the model is created, the accuracy of the model is evaluated. Finally, the decision tree is visualized to better understand the internal workings of the model. Following the methodology used in data science projects, the model design is performed by implementing Python code using Jupyter Notebook, following the sequence of steps described in Figure 4 (Mydyti, 2022).

Application Layer. This paper is aimed at business decision makers in customer service. The recommendation system aims to improve the quality of service and thus the customer experience.

The recommendation system will improve service quality and communication between customer service companies and subcontractors, retailers, wholesalers, and manufacturers. Users interact with the recommendation system without having to log in to process the information generated by the classification algorithm - the decision tree. Users have the advantage of receiving the probability prediction - data and charts.

The model created is a classification model that predicts the service quality of home appliance customer service based on the time required to resolve the complaint. Our model solution follows machine learning concepts and applies a decision tree algorithm that can manage categorical predictors and interpret results.

This section consists of one module: the Decision Maker module. The recommender system is built using a Python programming language code for data science projects according to the following steps in Figure 5 to predict the time needed to resolve the complaint (Mydyti, 2022).

The development of a recommender system is based on a series of steps to create an effective system. These steps include the following: (i) collecting the user-entered features and storing them in a data frame, which is the first critical step in building a recommender system; (ii) combining the user-entered features with the customer service record, which helps to create a complete data set; (iii) encoding the ordinal features, which consists of converting the data in such a way that the model (iv) can easily process the data, i. e. i.e., reading a stored classification model, i.e., a model that has already been trained and is used for prediction; (v) applying the model to make predictions, which is an essential step in the process of developing the recommender system. The model makes a prediction and gives a recommendation to the user based on the input features. (vi) finally, the data is visualized in a bar chart using "Plotly Chart" - this step is important for understanding the recommendation made by the model.

This module provides full functionality for users who have full permissions. The relevant forecast data and charts have been appropriately presented. The first part of the system displays the probability of predicting the 'time to resolve the complaint' as a percentage. The second part of the system provides a graphical comparison of prediction results that processes various classification inputs. The user can view the probability of repair prediction by product category and brand and search for predictions for products and product brands.

In addition, the main feature of this system is the probability of predicting the quality of service (time to fix the complaint) demonstrated in the search of an option. The target is 'weeks to repair' as a categorical predictor, and the model predicts service quality based on four response groups, including first week, second week, third week, and fourth week. The target indicates the number of weeks until the repair is completed.
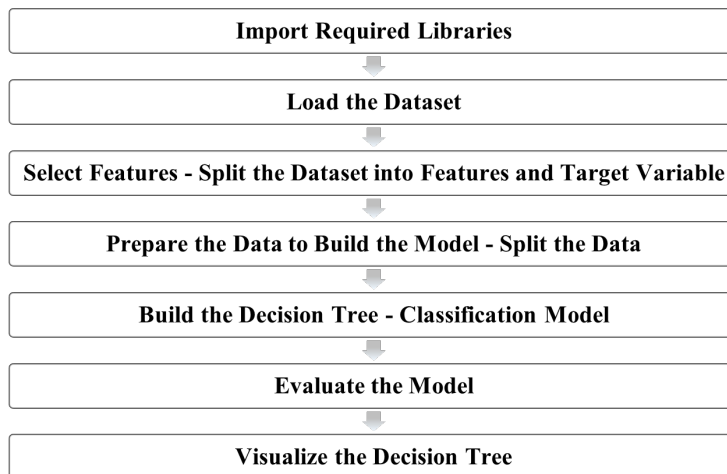
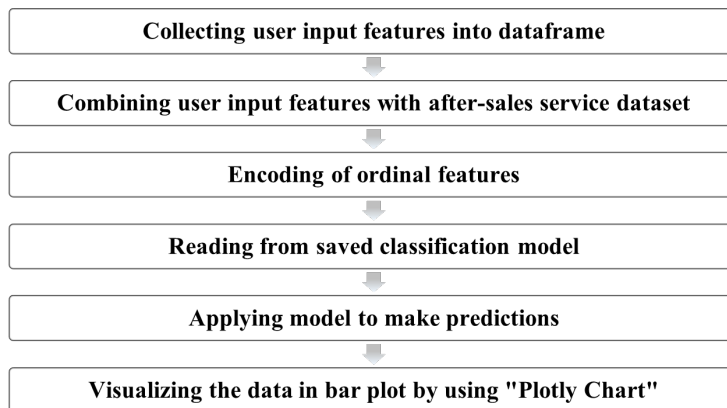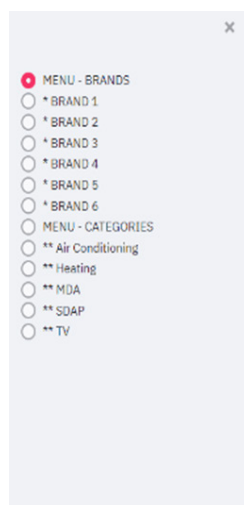*Figure 4: Steps to Build the Model*

Figure 5: Steps to Build the Recommendation System

Figure 6: Application - Recommendation System of a decision-maker

In the left sidebar of the module, you can select the brand or category for which you want a prediction of how long the product will take to repair. Figure 6 illustrates the web pages generated by the recommendation system. These illustrations serve as visual aids to demonstrate the functionality of the system and highlight the user interface. Figure 6 shows the options you can select in the left sidebar to get a prediction of the likelihood of a week-long repair, including (i) six leading product brands, including (a) Brand One, (b) Brand Two, (c) Brand Three, (d) Brand Four, (e) Brand Five, and (f) Brand Six, (ii) five leading product categories, including (a) Air Conditioning, (b) Heating, (c) MDA, (d) SDAP, and (e) TV. Figure 6 shows the first part of the recommender system and menu, including the selection of brands and categories.

4.2 Recommender System Usage

This section provides an overview of the two main usage of recommender system: brand prediction, and category prediction.

Brand prediction. The benefits expected and delivered by the recommendation system include security, speed, ease of access, and shorter loading times. The system's brand prediction application has links in the left sidebar to predict product' repair time by brand. For example, selecting the first option - Brand 1 - in the left sidebar displays the predicted results in Figure 7. Figure 7 shows the web pages generated by the recommendation system. These figures serve as visual aids to demonstrate the functionality of the system and highlight the user interface. figure 7 illustrates the prediction of Brand One within the system. Brand prediction within the system provides the probability of service quality prediction (time taken to resolve the complaint) for all five categories. The system indicates

the quality of service', specifically the predicted time to complete the repair. The green percentage indicates the predicted probability of completing the repair in the first week for each "Brand 1" category. The percentage in blue indicates the probability of completing the repair within two weeks for each "Brand 1" category. The percentage in red indicates the probability that the repair will be completed within three weeks for each "Brand 1" category. The percentage in orange indicates the predicted probability that the repair will be completed within four weeks for each 'Brand 1' category. The predicted probability for the Heating and TV categories is greater, and therefore better, because the probability of completing the product repair within one week is higher. The predicted probability for the SDAP category is worse, especially because the probability of completing the product repair longer than one week is higher.

The chart in Figure 8 graphically illustrates the comparison of the percent probabilities of how long it will take to resolve the complaint within a week. The comparative demonstrations belong to each "mark 1" category.

The left sidebar includes the same system components for all brands and provides the probability for predicting the time it will take to resolve the complaint for each brand category.

Category prediction. The system's category prediction has links in the left sidebar to predict the product's repair time by category. For example, if you select the first option of Categories - MDA in the left sidebar, the predicted probability results are shown in Figure 9. Figure 9 illustrates the web pages generated by the recommendation system. These figures are intended as visual aids to demonstrate the functionality of the system and highlight the user interface. the system category part indicates the predicted probability of the time required to resolve the complaints

Figure 7: Brand 1 Prediction of the Recommendation System
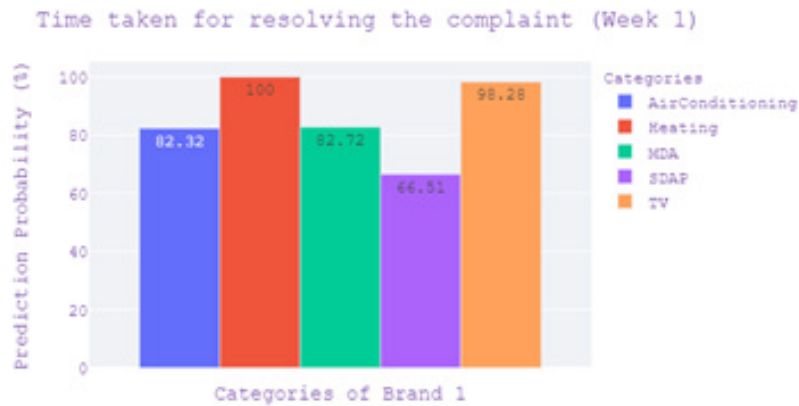
Figure 8: Brand 1 App - Chart of Repair Prediction for One Week

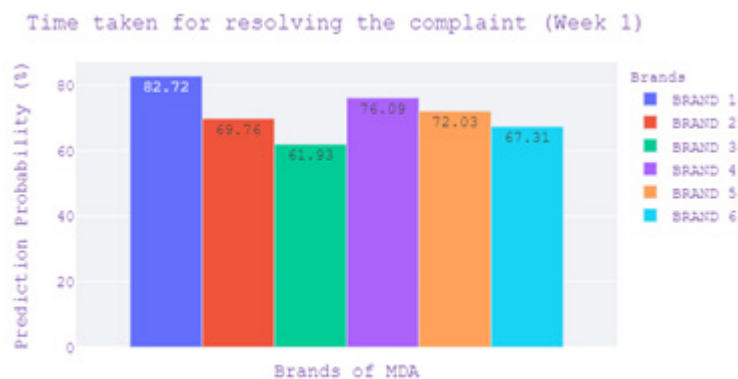*Figure 9: MDA Prediction of the Recommendation System*

Figure 10: MDA Category App - Chart of Repair Prediction of One Week

of the six brands. The predicted probability for brand 1 is higher and therefore better because the probability of completing the product repair within one week is higher. The predicted probability for brand three is worse, especially because the probability of completing the product repair longer than one week is higher.

The chart in Figure 10 graphically illustrates the comparison of the percent probabilities for the time required to resolve the complaint within one week. The comparative demonstrations focus on each brand in the MDA category.

The left sidebar includes the same system components for the categories, such as air conditioning, heating, SDAP, and TV, and indicates the probability that you can predict how long it will take to resolve the complaint for each brand category.

5 Model evaluation and Discussion of Results

This section presents and evaluates the results, how long it takes to resolve the complaint, and the positive effects of the referral system. The time it takes to resolve a complaint is one of the most important attributes of service quality, which affects customer satisfaction and non-financial performance measures for management decision making.

5.1 Evaluation of the impact of the outcome of the recommendation system

This section presents the results for 2020 and 2021, along with a comparison and positive results. The decrease in the average time to process a complaint in each year shows a positive impact. In 2021, the average time it took to process a complaint decreased by 7.78% (equivalent to 0.54 days) compared to 2020. Figure 11 shows the evaluation of the impact.

Figure 12 shows a year-on-year comparison of results for all brands, revealing a decline in average complaint handling time.

The presentation includes a comparison of brands and positive outcomes for 2020 and 2021. Each year, the reduction in the average time taken to resolve brand complaints is evidence of a positive impact.

In 2021, the average time to resolve complaints for each brand decreased compared to 2020, with a decrease of approximately 0.38 days in the average target time to resolve a complaint for Brand 1. The average target time to resolve a complaint for Brand 2 decreased slightly to approximately 0.05 days. For Brand 3, the average target time for processing a complaint decreased to approximately 0.59 days. For Brand 4, the average target time for processing a complaint increased by approximately 0.65 days. At Brand 5, the average target time for processing a complaint decreased by approximately 3.36 days. For Brand 6, the average target time for processing a complaint decreased by approximately 2.59 days.

5.2 Quality of the Recommendation System

The quality of the recommendation system's predictions depends on the studies conducted to determine the best classification algorithm and the system's speed of response to users.

This ensures that the recommender system can be adapted to the needs of the users, resulting in an effective and efficient system without negative consequences. In
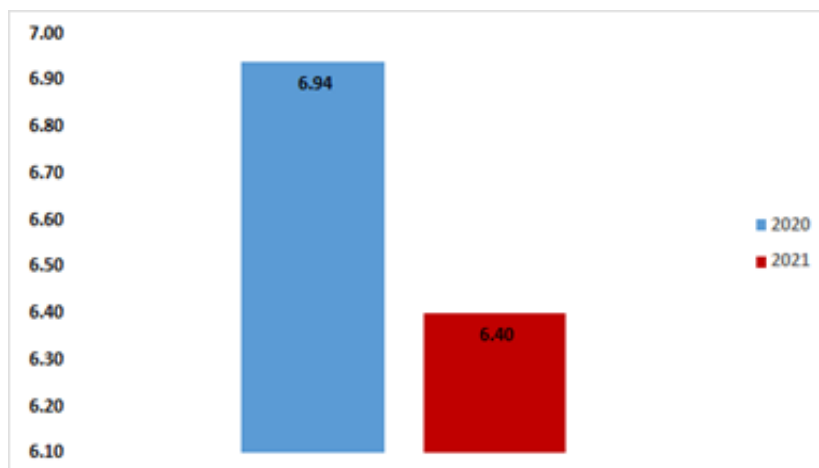

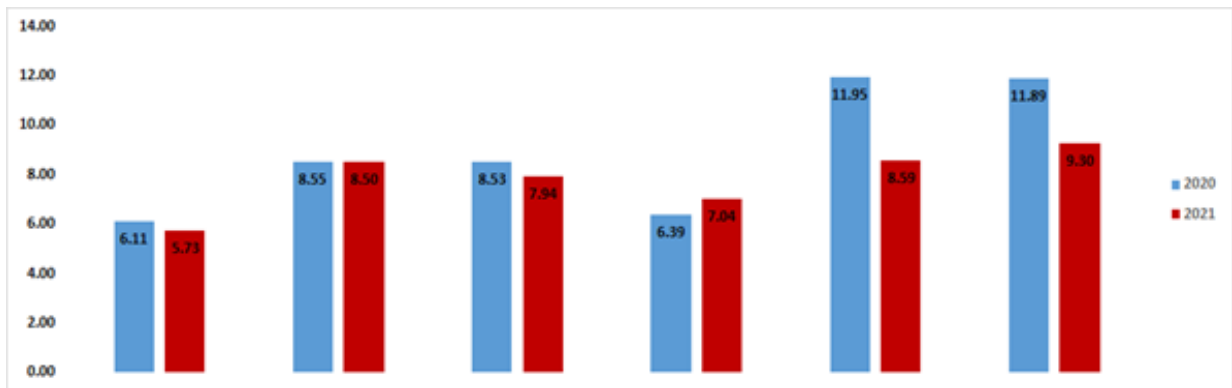*Figure 11: Yearly Comparison - Time Taken for resolving the complaint*

Figure 12: Yearly Comparison, By Brand - Time taken for resolving the complaint

Table 3: Testing Results of the Recommendation System Performance

Steps Taken	Expected Results	Outcome
Flexibility/Responsiveness of the system in different browsers to be tested. Three web browsers such as Chrome, Firefox and IE, were selected.	It is required that all elements of the system load properly without overflowing and remain responsive.	Successfully tested for flexibility and responsiveness, the system encountered no overflow issues.
Accessibility/Easiness to be tested.	We will test the accessibility and ease of use by intentionally refraining from entering credentials and disabling error catching.	Completed testing the ease of accessibility phase.
Incorrect/correct prediction probability percentage to be tested.	The user reported that the predicted probability percentage for the target variable "days to repair" was mostly accurate.	The completion of the testing phase to determine the accuracy of the predicted probability percentage was successful.
User Satisfaction during the testing process.	The testing process was satisfactory to the business.	The system achieved a good performance level.

Source: Authors' work

addition, the recommender system undergoes testing to identify and fix bugs and errors to ensure a high-quality implementation that meets business and technical requirements. The technique of usability testing, which predicts the quality of service, is beneficial to both decision makers (users) and the customer service business in general.

During the testing process, we received user feedback and ran a simple test with only one user to evaluate the implementation.

We tested the system to identify misclassifications and errors and to test behavior and performance. The features tested included the flexibility and responsiveness of the system in different browsers, accessibility and ease of use, and the accuracy of classification by the decision tree algorithm with prediction probability. The system is responsive to the user's expectations. The most important aspects of a system include interface, usability, and performance.

Table 3 shows the completed test steps, expected results, and outcomes.

The objective was to develop and apply a recommender system, evaluate its ability to maintain and operate effectively, and achieve this by selecting the most appropriate trends, data mining technologies, and tools.

The most valuable aspect of the research was the impact of the data mining approach on optimizing the strategic goals of the companies and strengthening the links between companies and customers.

In addition, the system implementation section contributes to the detailed elaboration of all phases of the integration of the data mining approach into the system and to the creation of a model for other companies with similar concerns. This case study provides a concrete example of how companies can apply data mining to analyze information and predict processes. Using data mining techniques,

we gained insight into how this approach can be applied to the home appliance customer service industry. Following this study, the recommendation system identified Python as the most appropriate implementation trend for system development. The evaluation results show how the implementation of the data mining approach can improve the decision-making process by providing reliable predictions for product repairs that have a positive impact on the company's productivity and efficiency.

6 Conclusions

Our research makes an important contribution to this field by proposing a model that involves the implementation of a recommender system that serves as an outcome. This model aims to promote the digital transformation of home appliance customer service by simplifying decision making. In particular, the recommendation system includes several functions of a data mining system. The implementation of this system can improve decision making, increase operational efficiency, and provide better customer service for enterprises. In particular, the recommendation system uses the decision tree classification algorithm that we implemented to improve the efficiency and accuracy of the system. The recommendation system is designed to streamline processes between business partners involved in customer service. The implemented recommender system provides data that primarily predicts the probability of the time required to resolve the complaint and digitizes the manual data presentation processes.

Evaluating the positive impact of the primary attribute of service quality, time taken to resolve complaints, is critical. Our evaluation proves that data mining improves decision making and increases efficiency by analyzing business forecasts.

The data mining approach empowers managers to make strategic decisions, and the use of data mining technologies is key to improving business performance. By helping companies, managers and researchers to become the main beneficiaries, this paper highlights the positive aspects of data mining, which serves as a contemporary approach to facilitate the digital transformation of companies.

Limitations of the study include the challenges in implementing the proposed model in the Kosovar market for home appliance customer service companies, the lack of previous research in the region for comparative studies, the limited assessment of the impact of data mining only on non-financial performance metrics, and the potential for improving the digitization and automation of the data mining system.

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Uporaba podatkovnega rudarjenja za izboljšanje podločanja: Študija primera razvoja sistema priporočil

Ozadje in namen: Cilj pričujoče študije je prikazati praktičen pogled na to, kako se tehnike podatkovnega rudarjenja uporabljajo v poprodajnih storitvah pri prodaji gospodinjskih aparatov. Študija prikazuje kako lahko sistem priporočil pomaga storitvenemu podjetju, ki načrtuje uporabo podatkovnega rudarjenja za izboljšanje odločanja med postopkom digitalne preobrazbe. Poleg tega študija zagotavlja podroben oris postopka za razvoj in analizo platform za izboljšanje analitike podatkov za tovrstna podjetja.

Metodologija: Za namen raziskave uporabimo pristop študije primera za ocenjevanje uporabnosti sistemov, ki temeljijo na pristopu podatkovnega rudarjenja v kontekstu poprodajnih storitev gospodinjskih aparatov. V raziskavi smo izbrali najnovejše platforme glede na njihovo relevantnost in njihovo uporabnost pri funkcionalnosti sistema podatkovnega rudarjenja kot tudi trende v načrtovanju sistema.

Rezultati: Ocena vpliva uporabe tehnik podatkovnega rudarjenja na odločanje kaže povečanje učinkovitosti organizacij. V članku je predstavljena ocena časa reševanja reklamacije, kot ključne lastnosti kakovosti storitev, ki vpliva na zadovoljstvo strank, in pozitivni rezultati, ki jih dosegamo s pomočjo sistema priporočil.

Zaključek: Raziskava prispeva k razumevanju prednosti pristopa podatkovnega rudarjenja v kontekstu sistemov priporočil. Prednosti podatkovnega rudarjenja, kot pomembnega sestavnega dela napredne analitike, vodijo do povečanja produktivnosti. Za prihodnje raziskave se lahko, za izboljšanje kakovosti rezultatov, vključijo tudi drugi atributi ali dejavniki, ki so koristni za sisteme priporočil.

Ključne besede: Digitalna transformacija, Podatkovno rudarjenje, Algoritem odločitvenega drevesa, Odločanje, Poprodajne storitve gospodinjskih aparatov

Does Spiritual Leadership Influence Hotel Employees' Voluntary Eco-Friendly Behavior? The Role of Harmonious Green Passion and Nature Connectedness

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Purpose: The current paper investigates the role of spiritual leadership in increasing employees' voluntary eco-friendly behavior. This research emphasizes the value of a harmonious green passion (HGP) and connectedness to nature (CTN) as a mediating factor between a spiritual leader (SL) and an employee's voluntary eco-friendly behavior (VEB).

Design/Methodology: The data was provided by a sample of 273 participants who worked as hotel employees in Yogyakarta's four and five-star hotels. SPSS and AMOS 25 were used as statistical programs to analyze the data.

Findings: Based on the discovery, the study presents strong theoretical and managerial implications that hospitality institutions can use to evaluate the importance of spiritual leaders on employees' eco-friendly behavior among employees. We also discovered that indirect associations between spiritual leadership and employee voluntary eco-friendly behavior exist via connectedness to nature and harmonious green passion.

Practical Implication: By shedding further light on how and when a spiritual leader influences employees' voluntary eco-friendly behavioral intention in hotels, this research added to the body of knowledge on the hospitality industry in South East Asia.

Originality: The study offers novelty by emphasizing the function of connectedness to nature and harmonious green passion in the relationship between spiritual leadership and employees' eco-friendly behavior.

Keywords: Spiritual, Leadership, Eco-Friendly, Nature, Harmonious, Passion, Connectedness

1 Introduction

Global ecosystems today have changed and are degraded due to human activities to meet the necessities of life (Mikhaylov et al.,2020). Human self-fulfillment may increase the consequences of climate change on ecologies. A growing global population with fast-changing energy, water, and food consumption behaviors puts strain on ecological processes and life-supporting services. The rising public consciousness of the need for environmental protection has recently prompted the hospitality industry to use environmentally conscious management practices along

the route to sustainability. Many hotels are committing to "eco-friendly" to lessen their negative environmental impact (Abdou et al.,2022). These green properties conserve water, electricity, and solid waste while reducing expenses to protect the environment.

Scholars have recently concentrated on employees' ecologically conscious actions to the necessity to promote environmental sustainability in the hospitality sector. Employees are seen as the primary actors enabling the implementation of green policies. The employee green performance of hospitality firms has been the subject of earlier empirical investigations. Further, the underlying factors that encourage employees' ecologically responsible behavior have also received scientific study. It is interesting to note that leaders, to a certain extent, determine how effective environmental programs are. Previous research has demonstrated the importance of leadership in the adoption of employee eco-friendly behavior initiatives, such as transformational leadership (Sun et al.,2022; Tosun et al.,2022; Sobaih et al.,2022), ethical leadership (Saleem et al.,2020 Wood et al.,2021; Islam et al.,2020); servant leadership (Tuan, 2020; Faraz et al.,2021; Ying et al.2020) and empowering leadership (Jiang et al., 2019). Except for a handful of recent leadership studies, there has been a minimal study on the function of spiritual leadership in employee voluntary eco-friendly behaviors (Afsar, 2016), particularly in the tourism industry. The concept of spiritual leadership represents a new paradigm that bridges the gap between spirituality and management (Sapta et al., 2021). Spiritual leadership guides followers in improving their ability to control themselves by imparting sound principles and practices (Bayighomog and Araslı,2019). According to Fry et al. (2012), the spiritual foundation of leadership is the pursuit of a sense of belonging and connection to oneself and others that helps people understand their identities and the sources of their significance in life. Their goal is to live in a way that helps other people. Self-reflection and inner life practices are essential for building the core values and sense of self needed for a character based on love and compassion.

According to Sharma et al. (2013), spirituality is associated with environmentally responsible actions. Spiritual orientation motivates employees to participate in meaningful activities in terms of ecological preservation in their workplace environment. Hence, when employees develop a self-awareness that allows them to comprehend their environmental consciousness, they gain a holistic perspective on their being, other people, and the natural environment around them. They are more likely to take the initiative for the benefit of the company's ecological action. It has been proposed that a spiritual leader is one of the primary elements influencing environmental concern by boosting ecological consciousness (Samul,2019). Since it has been noticed that spirituality influences an individual's initiatives based on their awareness, this article claims that spiritual leaders may affect employees' voluntary environmental behavior.

Despite the widespread acceptance of the hypothesis that leaders can favorably affect their subordinates' green behaviors, academics have paid scant attention to the impact spiritual leaders have on their employees' eco-friendly practices. The examination of spirituality has typically disregarded green activities and green employee behavior towards the organization. However, it could shed light on the idiosyncratic process through which employees assign meaning to their green actions and experiences. Prior literature has revealed the role of intrinsic motivation and psychological capital (Li et al., 2022); employee voice behavior (Zakkariya & Aboobaker,2020); and mindfulness (Mohammed et al.,2022) as the characteristics that serve as the mediators between spiritual leadership and work-related behavioral outcomes. Afsar et al. (2016) asserted that "Spiritual leaders emphasize ethical and ecological ideals and advocate their transcendental significance", which has a favorable impact on the results of their work-related outcomes. Maintaining the argument of Afsar et al. (2016) and following the future calls of Islam et al. (2020), the process through which spiritual leadership can influence individuals' employment results must be determined. In the setting of south-east Asian hospitality employees, we enhance the literature by assuming employee harmonious green passion and nature connectedness as a crucial mediating variable between spiritual leadership and employee voluntary eco-friendly action. Hence, this paper investigates the connection between spiritual leadership and employees' voluntary eco-friendly activities and mediating mechanism of value orientation and nature connectedness.

2 Literature Review and Hypotheses Development

2.1 Spiritual Leadership

Fry et al. (2005) explained that spiritual leaders assist workers in discovering meaning by creating a vision and culture based on altruistic values in their job and advancing their development by focusing on the fundamentals of their profession. Fry (2003) argues that spiritual leaders encourage a sense of spiritual fulfilment among their staff by emphasizing the transcendental significance (calling and membership) of the organization's mission. This condition has two effects. The first is that it helps fellow organization members share a common goal by making them feel their lives have a greater purpose. The second is to create an organizational culture based on altruistic love where the leader and followers genuinely care for and respect one another, making sense of belonging.

According to Fry (2009), the characteristics contained in spiritual leadership are vision, altruistic love, and hope/faith. The term "vision" refers to a meaningful future that causes employees to experience intrinsic self-worth and a sense of life purpose. Altruistic love is a cultural image or value in an organization defined as valuing mutual care and harmonious well-being through attention, respect and appreciation for self and others. Further, hope/faith is a desire for expectations to be met and are the basis for establishing the vision, goals and organizational mission. According to Wu & Lee (2020), spiritual practices that include the spiritual survival dimensions of calling and membership create an intrinsic motivational force that brings people spontaneous and cooperative efforts. Hence, encourage workers to be more eager to learn, develop, and use skills and knowledge to increase organizational values.

Additionally, the values contained in the spiritual leadership proposed by Pfeffer (2003) are (1) exciting and meaningful work that enables them to learn, develop, and have competence and skills, (2) meaningful work that gives a sense of purpose, (3) sense of belonging and positive social connection with coworkers, and (4) the ability to live in an integrated manner so that his work role and other roles are following the nature of basis and identity as a human being. Employees' expectations for eco-friendly behavior are raised by leaders' spirituality and support at work, influencing how they form their values, develop their vision, and set goals. Employees can deal with uncertainty and have the courage to create and implement eco-friendly behavior by thoroughly understanding their organization's mission and purpose (Mubashar et al., 2020). Employees are more willing to take the initiative for the organization's benefit when they work in a meaningful work climate, which promotes positive reciprocity toward their leader. Spiritual leadership demonstrates moral principles, respect and compassionate love through their behaviors. Hence, the actions of spiritual leaders reflect ecological transcendence and harmony with the self, social and natural environment.

2.2 Spiritual Leader and Employee Voluntary Eco-Friendly Behavior

Leaders frequently operate as salient referent individuals inside organizations, influencing staff members' behavior through interpersonal interactions (Usman et al.,2021). Leaders act as role models who influence employees by sharing crucial information about desired and prioritized behavior through a social learning process. Spiritual leaders also give staff members the skills to do their responsibilities successfully. Spiritual leaders emphasize the transcendental significance of moral and ecological principles and pay attention to them. Hence, spiritual leaders will intrinsically motivate employees to be aware of environ-

mental challenges by internalizing a sense of meaningful purpose and harmony toward nature.

The origins of spiritual leadership can be traced back to Fry's (2003) concept of a spiritual leader as an individual who seeks to serve others and establishes an organizational culture that values altruistic love. These leaders are selfless and driven by a desire to help others. According to the spiritual leadership philosophy, a leader acts altruistically to benefit followers and fosters their development by presenting material and emotional advancement opportunities. Spiritual leaders can organize dialogue, empower staff members' well-being through safety and harmony, and reduce uncertainty by inspiring workplace goals and vision to expose their initiative to engage in voluntary eco-friendly behavior. We argue that a spiritual leader's positive emotions like gratitude, caring, respect and appreciation toward followers as a manifestation of spiritual practice will drive subordinates' voluntary behavior towards nature. Hence, the belief that the organization's environmental sustainability objectives be gained (hope/faith), as well as the leader's care and gratitude for their staff (altruistic love), are likely to build trust and long-lasting relationships, improving employee green voluntary behavior initiative.

Additionally, Spiritual leaders can develop and encourage processes of the collective influence of environmental concern, such as motivating stakeholders through interaction and intellectual discourse to find life's meaning and purpose and align the workforce's morals and values with the firm's sustainability goals (Lean & Ganster, 2017). Developing individuals' ecological values is a priority for spiritual leadership that encourages employees to engage in green voluntary behavior. Hence, we argue that spiritual leadership encourage employee green voluntary behavior.

H1. Spiritual Leaders positively influence employees to green voluntary behavior.

2.3 Spiritual Leader and Harmonious Green Passion

The second hypothesis argues a connection between spiritual leadership and harmonious green passion. Since of the inherent relationship that exists between spirituality and harmonious green passion, we place a strong emphasis on spiritual leadership. Harmonious green passion denotes a person's strong desire to devote time and resources to environmental conservation that they enjoy or find meaningful (Robertson & Barling, 2013). Spirituality has been used to denote a positive affect and ignite positive emotion that spurs employees to act in green voluntary behavior. As a result, we presume that spiritual leadership is important in cultivating shared perceptions beneficial in generating a harmonious green passion. Spiritual leadership draws on spiritual leadership theory to develop an inspiring vi-

sion that outlines the path to fulfilling followers' ideas. Spiritual leadership involves deferring to followers' desires and goals to advance the organization's shared future (Fry et al.,2017). It also entails maintaining followers' trust and belief in the organization's vision by fostering hope and faith. Through identifying vision and inspiring faith/hope, spiritual leaders directly influence cognitive and affect-based trust, increasing followers' intrinsic motivation to internalize environmental passion. Spiritual leadership involves the values, attitudes, and behaviors which positively influence employee spiritual motivation (consider work as a calling), spiritual practices (expressing caring and concern, feeling understood and appreciated, demonstrating fair treatment) and spiritual values (harmony, trust, humility) (Rothausen, 2017). Hence, by establishing a vision, spiritual leaders assist team members in developing their spiritual values through their work.

Consequently, employees refer to their jobs as callings so that it has meaning and impact, contributing to initiatives for environmental improvements. Spiritual leaders can inspire employees to support, value and prioritize a harmonious work environment. They are creating collective judgments about work's meaning in eco-friendly behavior. A psychological mechanism will be formed by employees' perceptions of care and concern consistent with their values (e.g., supporting green responsibility). This psychological mechanism can encourage cohesion in their harmonious green passion. Consequently, the theories mentioned above will be examined:

H2. Spiritual Leaders positively influence employees to Harmonious Green Passion.

2.4 Spiritual Leader and Nature Connectedness

In earlier spirituality literature, it is emphasized that humans should coexist harmoniously because they are a part of nature. Further, since spirituality is a crucial component for creating a climate for work meaningfulness, organizations with a strong environmental concern inspire nature connectedness in their employees. Moreover, a spiritual Leader with the value of altruistic love and a sense of transcendence inspires subordinates to develop individual ecological values. Social learning theory also proposed that people who follow spiritual leaders may absorb and imitate their role models' transcendental self-concepts and duty toward nature (Brown et al., 2005), encouraging them to pay greater attention to environmental issues in their day-to-day work. Spiritual leaders firmly believe that it is their responsibility to educate their followers on the importance of being aware of and concerned with environmental issues. This leadership style engages workers through intellectual dialogue and an interactive approach that helps workers find meaning and purpose in the context of eco-

logical preservation. Spiritual leaders take the initiative to provide followers with assistance, guidance, and resources due to their holistic perspective of the environment (Frank, 2022). According to the same line of inquiry, spiritual leaders will inspire their subordinates to think above what is typically required at work by considering ecological values and being connected to nature. They are known to be people-centered, emphasizing their followers' well-being, and passionate about serving and inspiring others. In light of this, it is plausible to claim that spiritual leadership affects employees' connectedness to nature.

H3. Spiritual Leaders positively influence employees to Nature Connectedness

2.5 Harmonious Green Passion and Voluntary Eco-Friendly Behavior

An employee in the hospitality industry increasingly emphasizes environmentally friendly behavior due to growing environmental concerns. Employees adopting ecologically sustainable behaviors seem motivated by their green passion for the environment. Further, workforces with harmonious green passion are more inclined to take on more responsibilities and make extra efforts to find spiritual fulfilment. According to Choong et al. (2019), people who are in harmony with their passions are more willing to take extra initiative and make extra efforts to enjoy themselves and find spiritual fulfilment. Additionally, employees passionate about environmental issues often share that interest with others. Hence, it assists in spreading that enthusiasm to foster relationship pleasure, which pushes individuals to engage in prosocial green action.

Bashir et al. (2021) argued that employees with an environmentally harmonious passion engage in activities at work and their personal lives flexibly and are willing to learn from their experiences. Thus, employees' experiences of green absorption and environmental affectivity will create an internal drive and energy that causes them to engage in voluntary eco-friendly activity. Employees that enthusiastic about their jobs and communities are more likely to put in extra effort and show more altruistic tendencies. So, we argue that highly-harmonious green passion makes employees more aware of environmental issues and more likely to put their own needs aside to protect the natural environment.

In sum, we propose that employees with a high level of environmental passion will have a greater awareness and sensitivity to ecological issues, increasing their motivation to engage in voluntary eco-friendly behavior. Prior scholars have pointed to the role of harmonious passion in encouraging prosocial Behavior (Ali et al., 2020; Burke et al.,2015). As a result, it is possible to hypothesize that:

H4. Harmonious Green passion positively influences employees' voluntary eco-friendly behavior

2.6 Nature Connectedness and Voluntary Eco-Friendly Behavior

According to Geng et al. (2015), nature connectedness combines an individual's emotional and cognitive responses to their sense of connection with the natural world. The literature currently indicates that a connection to nature encourages voluntary eco-friendly behaviors. It has been hypothesized that people are less likely to cause damage to the natural world when they experience a sense of belonging. This condition is because they recognize that any harm done to the environment also harms themselves. As a result, a sense of connectedness to nature may offer an intrinsic motivation to engage in more environmentally conscious behaviors. According to the eco-psychology theory, having a deep spiritual connection to the environment helps people lead more environmentally friendly behavior. Connectivity to nature was also discovered to influence voluntary eco-friendly behavior, such as energy conservation at the workplace.

Additionally, as stated by Boiral et al. (2019), employees who see themselves as a part of nature and are connected to others living things are more likely to be extraverted and conscientious about the environment. According to Afsar et al. (2016), people's sense of ecological responsibility, concern over the outcomes of their green activities, and sense of connectedness to nature can stimulate their moral obligations and lead to voluntarily eco-friendly behavior. Based on these considerations, we contend that an enhanced state of connectedness to nature encourages people to engage more actively in voluntary eco-friendly actions, as seen by their voluntary behaviors compared to others. The following hypotheses are created in light of these arguments:

H5. Connectedness to nature positively influences employees' voluntary eco-friendly behavior

2.7 Mediating Role of Harmonious Green Passion and Nature Connectedness

Spirituality presents an opportunity that could result in the explanation and resolution of behavioral issues that positively impact people, modifying their perceptions and enhancing their quality of life. Spirituality is one of the expressions of a transcendental environment, which has been shown to positively affect an individual's well-being and productivity (Gupta & Mikkilineni, 2018). In addition, spirituality contributes advantages to the environment, such as preserving nature, which makes it possible for this favorable environment to be maintained throughout time.

Spiritual leadership incorporates ethical principles, moral behavior, and social ideals to encourage employees to set aside their interests and make discretionary efforts to benefit others and the environment (Rezapouraghdam et al.,2018). Burke et al. (2015) stated that employees might sustain a higher degree of harmonious work passion with a more profound feeling of spiritual presence (meaning and purpose of life). Spiritual leaders evoke positive emotions by realizing the connection between work and the pursuit of life among their followers. Spiritual leadership promotes the affective orientation to serve others and the community by sustaining high moral standards and fostering good social values to help others and address the fundamental spiritual needs of leaders and followers. Liu et al. (2011) asserted that spiritual leaders inspire self-directed, free moral choice actions for the benefit of society and offer individuals a sense of purpose and meaning in their professional roles in the context of environmental sustainability. These actions are considered very important for igniting harmonious green passion. According to research, having a purpose and meaning in life boosts happiness and increases autonomous motivation. Hence, a harmonious passion emerges when employees feel they have the autonomy to internalize their job. Spiritual leadership also encourages staff to transcend self-interests for the benefit of others and society by experiencing transcendence during their green work. Hence, this condition will inspire harmonious green passion (Wang et al., 2021). Additionally, it increases employees' energy and promotes fulfilment, allowing them to do their responsibilities flexibly and raising their voluntary eco-friendly behavior.

In the context of the ideological shift that fosters ecological compassion, the connection between spirituality and a sense of connectedness to nature is critical. Extant literature proved that the actions of spiritual leaders inspire a greater sense of the meaning of work and responsibility to contribute to nature preservation. Spiritual leadership promotes ecological value, pays attention to environmental issues, and will be salient referents, possibly influencing staff members' behavior through interpersonal interactions (Anser et al.,2021). This type of leadership emphasizes the transcendental significance of moral and ecological principles and pays attention to them. Thus, followers of spiritual leaders might internalize their leaders' sense of connectedness with nature, inspiring them to pay attention to the natural challenges around them. As a result, employees with a strong sense of connection to nature are more aware of environmental issues. They can show a stronger willingness to put aside their interests to protect the environment. This circumstance makes it more likely that workers will take voluntary environmental action. We, therefore, hypothesize the following hypotheses:

Hypothesis 6: The relationship between spiritual leaders and voluntary eco-friendly behavior is mediated by harmonious green passion.

Hypothesis 7: The relationship between spiritual leaders and voluntary eco-friendly behavior is mediated by connectedness to nature.
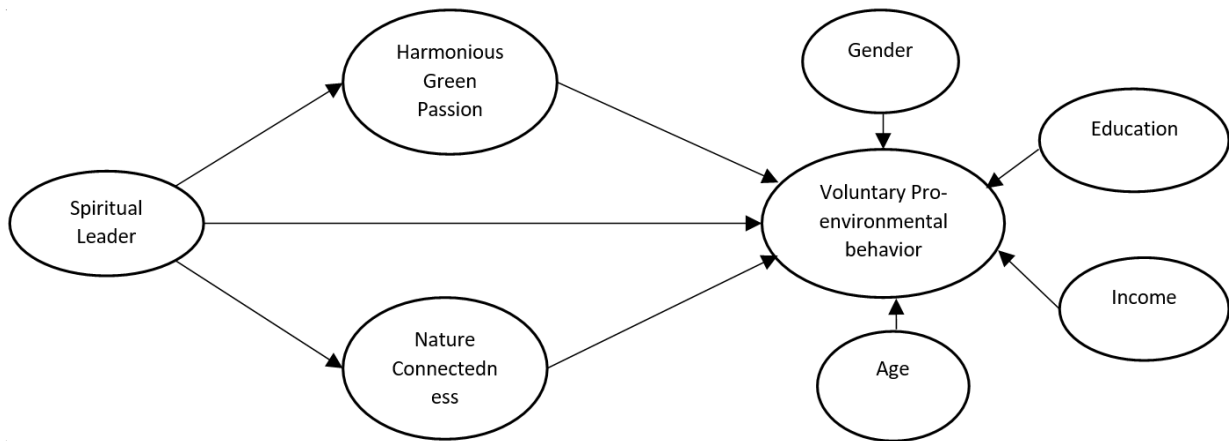
Figure 1: Proposed Theoretical Model

3 Methodology

3.1 Sample and Data Collection

This study focuses on a wide sample of hotel workers in Yogyakarta's hospitality industry to investigate how spiritual leadership affects employees' voluntary eco-friendly behavior. Based on the published research, these characteristics were prioritized because Yogyakarta is a city that applies spiritual and cultural ecosystem services as the city's image (Manikasari et al.,2018). Hence, the hospitality sector in Yogyakarta has a higher propensity to engage in environmental practices.

Participants must have at least a year of professional experience and work for their current employer for at least one year to be eligible for the study. The study used a self-reported questionnaire to investigate the spiritual leadership hypothesis on the voluntary eco-friendly behavior of workers. During the first stage of the empirical investigation, the research team contacted the manager of all four- and five-star hotels to describe the study's goals and request authorization to gather data. Three factors led to the selection of only four- and five-star hotels for this study. First, this study's focus on four- and five-star hotels were motivated by the extent to which these establishments support environmental action. Second, it was assumed that the more prestigious hotels in Yogyakarta would be a leader more likely to engage in eco-spiritual transcendence than their less prestigious counterparts. As a third point, it has been underlined that personnel at four- and five-star hotels are held to a higher standard of client satisfaction in eco-friendly activities. The immediate manager was selected as the sample for the research project with the presumption that the immediate manager's job

identity is composed of some spiritual elements like being a role model for transcendental self-concepts, maintaining followers' trust and belief in the organization's vision, directing subordinates for higher purposes and fostering a sense of wholeness and harmony.

Seven of the four and five-star hotels consented to contribute to the study. There was a total of 500 questionnaires distributed to the staff members working at the hotel. A total of 278 replies were received; five were invalid and could not be used. As a direct result, 273 questionnaires were utilized for additional research, representing a response rate of 55.6%. Finally, Respondents were also informed that their replies would be anonymized. The researchers did not ask for or record any identifying information about them to eliminate the possibility of social desirability bias.

3.2 Measurement

The survey questions were generated by previous research and adapted to the present research. To be consistent with previous research in the Yogyakarta hotel sector, which also used the original English language versions of the scales, we kept the original scales in their original English language form. Spiritual leadership was measured using a set of 17 items derived from Fry et al. (2005) to assess the organization's level of vision, hope/faith, and altruistic love from the viewpoint of the employees. The scale ranged from '1′ (strongly disagree) to '5′ (strongly agree). Participants indicated the degree to which they agreed or disagreed with each item (e.g., "employees understand and are committed to the organization's vision.".

Robertson & Barling's (2013) harmonious green passion scale was employed for this study. A 5-point scale, ranging from strongly disagree to strongly agree, was used

to score the items. Examples include " employee finds enjoyment in protecting the environment " and "enthusiastically discusses environmental issues with others."

Connectedness to nature was measured using three questions from Gosling & Williams (2010). The following was an example response on the scale: "I think the relationship between humans and nature is harmonious and symbiotic."

Employees rated their voluntary eco-friendly behavior using a 7-item measure (Boiral & Paille, 2012   ). The frequency of each item was scored (1 = never, 5 = always). Examples include "My coworker recycles at work whenever feasible" and "My coworker consumes less energy."

Control Variable: Participants provided information on their gender, age, educational attainment, and personal income. These four background factors served as controls in our later analyses.

4 Findings

4.1 Data Analysis

According to demographic data, respondents were split out among different categories. The data recorded that 53 percent of respondents were women, and approximately 47 percent were men. Most respondents, 192 (70%), were full-time employees, while 81 (30%) were part-timers.

Most employees (27%) were between the ages of 31 and 34, then 25 – 30 years old (19 per cent). In terms of the level of education, 64% were senior high school or below, while 30 % had undergraduate degrees, and only 6 % had Master's degrees. Less than $ 5.000 per month or less was the income range for the 191 participants in this online survey (70 %), followed by $ 2.501 to $ 5.000 (23%).

Table 1: Demographic Data (N: 273)

Category	Distribution	n	Frequency (%)
Gender	Male	146	53
	Female	127	47
Modes of Job	Full time	192	70
	Part-Time	81	30
Age	< 20	17	6
	20-24	46	17
	25 - 30	52	19
	31 - 34	73	27
	35 - 40	42	15
	>40	43	16
Education Level	Senior High School or below	174	64
	Undergraduate	82	30
	Master's degree	17	6
Annual Income	$2.500 or less	191	70
	$2.501 - $5.000	62	23
	$5.001-$ 7.500	15	5
	$7.501-$10.000	5	2

Table 2: Means, standard deviation, and correlation matrix

Variable	M	SD	1	2	3	4
Spiritual Leader	3.820	.755	**.807**			
Harmonious Green Work Passion	3.294	.784	.670	**.931**		
Nature Connectedness	3.713	.782	.584	.643	**.836**	
Voluntary Eco-Friendly Behavior	3.815	.746	.752	.741	.781	**.799**

Note: The values that appear on the diagonal are the square roots of the AVEs for their respective construct

Table I presents the statistical results for the proposed variables, including the correlation matrix, means, and standard deviation. The spiritual leader, harmonious green work passion, nature connectedness, and voluntary eco-friendly behavior variables show a positive correlation.

4.2 Common Method Variance

We initially checked using Harman's one-factor test to see whether the first variable can explain most of the variation to see if common technique variance may affect our results. We discovered that the first component only accounts for 36.54% of the variation. After combining the 34 data points from the same work into a single model, we compared the model fit indices. The results showed that the one-factor model could not accurately explain the data ($\chi2$ = 432.53, df = 269, $\chi2$/df = 3.87, CFI = 0.79, GFI = 0.73, TFI = 0.74, RMSEA = 0.15)

4.3 Measurement Model

Confirmatory factor analysis used AMOS to analyze the self-report items' factor structure and validate the proposed model's characteristics and connections. A model was considered a good match if its CFI was more than .90 and its RMSEA was less than .08 (Hair et al. 2014). The goodness-of-fit indices were X2/df = 2.38, CFI = .92, NFI = .93, TLI = .91, GFI = .91, IFI = .92 and RMSEA = .05. The model has a good fit following the Fornell & Larcker (1981) criteria. Cronbach's alpha and composite reliability (C.R.) were used to assess the reliability (Fornell & Larcker, 1981). Table 2 displays the reliability assessment's findings. Four latent variables had Cronbach's alpha and C.R. values that varied from 0.79 to 0.97, all higher than the recommended cutoff point of 0.70. (Fornell & Larcker, 1981). Therefore, the measurements exhibited satisfactory reliability. Additionally, validity tests for discriminant and convergence were conducted.

Item factor loading and extracted average variance (AVE) are standard ways to evaluate convergence validity.

The factor loadings of the items, as shown in Table 2, varied from 0.63 to 0.70 (p < .001) beyond the recommended cutoff point of 0.70. The AVE values were significantly higher than the suggested threshold of 0.50. Fornell and Larcker (1981) stated that discriminant validity is adequate when the square root of AVE is greater than correlation coefficients. Table 3 shows that all variables satisfied the criteria, indicating their discriminant validity.

5 Structural Model

5.1 Hypotheses Testing

The structural equation modeling analysis was utilized to test the proposed hypotheses. According to hypothesis H1, a spiritual leader positively correlates with employees' voluntary eco-friendly behavior. As displayed in Table 4, the relationship between spiritual leadership and employee voluntary eco-friendly behavior was favorable and significant in the structural model's path analysis (=.96, p < .01), resulting in H1 support. These findings imply that a spiritual leader who encourages people to pursue a stronger sense of life's purpose in environmental protection may feel more harmonious between organizational and individual spirituality. Thus, employees find life's meaning in an eco-friendly workplace and align values with the firm's sustainability goals. Hence, instigate workers to engage in green voluntary behavior. Further, hypothesis two aims to ascertain how spiritual leadership affects employees' passion for harmonious green work. The findings confirmed that a spiritual leader is significantly associated with employees' passion for harmonious green passion (= .23, p < .001); consequently, the proposed hypothesis was confirmed.

The purpose of hypothesis three was to investigate how spiritual leaders affect employee connectedness to nature. The findings (=.87, p < .001) corroborate these assumptions, demonstrating that spiritual leaders positively relate to employee nature connectivity. Connectedness to nature is the degree to which a person initially perceives himself as an intrinsic part of nature that calls their atten-

tion to environmental problems around them. Spiritual leaders demonstrate a strong emotive commitment to serving others and a sense of transcendence and duty to society and the environment. Hence, workers whom spiritual leaders supervise can internalize the intrinsic meaning and a sense of transcendence and promotes their sense of connectedness to nature. H4 proposed that harmonious green passion would positively affect employee green voluntary behavior. The finding supports H4, demonstrating a strong positive association between harmonious green passion and voluntary eco-friendly behavior (r = 0.73, p .001). Harmonious green passion incorporates eco-friendly workplace practices into a person's personality through personal support and preference. Positive emotions like happiness and pride are experienced due to harmonious passion, which motivates people to engage in expected behaviors. Additionally, this satisfying feeling will lead one to define oneself as an eco-workers or environmentalist. This sense of self-identity is a powerful indicator of voluntary eco-friendly behavior.

H5 predicts that connectedness to nature positively influences employees' voluntary eco-friendly behavior. The results indicate a significant relationship between connectedness to nature and eco-friendly behavior (0.34, p <0.05). The idea of connectedness with nature attempts to define a biophilic emotional bond with nature. According to Wilson's (1984) theory of biophilia, people have a natural desire to feel a connection to and a sense of belonging to the larger natural world. Hence, the chance of harming the environment is lower, and there is a larger desire to promote eco-friendly conduct when one feels more connected to nature.

Moreover, stronger connections to nature are associated with higher levels of ecological care, better compassion for the natural world, improved environmental protection intentions and encouraged employee voluntary eco-friendly behavior. This study used Preacher & Hayes' (2008) methodology for mediating assessment. To evaluate the importance of the mediation relationship, this strategy employs the bootstrapping method (indirect effects).

Table 3: Results of Measurement Model

Items	Factor Loading	C.R.	Average Variance Extract	α	The Square Root of AVE
Spiritual Leader (SL)					
Spiritual Leadership		**0.970**	**0.652**	**0.896**	**0.807**
Vision					
VIS1	0.823				
VIS2	0.781				
VIS3	0.779				
VIS4	0.796				
VIS5	0.808				
Altruistic Love					
ALT1	0.754				
ALT2	0.885				
ALT3	0.833				
ALT4	0.789				
ALT5	0.769				
ALT6	0.801				
ALT7	0.811				
Hope/Faith					
Hop1	0.873				
Hop2	0.789				
Hop3	0.881				
Hop4	0.776				
Hop5	0.768				

Table 3: Results of Measurement Model (continues)

Items	Factor Loading	C.R.	Average Variance Extract	α	The Square Root of AVE
Connectedness to nature		**0.875**	**0.700**	**0.912**	**0.836**
CTN_1	0.789				
CTN_2	0.796				
CTN_3	0.789				
Harmonious Green Work Passion		**0.931**	**0.658**	**0.932**	**0.811**
HGP1	0.790				
HGP2	0.813				
HGP3	0.778				
HGP4	0.756				
HGP5	0.784				
HGP6	0.787				
HGP7	0.769				
Voluntary Eco-Friendly Behavior		**0.796**	**0.639**	**0.869**	**0.799**
VEB1	0.724				
VEB2	0.781				
VEB3	0.672				
VEB4	0.772				
VEB5	0.821				
VEB6	0.778				
VEB7	0.676				

To begin with, as shown in Fig. 1, a structural model revealed that the spiritual leader was positively related to voluntary eco-friendly behavior (=.93, p .01). Similar to the path between connectedness to nature and eco-friendly behavior (=.58, p .01), the hypothesized relationships were also supported. The second hypothesis proposed that connectedness to nature was an intermediary mechanism to explain how spiritual leadership affected employee voluntary eco-friendly behavior. The statistical output proved that harmonious green passion partially mediates the effects of spiritual leadership on employee voluntary eco-friendly behavior because the total effect of spiritual leadership on VGB was.34, which was made up of direct effects (.26; p <.01) and indirect effects through VGB (.15; p .05).

SEM findings reveal that several control factors have no discernible influence on employees' voluntary eco-friendly behavior (gender: β = 0.03, null; age: β = −0.07, null; personal income: β = 0.02, null), whereas educational attainment level has a significant effect on employee voluntary eco-friendly (β = 0.17, p < .05). Confidence intervals (CI) using bootstrapping (5000 samples) revealed that zero was not included in the intermediate indirect effects of VEB. (95% CI = [.00,.31]; S.E. =.08, p <.05). In alignment with Hypothesis 7, the association between the presence of S.L. and VGB was mediated by perceptions of connectedness to nature (standardized indirect effect = .07, p < .01, 95% CI = 0.04; 0.15). The suggested hypotheses 6 and 7 are supported by these findings, respectively.

Table 4: Results of the direct relationship and mediation testing

Path	Hypothesis	β	C.R.	p-values	Status
Direct Effect					
SL->VEB	H1	.45	9.70	.000	Accepted
SL->HGP	H2	.26	5.71	.000	Accepted
SL->CTN	H3	.22	5.71	.000	Accepted
HGP->VEB	H4	.27	2.27	.003	Accepted
CTN->VEB	H5	.19	2.27	.023	Accepted
Mediating Effect of HGP	H6				Partially
SL->HGP->VEB					
Direct Path		.45		.000	
Indirect Path		.23		.000	
Mediating Effect of CTN					
SL->CTN->VEB	H7				Partially
Direct Path		.27		.000	
Indirect Path		.12		.002	
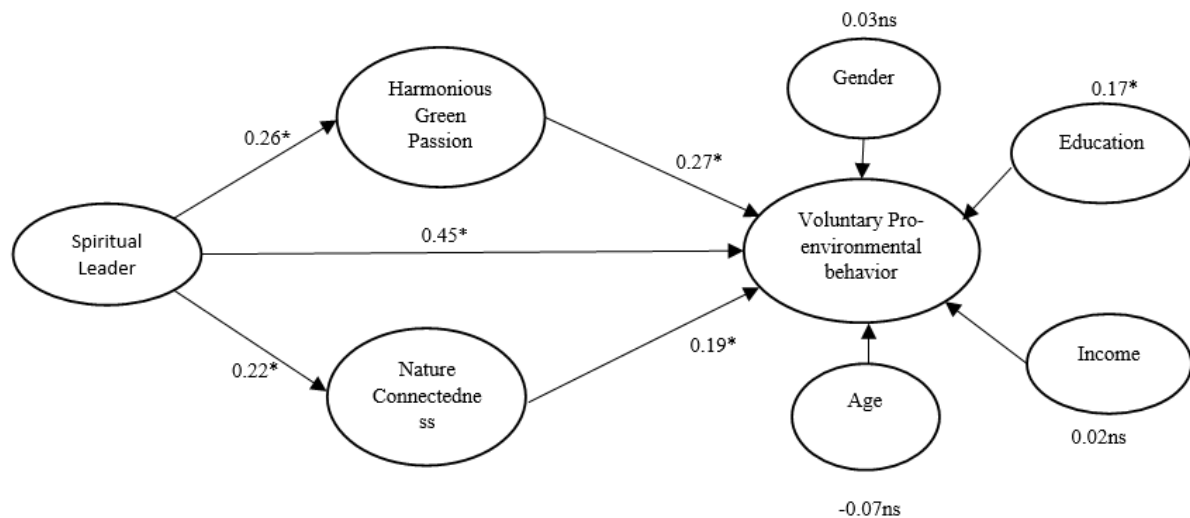
Notes: *Statistically significant (p<0.05); ns, statistically not significant (p>0.05)

Figure 2: Empirical Findings

6 Discussion

In the hotel industry, fostering a culture of voluntary eco-friendly behavior among staff members can help businesses reduce costs, achieve sustainable competitive advantage, and live up to their obligation to protect the environment. Understanding how human resources can influence such crucial behavior necessitates leadership skills that support employees' positive, motivating factors, such as green voluntary behavior. We propose that spiritual leaders embody altruistic love, hope, and vision intrinsically inspire their followers to take the initiative and engage in actions that lessen adverse environmental effects, preserving the environment and the community's concerns. The research presented in this paper provides solid evidence for the impact of spiritual leadership on

employee eco-friendly green behavior. This paper's conclusions have filled several knowledge gaps in leadership and employee eco-friendly behavior.

This study is the first to examine the effect of spiritual leadership on employees' extra-role green behavior in the hospitality industry in Yogyakarta, and its findings support the notion that such leadership encourages such behavior. Spiritual leader operates as a salient referent for their subordinates, influencing staff members' behavior by emphasizing the transcendental significance of moral and ecological principles. Hence, inspire workers' initiative to engage in voluntary eco-friendly behavior. The findings of this study are consistent with Rezapouraghdam et al. (2017) , which found that spiritual leaders can favor staff members' voluntary eco-friendly behavior in the hotel context. Second, this study explored how spiritual leaders and harmonious green passion relate. Spiritual leadership values and behaviors that underpin a sense of wholeness and harmony were understood to positively impact front-line hotel staff members' green engagement and enjoyment of their work. The results are consistent with the social learning theory (Bandura & Walters,1977), which contends that salient referents influence how closely followers of leaders replicate their role models' behaviors (Anser et al., 2020). We claim that employees pick up and practice the altruistic qualities of spiritual leaders, such as humility, fairness, and care for others, which gives them the willingness to engage in work flexibly and shows them to be receptive to gaining positive experiences as a representation of harmonious passion. Third, research findings supported H3 by showing that spiritual leaders positively impacted employees' green voluntary behavior. This relationship suggests that resources for environmental protection offered by a spiritual leader with the value of altruistic love and a sense of transcendence inspire subordinates to develop individual ecological values. Therefore, help their team members create a climate for work meaningfulness, which will foster the employee connectedness to nature.

The fourth hypothesis proposed that harmonious green passion positively affected eco-friendly employee behavior. The findings offer support for the fourth hypothesis. Prior research proved that highly-harmonious green passion makes employees more aware of environmental issues, more likely to put their own needs aside to protect the natural environment, and more willing to perform green voluntary behavior. Furthermore, the fifth hypothesis revealed that connectedness to nature positively affected employee eco-friendly behavior. These findings are consistent with the theoretical underpinnings of the biophilia hypotheses, which indicate that people have a natural desire to feel a connection to and a sense of belonging to the larger natural world. Hence, employees' sense of ecological responsibility, concern over the outcomes of their green activities, and sense of connectedness to nature can stimulate their moral obligations and lead to voluntarily eco-friendly behavior.

Statistical results of hypothesis six (H6) for mediation analysis show that harmonious green passion mediates the relation between a spiritual leader and an employee's voluntary eco-friendly action. This result is consistent with an earlier study, indicating that a potential mediation mechanism exists between spiritual leadership and eco-friendly behavior in the form of harmonious green passion. Harmonious-passionate workers who report to spiritual leaders typically have interactions with their immediate leaders that fuel their drive to improve their workplaces' green activity. The role of a spiritual leader is to facilitate the internalization of ecological and spiritual principles by their followers. As a result, it motivates staff to engage in voluntary eco-friendly behaviors and inspires them to protect the natural environment.

Finally, the seventh hypothesis noted a partial mediating role of nature connectedness between spiritual leadership and employees' eco-friendly behavior. The findings suggest that high levels of employee connectedness strengthen the links between a spiritual leader and voluntary eco-friendly behavior actions to nature. When employees observe spiritual leaders acting with a feeling of transcendence and obligation toward society and nature, we proved that this condition would naturally drive workers to pay attention to environmental issues. Hence, they develop a sense of nature connectedness toward their surrounding environment. As a result, these employees are inspired to exert extra effort and give personal resources to encourage hotel management to adopt eco-friendly action.

7 Theoretical Implication

The suggested framework and the reported findings complement the existing research in tourism and hospitality. Our study focuses on including spiritual leadership and environmental issues in hospitality literature and how it advances knowledge by examining the causes of an employee's voluntary eco-friendly behavior. This discussion could help tourism businesses become more sustainable. According to researchers, the spirituality that unites people with one another and the environment helps develop sustainability's challenging concerns effectively. Hence, spiritual leaders who possess spiritual values, altruistic love and vision may more accurately assess how well their staff contributes to the organization's environmental goal.

By demonstrating a significant positive association between spiritual leadership and employee voluntary eco-friendly behavior, we add to the knowledge of leadership theory and employee behavior. Additionally, the results show that harmonious passion acts as a mediator between a spiritual leader and voluntary environmental behavior. This result is consistent with prior studies and indicates that spiritual leaders and employee environmental behav-

ior are mediated by harmonious passion (Rezapouragh-dam,2017). Similarly, we discovered that connectedness to nature is a mediator between a spiritual leader and an employee's sustainable lifestyle. According to self-determination theory, people with an inner dimension of hope, value, or altruistic love tend to act more prosocial and ecologically friendly. Lastly, despite the extensive debate on employee spiritual leadership and voluntary eco-friendly behavior among the workforce in Western and European nations, its ramifications and discussion in South East Asia are largely unexplored. Hence, by testing these theories in an Asian context, it is anticipated that their generalizability would be increased.

8   Practical Implication

The current research offers several recommendations that can be implemented by hotel owners and managers interested in increasing the level of voluntary eco-friendly behavior involvement among their staff. Firms must promote such an atmosphere among employees because the results show that a spiritual leader influences voluntary green action from subordinates. Managers can learn more about supporting voluntary behavior among their staff members and lessen their companies' environmental impact by adhering to spiritual leadership. Additionally, managers can more precisely evaluate employees' contributions to the organization's environmental goals by emphasizing their participation and promotion of eco-friendly behaviors and their comprehension of the mission, altruistic love, and spiritual values of spiritual leadership. To fulfil the company's green goals, we propose that managers, as spiritual leaders, make it very clear why encouraging people to engage in environmentally conscious actions is crucial.

The results reveal that spiritual leadership can nurture employees' voluntary eco-friendly behavior by creating strong affective orientation and positive social emotion in hotel businesses. This condition can be the foundation for workers to be interested in harmonious green passion. Additionally, to encourage their voluntary eco-friendly activities, hotel leaders must continually facilitate their staff members' contact with nature or other natural factors. Managers may accomplish these goals by exerting social influence and cultivating a feeling of purpose and belonging in their staff that will help them control their behavior and deepen their connection to the ecological environment. In conclusion, Leaders must exhibit spiritual leadership beliefs and behaviors that foster a culture of hope/faith and altruistic love to direct the realization of a green vision.

9   Limitation and Further Research

There are certain limitations to our research. This research was restricted to a few hotels in Yogyakarta. The study may be expanded to include more samples, different service industries, and consideration of other regions to improve the model's generalizability. Our research was cross-sectional; as a result, we cannot draw any conclusions about cause and effect based on our findings. However, the design of further studies could be improved. We suggest that research on the factors that moderate the connection between spiritual leadership and another outcome (e.g., psychological well-being, engagement) might also reveal more insights. Future research could consider including these factors in the model to test separately the influences of these conditions on employees' voluntary eco-friendly behavior since this study did not distinguish between the emotional and cognitional connection.

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Ali spiritualno vodenje vpliva na prostovoljno, okolju prijazno vedenje zaposlenih v hotelirstvu? Vloga harmonične zelene strasti in povezanosti z naravo

Namen: Članek obravnava vlogo spiritualnega vodenja na povečanje prostovoljnega, okolju prijaznega vedenja zaposlenih. Raziskava proučuje vpliv harmonične zelene strasti in povezanosti z naravo kot posrednih dejavnikov med spiritualnim vodenjem in prostovoljnim, okolju prijaznim vedenjem zaposlenega.

Zasnova/metodologija: Podatke smo dobili na vzorcu 273 udeležencev, ki delajo v hotelih s štirimi in petimi zvezdicami v Yogyakarti. Za analizo podatkov sta bila uporabljena statistična programa SPSS in AMOS 25.

Rezultati: Rezultati raziskave dajejo pomembna teoretična in praktična spoznanja na področju teorij vodenja, ki jih lahko podjetja s področja gostinstva in turizma uporabijo pri svojem delu. Odkrili smo, da obstajajo posredne povezave med spiritualnim vodenjem in prostovoljnim, okolju prijaznim vedenjem zaposlenih prek konceptov povezanosti z naravo in harmonične zelene strasti.

Zaključek: Raziskava daje odgovor na vprašanje kako in kdaj spiritualni vodja vpliva na prostovoljno, okolju prijazno vedenje zaposlenih v hotelirstvu, s čimer zato dodatno prispeva k širjenju znanja o gostinstvu in turizmu v jugovzhodni Aziji. Prav tako raziskava, s svojim poudarjanjem povezanosti z naravo in harmonične zelene strasti v razmerju med spiritualnim vodenjem in okolju prijaznim vedenjem zaposlenih, predstavlja novost na področju vodenja.

Ključne besede: Spiritualno vodenje, Okolju prijazno vedenje, Narava, Harmonija, Strast, Povezanost

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Predložene prispevke pregledata in ocenita najmanj dva recenzenta. Na osnovi mnenj in predlogov recenzentov uredniški odbor ali urednik sprejmejo prispevek, zahtevajo manjše ali večje popravke in dopolnitve ali ga zavrnejo. Če urednik oziroma recenzenti predlagajo večje popravke, se dopolnjeni prispevek praviloma pošlje v ponovno recenzijo.

Članke za objavo lahko predložite preko spletnega mesta https://organizacija.fov.um.si/index.php/organizacija/information/authors. Za nadaljnje informacije in pojasnila se lahko obrnete na uredništvo Organizacije (organizacija.fov@um.si ali maja.mesko@um.si).

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