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The Effect of Human Resource Management Practices on Open Innovation: A Research on Blue Collar Employees in IT Business

İnsan Kaynakları Yönetimi Uygulamalarının Açık İnovasyona Etkisi: Bilişim Sektöründe Mavi Yaka Çalışanlar Üzerine Bir Araştırma

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ÖZET

İnsan kaynakları yönetimi uygulamaları insanların bir örgüte girişinden o örgütten çıkışına kadar geçen süreç içerisinde verimli, etkin ve etkili çalışmasını sağlamak ve örgüte olan katkılarını en üst seviyelere taşıyabilmek için gerçekleştirilmektedir. İşletmelerin rekabetçiliği açısından yenilikçiliğin önemi anlaşıldığından bu yana çalışanların yönetilmesi ve yenilik kapasitelerini desteklemek için insan kaynakları yönetimi uygulamalarını anlamak ilgi duyulan konulardan biri olmuştur. Bu çalışmada bilişim sektörü işletmelerinde alt kademe (mavi yaka) olarak çalışan personelin üzerinde gerçekleştirilen insan kaynakları yönetimi uygulamalarının örgütün açık inovasyon iklimi üzerindeki etkisini belirlenmeye çalışılmıştır. Bu amaç doğrultusunda insan kaynakları yönetimi uygulamalarının (insan kaynakları planlaması, eğitim ve geliştirme, personel güçlendirme, performans değerlendirme, ücret yönetimi ve ödüllendirme sistemi, işe alım ve yerleştirme, işçi sağlığı ve güvenliği) açık yenilik iklimi boyutları (yenilik ve esneklik, dışa odaklanmak ve içgörülü olmak) üzerindeki etkisi istatistiksel olarak ortaya konulmuştur. Araştırma neticesinde insan kaynakları yönetimi uygulamalarından biri olan insan kaynakları planlamasının açık yenilik iklimi boyutlarının üçü üzerinde de etkili olduğu ve işçi sağlığı ve güvenliği uygulamasının ise, dışa odaklanma boyutu üzerinde olumlu bir etkiye sahip olduğu tespit edilmiştir.

Anahtar Kelimeler:

İnsan Kaynakları Yönetimi Uygulamaları,

Açık Yenilik İklimi,

Bilişim İşletmeleri,

Mavi Yakalı Çalışanlar,

ABSTRACT

Human resources management practices are carried out in order to ensure that people efficiently, effective and actively work and to maximize their contribution to the organization during the process from entering an organization to leaving that organization. Since the importance of innovation has been understood in terms of the competitiveness of businesses, it has been one of the topics of interest to manage employees and to understand human resource management practices to support their innovation capacities. This study, it has tried to determine the effect of human resources management practices carried out on the personnel working as a lower level (blue collar) in IT sector businesses on the open innovation climate of the organization. For this purpose, practices of human resource management including human resources planning, training and development, personnel empowerment, performance evaluation, wage management and reward system, recruitment and placement, worker health and safety have been revealed statistically impact on open innovation climate dimensions (innovation and flexibility, outward focus and insight). In conclusion, it has been determined to be effective human resources planning, which is one of the human resources management practices on all three of the open innovation climate dimensions. Also, the occupational health and safety practice has a positive effect on the external focus dimension.

Keywords:

Human Resources Management Practices,

Open Innovation Climate,

IT Businesses,

Blue Collar Employees,

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1. INTRODUCTION

People are the most valuable asset in any organization, and their role is irreplaceable. While machinery, capital, materials, and management are all inputs to a business, human resources provide, plan, organize, and manage these resources, making them the dominant factor among the contribition. People are the non-substitutable resource that makes all other capital possible, giving them an invaluable position in any organization (Sabuncuoğlu, 2013:2). The traditional view of people as tools have shifted in modern business. People are now being seen as creative, highly motivated, and adaptive resources that are essential to be nurtured and developed. As a result, human resources have become the most significant resource of any business and must be invested in accordingly (Ertürk, 2011:4).

Human resource management (HRM) is the process of designing and implementing formal systems within an organization to effectively utilize human talent and achieve the organization's goals. It includes efforts to recruit, train, and retain a competent workforce (Daft, 2012:232). According to Sadullah (2013), HRM encompasses all aspects of managing human resources in any organizational setting that aims to benefit the environment, individuals, and the organization, while adhering to legal regulations. Storey (1995) posits that HRM is a unique method that aims to gain a competitive edge by utilizing a high degree of commitment and managing skilled workforces by exploting a combination of cultural, structural, and personnel practices. However, Guest (1987:511-515) has proposed four crucial elements of HRM, including e; *1. Commitment*: Alignment and commitment of employees with the goals and objectives of the organization. *2. Flexibility*: Willingness of employees to adapt to changes within the organization without resistance. *3. Quality*: The quality of employees and their management is crucial to achieving high performance in the organization. *4. Integration*: Alignment of human resource strategies with the overall business strategy.

HRM practices are defined as organized procedures intended to manage the entry and exit of personnel from an organization, to contribute to its success. In the HRM literature, there are certain determinations about such practices that applicable to the success of the organization (Genty, 2021). Dessler (2011:22-23) highlights that core HRM practices include recruitment and placement, training and development, compensation, and employee relations. According to De Cenzo et al. (2016:36-42), the functions of HRM include job placement, training and development, motivation and maintenance. Moreover, the HR department encompasses employment, training and development, compensation and benefits, employee relations, and talent management. Steward and Brown (2009:13) have stated that the core function of HRM is managing people and identified six rudimantary HRM functions: strategic management, workforce planning, development, compensation and benefits, employee and labor relations and health and safety.

In the research part of this study, the classification of HRM practices made by Karakulle (2020:25) was used. Karakulle (2020:25) states that while HRM practices may vary depending on the type of business, the type of work done, and the level of development of the country in which the enterprise is based, they generally include: job analysis and job design (JAJD), human resources planning (HRP), training and development (TD), staff empowerment (SE), performance evaluation (PE), wage management and reward system (WMRS), recruitment and placement (RP), and work safety (WS).

Scholars have taken a close look at the HRM practices needed to manage employees and foster their capacity for innovation, which is an essential part of the modern business world. Ling and Nasurdin (2010) found that the HRM practices employed by businesses are essential in creting positive work behaviors and the forecasting innovative behaviors. Evidence from Harter et al. (2002) confirms that HRM practices can increase motivation, synergy, commitment and comprehension among employees, providing a competitive edge for the firm. From this, it can be deduced that HRM practices affect the open innovation climate in the organization.

As a result, organizations that implement HRM practices create open cultures to encourage an open innovation climate and open innovation (Remneland-Wikhamn and Wikhamn, 2011). Li et al. (2022) explain that an open innovation climate features a creative, cooperative, sharing, and relaxed atmosphere that accepts failure and encourages the involvement of everyone in the innovation process. This extends the scope of innovation to include all employees, not just those in the research and development department. Open innovation involves the intentional exchange of knowledge to expand markets and create value (Engelsberger et al., 2022).

Innovation is very imperative in the development of countries and in increasing the sales of businesses (Esmer et al., 2020). Previous research has suggested that metrics such as market share, licensing revenue, the number of patents, and knowledge flows can be used to measure open innovation (Remneland-Wikhamn and Wikhamn,

2011). However, the preferred measurement scale in this study is the open innovation climate model developed by Patterson et al. (2005). Remneland-Wikhamn and Wikhamn (2011) found that this model is applicable when assessing the relationship between a firm's innovation processes and its organizational climate. The open innovation climate model will help to gauge organizations' performance in terms of focus (internal etc. external) and structure (flexibility etc. control). It consists of four quadrants: internal process, rational, open systems, and human relations, each with its dimensions that will be incorporated into the model for this study.

Existing studies in the literature have illuminated the three dimensions proposed by Remneland-Wikhamn and Wikhamn (2011) for measuring the Open Innovation Climate: (a) innovation and flexibility, (b) outward focus, and (c) reflexivity. To illustrate, Farnese et al. (2015) define flexibility as an organization's capability to react quickly and creatively to market uncertainty. Ni et al. (2020) suggest that the following factors influence an organization's ability to innovate: technological, cultural, leadership, resource, structural, and innovative flexibility. Innovative flexibility refers to an organization's capacity to quickly adapt to market demands at a low cost and create new products or services (Ni et al., 2020). As Naqshbandi et al. (2018) note, key components of the open innovation construct include empowering leadership and a climate of employee engagement that encourages members of an organization to seek, accept, and share new ideas to increase innovation outcomes.

Outward focus, a part of the open innovation climate construct, involves the ability to be aware of and respond to market dynamics. Szymura-Tyc (2021) outlines that sustaining outward focus implies exploring external opportunities and utilizing organizational innovativeness to exploit them (Szymura-Tyc, 2021). Other sub-mechanisms of outward focus that are associated with the open innovation framework include scouting external knowledge, technology, and partners, matching internal requirements with external resources, and the capacity to identify the value of external information and use it to achieve organizational objectives (Ogink et al., 2023). Therefore, the outward focus is an organization's ability to recognize and make use of external opportunities to innovate.

Lastly, organizational reflexivity is the ability to evaluate organizational performance and practices to identify and prioritize areas that need to be improved. Considering the obstacles that companies may encounter, it is very important to plan the existing resources in the best way and to use them effectively in increasing the performance (Esmer and Dayi, 2019). For instance, Schippers et al. (2015) explain that reflexivity as a significant predictor of innovation is the degree to which members of an organization collectively reflect on and modify their functioning and methods of working. Farnese et al. (2015) argue that reflexivity is essentially knowledge management used to promote organizational innovativeness, question existing norms, and routines, and verify current methods to facilitate change, learning, and innovation. Therefore, literature provides valuable insights into innovation and flexibility, outward focus, and reflexivity – all of which are critical dimensions of an organization's open innovation climate.

Leonard-Barton (1992:113) categorized a company's core innovation-related competencies into four dimensions: technical systems, employee skills and knowledge, management system, and shared values. One of the key goals of enterprises is to boost productivity by improving the knowledge, skills, and abilities of their personnel together with the training and development of human resources. Therefore, HRM is extremely important for modern enterprises. It is a highly important issue in the business world as it leads to an increase in productivity due to the positive attitudes generated by HRM in the perception of goods, services, and quality (Güney, 2014:25). As the number of qualified workforces grows in organizations and the knowledge, skills, and abilities of this workforce are utilized, business success increases, leading to an increase in the competitive edge of the business (Kaya, 2013:11). The importance of HRM has increased more than ever due to concerns such as labor-related costs, negative indicators of the labor force, productivity, changes, and globalization (Sadullah, 2013:5).

Management literature has long recognized that the knowledge and abilities of a company's employees are key factors in its innovativeness (Cano and Cano, 2006:12). Innovative, creative employees who have gained digitalization skills increase productivity in businesses. In this regard, the support of managers is very important. Organizations gather power thanks to information societies that produce creative ideas (Karagöz, 2022:79). Business leaders need the motivation and aptitude of human capital to generate creative ideas, develop innovative approaches, and implement fresh opportunities in the innovation of products and processes (Scarbrough, 2003). According to the findings of Beugelsdijk (2008), it is essential to capitalize on the relationship between HRM practices and innovation to increase the capabilities and competitiveness of the organization. In conclusion, the importance of task autonomy and flexible working hours for radical innovations was highlighted. The results of a study conducted by Chen and Huang (2009) on 146 companies demonstrated that strategic human resources practices are positively related to knowledge management capacity, and this has a

positive impact on innovation performance. Consequently, they suggested that businesses can apply HR practices such as personnel recruitment, training and development, performance evaluation, and remuneration to motivate employees and involve them in creative thinking and innovation.

As a result of their research on the human dimension of the open innovation climate in the food industry, Palumbo et al. (2022) found that human resource management practices impact the skills, motivation, and interpersonal relationships of employees. However, they discovered that these practices do not directly influence employees' perception of an open innovation-oriented organizational climate. Based on these findings, they suggest that while employee participation is crucial for organizational management, an open innovation-oriented organizational climate perception is indirectly fostered by human resources management practices.

2. METHODOLOGY OF RESEARCH

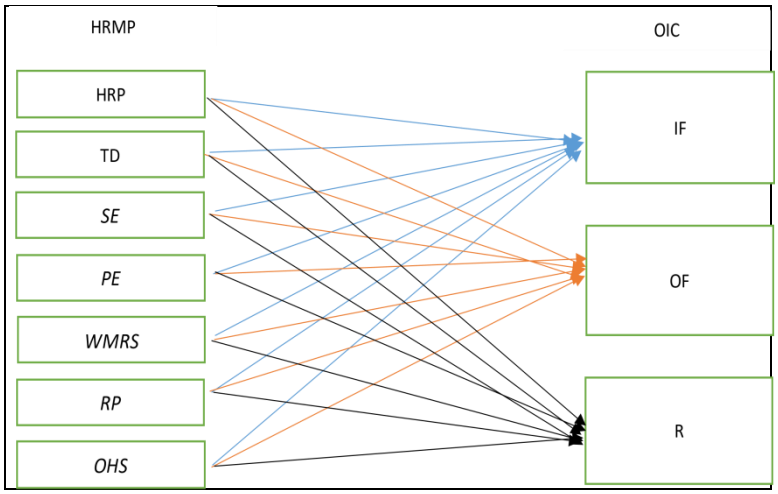
2.1. Purpose of the Research

This research aims to explore how Human Resources Management (HRM) practices affect the Open Innovation Climate of lower-level (blue-collar) IT sector employees. Waheed et al. (2019) highlighted the importance of innovation in driving performance in the IT sector. Innovation is necessary to provide a sustainable competitive advantage against the cutthroat competition in the IT sector, but employees are often reluctant to be innovative due to rigid structures and a lack of a conducive innovation climate. Based on this goal, this study seeks to understand how HRM practices such as Human Resources Planning (HRP), Training and Development (TD), Staff Empowerment (SE), Performance Evaluation (PE), Wage Management, and Reward System (WMRS), Recruitment and Placement (RP), and Occupational Health and Safety (OHS) can influence dimensions of the Open Innovation Climate such as Innovation and Flexibility (IF), Outward Focus (OF), and Reflexivity (R).

2.2. Research Design and Hypotheses

Based on the literature review and the research objective, a descriptive/situational research model was developed. In this type of research design, the variables and the relationships between them are specified and some predictions can be made based on these definitions (Kurtuluş, 1989:310). In the research design, Human Resource Management Practices (HRMP) is the independent variable, and it is hypothesized that it affects the dependent variable, the Open Innovation Climate (OIC) (Kurtuluş, 1989:69). The hypothesis expresses the researcher's expectations of the relationship between the variables in the research problem (Kalaycı, 2005:65).

Figure 1. Theoretical Model



Based on the research's purpose and design, the following hypotheses were proposed;

$H1_1$: HRP has a positive effect on IF.

$H1_2$: HRP has a positive effect on OF.

$H1_3$: HRP has a positive effect on R.

$H1_4$: TD has a positive effect on IF.

$H1_5$: TD has a positive effect on OF.

$H1_6$: TD has a positive effect on R.

$H1_7$: SE has a positive effect on IF.

$H1_8$: SE has a positive effect on OF.

$H1_9$: SE has a positive effect on R.

$H1_{10}$: PE has a positive effect on IF.

$H1_{11}$: PE has a positive effect on OF.

$H1_{12}$: PE has a positive effect on R.

$H1_{13}$: WMRS has a positive effect on IF.

$H1_{14}$: WMRS has a positive effect on OF.

$H1_{15}$: WMRS has a positive effect on R.

$H1_{16}$: RP has a positive effect on IF.

$H1_{17}$: RP has a positive effect on OF.

$H1_{18}$: RP has a positive effect on R.

$H1_{19}$: OHS has a positive effect on IF.

$H1_{20}$: OHS has a positive effect on OF.

$H1_{21}$: OHS has a positive effect on R.

2.3. Research Scales

The Human Resources Practices Scale (HRPS), developed by Karakulle (2020:195) in his doctoral thesis, is a 7-dimensional scale with 34 items that have been found to have validity and reliability in Turkish. On the other hand Open Innovation Climate Scale (OICS), is a 3-dimensional scale with 17 items, whose validity and reliability were established by Remneland-Wikhamn and Wilhamn (2011, 291). A five-point Likert-type scale was used for all statements, except for demographic variables, and responses were rated on a scale of "*strongly disagree*" (1) to "*strongly agree*" (5). The scale also includes five open-ended demographic questions, which include age, gender, graduation level, working title, and working year in the enterprise.

2.4. Population and Sample of the Research

The study population consists of 120 blue-collar (lower-level) staff of an IT company based in Istanbul, established in the year 2000. The sampling method used for selecting the participants is called total population sampling, which involves collecting data from all members of the population in small groups (Panacek and Thompson, 2007:77). The research was approved by the Ethics Committee of Isparta Applied Sciences University on May 25, 2022.

The questionnaire was applied as an online survey using Google Forms between September 15 and October 25, 2022, with the permission and approval of the company's top management. 80 questionnaires were completed by blue-collar staff of the company. Despite the small sample size, it does not pose a problem for the research method. Cinel et al. (2021:9) state that using Partial Least Squares Structural Equation Modeling (PLS-SEM) in small sample groups can still yield good results. PLS-SEM is a method that has been increasingly used in marketing and organizational research in recent years, as it can handle complex (mediation/regulation) models and does not require large sample sizes, normal distributions, and other assumptions (Kınaş, 2021:47).

3. RESEARCH FINDINGS

This section will first present the demographic findings, followed by the results of the hypothesis test obtained from the PLS-SEM analysis.

3.1. Demographic Findings

Table 1 shows that most participants in the research are male, over 34 years old and that there is a higher number of high school and associate degree graduates. Additionally, the enterprise appears to have a relatively long-term employment structure and a higher number of employees in technical services.

Table 1. Demographic Variables Frequency Distribution

Gender	**n**	**%**	**Age**	**n**	**%**
Female	9	11.25	18-25 years	8	10.00
Male	71	88.75	26-33 years	19	23.75
Total	*80*	*100.0*	34-41 years	25	31.25
Graduation Degree	**n**	**%**	42 years and over	28	35.00
High School	51	63.75	***Total***	*80*	*100.0*
Associate Degree	17	21.25	**Working Title**	**n**	**%**
Undergraduate	12	15.00	Technical Services Personnel	50	50.00
Total	*80*	*100.0*	Administrative Services Personnel	20	25.00
Working Time in the Profession	**n**	**%**	Transport Services Personnel	10	12.25
<1 year	3	3.75	Accounting and Finance Personnel	10	12.25
1-5 years	16	20.00	***Total***	*80*	*100.0*
6-10 years	24	30.00			
>10 years	37	46.25			
Total	*80*	*100.0*			

3.2. Hypothesis Test Findings

The SmartPLS program was used to analyze the data. Before analysis, new variables were created by calculating the mean values of the scale dimensions using the SPSS program. These newly generated variables were then used to start the reflective model analysis stage.

Figure 2. Research Design

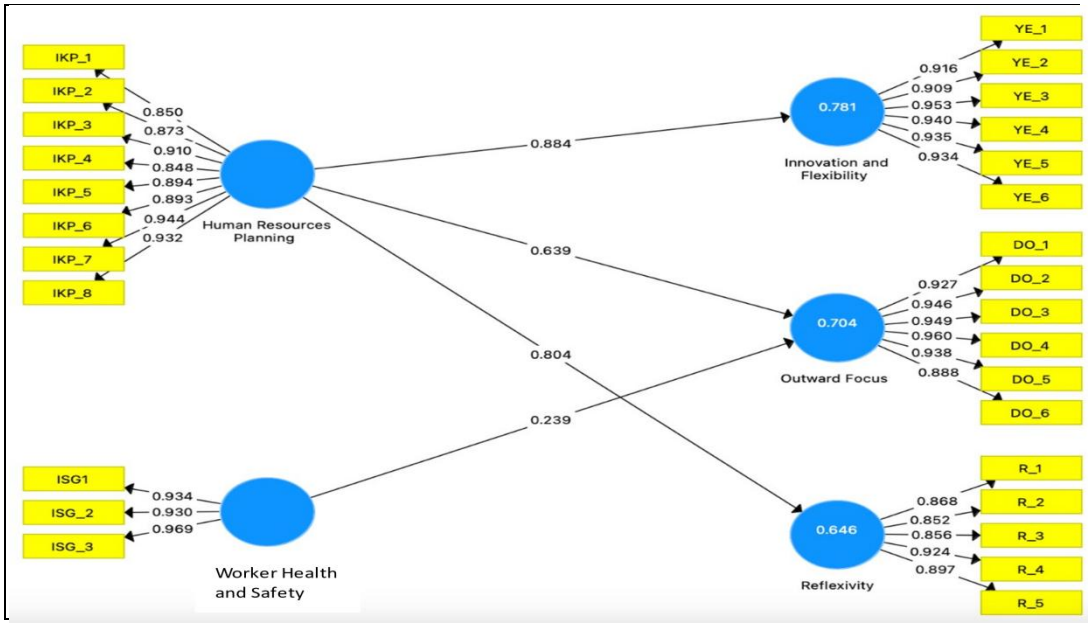


Table 2. Impact of Human Resources Practices on Open Innovation Climate

Variables	Reliability (□)	Combined Reliability (CR)	Average Variance Explained (AVE)
Human Resources Planning	0.964	0.969	0.799
Innovation and Flexibility	0.969	0.975	0.867
Outward Focus	0.971	0.977	0.874
Reflexivity	0.927	0.945	0.774
Occupational Health and Safety	0.940	0.948	0.892
Variables	R^2		
Innovation and Flexibility	0.779		
Outward Focus	0.696		
Reflexivity	0.642		
	f^2		
Variables	Innovation and Flexibility	Outward Focus	Reflexivity
Human Resources Planning	3.574	0.542	1.828
Occupational Health and Safety		0.076	
	VIF		
Variables	Innovation and Flexibility	Outward Focus	Reflexivity
Human Resources Planning	1.000	2.548	1.000
Occupational Health and Safety		2.548	
Variables	Q^2		
Innovation and Flexibility	0.661		
Outward Focus	0.591		
Reflexivity	0.474		
Causal Relationships		*T* statistics	*p* Value
➡	HRP I F	24.247	0.000
➡	HRP OF	5.456	0.000
➡	HRP R	15.742	0.000
➡	*OHS OF*	1.811	0.070
Causal Relations Path Analysis		Path Coefficient Values (ß)	
➡	HRP I F	0.894	
➡	HRP OF	0.639	
➡	HRP R	0.804	
➡	*OHS OF*	*0.239*	

According to the statistical results of the effect of human resources practices on open innovation climate, reliability values were evaluated first; the threshold values of 0.60 and above and 0.70 and above for internal reliability (Cronbach's alpha) and internal consistency (composite reliability) values (Kamis et al., 2020:991; Kandemir, 2016; Tekin and Çidem, 2015:982; Ringle et al., 2015:62; Tokmak et al., 2022:170) provided the prerequisite for a valid reflective model as seen in Table 2. Looking at the relevant values in Table 2, it is seen that the reflective model has internal reliability and internal consistency reliability. When using the PLS-SEM approach, it is considered important to have a fit validity coefficient/Average Variance Explained (AVE) value of 0.50 or higher (Kandemir and Özdaşlı, 2019:250; Wong, 2016:8).

Table 2 shows that the variables of the research model have a value of 0.50 and above. Another important coefficient of the research model is the determination coefficient (R^2). This value represents the proportion of variation in the endogenous variable that is explained by the exogenous variable, indicating the predictive power

of the model. Values range from 0 to 1, with higher values indicating greater predictive power. In other words, it reveals the predictive power of the model (Dinçer and Kart, 2021:34).

Another effect size coefficient is the f^2 coefficient. If the f^2 coefficient takes a value of 0.02 and above, the effect of the variable on the model is small, if it takes a value of 0.15 and above, the effect of the variable on the model is moderate, while a value of 0.35 and above indicates that the effect of the variable on the model is high. In this respect, Table 2 shows that the human resources planning sub-scale has a strong impact on the variables of innovation/openness, external focus, and reflexivity, whereas the effect of the job security dimension on the external focus variable is low. In SEM analyses, the VIF value is used to assess multicollinearity in the reflective model to identify any issues with high correlation among the observed variables (Wong, 2013:29).

A value greater than 5 indicates a multicollinearity problem. The VIF values of the research model are less than 5 as seen in Table 1. Therefore, the observed values have the expected measurement power. Q^2 value is used to evaluate the predictive appropriateness of the reflective model. This value indicates the out-of-sample predictive power of a model. A value greater than 0 indicates that it has predictive relevance (Hair et al., 2021). According to Table 2, in terms of Q^2 values, it can be stated that the endogenous variables of the reflective values have a predictive fit. Path coefficients and significance (p) values are presented in Table 2. Accordingly, HRP positively and significantly affects IF with a direct effect value of 0.89, OF with 0.64, and R with 0.80. OHS positively and significantly affects OF with an effect value of 0.24.

4. CONCLUSION

The literature on business performance emphasizes that the effectiveness of HRM practices and competitive strategies are mutually supportive, and complementary and can lead to an increase in business success when they are aligned (Alayoğlu, 2010). Furthermore, innovative HRM practices can raise awareness among employees and encourage them to compare their expectations with their job requirements, leading to the implementation of innovations by employees who are motivated (Pelenk, 2020).

Training programs, teamwork, job rotation, development of suggestion systems, social activities and social responsibility studies, a performance-based remuneration system, mentoring, employee empowerment, and promoting creativity are examples of HRM practices that can lead to positive outcomes for employees and also benefit the company. It can be stated that effective management of human resources can significantly contribute to competence, responsiveness, and speed abilities (Aktaş and Ülgen, 2021).

Successful businesses often achieve a competitive advantage in the market through innovation and creativity. This is not a coincidence, but rather a result of effective management of human resources to develop and promote new products and services. Successful, innovation-driven businesses know how to effectively manage, motivate and reward their human resources (Gupta and Singhal, 1993).

The literature on innovation and creativity suggests that not all industries have the same rate of innovation. The IT industry is known for having particularly innovative economic activities. It has been observed that IT companies frequently adopt open innovation strategies that involve cooperation and utilizing external sources of information to drive innovation (Asikainen and Mangiarotti, 2016).

The cooperation referred to in the open innovation climate primarily refers to the collaboration between employees in the innovation process, including lower-level employees, in the IT industry. Therefore, this study investigates the impact of human resources practices on the open innovation climate specifically for lower-level employees in IT companies.

The key findings of this research are that Human Resources Planning (HRP) has a positive effect on all three dimensions of the Open Innovation Climate (OIC), while the Occupational Health and Safety (OHS) practice has a positive effect only on the Outward Focus (OF) dimension. This suggests that businesses that address OHS issues, thus allowing their employees to experience workplace satisfaction, will be better equipped to focus on the external environment of the business. These employees may be more attuned to the needs of the market and customers, and more likely to come up with ideas for improving the business's services. As a result, the business will be more responsive to customer needs and more adept at identifying new opportunities in the market. It can easily integrate external ideas. Likewise, Bektaş (2019) states that quality assurance systems are important in ensuring Occupational Health and Safety (OHS) in the business. At the same time, employee satisfaction with OHS boosts an internal and external focus on the customer.

HRM practices that foster innovation and creativity include human resources planning, performance planning, rewards systems, and career management. Human resource planning can have a significant impact on business innovation, particularly by identifying and assembling effective innovation teams that align with the business's human resources needs (Gupta and Singhal, 1993).

Likewise, this research found that HRP has a strong positive effect on the OIC dimensions of innovation and flexibility (IF), outward focus (OF), and reflexivity (R). Therefore, when implementing HRP for lower-level employees, it is crucial to clearly define job responsibilities related to innovation and creativity, regularly update job analyses to align with current needs and tasks, provide opportunities for promotion, and prioritize internal employees for higher-level positions as needed. This will create an open innovation climate where lower-level employees are more inclined to actively engage in the process of change, adapt to new conditions and problems, embrace new ideas, and recognize the need for new ways of working. Additionally not only white-collar workers but also blue-collar workers can influence the development of new and creative applications in IT companies.

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