



Lean, agile, resilient, and green human resource management: the impact on organizational innovation and organizational performance

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Abstract

There are four paradigms of lean, agile, resilient, and green (LARG) which can promote human resource culture to create novel ideas and increase performance in organizations. This study aims to conceptualize, develop, and validate four lean, agile, resilient, and green paradigms in human resource management (HRM) context and investigates how different LARG HRM elements can affect organizational innovation and performance. In this way, a conceptual model for investigating the LARG concept in HRM is proposed. A new tool to measure lean, agile, resilient, and green indicators in service industry has been developed. Using convenience sampling method, an online survey questionnaire is managed to collect data from 102 service sector organizations, including banking and financial services, transportation, hotel, telecom, and insurance, having more than 50 employees in Iran. The collected data are analyzed by partial least squares-structural equation modeling (PLS-SEM). The results indicate that the LARG HRM significantly and positively influences organizational performance. In addition, the LARG HRM indirectly affects organizational performance through organizational innovation. The findings also showed that employee's ability to perform several different jobs from the lean paradigm, paying attention to employee's ideas in decision-making from the agile paradigm, increasing the ability of staff to change rules in different situations from the resilient paradigm, and having employees with a full understanding of environmental policies from the green paradigm, is the most effective elements among the LARG paradigms factors. This study provides valuable insights into recognizing the most effective LARG elements and factors for implementing the LARG HRM in organizations and how it contributes to enhancing organizational performance and organizational innovation in order to achieve competitive advantage.

Keywords Lean, agile, resilient, and green (LARG) paradigm · Human resource management · Organizational performance · Organizational innovation · Structural equation modeling

Introduction

Nowadays, one of the main challenges for organizations is the presence of the right, talented, and skilled human resource (HR) as it can determine the level of knowledge in their processes (Holtom et al. 2008), which play an essential role in achieving competitive advantages (da Silva César et al. 2019). According to Anwar and Abdullah (2021), human resource management (HRM) is positively associated with employees' knowledge, skills, and behavior.

Hence, an effective HRM can truly enhance organizational performance followed by employees' efficiency. Vaňová et al. (2019) demonstrated that talented and creative HR in both production and service-based organizations leads to sustainable development and competitive advantage through creating new economic values and increasing capabilities of attracting other high-quality HR. Production and service-based organizations have different characteristics and work policies, particularly regarding human resources' behavior and interaction with customers. Service-based organizations should concentrate more on employees' behavior and service-based aspect to achieve their goals and success in competitive environments (Lu et al. 2015). Employees in service-based organizations create an image of these organizations in customers' minds due to their direct and continuous relations. The staff of service-based organizations

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presents the products of these organizations (services), and they are responsible for the quality of services in customers' views (Lu et al. 2015). Indeed, the customers' satisfaction of service-based organizations depends greatly on their staff. Also, services are the non-separable part of each activity in each organization, and it is impossible to conceive an organization without services. In addition, the service sector is one of the most effective drivers of economic growth (Orhan et al. 2019) and one of the fastest-growing sectors in Iran due to the increasing internet services and social network usage in recent years. The service sector with an annual gross domestic product (GDP) growth rate of about 9% from 2018 to 2019 had the largest share in Iran's GDP (CBI 2019).

One of the most critical problems of the modern world is the customers' belated attainment of their goals, i.e., lengthening of the service receiving response time. On the other hand, the ever-increasing rise in the prices of commodities, especially in Iran, has been transformed into a fundamental problem. However, a large bulk of this cost escalation is rooted in unnecessary affairs or extra transportation. Likewise, attention to environmental issues has been turned into a principle for organizations since their consideration can alter people's attitudes toward the respective organization (Mathapati 2013). Lean, agile, resilient, and green (LARG) paradigms are recognized as the foundations of competitiveness (Cabral et al. 2012). Therefore, managers should perform the LARG thinking to make organizations more competitive by quickly responding to customer needs, effectively reacting to unexpected events in line with their environmental responsibilities, and eliminating worthless and insignificant processes (Cabral et al. 2012).

The LARG concept was first introduced by Azevedo et al. (2011a) () in supply chain management (SCM). In today's competitive world, lean, agile, resilient, and green should not be used separately in the system, while a set of requirements and activities should be used simultaneously to increase efficiency, effectiveness, and competitiveness (Machado and Duarte 2010). Carvalho and Cruz-Machado (2011) argue that an organization following the requirements of lean, agile, resilient, and green strategies benefits from their advantages, and subsequently, their competitiveness may increase, and the existing conflicts between them will be eliminated. As a result, synergy occurs in a system.

Despite the importance of applying the LARG concept in HRM, there is a lack of empirical research on how these four paradigms can be simultaneously applied in HRM. Hence, this study attempts to propose a conceptual model for the LARG HRM with the interference of organizational innovation by using the structural equation modeling (SEM) method to analyze the influence level of variables when implementing the LARG concept in organizations. This study aims to develop a conceptual model for the LARG

HRM and investigates how it affects organizational performance. The proposed model contributes to improve organizational performance and can be adopted by service-oriented organizations to achieve a high level of competitiveness.

The remainder of this study is organized as follows: the "Research framework" section presents the research framework, provides a theoretical development of the LARG HRM, discusses the concepts of organizational innovation and organizational performance, and develops a set of hypotheses. The "Research methodology" section describes the methodology adopted for the study. The results of the measurement and structural model are explained in the "Results" section, followed by discussing the implications and limitations of the study in the "Research implications" section. The "Conclusions, limitations, and future research directions" section concludes the paper.

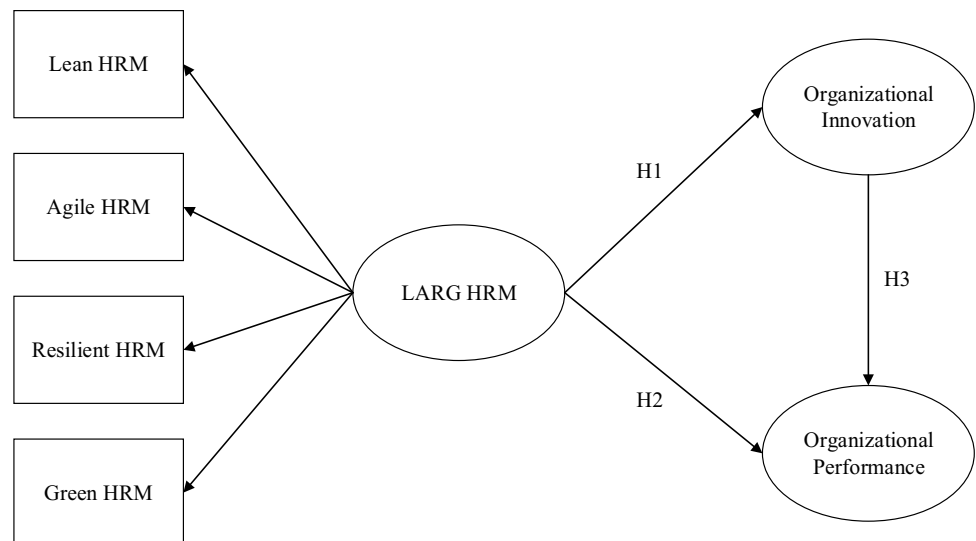
Research framework

Figure 1 presents the LARG HRM framework developed in this research by utilizing lean, agile, resilient, and green paradigms to investigate the impact of the LARG HRM on organizational performance and innovation. The proposed model used organizational innovation as a mediator variable to achieve organizational performance. The model proposes that the LARG HRM influences organizational performance both directly and indirectly through organizational innovation. The LARG HRM is divided into four paradigms: lean HRM, agile HRM, resilient HRM, and green HRM. Using literature support, the expected relationships among LARG HRM paradigms, organizational innovation, and organizational performance are discussed.

LARG HRM

In recent years, a limited number of studies have focused on the simultaneous combination of lean, agile, resilient, and green strategies, which have been conducted in a few specific domains, including SCM and production (Azevedo et al. 2011b; Cabral et al. 2012; Govindan et al. 2015; Rachid 2017; Raut et al. 2021; Salleh et al. 2020; Anvari 2021). The lean paradigm focuses on increasing productivity and quality, which can help managers reduce the organization's cost and improve the productivity and performance of the organization (Cabral et al. 2012; Hardcopf et al. 2021). Organizations have found the importance of the lean paradigm in the operation management area and identified the significant impact of HRM strategies in their operation management (Bamber et al. 2014). The lean paradigm in HR indicates improving employees' productivity and performance by reducing the time wastage in their activities in organizations. According to Madhani

Fig. 1 Research model



(2022), the lean paradigm also leads organizations to have an improved quality and consistency in services. To survive in an uncertain and unstable situation, organizations can consider the agile paradigm throughout their activities. Agility is the ability of organizations to manage changes in the market situations and respond to uncertainty (Gli-gor et al. 2015). Promoting agile thinking in HR aims to enhance the staff's reaction to the changes. Agile HR increases collaboration in organizations (Ranasinghe and Sangaradeniya 2021). Under this thinking, staff would work in groups to design, develop, and deliver their initiatives. Also, agile HR makes work cycles shorter in organizations which provides effective and continuous support for achieving the purposes (Ranasinghe and Sangaradeniya 2021). Ketkar and Sett (2009) stated that HR flexibilities intercede the effects of environmental mobility on organizational performance. They also found that HR practices, directly and indirectly, affect HR outcomes, which ultimately impact organizational performance. Before reacting to any instability, employees should learn to preserve the system in a balanced or normal mode. Organizations attempt to maintain the system in normal mode or improve their ability to recover the system in a normal situation (Azadeh et al. 2014). Concerning HR, this paradigm addresses the enhancement of employees' awareness, flexibility, teamwork, learning, and reporting culture. Moreover, this paradigm helps employees to encounter issues more effectively, thus affecting organizational performance both directly and indirectly. The capabilities of organizational resilience highlight the vital role of HRM in improving organizational performance through developing HR practices (Kossek and Perrigino 2016). Currently, the green paradigm allows organizations to achieve economic goals, decrease environmental impacts, and improve ecological performance through various ways such as

reducing and eliminating wastage, recycling, and saving energy (Chin et al. 2015; Khan and Qianli 2017; Zhu et al. 2008). Various works in the literature have emphasized the necessity of GHRM to support green management practices by discussing the positive effects of HR on organizational performance (Rajabpour et al. 2022; Paauwe and Boselie 2005; Schuler and Jackson 2014). Organizations should employ their staff emphasizing eco-friendly behavior and commitment to green thinking. GHRM increases staff's environmental knowledge and perceptions that truly boosts green behavior in organizations (Tanova and Bayighomog 2022). HR with green thinking in an organization can lead to the development of green culture reaching high ecological performance by highlighting the importance of green policies followed by organizations' employees (Alipour et al. 2019). Ahmad (2015) focused on green HRM (GHRM) practices and highlighted that GHRM includes policies to create a balance between the environment, society, and economic aspects. Amjad et al. (2021) investigate how green practices (training and development, performance appraisal, and reward and compensation) affect organizational sustainability through the mediating role of employee and environmental performance. They found that GHRM is an innovative idea in developing countries, and GHRM practices have a significant effect on organization sustainability. The LARG concept contains all four paradigms of lean, agile, resilient, and green simultaneously. The LARG concept is a new social-technical system that helps organizations' employees to reduce wastes and improve productivity. Also, it helps HR to be more flexible and provide an effective and quick response to changing customers' behavior, and to support environmental management by decreasing environmental risks at the same time (Cabral et al. 2012). Hence, by utilizing the LARG HRM concept, organizations can reduce

their costs, wastes, and environmental issues as well as improving their performance. Furthermore, the implementation of the LARG HRM thinking enables organizations to deal with sudden changes effectively and quickly, and to improve the stability of the system.

Organizational innovation

The growing concern over the importance of organizational innovation as a driver of competitiveness in a dynamic environment and its close relationship with financial growth leads organizations toward focusing on this concept. According to the definitions, innovation means implementing novel ideas and thoughts resulting from creativity (Azeem et al. 2021). The result of this process in service-based organizations can be a service or a new procedure with improved features and usages that can ultimately improve organizational performance and create values for their shareholders (Henard and Szymanski 2001). It also is a process in which these organizations can detect the existing problems and challenges, and then utilize the novel knowledge to solve them (Du Plessis 2007). Organizations having the capacity to create innovation can better respond to continuous environmental changes and challenges and adapt themselves to environmental evolutions (Lee and Hsieh 2010). The effects of innovation in the processes of an organization can be assessed through some criteria such as removing redundant activities in the service provision process, reducing variable costs, and increasing delivery speed (Shaukat et al. 2013). By definition, considering organizational innovation can help HR to find creative ways to implement lean, agile, resilient, and green paradigms and innovative organizations can act successfully in implementing the LARG concept.

Organizational performance

The success and survival of an organization depend on its performance. Organizational performance is an effective index for organizations to measure their success in reaching their objectives (Li et al. 2006; Rehman et al. 2019). Performance measurement is amply important since it monitors the system performance and reveals how organizational strategies are implemented (Chenhall 1997). Parker (2000) believe that performance measurement establishes standards for comparing, leading, and planning and assures that customer needs are supplied by real decision-making and regulating the use of resources. In addition, it bolds quality problems and specifies the areas that need specific attention and plays a significant role in improving quality and productivity. By measuring the organizational performance, managers, investors, and stakeholders can understand how

well their organizations are competing in the market, as well as future predicted results.

Research hypotheses

Innovative organizations always seek the best and effective way to manage their staff to implement the innovation concept, create new products, and provide better service (Ostraszewska et al. 2019). Skibiński and Sipa (2015) indicated that improving the knowledge of employees and converting them into high-skilled employees can be the source of ideas for new products and services. Organizations need to have employees who are highly participating and involving in the assigned tasks (Mak and Akhtar 2003). Organizations need innovative HR, with flexibility and risk-taking characteristics to develop innovations, including introducing new products, services, and new processes (Chen and Huang 2007). Addressing an innovation strategy requires organizations to have creative, skillful, and innovative HR, who have no problems with uncertain situations and take responsibilities to work independently (Jimenez-Jimenez and Sanz-Valle 2008). According to Agarwala (2003), organizations should continuously modify their HRM practices based on the changes in the situations. Jimenez-Jimenez and Sanz-Valle (2005) emphasized that adopting effective HRM practices significantly explains the organization's innovation orientation. Organizations should highly focus on the selection of supportive HRM practices to encourage employees to be innovative. Effective HRM practices motivate staff to bring up new ideas, share their knowledge with others, and implement changes resulting in organizational innovation. Concepts of lean, agile, resilient, and green paradigms have the most effects on process innovation, and the traits of each of them can result in the creation of new and creative ways to reduce costs and enhance HR flexibility to quickly adapt to changes (Möldner et al. 2020; Cabral et al. 2012; Gligor et al. 2015). HR flexibility positively impacts the adaptation culture and enhances the organization's innovation capability (Do et al. 2016). Additionally, they enhance employees' creativity by managing their creative abilities and cause them to redesign new ways of dealing with problems (Cooper et al. 2014). The concept of green by changing the mentality of employees about this concept leads to a change in employees' behavior within an organization and promotes green innovation (Diab et al. 2015; Huang and Li 2017). Thus, implementation of the LARG HRM thinking in organizations can increase their HR responsibilities and encourage them to work independently which motivates staff to encounter problems and issues in uncertain situations quickly. Hence, the following hypothesis is presented:

Hypothesis 1. *LARG HRM has a positive effect on organizational innovation.*

Increasing organizational performance is regarded as one of the most important targets of HRM (Guest et al. 2012). To achieve a competitive advantage, organizations should use HRM effectively, and their staff plays a critical role in this way (Jimenez-Jimenez and Sanz-Valle 2008). In recent years, a large body of research has addressed the relationship between HRM and organizational performance (Correa and Craft 1999; Khatri 2000; Yu et al. 2013). Given the lack of a precise definition for organizational performance, Guest (1997) suggested using the “outcome” concept instead of performance and categorizing it into the financial, organizational, and HR outcomes. Maheshwari and Vohra (2015) demonstrated the high connection between HR and organizational outcome, meaning that this part of the outcome is closer to HR practices in organizations. Al-Najjar (2010) found that promoting the knowledge of HR can significantly affect the performance of organizations, especially from the financial perspective (Safkaur and Sagrim 2019). Lambooi et al. (2006) investigated the relationship between HRM and organizational performance and found that HRM generally affects performance and allows organizations to have more productive employees and better performance.

Organizations that implement the lean concept among their employees have a higher potential to cut activities and expenses while also improving performance more quickly. Considering agile thinking, employees can enhance their speed and flexibility, increase the quality of employees activities, and lead to more productive operations (Lyskova and Rudakova 2020; Vilkas et al. 2019). According to Ali et al. (2022), implementation of green practices in organizations positively change employees’ behavior which can ultimately affect the organizations’ environmental performance. Due to its nature, the concept of resilience enhances the effective practices of HR in the face of crises and, as previously said, has a favorable influence on the organization’s performance (Ketkar and Sett). By creating green innovation, the concept of green innovation enhances the organizations’ environmental performance while also increasing sales and benefits (Diab et al. 2015). Using the LARG concept in HRM can help organizations have more productive staff and effectively enhance their performance. In addition, it can significantly affect HR flexibility, quality, and reactions in unpredictable situations. The resilience factors, including HR awareness, teamwork, learning, and reporting culture, would also be improved by implementing the LARG concept. It also decreases environmental impacts and increases personnel commitments, helping organizations to achieve higher ecological performance. Therefore, the following hypothesis is derived:

Hypothesis 2. *LARG HRM has a positive effect on organizational performance.*

Various studies have been carried out in the last few years on the relationship between organizational innovation and organizational performance (Al-Hakim and Hassan 2013a; Gunday et al. 2011; Uzokurt et al. 2013). Jimenez-Jimenez and Sanz-Valle (2008) concluded that considering innovation in an organization can simultaneously reduce costs and improve quality. Consequently, by adopting innovation, organizations can improve their productivity and the quality of products or services. Innovative thinking in an organization enables HR to be more creative which can improve the organizational performance (Su et al. 2018). The results of innovation in products/services and processes help organizations to have innovative behavior, which usually originates from organizational capacities (Prajogo and Ahmed 2006). Camisón (1999) analyzed the innovative behavior of organizations and their response to demands and demonstrated that this behavior provides the ability to achieve better entrepreneurial results. Organizational innovation is a vital factor in the long-term success of organizations. This factor can help organizations increase their profits (Jiménez and Valle 2006). By concentrating on innovation, organizations can gain more market share and higher income. In other words, organizational innovation is essential for gaining better performance (Chen et al. 2020; García-Morales et al. 2008). Therefore, we present the following hypothesis:

Hypothesis 3. *Organizational innovation has a positive effect on organizational performance.*

Research methodology

Sample and participants

The survey data for the present study were collected by an online form questionnaire from service-based organizations with front-end employees in Iran. The questionnaire respondents were selected from medium-to-large organizations with more than 50 employees (one per organization), located in the areas with the highest density of population and easily accessible for a personal visit. The respondents consisted of 210 organizational experts, senior experts, and managers with a minimum experience of 3 years. The service industries from which the questionnaires were collected were as follows: banking and financial services (32.3%); transportation (13.7%); hotel (16.7%); telecom (8.8%); and insurance (28.4%). The questionnaire included two parts of respondents’ demographic characteristics (age, gender, education level, and position) and the items related to the factors and paradigms of the proposed model. The convenience

Table 1 Respondents' demographic characteristics

Information	Frequency	Percentage (%)
<i>Gender</i>		
Male	87	85.3
Female	15	14.7
<i>Age (years)</i>		
20–30	8	7.8
31–35	37	36.3
> 35	57	55.9
<i>Highest educational level</i>		
Diploma and associate	11	10.8
Bachelor	71	69.6
Master	18	17.6
Doctorate	2	2
<i>Organizational position</i>		
Organizational expert	78	76.5
Senior expert	12	11.8
Manager	12	11.8
<i>Total work experience (years)</i>		
< 6	11	10.8
6–10	21	20.6
11–15	26	25.5
> 15	44	43.1

Table 2 Organizations' characteristics

Information	Frequency	Percentage (%)
<i>Industry</i>		
Banking and financial services	33	32.3
Transportation	14	13.7
Hotel	17	16.7
Telecom	9	8.8
Insurance	29	28.4
<i>Size</i>		
> 50	43	42.2
51–75	21	20.6
75–100	24	23.5
> 100	14	13.7

sampling method was used to access possible respondents (Constantiou 2009). As one of the non-probability sampling methods, this method can decrease the cost and time of the data collection process (Mosavi et al. 2018). Questionnaires were released on an Iranian platform (Porsline; <https://survey.porsline.ir>) among respondents. Also, various ways such as personal visits, phone calls, and e-mail reminders were used to increase the participation rate. In total, 127 questionnaires were returned, and among 127 collected questionnaires, 25 incomplete questionnaires included missing data, and thus, only 102 questionnaires were usable. The valid response rate was 48.6%. The organizations and respondents' demographic characteristics are reported in Tables 1 and 2, respectively.

Measurement

Due to few studies that have been conducted in the lean, agile, resilient, and green in the HRM area, the measurement items were extracted from studies investigating these paradigms in the domains of production and SCM. Since we distributed the questionnaire between non-English respondents, we translated the English version of the evaluating items into Persian. The translated items were checked by several experts who had professional experience in the field. Then, the translated items were translated to English and compared with the original English items in terms of equality, and the validity and clarity of the final questionnaire were confirmed. Then, a pilot study was implemented with almost 40 managers of organizations to ensure the validity and reliability of the questionnaire items. The pilot study was divided into two general parts: distributing the developed questionnaire and performing individual interviews with the respondents to receive their feedbacks. The questionnaires were distributed among the human resource managers working in the middle and top ranks of several service organizations (transportation and telecom) and the managers of banks who were selected randomly. Then, in-person interviews were held to receive more accurate feedbacks from the respondents. Following the respondents' feedbacks, some items were modified or rephrased.

The items used in the questionnaire of this study consisted of six parts of lean HRM, agile HRM, resilient HRM, green HRM, organizational innovation, and organizational performance. The lean HRM was measured using five items developed by Nawanir et al. (2018), and the agile HRM was measured using five items developed by Sharifi and Zhang (1999). The resilient HRM was measured using five items developed by Azadeh et al. (2018) and Bardoe et al. (2014), and the green HRM was measured using four items developed by Hsiao et al. (2014). Organizational innovation and performance were measured using five items developed by Chen et al. (2016) and 12 items developed by Maletič et al. (2014), respectively. The survey items are listed in the Appendix. All the items were measured using a 5-point Likert scale (1, completely disagree; 2, slightly disagree; 3, neither agree nor disagree; 4, slightly agree; 5, completely agree).

Analysis

As mentioned before, to analyze the processes and results, the PLS-SEM method was used. This method is a general statistical modeling method, which has been widely used in behavioral science in recent years. SEM provides a simplified framework for statistical analysis, which encompasses various traditional multivariate procedures such as discriminant analysis, regression analysis, and factor

analysis. Besides, SEM is a powerful method for combining complex path models with cryptic factors (Hox and Bechger 1998). PLS-SEM is particularly useful for studying new concepts where the theoretical foundation is not well-established. Another important reason to use the variance-based structural equation modeling rather than the covariance-based one is its less significant dependence to sample size. In addition, the normal distribution of data does not pose any constraint for the PLS as the approach supports non-normal data (Hair et al. 2011).

Results

Results for the measurement model

Convergent and discriminant validity

The model in Fig. 1 was analyzed through PLS-SEM using SmartPLS software. To test the homogeneity of the measurement model, a factor analysis was conducted for the LARG HRM model using 19 items in four dimensions, organizational innovation using five items, and organizational performance using 12 items. If the absolute value of the factor loading between the observed variable and the related latent variable is at least 0.7, the measurement model will be homogeneous (Sangari and Razmi 2015). In addition, if this increases the composite reliability of the measurement model, it would be better to eliminate observed reflective variables with a factor loading of less than 0.4 (Temme et al. 2010). The results of the research show that in all hypotheses, the factor loading values are higher than the acceptable level. The results shown in Table 3 indicate that item (question) number 1, “Easy access of staff to the demanded facilities,” had the highest factor of 0.602 and item (question) number 18, “perception of the staff about environmental policies of the organization,” had the lowest factor of 0.883. All the factor loading values, means, and standard deviations are shown in Table 3.

Assessing reliability

The reliabilities of the LARG HRM (lean HRM, agile HRM, resilient HRM, and green HRM), organizational innovation, and organizational performance were evaluated with Cronbach’s alpha. In the present study, Cronbach’s alpha of all variables was higher than 0.7, which is considered acceptable (Lee et al. 2011). In the next step, we also analyzed the correlations for each of the constructs. All the correlations are significant at the 0.01(**) and the 0.05 (*) levels.

Table 3 Factor analysis, means, and standard deviations

Factors and items	Means	Standard deviations	Items loadings
<i>Lean</i>	3.88	0.596	
Lean 1	4.14	0.944	0.617
Lean 2	4.01	0.928	0.707
Lean 3	4.25	0.875	0.863
Lean 4	4.27	0.773	0.723
Lean 5	3.33	0.978	0.602
<i>Agile</i>	3.64	0.807	
Agile 1	3.51	1.13	0.854
Agile 2	3.45	1.02	0.786
Agile 3	3.71	0.981	0.665
Agile 4	3.82	1.075	0.724
Agile 5	3.74	1.071	0.751
<i>Resilient</i>	3.47	0.691	
Resilient 1	4.04	0.889	0.603
Resilient 2	3.39	0.924	0.707
Resilient 3	3.51	1.088	0.849
Resilient 4	2.85	1.112	0.745
Resilient 5	3.29	1.113	0.752
<i>Green</i>	3.35	0.832	
Green 1	3.32	1.064	0.830
Green 2	3.13	1.087	0.857
Green 3	3.29	0.929	0.883
Green 4	3.64	0.888	0.779
<i>Innovation</i>	3.65	0.658	
Innovation 1	3.78	0.961	0.681
Innovation 2	3.87	0.886	0.692
Innovation 3	3.74	0.795	0.622
Innovation 4	3.76	0.892	0.630
Innovation 5	3.47	0.972	0.773
Innovation 6	3.27	1.064	0.617
<i>Performance</i>	3.61	0.634	
Performance 1	3.77	0.984	0.705
Performance 2	3.66	1.067	0.822
Performance 3	3.64	0.963	0.771
Performance 4	3.68	1.064	0.827
Performance 5	3.74	0.954	0.680
Performance 6	3.93	0.904	0.670
Performance 7	3.79	0.905	0.657
Performance 8	3.74	0.964	0.791
Performance 9	3.07	1.119	0.670
Performance 10	3.42	1.189	0.661
Performance 11	3.84	0.952	0.720

Internal consistency

The internal consistencies of measurement items were assessed by the average variance extracted (AVE) and the composite reliability (CR). According to Fornell and Larcker (1981), this index shows the correlation between a variable and the items that explain it. The results of this test show that this index was above 0.5 in all variables, and the internal consistency of the first-order measurement model is acceptable (Davadas and Lay 2017). Table 4 also reports the results of the AVE test. Furthermore, the CR test, which estimates

Table 4 Cronbach's alphas, AVEs, CRs, and correlations of variables

Variables	Cronbach's α	AVE	CR	1	2	3	4	5
1. Lean	0.748	0.502	0.832	-				
2. Agile	0.813	0.576	0.871	0.680**	-			
3. Resilient	0.786	0.541	0.854	0.506**	0.619*	-		
4. Green	0.859	0.702	0.904	0.514**	0.670**	0.617*	-	
5. Innovation	0.798	0.530	0.851	0.350**	0.508**	0.239**	0.485**	-
6. Performance	0.914	0.500	0.922	0.364**	0.439**	0.348**	0.559**	0.440*

* $P < 0.05$ ** $P < 0.01$ **Table 5** Cronbach's alpha, AVE, and CR of second-order variable

Variable	Cronbach's α	AVE	CR
LARG HRM	0.907	0.590	0.921

the internal consistency of latent variables, was conducted between the factors of the conceptual model. The results of the CR test ranged from 0.832 to 0.922, exceeding the recommended value of 0.7 (Sangari and Razmi 2015), indicating favorable stability of the internal latent variables. The results of reliability and consistency are reported in Table 4.

Validation of second-order constructs

According to the conceptual model, lean, agile, resilient, and green HRM paradigms and organizational innovation and organizational performance are the first-order constructs. However, lean, agile, resilient, and green HRM variables are influenced by a fundamental variable called the LARG HRM. The LARG HRM is the second-order variable of the model. The reliability and validity of the second-order variable were assessed by Cronbach's alphas, AVE, CR, and the results of these tests are shown in Table 5. According to the results, the reliability and the validity of the second-order variable were confirmed.

Results for the structural model

The relationships between independent latent variables (exogenous) and dependent variables (endogenous) are detailed. Therefore, after confirming the reliability and validity of measuring instruments, the next step analyzes and confirms the structural model. In this analysis, the size, sign, and significance level of the path coefficients should be examined. Greater coefficients indicate stronger relationships between two variables, and the negative coefficient will also indicate the inverse relationship between the variables (Henseler et al. 2009). The significance of these coefficients is also one of the essential parameters to confirm the structural model, which completes the size and sign of the beta

coefficients in the model. The hypothesis is confirmed if this statistic is within the range of the level of confidence intended for it (Hair et al. 2011; Henseler et al. 2009). The results of path analysis are shown in Fig. 2 and Fig. 3. As shown in Fig. 2 and Fig. 3, the LARG HRM was supported very effectively by each of the four lean, agile, resilient, and green paradigms. Specifically, The LARG HRM relates to organizational innovation significantly and positively, which supports Hypothesis 1. The LARG HRM had a positive and significant effect on organizational performance. Additionally, organizational innovation positively and significantly affects organizational performance, which confirms Hypotheses 2 and 3. Table 6 reports the results of this analysis.

The conceptual model of the present study shows that the LARG HRM not only directly affects the organization's performance but also indirectly affects the performance by encouraging organizational innovation. According to Table 6 and Fig. 3, the direct effect was 0.362, while the indirect effect was 0.160. The total effect of the LARG HRM variable on organizational performance is 0.522.

In the SEM method, the goodness-of-fit (GOF) index was used for fitting the model. Totally, three values were obtained for this index (small = 0.1, medium = 0.25, large = 0.36) (Birmingham et al. 2017). The coefficient R^2 indicates the data support level of the conceptual model (Nikbin et al. 2016). The following equation was used to calculate this index for the proposed model (Henseler and Sarstedt 2013):

$$GOF = \sqrt{\text{communality}} \times \sqrt{\frac{R^2}{R}} \quad (1)$$

In this study, R^2 , communality, and GOF index values were 0.478, 0.534, and 0.509, respectively, indicating the desired rate of the fitting process in the proposed model.

Mediator variable effect

To test the mediation effect of organizational innovation in the conceptual model, the Sobel test was used. This test uses Eq. 2 such that if the Z value is significant, then the mediator variable plays a significant role in the model (Hu et al. 2017). Considering the results of the Sobel test, the Z value

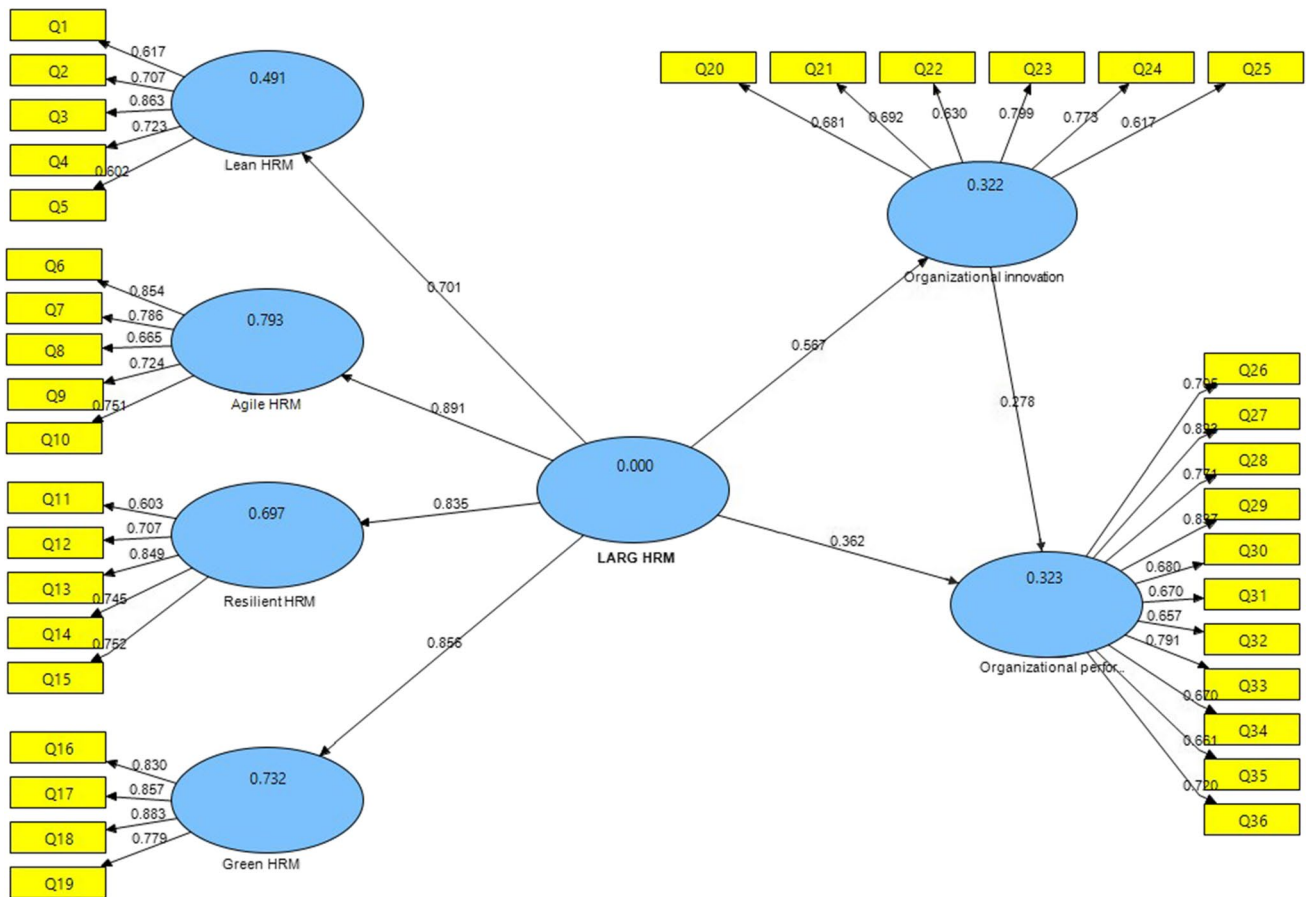


Fig. 2 Path analysis (measurement model)

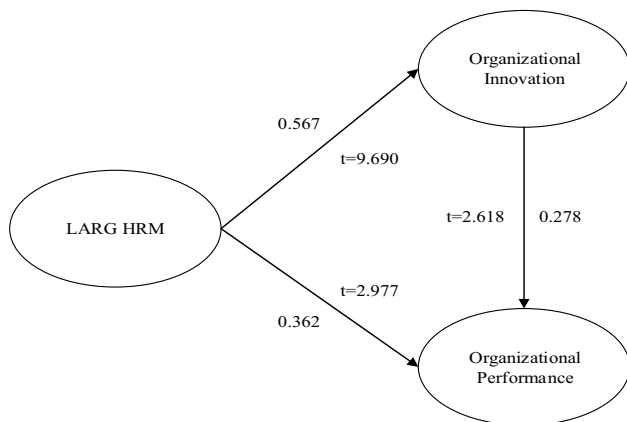


Fig. 3 LARG HRM, organizational innovation, organizational performance (structural model: bootstrapping)

obtained was 2.527, which shows the significant effect of the mediator (organizational innovation). In models with a partial mediator variable, calculating that part of the indirect effects of the independent variable on the dependent variable is conducted through the variance accounted for (VAF)

indicator (Temme et al. 2010). The partial mediator variable in this study is “organizational innovation.” The value obtained for this indicator is 0.304, which indicates the relatively medium impact of this variable (organizational innovation). In other words, organizational innovation can justify more than 30% of changes in organizational performance.

Research implications

This study reveals how lean, agile, resilient, and green paradigms can play a critical role in implementing the LARG thinking in the organizations’ HRM. As shown in the previous section, all four paradigms significantly and positively affect the LARG HRM and can assist managers in organizations to realize the LARG concept and effectively apply it in HRM to achieve higher performance. Considering the significant and positive relationship between the LARG HRM and organizational innovation, it can be argued that applying the LARG thinking in HRM can significantly affect innovativeness, which was supported by previous studies (e.g., Fay et al. 2015; Jiang

Table 6 Results of path analysis

Path	Path coefficient	<i>t</i> value	Supported
H1: LARG HRM → organizational innovation	0.567	9.690	Yes
H2: LARG HRM → organizational performance	0.362	2.977	Yes
H3: Organizational innovation → organizational performance	0.278	2.618	Yes

All the relationships are significant at $\alpha < 0.01$

et al. 2012). Implementation of the LARG HRM in service-based organizations can increase HR accessibility to the necessary knowledge and encourage senior managers to pay attention to employees' creativeness. It can lead to innovative methods in performing tasks and motivate the introduction of new services. Furthermore, applying the LARG concept in HRM develops methods to create new systems for strategic planning, employees' training, and promotion. Accordingly, the LARG concept plays a significant role in HR creativity and their growth and causes to recognize new markets constantly.

The LARG HRM enabled organizations to enjoy higher intra-organizational coordination and maintain continuity of their operations or rapidly adapt to new situations and prevent financial losses in the case of any changes in laws or market policies and the increase in prices by adopting functions like raising the awareness of their staff and introducing flexibility to operations.

As it was mentioned before, employees in service-oriented organizations are in direct contact with the clients. Thus, the implementation of the proposed concepts in such places can resolve the issue of delayed service provision and increase its speed via the agility of human resources. Consequently, a positive image is formed in the customers' minds, and they are drawn once again to the organization. This can increase the number of customers and, consequently, the rate of sales. In terms of theory, the paper contributes to the existing literature by developing a novel framework for the LARG HRM and providing empirical evidence on how it enhances organizational innovation and performance. It responds to the need for research on the consequences of implementing LARG HRM and expands upon the perspective of dynamic capabilities in the HRM domain. The research also presents an operationalization of the LARG HRM that can be used in future investigations.

Our findings also support the significant and positive relationship between the LARG HRM and organizational performance, which was also confirmed by previous studies (e.g., Katou 2012, 2015, 2017). Organizations should focus on their staff to reach a higher organizational performance. As mentioned before, the LARG HRM leads organizations to have highly productive and innovative employees who can expand the market by developing new methods and services. This market expansion can benefit organizations from the

customer side, which significantly improves organizations' performance.

The results of this study have also confirmed the significant and positive relationship between organizational innovation and organizational performance. Due to the presence of creative, skilled, well-trained, and promoted employees and novel systems for strategic planning, organizations can develop effective methods and processes offering new services to their customers. Subsequently, it results in increasing organizations' liquidity absorption, overall asset, profit, and improving performance. This finding highlights the necessity of supporting innovation by organizations in today's competitive world which has been verified by the results of previous studies (e.g., Al-Hakim and Hassan 2013b; García-Sánchez et al. 2018; García-Morales et al. 2008).

Empirical results also confirmed that the path between the LARG HRM and agile HRM has the highest value meaning that considering the agile paradigm has a considerable effect on HRM and is crucial for achieving the LARG HRM in the service sector. Concerning our results, organizations' employees tend to have easy access to the information and be more independent in performing their tasks (in groups or individually). Hence, managers should provide more freedom for the employees and pay more attention to their viewpoints in their decision-making process to enhance creativity among HR. Besides, green HRM, resilient HRM, and lean HRM have a relatively high path coefficient and play an essential role in achieving the LARG HRM. To successfully implement this concept, organizations should adequately understand all four paradigms of the LARG HRM concept. In this respect, the paradigm of lean by enhancing employees' productivity and organizational performance by eliminating or minimizing operational time; the paradigm of resilience by improving organizational adaptability and future survival, even in the event of problems; and the paradigm of green by improving organizations ability to improve performance in environment-related issues are inseparable components of this concept.

Concerning the results, "employee's ability to perform several different jobs" (Q3) is the most effective criterion for the lean paradigm and greatly contributes to changing HR insight into lean thinking. Laying the ground for the training of employees to fulfill different tasks enables organizations

to enjoy multifunctional expert employees. Such employees can fulfill tasks more efficiently. As a result, an employee can be an excellent substitute to perform the other employees' jobs. The presence of multifunctional employees in an organization significantly enhances the productivity and performance of the organization.

“Pay attention to employee’s ideas in decision-making” (Q6) is another effective element in the implementation of the agile paradigm into the service sector. In today’s pioneer organizations, employees exhibit their high decision-making capabilities once they face problems. It shows that managers no longer make important decisions in organizations, and employees play an important role in solving problems. In other words, managers can identify new capacities for their organizations by taking into account the ideas of their employees and providing them with higher freedom of action. Therefore, to benefit from HR with resilient thinking, “organization managers should adopt methods to increase the ability of their staff in changing rules or ways in different situations” (Q13). This flexibility helps HR make decisions quickly without wasting time in emerging problems and different situations. Given the results related to green HRM, “having employees with a full understanding of the extent of organization’s environmental policies” (Q18) is the most crucial factor from the perspective of HR. In other words, realizing environmental issues by the staff is the first step in considering the green paradigm in the organization. Organizations with employees who have a comprehensive understanding of eco-friendly policies with an appropriate reward and compensation system associated with their eco-friendly behavior can be at the forefront of implementing the LARG HRM.

Conclusions, limitations, and future research directions

The present study investigates the paradigms of lean, agile, resilience, and green in HRM. A conceptual model is developed to analyze the impact of the LARG HRM on organizational performance with the mediation of organizational innovation. To the best of our knowledge, no study has been carried out to analyze the impact of LARG in the HRM context. In this way, we use structural equation modeling for analyzing the data obtained from questionnaires distributed among 210 organizational experts, senior experts, and managers. Based on the results, almost all lean, agile, resilient, and green items have substantial roles in implementing the LARG HRM. Furthermore, the LARG HRM affects organizational innovation and organizational performance significantly. In addition, there is a significant and positive relationship between organizational innovation and organizational performance. The

results indicate that the top management of organizations should promote the LARG concept among their staff to improve their performances. The present study provides managers in organizations with a good insight into the implementation of the LARG HRM and how it contributes to the staff effectiveness to achieve higher organizational performance.

Despite the innovations in this study, there have been limitations that can be considered in future research. The results of this study are only significant in the service sector with a low response rate and cannot necessarily be generalized to all industries. Independent research can be conducted in the same way in other industries such as healthcare and manufacturing with a higher number of respondents. Another potential venue for future research could be to examine the impact of different HR levels in the organization. Furthermore, since little research has investigated the lean, agile, resilient, and green paradigms in the HRM context, more empirical research is needed in to validate our results. Different variables such as knowledge management, organizational commitment, service quality, and job satisfaction can be added to the conceptual model of the research to evaluate their effects.

In addition to the above consideration, a comprehensive model including the LARG human resource practices and key performance indicators can be used instead of the conceptual model of the study to rank the paradigms, practices, and indicators of the LARG HR using a multi-criteria decision-making methods such as fuzzy best–worst method (Jafarzadeh Ghouschi et al. 2019). This can be significantly helpful to organizations in terms of knowing the most valuable practices and paradigms of the LARG concept for its implementation. Moreover, the sustainability paradigm can be considered in addition to lean, agile, resilient, and green paradigms (Sharma et al. 2021) in the domain of HRM in order to develop the lean, agile, resilient, green, and sustainable (LARGS) concept and evaluate its influences as well as the dimensions of its implementation in organizations.

Appendix

The survey items for the LARG HRM, organizational innovation, and organizational performance

LARG HRM

Lean HRM

Q1 In our organization, if there is no demand in a department, the department’s employees can go to another department to manage the department that needs help

- Q2 In our organization, if an employee is not present, another employee can take on the same responsibilities
- Q3 The employees of our organization are trained in a way that they can do a variety of tasks
- Q4 The employees of our organization are capable of performing different tasks
- Q5 The employees of our organization have no problem accessing the systems and equipment they need

Agile HRM

- Q6 In our organization, lots of attention is paid to the employees' viewpoints in making decisions
- Q7 In our organization, the independence of employees in making decisions related to their work is high
- Q8 In our organization, employees have great access to the information and knowledge they need
- Q9 In our organization, performing tasks in groups and teams by employees is prevalent
- Q10 In our organization, special attention is paid to the personal initiatives of employees

Resilient HRM

- Q11 Our organization is able to compensate for workforce shortages if needed
- Q12 The employees of our organization are permitted to use trial and error methods to perform tasks
- Q13 The employees of our organization are able to change methods and conditions if needed
- Q14 The employees of our organization have a balance between their personal and professional lives in difficulties
- Q15 In our organization, employees' ideas are welcomed in case of problems

Green HRM

- Q16 Our organization provides training to improve environmental management
- Q17 In our organization, the reward and compensation for services are associated with the environmental behavior of employees
- Q18 The employees of our organization understand the company's environmental policies
- Q19 Our organization utilizes ethical rules as a stimulus for environmental issues

Organizational innovation

- Q20 In our organization, the introduction rate of new services is constantly increasing
- Q21 In our organization, the introduction rate of new service methods is growing rapidly
- Q22 The introduction rate of new markets and service sections of our organization is constantly increasing
- Q23 In our organization, the introduction rate of new training, development, and promotion systems is constantly growing
- Q24 The introduction rate of new systems for strategic planning and control in the organization is constantly increasing

Organizational performance

- Q25 If existing methods and processes are not effective anymore, our organization is able to develop new types of them
- Q26 The new services of our organization are increasing compared to other competitors
- Q27 The revenue of our organization is increasing compared to other competitors

- Q28 The investment of companies in our organization is increasing compared to other competitors
- Q29 The profit of our organization is increasing compared to other competitors
- Q30 The number of depositors in our organization is increasing compared to other competitors
- Q31 Operations in our organization are increasing compared to other competitors
- Q32 The liquidity absorption of our organization is increasing compared to other competitors
- Q33 The overall asset growth of our organization is increasing compared to other competitors
- Q34 The investment amount of our organization in hiring, training, and compensating for human resources damage is more than other competitors
- Q35 The level of employees' satisfaction with their situation in our organization is high
- Q36 The productivity of our organization employees is higher than other competitors

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Drafting the manuscript: NA, SN, HRV.

Approval of the final version of the manuscript as submitted: NA and SN, MSS, HRV.

Data availability All data and materials are available within the article and codes are available from the corresponding author on request.

Declarations

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