



ECONOMIC ANNALS-XXI

ISSN 1728-6239 (Online)
ISSN 1728-6220 (Print)
<https://doi.org/10.21003/ea>
<http://ea21journal.world>

Volume 207 Issue (1-2) 2024

Citation information: Zokirov, K., Atadjanov, M., Eshnazarova, M., Pulatova, M., Otabaeva, F., & Alzubaidi, L. H. (2024). Green supply chain management development through the digital educational management of human resources. *Economic Annals-XXI*, 207(1-2), 45-49. doi: <https://doi.org/10.21003/ea.V207-07>



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Green supply chain management development through the digital educational management of human resources

Abstract. The present study aims to investigate the strategic management of human resources on the efficiency of the digital supply chain. This research is applied and descriptive-survey type. The statistical population of this research included senior, middle and operational managers of food industry and biotechnology companies in Central Asia, whose number was equal to 622 people in 2023. Of these, 188 people were randomly selected as a sample using Morgan's table. The research tool was a researcher-made human resource management and digital supply chain questionnaire, which was designed in the format of a Likert scale. Its validity has been confirmed by professors and its reliability through Spearman's correlation test. The findings of the research indicate that the factors of human resource management, digital purchasing, digital marketing, digital strategy, digital training and environment have had a positive and significant impact on the efficiency of the digital supply chain. Also, among the factors affecting the efficiency of the digital supply chain, human resource management and internal environment have the most impact, while digital strategy evaluation and control has the least impact.

Keywords: Green Supply Chain; Digital Marketing; Digital Education; Human Resource

JEL Classifications: E24; E41; E64; I18; J28; J31

Acknowledgements and Funding: The authors received no direct funding for this research.

Contribution: The authors contributed equally to this work.

Data Availability Statement: The dataset is available from the authors upon request.

DOI: <https://doi.org/10.21003/ea.V207-07>

1. Introduction and Brief Literature Review

Supply chain strategy is one of the new concepts of improving the performance of the goods distribution system in today's competitive and turbulent market. The emergence of digital supply chain management (DSCM) has been one of the most striking developments of the past decade and has created opportunities for hotels to adjust their supply chain according to environmental goals (Setyaningrum & Muafi, 2023; Ram et al., 2024). Digitizing the supply chain is the process of integrating environmental criteria with the purchasing decisions of companies and long-term relationships with suppliers. Supply chain strategy is a set of management factors that forms the long-term performance of an organization (Nainggolan et al., 2024). Therefore, Supply chain strategy is based on checking and determining the external events. In the shadow of considering the weaknesses and strengths of an organization, it emphasizes.

The goal of digital supply chain management is to reduce climate change, reduce or eliminate solid waste, greenhouse gas emissions, and waste containing hazardous chemicals throughout the supply chain and pave the way for sustainable production). They are human beings. For example, including senior managers, managers, employees and suppliers) and when multiple organizations in the supply chain find a structure and are combined and coordinated, more people are involved, and human relations become more complicated. It becomes an important and prominent behavior (Foroughi, 2021; Nursalim, 2021). The successful implementation of the digital supply chain and environmental management depends on behavioral and human aspects (Li, 2021; Kiki et al., 2023). Therefore, the conflict between the organization's employees and the management of the digital supply chain must be analyzed and analyzed in a continuous and related manner. Empowering the organization in attracting talents and acquiring knowledge, improving necessary skills and competences, empowering employees and increasing employee motivation will be achieved.

Song et al. (2021) investigated the effect of strategic human resource management practices on the financial performance of some companies in Australia. The results of this research show that the strategic coordination of human resource activities with business goals and strategies has an impact on the financial performance of companies. Sanusi et al. (2019) measured the impact of human resource management on organizational performance in his research. The results of this research indicate that human resource management and the performance of the studied companies have a significant relationship. Jhan et al. (2022) investigated the relationship between the strategic management of human resources and the performance of Kenyan companies. In this research, a conceptual framework has been developed to examine the relationship between strategic human resources management and the company's performance. The research results indicate that capable management and Strategic human resources and along with it, appropriate competitive strategies create a competitive advantage for the company and improve the performance of the mentioned organization. The results of this research indicate a positive and significant relationship between supply chain management and the environment. They investigated the structure of supply chain management and organizational performance in Malaysia. There is a direct relationship between these two categories.

Despite the research on the relationship between the organization's employees and supply chain management (Zaidia & Hasana, 2022), few studies have been done on the effectiveness of the «digital» version of these concepts and the relationship between the organization's employees and supply chain management. It is not completely clear. In this article, the effect of knowledge management capability and the desire to digitize the supply chain on the performance of supply chain management was investigated. The research hypothesis are considered as follows:

- H1: Human resource management has a significant effect on digital supply chain management;
- H2: Digital recruiting and hiring has a significant effect on digital supply chain management;
- H3: Digital education and development significant effect on digital supply chain management;
- H4: Digital purchasing and marketing has a significant effect on digital supply chain management;
- H5: Digital strategy and process has a positive and direct impact on digital supply chain management.

2. Methodology

The current research is practical and descriptive-survey method. The statistical population of this research included senior, middle and operational managers of companies active in food and biotechnology industries in East Asia, whose number is equal to 622 people. Of these, 188 people were randomly selected as a sample using Morgan’s table. A researcher-made questionnaire is used for collection data, the validity of which has been confirmed by the professors, and the Cronbach’s alpha for the reliability of the tool is higher than 0.8, which is an acceptable reliability. In order to analyze the data, descriptive statistics and inferential statistics tests were employed.

The conceptual framework of the research is presented in Figure 1. This framework includes human resource management variables as an independent variable, digital purchasing factors, digital marketing, digital strategy, digital education as a mediating variable, and environment as a moderating variable affecting supply chain efficiency as a dependent variable.

3. Results

According to the collected questionnaires, before examining the hypotheses, to better understand the relationship between the research variables, their correlations were calculated. In this regard, due to the normality of the data collected, Spearman’s correlation test was used. The results for the variables Digital supply chain management (DSCM), Digital human resource management (DHRM), Digital purchasing, Digital marketing, Digital strategy, and Digital education are presented in Table 1. The coefficients indicate the significance of the strong correlation between the independent variable and the dependent variables with a 99% confidence interval. This, in turn, shows that the research variables for the structural equation model test are also highly dependent.

Structural equations are used for modeling. It should be mentioned that in order for the structural model or the path diagram to be approved, at first, they should have appropriate

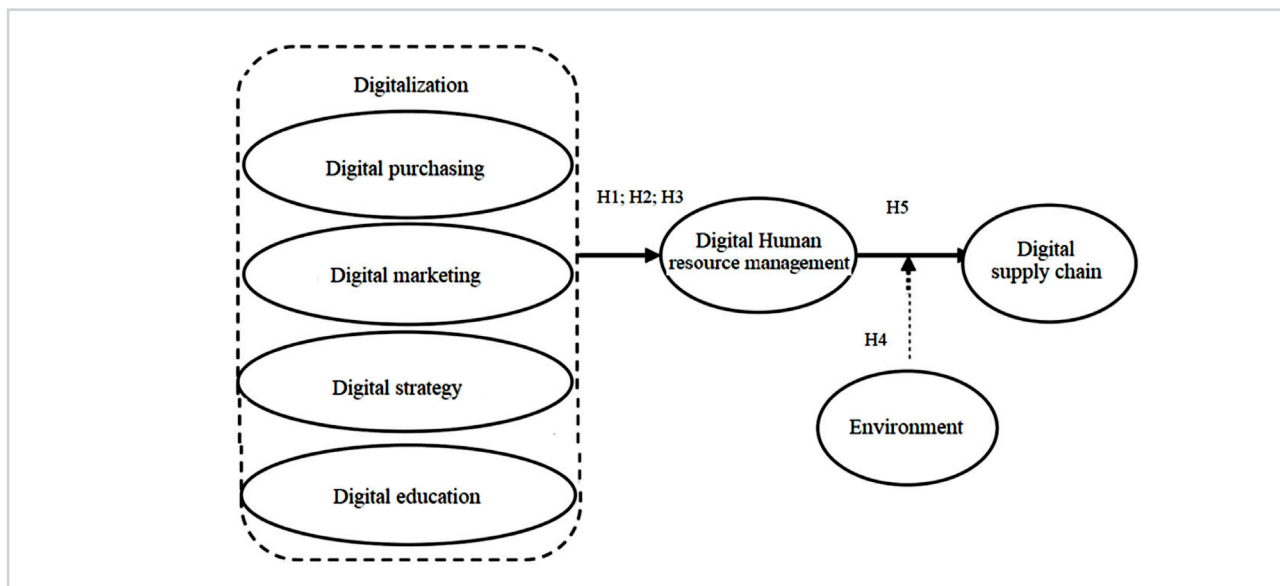


Figure 1:
Conceptual model
Source: Authors’ own research

Table 1:
Spearman correlation coefficients between research variables

Variable	DSCM	DHRM	Digital purchasing	Digital marketing	Digital strategy	Digital education
DSCM	1	-	-	-	-	-
DHRM	0.88	1	-	-	-	-
Digital purchasing	0.67	0.45	1	-	-	-
Digital marketing	0.62	0.51	0.71	1	-	-
Digital strategy	0.61	0.56	0.48	0.51	1	-
Digital education	0.61	0.63	0.66	0.72	0.59	1

Note: DSCM - Digital supply chain management; DHRM - Digital human resource management.

Source: Authors’ own research

fit indices and in the next step, the t-value and standard coefficients should be significant (Chetthamrongchai et al., 2022).

If the values of 2 are greater than 1.96, they will be significant at the 95% confidence level. As can be seen in Figure 2, the validity and appropriateness of the models are confirmed, that is why the RMSEA value is less than 0.05 and the chi-square ratio to the degree of freedom in the model is less than 3. The value of GFI and AGFI in the model is above 90%. Please, explain the abbreviations, graphs and numbers from this paragraph. Now they are given from nowhere and are out of the context.

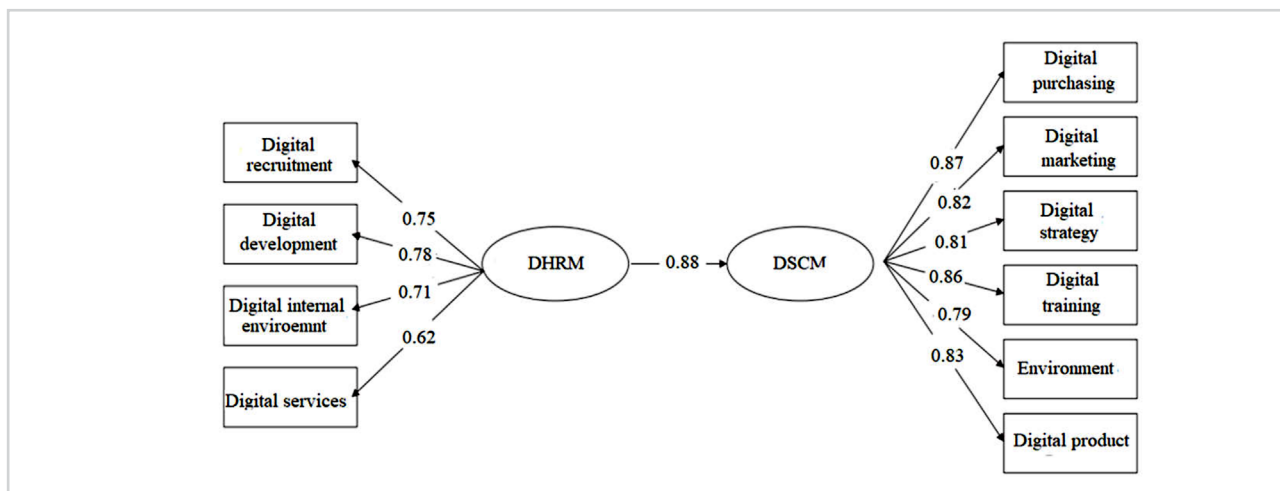


Figure 2:
Structural equation modeling
Source: Authors' own research

The standard coefficient of the human resource management variable with digital supply chain management is equal to 0.88; considering that this is the significance level of the small effect coefficient of 0.05, therefore it can be said with 95% confidence that human resource management has a positive and significant relationship with digital management of digital supply chain. With reference to Table 2, as far as the significance level of the effect coefficient of the four sub-hypotheses is less than 0.05, it can be stated with 95% confidence that digital human resource management subsystems (digital recruitment and recruitment, digital training and development, performance evaluation and digital compensation) have a positive and significant relationship with digital supply chain management.

The outcomes of research indicated that with a confidence of 0.95 there is a relationship between the examination of the digital supply chain, the internal environment, the formulation and implementation of the digital strategy with the efficiency of the supply chain, whereas the factors of digitalization have explained an average of 0.42 of the variance of the efficiency of the supply chain.

Table 2:
Research hypothesis results

Hypothesis	Standard coefficient	Significance level	Results
H1	0.88	8.11	confirmed
H2	0.34	2.88	confirmed
H3	0.45	3.41	confirmed
H4	0.31	2.75	confirmed
H5	0.37	3.01	confirmed
$\chi^2 = 76.23$; $df = 33$; $RMSEA = 0.081$; $GFI = 0.96$; $AGFI = 0.92$			

Source: Authors' own research

4. Conclusion

The objective of current research was to evaluate the role of strategic human resource management on the efficiency of the DSCM. Since the human resources in the digital supply chain play an important role in the effective implementation of the DSCM, in this research the importance of

digital supply chain management and human resource management and the relationship between these two categories and the role of mediating employee engagement and environmental moderation and digitalization of the process of marketing was stated.

According to the obtained results, the main dimension of the human resources management has a direct impact on the efficiency of the digital supply chain. Therefore, according to the findings of the testing of our research hypotheses, it can be argued that human resource management is an important source for achieving the organizational goals through employees' participation. In this regard, organizations should adopt digital management in all units, one of which is management. Also, there exists an urgency in the companies to revise their human resources policies and direct their human resources management activities to digitization and pay more attention to the environment. In the management of digital human resources, it is necessary for organizations to institutionalize and train and develop a move-forward thinking among their managers and employees before doing major practical changes. In this regard, human resource training is one of the most important issues that organizations should incorporate. Therefore, managers are suggested to adopt the following strategies:

- analysis of training needs to identify the digital training needs of employees;
- holding training courses before service and during continuous service for managers and employees or distributing brochures, catalogs and announcements;
- training employees about climate change and other environmental issues, such as using automation and computer software instead of using paper;
- creating changes and transformations in work for the education of future digital managers;
- education and presentation of correct energy consumption patterns;
- training on safety dimensions, energy efficiency, waste management and recycling.

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Received 12.09.2023

Received in revised form 14.10.2023

Accepted 21.10.2023

Available online 22.02.2024