Role of Human Capital and Digitalization to Upgrade Innovation

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Abstract

Innovation is the mainstay of the business landscape of business. It not only improves the firms' position in the market but also provides a sustainable competitive advantage. Such a competitive advantage is inimitable for rivals, as it resides in the human capital and structures of firms. With the help of human capital, firms can realize innovation in products as well as processes. Firms with developed human capital can encourage their employees to undertake entrepreneurial ventures that are more often called intrapreneurship. Intrapreneurship is the way of carrying out innovative and creative activities by the employees of firms that are fully supported by them. Therefore, this research investigates the influence of human capital on the intrapreneurial activities of firms as they are closely associated with each other. In doing so, the mediating role of digitalization and supply-chain competitiveness is also studied. After collecting data from 195 Malaysian manufacturing sector firms, PLS-SEM was applied to test the modeled relationships. The findings reveal that human capital positively improves the intrapreneurial activities of firms. In addition, this relationship is fully mediated by digitalization as well as supply-chain competitiveness. This study provides a novel contribution by exploring the association of human capital and intrapreneurship with digitalization and value chain competitiveness. Therefore, firms should develop their human capital in order to remain innovative and competitive. Furthermore, developed human capital will complement the digitalization and competitive value chain in this association. Future researchers are suggested to study this relationship sector-wise, such as investigation of service sector and textile sector firms.

Keywords: Innovation; human capital; digitalization; Intrapreneurship.

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1. Introduction

In the current hyper-competitive and technological era, the locus of competitiveness resides in its innovation activities. Intangible capital of the 21st century known as human capital plays a significant role in developing innovation in firms whether it is the process or product-related innovation (Mubarik et al., 2022). The human capital of a firm is the combination of education, skills, experience, and emotional and cognitive abilities of its employees (Ahmed et al. 2016). This intangible capital neither can be imitated nor can be stolen; therefore, firms nowadays are taking this form of capital as vital for their growth and innovation. In order to remain competitive and ahead of rivals, firms always try to produce some innovative product or improve their processes to enhance value for customers. To support this phenomenon, they support their employees to be creative and engage in innovative and entrepreneurial activities that are called intrapreneurship (Frese et al., 2014; Mubarak et al., 2019). Intrapreneurship is the undertaking of innovation activities by firm employees with the help of their support and resources (Lumpkin, 2014). As a result, they try to produce some innovative products or processes. Intrapreneurship is particularly important for SMEs as they often do not have well-established and structured research and development functions or departments due to a lack of resources.

Therefore, such firms should encourage their employees to carry out such innovative activities. Moreover, firms nowadays are increasingly adopting and relying on digitalization and technologies to make their processes efficient (Ghobakhloo et al., 2022). It is also argued that the higher level of human capital improves the digitalization of firms that can contribute to the innovative activities carried out by employees of firms in the form of intrapreneurship, as well as the firms' overall functioning (Gündoğdu, 2012). Hence, firms should develop human capital in order to improve intrapreneurship-related innovation through the adoption of digitalization.

Furthermore, the competitive value chain or supply-chain of companies can also increase sustainability and competitiveness in the market. It can also be utilized to promote intrapreneurship by capitalizing on competitive supply-chains and vertical integration. Firms with a developed and competitive supply-chain can benefit in the form of improved innovative activities (Mubarik et al., 2022). Moreover, digitalization can also transfer the effect of developed human capital towards intrapreneurship (Mubarak et al., 2021). In a nutshell, human capital can positively improve the intrapreneurial activities of firms. These activities are supported by digitalization and the competitive supply-chain of firms (Khan et al., 2021; Mubarik et al., 2022; Muller, 2016s).

Therefore, this study investigates the effect of human capital on intrapreneurship. In doing so, the mediating role of digitalization and supply-chain competitiveness is studied. The study focuses on the manufacturing sector of Malaysia, which has tremendous innovation potential, especially in electrical and electronics subsectors and similar.

2. Theoretical exposition

2.1 Intrapreneurship

Intrapreneurship is a process of making new ideas that result in new opportunities for the organizations. These are self-driven by organizations, within the boundaries of the organization and are run by current employees. The definition of corporate entrepreneurship according to Perlines et al. (2022) is the organizational change which is manageable and the management can control the actions of employees' actions so that they can decide which idea of innovation can be implemented and which cannot .The word 'intrapreneurship' was first discussed in 1978 by Gifford and Elizabeth Pinchot in their work "Intra-Corporate Entrepreneurship" after which the Norman Macrae's Economist article, "We're all intrapreneurial now" did further development on the concept of intrapreneurship and supported Pinchot's view. Guy Kawasaki, who is an author, motivational speaker, and venture capitalist, was an early employee at Apple for years. In 2004 his book, "Art of the Start", he made direct references to intrapreneurs. In July 2013, he wrote on the blog named "The Art of Intrapreneurship" in which he mainly said that there are many employees in large companies who are innovative and revolutionary as an entrepreneur and they face a different kind of reality which is that they are fighting against management (Lumpkin, 2014).

To understand the concept of intrapreneurship is essential to get its benefits. The definition of Intrapreneurs by) Sekerin et al. (2020) is that they are not employees who have same characteristics but a mix of employees who have entrepreneurial characteristics, they are mainly self-driven, they have a critical thinking approach towards uncertain situations of day-to-day business, and these are the reasons they achieve their targets successfully. In their study Ping et al. (2010) described that intrapreneurship has special requirements as it cannot arise in the traditional structure of the organization as the benefits of dynamic capabilities fewer boundaries among departments are required for the perfect outcome, they also identified the need for research in intrapreneurship organization structure and the methods of managing it (Alpkin et al., 2010). Intrapreneurship is difficult but can completely change the destiny of an organization as it empowers employees, and as a result, they not only advance themselves and their abilities but also work hard for the organization they are part of, this concept mainly supports the junior level as they have the innovative thinking and ideas but are reluctant to share them with the management. When the combination of juniors with the seniors are made, ideas go through screening of the seniors on the basis of their experience and then a realistic approach is used to make the idea into a business plan.

2.2 Human Capital

The idea of human capital was introduced around the 17th century, by William Petty, who calculated the value of human capital by placing value on the laborers to identify the

power and measure the cost of life which was lost in war. In 1853, William Farr presented a concept of the present value of a person's net future earnings, Theodore Wittstein (1867) supported that Farr's present value of net future earnings can be a measure to determine the compensation claims after the loss of lives. Louis Dublin and Alfred supported Wittstein's idea as it could be used for calculations of life insurance and they were working in insurance sector so they worked on it to find the mortality statistics.

Human capital can be defined as the skills that the labor force possesses and is regarded as a resource or asset. It comprises efforts made to develop people by the management by providing them with facilities such as training, education and health benefits. When these benefits are provided they increase an individual's productivity (Molly et al., 2012; Mubarik, 2015; Preko, 2014). Human Capital Theory refers to human capital as a combination of competencies, knowledge, social and personal attributes that can create essential and commercial value. This theory supports the idea of viewing humans as economic units acting as their own economy. The human capital role is discussed in economic development, productivity analysis, innovation, public policy, and education (Khan et al., 2010).

In their study, Jurcevic et al. (2014) stated that it is the responsibility of management to create such a structure which will motivate the old employees to adapt new changes in the working environment, and make an environment that welcomes the new employees; if such an environment is not created then employee turnover will start, and poor business performance and dissatisfaction among employees will be witnessed. Many traditional factors for competitive success have changed, but what has remained constant in achieving success is the people of the organization organization, as the way they perform can have a high impact on the success of the organization (Amaechi et al., 2021). According to Bharthvajan (2014) the ideal qualities of human capital are deeper knowledge, communication skills, ability to learn new things, team management, flexibility to adopt new roles, knowledge on how to manage people, analytical skills, and problem solving skills. Human capital is vital for growth in the economic condition; the increase in investment in human capital can increase workforce output, enable innovations and technology usage, raise the profit on investments, and can make growth more achievable (Blanka et al., 2022).

2.3 Digitalization

The advent of the fourth industrial revolution, also known as Industry 4.0, has accelerated the pace of digitalization (Mason, 2011; Mubarak & Petraite, 2020). The main technologies of industry 4.0 include big data, block chain, cyber-physical systems, internet of Things, and smart manufacturing. These technologies have transformed the way firms used to operate previously and have not only increased the speed but also the accuracy and efficiency of operations (Ghobakhloo et al., 2022). These technologies have also improved integration and connectivity across the value chain and external business partners. In doing

so, efficient collaboration and coordination with external actors are enabled. Industry 4.0 technologies are increasingly adopted in firms' operations, whether they are supply-chain, manufacturing or planning (Kusi-Sarpong et al., 2022). Since these are the sophisticated technologies of the present time, therefore, accordingly developed human capital with considerable absorptive capacity can manage these technologies towards the streamlining of firms, especially supporting the innovation ventures through collaboration with external partners (Mubarak et al., 2019; Rafique, 2015).

2.4 Supply-chain competitiveness

The conceptual framework of supply-chain competitiveness according to Al-khawaldah et al. (2022) consists of service quality amongst supply-chain partners and the functions within the organizations which create value in the eyes of the customer, and thus the organization achieves competitiveness through their supply chain. Bharthvajan (2014) described that supply chain is considered a network whose main objective is to provide highest customer value which is the key aspect in becoming a competitive organization , hence employees at all levels should have knowledge about the supply-chain and most importantly the idea should be supported by the top management.

Supply-chain management today is a much familiar concept compared to a decade ago, which is mainly due to its importance in achieving a competitive advantage and the increasing trend of accepting the benefits of globalization; the benefits of supply-chain have been numerous but there is a need to understand and apply this field to the business effectively and efficiently to get maximum benefits. The study conducted by Verma and Singhal (2018) stated that the development of the supply-chain system that can help manage competitiveness is necessary, and also the supply chain inputs must be identified which have greater importance specifically in the manufacturing industries as the variables to achieve supply chain competitiveness are in a wide range. The supply-chain covers a wide range of functions; it is not just few departments of the organization. The research work done by Menon (2012) stated that for successful supply-chain, integration of different departments is necessary which can be achieved by giving importance to cross functional and horizontal workflows. Supply-chain needs to be given the same importance in organizations in Pakistan as like countries to overcome the hurdles in business expansion.

The study by Verma and Seth (2011) found that to achieve organizational productivity, profitability and competitive success, supply-chain competitiveness is a main component. The framework of supply-chain competitiveness includes its inputs, the environment and the outcomes achieved; inputs include activities which are conducted on different levels of supply-chain in an organization to attain competitiveness, as these are the main requirements for achieving an edge over the rivals in the industry. The input activities are mainly related to the level of flexibility of the organization towards the change, how effective there is the

concept of team management, the value of customer needs and creating a combination of supply-chain to achieve synergy, management of the demand speed shown to achieve it on time (Gündoğdu et al., 2012; Mubarak et al., 2019a; Shahbaz et al., 2019). The benefit of this framework is the detailed knowledge of the input activities, which roles and responsibilities are mandatory by each party involved in the supply-chain for achieving competitiveness. The framework can also be used as a guiding tool for managing supply-chain according to the needs of the organizations.

2.5 Conceptual Framework

The dynamic capability view posits that firms should improve their competencies in order to cope with changing market conditions (Teece et al., 1997). Therefore, human capital is a vital capability of a firm that is inimitable and critical to stay innovative in order to survive in the competitive environment. Moreover, the adoption of digitalization according to the prevailing scenario is also inevitable for any firm to function smoothly. Finally, the competitive and robust relationship with the value chain or supply-chain also plays a vital role in improving the overall competitiveness and performance of the company. Therefore, this study proposes that human capital improves intrapreneurial activities of firms. Moreover, the competitiveness of the supply-chain improves it by transferring the effect of human capita on it. In addition, digitalization plays a mediating role in the relationship between human capital and enterprise. These facts are shown in Figure 1. The conceptual framework also navigates the three hypotheses of study. The first is that human capital improves intrapreneurship (H1); second, digitalization mediates between human capital and intrapreneurship (H2); and finally, third, supply-chain competitiveness mediates between human capital and intrapreneurship (H3).

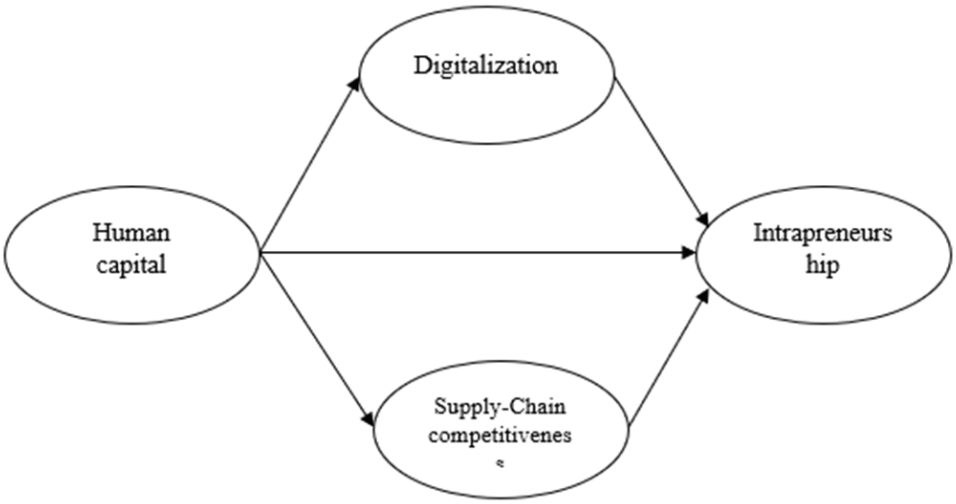

Figure 1: Conceptual Framework of study

3. Research Methodology

This study applied a deductive approach of research by adopting the quantitative method of research. In doing so, a structured questionnaire was developed on human capital, digitalization, supply-chain competitiveness, and intrapreneurship. The items on these constructs were taken from previous studies such as Mubarik et al. (2016), Ghobakhloo (2020), Pradabwong et al. (2017) and Mamabolo (2016). The dimensions of Human Capital were taken from study of Mubarik et al. (2016) performed on human capital and performance of SMEs in which they devised a comprehensive index to measure the human capital in a more robust way. Moreover, the Intrapreneurship elements were taken from Mamabolo, (2016) who performed empirical research on various entrepreneurial facets and antecedents the association of with human capital. The items on digitalization were taken from Ghobakhloo et al. (2020).

While competitive supply-chain constructs were taken from the research of Pradabwong et al. (2017) who performed experimentation on supply-chain domain linking competitiveness and enhanced performance aspect. After developing the questionnaire, by following the sampling frame of Krejecie and Morgan (1970) it was sent to 390 manufacturing sector SMEs of Malaysia for the purpose of data collection by adopting the convenient sampling technique. After completing the data collection, it was processed by smart PLS and applied PLS-SEM in order to hypothesize relationships of study.

4. Results

4.1 Profile of respondents

During data collection, the questionnaire was sent to 390 manufacturing sector firms of Malaysia by utilizing online as well as physical sources. As a result, 203 questionnaires were received from respondents in which 8 were excluded due to incomplete responses and 195 were finally considered for further data analysis. The received questionnaire included 58% firms with ages from 6 to 10 years age, 10% firms with ages 11 and more, while 32% responding firms had ages from 1 to 5 years. The sample included reasonably mature firms to be considered for the analysis and hypothesis testing.

Furthermore, 37% responding firms comprised high-tech SMEs from electrical and electronics sector, 28% from pharmaceutical that is also considered as technology-based industry, 19% from rubber and plastic manufacturers, and 16% were from food and beverages sector. Altogether, the responding firms covered from high-tech to medium tech to low tech industries that is an appropriate mix of respondents' coverage. The demographic profile of firms is provided in table 1.

Table 1
Responding firms Profile (n=195)

Age of firms (in years)	***Number of firms***	***% of firms***
1 to 5	63	32
6 to 10	114	58
11 to 15	11	6
More than 16	7	4
Industries of responding firms		
Electrical and Electronics	72	37
Rubber and plastic	38	19
Pharmaceutical	55	28
Food and Beverages	30	16

4.2 Reliability, Consistency and Validity

Moving further, the reliability, consistency and validity of construct was tested by applying PLS-SEM. In doing so, the factor loadings, Cronbach Alpha, composite reliability, and average variance extracted values were assessed. As a result, the loadings of more than 0.60 were retained, Cronbach alpha value and CR values of all constructs were more than 0.70 that are acceptable according to Hair et al. (2014). Moreover, the AVE values of all constructs were also more than 0.50 that are deemed as acceptable (Hair et al., 2014). The results confirmed the reliability, consistency, and validity of the instrument which led us to further analysis. The results are shown in table 2.

Table 2
Reliability, Consistency and Validity

Construct	Items	Loadings	CB alpha	CR	AVE
	HC1	0.71	0.74	0.82	0.55
Human capital	HC2	0.69			
	HC3	0.78			
	HC4	0.82			
	DG1	0.78	0.83	0.86	0.53
	DG2	0.82			
Digitalization	DG3	0.68			
	DG4	0.75			
	INT1	0.76	0.79	0.87	0.51
Intrapreneurship	INT2	0.78			
	INT3	0.71			
	SC1	0.76	0.78	0.81	0.57
Supply-chain	SC2	0.78			
competitiveness	SC3	0.72			

Note: The items' loading less than 0.60 were deleted.

Fornell-Larcker Criteria for Discriminant Validity

Furthermore, the discriminant validity of construct was also tested by analyzing the Fornell-Larcker criteria. The results showed that all the constructs were discriminant enough to gauge the different nature of variables. Also, the results ruled out any multi-collinearity issues in data that clarified for final analysis for hypothesis testing. The results of discriminant validity are shown in table 3.

Table 3
Fornell-Larcker Criteria for Discriminant Validity

	VIF	HC	DGT	INT	SC
Human capital (HC)	2.19	***0.74***			
Digitalization (DGT)	2.63	0.34	***0.72***		
Intrapreneurship (INT)	2.77	0.31	0.41	***0.72***	
Supply-chain competitiveness (SC)	1.92	0.33	0.34	0.42	***0.75***

Diagonal values are square root of AVE

Hypothesis testing

*F*inally, the hypothesis testing was performed by applying the structural equation modelling that revealed that human capital has positive impact on intrapreneurship-related activities of firms with the values of β=0.49 and p-value=0.001, that leads us to accept the first hypothesis of study (H1) Moreover, the findings also showed that digitalization has positive mediating role between human capital and intrapreneurship of firms with the values of β=0.57 and p-value=0.004 that hints to accept the second hypothesis of this research (H2). Finally, it is also shown that supply-chain competitiveness acts as a mediator in relationship of human capital and intrapreneurship related innovation of firms that confirms the acceptance of third hypothesis (H3) at β=0.51, p-value=0.000. The results are shown in table 4.

Table 4
Hypotheses testing

	Hypotheses	p-value	Accept/Reject
H 1	HC → INT	0.001	Accepted
H 2	HC →DGT→ INT	0.004	Accepted
H 3	HC →SCC→INT	0.000	Accepted

5. Discussion

In order to stay competitive, firms need to increase the value of their customers by offering new and innovative products and services for them more frequently. Intrapreneurship is one of the suitable ways to cater to this requirement of prevailing market settings. Intrapreneurship is to apply entrepreneurial activities in the organization where an individual works as an employee and has the full support of the management of the firm. The personality is the key element to the success and failure of an intrapreneurship and organization, as every employee has unique strengths and weakness (Khan et al., 2011; Haque. 2007; Huo et al., 2016; Ping et al., 2010). As every employee has different strengths and weakness but when given proper attention by the management, the employee can perform remarkably. The current study investigated the role of multiple competencies of an individual called human capital in intrapreneurial development. The findings indicated that human capital exerts a positive effect on intrapreneurship, which confirms the study previously performed by Mubarik et al. (2022), Khan et al. (2022), Kusi-Sarpong et al. (2022), Mubarik et al. (2023) and Mamabolo (2016) who also confirmed the positive role of human capital for firms' innovation outcomes. Furthermore, this study establishes that digitalization can transfer the fruition of human capital towards making firms more innovative by promoting the intrapreneurial spirit in employees. Therefore, companies should develop their human capital and adopt industry 4.0 technologies in order to remain innovative that will further lead them to be a market leader eventually. Furthermore, the research also implies that the developed value chain or

competitive supply-chain of firms can channel human capital to achieve innovative results in the form of developing creativity and innovation activities in employees, as indicated by Mubarak et al. (2023) and Pradabwong et al. (2017). Therefore, firms should develop human capital if they want to achieve innovative outcomes. Also, they should develop their capacity to utilize and adopt the digitalization as well as the value chain improvement to succeed in innovative outputs as suggested by Mubarak and Petraite (2020).

6. Conclusions and future research directions

Softness of firms holds a pivotal position to make them innovative and competitive today. In doing so, human capital is considered a precious and inimitable form of capital that can play a critical role in innovation outcomes. Furthermore, the adoption of digitalization technologies accelerates the pace of innovation and growth of firms. Moving further, a well-established and developed value chain in the form of a competitive supply-chain of firms can also push the boundaries of innovation. Therefore, firms must invest in developing their human capital to be innovative and creative in the marketplace. The appropriate training should be imparted that may tangibly improve and enhance the skillset of employees toward stimulation of creative ideas and innovation in business processes and offerings.

The training should be designed so trainees may acquire transferable skills to the actual job. Moreover, employees should be encouraged to participate in the business development process by giving certain suggestions, nevertheless, employees in all organizations should be empowered and given a robust system to convey their suggestions for improving operations, processes, products, or services. Likewise, firms should enhance their capacity to transform their processes by increasing the usage of industry 4.0 led digitalization infrastructure. In this context, the relationships of firms with their suppliers and distributors at multiple tiers should be improved by collaborating and integrating with them. By doing so, they will not only upgrade their network but also make themselves more resilient.

The current study has investigated the manufacturing sector firms of Malaysia in which a variety of industries from high-tech, medium tech, and low tech were considered. Future researchers are suggested to investigate each of these categories of firms. It is also suggested to perform a cross comparison of these technology-based categories. Moreover, this study has been conducted only in manufacturing sector firms; future studies are suggested to investigate service sector firms. In addition, it is suggested to conduct a longitudinal study by investigating before and after development in human capital of specific sectors or categories of firms.

References

Ahmad, S., Khattak, M. A. R., & Siddiqui, A. A. (2016). Impact of Human Resource Management Antecedents on Corporate Entrepreneurship. *University of Haripur Journal of Management (UOHJM), 1*(1), 48-61.

Al-khawaldah, R., Al-zoubi, W., Alshaer, S., Almarshad, M., ALShalabi, F., Altahrawi, M., & Al-Hawary, S. (2022). Green supply chain management and competitive advantage: The mediating role of organizational ambidexterity. *Uncertain Supply Chain Management, 10*(3), 961-972.

Alpkan, L., Bulut, C., Gunday, G., Ulusoy, G. & Kilic, K. (2010). *Organizational support for intrapreneurship and its interaction with human capital to enhance innovative performance Management decision, 48*(5), 732-755.

Bharthvajan, R. (2014). Human resource management supply chain management intersection. *International Journal of Innovative Research in Science, Engineering and Technology, 3*(3), 10163-10167.

F. Hair Jr, J., Sarstedt, M., Hopkins, L., & G. Kuppelwieser, V. (2014). Partial least squares structural equation modeling (PLS-SEM) An emerging tool in business research. *European business review, 26*(2), 106-121.

Frese, M., & Gielnik, M. M. (2014). The psychology of entrepreneurship. Annu. Rev. Organ. Psychol. *Organ. Behav., 1*(1), 413-438.

Ghobakhloo, M. (2020). Determinants of information and digital technology implementation for smart manufacturing. *International Journal of Production Research, 58*(8), 2384-2405.

Ghobakhloo, M., Iranmanesh, M., Mubarak, M. F., Mubarik, M., Rejeb, A., & Nilashi, M. (2022). Identifying industry 5.0 contributions to sustainable development: A strategy roadmap for delivering sustainability values. *Sustainable Production and Consumption, 33*, 716-737.

Gündoğdu, M. Ç. (2012). Re-thinking entrepreneurship, intrapreneurship, and innovation: A multi-concept perspective. *Procedia-Social and Behavioral Sciences, 41*, 296-303.

Haque, N., (2007) Entrepreneurship in Pakistan. Pakistan Institute of Development Economics, Islamabad. (PIDE Working Papers No. 29.)

Huo, B., Ye, Y., Zhao, X., & Shou, Y. (2016). The impact of human capital on supply chain integration and competitive performance. *International Journal of Production Economics, 178*, 132-143

Jurcevic, M., Ivakovic, M., & Babic, D. (2014). The role of human actors in supply chains. Faculty of Transport and Traffic Sciences, Vukeliceva Zagreb, Croatia.

Khan, M. M., Mubarik, M. S., Ahmed, S. S., Islam, T., & Khan, E. (2021). Innovation with flow at work: exploring the role of servant leadership in affecting innovative work behavior through flow at work. *Leadership & Organization Development Journal, 42*(8), 1267-1281.

Khan, S. A., Hassan, S. M., Kusi-Sarpong, S., Mubarik, M. S., & Fatima, S. (2022). Designing an integrated decision support system to link supply chain processes performance with time to market. *International Journal of Management Science and Engineering Management, 17*(1), 66-78.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and psychological measurement, 30*(3), 607-610.

Kusi-Sarpong, S., Mubarik, M. S., Khan, S. A., Brown, S., & Mubarak, M. F. (2022). Intellectual capital, blockchain-driven supply-chain and sustainable production: Role of supply-chain mapping. *Technological Forecasting and Social Change, 175*, 121331.

Lumpkin, G. Tom. "Intrapreneurship and innovation." In The psychology of entrepreneurship, pp. 269-296. Psychology Press, 2014.

Mamabolo, M. A. (2016). Human capital investments and skills outcomes specific to the different entrepreneurship phases (Doctoral dissertation, Gordon Institute of Business Science, university of Pretoria).

Mason, C. (2011). Entrepreneurship education and research: emerging trends and concerns. *Journal of Global Entrepreneurship, 1*(1), 13-25.

Menon, S. T. (2012). Human resource practices, supply chain performance, and wellbeing. *International Journal of Manpower, 33*(7), 769-785.

Molly, V., Laveren, E., & Jorissen, A. (2012). Intergenerational differences in family firms: Impact on capital structure and growth behavior. *Entrepreneurship Theory and Practice, 36*(4), 703-725.

Mubarak, M. F., & Petraite, M. (2020). Industry 4.0 technologies, digital trust and technological orientation: What matters in open innovation? *Technological Forecasting and Social Change, 161*, 120332.

Mubarak, M. F., Petraite, M., & Kebure, K. (2021). Managing Intellectual Capital for Open Innovation: Components and Processes? In the Dynamics of Intellectual Capital in Current Era (pp. 149-169). Singapore: Springer Singapore.

Mubarak, M. F., Petraite, M., Rasli, A., & Shabbir, M. (2023). Capability Framework to Support Supply Chain Open Innovation Networks. In Blockchain Driven Supply Chain Management (pp. 119-134). Springer, Singapore.

Mubarak, M. F., Shaikh, F. A., & Sohu, S. (2019a). Triad of supply chain orientation, strategies and competencies in the construction industry. *International Journal of Sustainable Construction Engineering and Technology, 10*(2), 74-84.

Mubarak, M. F., Shaikh, F. A., Mubarik, M., Samo, K. A., & Mastoi, S. (2019). The impact of digital transformation on business performance: A study of Pakistani SMEs. *Engineering technology & applied science research, 9*(6), 5056-5061.

Mubarak, M. F., Yusoff, W. F. W., Mubarik, M., Tiwari, S., & Kaya, K. A. (2019). Nurturing entrepreneurship ecosystem in a developing economy: myths and realities. *Journal of Technology Management and Business, 6*(1),1-8.

Mubarik, M. S. (2016). Human capital and performance of small and medium manufacturing enterprises: A study of Pakistan (Doctoral dissertation, Jabatan Ekonomi, Fakulti Ekonomi dan Pentadbiran, Universiti Malaya).

Mubarik, M. S., Bontis, N., Mubarik, M., & Mahmood, T. (2022). Intellectual capital and supply chain resilience. *Journal of Intellectual Capital, 23*(3), 713-738.

Mubarik, M., Rasi, R. Z. R., Pilkova, A., Ghobakhloo, M., & Mubarik, M. S. (2023). Developing Resilient Supply Chain Networks through Blockchain Technology: Strategies and Implications. In Blockchain Driven Supply Chain Management (pp. 35-51). Springer, Singapore.

Müller, S. (2016). A progress review of entrepreneurship and regional development: What are the remaining gaps? *European Planning Studies, 24*(6), 1133-1158.

Perlines, F. H., Ariza-Montes, A., & Blanco-González-Tejero, C. (2022). Intrapreneurship research: A comprehensive literature review. *Journal of Business Research, 153*, 428-444.

Ping, W. L., Jie, J., Naiqiu, L., & Zhengzhong, X. (2010). A review and prospects of research on human resource management of intrapreneurship. In 2010 IEEE International Conference on Advanced Management Science (ICAMS 2010).

Pradabwong, J., Braziotis, C., Tannock, J. D., & Pawar, K. S. (2017). Business process management and supply chain collaboration: effects on performance and competitiveness. *Supply Chain Management: An International Journal*.

Preko, A. (2014). Assessing the impact of human capital development on effective work performance at selected departments in the College of Arts and Social Sciences (Knust) (Doctoral dissertation).

Rafique, B. (2015). Impact of uncertainties on supply-chain operations in Pakistan. *South Asian Journal of Management Sciences, 9*(1), 15-22.

Sekerin, V. D., Gorokhova, A. E., Bank, S. V., Gayduk, V. I., & Skubriy, E. V. (2020). Development of innovative intrapreneurship in the conditions of the digital economy. *Eur Asian Journal of Bio Sciences, 14*(2), 7033-7041.

Shahbaz, M. S., Mubarik, M. S., Mubarak, M. F., & Irshad, M. B. (2019). The impact of lean practices on educational performance: an empirical investigation for public sector universities of Malaysia. *Journal of independent studies and research: management, social sciences, and Economics, 17*(2), 85-96.

Teece, D. J., Pisano, G., & Shuen, A. (1997). (1997). Dynamic capabilities and strategic management. Resources, Firms, and Strategies: A Reader in the Resource-Based Perspective, 268.

Verma, A., & Seth, N. (2011). A conceptual framework for supply chain competitiveness. *International Journal of Human and Social Sciences, 6*(1), 5-10.

Verma, A., & Singhal, N. (2018). A Computing Methodology for Evaluating Supply Chain Competitiveness. *Materials Today: Proceedings, 5*(2), 4183-4191.

Zhao, L. L. (2013). Corporate intrapreneurship: steps to building a sustainable startup mentality within an established organization (Doctoral dissertation, Massachusetts Institute of Technology).