

Towards innovation performance of SMEs

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Towards Innovation Performance of SMEs: Investigating the role Digital Platforms, Innovation Culture and Frugal Innovation in Emerging Economies

Abstract

Purpose

The study in hand investigates the impact of digital platforms, frugal innovation and innovation culture (IC) on innovation performance (IP). Mediation role of IC between digital platforms and IP, as well as moderating role of frugal innovation between IC and IP is also tested.

Method

Data is collected from 387 top management officials from the SMEs working in emerging economies like Pakistan. Quantitative research design was applied for the collection of data and analysis. Various statistical techniques i.e. correlation and regression were utilized.

Findings

Findings revealed that digital platforms positively affect IC and IP. Results proved that IC mediates the association between digital platforms and IP link.

Originality

The SMEs of emerging economies are working in a dynamic scenario and their performance in term of innovation is critically needed. Only those businesses which updates its products and services according to customers' demand can achieve success. Hence, SMEs of emerging economies need IP to flourish their businesses. This study highlights an overlooked link of digital platforms with IP and also shows the mediating role of IC.

Keywords: Digital Platforms, Innovation Culture, Frugal Innovation, Innovation Performance, SMEs.

1. Introduction

Emergence of the digitalization brought new challenges for the business world (Lin *et al.*, 2020; Yousaf *et al.*, 2021a). Digitalization increases e-commerce activities which transform traditional business processes, methods and product into new ones (Ranta *et al.*, 2021). For survival and cope with these emerging challenges of digitalization, circular economy and e-commerce, business organizations bring innovation in their methods to search new processes (Lestari *et al.*, 2020; Yousaf *et al.*, 2021b). In order to deal with these global challenges emerged due to e-commerce and change in economic system, the circular economy organizations are mostly dependent on innovation in business operations (Geissdoerfer *et al.*, 2017; Frishammar *et al.*,

2018) to eliminate waste. Innovation requires the shifting of the traditional business economy into the modern one. Digital platforms make possible for such kind of shifting and enable organizations for the execution of innovation activities (Bukht and Heeks, 2017). Survival of business organization becomes challenges due to technological dynamism (Curado *et al.*, 2018; Yousaf, 2021). Under these circumstances, digital platforms of business organization cannot be neglected due to the influencing role in leading business towards success and for the improvement of innovation performance (IP) (Boganini and Casazza, 2017; Cenamor *et al.*, 2019). Therefore, the current study provides in-depth understanding about the impact of digital platforms on the IP.

The IP become a real challenge for SMEs operating in the developing economies due to the resource constraints (Curado *et al.*, 2018). Innovation in the business processes become a pertinent requirement of SMEs of emerging economies and for improving their IP (Lee and Kim, 2020). In response to changing environment the owner/managers of SMEs develop digital platform to leverage their existing resources (Lee and Kim, 2020).

Digital platforms perform a critical role for the survival of business organization in the situation of environmental and technological challenges (Cenamor *et al.*, 2019). The digital platforms include technologies that allow organization to edit, standardize and distribute data on an unprecedented scale (Williamson, 2021). Digital platforms help out for transforming the way organizations build competitive advantages (Parker *et al.*, 2016). Digital platforms are important for the achievement of innovation process of the firms' by enabling them to receive and disseminate valuable information (Cenamor *et al.*, 2019). Existing literature highlighted various outcomes of the digital platforms like firm financial performance (Kazan *et al.*, 2018), network capability (Cenamor *et al.*, 2017), customer value creation (Matarazzo *et al.*, 2021) and improvisation the capability and organizational readiness (Jun *et al.*, 2021). However, there is a limited discussion about innovation culture (IC) and IP as outcomes of digital platforms. Therefore, the current study fills this gap and provides in-depth understanding for the role of the digital platforms, IC and frugal innovation towards IP of SMEs (Jun *et al.*, 2021).

The current study also focused on the mediating role of IC. Sattayaraksa and Boon-Itt (2016), define IC as "a set of shared values and beliefs within a firm that is favourable to exploring new opportunities and developing innovation" (p. 733). IC is the infrastructure which enables management to utilize information for exploring new knowledge, opportunities and creating novel ideas for business operation (Naranjo *et al.*, 2010; Yousaf, Majid and Yasir, 2019). Researchers like Aksoy (2017) and Ghasemzadeh *et al.* (2019) have acknowledged that IC acts as a facilitator to IP. IC acts as bridge between the digital platforms and IP. IC helps an organization to get involve in innovative activities relating to their product or processes. IC helps an organization to enhance its IP via providing infrastructure for the best utilization of information resources to explore new ways for business processes. At the same time frugal innovation also play an important role for enhancing IP. Frugal innovation is defined as the mechanism that enables the organizations to gain information about the market, customers, suppliers and competitors (Rossetto *et al.*, 2017) in the developing countries that face many

financial and economic constraints. This valuable information is input for the decision of the innovation activities (Borjesson and Lofsten, 2012). Moreover, researchers have presented various outcomes of frugal innovation, however, studies lack in providing any relevant evidences about the moderating role of frugal innovation which is overcome through current study.

2. Literature Review

The circular economy (CE) considered as a vital model for the business organizations that ensure the growth and sustainable development (Centobelli et al., 2020). Innovating new business models help business organizations to create value in the CE. CE brings challenges for the business world and it conceptualizes a new economic system which demands innovativeness among businesses (Frishammar et al 2018; Urbinati et al 2017). Business organization captures the opportunities available due to the emergence of CE and moving their thinking from linear to circular. Digitalization enables the business organizations to develop digital platforms for the acquisition of valuable information for the formulation of CE business model and extended the work of Hysa et al., (2020). There is a lack of studies that provides empirical evidences for the implementation of digital technologies for the innovation business model that support CE (Centobelli et al., 2020). The current study mainly focused on the mechanism through which business organizations can established innovation model with the help of advanced technologies that support CE. It is self-evident that CE required novel business models to respond the CE economic system. Innovation activities within an organization can increase innovations through efficient utilization of existing resources (Ghisellini et al., 2016). Higher innovation performance is pertinent for the business development that is the essence of CE. Business organizations need to bring innovation in their processes for improving circularity of the business via observing the CE principles.

2.2 Digital Platforms and IP

Emergence of digitalization increases the importance of digital technologies for the operational activities of business organization (Frishammar, *et al.*, 2018; Giotopouloset *al.*, 2017; Viglia *et al.*, 2018). Digital platforms allow organizations to integrate vital knowledge for better respond to dynamism market requirements (Teece, 2018). With the help of digital platforms organizations are in a better position to improve their internal as well as external coordination and combination (Helfat and Raubitschek, 2018; Giotopouloset *al.*, 2017). Precisely, digital platforms facilitates for the formalization and centralization of integrated information among the various performers of the organization.

On the other hand, innovation activities largely based on the creation of new information gain from both internal and external resources of the firms (Scuotto *et al.*, 2017). Digital platforms provides foundation for the integration of information from various resources (Jun *et al.*, 2021), which can be useful for the promotion of innovative ideas and bring change in the organization's core processes and products (Zeng *et al.*, 2010). Organizations with organized digital platforms

are more likely to create novel ideas and formulate and implement innovative activities (Jun *et al.*, 2021), which enhance the IP of these organizations. Therefore, in the current study we formulate the following hypothesis:

H1: Digital platforms are positively related to innovation performance.

2.3 Digital Platforms and Innovation Culture

Digital platforms facilitate organizations for the acquiring of valuable knowledge and information from various internal and external resources (Yunis *et al.*, 2018). On the other hand, IC is defined as shared values and beliefs within an organization that ensure the utilization of acquired knowledge and information for pursuing new opportunities (Sattayaraksa and Boon-Itt, 2016). Digital platforms significantly contribute for the creation of IC by providing essential knowledge and information. According to Aksoy (2017), organizations are more inclined towards innovation having advanced technologies to gain information about markets, supplies, competitors and customers. Digital platforms provide an infrastructure for the exchange of information among the organizational members which allow them to explore new ways of business methods to satisfy the demands of customers (Pesceet *al.*, 2019; Vey *et al.*, 2017). Organizations with sound technological resources to communicate with external partners are able to improve IC (Fitzgerald *et al.*, 2014; Kline *et al.*, 2003).

H2: Digital platforms have positive relationship with innovation culture.

2.4 Innovation Culture and Innovation Performance

Previous literature documented that organizations achieved IP through infrastructure that facilitate for execution of innovative activities (Naranjo *et al.*, 2010; Pesceet *al.*, 2019; Globocniket *al.*, 2020). Therefore, IC shapes an environment through which organizational members can explore new opportunities, formulate and implement new ways of doing their businesses (Lijaucoet *al.*, 2020). IP is embedded in the frequency of exploring new opportunities to bring about change in businesses processes and products (Ghasemaghaeiet *al.*, 2020). IC enables firms to explore and utilize knowledge and information to attain innovation efficiency and efficacy in order to enhance the IP (Aksoy, 2017; Halim *et al.*, 2015). According to Padilha and Gomes (2016), organizations culture that support innovation activities are more likely to involve in creativity and improve their IP. IC provide infrastructure that allows for the promotion of creative behaviour and innovation activities (Ghasemzadehet *al.*, 2019; Chen *et al.*, 2018). In the current study we have formulated the following hypothesis i.e.

H3: IC has positive association with IP.

2.5 Mediating role of Innovation Culture

Digital platforms in the form of latest technology and its application become the source of new information and knowledge for the organization (Kazan *et al.*, 2018). Similarly, the IC that

allows the organization to explore new opportunities for developing innovation strategies largely based on digital platforms. It is self-evident that digital platforms provide required information necessary for the development of innovation process (Cenamoret *et al.*, 2019). Therefore, the current study proposed that IC mediate the digital platforms and IP link. Almost all business organizations are getting advantage of digital platforms for the promotion of IC (Fitzgerald *et al.*, 2014; Kline *et al.*, 2003).

This IC helps to utilize the acquired information to enhance the IP by bringing novelty in the business processes and products (Aksoy, 2017; Halim *et al.*, 2015). The digital platform provides opportunity to acquired variety of information from various stakeholders (Aksoy, 2017). The digital platforms enhance IC to achieve the IP. These platforms enable the firms to built-up relationships with business partners for the development of new methods for business processes and products, which ultimately enhance the IP (Zeng *et al.*, 2010; Jun *et al.*, 2021).

H4: Innovation culture mediates between digital platforms and innovation performance link

2.6 Moderating role of frugal innovation

Frugal innovation is related to the organizing of organizational resources in such a manner that enable to perform in an uncertain environment which enables the firms to move forward and become innovative (Hossain, 2020). Frugal innovation contributes to fulfil the demands of customers who are unable to approach the existing products and services. Existing studies highlighted the progressive role of innovation culture for the improvement of frugal innovation (e.g. O'Regan *et al.*, 2006; Terziovski, 2010). Frugal innovation contributes for strengthen the connection between IC and IP. The IC plays a significant role and facilitate for execution of innovation activities, which ultimately enhance the IP (Taghizadeh *et al.*, 2016). Frugal innovation assists organizations to take up successful innovation activities for underserved customers and enhance their IP.

H5: The association between IC and IP is moderated by frugal innovation.

2.7 Theoretical framework

Figure 1 shows the theoretical framework.

“Figure 1 Here”

3. Methods

3.1 Data Collection and Participants

To test the study hypotheses, cross-sectional design was applied for the current study. A sample was selected from the SMEs registered in SMEDA (small medium enterprises development

authority). Using random sampling techniques, 509 SMEs were chosen as sample for the study. Before distribution of questionnaire to the respondent firms, its contents were checked and validated. During three month process of data collection we received only 417 responses from the selected SMEs. Out of 417 responses only 387 responses were considered for further analysis which were completed in all respect.

3.2 Measurement

Five point Likert scale was used for recording the responses of selected SMEs about study constructs i.e.digital platforms (independent variable), IC(mediating variable), and frugal innovation(moderating variable) and IP(independent variable) Table 1 shown the detail of the study constructs.

3.2.1 Digital Platforms

Digital platforms which are used as independent variable refer as the online mechanism which enables the firm to connect and communicate with other organizations for mutual benefits (Rai and Tang, 2010). For the measurement of digital platforms 8 items scale was adapted which was formulated by Rai and Tang, 2010. (See Appendix A).

3.2.2. Innovation Culture

IC was measured with six items scale adapted from the work of Terziovski(2010). (See Appendix A).

3.2.3 IP

11-item scale formulated by Alegre and Chiva(Alegre and Chiva, 2008) was used for the measurement of IP. Chiva and Chiva (2008) documented two dimensions i.e.innovation efficacy and innovation efficiency. 7 items measure innovation efficacy and 4 items measure innovation efficiency (See Appendix A).

3.2.4 Frugal innovation

Moderating variable frugal innovation 9-item scale from Rossetto *et al* was used (2017)(See Appendix A).

3.2.5 Controls

Gender, age, work experience and educational level of respondents were controlled for the better understanding of the association between digital platforms, IC and IP.

4. Results

For the analysis of collected data and to test the hypothesized model in the current study we used various statistical techniques such as descriptive, correlation and regression. Furthermore, correlation was applied to confirm the association among study variables. Moreover, direct effects are tested with the help of regression analysis. For testing the mediation we applied the 'Process' approach which is developed by Preacher and Hayes (2008). Contract validity and

model fitness are tested with the help of CFA. Table 1 contained the outcomes of reliability and validity. All the calculated values are equal to or above the threshold value.

“Table I Here”

Model fitness was accessed using four different configurations. The outcomes of four models with different configurations are shown in Table 2. The results revealed that only fourth model best fitted (See Table 2).

“Table II Here”

4.1 Correlation results

The outcomes of descriptive and correlation statistics were shown in Table 3. The results of correlation confirmed the positive and significant association among study constructs. The digital platforms are clearly associated with the IC ($r= 0.32^{**}$, $p<0.0001$) and IP ($r= 0.21^{**}$, $p<0.0001$). IC is also positive correlation with the IP ($r=0.30^{**}$, $p<0.0001$) and frugal innovation ($r= 0.23^{**}$, $p<0.0001$). Finally, the outcomes of correlation statistics shows that frugal innovation is significantly related with the IP ($r=0.17^{**}$, $p<0.00001$).

“Table III Here”

4.2 Testing direct effects

Direct effect of digital platforms on IC and IP was tested using regression analysis. Regression provides the dependence among the variables. In this study, we proposed that IC and IP of organizations are dependent on the digital platforms established by these organizations. Regression coefficients which are shown in Table 4, confirmed that digital platforms predicts both IC and IP of organizations. Model 1 described the regression coefficients that explained the direct effect of digital platforms on IP. Model 2 described the regression coefficients regarding direct effect of IC on IP. Model 3 contained the regression coefficients for the direct effect of digital platforms on the IC. Furthermore, Model 2 also explained the indirect effect of IC.

On the basis of results shown in Model 1 i.e. ($\beta = 0.21^{**}$), the study H1 i.e. direct effect of digital platforms on IP was confirmed. Furthermore, the results presented in Model 4 ($\beta = 0.30^{**}$), the study H2 direct effect of digital platforms on IC was also confirmed. Model 2 confirmed that IC significantly predict IP ($\beta = 0.32^{**}$). On the basis of these findings study Hypothesis 3 is confirmed.

“Table IV Here”

4.3 Mediating role of IC between Digital platforms and IP

Regression coefficients depicted in Model 2 provide information about the mediation effect of IC. IC mediate between the digital platforms and IP, when we added IC in the regression model the results revealed that the regression coefficients shown significant effect on IP ($\beta = 0.32^{**}$)

and ($\beta = 0.13$). These findings confirmed the intervening role IC between digital platforms and IP link. Therefore, the study H4 was also confirmed.

4.4 Moderating role of frugal innovation on IC and IP link

H5 proposed that frugal innovation strengthen the IC and IP link positively. Coefficients of hierarchical regression analysis are shown in Table 5. The results for the moderating effect of frugal innovation are presented in with three Models. Model 1 entered control variables i.e. the coefficients regarding their effect. Model 2 we entered IC and frugal innovation along with the control variables. The coefficients that innovation culture and frugal innovation positively effects IP. Finally, we entered the interaction term in Model 3 along with control variables, independent variable (IC) and moderating variable (frugal innovation). The findings of Model 3 present the coefficient of the interaction term i.e. ICx frugal innovation, which indicates that frugal innovation positively affects the connection between IC and IP ($\beta = .24, p < .01$). As per the suggestion of Aiken et al. (1991) we also conducted slope analysis. Figure 2 revealed that IC increases IP in the context of frugal innovation. On the basis of these findings the study H5 is confirmed.

“Table V Here”
“Figure II Here”

5. Discussion

The current study provides in-depth understanding about the positive role of digital platforms for the promotion of IC and IP. For empirical findings the current study formulated five hypotheses. These hypotheses suggested direct, indirect and moderating effect. Hypothesis 1 of the study proposed a direct effect of digital platforms on IP. The results of regression confirmed positive direct effect of digital platforms on IP. On the basis of these findings H1 is accepted. These findings are consistent with the previous work of Jun *et al.*, (2021) and Zeng *et al.*, (2010). Digital platforms enable for the acquisition of required information that are utilized for the promotion of innovation activities of an organization (Jun *et al.*, 2021).

Study H2 proposed a direct effect of digital platforms on IC. The findings revealed that digital platforms provide infrastructure that support the innovation activities at organizational level which contributes for the enhancement of IP. The findings of current study are relevant to the previous work documented by Fitzgerald *et al.*, (2014). According to Fitzgerald *et al.*, (2014), digital platforms provide basic foundation for the development of culture that supports the innovation activities. Therefore, we suggested that digital platforms play an important role for the establishment of IC. Furthermore, study H3 proposed that IC positively supports the IP of an organization. The findings show that an organization with IC at workplace is more inclined to execute innovation activities consistently and improve the IP. Our findings support the previous work regarding the direct effect of digital platforms on IP (Aksoy, (2017) and Halim *et al.*,

(2015). These findings suggested that the innovation climate helps organizations to extensively involve in the innovative activities and enhance their IP.

The current study also proposed an indirect effect of digital platforms. The study H4 i.e. IC significantly mediates between digital platforms and IP link. The findings confirmed the study hypothesis based on the results calculated for the mediating effect of IC. Digital platforms provide necessary innovation knowledge and infrastructure for the innovation activities that enhances the IP of the business. Findings revealed that organizations with innovation knowledge and information have robust IC which in turn increases the IP of an organization.

Finally, the current study also proposed that frugal innovation plays a strengthened role on the association between IC and IP. The findings regarding H5 suggested that frugal innovation positively strengthens the effect of IC on IP.

5.1 Contribution to Theory

This study contributes to the theory in a distinguished manner, as it extends the newest knowledge about innovation considering digital platforms as a predictor for the IP of business organization. Therefore, the empirical findings contribute to the current stream of knowledge by providing a direct effect of digital platforms on IP. Using digital platforms as a predictor of IP ensure valuable theoretical contributions towards SMEs of emerging economies. Second, the study in hand enhances the understanding of IP of SMEs by formulating an IP- Model for SMEs, focusing on the digital platforms, IC and frugal innovation that are the prerequisites for the promotion of IP.

Third, the significance role of digital platforms for developing IC is required i.e. empirically tested in this study. Infrastructure for the implementation of innovation activities is an important mechanism for exploring the new opportunities that support innovation directions (Aksoy *et al.*, 2017; Ghasemzadeh *et al.*, 2019; Halim *et al.*, 2015; Chen *et al.*, 2018). The existing studies in the relevant fields ignore the discussion about IC as a major outcome of DP and determine IP of SMEs. Therefore, the aim of this study was to highlight the role of digital platforms as potential determinants of IC, and IP.

5.2 Practical implications

Beyond some theoretical contributions, this study also suggested valuable practical implications. Due to the emergence of digitalization the owners/managers of SMEs require to establish digital platforms for the acquisition of required knowledge that enable them for the promotion of IP. Furthermore, for the formulation of best strategies of innovation, digital platforms can be considered for the better response to the dynamic environment via of IP (Jun *et al.*, 2021).

Second, the owners/managers of SMEs must create a supportive culture that facilitates the promotion of innovation strategies which is necessary for the frugal innovation. Therefore, for the successful response to the various demanding frugal innovations which ultimately strengthen the IP, management must focus on IC (Yunis *et al.*, 2018). Therefore, on the basis of these findings we suggested that digital platforms are the basic foundation for promoting IC in order to acquire the updated information for the betterment of IP.

5.3 Conclusion

The current study highlighted the role of digital platforms for the promotion of IP of SMEs, as innovation in business models become a part of strategic planning due to the emerging challenges of e-commerce and changes in economic system. Therefore, the current study also explored if IC and frugal innovation play a significant role for the execution of innovation activities that enhance the IP. The hypothesized model also explained the mediating role of IC between digital platforms and IP connection. Moreover, the moderating role of frugal innovation has also been tested on the relationship between IC and IP. Frugal innovation is closely connected to the circular economy concept. The hypothesized model was tested with the help of five hypotheses. The findings suggested that digital platforms show significant direct effect on IC and IP. The results also confirmed the mediating effect of IC. Finally, the moderating role of frugal innovation was also confirmed by the findings of the study.

Beyond, the empirical findings the current study also contain limitations. This is cross sectional design for testing the study hypotheses, while, longitudinal study design will give more in-depth understanding for the innovation performance of the SMEs. Therefore, cross sectional design is considered as the limitation. In future studies longitudinal design will be used as study design particularly in the field of innovation management. The current study only focused on SMEs sector of emerging economies therefore results are not generalized to other sectors of the economy due to context differences. In future study will be conducted on the other sectors like manufacturing and services. Finally, the current study only consider frugal innovation as a moderator, in future it can be considered an independent.

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