

**Emerging issues on business innovation ecosystems: the role of information and communication technologies (ICTs) for knowledge management (KM) and innovation within and among enterprises***Introduction to the special issue: ICTs in KM and innovation*

Nowadays, ICTs operate as a large network infrastructure system or digital platform, where distinct business agents exchange information and knowledge. This “innovation ecosystem” (Adner and Kapoor, 2010; Nambisan and Sawhney, 2011) or “ecology of complex innovation” (Dougherty and Dunne, 2011) has been defined as the innovation context where employees, customers, suppliers and business partners play an active role in supporting innovation.

There are both direct and indirect network externalities between and among the different business agents and partners, which enable the creation of an innovation ecosystem. For instance, an interaction occurs when a web “surfer” joins a page or a profile created by an enterprise and shows an interest in the firm by expressing his/her idea on the digital platform. This interaction calls for a knowledge exchange process from which more innovations are generated (Scuotto, Del Giudice, Della Peruta and Tarba, 2017; Soto-Acosta *et al.*, 2010). Likewise, digital platforms involve users from both the outside and inside of the organizational environment. For instance, the wide spread of the intranet among all different forms of business (from small- and medium-sized enterprises (SMEs) to corporate companies) is supporting the knowledge exchange process and, in turn, the improvement of KM systems (Scuotto and Mueller, 2017; Soto-Acosta *et al.*, 2014, 2017). Alongside, innovation ecosystems and their associated ICTs enable employees to feel more committed to the organizational environment and, therefore, digital platforms are prone to deliver innovative ideas. This has resulted in overcoming companies’ boundaries and bringing a heterogeneous set of knowledge in the process of idea generation (Scuotto, Del Giudice, Bresciani and Meissner, 2017). In a nutshell, ICTs facilitate interaction between employees to execute the innovation process with users and business partners from remote places. Thus, ICTs enhance knowledge creation and sharing by bringing together partners and/or employees with diverse expertise and experience and, in turn, enabling open and closed innovation (Martinez-Conesa *et al.*, 2017; Vrontis *et al.*, 2017). Furthermore, ICTs enhance companies’ innovation ambidexterity as the capability of simultaneously pursuing incremental and radical innovation with equal dexterity (Scuotto, Santoro, Bresciani and Del Giudice, 2017; Soto-Acosta *et al.*, 2018).

Although there is research analyzing the network effects and their impact on platform adoption and use (e.g. Gallaughner and Wang, 2002; Katona *et al.*, 2011; Nair *et al.*, 2004; Clements and Ohashi, 2005; Lee and Mendelson, 2008), this special issue advances existing theoretical and practical research by examining the impact of the use of digital platforms on business performance, innovation as well as KM. The papers of this special issue offer worldwide empirical studies on the role of ICTs for KM and innovation, using different methodologies—from a quantitative (e.g. structural equation modeling) to a qualitative approach (e.g. case study).

**Overview of the special edition papers**

Crammond, Omeihe, Murray and Ledger conduct a research on Scottish SMEs entitled “Managing knowledge through social media: modeling an entrepreneurial approach for

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Scottish SMEs and beyond.” The paper conceptualizes Social Media Use as a contributory KM tool toward entrepreneurial behavior amongst SMEs. The authors propose a process model toward entrepreneurial exploitation by acknowledging systematic phases of research, concept, institutionalize, develop, target and assess, referred to as the RCIDTA model. This model can be useful in enhancing the knowledge ecosystem of SMEs by using social media.

By analyzing a different country, with a research entitled “Social media as tool for facilitating knowledge creation and innovation in small and medium enterprises” Papa, Santoro, Tirabeni and Monge study 96 SMEs operating in food and beverage, fashion and ICT sectors, randomly selected from the Italian database AIDA-Bureau van Dijk via ordinary least squares regression models. Italy is recognized to be a suitable territory to analyze this phenomenon due to the increasing use of social media in all forms of business, mainly SMEs which are more predominant in Italy. As emerged, social media positively influence three out of four knowledge creation steps: socialization, externalization and combination in fostering SMEs’ innovation process. The fourth step, that is the internalization, is non-significant. These results are in line with some previous studies (Davenport and Prusak, 1998; Lopez-Nicolas and Soto-Acosta, 2010), confirming the relevance of using social media for SMEs.

Again, considering another European country Garcia-Morales, Martín-Rojas and Lardón-López investigate 201 technological firms located in Spain. Their article entitled “Influence of social media technologies on organizational performance through knowledge and Innovation” demonstrates how social media technologies (SMTs) make the firm proficient to act on business opportunities and reconfigure business resources by encouraging networks to routinize the firm’s knowledge and innovation competencies. The findings highlight the significance of the use of SMTs within an organizational environment. In fact, these tools spur innovation through a dynamic knowledge flow, which, in turn, generates value for enterprises. On this basis, the authors propose a conceptual framework to describe how social media create value for businesses, leveraging on network effects and knowledge flow. This, in turn, has changed the way to run a business, generating more interactions with the ecosystem (Aral *et al.*, 2013). The present research enlarges the current literature emphasizing the significance of knowledge-based technological competencies (technological knowledge competencies) in the process of learning by doing for innovation.

Moving from Europe to Asia, Wang and Xu examine 165 modern service enterprises located in the Yangtze River Delta region, a Chinese economic region which surrounds Shanghai municipality. The scope of this research entitled “Examining the linkage among open innovation, customer KM and radical innovation: the multiple mediating effects of organizational learning ability” are to propose a research model exploring the link between open innovation and customer KM to radical innovation. Especially, they noticed that inbound open innovation activities have a direct impact on a radical innovation. Whereas the nexus of outbound open innovation activities and organizational exploitative learning have an indirect effect. Additionally, customer KM has also an indirect effect, although it was initially assumed to have a direct impact on the development of a radical innovation. A twofold contribution to the literature has been offered. First of all, in line with Hult (2004) and Ahn (2015), the study shows the relevance of customers in the early stage of an innovation process, although an innovation spurred from the external environment can generate more uncertainty. Second, as also suggested by Del Giudice and Maggioni (2014), knowledge circulation plays a key role within the innovation process.

Finally, Kim offers a research entitled “Market entry strategy for a digital platform provider which considers the virtual market.” In particular, the author wonders how a digital platform provider can successfully secure users in its early stage to build an ecosystem. And therefore to answer this question the author explores the information diffusion procedure based on diffusion simulations using the susceptible-infectious-recovery model of network services (Newman, 2002; Goldenberg *et al.*, 2001; Granovetter, 1978). By employing a case

study methodology on the digital platform service RecordFarm, the study identifies two important early stage characteristics for a business platform to be successful: the core users' activities on the platform are a critical element for the network's expansion and usage, and user relationships are more important than user contents on the digital platform. This research brings up insightful thoughts on the relevance on the way to extend enterprises' networks by using the online system. In fact, an enterprise assumes the form of an open system where different nodes interact with each other, intertwining the internal and external organizational environment.

Generally, this special issue enlarges the current literature focused on KM and innovation, demonstrating the greater relevance of the use of social media in the ICT industry. Especially, it provides new insights on the use of social media in SMEs, enforcing the significance of the multidirectional collaboration with the ecosystem (Kietzmann *et al.*, 2011) and, thus, the new network-centric organization approach (Nambisan and Sawhney, 2008; Adler and Heckscher, 2006).

Hence, new theoretical and practical approaches are developed and shown on the topic of:

- social media, KM and entrepreneurship;
- SMTs for KM and innovation;
- knowledge-based technological competencies in the process of learning by doing for innovation;
- open innovation, customer KM and radical innovation; and
- the role of digital platforms for developing an ecosystem.

### **Directions for future research**

The present special issue offers a clear overview on the digital technologies with a particular focus on social media networks for SMEs. Although a case study of a corporate company is also offered, we believe that further research on the use of social media networks for corporations is needed. For instance, scholars can critically investigate if there are any best practices of large firms to be embedded within SMEs. Additionally, the special issue provides a wide range of analysis on a different set of sectors and therefore in the future each sector can be examined singularly, investigating differences and similarities. Furthermore, other studies on emerging countries can offer a worldwide knowledge on the social media phenomenon in relation to KM activities for enterprises. Hence, as knowledge has been firmly confirmed that generates value for enterprises either if it emerges from the internal or the external organizational environment, the digital technologies can be a perfect complementary tool to improve the management of knowledge as well as enhance the knowledge-intensive network.

Concluding, the guest editors desire to kindly thank all peer-to-peer reviewers for their great insights and effort in examining assigned papers in time. We believe that without them the special issue could not be as good as it is. Indeed, thanks to them, the authors were able to improve their work and offer a thoughtful contribution.

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**References**

- Adler, P.S. and Heckscher, C.C. (Eds) (2006), *The Firm as a Collaborative Community: Reconstructing Trust in the Knowledge Economy*, Oxford University Press, Oxford, pp. 11-106.
- Adner, R. and Kapoor, R. (2010), "Value creation in innovation ecosystems: how the structure of technological interdependence affects firm performance in new technology generations", *Strategic Management Journal*, Vol. 31 No. 3, pp. 306-333.
- Ahn, J.M., Minshall, T. and Mortara, L. (2015), "Open innovation: a new classification and its impact on firm performance in innovative SMEs.
- Aral, S., Dellarocas, C. and Godes, D. (2013), "Introduction to the special issue—social media and business transformation: a framework for research", *Information Systems Research*, Vol. 24 No. 1, pp. 3-13.
- Clements, M.T. and Ohashi, H. (2005), "Indirect network effects and the product cycle: video games in the US, 1994–2002", *The Journal of Industrial Economics*, Vol. 53 No. 4, pp. 515-542.
- Davenport, T.H. and Prusak, L. (1998), *Working Knowledge: How Organizations Manage What they Know*, Harvard Business Press.
- Del Giudice, M. and Maggioni, V. (2014), "Managerial practices and operative directions of knowledge management within inter-firm networks: a global view", *Journal of Knowledge Management*, Vol. 18 No. 5, pp. 841-846.
- Dougherty, D. and Dunne, D.D. (2011), "Organizing ecologies of complex innovation", *Organization Science*, Vol. 22 No. 5, pp. 1214-1223.
- Gallaughier, J.M. and Wang, Y.M. (2002), "Understanding network effects in software markets: evidence from web server pricing", *MIS Quarterly*, Vol. 26 No. 4, pp. 303-327.
- Goldenberg, J., Libai, B. and Muller, E. (2001), "Using complex systems analysis to advance marketing theory development: modeling heterogeneity effects on new product growth through stochastic cellular automata", *Academy of Marketing Science Review*, Vol. 2001 No. 9, pp. 1-18.
- Granovetter, M. (1978), "Threshold models of collective behaviour", *American Journal of Sociology*, Vol. 83 No. 6, pp. 1420-1443.
- Hult, G.T.M., Ketchen, D.J. Jr and Slater, S.F. (2004), "Information processing, knowledge development, and strategic supply chain performance", *Academy of Management Journal*, Vol. 47 No. 2, pp. 241-253.
- Katona, Z., Zubcsek, P.P. and Sarvary, M. (2011), "Network effects and personal influences: the diffusion of an online social network", *Journal of Marketing Research*, Vol. 48 No. 3, pp. 425-443.
- Kietzmann, J.H., Hermkens, K., McCarthy, I.P. and Silvestre, B.S. (2011), "Social media? Get serious! Understanding the functional building blocks of social media", *Business Horizons*, Vol. 54 No. 3, pp. 241-251.
- Lee, D. and Mendelson, H. (2008), "Divide and conquer: competing with free technology under network effects", *Production and Operations Management*, Vol. 17 No. 1, pp. 12-28.
- Lopez-Nicolas, C. and Soto-Acosta, P. (2010), "Analyzing ICT adoption and use effects on knowledge creation: an empirical investigation in SMEs", *International Journal of Information Management*, Vol. 30 No. 6, pp. 521-528.
- Martinez-Conesa, I., Soto-Acosta, P. and Carayannis, E.G. (2017), "On the path towards open innovation: assessing the role of knowledge management capability and environmental dynamism in SMEs", *Journal of Knowledge Management*, Vol. 21 No. 3, pp. 553-570.
- Nair, H., Chintagunta, P. and Dubé, J.P. (2004), "Empirical analysis of indirect network effects in the market for personal digital assistants", *Quantitative Marketing and Economics*, Vol. 2 No. 1, pp. 23-58.
- Nambisan, S. and Sawhney, M. (2008), *The Global Brain, Roadmap for Innovating Faster and Smarter in a Networked World*, Pearson Education, NJ.
- Nambisan, S. and Sawhney, M. (2011), "Orchestration processes in network-centric innovation: evidence from the field", *Academy of Management Perspectives*, Vol. 25 No. 3, pp. 40-57.

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- Newman, N. (2002), "Trade secrets and collective bargaining: a solution to resolving tensions in the economics of innovation", *Employee Rights and Employment Policy Journal*, Vol. 6 No. 1.
- Scuotto, V. and Mueller, J. (2017), *ICT Adoption for Knowledge Management: Opportunities for SMEs*, RossiSmith Academic Publishing, Oxford.
- Scuotto, V., Del Giudice, M., Bresciani, S. and Meissner, D. (2017), "Knowledge-driven preferences in informal inbound open innovation modes. An explorative view on small to medium enterprises", *Journal of Knowledge Management*, Vol. 21 No. 3, pp. 640-655, doi: 10.1108/JKM-10-2016-0465.
- Scuotto, V., Del Giudice, M., Della Peruta, M. and Tarba, S. (2017), "The performance implications of leveraging internal innovation through social media networks: an empirical verification of the smart fashion industry", *Technological Forecasting and Social Change*, Vol. 120, pp. 184-194.
- Scuotto, V., Santoro, G., Bresciani, S. and Del Giudice, M. (2017), "Shifting intra-and inter-organizational innovation processes towards digital business: An empirical analysis of SMEs", *Creativity and Innovation Management*, Vol. 26 No. 3, pp. 247-255.
- Soto-Acosta, P., Casado-Lumbreras, C. and Cabezas-Isla, F. (2010), "Shaping human capital in software development teams: the case of mentoring enabled by semantics", *IET Software*, Vol. 4 No. 6, pp. 445-452.
- Soto-Acosta, P., Colomo-Palacios, R. and Popa, S. (2014), "Web knowledge sharing and its effect on innovation: an empirical investigation in SMEs", *Knowledge Management Research & Practice*, Vol. 12 No. 1, pp. 103-113.
- Soto-Acosta, P., Popa, S. and Martinez-Conesa, I. (2018), "Information technology, knowledge management and environmental dynamism as drivers of innovation ambidexterity: a study in SMEs", *Journal of Knowledge Management*, Vol. 22 No. 4, pp. 931-948.
- Soto-Acosta, P., Popa, S. and Palacios-Marqués, D. (2017), "Social web knowledge sharing and innovation performance in knowledge-intensive manufacturing SMEs", *Journal of Technology Transfer*, Vol. 42 No. 2, pp. 425-440.
- Vrontis, D., Thrassou, A., Santoro, G. and Papa, A. (2017), "Ambidexterity, external knowledge and performance in knowledge-intensive firms", *The Journal of Technology Transfer*, Vol. 42 No. 2, pp. 374-388.