

Guest editorial

Knowledge-based perspectives of innovation and performance improvement in health care

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Summary

Purpose – This editorial of the special issue of *Measuring Business Excellence* is devoted to introduce and discuss a knowledge-based perspective of innovation and performance improvement in health care (HC).

Design/methodology/approach – The approaches, evidences and insights discussed in this introduction are based on the discussion of the topics of the conference “International Forum on Knowledge Assets Dynamics” organised in June 2012 in Matera, Italy. After a brief analysis of the importance of the HC for research and practice related to the reform of HC sector that encompassed most OECD countries in the last 15 years and the diffusion of the new public management philosophy, the article presents a rationale explaining the roots and the meanings of a knowledge-based perspective of innovation and performance improvement in HC. The model of the innovation cycle is introduced and discussed. Finally, the article provides an overview of the papers of the special issue.

Findings – At the conference, leading experts discussed the importance of identifying and managing new key-value drivers in order to face emergent competitive scenarios, and research and management practices for addressing complexity, uncertainty and changes of today's business landscape. This article as well as all the contributions to the special issue provide useful implications both for research and practice. In particular they support the analysis about the resources, the assets, the processes, the factors and the contingency conditions playing a role in determining the improvement of the innovative capacity and consequently the global performance of the HC organisations.

Originality/value – This article – and the contributions to the special issue – deal with different aspects which are important in the discussion about how fostering innovation and performance improvement in HC organisations exploiting knowledge-based factors. The articles also deal with the approaches, tools, methods and techniques that disentangle the mechanisms by which different knowledge-based factors, separately or interdependently, contribute to improve HC organisations' innovation dynamics and organisational performance.

Keywords Performance improvement, Health care, Knowledge-based innovation, Health services, Innovation

Paper type Research paper

1. The question

This special issue of *Measuring Business Excellence* is devoted to analyse and discuss different knowledge-based perspectives of innovation and performance improvement in health care (HC). Specifically, the focus will be about the role of the cognitive and intangible resources and assets, the importance of the learning processes and the identification and management of the enhancing factors in supporting innovation dynamics and performance improvement in HC organisations.

HC is a context particularly interesting for research and practice. In fact the reform of HC sector that encompassed most OECD countries in the last 15 years and the diffusion of the

New Public Management philosophy (Pollitt and Bouckaert, 2000) determine an increasing relevance of the innovation management able to drive incremental and radical performance improvement in the HC organisations (Fleuren *et al.*, 2002).

It is widely recognised that HC organisations have to face more and more the challenge to keep together and balance the achievement of service quality and economic efficiency, accountability and cost reduction and services reliability and continuity, autonomy and integration with the HC national policies (Habersam and Piber, 2003; Länsisalmi *et al.*, 2006; Omachonu and Einspruch, 2010; Varkey *et al.*, 2008). It is a challenge that involves the organisations at strategic, managerial and operative level (Burns, 2002) and on different aspects such as the focus on the patient, the clinical governance, the technical and perceived quality, the evaluation of the performance and the measurement of the outcomes, the re-organisation of the supply-system, particularly referred to hub-and spoke systems (Bartholomew *et al.*, 2001; Djellal and Gallouj, 2005; Howie and Erickson, 2002; Huntington *et al.*, 2000).

At the same time, there is a wide awareness about the nature strongly knowledge-intensive according to which HC organisations' innovation processes have to develop in order to determine both efficiency and quality of the services provided (Gupta, 2008; Peng *et al.*, 2007; Zigan *et al.*, 2008). Moreover, there is the same acknowledgement that, in the nowadays scenarios, it is more and more important the role played by knowledge assets in fostering innovation processes, performance improvement and value creation both in HC private and public organisations. Knowledge assets contribute to improve innovative capacity of an organisation (Subramaniam and Youndt, 2005; Teece, 2000, 2007), stimulate the process of organisational learning, (Kang *et al.*, 2007; Kang and Snell, 2009), enhance individual and organisational performance, and particularly innovative behaviour (Carmeli and Tishler, 2004; Damanpour, 1991; Youndt and Snell, 2004).

Knowledge assets comprise, traditionally, human capital, structural or organisational capital, and relational or social, and often they are summarised in the holistic notion of intellectual capital (IC) (Marr *et al.*, 2004; Schiuma *et al.*, 2008). Human capital refers to the knowledge, competences and abilities of the people operating within an organisation, the structural or organisational capital refers to all the mechanisms that organisations use to storage and share knowledge, such as databases, operative protocols, manuals and organisational routines; and finally, relational or social capital is about the network of internal and external relationships that organisations and its members develop with their key-stakeholders.

However, despite this relevance for the HC organisations (Habersam and Piber, 2003), the research on this topic is still open and require further investigation. In particular, research is called to improve its analysis about the resources, the assets, the processes, the factors and the contingency conditions playing a role in determining the improvement of the innovative capacity and consequently the global performance of the HC organisations: these elements, in fact, together with normative factors, can strongly stimulate or decrease the change management and, for these reasons, their understanding is more and more essential to plan coherent and effective performance improvement plans (Fleuren *et al.*, 2002; Grol and Wensing, 2001).

The special issue aims to propose, analyse, discuss and transfer different models and connected operative tools to plan, project and implement actions and initiatives able to support innovation processes and performance improvement within healthcare organisations. Most analysis shares a knowledge-based approach and emphasise aspects related to the exploitation of intangible assets and cognitive processes levered to support performance improvement in HC organisations. Particular attention is paid then to:

- explore the modalities and the dynamics through which knowledge-based factors of the HC organisations influence their innovation capacity both at radical and incremental level and performance dimensions;
- understand the different organisational, group and individual factors moderating the relationships between knowledge-based factors, innovation capacity and performance improvement within HC organisations;

- integrate different research perspectives towards an explicative theory about the relevance of managing knowledge-based factors and cognitive processes to foster innovation dynamics and performance improvement of the HC organisations;
- analyse how contingent variables, such as dimension, research orientation, and environmental variables may modify the relationship between knowledge-based factors, innovation capacity and performance improvement within HC organisations.

The selection of articles collected in this special issue is based on the works of the conference “International Forum on Knowledge Assets Dynamics – IFKAD 2012” organised in June 2012 in Matera, Italy. At this conference, leading experts explored the challenges of managing knowledge and innovation to support performance improvement and sustainability of private and public organisations.

2. Rationale for a knowledge-based perspective of innovation and performance improvement in health care

Background

Various theoretical perspectives have been employed in efforts to understand innovation as it happens across the full range of organisational levels. Scholars of the rational and purposive view argued that innovation is a problem-driven response to declining organisational performance or to the fear of future decline (Bolton, 1993). Similarly, Nelson and Winter's (1982) evolutionary view is purposive, in which the fundamental mechanisms are the search for better techniques and the selection of successful innovations by the market (Ruttan, 1997). Other perspectives include the population ecology perspective (Hannan and Freeman, 1977), general systems (von Bertalanffy, 1962) and contingency theory (Burns and Stalker, 1961). Schumpeter's (1934) view of innovation was broad. He proposed a typology of organisational innovation arranged under five categories: new goods or modified existing ones, new processes, new markets, new sources of raw material supply and the creation of new types of industrial organisation. Newness is conceptualised in several different ways in the literature (Coopey *et al.*, 1998; Van de Ven, 1986; Zaltman *et al.*, 1973) and traditionally is focalised on the distinction between radical or incremental innovation (McAdam and McClelland, 2002).

Dougherty (1992) conceives of innovation as the creation and exploitation of new and existing knowledge that links market and technological possibilities. Knowledge helps organisations achieve these objectives, as opportunities get noticed and exploited because of asymmetries in knowledge across organisations. Not surprisingly, the process of innovation is commonly equated with an ongoing pursuit of harnessing new and unique knowledge (Nonaka and Takeuchi, 1995). A critical portion of the knowledge and skills required for innovation resides with and is used by individuals. The complexity of many modern innovations, however, necessitates a pooling and integration of multiple strands of this knowledge. Thus, organisations accumulate, codify and store individual knowledge in manuals, databases and patents for collective current and future use and establish robust structures, systems and processes to streamline individual inputs into steady streams of innovative outcomes. In its broadest sense, then, innovation is about the creation and implementation of a new idea in a social context with the purpose of delivering benefits. West and Farr's (1989, p. 9) definition succinctly captures all these ideas, defining innovation “the intentional introduction and application within a role, group or organisation of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, organisation or wider society”.

There is a range of models – conceptual and empirical – that attempt to encapsulate some of the complexities of innovations. They derive from diverse research streams and reflect different theoretical perspectives. Commonly, there is the tendency to adopt a view of innovating as consisting of a series of inputs which is converted by a process to deliver a series of outputs (Wolfe, 1994). Taking and expanding upon Wolfe's categorisation and drawing upon the various approaches in innovation research, considering the lack in the literature of a comprehensive but parsimonious framework capable of facilitating cumulative

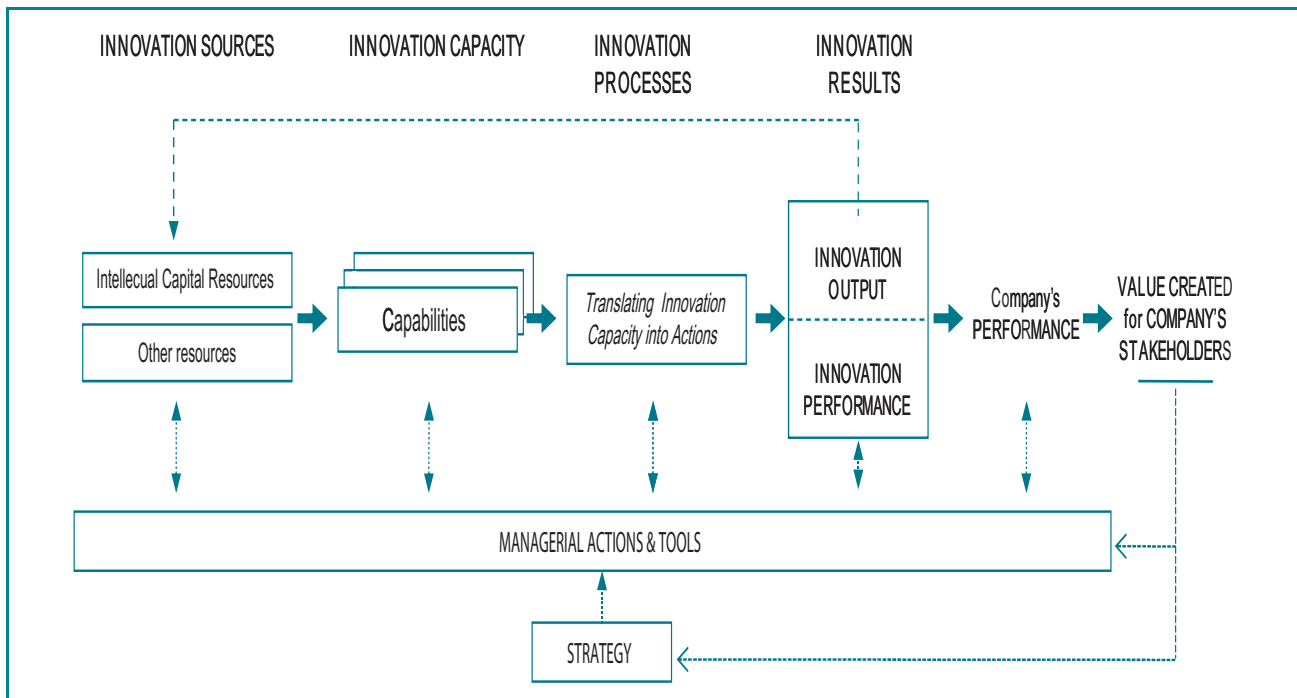
research, a holistic conceptualisation based on five pillars – strategy, innovation sources, innovation capacity, innovation processes and innovation results – is developed. This conceptualisation, called Innovation Cycle, try to support interpretation and analysis of the dynamics of the organisational innovation capability and definition of managerial actions, programs and projects according to a knowledge perspective.

The innovation cycle

High performing innovators do not see innovation as just a user of scarce resources for uncertain outcomes, but rather as a mechanism for creating new knowledge and competitive advantage. Different elements, therefore, need to be managed integratively. The literature on innovation management contains numerous framework examining the technical innovation audit (Chiesa *et al.*, 1996), the new product development process (Clark and Fujimoto, 1991), R&D management and technology acquisition process, implementation of production innovations (Voss, 1988). There have, however, been few attempts using a knowledge-based approach to generate a holistic model of organisational innovation capability. This lack has driven the conceptualisation of the Innovation Cycle as shown in Figure 1.

The model assumes that company's performance is based on the results of the innovation which, in turn, is primarily dependent of the innovation sources. Innovation capability itself, then, is not a separately identifiable construct. The capability is composed of reinforcing practices and processes within the firm according to the innovation sources available. These sources are the key elements for stimulating, measuring and reinforcing innovation mechanisms. We note that there is no clear agreement of what the real variables of innovation capability might be. A holistic model of innovation capability will thus attract debate about the categorisation of pillars and elements, but it is a necessary step in order to facilitate analysis and construction of an innovative framework. The elements making up an innovation capability are grouped into major pillars. These pillars and elements have been built up from the literature on innovation management as well as best practice models and specific studies of innovative firms.

Figure 1 The Innovation Cycle



The following pillars are proposed to exist within innovative companies. They are strategy, innovation sources, innovation capacity, innovation processes and innovation results. The innovation capability will lead to continuous products, process and systems innovation. The stronger the innovation capability possessed by a company, the more effective will be its performance and value creation. The core pillars of innovation capability, as well as their major elements, are discussed in detail in the next sections.

Strategy. The link between strategy and innovation is important to effective innovation management. Successful innovation requires a clear articulation of a common vision and the company expression of the strategic direction. This is a critical step in institutionalizing innovation, creating a vision, a target which if achieved will create products that outperform and provide a distinct market position. The success of companies breaking the rules of their industries through innovation and become a dominant player has been well-documented (Hamel, 1998; Kim and Mauborgne, 1999). These companies are able to stimulate demand, expand existing markets and create new ones through accessible and competitive market prices.

Innovation sources. Competitive pressure and the rapid growth of ICT have forced companies to review the sources of their innovation performance and value creation dynamics. This has resulted in a focus on both innovation and knowledge, and the concept of knowledge has received a deal of attention in recent years. The concept of knowledge has emerged a strategically significant resource for the firm (Grant, 1996) and has been asserted to play a significant role in the innovation process (Schiuma *et al.*, 2008; Subramaniam and Youndt, 2005). Indeed, the complexity of skills and processes needed in the development of today's products and services requires that managers attend the processes of managing knowledge combination as the very basis of innovation (Leonard and Sensiper, 1998). Mingers (1990) conceptualised innovation as both an exploration and synthesis involving a process of the combination and exchange of knowledge (Nahapiet and Ghoshal, 1998). It has also highlighted that firms are encouraged to innovate by searching out new resources or finding new ways of using existing resources. Sometimes, innovation consists of a recombination of knowledge and other resources that were previously in existence (Coopey *et al.*, 1998). Grant (1996) suggests that organisations accumulate knowledge over time, learning from their members. Organisational knowledge is created through the interactions of individuals. Thus, moving towards a knowledge-based approach, it is possible to analyze the organisational resources in terms of knowledge embodied by them. In particular, according to a knowledge-based approach, and getting over the distinction between the tangible or intangible nature of the resources, we think the real important thing that provides strategic relevance to all the resources is the role played by themselves as cognitive components, or, in other terms, as entities embodying knowledge qualifying the organisation to perform innovation, business activities and to gain competitive advantages. It derives that the criterion to define and evaluate the value of a resource, both tangible and intangible, resides into the cognitive role that it assumes, or, in other words, into the level of relevance to define and build organisational competences. The adoption of a knowledge-based approach lets, then, to introduce the concept of knowledge asset as any organisation resource made of or incorporating knowledge which provides an ability to carry out a process or an activity aimed to create and/or deliver innovation and value (Marr *et al.*, 2004), as well as to define intellectual capital (IC) as the group of knowledge assets that are attributed to an organisation and most significantly drive organisational innovation and value creation mechanisms for targeted key stakeholders. Then, according to a knowledge-based approach, the management attention have to move then from the analysis and the evaluation of the tangible and intangible resources towards an analysis of the resources embodying knowledge and at the basis of the innovation and value creation dynamics of the organisations. This determines a distinction of resources into two categories:

1. resources made of or incorporating knowledge, and then defined knowledge assets, which together constitute the intellectual capital (IC) of an organisation; and
2. complementary resources.

Innovation capacity. Innovation resources nurture innovation capability. The innovation capability enables integration and transformation of resources to develop potential innovation that can be transferred into the companies' processes through the leverage of their knowledge base (Cohen and Levinthal, 1990). An innovation capability is therefore defined as the ability to continuously transform knowledge and ideas into new products, processes and systems for the benefits of the company and its stakeholders (Lawson and Samson, 2001), or in other terms, the company's ability to combine, integrate and exploit its tangible and intangible resources, to create and deliver products and services. The cross-functional integration and co-ordination of organisational capabilities are at basis of "innovation capacity". In fact, in line with Lawson and Samson (2001) statements, the "innovation capacity" can be interpreted as the organisational ability to mould, integrate and manage multiple resources and capabilities of the firm to successfully stimulate innovation.

Innovation processes. Traditionally, process research addresses the nature of the innovation process, how and why innovations emerge and grow. In our model, process has come to be conceived as a temporal, path-dependent phenomenon (King, 1992; Koput, 1997) that is a collection of tasks or activities and an integration and exploitation of organisational capabilities, which together transform inputs into outputs. This allows innovative companies to produce new products and services in a quality-focused, efficient and responsive manner. Innovation is clearly not just about technical research and development, nor is it something that can be successfully performed in an innovation department or a separate piece of an organisation. Rather, for those who did it well, it pervades all aspects of an organisation's existence, from the core value system to the measures and behaviours that are manifested on a daily basis. Successful innovation requires an optimal overall formal business structure (Burgelman and Maidique, 1988). Unless this structure and its resulting processes are conducive to a favourable environment, other components of the innovation systems are unlikely to succeed. The nature of the innovation processes has been shown to be affected by a range of factors such as organisational structure (Burns and Stalker, 1961; Daft, 1978), environmental factors (Tidd, 2001), technology management. As businesses grow, there is a tendency to add layers, becoming more mechanistic and institutionalizing bureaucracy (Kanter, 1983). High performing companies motivate and enable innovative behaviours by creating permeable business boundaries helping break down the barriers separating functions, product groups and businesses. Also environmental factors affect innovation processes through team size, group climate, heterogeneity, vision, leadership style and group cohesiveness (Agrell and Gustafson, 1994). Finally, the management of technology is crucial for all kinds of organisations. Innovative companies are able to effectively link their core technology strategies with the innovation strategy and business strategy. This alignment generates a powerful mechanism for competitive advantage.

Innovation outputs and company's performance improvement. It is not difficult to recognise the contribution that innovation makes to performance improvement and competitive advantage (Tidd, 2001). This output has generally been construed in terms of financial, market or organisational performance. Despite this, few studies have focused on the performance of the process of innovating. There is a trend in these studies to treat innovations as unitary phenomena, such that it becomes difficult to distinguish between the innovation and the performance. Short-term financial indicators can undervalue innovation; number of patents, measures of market growth and so forth do not tell the whole story. The measures might identify some organisations as innovative but they do not tell anything about how they do it, or from where the innovations. Furthermore, implicit in the approach is the assumption that outputs of the processes of innovating are directly related to the process: that is, the activities in which innovators engage and the model of their engagement influence the resultant outcome. However, this relationship is far from clearly established in the literature other than to suggest that some types of temporal and sequential activities are related to innovation novelty (King, 1992). The argument that output and process are related has theoretical and practical implications. Empirical works establishing that different outputs of innovation are related to different dynamical processes can be useful in developing our understanding of innovation, particularly if developed within a framework that will permit comparisons across future studies. Further, there is a practical application in helping

organisational leaders understand the requirements of their innovating systems. Output performance research focuses intently on the role of novelty or newness as a factor of success, although results are not completely shared (Kleinschmidt and Cooper, 1991; Tidd *et al.*, 1997). Finally, according to a value based approach, superior innovation performances mean major value created for company's key stakeholders.

Although the basic relationship between knowledge-based factors, innovation dynamics and companies' performance is on the whole persuasive, different and relevant issues remains to be understood and require further investigation. In particular, the variety of ways of performing through knowledge and intangible resources exploitation raises the question of how this kind of resources can be coherently and successfully declined into companies' processes and operations, what are the "right", or appropriate approaches to manage knowledge and how these approaches can disentangle the mechanisms by which those resources contribute to improve companies' innovation dynamics and global organisational performance. This is particularly true in HC. Health care organisations represent high managerial complexity-contexts, they show often big dimension and above all intangible and cognitive resources, such as professional competences, know-how, relational abilities, image and organisational culture, represent for them a fundamental source to reach high performance and to drive the value creation dynamics for all their key-stakeholders. These reasons provide a strong rationale for a better understanding of the importance to adopt a knowledge-based approach to the innovation management and performance improvement in HC.

3. Overview on contributions to this issue

The contributions to this special issue deal with different aspects, which are important in the discussion of needs for a better understanding the role of the knowledge-based factors and processes in driving innovative dynamics and performance improvement in HC organisations.

Main topics are traced back in the challenge to improve hospital performance by enhancing and balancing knowledge exploration and knowledge exploitation capabilities (Gastaldi, Lettieri, Corso, Masella), on the role of Information Systems as mechanisms able to manage the existing and widespread knowledge in health care organisations (Cristofaro, Lacroce, Reina, Ventura), on the value of information in health services market (Cernohorsky and Voracek), on the role of knowledge management practices in healthcare services performance (Myllärniemi, Laihonen, Karppinen, Seppanen), in the management of external knowledge to build innovation capabilities in a medical devices organisation (Nilsson), on the evaluation of the organisational climate through the Intellectual Capital (IC) lens (Carlucci and Schiuma).

The first paper – written by Luca Gastaldi, Emanuele Lettieri, Mariano Corso and Cristina Masella – offers new insights to our understanding about how to solve the quest for systematically improving hospital performance by enhancing and balancing knowledge exploration and knowledge exploitation capabilities through the development of an Electronic Medical Record (EMR). Specifically, through an interpretative, inductive perspective, based on multiple and embedded case studies, three large-sized Italian hospitals have been considered on the basis of their strategies for improving healthcare performance through the development of an EMR by leveraging on their knowledge exploration and knowledge exploitation capabilities.

The aim of the second paper – written by Concetta Cristofaro, Assunta Lacroce, Rocco Reina and Marzia Ventura – is the investigation of role of the Information Systems as mechanisms able to manage the existing and widespread knowledge in health care organisations. Also this paper focuses on EMR – Electronic Medical Record – as a knowledge tool potentially adaptable for managing the operative and informative integration among health operators through the coordination of the existing functional interdependencies.

The third paper – written by Petr Cernohorsky and Jan Voracek – combines areas of health economics, enterprise management and computational economics in a challenging and innovative way to provide evidences about the value of information in the health services market. Its first interesting outcome is the clear experimental evidence justifying the impossibility of purely market-driven control and development of national healthcare system. Furthermore, it is presented a novelty heterogeneous model as a viable tool for analysis of emergent market behaviour enabling evaluation of different public health policies.

The purpose of the fourth paper written by Jussi Myllarniemi, Harri Laihonen Henri Karppinen and Kaisa Seppanen is to analyse the role of information and knowledge in healthcare processes and thereby create basis for practices that would better support the actual service provision. Combining conceptual analysis and empirical findings, knowledge processes and flows are modelled and analyzed in four different use cases that were extracted from two case settings: laboratory and radiology units of a Finnish regional healthcare system.

Susanne Nilsson, in the fifth paper, describes and analyzes the implementation and the use of a systematic and collaborative approach for environmental scanning to support the identification and analysis of opportunities for radical and incremental innovation in a company producing medical devices. The study provide rich multi-level longitudinal empirical data and addresses the current gap in research on how firms are working to create new knowledge improve based on external information and knowledge as means to build innovation capabilities in practice. It specifically contributes to the need to better understand how firms build capabilities to identify opportunities and problems in the early phases of product innovation when aiming to generate both radical and incremental innovations.

Finally, the sixth paper, written by Carlucci and Schiuma, shows how the adoption of an intellectual capital (IC) lens to disentangle and examine organisational climate (OC) in public hospitals can enhance the analysis of components of climate and the identification of initiatives for their effective management. The examination of OC according to an IC based perspective is proposed both as tool for identifying elements of OC which are hindering productivity, reducing effectiveness and quality of HC services and as tool for supporting managers in designing management initiatives aimed to enhance organisational performances by leveraging OC.

4. Final remarks

The relevance of managing knowledge is related to its impact on innovation dynamics and organisational business performance improvement. Nowadays, to get gains, private and public organisations have to be able to transform their knowledge domains into profitable products and services as well as they have to dynamically renew their capabilities. For these purposes, they have to continuously and actively identify, acquire, organise, share, apply and assess their knowledge resources. In this perspective a critical issue for organisations is how to extract and generate the greatest value from these resources. The full potential of knowledge resources is realised when they are efficiently and effectively identified through easy-to use models and frameworks as well as managed through proper knowledge processes.

Although the relevance of the knowledge resources and of the knowledge processes have been extensively analyzed and discussed in the strategic, organisational and managerial literature, currently the debate on the role of the knowledge resources as well as of the knowledge management processes in HC is still lively. In particular it is critical to outline how knowledge-based factors and knowledge management initiatives affect HC organisational value creation capacity. This special issue has intended to provide new insights about how through managing knowledge-based factors it is possible to enhance innovation dynamics and organisational performance. From different perspectives the papers gathered in this special issue outlined both the frameworks and tools to manage knowledge resources, and the knowledge processes characterizing the management and impact of knowledge resources on HC organisations' performance.

References

- Agrell, A. and Gustafson, R. (1994), "The team climate inventory (TCI) and group innovation: a psychometric test on a Swedish sample of work groups", *Journal of Occupational and Organisational Psychology*, Vol. 67 No. 2, pp. 143-51.
- Bartholomew, K.L., Parcel, G.S., Kok, G. and Gottlieb, N.H. (2001), *Intervention Mapping: Designing Theory – and Evidence-based Health Promotion Programs*, McGraw-Hill, New York, NY.
- Bolton, M.K. (1993), "When is necessity the mother of invention? Organisational innovation in successful and unsuccessful firms", in Cozijnsen, A. and Vrakking, W. (Eds), *Handbook of Innovation Management*, Basil Blackwell, Oxford, pp. 14-41.
- Burgelman, R.A. and Maidique, M.A. (1988), *Strategic Management of Technology and Innovation*, Irwin, Homewood, IL.
- Burns, T.R. and Stalker, G.M. (1961), *The Management of Innovation*, Tavistock Publications, London.
- Burns, L.R. (2002), *The Health Care Value Chain: Producers, Purchasers, and Providers*, Jossey-Bass, San Francisco, CA.
- Carmeli, A. and Tishler, A. (2004), "The relationships between intangible organisational elements and organisational performance", *Strategic Management Journal*, Vol. 25 No. 13, pp. 125-778.
- Chiesa, V., Coughlan, P. and Voss, A. (1996), "Development of a technical innovation audit", *Journal of Product Innovation Management*, Vol. 13 No. 2, pp. 105-36.
- Clark, K.B. and Fujimoto, T. (1991), *Product Development Performance*, Harvard Business School Press, Boston, MA.
- Cohen, J. and Levinthal, D.A. (1990), "Absorptive capacity: a new perspective of learning and innovation", *Administrative Science Quarterly*, Vol. 35 No. 1, pp. 554-71.
- Coopey, J., Keegan, O. and Emler, N. (1998), "Managers' innovations and the structuration of organisations", *Journal of Management Studies*, Vol. 35 No. 3, pp. 263-84.
- Daft, R. (1978), "A dual-core model of organisational innovation", *Academy of Management Journal*, Vol. 21 No. 2, pp. 193-210.
- Damanpour, F. (1991), "Organisational innovation: a meta-analysis of effects of determinants and moderators", *Academy of Management Journal*, Vol. 34 No. 3, pp. 555-90.
- Djellal, F. and Gallouj, F. (2005), "Mapping innovation dynamics in hospitals", *Research Policy*, Vol. 34 No. 6, pp. 817-35.
- Dougherty, D. (1992), "A practice-centered model of organisational renewal through product innovation", *Strategic Management Journal*, Vol. 13, S1, pp. 77-92.
- Fleuren, M.A.H., Wiefferink, C.H. and Paulussen, T.G.W.M. (2002), *Determinants of Innovations in Health Care Organisations*, TNO Prevention and Health, Leiden.
- Grant, R.M. (1996), "Toward a knowledge-based theory of the firm", *Strategic Management Journal*, Vol. 17, S2, pp. 109-22.
- Grol, R. and Wensing, M. (2001), *Implementation. Effective Change in Patient Care*, Elsevier, Maarssen.
- Gupta, K.S. (2008), "A comparative analysis of knowledge sharing climate", *Knowledge and Process Management*, Vol. 15 No. 3, pp. 186-95.
- Habersam, M. and Piber, M. (2003), "Exploring intellectual capital in hospitals: two qualitative case studies in Italy and Austria", *European Accounting Review*, Vol. 12 No. 4, pp. 753-79.
- Hamel, G. (1998), "Strategy innovation and the quest for value", *Sloan Management Review*, pp. 7-14.
- Hannan, M.T. and Freeman, J.H. (1977), "The population ecology of organisations", *American Journal of Sociology*, Vol. 82 No. 5, pp. 929-64.
- Howie, J.N. and Erickson, M. (2002), "Acute care nurse practitioners: creating and implementing a model of care for an inpatient general medical service", *American Journal of Critical Care*, Vol. 11 No. 5, pp. 448-58.

- Huntington, J., Gillam, S. and Rosen, R. (2000), "Organisational development for clinical governance", *British Medical Journal*, Vol. 321, pp. 679-82.
- Kang, S-C. and Snell, S.A. (2009), "Intellectual capital architectures and ambidextrous learning: a framework for human resource management", *Journal of Management Studies*, Vol. 46 No. 1, pp. 65-92.
- Kang, S-C., Morris, S.S. and Snell, S.A. (2007), "Relational archetypes, organisational learning and value creation: extending the human resource architecture", *Academy of Management Review*, Vol. 32 No. 1, pp. 236-56.
- Kanter, R.M. (1983), *The Change Masters*, Simon & Schuster, New York, NY.
- Kim, W.C. and Mauborgne, R. (1999), "Strategy, value innovation and the knowledge economy", *Sloan Management Review*, Vol. 40 No. 3, pp. 41-54.
- King, N. (1992), "Modelling the innovation process: an empirical comparison of approaches", *Journal of Occupational and Organisational Psychology*, Vol. 65 No. 2, pp. 89-100.
- Kleinschmidt, E.J. and Cooper, R.G. (1991), "The impact of product innovativeness on performance", *Journal of Product Innovation Management*, Vol. 8 No. 4, pp. 240-51.
- Koput, K. (1997), "A chaotic model of innovative search: some answers, many questions", *Organisation Science*, Vol. 8 No. 5, pp. 528-42.
- Lämsäalmi, H., Kivimäki, M., Aalto, P. and Ruoranen, R. (2006), "Innovation in healthcare: a systematic review of recent research", *Nursing Science Quarterly*, Vol. 19 No. 1, pp. 66-72.
- Lawson, B. and Samson, D. (2001), "Developing innovation capability in organisations: a dynamic capabilities approach", *International Journal of Innovation Management*, Vol. 5 No. 3, pp. 377-400.
- Leonard, D. and Sensiper, S. (1998), "The role of tacit knowledge in group innovation", *California Management Review*, Vol. 40 No. 3, pp. 112-32.
- McAdam, R. and McClelland, J. (2002), "Individual and team-based idea generation within innovation management: organisational and research agendas", *European Journal of Innovation Management*, Vol. 5 No. 2, pp. 86-97.
- Marr, B., Schiuma, G. and Neely, A. (2004), "The dynamics of value creation: mapping your intellectual performance drivers", *Journal of Intellectual Capital*, Vol. 5 No. 2, pp. 312-25.
- Mingers, J. (1990), "The philosophical implications of Maturana's cognitive theories", *Systems Practice and Action Research*, Vol. 3 No. 6, pp. 569-84.
- Nahapiet, J. and Ghoshal, S. (1998), "Social capital, intellectual capital, and the organisational advantage", *Academy of Management Review*, Vol. 23 No. 2, pp. 242-66.
- Nelson, R. and Winter, G. (1982), *An Evolutionary Theory of Economic Change*, Belknap Press, Cambridge, MA.
- Nonaka, I. and Takeuchi, H. (1995), *The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation*, Oxford University Press, New York, NY.
- Omachonu, V.K. and Einspruch, N.G. (2010), "Innovation in healthcare delivery systems: a conceptual framework", *The Innovation Journal: The Public Sector Innovation Journal*, Vol. 15 No. 1.
- Peng, A., Pike, S. and Roos, G. (2007), "Intellectual capital and performance indicators: Taiwanese healthcare sector", *Journal of Intellectual Capital*, Vol. 8 No. 3, pp. 538-56.
- Pollitt, C. and Bouckaert, G. (2000), *Public Management Reform: A Comparative Analysis*, Oxford University Press, Oxford.
- Ruttan, V.W. (1997), "Induced innovation, evolutionary theory and path dependence: sources of technical change", *Economic Journal*, Vol. 107 No. 444, pp. 1520-9.
- Schiuma, G., Lerro, A. and Sanitate, D. (2008), "Intellectual capital dimensions of Ducati's turnaround – exploring knowledge assets grounding a change management program", *International Journal of Innovation Management*, Vol. 12 No. 2, pp. 161-93.
- Schumpeter, J. (1934), *Theory of Economic Development*, Harvard University Press, Cambridge, MA.

- Subramaniam, M. and Youndt, M.A. (2005), "The influence of intellectual capital on the types of innovative capabilities", *Academy of Management Journal*, Vol. 48 No. 3, pp. 450-63.
- Teece, D.J. (2007), "Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance", *Strategic Management Journal*, Vol. 28 No. 13, pp. 1319-50.
- Teece, D.J. (2000), "Strategies for managing knowledge assets: the role of firm structure and industrial context", *Long Range Planning*, Vol. 33 No. 1, pp. 35-54.
- Tidd, J. (2001), "Innovation management in context: environment, organisational and performance", *International Journal of Management Reviews*, Vol. 3 No. 3, pp. 169-83.
- Tidd, J., Bessant, J. and Pavitt, K. (1997), *Managing Innovation: Integrating Technological, Market and Organisational Change*, John Wiley & Sons, London.
- Van de Ven, A. (1986), "Central problems of the management of innovation", *Management Science*, Vol. 32 No. 5, pp. 590-607.
- Varkey, P., Horne, A. and Bennet, K.E. (2008), "Innovation in health care: a primer", *American Journal of Medical Quality*, Vol. 23, pp. 382-8.
- von Bertalanffy, L. (1962), "General system theory – a critical review", *General Systems Yearbook*, Vol. 7, pp. 1-20.
- Voss, C.A. (1988), "Implementation: a key issue in manufacturing technology, the need for a field of study", *Research Policy*, Vol. 17, pp. 53-63.
- West, M.A. and Farr, J.L. (1989), "Innovation at work, psychological perspectives", *Social Behavior*, Vol. 4 No. 1, pp. 15-30.
- Wolfe, R.A. (1994), "Organisational innovation: review, critique and suggested research directions", *Journal of Management Studies*, Vol. 31 No. 3, pp. 405-31.
- Youndt, M.A. and Snell, S.A. (2004), "Human resource configurations, intellectual capital, and organisational performance", *Journal of Managerial Issues*, Vol. 16 No. 3, pp. 337-60.
- Zaltman, G., Duncan, R. and Holbek, J. (1973), *Innovations and Organizations*, John Wiley & Sons, New York, NY.
- Zigan, K., McFarlane, F. and Desombre, T. (2008), "Intangible resources as performance drivers in European hospitals", *International Journal of Productivity and Performance Management*, Vol. 57 No. 1, pp. 57-71.

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