

The interaction of intellectual capital assets and knowledge management practices in organizational value creation

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Abstract

Purpose – Organizational performance is increasingly grounded on knowledge-related issues. The two key academic discussions addressing knowledge in organizations are the Intellectual Capital (IC) and Knowledge Management (KM) literatures. However, there are very few earlier studies systematically combining these approaches and demonstrating how IC assets and their management mechanisms might interact in organizational value creation. Therefore, the purpose of this paper is to develop and argue a theoretical model depicting the connections between intellectual capital, knowledge management practices and organizational performance outcomes.

Design/methodology/approach – The paper draws on IC and KM literatures to build a theoretical model on how intellectual asset assets and their management practices interact in producing organizational performance. Several conceptual models and related discussion on the interaction of IC and KM practices are put forth.

Findings – Organizational value creation is based on both static (IC assets) and dynamic (KM practices) aspects of organizational knowledge, in various combinations. In this paper, potential interaction effects between IC assets and KM practices in terms of moderation and mediation were conceptually analyzed, and four alternative models were proposed on how the knowledge-based issues affect organizational performance.

Originality/value – By addressing both the “static” asset aspect of IC as well as the “dynamic” perspective of how leveraging IC assets can be enabled by systematic managerial activities, the paper combines the key issues in IC and KM literatures and demonstrates how intangible resources should be managed to produce value. The authors are not aware of any previous studies explicitly combining and distinguishing IC and KM fields to this extent. The paper therefore contributes to the literature on knowledge-based issues in organizations at large and potentially offers a theoretical grounding for many empirical and theoretical future studies.

Practical implications – The paper suggests that organizational value creation is a function of both possessing valuable intangible assets as well as being able to manage these assets systematically. The four models concerning the interaction of IC assets and KM practices in value creation presented in the paper provide managers with tools to reflect about their own thinking model concerning how knowledge produces value in their own firms.

Keywords – Intellectual Capital, Knowledge Management, Knowledge Management Practices, Value Creation, Organizational Performance

Paper type – Conceptual Paper

1 Introduction

Organizational performance is increasingly a knowledge-related issue. The two key academic discussions addressing knowledge in organizations are the literatures of Intellectual Capital (IC) and Knowledge Management (KM). While the first focuses on intangible resources that contribute to value creation (e.g. Edvinsson & Malone 1997; Sullivan 1998; Spender et al., 2013), typically in terms of human, structural and relational capital assets governed by an organization (e.g. Bontis 2001; Guthrie 2001), the latter concentrates on the knowledge-related processes and management activities in firms (e.g. Gold et al 2001; Lee & Choi 2003; Heisig 2010).

In other words, the IC literature examines the kind of intangible resources there are in firms, while the KM literature addresses the mechanisms by which these resources can be controlled and managed. In order to understand more about how knowledge-based value is created, it would be most useful to understand the interaction of both of these aspects. However, even though there is a great deal of research on IC and KM fields separately, there are very few earlier studies systematically combining these approaches and demonstrating how IC assets and their management mechanisms might interact in value creation.

In fact, this separation between these literatures has led to a conceptual as well as empirical ambiguity. First, there are two types of interpretations on IC; those that conceptualize it as passive, measurable, categorizable assets (e.g. Brooking, 1996; Stewart 1997; Petty & Guthrie 2000; Gu & Lev 2001) or also more dynamic activity including also process or capability perspective more or less explicitly (e.g. Edvinsson & Malone 1997; Roos et al. 1998; Bontis 1999; Meritum project 2002). In the case of latter interpretation of IC, there is a concrete overlap with KM practices which describe process and activity issues. Second, there is ambiguity over the role of knowledge as an asset or “capital” which can be managed or knowledge itself as a value-creating process, integrated into management practice of the organization. Therefore, *the purpose of this paper is to conceptually distinguish between the concepts of intellectual capital and knowledge management practices, and examine their roles in organizational value creation and performance.*

In this article, it is suggested that IC could be examined from static perspective – i.e. as a raw material for organizational value creation, especially when simultaneously coupled with the analysis of the organizational processes that help to create that value. Here, these processes are called KM practices. It is acknowledged that making these distinctions may seem to simplify the complexity of knowledge and knowing in organizations. However, such distinctions may also prove to be valuable in research and practice in providing some level of analytical simplicity to untangle the value creation processes related to knowledge in organizations.

In the remainder of the study, the nature of knowledge is discussed as an asset or a resource on the one hand, and as a value-creating management process or a practice on the other, building on the distinction between the “static” asset aspect of IC as well as the “dynamic” perspective of IC (Kianto 2007). Then the ways in which IC assets and KM practices might interact in order to produce value for the firm are examined. The study concludes with presenting implications of the argument for future studies on IC and KM, and for practitioners aiming to improve the knowledge-based performance of their organizations.

2 Intellectual capital assets and knowledge management practices

The basic tenet of the knowledge-based view of the firm is that performance differences among firms accrue due to their differing assets and management mechanisms of knowledge. For example, Kogut and Zander (1992), Grant (1996), and Eisenhardt and Santos (2001) distinguish between knowledge and the capabilities to manage it as the key bases of organizational value creation. Ultimately, this distinction goes back to the separation between structure and process or parts and motions, underlying much of the current management and organizational research.

These two key aspects of knowledge-based organizing, *stocks* of knowledge assets or resources and knowledge management *practices*, have been most profoundly addressed by two key related literatures: the Intellectual Capital (IC) literature and the Knowledge Management (KM) literature. While the first focuses on intangible resources that contribute to value creation (e.g. Edvinsson & Malone 1997; Sullivan 1998), typically in terms of human, structural and relational capital assets governed by an organization (e.g. Bontis 2001; Guthrie 2001), the latter concentrates on the knowledge-related processes and management activities in firms (e.g. Gold et al 2001; Lee & Choi 2003; Heisig 2010). The difference between the knowledge resource stocks and knowledge management practices has also been discussed in terms of the static and dynamic aspects of IC (Kianto 2007).

Specifically, intellectual capital can be defined as "the possession of the knowledge, applied experience, organizational technology, customer relationships and professional skills that provide a company with a competitive edge in the market" (Edvinsson & Malone, 1997). According to another definition, intellectual capital consists of "knowledge-based resources that contribute to the sustained competitive advantage of the firm," or simply "knowledge that can be converted into profits" (Sullivan, 1998). To recap, the overall intellectual capital can be defined as the sum of all of the intangible and knowledge-related resources that an organization is able to use in its productive processes in the attempt to create value.

2.1 *Static view: Intellectual capital as asset/stock categories*

Normatively, in most studies IC has been seen to consist of three elements: human capital, structural capital and relational capital. Thus it has been seen to include the human skills, expertise and motivation; the structural features of production embedded in organizational processes, systems, databases, patents and IPs; the relationship networks the organization is able to draw upon.. However, according to recent studies, there are also other dimensions that could be seen as parts of IC: "renewal capital" in terms of innovative solutions, products and services available for the firm (e.g. Kianto, 2008) "trust capital", i.e. the trust embedded in its internal and external relationships (e.g. Mayer et al., 1995); and "entrepreneurial capital" i.e. the competence and commitment related to entrepreneurial activities in the organization (e.g. Erikson, 2002). This broad definition of intellectual capital is based upon a wide understanding of knowledge, as not only the explicit outcomes of knowledge-intensive work such as patents, formulae and actualized products, but also as the tacit potential of organizational actors e.g. to react flexibly to unexpected situations and rapidly changing customer demands.

From the perspective of this study, the static view here refers to viewing certain type of knowledge as "capital" in a given point of time. This does not explicitly mean that such a capital could be automatically exploited in organizational value creation. However, it means that such capital exists and can be considered an

asset or a resource available for the organization, and that it can be *potentially useful* in value creation. Thus, this view should be coupled with a dynamic perspective where these assets or stocks are managed over time within the organization.

2.2 *Dynamic view: Knowledge management practices*

However, drawing from the dynamic interpretation of IC (Kianto, 2007) one can argue that IC, or more generally organizational knowledge, is not only about what the organization possesses or has in a given point of time, but it is also about what the organization does. From this perspective a key distinction is that between the level of intellectual capital assets possessed by a firm (e.g. human, structural and relational capital) and the activities conducted for managing them. In this sense, the dynamic perspective draws attention to the *conscious and systematic managerial activities* for dealing with intangibles in a firm. In other words, while the intangible resources controlled by an organization are a key factor determining its value creation potential, the other necessary factor in the equation is the means by which these controlled and managed. For example, proper management methods have the ability to multiply the leverage of intangibles, while conversely, poor management can undermine the value creation potential of even the most skilled workforce with the most developed ICT systems and extensive relationship networks in use. Therefore, the management mechanisms should be analysed to understand the key factors that impact firms' ability to create value based on knowledge.

These systematic management mechanisms of intellectual capital can be called the knowledge management practices of an organization (in the remainder of the study "KM practices"). KM practices refer to the aspects of the organization that can be manipulated and controlled by conscious and intentional management activities (Foss & Michailova, 2009; Andreeva & Kianto, 2012). Accordingly, they are conceptualized in this study as the *set of management activities that enable the firm to deliver value from its intellectual capital*. Following Schumpeter's idea that entrepreneurship is what puts economy into motion, it can be argued that it is management that puts the static assets into motion, and that this provision of the dynamism is the key role of management. Specifically, while there is no established categorization of KM practices as such, the literature has identified several key KM practices that organizations use to leverage their IC assets: 1) Strategic knowledge management practices (Zack 1999), 2) organizational structural arrangements (Hedlund 1994), 3) knowledge-sharing and creation friendly culture (De Long & Fahey 2000), 4) information and communication technology (ICT) practices (Alavi & Leidner 2001), 5) learning mechanisms (Crossan et al. 1999) and 6) human resource management (HRM) practices focused on knowledge (Scarborough 2003) practices, and 7) knowledge protection practices and mechanisms (e.g. Hurmelinna-Laukkanen, 2009).

2.3 *Combining static and dynamic perspectives*

Taking into account the breadth of existing studies, it is rather interesting how few studies have aimed to combine the IC and the KM approaches, or the static and dynamic perspectives on knowledge for understanding organizational value creation and performance. In the background, of course, stands Penrose's (1959) work on the growth of the firm. This can be summarized as arguing that the management team's knowledge leverages the value of resources into the 'services' these assets provide to the firm and hence into profit. She argued that the firm's rate of expansion is limited by the management team's learning, the growth of its knowledge, rather

than by the acquisition of its assets. While Penrose's work seems to have had surprisingly little impact on the IC literature, there are a number of studies underlining that what really produces value for the firm is the interaction of different IC assets and consequently examining the inter-connected flows between different types of IC (e.g. Johnson, 1999; Bontis 1999; Roos et al. 2001; Marr et al. 2004; Reed et al. 2006.). Specifically, these studies tend to argue that various types of IC, such as human, structural and relational capital, influence each other and produce value in synergistic combinations. However, very few studies have taken the idea of dynamics as far as to examine the actual management practices by which the efficient flow, interaction and leverage of IC assets is enabled. On the other hand, while the KM literature includes a multitude of studies examining the impact of a number of the various KM practices on organizational performance (e.g. Gold et al. 2001; Chuang 2004; Darroch 2005; Andreeva & Kianto 2012), the stock of knowledge resources (i.e. IC) on which the management mechanisms are applied has not normally been a focus of concern. To put it rather bluntly, the situation is that either there are studies examining the different organizational assets as such, or the means of their management, but very few studies focusing on how a particular knowledge object has been managed.

In this study a conceptual and theoretical suggestion that IC and KM practices could be coupled in the same analysis was put forward, combining both static and dynamic aspects of knowledge-based value creation. This means treating IC assets as static (in one point of time) and KM practices as processes that provide the dynamism over time. The static treatment of IC assets does not mean that it would not be acknowledged that knowledge is embedded in individuals and processes, and that it would not be constantly evolving. However, what is argued here is that in organizational value creation there are processes available to the organization that can affect the inherent flow and dynamics of the IC assets. The processes are those that can be called KM practices here, and by distinguishing such practices from the IC assets helps to gain more in-depth understanding of what managers can *consciously* do within organizations in improve the value creation based on IC.

3 Interaction of IC assets and KM practices

To conceptually analyze organizational value creation with both static and dynamic perspectives, several possibilities concerning the nature of interaction between IC assets and KM practices are overviewed. For the sake of simplicity, throughout the models "organizational performance" is discussed as an outcome variable, while "value creation" can be seen more as a meta-level concept discussing the whole process. As for organizational performance, a generic perspective is taken here, without distinguishing between different aspects of it. In fact, both financial and innovation-related outcomes of organizational performance have been found to result from the possession IC assets (Bontis & Fitz-Enz 2002; Youndt & Snell 2004; Subramanian & Youndt 2005; Hermans & Kauranen 2005; Wang & Chang 2005; Wu & Hsu 2007; Cabrita & Bontis 2008; Mention & Bontis 2013) or utilization of and KM practices (e.g. Gold et al. 2001; Lee & Choi 2003; Chuang 2004; Gloet & Terziovski 2004; Darroch 2005; Zack et al. 2009; Andreeva & Kianto 2012). Kogut and Zander (1992) propose that value creation through innovation takes place when various types of existing knowledge is combined to generate new applications, and thereby it is the capabilities for combining knowledge that produce and replenish the IC assets of a firm. This can be – and has been – interpreted in various ways in terms of the

nature of interaction between IC assets and KM practices. Next all the possible interactions are discussed, and also their feasibility from both theoretical and empirical perspectives is assessed. In doing this, a division is made between two types of interaction processes: moderating effect and mediating effects. The moderating effect is defined as a third variable's effect that changes the relationship between two related variables, whereas mediation means the effect of third variable intervening between two other related variables (see e.g. Hair et al., 2006).

3.1 Option 1: KM practices moderate the effect of IC assets on organizational performance

The first and perhaps most intuitive option is that *KM practices moderate the effect of IC assets on organizational performance*. The basic thinking here is that IC assets have a potentially positive effect to organizational performance, and that this effect is positively moderated by certain KM practices. The stronger the KM practices, the better they help to leverage the potential performance effects of IC over time. Based on the existing literature, it was possible identify several feasible moderators in terms of theory and empirical measurement. First, the effect of human capital to organizational performance could be moderated intuitively KM-focused human resource management practices, as well as strategic knowledge management practices. Both of these practices take human capital (e.g. skills of employees and teams) into explicit account, and thus their utilization is likely to enable better leveraging of human capital. Second, structural capital is likely to be positively moderated by ICT practices, since in this case the structural issues in organizations (e.g. systems, tools etc.) would be leveraged by practices that pursue to utilize information and communication technologies. Third, it can be assumed that renewal capital's effect on organizational performance is moderated by learning mechanisms, because when those are utilized properly, the potential of the renewal capital will be more likely lead to better performance.

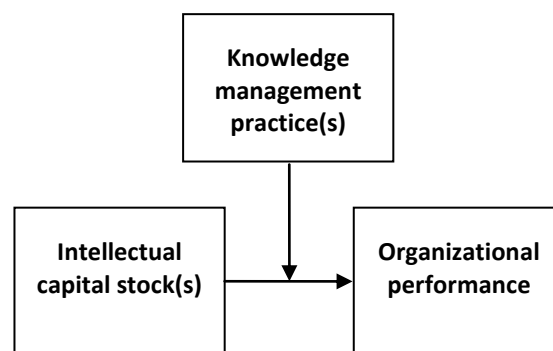


Figure 1. KM practices moderate the effect of IC stocks on organizational performance

3.2 Option 2: IC assets moderate the effect of KM practices on organizational performance

The second option is the *IC practices moderate the effect of KM practices on organizational performance*. Here the intuition is that when KM practices are utilized, their potentially positive effect on performance is increased when more developed IC assets are in use. For example, it has been found by de Castro et al. (2013) that innovation culture (comparable to KM-friendly organizational culture) moderates the relationship between human capital and product innovation. Here, the similar types of IC asset – KM practice "pairs" as suggested in connection to option 1, are likely to be impactful for two reasons. First, moderating effects are calculated empirically the same way as in the first option (as an interaction effect). Second, the same type of thinking broadly applies when the discussion is in better leveraging the available IC assets through KM practices (the first option) or utilizing the KM practices with better IC assets at hand (the second option).

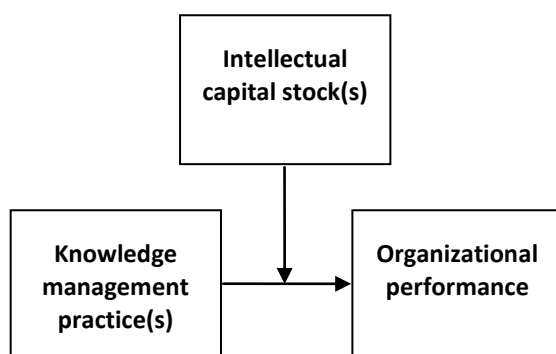


Figure 2. IC stocks moderate the effect of KM practices on organizational performance

3.3 Option 3: Effect of KM practices on organizational performance is mediated by IC assets

The third option is that the *effect of KM practices on organizational performance is mediated by IC assets*. This type of effect implies a dynamic relationship where the utilization of KM practices would either create new or improved levels of knowledge assets (IC assets), leading to increased organizational performance. This means that the value creation efforts linked to managing knowledge with various types of practices would bear fruit over time, and realize as higher levels of various types of IC. For example, Cabello-Medina and colleagues (2011) found that HRM practices (and especially employee empowerment) have a positive effect on innovation performance through mediating effect of human capital. Youndt and Snell (2004) found that IC mediates the impact of HR activities on organizational performance. In addition, according to study by Yang and Lin (2009) intellectual capital (measured as human, relational, and organizational capital) mediated the relationship between HRM practices and organizational performance. These types of transformations in value creation could be considered as a source of long-term organizational performance. Well conducted pursuits to manage knowledge in an organization should have an effect on intellectual capital assets (their level in one point of time or their flow into a direction that creates value). As KM practices and IC assets are epistemologically of a

different genus, this model implies a process of transformation where the active utilization of a set of management practices is over time turned into a more stable set of intellectual capital asset stocks.

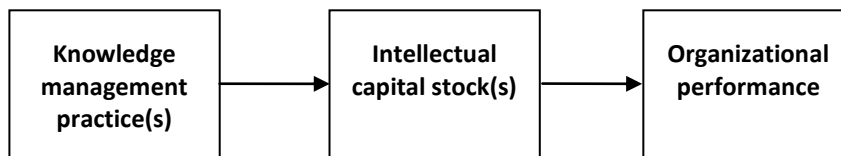


Figure 3. Effect of KM practices on organizational performance is mediated by IC stocks

3.4 Option 4: Effect of IC assets on organizational performance is mediated by KM practices

The fourth option is that *effect of IC assets on organizational performance is mediated by KM practices*. In measurement terms, this means that IC assets would increase the KM practices, which would then increase organizational performance. In causality sense, this option is the most difficult to theorize, as well as measure. An intuitive claim would be that when the organization has high levels of IC (e.g. skilled individuals and lot of relationships), it will increase its capabilities in managing IC over time. In other words, organization having high levels of IC eventually leads to the need to establish practices for managing it, which lead to eventual performance. In this case the effect would take place over time, and would be hard to empirically measure. There are, however, studies that examine the interaction effect from this perspective. For example, Hsu and Sabherwal (2011) suggest that knowledge management capabilities mediate the impact of intellectual capital on firm performance. Specifically, their study of 533 Taiwanese publicly listed companies demonstrated that the impact of organizational capital and social capital on innovation was fully mediated by knowledge enhancement and knowledge utilization capabilities. Also Chien and Chao (2011) found a mediating effect of cross-functional integration and co-production on IC and sale performance. Here the transformation from IC assets to KM practices happens when over time, having a lot of IC assets leads to the need for the firms to establish systematic practices for managing knowledge.

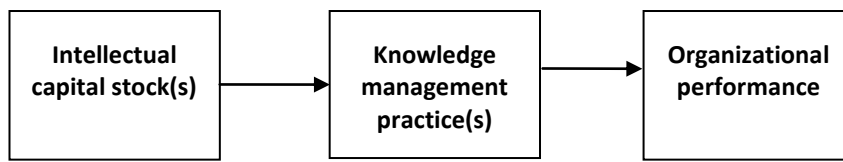


Figure 4. Effect of IC stocks on organizational performance is mediated by KM practices

In sum, several differing conceptual, theoretical and empirical arguments concerning the manner in which IC assets and KM practices could interact in organizational value creation were presented. It is noteworthy they have been discussed from the perspective of static “asset” perspective of IC assets and dynamic “process” perspective of KM practices. These insights could be tested in future empirical studies using various types of models and measurement approaches, to provide support for or - counterargument against - the suggestions presented here.

4 Discussion and implications

This paper addressed an important issue which so far has been relatively overlooked in the IC and KM literature: how different types of intangible assets can be better managed for creating value and organizational performance. The study is an attempt to bring together the two main literatures within the knowledge-based view of organizations: the Intellectual Capital (IC) and Knowledge Management (KM) traditions and to build a conceptual-theoretical bridge between those traditions.

4.1 Theoretical implications

The study contributes to the theoretical discussion in the two fields of IC and KM by demonstrating how the issues dealt within them relate to one another, and thus advances possibilities for gaining a better overall perspective on knowledge-based aspects of organizations. It was argued that there have been fundamental differences in that IC studies have focused on “capital” from a measurable, economist point-of-view (e.g. Stewart 1997; Lev 2000; Pulic 2000), while many KM studies have viewed organizational value creation fundamentally as a process (e.g. Nonaka, 1994; Argote & Ingram 2000; Adams & Lamont 2003; Lee & Choi 2003). The attempt to bridge these differences may be a gargantuan task for one study, but this paper provided one perspective to this. In particular, IC was discussed from static asset perspective (in one point of time) and KM practices as dynamic process perspective – since both of these are needed in organizational value creation, and distinction between them can be helpful for both research and practice of knowledge-based organizing. To provide further clarity to this discussion, potential interaction effects between IC assets and KM practices in terms of moderation and mediation were conceptually analyzed, and four alternative models were proposed on how they affect organizational performance. Some of these models are more feasible than others, but by discussing the full diversity of them, it was hoped to broaden the understanding of the theoretical and empirical possibilities and challenges in the field.

The authors are not aware of previous studies explicitly combining IC and KM fields to this extent. The paper therefore contributes to the literature on knowledge-based issues in organizations at large and potentially offers a theoretical grounding for many empirical and theoretical future studies. The paper contributes to the literatures of intellectual capital and knowledge management in providing a suggestion of a potential distinction and interactions between static and dynamic aspects of organizational knowledge-based value creation. The discussion points to four somewhat distinct discourses – that turn on the assumptions made about the terms being used: While the IC researchers are trying to treat knowledge as ‘capital’ as many economists do - something tradable beyond the individual, the KM researchers are following a very different line – that process yields value. This is a distinction between knowledge as an asset – pure and simple - which can be added to other assets – versus knowledge as a special type of asset that ‘mediates’ ‘normal kinds of resource/assets. The latter points to the idea of management as a term for knowledge as mediating the value of assets, and of capability as “being able to practice”.

And more broadly, this study contributes to organizational and management research in examining the role of knowledge-based resources and processes in organizational value creation. While resources and capabilities are sometimes mixed together in strategic management literature (e.g. Barney, 1991), there are also other perspectives suggesting their separation (e.g. Teece et al., 1997, who put forward a perspective between resources as stocks and capabilities as those processes that modify them). Thus, the view presented here may be complementary to some of the attempts to understand dynamics of resources and capabilities in organizations.

4.2 Practical implications

From a practical perspective, the paper underlined that in order to improve their overall performance, firms should pay attention not only to their intangible resources but also to how these resources are being managed. Specifically, the paper demonstrated what the key intellectual resources of a firm might be, and what kinds of key mechanisms could be used for managing these resources. The four interaction models presented in the paper provide managers with tools to reflect about their own thinking model concerning how knowledge produces value in their own firms.

4.3 Further research directions

The key limitation of the paper is its purely theoretical nature. It should be noted that at this point, the suggestions in the body text represent somewhat tentative attempts to speculate the plausible strong interconnections, rather than fully developed theoretical explanations or empirically-based findings. The key future research paths concern further conceptual and theoretical work on the interconnections and roles between IC assets and KM practices, as well as methodological and empirical efforts to distinguish the effects discussed throughout this study.

First, further theoretical clarification between static and dynamic elements in knowledge-based organizing at large is needed. While an analytical – but unarguably simplistic – division between IC assets and KM practices was put forward, there is space for more foundational discussion on the issue. For instance, if the premise that all knowledge is dynamic over time is accepted, more attention should be given to the discussion of relative frames when knowledge can be measured/assessed as “static” resource, and when it should be treated genuinely as a flow.

Second, the four models concerning the theoretically possible interactions of the IC assets and KM practices should be further studied in different kinds of contexts and empirically. As each of them is theoretically sound, at least from a particular perspective, their applicability in various empirical contexts would shed light to their relative usefulness. Further, the organizational performance outcomes could be measured in various empirical context (e.g. firm-level vs. employee-level performance) or from different viewpoints (accounting, subjective or objective performance etc.).

Third, further research on IC & KM measurement should be conducted to capture the concepts and the levels of analysis suggested in this study. However this requires careful planning of the research design. For example, Wu and Zumbo (2007) state that mediation and moderation are two approaches for refining and understanding causal relationships and empirical investigation for those requires an integrated research design rather than the approach driven by data analysis that is often seen in the literature. This sets some challenges for researchers in terms of causal assumptions and timing of measurement (see e.g. Baron and Kenny, 1986; Hair et al. 2006).

In order to show causality, not only in mediation models, but also in moderation models, variables should be measures in the different points of time. Ideally in the mediation models cause, effect as well as mediator should be measured so that the causality is inevitable. This means that cause is measured prior to the mediator, and mediator prior to effect. In the moderator models, cause should be measured prior to effect and moderator should be ideally measured before either of those, because it is perceived as an “external” contingency variable that has an effect on the strength of relationship between cause and effect. However, in practice moderator effects are often measured at the same time as the cause (but before effect), especially when moderator is not a fixed variable (e.g. industry). Thus, measurement and showing empirical evidence for the four different models above in order to meet most rigorous methodological requirements demands several measurements in different points of time and is in practice impossible within one study or with one data collection.

In addition, in terms of measurement validity of the measure, respondents/source for the data and how to collect performance data are critical in order to empirically test different models. Models contain so many different concepts (i.e. different IC assets, KM practices, and organizational performance) that content and discriminant validities should be assured for example by careful operationalization of the concepts i.e. clearly distinct concepts (e.g. no overlapping items). In addition, so that possibility of common method bias is prevented, the respondents for IC asset, KM practices and organizational performance should not be the same. The most optimum research setting would be for example that IC asset related issues are asked from management, KM practices from the employees, and performance measures are gained as objective data from the databases.

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