



An empirical analysis of the IC Navigator approach in practice – a case study of five manufacturing firms

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Abstract

The literature surrounding Intellectual Capital (IC) theory has grown substantially over the last 10 years with new models, frameworks and approaches introduced for how to manage IC. Yet, the practical implication of deploying IC methods in an organisation and its impact on a firm's business model innovation and decision-making process is relatively unexplored. This paper will review one tool, the IC Navigator approach and its effectiveness as a tool for resource deployment analysis and its impact on a firm's future value creation activities. The paper reports on research that involved five manufacturing firms who participated in an action learning workshop series and particularly the workshop dedicated to using the IC Navigator approach. The usefulness of this model as a tool to reconfiguring a firm's resources, as perceived by the five firms, is examined and findings are presented.

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Introduction

In the current manufacturing environment, value creation and economic success relies less on the production of material goods or tangible assets and more on the creation and manipulation of information, knowledge and ideas (Raj & Seetharaman, 2012). Intellectual Capital (IC) theory has seen substantial developments over the past decade, with new models, frameworks and approaches introduced on how to manage IC (Bontis *et al*, 1999; Brennan & Connell, 2000; Márquez *et al*, 2010; Sveiby, 2010; Raj & Seetharaman, 2012). However, very little is known about the practical implementation of these theories, the potential problems encountered or the benefits as identified by organisations themselves (Dumay, 2009; Lönnqvist *et al*, 2009). The following paper will examine the concept of IC and analyse how one method for resource deployment, the IC Navigator approach, has been used in practice by a selection of manufacturing firms.

While there is no unified definition of IC, many authors offer their interpretation. According to De Pablos (2002), 'intellectual capital is the sum of the hidden resources of the organization not fully captured on the traditional accounting reports'. Steenkamp & Kashyap (2010) define IC as, 'all the assets/resources, elements and capacities that are attributed to an organisation and contribute to the delivery of the organisational strategy, which are not currently recognised and disclosed in the balance

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sheet'. However, while these definitions focus attention on the critically important 'hidden' and 'unrecognised' aspects to define IC, the characteristics of these types of resources are still vaguely described by de-limiting IC as those things that do not appear in accounting financial instruments such as 'accounting reports' or 'balance sheets'. This approach to definition permits confusion when accounting instruments can, in effect, clumsily account for components of intellectual resources such as Intellectual Property (i.e. patents and trademark valuations) or portray hidden value in terms of 'goodwill'. The definition for IC preferred by the authors is the one proposed by Roos *et al* (2005) as 'all nonmonetary and nonphysical resources that are fully or partly controlled by the organization and that contribute to the organization's value creation', which makes much more apparent what is included and excluded as IC with respect to the resources that shape and transform strategy for value creation.

This study uses data obtained during and subsequent to a series of workshops designed to deliver strategies for business model innovation. The concept of the business model draws attention to the activities or activity systems that provide the source of a firm's competitive advantage (Zott *et al*, 2011). Within the workshop series, business model concepts such as value propositions, business ecosystems, technology domains, distribution, supply chain models, cost and revenue models were discussed in detail. Of all the workshops, the single one dedicated to IC using the IC Navigator approach was ranked the second most important from the workshop series by the participants in a follow-up survey. The research presented here is based on further data gathered specifically related to the IC Navigator workshop to determine the effectiveness of the IC Navigator approach as a practical tool for use by firms. The workshop series was organised by an industry association underpinned by a state government initiative, and included a group of 10 manufacturing firms.

Literature review

Using the resource-based view, firms are identified as 'a bundle of resources and capabilities' (Penrose, 1995 [1959]; Wernerfelt, 1984 cited in Peteraf, 2005) and comparative advantage is determined by differences in the resources and capabilities of rival firms (Peteraf, 1993). As classically stated by Kaplan & Norton (1996), 'the information age environment for both manufacturing and service organizations requires new capabilities for competitive successes'. Luo & Tung (2007) argue specifically that integrating and extending original equipment manufacturing (OEM) by offering original design and manufactured goods (ODM) sold by others under their own brand and/or sharing production, partially or wholly, with others to sell goods as original branded manufacture (OBM) can offer advantages such as preserving identify, creating economies of scale, and enhancing international reputation. Such shifts in economic

behaviour can be observed in Australian manufacturing with many organisations moving from a product offering toward a services-oriented offering (Neely, 2009) in an attempt to appropriate more of the value they create.

Many authors have investigated why manufacturers have moved into providing services and from the literature, three key drivers are identified; financial (services provide a new source of revenue); strategic (services are more difficult to replicate and hence, allow greater potential to form competitive advantage); market demand (customers are demanding outcomes that require service delivery) (Levitt, 1983; Wise & Baumgartner, 1999; Oliva & Kallenberg, 2003; Vargo & Lusch, 2004; Windahl *et al*, 2004; Gebauer & Friedli, 2005; Ward & Graves, 2005; Slack, 2005a,b; Schmenner, 2009; Baines *et al*, 2009a,b; Slepnirov *et al*, 2010). Under Stabell & Fjeldstad's (1998) categorisation of value configuration for competitive advantage, such organisations can be said to be moving from the traditional value chain to the value shop model in an attempt to extract the maximum value from their offering. For a firm, the strategic value of capabilities lies in the ability to manipulate resources into value-creating strategies. A dynamic view of resources has focused on capabilities that include organisational and strategic processes like forming alliances and product development (Teece *et al*, 1997; Eisenhardt & Martin, 2000; Salomo *et al*, 2007; Den Hertog *et al*, 2010). Through the optimal deployment of resources, a firm can appropriate more of the value they create.

The management of a firm's intangible resources, regardless of whether it be motivated by financial, strategic or market demand reasons, is considered a key to firm performance (Hurwitz *et al*, 2002); however an organisation's IC is still not often articulated and considered in a systematic and meaningful way (Daniels & Noordhuis, 2005). Of all the methods used in the strategic management domain over the past few decades, those that have had the most impact are those used to measure and report knowledge management and IC (De Pablos, 2002). Studies indicate that successful firms are those who routinely maximise the value from their IC and the key to achieving competitive advantage is through the identification and appropriate deployment of a firm's IC (De Pablos, 2002; Mehralian *et al*, 2012b).

With no universally accepted definition for IC, it makes it problematic when valuing and measuring IC (De Castro *et al*, 2011; Raj & Seetharaman, 2012). However, the measurement of IC has gained importance, given the direct and indirect advantages that can be gained from this (Mehralian *et al*, 2012a). While managers and CEOs have been deploying IC approaches in their strategic decision making for decades, it is perhaps thought to be based on intuition or past experience rather than a grounded model or theory. As stated by Roos *et al* (2005) managers have been 'frequently frustrated in their endeavours to monitor the effectiveness and efficacy of value creation from ... intellectual capital resources'.

Several methods have been proposed to help measure IC and guide decision makers in the allocation of a firm's resources, including the Skandia Navigator, Balanced Score Card and Intangible Asset Monitor (see Sveiby, 2010 for explanation of these and others and Pike & Roos, 2010 for the measurement theory discussion around these). Some critiques of these techniques suggest a lack of clarity and distinction in types of asset, which lead to overlaps (Stewart, 1997; Leliaert *et al*, 2003), and missing components of value creation (McElroy, 2002). However, the IC Navigator model presented by Roos *et al* (2005) classifies resources as 'traditional economic resources (divided into monetary and physical resources) and intellectual capital resources (divided into human, relational, and organizational resources)', both resource classifications include tangible and intangible forms of resources regardless of whether they are captured in accounting instruments. This method draws distinctions between resources by defining differences in marginal utility behaviour to ensure capture of relevant information and avoid overlaps. Table 1 provides a description of each of these resources.

A firm's ability to create value is governed by its ability to effectively deploy its total set of resources, a process also referred to as resource orchestration (Sirmon *et al*, 2011). Value creation, as stated by Roos *et al* (2005), is not achieved just through the possession of the above resources, but through the appropriate deployment of these resources (a structure where one resource can be transformed into another). This transformation concept was first introduced in Roos & Roos (1997) and later operationalised in Roos & Jacobsen (1999).

Roos *et al* (2005) provide an easy way to visualise an organisation's resource portfolio by plotting resources distinguished by economic behaviour in the form of a resource distinction tree (RDT). This process is said to help an organisation to identify, prioritise and evaluate the most important resources necessary for its value creation efforts and is the first step in constructing an IC Navigator. The IC Navigator is a numeric and visual representation of

how management views resource deployment to create value in the organisation (Roos *et al*, 2005, p. 111) and is the approach that is central to this current study. One limitation to be mindful of when using the navigator approach is that the results are dependent on value judgements, that is the choice of the weights and indicators applied to each resource (Bontis *et al*, 1999).

Our intent in this work is to examine how the use of RDT and the development of IC Navigator when applied to cases of action learning influence innovation in the business model and the perceptions and understandings of senior managers of the value-adding potential of the firm's resources when business model innovation is a strategic objective. In effect the research examines two primary research questions:

RQ1: *How does the application of an IC analysis approach influence the business model innovation strategy process?*

RQ2: *How does the application of an IC analysis approach alter understanding and perceptions about the value-adding potential of a firm's resources in formulating a business model innovation strategy?*

Through this study we do not specifically examine the motivations or the implemented changes in business model innovation but instead focus intently on the IC Navigator method, as a tool, its relevance to the process and shaping of outcomes for business model innovation and the influence it has on the cognition of IC by the managers who use the tool as part of the strategy formulation process. The following section explains the methodology employed by the research to gain specific insights that respond to the overarching research questions.

Methodology

A case study analysis involves exploring data from within a specific site through an inductive process (Glaser & Strauss, 1967; Mintzberg, 1979; Eisenhardt, 1989; Gioia & Pitre, 1990; Strauss & Corbin, 1990; Lewis & Grimes,

Table 1 Characteristics of the five resource categories

	<i>Monetary resources</i>	<i>Physical resources</i>	<i>Relational resources</i>	<i>Organisational resources</i>	<i>Human resources</i>
Description	Financial resources that take the form of cash or assets (such as marketable securities) that can easily be converted to pure cash.	Normally what would be found under the heading of plant and equipment on the balance sheet but also assets that have physical characteristics (e.g. any form of physical inventory or for a beer bottle: the paper that the label is printed on, the metal cap, the glass bottle itself as well as the physical liquid that fills it).	Any and all stakeholders that influence the operations of the organisation be they customers, suppliers, donors or local government and pressure groups of the like.	Resources that the organisation has developed or procured and that the organisation legally owns that are not physical in nature, e.g. brands, image, reputation, IP, processes, routines, systems, structures and information in data bases or on paper.	Resources that are unique to the human being such as tacit knowledge, creativity, decisiveness, ability, attitude, motivation etc.

Source: (Roos *et al*, 2005, p. 30).

1999). Case study research is grounded in the interpretive research tradition (Burrell & Morgan, 1992) and this current research draws upon this field of inquiry informed by case study methods (Yin, 1994). The boundaries of the case are defined by the series of workshops and the 10 firms participating in the workshop series. The case research deploys exploratory and interpretive approaches to examine perceptions of the managers by using the principles of Canonical Action Research (CAR). CAR is 'iterative, rigorous and collaborative, involving a focus on both organizational development and the generation of knowledge' (Davison *et al*, 2004, p. 68).

A case study is defined by its in-depth collection and analysis of a range of informing data in order to understand a particular circumstance (Leedy & Ormrod, 2001, p. 157). This includes observations, interviews, and text-based and/or visual documentation. This current research includes the examination of empirical data that include workshop documentation, observations during the workshop, interview notes and reflections provided in follow-up interviews 6 months after the workshop. It should be noted that all three researchers were present at the IC Navigator workshop, which was also video filmed with the participants' permission. However, one researcher acted as a participant observer throughout the entire workshop series and regularly interacted with the workshop participants in the cycle of actions that were driven by the individual workshop topics. The follow-up interviews were carried out over the telephone with one representative of the company, usually the CEO or Managing Director, but in one case a board member. All five telephone interviews were conducted by the same researcher to ensure consistency in data collection. The structured interviews included 12 questions (listed in the Appendix) with the objective to respond to the two overarching research questions by testing a set of propositions that were made apparent during the CAR phase sustained through the workshop series.

Framed by the literature and the informed observations of the participant researcher during the CAR phases, the two research questions prompted the first stage of analysis, which applied a first person action research technique (Reason & Bradbury, 2001; Torbert, 2001) to analyse and distil from observations of the data a set of propositions that may explain the experience of the participants. It is also important to note that first person reflection and learning was enhanced by a second person (group) process of reflection and learning whereby the research team challenged each other researcher's particular assumptions (CHS, 2005). Arising from this analysis was a number of propositions that we sought to test with the participants in the workshop series through the post-workshop interview process. The propositions that evolved were that:

- (a) Participants were not familiar with the tools and techniques of IC analysis although they were likely to

have intuitively incorporated IC considerations into their strategy-making process previously.

- (b) The inclusion of IC analysis would reveal the benefit of increased insight into the value-creating potential of IC resources and would have an impact on how the management teams would go about their strategy-making process in the future.

With respect to understanding and perceptions we also constructed two further propositions, that:

- (a) The IC Navigator analysis caused a reconsideration of the composition and value contribution of the IC portfolio held by the firm.
- (b) There was a shift in approach to the firm's strategy, which would be reflected by actual changes in behaviour with respect to business model innovation.

The first six questions formed an understanding about how their participation in and application of the IC analysis process had influenced their business model innovation strategy. The remaining six questions explored how the application of the IC analysis process altered their understandings and perceptions about the value-adding potential of their firm's resources in formulating a business model innovation strategy. The set of questions is provided as an Appendix.

This approach to validating a set of propositions that surfaced through the CAR provided triangulation of the data by employing two different analytical lenses adopted by the analyst/researchers involved in the project (Leedy & Ormrod, 2001, p. 143). The first is the analysis of the participant observations gained by in-depth engagement in the cycle of actions to conclude a set of insights on the influence of the IC workshop grounded on the observed shifts in behaviour. The second lens was applied by forming a set of structured interview questions and interrogation of transcribed interview data to emerge a number of coded themes. The three researchers then distilled their findings accounting for differences and similarities in their conclusions.

Sample and case study setting

Data have been collected from five Australian-based manufacturers who participated in the case study workshop. This sample size was determined based on the availability of the participants for follow-up surveys. Each participating company nominated three or four people to attend the workshop, who were CEOs, Managing Directors, members of the senior management team, or for one company, board members. The full-day IC Navigator workshop in focus for this research introduced participants to the concept of IC, provided an understanding of organisational resources and their economic behaviour, and stepped through the methodology for using the IC Navigator tool as outlined in Roos *et al* (2005). Table 2 provides a profile of the firms that participated in the study.

Table 2 Profile of manufacturers involved in study

<i>Profile of company</i>			
<i>Industry</i>	<i>Number of employees</i>	<i>Geographic representation and characteristics</i>	<i>Type of company</i>
Automotive sub-supplier	600	Broad customer base includes all major car makers in North America, Europe, Asia and Australia.	Private company (Proprietary Limited) Member of Asian group.
Corrosion Specialist	242	The company has sales offices located in Adelaide, Melbourne, Sydney, Brisbane and Perth, with distributors in Darwin, Townsville, Hobart, and Christchurch (NZ).	ASX Listed since 1970 Australian Public Company
Metals fabricator	55	Based in South Australia	Private company
Refrigeration	300+	Exports to more than 100 countries Manufacturing and sales operations Australia	Private company (Proprietary Limited)
ICT provider	300	Seven locations around Australia; Adelaide, Melbourne, Sydney, Brisbane, Whyalla, Darwin, Tasmania	Private company (Proprietary Limited)

Table 3 Steps that each company followed during workshop process – all approaches were taken from Roos *et al* (2005)

Step 1	Identify the relative importance of the different resources for your organisation's ability to continue to create value (distribute 100 points across the five types of resources).
Step 2	Identify the relative importance of the different transformations for your organisation's ability to create value (distribute 100 points across the five types of resources).
Step 3	Normalise the results in the transformation cells by multiplying each cell with the weight of the resource in the leftmost column and divide the result by 100
Step 4	Add up the rows and columns
Step 5	Divide each row sum with its corresponding column sum and enter the results in the top row.
Step 6	Use the numbers indicated and plot a diagram (example: effector plot)
Step 7	Evaluate the effector plot using a normal distribution assumption to eliminate the small and insignificant resources and transformations.
Step 8	Draw this Navigator in its graphical form Evaluate the Navigator

An overview of the IC Navigator workshop

The IC workshop involved a combination of theory dissemination, real-world examples and practical exercises relating to IC. Throughout the session, individual firms worked within their own groups to implement the theory presented in an effort to undertake their own resource deployment analysis. Each company worked through a series of eight steps (listed in Table 3) to identify the relative importance of their resources; identify the transformations available to create value; plot their findings using an effector plot; and draw an IC Navigator in a graphical form for further analysis.

The thought behind the theory as presented to the participants was that by understanding how they are deploying their resources, the IC management process would allow the organisation to determine if they can directly pursue their chosen business model strategy or if they need to take action (through acquisition of resources or a modified strategy). Knowledge was also presented on

how transformations of resources can generate more value for the firm.

Findings

Our findings suggest that the application of the IC Navigator process has three levels of influence on the business model innovation strategy process and alters understanding and perceptions about the value-adding potential of resources in several ways. This section explains the findings with reference to Table 4, which summarises the findings with reference to Table 4, which summarises the coding, provides a descriptive tag and a sample of coded text that exhibits the code and the number of coded text fragments that relate to that particular code.

In response to our first research question, the primary influence we found was that the IC Navigator provided a practical tool that expanded the strategy development tool kit of the participants. Much of the commentary was centred upon the IC Navigator as a new tool that

Table 4 Coding summary

<i>RQ1: How does the application of an IC analysis approach influence the business model innovation strategy process?</i>			
<i>Coding</i>	<i>Description</i>	<i>Sample text</i>	<i>No. of items coded</i>
<i>Level 1: The practical use of the approach:</i>			
Provided a new tool to facilitate the strategy process	The IC process is now used in conjunction with other strategic planning tools.	'Annual planning day coming up and this will be part of annual review process'.	5
Provided rigour to the strategy process	Removed guess work and provided a means to verify or substantiate what was previously 'gut feel', intuitive or instinctive.	'No it wasn't part of strategy process but we were doing it intuitively. What the workshop has done is put a science into the intuitive process'.	2
Facilitated shared understanding and easier firm transition and adaption	Provided the management team a common understanding and language that made sharing of ideas and communicating plans easier.	'Fortunate to have participating in the workshop the General Manager – Sales & Marketing, General Manager – Resources and General Manager – Systems & Processes. When it came to implementing some of the insights from the workshop, there was an easy transition because we had the right people in the workshop ...'	1
<i>Level 2: Influence on strategy process</i>			
Helped to integrate strategy into the firm and link strategy to resources	Closed the gap between the strategy and the resources needed to employ a strategy.	'... now looking for more of these types of exercises and will continue using in strategic discussions. We have recognised that we need to do a deeper dive. We looked at resources at a high level in the workshop, but we now want to dig down to weighting different types of relational resources'.	5/14*
Exposed and presented alternatives	Broadened horizons and facilitated discussion and decision making on alternate strategic options.	'Helped thinking for process. Joint venture with overseas company which may not have been considered previously'.	5/5*
Accelerated refinement	Made planning somewhat quicker and easier due to the transparency and value creating attributes of the resources to be employed.	'... has helped accelerate our business plan and to refine it'.	1
Changed resource perceptions	Influenced the way resources were considered and what was important about them.	'After the workshop process realised that what we initially thought had changed significantly'.	2
Focused questions	Raised important and critical questions about the existing and proposed strategies.	'How do you grow more than that?'	2
Provided a holistic approach	Added a new dimension that filled a blind spot in strategy development.	'... we have tried to make IC more integrated in our business processes and decision making'.	2
<i>Level 3: Influence on strategy outcomes</i>			
Confirmed strategic choices	The IC navigator process provided a means to confirm [or otherwise] previous choices and new decisions.	'... but the model has endorsed and supported the path that we were already on. The process has reinforced that we are on the right track'.	4
Refocused strategy	Provided a means to re-think a firm's strategy and re-focus future direction.	'So now not only offering [service] but selling solution as a package (so from looking at our resource portfolio, it helped us re-assess our potential offering)'.	3
Shifted industry focus	Participants were more aware of other industry opportunities and the resources needed to capitalise upon them.	'Created [new company] so this company can 'speak a different language' and focus on other activities outside of [current industry]'.	1

Table 4 (continued)

RQ2: How does the application of an IC analysis approach alter understanding and perceptions about the value-adding potential of a firm's resources in formulating a business model innovation strategy?

Coding	Description	Sample text	No. of items coded
Aided decision/drove new initiatives and action	Made decisions clearer with a more refined view about the value-adding potential. Unrealised value suggested new initiatives and, confidence gained in the value-adding potential, drove action.	'We recently were in the position to start up or acquire a new business ... but we decided to acquire [a] business rather than starting up a new one because we understood the value of human and relational resources'.	4/5/7*
Exposed weaknesses	Recognised that particular resources were not valued sufficiently with respect to strategy.	'It showed that we were not constantly managing those relationships – human and relational'.	12
Driving future orientation	Understanding the value adding potential it shifted the focus from what is now to what could be.	'[Company] running well but weighted heavily towards now rather than future'.	6
Highlighted over investment	Showed up where investment in particular resources was not beneficial to strategy.	'Before 80% of effort and time was dedicated to organisation now we are focusing on where we can get more bang for buck. Now spending time on relational resources'.	5
Focused resource priorities	Allowed recognition of the higher value adding resources.	'Very useful to understand where we should dedicate/focus our time and efforts'.	3
Questioned value	Focused questioning of the value of various resources.	'Yes, looking at where value created. Relational (external and internal) and have since simplified structure. People & relational'.	3
Put things in perspective	Allowed relative value among the resources transparent.	'This helped put things into perspective – it's not just about "changing just to change" but it is about having a vision'.	2
Drove change in resource attributes	It meant that the attributes or character of resources were modified when the current value was deemed not in line with strategy.	'Looking for employees with degree, not just tradesman'.	1
<i>Other outcomes</i>			
Raised cultural challenges		'We have had some cultural challenges as with any type of change'.	1
Seeded agent for change		'We have undertaken some acquisitions and using it as a change agent. [New company] is now the change agent and this is where we will be in the future – using it as a seed to grow'.	1

* indicates where multiple codes have been grouped to the single concept.

participants were keen to re-use and apply regularly within their strategic planning process. Adopting the IC Navigator process provided rigour into a process that the participants claimed was always present but intuitive and without a basis for objective judgement. The transparency of the process also facilitated a better and shared understanding of the nature of and relationships between resources and how the resources related to the firm's strategy, which in turn was key to a smooth implementation of strategy. These findings validated our first proposition that the participants had not previously used an IC analysis tool although in some cases they had intuitively included some IC considerations into the strategy-making process.

The second level of influence was located with the strategy process itself afforded by the use of the IC

Navigator. While the first level was concerned with the tool and the usefulness of adopting such a tool in a generic sense, the second level was more isolating of the influence on the strategy process. The IC Navigator was claimed to tightly integrate strategy with resources and vice versa. This aspect helped in underpinning the shared understanding mentioned above as all parties were aware of how the tactical resource manoeuvres were destined to impact on strategic objectives. The process also served to surface new strategic alternatives not previously identified by some of the teams and assisted others to more rapidly refine their business plan than may have otherwise been the case. The process also influenced the perception of resources with respect to how they were considered by the teams to be part of the firm's strategy and what was particularly important about them. The

closer examination of resources was also instrumental in focussing critical questioning about current and proposed strategies and generally filled in a blind spot in the strategy-making process, making the procedure much more holistic in the sense that a more complete understanding was now available that had previously been lacking.

The third level of influence provided by the IC Navigator related to the strategy process outcomes. Some firm teams were reinforced in their resolve about their strategic decisions as the Navigator confirmed their previous 'gut feel' and instinctive strategic choices while others found the tool re-shaped and re-focused their strategy. For one firm in particular it resulted in shifting their industry focus and re-directing some of their attention to new opportunities found in adjacent industry sectors.

These second and third order influences confirmed our second proposition that the IC analysis did reveal benefits to increased insight into the value-creating potential of IC resources. Further, it at least seemed that exposure to the IC Navigator tool would impact strategy-making processes and to some extent the analysis went part way in highlighting changing perceptions and understandings about IC.

The second research question directed the inquiry toward altered understandings and perceptions about the value-added potential of resources as made apparent by application of the IC Navigator. In coding the data in response to this question, we found a second step in the analysis was required. The first level of coding identified the objective changes that were perceptible in the data and the second descriptive step was needed to explain why these changes were observed as supported by the data. In all there were various ways that the application of an IC Navigator analysis produced altered understandings and perceptions.

One of the most predominant shifts in understandings and perceptions was apparent when decisions were taken, new initiatives were adopted or some other actions were implemented that resulted from the IC Navigator work. Drilling deeper into the data revealed that at these points it was the recognition of unrealised value or the confidence gained in recognising the value creation potential that resulted in the sets of actions. The second most frequent observation from the data was when weaknesses were exposed in strategy implementation. Again underlying this realisation was recognition that a particular resource was under-valued by the firm, which resulted in less attention being paid to the resource than it deserved if a particular strategy was to be pursued. Other teams found that adoption of the IC Navigator focus drove them to more clearly adopt a future orientation rather than being locked into the current and day to day management, which was spurred on by recognition of how further value could be extracted from the combination of resources.

Among some teams, a clearer understanding of the value-adding potential of resources revealed that

the investments in some resource categories did not correspond to the importance of the resource causing wasteful over-investment, which added little benefit to strategy. This can be linked to comments by other teams that claimed that the IC Navigator focused their resource priorities on those that could deliver the most value. The comments coded as 'questioned value' and 'put things into perspective' explain how a shift in understanding and perception of the value of resources makes a team much more aware of resource influence and relative importance. An interesting code related to how one firm deliberately set about changing the attributes of a resource once they understood how the resource could be influential to their strategy.

Examination of the data in response to the second research question confirmed the third and fourth propositions that the IC Navigator analysis support a reconsideration of the composition and value contribution of the IC portfolio held by the firm and clear shifts in approach to the firm's strategy and actual changes in behaviour with respect to business model innovation were detectable in the data provided by the interview respondents.

Figure 1 illustrates the key findings highlighting the three levels of influence being a new analytical tool for internal analysis, the insight from the tools application that affects the strategy process, which in turn alters the outcomes of strategic thinking and application.

Two final codes were also observed that did not assist any particular response to the research questions although they were noted as outcomes that were linked to the IC Navigation process. The first relates to how the focus on resources brought about change, which consequently also raised cultural challenges as a result. A second outcome was the initiation of a new firm, which was to spearhead strategic change for firm. Both these observations raise further questions about how the application of the IC Navigator as a resource-based strategy tool is linked to aspects of organisational behaviour and issues of firm change.

Discussion

All five companies found the IC approach and the development of an IC Navigator useful in shifting

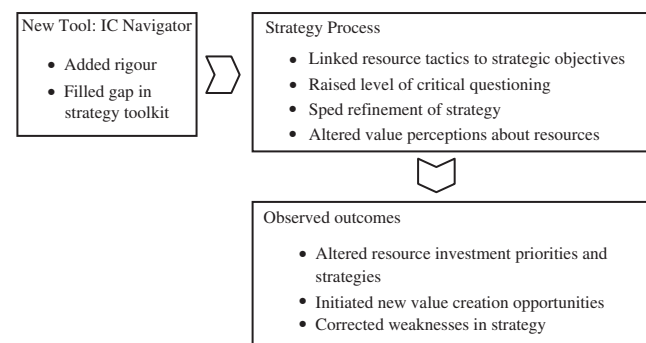


Figure 1 The benefits of introducing the IC Navigator.

their perspective to a better balanced resource view with their externally perceived and focused strategy to shape their future activities. This is consistent with the finding in Roos & Pike (2009). While IC was previously taken into account in strategic planning efforts, it was not an independent criterion but rather submerged into strategy and planning. It was thought that the IC Navigator model and workshop process helped to put rigour into a previously intuitive process. The real benefit (as expressed by the firms) was gained by analysing their resources separately; using the resource criteria of money, physical, relational, organisational and human as provided by Roos *et al* (2005). This benefit manifests in smoother transitions within the firm when strategy changes and adjustments are made. This occurs as the strategic management team can better understand and communicate among and between each other in a similar way to the observations of Paiva *et al* (2008) who found that the when the manufacturing team acquired a higher organisational knowledge, there was better integration of strategic decisions.

For the participating firms all being manufacturing based, relational resources turned out to be heavily weighted as a source for competitive advantage. Human resources also received a high level of attention, which correlates to the premise that manufacturers are trying to move from traditional value chain logic to value shop logic (Stabell & Fjeldstad, 1998), in order to appropriate more of the value they create and also as a consequence of adding service activities to their existing manufacturing activities. These findings were also underpinned from the free flowing discussion in the workshop. The findings align with the analysis of Galbreath (2005) in his study of relative resource importance in 54 different firms.

The analysis of the IC Navigation application as a process also adds to questions about structure. For instance Terziovski (2010) highlighted the need for better understanding of the relationship between structure and a manufacturing firm's innovation performance, which in the past has shown mixed results. One contention that may be drawn from this current analysis is the layer within a firm at which structure is considered. If structure were considered as a homogenous quality of a firm it may be difficult to identify if differences of structure occur at sub-strata within the firm. This case analysis suggests that the discipline of structure and process at the strategy-making level might be highly beneficial but as the shape of the manufacturing sector changes, with respect to adoption of different value logics, the structure of the manufacturing and operations sections may be much more flexible and responsive to strategic change and innovation due to higher reliance on human and relational resources.

The challenges as expressed by the firms in implementing these actions were timing issues, for example, how fast the company should shift their business model without risking existing business, and the cultural challenges faced when implementing any new activities

requiring new knowledge and skills. However, it was also stated that the IC approach helped both to accelerate change and to refine the business model. These findings shed light on how the theoretical concept of IC can be applied and communicated in a meaningful way to deliver practical outcomes for firms seeking new ways and means to innovate.

Although all five companies found the IC Navigator approach very thought-provoking and a tool that they would like to continue to use in their future strategy and planning processes, some companies seemed to lack confidence in their ability to replicate the IC Navigator process on their own (without the workshop facilitator). Another limitation that some companies identified was that there was some uncertainty as to the reliability of the outcomes as the participants were not confident in their initial weighting of their resources. As a complex process that uses subjective data, it is critical that the appropriate members of the company are involved in the process. This also has a dramatic effect on the ability of the company to make the necessary changes in their future resource allocation process.

Two key questions arise from this analysis with respect to when and how the IC Navigator may be a useful tool. With respect to when to use the IC Navigator, Peppard & Rylander (2001) suggest that the Navigator is the visualisation tool of the system of resource interactions. Three steps precede the visualisation; operationalising the value creation, outlining the strategic intent and articulating the value creation pathway. Therefore, the use of the IC Navigator is predicated upon the competitive analysis, situational analysis, the vision and mission of the firm, and the statement of strategic intent, which lead to the strategic choices for the firm. At this point, the firm's challenge is, for a particular strategic intent, to decide an implementation strategy and the set of actions required to test the firm's hypothesis for competitive advantage (Barney & Hesterly, 2010). The use of the IC Navigator, at this time in the strategy formulation process, provides a means to model the investments of the firm in its resources and predict the ability of a particular resource orchestration to create value. Thus, it shortens the firm's implementation time by eliminating some of the trial and error involved in moving toward a competitive advantage. This is quite apparent in the observed outcomes among the researched firms whereby weaknesses were addressed sooner, pathways to value creation were more obvious and errors in strategy were more detectable.

Adopting a resource-based view of internal analysis often considers the relationship between resources and improved efficiencies and effectiveness and/or competitive advantage (Leiblein, 2011). These types of analyses overlook issues of configuration or orchestration of resources and the interactions and transformations that occur among the resources, tangible and intangible, available to a firm. Sirmon *et al* (2011, p. 1404) articulate the complexity of resource orchestration in the statement

'... synchronizing resource orchestration actions across levels is more complex than existing work suggests'. The IC Navigator, by contrast, focuses precisely on the nature of the resources and how they interact in a system configuration or orchestration when focused on achieving the aims of a particular stakeholder's perspective. Therefore, how the IC Navigator is useful is answered when the strategist uses it to comprehend and synchronise the configuration of a firm's resources. In other words it is useful as a resource orchestration design tool.

From this context the usefulness of the IC Navigator is given some boundaries within the strategy formulation and implementation process. However, as a design tool, the application with respect to type and size of firm is unbounded. That is, given that all firms represent a bundle of resources as is suggested by the resource-based view (Penrose, 1995 [1959]), all firms face the same challenge in working out how best to configure their resources in competitive environments, whether new or old, manufacturing or retail, small or large etc. Over the last few years the concept of dynamic capabilities has surfaced, which suggests that while all firms will attempt to uniquely configure their resources for competitive advantage, there is a ubiquitous need to hold the capability that allows a firm to configure and reconfigure their resource base to meet the dynamic demands of a market (Eisenhardt & Martin, 2000). With respect to the usefulness of the IC Navigator it provides a competitive edge in the strategy process that can sharpen the dynamic capability of all firms and focus efforts on unique orchestrations of resources.

Limitations

It should be noted that company participants invested their time and money to attend the workshop series so their willingness to try new tools was high and the decision to implement these could be made on the spot based on their deemed usefulness by the management team. Due to the short amount of time between this study and the original workshop, the authors are unable to quantitatively measure the impact the firm's performance. However, from the qualitative responses received, it

is evident that the workshop process and the introduction of IC theory were influential in achieving practical outcomes.

Conclusion

This research is the first, as far as we know, to examine the practice of deploying IC theory as a strategy tool in an organisation and its impact on a firm's business model innovation and decision-making process. The IC Navigator, as presented by Roos *et al* (2005), was felt to be a powerful diagnostic tool, which shed light on how firms actually operate as well as highlighting the importance of different resources in the firm's future value-creating activities. Future research will need to further validate the long-term effects of the process and closely examine the changes that take place within a firm's system of activities. It is suggested that further research be carried out, specifically looking at the benefits of applying an IC lens (as it relates to the manufacturing environment) and also an investigation into how the values of particular resources may change over a period.

In conclusion, while acknowledging the limitations of our small but focused study, it does suggest that the IC Navigator added rigour to what was previously an intuitive and unsubstantiated approach to thinking about a firm's IC. It effectively filled a gap in the strategy-making toolkit and linked resource tactics to strategic objectives, raised the level of critical questioning and enabled a more rapid refinement of strategy. The IC Navigator altered value perceptions about resources by the management team and enabled more confident resource investment decisions and helped to initiate new value-creating opportunities while simultaneously correcting weaknesses identified in current strategies. IC analysis was well received by the firms included in this research and was generally considered a useful and valuable addition to making use of resource-based theory. More particularly the IC Navigator appeared to be an important technique that enhanced the abilities of a firm to examine and simulate experiments in resource orchestrations to find the high value-creating pathways and more focussed strategies.

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Appendix

List of 12 questions for telephone interviews on intellectual capital (IC)

The objective of this research is to respond to two overarching research questions:

- (1) How does the application of an IC analysis approach influence the business model innovation strategy process?
- (2) How does the application of an IC analysis approach alter understanding and perceptions about the value-adding potential of a firm's resources in formulating a business model innovation strategy?

Interview questions:

Note: The following closed questions were used to verify observations.

First we would like to understand how your participation in and application of the IC analysis process has influenced your business model innovation strategy.

- (1) Can you please briefly describe your business model prior to the IC analysis workshop series and how it has changed since participating in the series?
- (2) How familiar were you and your group with the concept of IC before the workshop process? / Had you

undertaken similar exercises before and particularly have they been a part of your business model innovation strategy process?

- (3) Did you find the resources distinction tree and weighting process a useful tool to map out your resource portfolio?
- (4) When mapping out your IC resources, what insights did you gain from undertaking the process? What questions did the exercise raise?
- (5) Has your perception of IC and its value in the business model innovation process changed since the workshop process?
- (6) What have been the major challenges and/or limitations (if any) during the process of implementing the IC theory presented in this workshop?

Next we would like to explore how the application of the IC analysis process has altered your understandings and perceptions about the value-adding potential of your firm's resources in formulating a business model innovation strategy.

Referring to your original resource map (depicted during the workshop):

- (1) Looking at your resource portfolio, did you have the right resources, in sufficient quantity and quality to pursue your ultimate business model innovation strategy?
- (2) Have you needed to take action (e.g. acquisition) to alter the profile of your resources before being able to pursue your chosen strategy? Or did you have to modify your strategy?
- (3) Did you find you were getting the maximum value from the resources you had at your disposal?
- (4) Has the value of any particular resources changed after going through this process? For example the value of resources not owned but at your disposal, for instance partner relationships, supplier relationships etc.
- (5) What particular value creating resources does your company have access to that is critical to your business model innovation strategy?
- (6) What actions have you taken (if any), since this workshop (effectiveness analysis/mapping activity etc) in order to innovate the firm's business model?

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