

**BALANCING INTUITION AND RATIONALITY FOR IMPROVING INNOVATION
DECISION-MAKING: THE ROLE OF DESIGN CONSULTANCIES**

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ABSTRACT

To contain risks and increase the profitability of innovation efforts, firms frequently engage in joint innovation activities with external sources of knowledge, like design consultancies. Innovation literature has given limited consideration to the strategic role that design consultancies can play in the innovation efforts of their clients. A plausible explanation reside in the difficulty to assess and quantify the quality of their output, given the intangibility of the output itself and the difficulty of connecting a knowledge-intensive output to clients' performance indicators. By analyse the data from 7 dyadic case studies, we examine design consultancies' impact on their clients' strategic decision-making as a way of capturing their strategic role in clients' innovation efforts. We conclude that design consultancies can influence clients' strategic decisions by enhancing the two main strategic decision-making mechanisms

identified by the literature – rationality and intuition. Design consultancies' impact on strategic decision-making is then transferred to some indicators of innovation performance. Early involvement in problem definition and long term relationships with clients seem to strengthen design professionals' influence.

INTRODUCTION

Prior research has shown that access to external sources of knowledge can result in better new product development (NPD) processes, higher innovativeness and better organizational performance (Barczak, Griffin, and Kahn, 2008; Rothaermel and Deeds, 2004). As a consequence, different forms of knowledge-driven inter-firm collaborations emerged and firms increasingly engaged in activities for accessing knowledge outside their boundaries (Grant and Baden-Fuller, 2004). Given the prominence of the phenomenon, theoretical and empirical research has quickly emerged on knowledge-driven inter-firm collaborations, their causes and consequences (Hagedoorn, 2002).

Design consultancy firms (DC) have progressively established as a key external source of specialized knowledge for firms pursuing successful innovation (Cross, 2004; Hargadon and Sutton, 1997). Despite the increasing size of the DC industry, and the growing amount of activity at the DC-clients interface, both academic research and business practice developed limited knowledge on how to optimize this knowledge-driven collaboration and maximize its innovation outcome.

This lack of progress could be ascertained to some DCs' intrinsic characteristics, which are typical of professional service firms (PSF) (Von Nordenflycht, 2011). PSFs are companies that a) master a substantial body of complex knowledge (expertise), b) rely on this body of knowledge as their main source of revenues, and c) use relatively limited capital assets for producing their outcome. One of the main challenges for PSFs – thus also for DCs – is the issue of transactional ambiguity in PSF-client interaction, which is considered the main reason for scarce theoretical and empirical research on the topic (Alvesson, 2011; Sturdy, 2011). Transactional ambiguity refers to the difficulty of quantifying and assessing the quality of PSFs' output, even after its production and delivery. Since most literature on knowledge-intensive collaborations is based on the measurability of the collaboration output (e.g. patents), it is difficult to conduct empirical research for extending existing theories to PSFs. i.e., to DCs.

This paper attempts to overcome the issue by studying the relationship between DCs and their clients from a strategic decision-making (SDM) perspective. We focus on whether the collaboration with DCs contributes to clients' SDM. We propose that DCs may influence the different mechanisms – i.e., rationality and intuition - through which clients take strategic decisions in NPD strategy and processes (Elbanna and Child, 2007). Given the explorative nature of our research, we use a qualitative empirical approach, and draw conclusions based on 7 dyadic case studies of NPD collaborations between DCs and their clients.

LITERATURE REVIEW

Strategic decision-making research focuses on the processes through which firms take strategic decisions. Strategic decisions are decisions implying high uncertainty in the final outcome, prolonged course of actions, significant resource commitment, and involvement of several decision makers (Eisenhardt and Zbaracki 1992). Decisions typically regarded as 'strategic' include portfolio management, innovation strategy, business diversification, mergers and acquisitions, and organizational change. Different perspectives exist for characterizing the strategic decision-making process (for an overview, see Elbanna, 2006). Given our aim of studying the interplay between intuition and rationality, in this paper we follow the more recent integrative approach, according to which strategic decisions result from the interplay between several mechanisms, including rationality and intuition (Elbanna, 2006; Elbanna and Child, 2007; Kester et al., 2012; Rajagopalan et al., 1998).

We will briefly review the relevant literature on rationality, intuition, and on their relationship. We draw on contributions from both managerial decision-making science and behavioural perspective on strategy, which represent the most active management research fields in our topic of interest.

Rationality

Rationality has been investigated in-depth both theoretically and empirically. Since most empirical studies support a positive effect of rational processes on SDM effectiveness (Dean and Scharfman, 1996; Elbanna and Child, 2007; Miller and Cardinal, 1994; Schwenk and Shrader, 1993), rationality has been established as the mainstream approach to strategic decision-making. Rationality refers to an analytical, systematic and linear decision-making process including the problem identification and formulation, a thorough assessment of all pertinent information, the generation of a set of alternatives, their evaluation in terms of costs and benefits, and, ultimately, a choice based on conscious deliberation (Elbanna, 2006; Janis and Mann, 1977; Schwenk, 1984). Rationality enables individuals to engage in analyses in an attentive manner. However as the degree of accuracy increases, rational decision-making can be slow, time-consuming, and effortful, thus not particularly appropriate to circumstances requiring speed and processing of complex information (Dane and Pratt, 2007). According to the economists' notion of rationality, decision makers aim at achieving maximum rationality by collecting complete information about alternatives and their consequences, and then simply selecting the one maximizing their utility (Elster 1986).

Thus, decision-makers seek to improve the outcome of their decision-making process by gathering more and more information and creating more and more alternatives for their choice (Eisenhardt and Zbaracki, 1992). However, the unrealistic and resource consuming nature of the economic perspective has been challenged by Simon through his notion of bounded rationality (1957). Simon (1957) argued that rationality of decision makers is limited by the information they have, the cognitive limitations of their minds, and the finite amount of time they have to make a decision. In a context of bounded rationality the process of utility maximization is replaced by the logic of *satisficing*, according to which decision-makers opt for the alternative that is good enough rather than the one maximizing their utility. The fundamental concept of bounded rationality (Simon, 1957) has exposed the cognitive limits of decision

makers, and at the same time paved the way to a potential role for non-cognitive processes, such as affect, and – of particular interest to this paper – intuition in SDM.

Intuition

Intuition is a sophisticated decision-making process relying on the chunks of knowledge accumulated by decision-makers over time (Prietula and Simon, 1989), and on their ability of generating solutions by recognizing patterns and making holistic associations (Dane and Pratt, 2007). In an intuitive decision-making process, decision makers consciously recognize a problem through the perception of relevant cues and patterns, non-consciously activate all the cognitive schemas associated to the problem, non-consciously make associations across cognitive schemas, and consciously generate a solution (Dane and Pratt, 2007). A classical example of intuitive decision-making is the behaviour of a medical doctor in an emergency room: he or she perceives some relevant symptoms and, based on accumulated expertise in the form of complex, domain-relevant cognitive schemas, he or she rapidly identifies a single course of action and follows it through without collecting additional information and generating and evaluating multiple alternatives such as in rational decision-making. Thus, similar to rational decision-making, the intuitive process goes through problem definition, analysis and synthesis, but these stages are faster, mostly sub-conscious and deeply intertwined. Additionally, the intuitive process is not random or irrational, but based on experience and a solid and complete grasp of a problem's details (Khatri and Ng, 2000). Expert knowledge is stored in the brain in the form of cognitive schemas, namely cognitive structures representing and sorting knowledge about a concept or a topic, including its attributes and relations among those attributes (Fiske and Taylor, 1991). Experience in a certain domain improves the quality of cognitive schemas, thus making pattern recognition and subsequent intuitive judgement more and more accurate. Another important characteristic of intuition is the affective charge of its judgement, namely the feeling of certitude and the perception that one's intuitions are correct, despite the lack of rational analysis (Shirley and Langan-Fox, 1996).

NPD can be regarded as a set of strategic decisions (Krishnan and Ulrich, 2001). According to different NPD research streams and empirical evidence, both SDM mechanisms – rationality and intuition – seem to coexist during NPD. Specifically, according to the information processing perspective on innovation (Galbraith, 1983), NPD is a process of innovation's uncertainty reduction by collecting and processing as much information as possible through its different stages. Thus, NPD is a rational process and its performance depends on a firm's capability of eliminating the different sources of uncertainty (Moenaert and Souder 1990). Due to time pressure, information processing limits and innovation intrinsic nature, uncertainty cannot be completely eliminated, but rather managed and exploited by recurring to executive judgement, i.e., and intuition-driven decision-making approach (Hodgkinson and Healey, 2011).

Through our empirical study, we aim at providing insights on how the interaction with DCs can improve both decision-making processes in NPD.

METHOD

Given our exploratory aims, we opted for a multiple case study design (Eisenhardt, 1989; Yin, 2003) and studied 7 new product (service) development (NPD) projects. We focussed on NPD projects in which the innovating company hired a DC to provide support in the creation of new products or services.

We used a dyadic approach for our case studies, namely for each case we collected data from (1) interviews with design professionals involved in the selected cases, and (2) interviews with key informants from the company that subcontracted the DC. Additionally, we used secondary sources - project documentation (briefs, reports, presentations, supporting visual material), web sites and informal observations – to complement and triangulate the interviews' data. The interviews were semi-structured and open-ended, with the same interview guide (with some adaptations) for both types of informants. We performed a total of 36 interviews. Table 1 provides summary information regarding NPD projects considered in the cases, informants and interviews.

Table 1 - Description of Case Data

Name	Project description	Interviews	Type of informants
Project A	New services related to public transportation	8 (6 DP, 2 CL)	DP: project manager, 2 strategic designers, creative director, interaction designer, service designer. CL: project manager, marketing director
Project B	New service for a cultural institution	6 (3DP, 3CL)	DP: project manager, 2 strategic designers CL: marketing director, brand manager, service manager
Project C	A portfolio of 100% recycled new products	3 (2PD, 1CL)	DP: 2 strategic designers CL: owner & general manager
Project D	New products for greenhouse lighting	4 (2PD, 2CL)	DP: 1 strategic designer, 1 product designer CL: project manager, R&D manager
Project E	New services for a pharmaceutical company	4 (2PD, 2CL)	DP: 2 strategic designer CL: project manager, service manager
Project F	New bicycle accessories	7 (3DP, 4CL)	DP: project manager, 1 strategic designer, 1 product designer CL: NPD manager, R&D manager, service manager
Project G	New street furniture	4 (2DP, 2CL)	DP: project manager, 1 strategic designer CL: project manager, architect

Notes DP= design professionals CL = innovating company

Data collection

For each case we collected data from three sources: (1) interviews with design professionals involved in the selected cases; (2) interviews with key informants from the company that subcontracted the design consultancy firm and interacted with the design professionals; (3) secondary sources such as project documentation (briefs, reports, presentations, supporting visual material), web sites and informal observations. The interviews were semi-structured and open-ended. The interview guide included four sections: (1) respondent's background, and his/her role in the project; (2) project's content, including objectives and main implementation steps; (3) the interplay between rationality vs intuition during decision making; and (4) an overall assessment of the decision making including its quality, outcome and pitfalls.

Informants: Each case started with interviewing the project leader(s) from both the design professionals and their client, in order to get an overview of the project history. Subsequently we alternated respondents from the two parts, in order to triangulate information, clarifying inconsistencies, and filling-in gaps. We taped and transcribed the interviews, which lasted from 60 to 90 minutes each. After each interview, the interviewer developed field notes, impressions and conclusions to be taken into account in the follow-up interview (Eisenhardt, 1989). In order to avoid respondent biased and unintended social behaviours, we followed the guidelines of Miles and Huberman (1994) by clarifying our study objectives and data collection process to the interviewees, and by ensuring the confidentiality of conversations and results. Since our data collection effort relied heavily on retrospective reports, we followed the suggestions of Miller, Cardinal, and Glick (1997) and Miles and Huberman (1994), and implemented some precautionary and/or corrective actions. First, we selected projects that are still on-going or concluded no longer than one year before the data collection. Second, we encouraged free reporting, allowing respondents to not answer a question if they did not remember clearly. Third, we triangulated answers by asking the same questions to multiple participants. Fourth, we integrated the responses with secondary data, both during and after the interview. For instance, we used projects' presentations and other deliverables (e.g., style books, reports) during the interviews to help respondents recall the collaboration process, and to analyse the usefulness of the deliverables themselves in supporting information processing approaches.

Data analysis

The analysis followed the general approach indicated by Eisenhardt – 'it is the connection with empirical reality that permits the development of a testable, relevant, and valid theory' (1989, p. 532) – and the steps described by Miles and Huberman (1994):

- *Step 1: Using a contact summary sheet and individual case history:* for each interview, one researcher completed a contact summary sheet, recording the main themes, constructs and insights from each interview (Miles and Huberman, 1994). A theme was defined as a topic recurring and/or prominent during the interview, and relevant to the research question. For each case, the researchers subsequently wrote an individual case history, based on the

combination of contact summary sheets and secondary data. We followed up with emails and calls to fill in missing details

- *Step 2: Creating a preliminary list of construct and themes:* The completion of step 1 resulted in a list of unique themes, sub-themes and constructs. Following O'Reilly, Chatman and Caldwell (1991), we required the categories to be non redundant, readable, general, and discriminant. For defining themes, sub-themes and construct we used previous research (whenever possible).
- *Step 3: Cross-case analysis:* We then began cross-case analysis, looking for the extent to which themes and constructs recur in the cases (Eisenhardt and Graeber, 2007). We started the cross-case analysis after most data had been collected in order to preserve the integrity of replication logics across cases (Eisenhardt, 1989; Yin, 1994). We used tables and other cell designs to compare several possible constructs at once (Miles and Huberman, 1994), and numerous case pairings to highlight similarities and differences. The cross case-analysis refined the list elaborated in step, by adding new entries or by collapsing existent entries into others.
- *Step 4: Finding tentative relationships:* from the emerging constructs and themes we established tentative relationships between constructs. We then refined these initial relationships through replication logic, regularly re-examining each case to contrast and validate the occurrence of certain constructs. We also compared relationships and constructs with extant literature to emphasize similarities and differences, increase the internal validity of the results, and refine recurring themes and constructs. The iteration between data, literature and analysis was repeated several times.

FINDINGS

Our findings show that DCs improve clients' NPD decision-making processes by affecting clients' capability of using both rationality and intuition. This impact on clients' NPD decision-making mechanisms can subsequently enhance certain NPD performance indicators. Additionally the impact is stronger in case of long-term relationship between the DC and their client. Our findings are summarized in Table 2 and illustrated in the following paragraphs.

Table 2 - Summary of the Findings

Outcome of the collaboration	Drivers of improvement	Proof quotes
Improved rationality	Clear problem formulation	“They came to us and said that they needed a new website [...] One we found out what kind of organization they were [...] and the technical issues to take into account, we understood the challenges they were facing. We started to propose basic architecture, propose a vision of design, and propose ways to accomplish these quite radical changes. And we proposed that for them to do that, they would have to adopt a different brand [identity]” (Project B, design professional).
	Procedural knowledge	“The structuring part of the process of development that was very much a redox [the design professional], as this sort of chairman of this brainstorm discussion [Their role] in structuring the development of this brand design discussion. I see that as a very important redox [the design professional]” (Project B, client)
	Knowledge brokering	“We are somehow capable to refresh [our client’s] knowledge on a very regular basis. They cannot do that within their own knowledge. There is a lot of what I always call ‘crossovers’. What we learn in one project we can apply in another project. What we learn in a big project for [a big client] we can apply in a project for a small start-up. A lot of what we do is juggling with that knowledge and find the right pack to sell to the client” (Project G, design professional).
Improved intuition	Reducing reliance on intuition	[Referred to customer experience flow as designed by the design professional] I like it because it gives you an overview. It is quite easy to name all the different touch points of an organization in a relatively ordered way, which is for us to identify the weak points in [our service]” (Project E, client).
	Externalizing cognitive maps	“The moment that they came up with the first sketch and design for the website and the paper material was a turning point. Since this network organization was young as well as the people sitting around the table, words could mean anything. But when they started to visualize our words... that was an important communication tool that helped us a lot to get sharper in where we were standing for in that moment” (Project B, client).
Length of relationship	Trust	“[Trust] is a very important feature. That’s necessary because you open up your organization and you are very fragile. If I had the feeling that the [design professional] cannot be trusted [...] the project would not have developed”. (Project B, client).
Improved NPD performance	Speed	“Yes! I think what they do is now completely focused and I think that’s the best thing we achieved. And there is a lot of focus in the company. And if there is focus everything goes easier and faster” (Project B, client)
	Internal coherence	“After we got the assignment [for the development of new services] the first thing we did is to establish the value proposition of the client. [...] At any moment we always had to remind the client of the value proposition, what we were trying to achieve during the project. They are always drifted away by the particular task they are doing or by the daily things” (Project E, design professional)
	External coherence	“And now finally I can see that each new product we developed with [the design professional] fits its product family and it’s suitable for the target group for which we developed” (Project G, client)

DCs' impact on clients' rational processes in NPD decision-making

Our findings show that DCs can impact their clients' decision making in three ways, namely by improving NPD problem formulation, by providing declarative and procedural knowledge, and by extending clients' knowledge through knowledge brokering.

As to the first contribution, our respondents indicated that, due to lack of experience, time constraints or political biases, clients do not have good skills in NPD problem formulation, namely the first, fundamental step of rational decision-making process. For instance, it is not rare that behind a request for a new product design there is a product portfolio or a feasibility problem that the client is not aware of or not willing to recognize. Consequently, problem formulation can be too narrow or even erroneous, thus jeopardizing NPD execution and performance.

As our data show (see Table 2), due to their holistic and associative thinking design professionals are able to help their clients to overcome biased and narrow problem formulations, and make sense of the disparate elements of an ill-defined situation, as it is often the case in NPD projects. Respondents find that time spent in early stages to investigate clients' real needs and to collaboratively (re)define the assignment is invaluable to reduce NPD uncertainty and, thus, to improve the rationality of NPD decision-making.

As to the second contribution to rationality, our findings show that firms generally hire design consultancies to fulfil NPD knowledge voids in product design and engineering (DCs' declarative knowledge). Indeed, when firms use a rational decision-making approach, they strive to consult all the information relevant to the decision area, in order to improve decision alternatives' generation and finally select the optimal one (Elbanna, 2006). Given the uncertainty and the number of knowledge domains affecting strategic decision-making areas (e.g., innovation), firms increasingly turn to external sources – like DCs - to achieve information completeness. As shown by the proof quotes in Table 2, DCs are an external source not only of deliberative knowledge, but also of procedural knowledge, i.e., the strategies, rules, and skills for acquiring, storing, retrieving, and manipulating declarative knowledge (Cantor and Kihlstrom, 1989). In our data, NPD tasks for which DCs provide procedural knowledge include concept definition and its translation into a product design; but also more strategic tasks, like portfolio management and NPD alignment clients' innovation and branding strategy. In these tasks, DCs indicate to the clients the set and sequence of decisions to be taken in order to complete the task in a satisfactory manner.

Additionally, our results suggest that firms increasingly hire DCs because of their knowledge brokering capability – i.e. their capability of learning about potentially useful technologies or product/service solutions by working for clients in multiple industries, and transferring that knowledge into new products/services for industries where there is little or no prior knowledge of these technologies or product/service solutions (Hargadon and Sutton, 1997).

Through knowledge brokering firms gain access not only to DCs' specific knowledge, but also to knowledge domains never regarded as relevant. According to our interviewees, this not only increases available information, but also facilitates the concluding stage of clients' rational decision processes – i.e., the choice of the optimal alternative - since DCs' positive experience in other industries is regarded as valuable evidence for assessing decision alternatives.

Proposition 1: DCs facilitate clients' rational processes in NPD decision-making by (a) improving problem formulation, (b) providing domain specific declarative and procedural knowledge, and (c) generating knowledge brokering.

DCs' impact on clients' intuition processes in NPD decision-making

When asked about DCs' most valuable skills for improving their clients' NPD decision making-processes, respondents on both sides often mentioned DCs' ability of visualizing and materializing issues by means of the drawings, sketches and models that DCs commonly use to support their interpretive processes. According to our respondents, these artefacts help clients to better understand their market and its future direction, to become aware of their core strengths, to detect hidden problems, to comprehend brand associations, and to reduce the perceived uncertainty of developing new offerings.

These examples refer to highly uncertain decision-making areas in NPD and innovation strategy in general, for which firms cannot rely entirely on rational processes, but rather need to turn to intuition synthesis. Using intuition in decision-making is generally regarded as inferior to rational processes (Dane and Pratt, 2007). DCs' material and visual artefacts can both reduce client's reliance on intuitive mechanisms and, when the previous is not possible, improve the quality of intuitive judgement.

Since material and visual artefacts make observable and explicit the mental processes through which individuals within the organization make sense of things (Rafaeli and Vilnai-Yavetz, 2004), choices previously perceived as intuitive become rational, thus reducing decision makers' reliance on intuitive synthesis. Additionally, according to the literature 'expert' intuition could be as good as rationality, and it is achieved when decision makers develop, usually through experience, complex cognitive maps of the decision domain (Dane and Pratt, 2007). By making clients' cognitive maps explicit, designers' material and visual artefacts facilitate the sharing and the explicit learning of NPD-related cognitive maps, thus triggering more effective intuitive judgement when using intuition is unavoidable.

Proposition 2: DCs' visualization and materialization capabilities (a) reduce clients' reliance on intuition in strategic decision-making, and (b) improve clients' effectiveness in intuitive decision-making.

Overall impact on NPD performance

In addition to the specific effects during each step, integrating intuition within a rational decision making process has a cumulative positive effect on the overall process and its outcome.

According to our respondents, an implication of collaborating with DCs is a faster NPD, mainly due to the more focused decision-making and the reduced amount of subsequent mistakes. As a further explanation, based on previously discussed findings, faster NPD is the consequence of the additional deliberative and procedural knowledge provided by the DCs, which lead to a more structured execution of certain NPD tasks. Additionally, reducing clients' reliance on intuition and at the same time helping them developing expert intuition can diminish the chances of wrong decisions, thus the number of mistakes in the implementation.

Respondents also detected an increase in NPD internal coherence as a result of the collaboration with DCs. Internal coherence refers to the coherence across NPD stages, and between NPD strategy and execution. A decision-making process implies taking into account a set of objectives and constraints across different stages. By enabling a sharp and thorough definition of objectives, a clear problem formulation – as facilitated by the collaboration with DCs - is the first step towards internal coherence. Additionally, since by nature design professionals operate by recognizing and maintaining patterns of coherence (Dane and Pratt, 2007), DCs help clients maintaining coherence with their objectives and constraints throughout the entire process. For similar reasons, collaborating with DCs improves the external coherence of the decision process and its outcome, namely NPD fit with other strategic decisions within a company.

Proposition 3: DCs' impact on NPD decision-making increases (a) speed, (b) internal coherence, and (3) external coherence.

Characteristics of the DC-Client relationship: Length of the relationship

All the respondents agreed that DCs' influence on clients' decision-making is higher if there is a long term, trusting relationship. Only after repeated satisfactory transactions clients become aware of the full range of DCs' capabilities, hire them for broader tasks than product design, and ask DCs for their insights on more strategic NPD decisions, such as e.g. concept generation or portfolio management. Developing long-term, trusting relationships is a condition for success in any kind of inter-firm collaboration. However, the issue is particularly relevant for DCs, given the high level of ambiguity and uncertainty associated with the knowledge intensive nature of the design industry (Alvesson, 2011). As explained in the introduction, the DC-client collaboration is characterized by high transactional uncertainty, given the difficulty of assessing the quality of DCs outcomes. Further ambiguity in the relationship is added by the 'institutional uncertainty' characterizing DC industry (Glückler and Armbrüster, 2003), namely uncertainty on DCs' nature and scope, given the lack of formal institutional standards such as professionalization, industry boundaries, and product standards.

Under conditions of uncertainty, partner choices are driven by personal trust based on previous experience (Glückler and Armbrüster 2003). Once established, experience-based trust enables reciprocal and enduring relations, and organizations will tend to increase the volume of transactions with trusted DCs, by making the collaborations more frequent, but also by broadening their scope.

Proposition 4: DCs' impact on clients' intuition and rationality and on the overall NPD decision-making is stronger in long-term DC-client relationships.

Concluding Remarks

By examining 7 dyadic cases of NPD collaborations we found initial evidence of DCs' capability of affecting clients' strategic decision-making in the area of innovation. Specifically, DCs can enhance both client's rationality and intuition - the two core strategic decision-making mechanisms - and some indicators of NPD overall performance. Early

involvement in problem definition and long term relationships with clients seem to strengthen DCs' influence.

In the upcoming months, we plan to extend the analysis in several manners. First, we will collect dyadic data for some additional cases, in order to improve the validity and generalizability of our findings. Additionally, this paper describes the DCs' capability of contributing to their clients' strategic decision-making, but the intensity and effectiveness of the contribution is not yet examined. In our additional data collection we would like to focus on this aspect and draw conclusions on whether DCs play an advisory role in strategic decision-making or replace the clients in making some decisions. Additionally, we would like to add observation of DC-client interaction moments in order to capture additional nuances on how DCs affect their clients' rationality and intuition. Analysing dyadic case studies will culminate in creating and testing a theoretical framework of drivers of effective DC-client collaboration. With effective strategic decision-making as the dependent variable, drivers can include: DCs' skills and capabilities making them able to effectively influence their clients' strategic decision-making; clients' characteristics facilitating the interaction with DCs and the assimilation of DCs' knowledge; and characteristics of the DC-client relationship.

References

- Alvesson, M. 2011. De-essentializing the knowledge intensive firm: Reflections on sceptical research going against the mainstream, *Journal of Management Studies*, 48(7): 1640-1661.
- Barczak, G., Griddin, A., & Kahn, K.B. 2008. PERSPECTIVE: Trends and drivers of success in NPD practices: results of the 2003 PDMA Best Practices Study, *Journal of product Innovation Management*, 26 (1): 3-23.
- Cantor, N., & Kihlstrom, J.F. 1989. Social intelligence and cognitive assessments of personality. In R.S. Wyer & T.K. Srull (Eds.), *Advances in Social Cognition*, vol. 2: 1-60. Hillsdale (NJ): Erlbaum.
- Dane, E. & Pratt, M.G. 2007. Exploring intuition and its role in managerial decision making, *Academy of Management Journal*, 32: 33-54.
- Dean, J.W., Sharfman, M.P. 1996. Does decision making process matter? A study of strategic decision making effectiveness, *Academy of Management Journal*, 39: 368-396.
- Eisenhardt, K.M. 1989. Building theories form case study research, *Academy of Management Review*, 14(4): 532-50.
- Eisenhardt, K.M., & Graebner, M.E. 2007. THeory building from cases: Opportunities and challanges, *Academy of Management Journal*, 50: 25-32.
- Eisenhardt, K.M. & Zbaracki, M.J. 1991. Strategic decision-making, *Strategic Management Journal*, 13:17-37.
- Elbanna, S. 2006. Strategic decision-making: Process perspectives, *International Journal of Management Reviews*, 8: 1-20.
- Elbanna, S., & Child, J. 2007. Influences on strategic decision effectiveness: Development and test of an Integrative Model, *Strategic Management Journal*, 28: 431-453.
- Elster, J. 1986. *Rational Choice*. Oxford, UK: Blackwell.
- Fiske, S.T., & Taylor, S.E. 1991. *Social Cognition* (2nd ed.). New York: McGraw-Hill.
- Galbraith, J.R. 1973. *Designing Complex Organizations*, Boston (MA): Addison-Wesley Longman Publishing Co.
- Glückler, J., & Armbrüster, T. 2003. Bridging uncertainty in management consulting: The mechanisms of trust and networked reputation, *Organization Studies*, 24(2): 269-297.
- Grant, R.M. & Baden-Fuller, C. 2004. A knowledge accessing theory of strategic alliances, *Journal of Management Studies*, 41(1): 61-84.
- Hagedoorn, J. 2002. Inter-firm R&D partnerships: an overview of major trends and patterns since 1960, *Research Policy*, 31: 477-492.
- Hargadon, A., & Sutton R.I. 1997. Technology brokering and innovation in a product development firm, *Administrative Science Quarterly*, 42(4): 716-749.
- Hodgkinson, G.P., & Healey M.P. 2011. Psychological foundations of dynamic capabilities: Reflexion and reflection in strategic management, *Strategic Management Journal*, 32: 1500-1516.
- Janis, I.L., & Mann, L. 1977. *A Psychological Analysis of conflict, choice, and commitment*, London: Cassel & Collier Macmillan.
- Khatri, M.F., & Ng, H.A. 2000. The role of intuition in strategic decision-making, *Human Relations*, 53: 57-86.
- Kester L., Griffin A., Hultink E.J., & Lauche K. 2012. Exploring portfolio decision-making, *Journal of Product Innovation Management*, 28 (5): 641-661.
- Krishnan, V., & Ulrich, K.T. 2001. Product development decisions: A review of the literature, *Management Science*, 47(1): 1-21.

- Moenaert, R.K., & Souder, W.E. 1990. An information transfer model for integrating marketing and R&D personnel in new product development projects, *Journal of Product Innovation Management*, 7(2): 91-107.
- Miles, M.B., & Huberman A.M. 1994. *Qualitative Data Analysis: A Sourcebook of New Methods* (2nd ed.). Beverly Hills, CA: Sage.
- Miller, C.C., & Cardinal, L.B. 1994. Strategic planning and firm performance: A synthesis of more than two decades of research, *Academy of Management Journal*, 30 (6): 1649-1665.
- Miller, C.C., Cardinal, L.B., & Glick, W.H. 1997. Retrospective reports in organizational research: A re-examination of recent evidence, *Academy of Management Journal*, 40: 189.
- O'Reilly, C.A., Chatman, J., & Caldwell, D.F. 1991. People and organizational culture: A profile comparison approach to assessing person-organization fit, *Academy of Management Journal*, 34: 487-516.
- Prietula, M.J., & Simon, H.A. 1989. The experts in your midst, *Harvard Business Review*, 67(1): 120-124.
- Rafaeli A., & Vilnai-Yavetz, I. 2004. Emotions as a connection of physical artefacts and organizations. *Organization Science*, 15(6): 671-686.
- Rajagopalan N., Rasheed A., Datta D.K., Spreitzer G.M. 1998. A multi-theoretic model of strategic decision-making processes. In *Strategic Decisions*, Papadakis V., Barwise P. (eds), Norwell (MA): Kluwer Academic, 229-249.
- Rothaermel, F.T. & Deeds, D.L. 2004. Exploration and exploitation alliances in biotechnology: A system of new product development, *Strategic Management Journal*, 25(3): 201-221.
- Schwenk, C.R. 1984. Cognitive signification processes in strategic decision-making, *Strategic Management Journal*, 5: 111-128.
- Schwenk, C., & Shrader, C.B. 1993. Effects of formal strategic planning on financial performance in small firms: A meta-analysis, *Entrepreneurship: Theory and Practice*, 17(3): 53-64.
- Shirley, D.A., & Langan-Fox, J. 1996. Intuition: A review of the literature, *Psychological Reports*, 79: 563-584.
- Simon, H.A. 1957. *Models of Man*, New York, NY: Wiley.
- Sturdy, A. 2011. Consultancy's consequences? A critical assessment of management consultancy's impact on management, *British Journal of Management*, 22: 517-530.
- Von Nordenflycht, A. 2010. What is a professional service firm? Toward a theory and taxonomy of knowledge intensive firms, *Academy of Management Review*, 35(1): 155-174.
- Yin, R.K. 2003. *Case Study Research: Design and Methods*, 3rd ed., Thousands Oaks, CA: Sage publications.