

Collaborating with Design Consultancy firms for Effective Strategic Decision-Making in New Product Development

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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 analysing 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.

Key words : strategic design, decision-making, rationality, intuition.

Introduction

Knowledge has been identified as the most strategically important of firms' resources (Grant, 1996). To access new knowledge, firms are increasingly engaged in inter-firm collaborations (Grant and Baden-Fuller, 2004). As shown in prior research, 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). 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 themselves as a key external source of specialized knowledge for firms pursuing successful innovation (Cross, 2004; Hargadon and Sutton, 1997). Design consultancy firms can cover all the different design areas, ranging from graphic design, to interior design, architecture or human-computer interaction. In this paper, we focus on product and service design firms that are hired to assist clients in their NPD process.

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.

Strategic Decision-Making Research

SDM 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).

Despite the existence of different views on SDM process (for an overview see Elbanna, 2006), there is agreement on two core mechanisms for taking strategic decisions: rationality and intuition (Elbanna and Child, 2007). Rationality refers to a rational and linear decision making process, which includes problem formulation, collection and evaluation of all relevant information, a comprehensive generation of alternatives, and a consequent assessment and choice (Elbanna, 2006). In intuition-based decision making, decisions are taken on the basis of “affectively charged judgements that arise through rapid, non-conscious and holistic associations” (Dane and Pratt, 2007, p.40).

NPS 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 (Bonoma, 1985). 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.

Insert Table 1

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). To deal with the dyadic data, for each case we attempted to match the answers from the two parts on the different topics, and included in the findings only the issues where there is sufficient agreement between the respondents. Subsequently, we conducted a cross-case comparative content analysis to corroborate patterns emerging in each case and draw conclusions (Eisenhardt, 1989; Miles and Huberman, 1994). This iterative procedure resulted in the propositions discussed in the following paragraphs.

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 illustrated in the following paragraphs.

1. 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.

2. 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.

3. 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.

4. Characteristics of the PSF-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 PSFs' 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.
- Bonoma, T.V., (1985). Case research in marketing: Opportunities, problems, and a process. *Journal of Marketing Research*, 22 (2), 199-208
- 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.
- Eisenhardt, K.M. (1989). Building theories form case study research. *Academy of Management Review*, 14(4), 532-50.
- 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.
- 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. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal* 17, 109-122.
- 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: Reflection and reflection in strategic management. *Strategic Management Journal*, 32, 1500-1516.
- 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.
- Rafaeli A., & Vilnai-Yavetz, I. (2004). Emotions as a connection of physical artefacts and organizations. *Organization Science*, 15(6), 671-686.
- 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.
- 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.

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; IC = innovating company