Discussing a New Direction for Design Management through a New Design Management Audit Framework.

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Abstract: Design management has evolved from the simple view as the management of design projects and processes, to include more upstream responsibilities and skills, at the intersection of design and strategic management. Recent literature highlights the role of design in leading and shaping company strategy, conceiving new business models, and in driving organizational change and renewal. Yet existing tools and frameworks for assessing design management capabilities fall short in catching up with the transition that has been undergoing in the ways design is utilized and managed inside organizations. This paper presents a new *Design Management Audit Framework* that aims to fill the gaps in existing tools by incorporating new capabilities that are increasingly emphasized by the emerging design, design management and strategic management literature. The tool also seeks to provide an answer to the question: "What are the new capabilities to be integrated into design management practices of our future economies?"

Keywords: Design Management, Strategic Design, Design Management Audit

1. Introduction

Inside the ever more demanding conditions that characterize today's competitive landscape, businesses recognize the urgent need to develop new capabilities that can support them in the progress towards a new economy that is centered more and more on knowledge and creativity, and one that requires a growing emphasis on service, experience, knowledge and interaction as on physical products. As a result, organizations are increasingly turning their attention towards design as an important capability that can help them generate innovation and improve business outcomes (Brown, 2009; Brunner et al. 2009; Danish Design Council, 2003; Gemser & Leenders, 2001; Martin, 2009). Inside the next economy, design is expected to sustain its growing significance as a strategic capability, contributing to the generation of better products, services, business models; the creation of powerful consumer connections; and ultimately the improvement of business performance, environmental performance and social welfare.

It is also recognized that in order to attain the contributions that design can offer to a business, organizations need to carry out effective design management practices that must begin with the connection of design to corporate objectives, business strategy and the overall business context. (Bruce & Bessant, 2002; Chiva & Alegre, 2007; 2009; Dumas & Mintzberg, 1989; Gorb & Dumas, 1987). In this respect, development of design management capabilities is a critical organizational learning and capability building process, for firms from both developed and newly industrialized economies of the world, which aim to sustain their competitiveness inside the novel contexts and characteristics of the emerging economic scenery.

As businesses focus on acquiring and developing their design and design management capabilities, they also require effective tools and guides to help them in this significant capability building route. Recognizing this fact, various design management frameworks and audit tools have been put forward to be used as best practice benchmarks and as models for evaluating design and design management practices. However, when reviewed in the light of new perspectives and research that have emerged over the last decade, important gaps can be identified in these tools.

A review regarding the evolution of the design management field reveals that the roles design can undertake has moved past beyond its more traditional boundaries - such as functioning inside the design and development of products and services - and broadened to include more upstream activities, skills and responsibilities related to the overall business context, strategy and organization. Recent literature indicates that design is increasingly undertaking new roles such as restructuring and shaping company strategies; formulating new or improved business models and visions; in driving organizational change and renewal; and participating in organizational cultural change (Borja de Mozota, 2003; Buchanan, 2008; Deserti & Rizzo, 2013; Lee & Evans, 2012; Junginger, 2008; Lockwood, 2011; Ravasi & Lojacono, 2005; Smith, 2008). Similarly, observations regarding design practice reveal that leading design consultancies around the world (e.g. Frog, IDEO and Continuum) have long been including services such as brand strategy, technology strategy, innovation strategy, and business design among their more traditional design services. These developments clearly signify that the influence and contributions of design inside organizations are undergoing a significant expansion, with widened responsibilities for designers and design managers particularly in the context of strategy formulation processes inside organizations.

Although this is the current picture, existing design management audit tools and frameworks somewhat lack to catch up with the emerging contexts and needs. The briefly reviewed outlook provide the grounds to suggest that frameworks regarding the assessment of design management capabilities need to be updated in the light of new perspectives and research that have emerged over the last decade, in order to better accommodate and evaluate the increasing role of design in contributing to strategy formation processes. As an answer to this need, this paper presents a new *Design Management Audit Framework* (DMAF) which integrates new capabilities and responsibilities that are necessary to support the changing and broadening context and roles of design.

2. Theoretical Review

The development of the new *Design Management Audit framework* (DMAF) is grounded on a theoretical review and synthesis of existing literature in design, design management and strategic management, as well as a comparative analysis of existing design management frameworks and audit tools. The following sub-sections briefly present the critical review that was undertaken in these major spheres and how each part contributed to the development of the new audit framework.

2.1 Review of Evolving Design and Design Management Literature

The review in this part informed the development of the new audit tool by providing a comprehensive understanding about how the discourse in design and design management literature evolved with respect to the roles and contributions of design inside organizations. More important, it helped to delineate the breadth of activities, processes and notions that require a consideration in managing design.

The earlier literature predominantly specified the roles of design with respect to areas of actual design practice, depicting design's direct role in the creation of products and services, organizational environments, communications and corporate identity (Blaich & Blaich, 1993; Cooper & Press, 1995; Kotler & Rath, 1984; Lorenz, 1986; Walsh et al., 1992). Scholars highlighted that through the added value and distinctiveness, design generated product/brand differentiation, customer satisfaction, preference and choice (Bloch, 1995). Evidently, these roles were directly tied to design's contribution in improving business performance, in terms of metrics such as sales, exports, market share and turnover, portraying design as a significant tool to improve competitiveness (Gemser & Leenders, 2001; Hertenstein & Platt, 1997; Hertenstein et al. 2005; Roy & Riedel, 1997; Walsh et al. 1992). In this context, design management concerned the management of specific design projects with the ultimate objective of ensuring their successful execution and their contribution to increased business performance.

Other scholars focused on depicting design's role in diverse contexts such as enabling efficiency and speed in terms of product development and production (Trueman & Jobber, 1988; Walsh et al. 1992), understanding user needs (Borja de Mozota, 2003; Veryzer & Borja de Mozota; 2005), creating deeper consumer connections (Noble & Kumar, 2008), and fostering a creative organizational culture (Cooper & Press, 1995). This perspective centered more on the role of design in the context of critical organizational processes, such as production, new product development (NPD), and innovation. In this perspective, academics particularly underlined the communicative and integrative role of design. They described designers as a "bridge", a "connector", a "gatekeeper", an "interface", an "interpreter", a "translator", an "integrator" between different networks of people, different networks of functions, and between different business objectives (Borja de Mozota, 2003; Cooper & Press, 1995; Lorenz, 1986; Trueman & Jobber, 1998; Walsh, 1996; Walsh et al. 1992). The role of "design as a knowledge integrator" (Bertola & Texeira, 2003, p. 183) became increasingly highlighted in the context of NPD (Perks et al., 2005) and innovation processes (Verganti, 2008, Veryzer, 2002; Von Stamm, 2003), with design being characterized as driving the innovation process (Utterback et al., 2006; Verganti, 2008, 2009), as well as contributing to the generation of an environment and culture for innovation to flourish. On the part of design management, these perspectives necessitated a concentration on developing procedures and methods to structure the design and development process, to organize and improve the collaboration between different functional groups, and to assist the generation of a supportive environment for design and innovation.

Recent research adds to these operational and integrative roles of design the dimension of strategy and organizational change by depicting how designers and design processes contribute to strategy formation, renewal and change inside organizations. Research reveals that design can also be a valuable resource in the formation of strategy by helping to define corporate objectives and by providing ideas about business possibilities, new directions and opportunities that can inspire and shape strategy (Chung & Kim, 2011; Francis, 2002; Sanchez, 2006; Weiss, 2002). Scholars also indicate that the process of carrying out design projects, the introduction of design knowledge and skills to the organization, and the continuous application of these skills in the development of new

products and services are observed to incite important indirect effects, such as changes in organizational processes, corporate strategy and organizational culture (Borja de Mozota, 2003; Buchanan, 2008; Deserti & Rizzo, 2013; Junginger, 2008; Lee & Evans, 2012; Lockwood, 2011; Ravasi & Lojacono, 2005; Smith, 2008).

Additionally, the role of design in strategy formation is not limited to new product or service strategies, but can be extended to cover wider business problems and contexts, as well as the overall strategy making process. These new roles for design are also becoming increasingly embraced by management and strategic management scholars under the concepts of design thinking (Brown, 2005; Liedtka, 2000; Liedtka & Ogilvie, 2011; Martin, 2009), design attitude (Bolland & Callopy, 2006) and managing as designing (Bolland & Collopy, 2004). They are informing on the potential of design approaches and methods to reframe business thinking processes and to contribute to solving broader business problems that are beyond the traditional boundaries of design. Therefore, recent perspectives underline the transition taking place in the way design is utilized inside organizations and how this brings about new roles for designers and design managers in terms of strategy and decision-making processes. As Muratovski (2015) identifies "[…] we can see designers successfully contributing to a range of organizations on a strategic level by being involved in decision-making processes and strategic planning" (p. 135).

Parallel to the evolution of the discourse on diverse roles for design inside the organization, the definitions of design management expanded from a focus on project level tasks (See Table 2, definition by Farr, 1965) to organizational and process based responsibilities (See Table 2, definition by Gorb, 1990); and later to the importance of relating design activities and resources to corporate objectives and strategy (See Table 2, definitions by Blaich & Blaich, 1993; Er, 2004; Er & Er, 1996; Design Management Institute, n.d.). These definitions as well as others coming from different scholars and practitioners clearly emphasized the point that effective management of design projects and processes is not sufficient as an end in itself. Beyond the management of design projects, new roles regarding taking part in informing and shaping corporate strategy, in addition to establishing the connection between design activities & resources and corporate objectives & strategy, began to emerge among the primary and fundamental responsibilities under design management (Best, 2006; Cooper & Press, 1995; Cooper et al., 2011; Er, 2005; Turner 2013).

Table 1. Evolving definitions of design management.

Definition of design management	Authors
"Design management is the function of defining a design problem, finding the most suitable designer, and making it possible for him to solve it on time and within a budget."	Farr, 1965, p. 38
"Design management is the effective deployment by line managers of the design resources available to an organisation in the pursuance of its corporate objectives. It is therefore directly concerned with the organisational place of design, with the identification with specific design disciplines which are relevant to the resolution of key management issues, and with the training of managers to use design effectively. "	Gorb, 1990 as cited in Cooper et al., 2011, p. 14.
"the implementation of design as a formal program of activity within a corporation by communicating the relevance of design to long-term corporate goals and coordinating design resources at all levels of corporate activity to achieve the objectives of the corporation"	Blaich and Blaich, 1993, p.13

"design management is the coordination and direction of creative processes in the context of company strategy"	Er and Er, 1996
"the management of the firm's or organization's joint process of experience and thus value creation together with its stakeholders"	Er, 2004
"On a deeper level, design management seeks to link design, innovation, technology, management and customers to provide competitive advantage across the triple bottom line: economic, social/cultural, and environmental factors. It is the art and science of empowering design to enhance collaboration and synergy between "design" and "business" to improve design effectiveness."	Design Management Institute, n.d., para. 2

2.2 An Analysis of Strategic Management Literature and Implications for Design Management

This section aims to review the literature on strategy and strategic management in order to understand different perspectives on strategy making and to draw inferences about the roles of design and design management capabilities in the strategic management of organizations.

In essence, strategy is concerned with the "long term prosperity" of the organization (Pearson, 1990, p. 21). It aims to answer major questions about the ends an organization seeks and what it should do to attain these results. One of the foundational figures in strategic management literature, Alfred D. Chandler (1962) defines strategy as: "the determination of the basic long-term goals of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals" (p. 13). Despite the multiplicity of distinct schools and perspectives, the literature in strategic management revolves around two main groups of thought. They are denoted as: the Market Based View (MBV) (Caves & Porter, 1977; Porter, 1980; 1985), also referred to as the outside-in view, and the Resource Based View (RBV) (Barney, 1991; Penrose, 1959; Peteraf, 1993; Wernerfelt, 1984) or the inside-out view. These two theoretical perspectives provide alternative approaches to explaining the source of competitive advantage, and therefore strategy making, for firms.

From the MBV's perspective, the industry structure is the principal factor "determining the competitive rules of the game as well as the strategies potentially available to the firm" (Porter, 1980, p. 3). Therefore, the fundamental sources for value and competitiveness lie largely on conditions external to the firm. Scholars of the MBV argue that strategy formulation starts with a thorough analysis of industry conditions and based on this analysis, it involves determining a profitable product market position - cost leadership, differentiation or focus (Porter, 1980; 1985) - and then directing all organizational efforts to attaining and sustaining that position. As the MBV has long dominated literature and practice, it is not surprising that especially the early literature in design management has considered the relationship between design and strategy largely through the lens of the MBV. In this context, scholars mostly elaborate on how design can be used in terms of key generic strategies suggested by Porter (1980, 1985) and discuss the role of design in reference to the specific requirements of differentiation, cost leadership and focus strategies (Bruce & Bessant, 2002; Cooper & Press, 1995; Kotler & Rath, 1984, Lorenz, 1986, 1994; Walsh, 1996; Walsh et al., 1992).

Therefore, design and design management capabilities are mostly placed in a subservient role in the context of the MBV. The focus of design management is limited to deploying design resources and capabilities effectively, in order to implement the formulated strategy, by providing "the right product at the right price in the right position at the right point in time" (Francis, 2002, p. 64). As a

result, from this perspective, design management focuses largely on the direct and tangible contributions of design with respect to products, communications, identities and environments, and how these processes and projects can be executed in the light of the chosen product market position. Consequently, MBV brings the emphasis more on the project level tasks in managing design.

On the other hand, scholars of the RBV take an inward looking stance, and consider firm-specific, unique, hard to imitate and hard to substitute resources and capabilities as the main sources of competitive advantage for firms. The enterprise is viewed as a bundle of tangible and intangible resources and capabilities, among which some can constitute the firm's distinctive or core competencies (Amit & Schoemaker, 1993; Barney, 1991; Grant, 1991, 1996; Prahalad & Hamel 1990; Wernerfelt, 1984). These capabilities are developed over long periods of time through firm specific learning processes. Therefore, they are not easily traded or imitated, presenting a more lasting competitive advantage for the enterprise.

Since the 1990s, RBV has gained increasing popularity and diffused rapidly throughout the strategic management literature (Mahoney & Pandian, 1992; Priem & Butler, 2001). Other important concepts and perspectives originated in relation to the RBV, such as dynamic capabilities (Helfat et al., 2007; Teece et al., 1997), organizational learning (Crossan & Berdrow, 2003; Nelson & Winter, 1982), the learning organization (Senge, 1990), knowledge creation (Nonaka & Takeuchi, 1995) and the knowledge based perspective (Grant, 1996a, 1996b; Kogut & Zander, 1992). By turning the focus of strategy, from planning of responses to external market conditions, towards identifying and building valuable internal resources and capabilities, the RBV aligns itself with a more dynamic approach to strategy making. It encourages strategic management to focus on developing distinctive competences (such as, fast product development cycles, superior process and product design, or advanced customer service) in order to create long-lasting sources of competitive advantage.

The influences of the RBV can be observed especially inside the more recent design management literature. Particularly since the late 1990s, design and design management capabilities are increasingly linked to the core notions of the RBV, and explored as strategic resources (Borja de Mozota, 2003; Svengren-Holm, 2011), core competencies (Borja de Mozota, 2003; Svengren-Holm, 2011), and dynamic capabilities (Jevnaker, 1998). Jevnaker (1998) relates design and design management capabilities to the RBV, and specifically elaborates on design management capabilities inside the dynamic capability perspective (Teece et al., 1997). Questioning how design-based competitive advantages are created by firms "not just once, but repeatedly", and how they are developed and sustained over time, Jevnaker (1998) suggests that we consider design management as a set of dynamic capabilities that enable both the exploitation and exploration of design resources. She indicates that in companies that are renowned for their design capabilities, the generation of new designs are "more about nurturing and motivating and combining competencies and expertise, than just administration and control of the assets" (p. 20). Similarly, rooting her discussion in the RBV, Borja de Mozota (2003) analyzes design as a resource; as knowledge, as a source of organizational change and as a core competency. In this discussion, the management and integration capabilities for design emerge as essential capabilities, in order to turn design into a core competency.

The perspectives suggested by the RBV are seen to be highly influential in expanding the traditional conception of design and design management inside an organizational context. Whereas design and design management had conventionally been regarded as subsidiary organizational processes supporting the generation of value, the ideas of the RBV laid the foundations for their consideration as significant resources, capabilities and core competencies, which can become the basis for creating

sustainable competitive advantages, and therefore capabilities that must be developed over time and continually nurtured. Therefore, when considered from this perspective, design management emerges as the administration of design as a learning process; a fundamental capability for organizational knowledge creation (Nonaka & Takeuchi, 1995); and a dynamic capability (Teece et al., 1997) that renews and reconfigures design capabilities, "regenerating both the products and the company" (Borja de Mozota, 2003, p. 160).

Additionally, this approach recognizes design's role not only in the creation of more direct and tangible outcomes, but also in the coordination and development of other significant organizational processes, capabilities and core competencies, such as those related to rapid NPD, design-driven innovation, unique service provision, the creation and development of a creative organizational culture, as well as design's role in strategy formulation, organizational learning and organizational change.

Through this analysis, it is concluded that some important implications of the RBV in terms of design management tasks and responsibilities can be listed as:

- focusing on the integration of design with other business processes and capabilities to generate core competencies,
- continual nurturing of design skills and resources,
- ensuring design's participation in strategic management processes,
- focusing on the integration of outside knowledge through design research capabilities to feed into innovation processes,
- and the generation of a culture and environment supportive of learning as well as design.

2.3 Analysis of Existing Design Management Assessment Tools and Frameworks and Identification of Major Gaps

In the light of inferences gained and arguments put forward in the previous sections, the review in this part focuses on an appraisal of existing tools and audits utilized for assessing design and design management capabilities inside organizations.

The assessment of design and design management capabilities possessed by businesses is a significant subject, valuable for both academic research and business practice. In the most basic sense, the assessment of these capabilities enables businesses to review and discuss how the organization handles design activities and decisions, and to evaluate design processes and outcomes, as well as their effectiveness (Best, 2006; Cooper & Press, 1995). This process establishes awareness about existing routines and shortcomings, and opens up a path for improvement and change. Moreover, these tools and frameworks are also used for research purposes, to explore existing capabilities in organizational, industrial and national contexts, and to understand problems, as well as conditions facilitating good practices in design and design management (See Dickson et al., 1995; Heskett & Liu, 2012; Koostra, 2009; Moultrie et al., 2006; Storvang et al., 2014). Scholars commonly refer to these tools and frameworks under the term *design audit* (Best, 2006; Cooper & Press, 1995), as a broad heading to cover audits regarding every possible area related to design and its management inside an organization.

British Standards Institution (2008) defines audit as a "systematic examination to measure conformity with predetermined requirements" (p. 3). Cooper and Press (1995) indicate:

> "An audit, like any other examination, is basically a research activity, involving asking questions, searching for answers and testing the reliability of those answers in order to gain new knowledge and move forward." (p. 212)

In essence, audits are formed of a list of questions that provide the foundations for "an in-depth analysis of a particular area of importance to the corporation" (Cooper & Press, 1995, p. 190). Inns (2002) explains that the audit process is similar regardless of the subject area; it begins with the identification of areas and activities to be examined; continues with the determination of relevant stakeholders; and using questioning, observation and research methods, assesses the quality and performance of the activity under focus. This is followed by analysis of the results in order to offer recommendations and directions for change (Inns, 2002).

To inform the development of a new design management audit framework, the following design audit tools and design evaluation frameworks were reviewed and analyzed:

- Corporate design sensitivity and design management effectiveness audit by Kotler & Rath (1984)
- Self-assessment of design management skills (Dickson et al., 1995)
- The Design Atlas Audit framework (Design Council, 1999)
- The Design Ladder (Danish Design Center, 2001)
- Design audit tool for evaluating design performance in SMEs (Moultrie et al., 2006)
- Design Management Staircase (Kootstra, 2009)
- A model for design capacity (Heskett & Liu, 2012)
- Design Capacity Model (Storvang et al., 2014)

Among these, except for the Design Ladder by the Danish Design Center (2001), which is suggested only "as a tool for rating a company's use of design", all the other tools either completely target design management capabilities, as in the case of Design Management Effectiveness Audit by Kotler and Rath (1984), Design Management Staircase by Kootstra (2009) and Design Capacity models by Heskett and Liu (2012) and Storvang et al. (2014); or encompass important dimensions regarding design management, as in the case of Design Atlas (Design Council, 1999). Some of these tools are in the form of short self-assessment questionnaires, such as Design Management Effectiveness Audit (Kotler & Rath, 1984), and design skills assessment tool (Dickson et al., 1995). Some are more visual and aim to provide an instant characterization of design management without much concern for a detailed evaluation, such as Design Capacity models by Heskett and Liu (2012) and Storvang et al. (2014). Yet others are more structured and comprehensive, such as the Design Atlas (Design Council, 1999) and Design Management Staircase (Kootstra, 2009), allowing for an extensive and systematic review of design and design management capabilities. However, a closer look reveals that they are found missing in several respects.

As revealed in the previous sections, design management field has evolved from being concerned solely with the organization and management of design projects and corporate wide design activities, to include more upstream activities, skills and responsibilities that emphasize the integration of design strategies and processes with organizational goals and business strategy. Yet existing tools and frameworks are somewhat lacking to provide a satisfactory approach to frame and evaluate design management capabilities that specifically focus on establishing the link between the business context, organizational goals, and company strategies, and the way design is organized, managed and utilized inside organizations.

Secondly, although the literature highlights attaining a higher level of design integration inside the organization among the most critical conditions for effective design management (Borja de Mozota,

2003; Bruce & Bessant, 2001; Dumas & Mintzberg, 1989; Stevens et al., 2009; Topalian, 1990; Turner, 2013), existing tools and frameworks do not provide a way to evaluate design integration inside organizations, such as: design's level of coordination and communication with other business functions and processes; the extent of design activities carried out in different fields, or the level of coordination and coherence between design activities in different domains.

Another critical point is that in the current business context the significance of creativity and knowledge has long been established. This in turn underlines knowledge creation, integration of outside knowledge and organizational learning as extremely critical capabilities for businesses in the generation of competitive advantages. Yet existing tools and frameworks do not provide any dimension concerning how outside knowledge is acquired and integrated in the context of design, for example through processes such as design research, or the establishment of idea and information networks (except for some focus to this issue in Moultrie et al. (2006) in the context of requirements capture through user and competitive research). Neither do they provide a way to review how design and design management capabilities are advanced and renewed inside the organizations, which are highly significant capabilities in connection to organizational learning.

Below is a summary listing of the identified gaps in existing tools for auditing design management capabilities:

- Whether/how organizations integrate design with the wider business context, organizational goals and strategies.
- Whether/how designers, design managers or design consultancies provide input to strategy making processes taking place within the organization.
- Whether/how organizations integrate design with other processes, business functions and their strategies, and ensure their effective coordination and communication.
- Whether/how organizations ensure the coordination of design activities undertaken in different areas.
- Whether/how organizations provide training and learning mediums for design employees.
- Whether/how organizations integrate outside knowledge through activities such as design research, and the establishment and sustenance of information and idea networks.
- Whether/how organizations evaluate design projects as well as the contribution of design to the overall organization.
- Whether/how organizations protect their design based intellectual rights.

3. A New Design Management Audit Framework

In order to fill the gaps that were identified and summarized in the previous section and to update existing tools based on new research and perspectives provided by the evolving literature, a new *Design Management Audit Framework (DMAF)* is developed, which is presented in Table 2 in its brief form.

Design Management Audit Framework consists of 9 major dimensions, in other words capability categories, which altogether define a company's design management capability. These are:

1. Design in Strategy
2. Planning for Design
3. Investments for Design

4. Design Processes
5. Design Organization
6. Research for Design
7. Training and Development for Design
8. Design Integration
9. Culture and Climate for Design

Each capability category further comprises of 2 to 6 items that represent the most significant activities or skills under each category, generating a total of 31 items for reviewing design and design management capabilities inside an organization.

Although with some differences, the 5 categories of Planning for Design, Investments for Design, Design Processes, Design Organization, and Culture for Design, largely overlap with the dimensions included in the Design Atlas (Design Council, 1999) and the Design Management Staircase (Kootstra, 2009) frameworks and constitute the more typical and acknowledged dimensions under design management. Yet the other 4 categories, Design in Strategy, Research for Design, Training and Development for Design and Design Integration, and the respective items under each, are devised to address the aforementioned gaps and are proposed as significant skills and activities that must be included inside an up to date and comprehensive design management system.

Table 2. Design Management Audit Framework (DMAF).

Key Capability Categories	Major Questions
1. Design in Strategy	
Strategy Formulation Process	How effective is the business in strategy formulation? How are strategies formulated in the organization?
Strategic Planning Process	How effective is the business in planning its activities? Are strategies turned into business plans? How is the planning process carried out?
Strategy and Planning Communication	Are business strategies, goals and plans communicated effectively within the organization?
Design in Strategy	Is design included in strategy formulation? How is design positioned inside business strategy and objectives? Is there a defined design strategy?
Design's Input to Strategy Formulation	Is there any form of design/designer/design thinking input in the strategy formulation process? Do design managers or designers contribute to the shaping of business strategy and design objectives?
2. Planning for Design	
Design Planning	Does the business carry out design planning? If yes, how is this done; what types of evaluation and objectives guide the design planning process?
Design Planning Horizons	How far into the future does the organization think when planning for design?
Design Policy and Principles	Is there a formal/established corporate design policy or major notions that guide design? Are there defined design principles?
3. Investments for Design	
General Budget Allocation	Does the business carry out its budget allocation in a structured manner?
Design Budget Allocation	Does the business allocate budgets to design activity? If yes how are decisions regarding design budgets made? Does the business utilize any methods to guide design budget allocation decisions?
4. Design Processes	
General Process Awareness	Does the business identify its activities as processes?
Design Process Awareness	Are design processes recognized and defined inside the organization and in connection with other processes? (ex: design in NPD, marketing, corporate communications)
Design Process Management	Does the business have structured processes for design project management and monitoring? (Time plans, review meetings, documentation, brief formats, cost monitoring)
Design Process Thinking, Methods &	How do design projects/activities proceed? Are structured methods,

Tools	techniques and tools utilized during design processes? (Research, Concept generation, Design development, decision making tools, evaluation of concepts)
Legal Processes for Design	Does the business ensure the legal protection of design based intellectual rights? How is this process managed?
Design Evaluation Processes	Are there structured procedures for evaluating design? (both pre-launch and post-launch, the success of design projects, the contribution of design to profitability, ROI, effectiveness in market?
5. Design Organization	
Design Management Responsibility	Does the business have an assigned management responsibility for design?
Design Skills	Does the business have the necessary skills to carry out design activities? Does the business have a design function? Does it utilize outsourced design capabilities?
Organizing for Design	Does the business effectively organize its (in house and/or outsourced) design activities?
6. Research for Design	
Design Research Programs and Resources	Does the organization carry out design research activities or utilize resources to inform design? (user needs and requirements, market research, user research, demographic and social trends, future trends, lifestyle research, technology, competitors)
Information and Idea Networks	Are there established information and idea networks for design?
7. Training and Development for Design	
General Training and Development	Does the organization carry out training and development programs for its employees?
Nurturing Skills and Creativity of Design Related Personnel	How does the organization nurture the skills, knowledge and creativity of design related personnel/in-house design staff?
8. Design Integration	
Coordination and Communication with Other Business Functions, Strategies and Processes	Are there effective structures and processes for communication and coordination between design and other business functions?
Role and Place of Design	Which processes does design contribute throughout the organization? When does design get involved in these processes? When do design processes start?
Breadth of Design (Design Activities Undertaken in Different Areas)	What are different design activities undertaken throughout the organization?
Coherence and Coordination Between Different Areas of Design	If design is undertaken in different design fields, is there coordination and coherence between design activities undertaken in different areas?
9. Culture and Climate for Design	
Design Awareness & Understanding of Senior Management	Do senior managers have a broad understanding and awareness about how design contributes to the organization?
Design Commitment of Senior Management	How committed are senior managers to design?
Design Attitudes of Employees	How positive are the attitudes to design among the employees?
Environment for Creativity	Is there an environment supporting creativity? Do managers encourage creative experimentation and design?

Additionally, as part of the Design Management Audit Framework, an assessment scale is developed based on the process maturity principle, in the form of a 4 level maturity grid, similar to the approach utilized by the Design Atlas (Design Council, 1999), Design Management Staircase (Kootstra, 2009) and the design audit developed by Moultrie et al. (2006). Maturity grids are widely utilized assessment tools inside management audits (Crosby, 1980; Moultrie et al., 2006). In order to evaluate the level of maturity attained in undertaking a certain activity or skill, maturity grids provide descriptions for the typical behaviors demonstrated by an organization at each level of development, progressing from the lowest level of maturity to the highest. This way, they offer an effective way to summarize the progression of behaviors towards successful practices, as well as indicating an outline for how to improve performance (Moultrie at al., 2006). Descriptions are also intended to improve

objectivity and reduce bias by providing guidance to the auditor. Table 3 presents the assessment scale developed for the capability category Design in Strategy, in the form of a maturity grid.

Table 3. Assessment scale of the Design Management Audit Framework for the capability category Design in Strategy.

	Level 1	Level 2	Level 3	Level 4
Strategy Formulation Process	There is no strategy formulation process.	Strategy understood as setting a few conventional performance targets without the formulation and evaluation of strategic options, no clear, guiding strategic visions.	Business strategies are developed, however with a limited analysis of internal & external factors and strategic options, and the process is not regular and structured.	Business strategies are developed through a structured process, and a detailed analysis of internal and external factors (trends, technology) and promising strategic options.
Strategic Planning Process	There is no business planning process.	Planning is carried out in a limited and unstructured way in a few business areas/functional departments.	Business strategies are turned into detailed business plans in several business areas/functional departments.	Business strategies are turned into business plans through a detailed and structured planning process in all business areas/functional departments, planning is an organization-wide approach that drives the business.
Strategy and Planning Communication	Strategy and business goals and plans are known only by few key individuals.	Business strategies, goals and plans are communicated in an unstructured way to senior management.	Business strategies, goals and plans are communicated in a structured way to senior management but there are problems in their communication to lower levels.	Business strategies, goals and plans are communicated in a structured way, with all company staff receiving relevant information and being updated.
Design in Strategy	Design is not part of strategy formulation or business plans.	Design is sometimes articulated as part of strategies and business plans of other areas like marketing and new product development but as individual projects.	Design is integrated into company strategy and business plans, but under marketing or new product development strategy.	Design is part of company strategy and business plans with a clear design vision, objectives and planning for design, design strategy is linked to other business processes and corporate objectives in various areas.
Design's Input to Strategy Formulation	There is no input from design to strategy formulation or business planning.	Designers and design managers indirectly contribute to strategy and plans through their interaction with key individuals and senior managers.	Designers and/or design managers contribute to strategy and plans however in the lower levels of marketing strategy or design strategy formulation.	Design managers and/or design staff contribute to strategy formulation by taking part in the company's strategy formulation process through structured meetings and processes.

4. Discussions Based on Cases of Practical Application of the Design Management Audit Framework

The framework was applied to audit design management capabilities in 3 large scale organizations, as part of a larger case study research investigating how design and strategy are linked through design management capabilities inside these organizations. Therefore, the organizations were selected based on the objectives of the case study research, where the fundamental concern was to

choose cases that offered the greatest possibility for learning. This condition meant that the companies did not simply use design, but that they showed a discernible and consistent emphasis on design use in connection to their business strategies. As a result, 3 large scale ceramic sanitary ware manufacturers were selected from the Turkish ceramic sanitary ware industry and the audit was undertaken inside a case study research strategy.

With the objective of triangulating the evidence, data was collected through 4 major sources: interviews with key informants; documents, including company documents, books, reports and articles covering the cases under study; direct observations regarding work environments; and physical artifacts, which included the outputs of different design activities carried out by these organizations, such as product designs, retail environments, websites, product catalogues and other marketing and communication materials. Yet, interviews constituted the principal method of data collection, which were carried out with key informants such as design managers/directors, marketing managers/directors, designers, and general managers. The framework established the interview guide, where the list of topics and questions structured under this framework were utilized as the basis of semi-structured interviews, comprising questions of an open ended nature.

Throughout the research, the audit tool demonstrated to be an effective instrument to guide an in-depth analysis of design and design management capabilities inside organizational contexts. It provided a comprehensive basis for evaluating how design activities are managed, allowing the analysis to begin from company's business strategy, strategy formulation and business planning routines. However taking into account the experiences gained while carrying out the audit, several important issues were identified.

Firstly, the audit was employed as a research tool, by one of the authors contacting the companies as an external researcher studying design management capabilities. Unsurprisingly, confidentiality was a major concern on the part of all participants, which was generally observed to increase in relation to a higher position in the management hierarchy. As a result, the application of the audit framework in a research setting at times becomes complicated due to confidentiality reasons. Therefore, it is believed that the tool can be applied more effectively if it is demanded by the organizations themselves, in a setting where the auditor or audit committee would not be perceived as a threat to confidentiality.

Secondly, as mentioned the audit tool is complemented by an assessment scale, which was developed based on a process maturity principle, with 4 different levels of process maturity. The choice of 4 levels was made based on the observation that the 4 level maturity scale has become widely utilized in several models that were devised to evaluate companies' design or design management capability, such as the Design Management Staircase (Kootstra, 2009), the Design Ladder (Danish Design Center, 2001) and the rating scale used in the Design Atlas (Design Council, 1999) audit tool. However, during the assessment of audit findings and the conduction of cross case analysis, a 4 level scale was sometimes found inadequate to provide a precise differentiation, specifically in terms of the variance between capabilities possessed by different companies. Consequently, it is observed that a 4 level assessment scale is useful for providing a broad categorization, but requires additional differentiation to provide a more precise assessment, especially if the audit tool is to be used for a comparative analysis.

Thirdly, some items of the *Design Management Audit Framework* were identified to be more challenging to evaluate due to being more difficult to observe. Especially, the 4 items grouped under the category of *Culture and Climate for Design,* which are *Design Awareness and Understanding of Senior Management*, *Design Commitment of Senior Management*, *Design Attitudes of Employees* and

Environment for Creativity, are more difficult to assess, since different from the other items, they are about attitudes, thoughts and culture existing inside the organization. Consequently, they involve a higher degree of bias and variability depending on the opinions of individual interviewees. Therefore, it is believed that the audit tool will generate more effective results if it can be supplemented by a more pervasive research methodology such as an organization wide survey, regarding items that focus on culture and climate.

Another important issue is that the audit tool needs to be evaluated about how it performs in the context of SMEs, especially with regards to the relevance of the dimension Design in Strategy. Since SMEs have considerable differences from large scale organizations in terms of the availability of resources and with regards to their strategy formulation and strategic management processes, the applicability and relevance of the newly proposed dimensions of the framework must be investigated and understood further in the context of SMEs. Nonetheless, it is believed that these new dimensions have significant value also in the SME context, providing guidance about new capabilities that must be developed to manage design more effectively.

5. Conclusions

Despite design management's broadened roles and responsibilities, existing tools and frameworks that have been developed to audit and assess design management capabilities are lacking to frame and evaluate capabilities that enable the essential connection to be made between an organization's goals, its business strategy and its design practices. Additionally, a more detailed review of literature suggests that it is necessary to expand and update current frameworks in the light of new perspectives and research that have emerged over the last decade. As an answer to this need, a comprehensive *Design Management Audit Framework* is developed, based on the analysis of existing design audit tools and frameworks, as well as an extensive review and integration of the literature in design, design management and strategic management. Through the new capability dimensions suggested, *Design Management Audit Framework* allows not only the examination of more traditional capabilities and responsibilities under design management, but also the appraisal of strategic level design management capabilities, which put emphasis on the alignment of design practices with corporate strategy and organizational goals. Additionally, *Design Management Audit Framework* establishes a connection between design management and integral streams of literature inside the strategic management field, such as the RBV, dynamic capabilities, the knowledge based perspective, knowledge creation and organizational learning.

On the whole, *Design Management Audit Framework* provides a major update to existing tools and frameworks by accommodating key responsibilities and skills that are increasingly underlined by the recent design management literature and which are finding their counterparts in emerging design management practices. As a result, in addition to the more established dimensions of design management audits, the framework suggests 4 totally new dimensions: Design in Strategy, Research for Design, Training and Development for Design and Design Integration that altogether propose a new direction for design management practices, which is more focused on:

- ensuring design's involvement throughout strategic management processes;
- the integration of outside knowledge by a stress on design research activities and the formation of idea and information networks;
- continual training and learning directed at improving design capabilities;

- and achieving a higher level of design integration throughout the organization by improving design's breadth, roles and coordination with other functions, processes and specialists.

These new capabilities under the new *Design Management Audit Framework* are also suggested as necessary capabilities that must be cultivated by those organizations that aim to turn design into a core competency. Therefore, the new *Design Management Audit Framework* offers one possible perspective to the critical question: What are the new capabilities that must be integrated into design management practices of the next economy?

Besides its theoretical implications, *Design Management Audit Framework* has major practical contributions since design management audits are already utilized in business practice as important tools to review existing capabilities and to identify areas of improvement for the organization. Many parties can benefit from the *Design Management Audit Framework* such as design managers and design leaders inside organizations; design consultants from agencies, design consultancy studios or design support programs; as well as any specialist inside an organization, who is assigned with responsibilities concerning design management, such as a marketing manager or a product development manager. The tool can be employed by these parties to understand and improve design management processes, to advise and guide changes to design management systems, to identify how design management can support the business strategy more effectively, to monitor the implementation of design programs and policies, or as a tool to track improvement.

In addition to its use as an audit tool, the framework can also be utilized by practitioners as a guiding framework in order to reflect, structure and plan design management processes and systems for their organizations, both in the context of their initial establishment or for the improvement of existing systems and routines. In such a situation, it can also function as tool to familiarize other specialists inside the organization with design management concepts, responsibilities and processes.

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