ABSTRACT

Examining the existing management structures that are internal to architectural practice, as well as the historical formation of the discipline of architecture, this paper will investigate the relationship between collaboration, multi-disciplinary teamwork and creativity in the organization of architectural practice. Focusing on the important model of Skunk Works, and with a particular emphasis on the design practices of Diller, Scofidio + Renfro in architecture, this paper will examine the horizontal and vertical management of organizations and the opportunities for innovation and invention that are enabled within it. The paper opens onto a broader argument about the disciplinary constraints of architectural production and the enabling perspectives offered by cross-disciplinary collaboration.

KEYWORDS
Diller, Scofidio + Renfro, Skunk Works, architectural management, creativity, collaboration.

INTRODUCTION

In one of their early texts, Elizabeth Diller and Ricardo Scofidio observe that a “deviant” is, by definition, a crossing of lines and, by implication, the internal collapse of edges (Diller & Scofidio, 1996). Writing in the preface to a 2007 monograph on the work of Diller, Scofidio + Renfro, Martin Reinhold discovers that “[t]here is a small marker that recurs with astonishing regularity in the work of [Diller, Scofidio + Renfro...] sometimes explicitly, sometimes implicitly. Call it a crosshairs, an ‘x’—or really, a ‘+’—marking any number of spots, whether they are occupied by buildings and/or parts of buildings, or by viewers and/or
users.” However, for Reinhold, this intersection is not only graphical but structural, “[t]o the extent that this sign also marks the collaborative space between partners and thus the space of the architectural firm itself” (Martin, 2007). Elaborating on this in the conclusion to the piece, Martin argues that the “+” constitutes “something like a world view […] in the sense of a view of the world seen from within architecture.” The cross marks the hinge, or the collision of horizontal and vertical. In an architectural sense, this becomes plan and section. In corporate management terms, it is the intersection of horizontal and vertical organizational structures. However the “+” can also be read as an additive element, implying the addition of both techniques and critical knowledge that are traditionally extraneous to architectural production but also profoundly relevant to its conceptualization. Martin’s starting point in positioning the work of Diller, Scõfidio + Renfro is instructive and enables a reading of the additive nature of their practice as well as its connection with issues of management and innovation.

ARCHITECTURAL PRACTICE AND DESIGN MANAGEMENT

The scholarly exploration of architectural practice and “design management” is a relatively new scholarly field that has only recently attracted academic interest and the emergence of a discernible critical discourse. As Emmitt, Prins and den Otter (2009) have noted, prior to the 1990s the management of architectural practice was of interest to professional bodies and engaged practitioners (Bennett, 1981; Coxe, 1980; Kaderlan, 1991; Oakley, Clipson & Borja de Morzota, 1990) but virtually absent in scholarly writings within the discipline. The first inter-disciplinary conferences and edited publications on architectural practice and management in the early 1990s were instrumental in setting up an academic forum for the exploration of practice and management (Nicholson and Prins, 1993; Nicholson, 1992) as well as adding legitimacy to architectural practice as distinct from other management structures. While these publications and events have been influential in establishing a scholarly interest in the subject, they have generally focused on the operational and internal pressures that limit architectural production and with a discernible bias towards the United Kingdom and European economic conditions. Within this expanding discourse, the relationship between creativity and architectural management has been a submerged (but recurring) theme, tied to the recognizable peculiarities of the design process and the associated risks that pertain to the built environment. While this discourse has established architectural practices as an independent, and highly idiosyncratic, organizational structure, the significance of cross-disciplinary and extra-disciplinary management structures in influencing architectural practice has been relatively under-represented or overlooked. Through an examination of engineering and management practices outside of architecture, this paper will look at the role of inter-disciplinary collaboration in architectural practice and the impact this has on creativity and innovation.
Even though the relationship between creativity and organizational structure has been a central theme in the discourse of management (Bilton, 2007; Julier & Moor, 2009), it is not as widely researched in the field of architecture. Given the transformations that the profession has undergone in the last two decades, the specific issues of practice management are becoming more critical to the production of architecture and indelibly linked to its conceptualization (Sebastian & Prins, 2009). Equally, with the growth of technology in the design and documentation of architecture, practices find themselves working in extended multi-disciplinary environments that often require the coordination of vast amounts of technical information within very short frameworks in time. The pressures placed on creativity in this scenario are significant and require new models through which architects are organized and engage with the world.

While a number of practices have explored creative avenues in the organization and management of their practices in the last two decades (Gimeno, 2002), there is still an overwhelming emphasis on vertically structured design and decision making teams that work directly with consultants as part of an extended network of responsibility and risk. One of the practices in this period that has (consciously) sought to explore more deeply the opportunities for horizontally structured organization is Diller, Scofidio + Renfro which, as well as embodying the creative issues of inter-disciplinary collaboration, have sought to rethink the modes through which organizations are structured, interact and are managed. Embodied in the “+” that Reinhold observes in the naming of their practice, the “+” is also representative, in this context, of the adding of disciplinary knowledge, configured through a studio process that enables: architecture + art + theatre + performance. The determination to blur these disciplinary boundaries is fundamental to the practices of Diller, Scofidio + Renfro, as well as providing the framework through which their work can be read in the context of management and experimental studio practice.

ORGANIZATIONAL STRUCTURES IN DILLER, SCOFIDIO + RENFRO

Diller + Scofidio began as a partnership between Elizabeth Diller, architect and theorist, and Ricardo Scofidio, artist and architect. The two began their collaboration in the early 1980s completing a number of installation and gallery works that received a large amount of critical attention and curatorial praise. In the mid 1980s the pair became heavily involved in set design, dance performance and collaborated on a significant adaption of Marcel Duchamp’s Large Glass into a theatrical form. This last project was undertaken in collaboration with Susan Mosakowski (as director) and was first performed in the Philadelphia Art Museum (the home of the Large Glass) to celebrate the centenary of the death of Duchamp in 1987 (Diller
& Scofidio, 1988). While these projects were received more favorably amongst architectural theorists (Hays, 2003; Hays & Kogod, 2002; Teyssot, 1996; Friedman, 1991; Betsky, 2003; Vidler, 2003) than with art critics (Foster, 2007; Rothkopf, 2003; Philips, 2004), the projects garnered an array of critical attention and established the reputation of the practice as an innovative and dexterous creative team.

In the 1990s, the concerns of the practice shifted from gallery installations to built architectural works that, embodying the critical currents that underpin their art installations, saw a migration of their key ideas from explorations in new media, towards critical insertions into the built environment. While architecture was an underlying theme in the early works of the practice, the migration into architecture saw a renewed emphasis on buildings and the growth of the practice to facilitate an expanded and intensive design studio culture. This transformation also saw the dramatic expansion of the practice and a restructuring of its organization and management. In the middle of 2004, Diller + Scofidio changed the name of their practice to Diller + Scofidio (+ Renfro) acknowledging that Charles Renfro had been made a partner. Shortly after the name became Diller, Scofidio + Renfro and the two are sometimes used interchangeably (Incerti, Ricchi & Simpson, 2007).

The recent mainstream success of Diller, Scofidio + Renfro—built upon the revered Blur project (Diller & Scofidio, 2000; Diller & Scofidio, 2002) and subsequent commissions for demanding and constrained gallery and performance spaces (Foster, 2007) as well as tightly considered contextual insertions (Diller & Scofidio, 2003)—has seen the nature of their practice change as the themes embedded in their early work have shifted to the margins of their productive output. The most high profile projects from this period are the Boston Institute of the Contemporary Arts (2006) and the Juilliard School of Ballet in New York (ongoing), however the un-built Eyebeam institute (Diller & Scofidio, 2003) is one of the most widely published projects and has attracted a lot of attention in the popular and architectural media. This popular attention has coincided with the growth of interest in their architectural projects from the perspective of architectural theory and the practice’s increasing alignment with architecture as the predominant medium in which it operates (Vidler, 2003). In a number of ways, this process has seen “traditional” architecture replace their earlier concerns with experimentation and the dematerialization of architecture. Using a methodological approach that draws comparisons between the discourse of management theory and the pragmatism of architectural practice, this paper intends to examine the work of Diller, Scofidio + Renfro as an emerging model of cross-disciplinary collaboration. With this in mind, the remainder of this paper will focus on the transformation of the management structure of Diller, Scofidio + Renfro in this period and the extent to which it diverged from contemporary architectural practices.
DEVIAN'T PRACTICES AND THE STRUCTURE OF SKUNKWORKS

That Diller, Scofidio + Renfro’s work is esoteric is already well established in the disciplinary studies of their practice in architecture. It is no doubt a result of this esoteric structure that K. Michael Hays and Lauren Kogod (2003) locate their work “at the boundaries of the architectural discipline”. In Anthony Vidler’s (2003) summation of the practice, he argues that the work of the practice is paradigmatic in shifting the concerns of architecture away from the autonomous status of the architectural object and towards a re-engagement with the functional requirements of program. Vidler argues that this approach “points to the way in which critical theory, new media and the inventive reconstruction of space and time can imply programmatic invention that is neither functionally determinist nor formally autonomous”. The work of the practice is inseparable from broader discussions of autonomy and the extent to which their process liberates them from the functional burdens of architecture and its limits. By traversing the boundaries between disciplines, Diller, Scofidio + Renfro are able to interrogate aspects of architectural agency: firstly, in their productive capacity as architects and, secondly, as interlocutors, questioning the institutional and functional preconditions of modernism through their installation work. In each case, they have undertaken to expand the creative potential of architecture through an investigation of the structures that organize its production.

As well as its clear affiliations with the hermetic world of the gallery installation, the work of the practice is characterized by its radical departure from the conventional means of architectural practice and the blurring of the boundaries between art and architectural organization. Theorists such as Aaron Betsky have positioned their work as an elaborate form of visual “engineering” which interweaves the commercial tactics of display with an inbuilt exploitation of architectural craft. However the practice is equally influential for the radical management structure that it has deployed, that inverts the traditional edges of design practice (and management) and blurs the roles pertaining to it. While Diller, Scofidio + Renfro continually refer to their practice as “deviant” from the traditional modes of architectural production (Diller & Scofidio, 1996), they also make clear the dependence that they place on the organizational theories of creativity and innovation (Philips, 2004). Of most importance to this deviant model is Skunk Works; the innovative creative arm of the American aeronautical giant Lockheed Martin.

The blurring of disciplinary edges is an important aspiration in the integrated management schema pioneered in Skunk Works, which revolutionized the nature of engineering design by dismantling the emphasis on a linear production line of manufacture and establishing interdisciplinary teams that tackled design problems in an inclusive and holistic way. As the research and development arm of Lockheed Martin, Skunk Works was set up as an independent (and autonomous) unit that had to balance the need for creativity and innovation...
with the burdens of institutional, political and time-based pressures that tend to limit innovation in design scenarios (Steiner & Steiner, 2003). In this organizational model, there was a horizontal and vertical integration of studio culture deployed in order to ensure a cross-disciplinary transfer of knowledge in both directions. Having recognized that the linear design model concentrated expertise into isolated pockets within a process with little or no communication between the separated parts, the Skunk Works approach saw a horizontal interconnectivity of knowledge (Rich & Janos, 1996), so that their was not only an accumulation of knowledge between disciplines, but also the opportunity for knowledge in one sphere to have an impact on the design of the whole.

While the achievements of Skunk Works in engineering have been extremely influential in the narrow field of aeronautical design, the management structure has had a disproportionate influence on the field of management, and particularly in regard to the strategic organization of commercial and business-oriented workforces. The premise of Skunk Works—where “highly talented people are given the time and freedom to let creativity reign”—has become a catchphrase of management protocol, evolving into a terminology frequently used to describe small and intensive design units in all manner of strategic organizations and networks (Daft & Marcic, 2011). The term “Skunk Works” was first used as a strategy of innovation in corporate management in the early 1980s in Peter & Waterman’s (1982) influential text, In Search of Excellence and, in the 1990s, became synonymous with the financially-saturated and jargon-laden fields of “Effective Corporate Entrepreneurship” (Dess & Lumpkin, 2005; Stopford & Baden-Fuller, 1994), “Operational Expert Systems” (Eom, 1996) and “Strategic Human-Resource Management” (Colbert, 2004). The correlation between this idiosyncratic organizational structure and corporate notions of “innovation”, “creativity” and “excellence” is firmly entrenched in this discourse (Newstrom, 2002), which positions skunkworks as an effective strategy in the efficient practice of capitalism. While there is a clear differentiation between Skunk Works (the organization) and skunkworks (the corporate strategy), the seamless interchangeability of these terms has ensured that the innovative engineering experiment is now firmly established as an inevitable prerequisite in the various textbooks for corporate management practice, despite the clear slippage that occurs in this translation and the competing trajectories that are in play.

Not coincidentally, this popularization of the Skunk Works model, and its idolization as a model of innovation and invention (Van de Ven, 1986), coincided, to a large extent with the expansion of Diller, Scofidio + Renfro’s practice and its transformation from an intellectual collaboration to an economic and financial strategic brand. The first major historical accounts of Skunk Works (Miller, 1995; Rich & Janos, 1996) were released in the year before the first monograph of Diller, Scofidio + Renfro’s work (1996) and this marks a significant shifting in both the work and organization of the practice. That both Diller and Scofidio were aware of the precedent of Skunk Works is evident from interviews undertaken in the 1990s through until the present. In 2000, for instance, Scanlon had referred to Diller, Scofidio + Renfro’s
studio as a “skunkworks: a laboratory where they play with ideas about space and culture” (Scanlon, 2000). Elizabeth Diller has directly cited Skunk Works as a model for their creativity in conversations since 2003 (Simpson, 2007) and, in the words of Ricardo Scofidio, their working practices resemble a “skunk-factory” (Davidson, 2007) where their studio becomes a “walk into the inside of our brain” (Davidson, 2007). Based on this influence, Deane Simpson develops an argument relating to “vertical” and “horizontal” management structures and organizational models that have enabled Diller, Scofidio + Renfro to operate independently of the mainstream pressures on architectural practice and to explore creative and often artistic avenues for architectural production. This results in a blurring of the traditional roles of architectural practice and an emphasis on the themes of management, collaboration and creativity. Simpson’s analysis of their work focuses on the “disciplinary status of architecture”, referring to the “common perception of the architects as outsiders to the discipline”, describing “their indifference to disciplinary structures”, their project to “create an alternate organizational model of disciplinary production” and their “declared disinterest in the disciplinary regulated boundaries of architecture.” Positioning their work outside of the dominant “strains of criticality” in architecture—the textual, epitomized in Manfredo Tafuri and the architectural, epitomized in Peter Eisenman—Simpson argues that Diller, Scofidio + Renfro’s work is “extra-disciplinary” in that, rather than engaging in the formalist exercises aimed at preserving the autonomy of architecture, they provide a “spatial” critique that “addresses aspects of the contemporary everyday”.

Simpson’s application of the Skunk Works model to the design processes of Diller, Scofidio + Renfro, while supported through statements directly from the practice, is not without its problems. Simpson draws from an understanding of Skunk Works that is heavily indebted to management theory and has a focus on corporate organizational structures. The definition of skunkworks in the various management texts from the 1990s emphasizes a number of critical elements that are essential to its implementation as a management strategy. Critical amongst these are the emphasis on autonomy—talented employees are taken out of their normal office environment and isolated from the broader umbrella of the company (Dess & Lumpkin, 2005; Schneider, 1987)—teamwork (Hart, 1992)—individuals work in small teams with a range of specializations—and innovation—the group is encouraged to innovate and experiment in ways that corporate culture can not normally tolerate or encourage. While each of these aspects was a condition of Skunk Works, the application of the term in a generic sense, neglects the contextual pressures that saw Skunk Works come into existence. The intensive studio was a way to subvert the mainstream pressures of manufacture as well as the inherent cultural repetition that this indoctrinated. The original “14 Point” objectives of Skunk Works, outlined by Kelly Johnson (Miller, 1995) makes this aspect explicit. In this manifesto there is an emphasis on “strong but small” studio teams, “simple drawings with great flexibility for making changes”, a minimizing of reports (but emphasis on documentation) and complete and strategic autonomy from the outside world. Skunk Works was designed to operate within a military environment with great efficacy and so the streamlining of the design process and personnel—“the number of people having any connection with the project must be restricted
in an almost vicious manner”—not only simplifies decision-making but also enables rapid development of ideas and strategies.

For Lockheed Martin, Skunk Works was never a financial model but an organizational tool that enabled greater collaboration (with both governments and the private sector) as well as establishing the work conditions through which complex problems could be quickly and effectively solved. The autonomy of the organization meant that it could collaborate effectively with a number of other organizations and establish strategic partnerships without losing its organizational impetus, giving it a competitive advantage in complex financial and technical projects (Coffmann, 2002). While the management texts stress the importance of a corporate elite, in Lockheed and Martin it was a strategy for connecting various models of specialization emphasizing not the vertical management structures but the horizontal modes of communication. This placed the emphasis on “a small number of good people” but removed the bureaucratic and institutional hurdles that prevented performance or collaboration. In this sense, it was intended to subvert the linear industrial process by conflating the various moments of design into a singular and simultaneous creative team.

CONCLUSION: PLUS (+) OR MINUS (-)

Given the limitations of the Lockheed Martin model, when applied to the structures of architectural practice at play in Diller, Scofidio + Renfro throughout this period, a number of incongruous aspects emerge, especially in regard to the primary elements: autonomy, teamwork and innovation. While Skunk Works was always a subsidiary of Lockheed Martin, as Diller, Scofidio + Renfro have grown, they have retained the pressures that accompany large to medium-sized practices and, to a large extent, are organized accordingly. While there is an emphasis on breaking down the vertical and horizontal networks that underpin an architectural studio, the model doesn’t preserve autonomy in the same way as a skunkworks laboratory. Equally, in relationship to teamwork, the growth of the practice—nearly fifty in 2007 (Davidson)—has not seen a splintering of the organization into smaller independent groups or a distribution of decision making away from the lead partners. On the contrary, the recent history of the practice has seen the concentration of decision making into the hands of the three lead partners and in an increasingly public way. Both Diller and Scofidio acknowledge their role in not only coordinating the creative direction of the practice (Phillips, 2004) but also positioning themselves as the centre of the marketing, financial and managerial direction of the practice. Equally, where Skunk Works is based on the strategic inoculation of expertise, Diller and Scofidio have acknowledged that architects, in the last decade, inherently operate as generalist consultants and that their grasp of expertise is increasingly compromised (Phillips, 2004). They also acknowledge the importance of
engaging “experts” at critical stages. In their mapping of the management structure for the Blur building, they effectively position themselves as agents in the choreography of expertise, as vast teams of specialists are organized horizontally and connected, to a large extent, through communication networks managed by the architect. This temporal structure, which controls when “experts” are introduced into the process, is the antithesis of the Skunk Works model, which is built on the concentration of expertise through which unexpected outcomes may occur.

One final point that is of significant in this regard is in relationship to secrecy. Without doubt, the significant innovations of Skunk Works were attributable to the inherent secrecy of their operations which allowed experimentations behind-closed doors and with relative anonymity within the organization. As Diller, Scofidio + Renfro have expanded, their work has achieved an immense level of international exposure and scrutiny, to the point where innovative projects—such as the Blur building—are published several years before they are ever implemented. This reality of architectural practice inevitably means that an image must be produced that “stabilizes” the creative process and automatically limits its potential. The emphasis on images as a primary drive in the process is verified in the management network diagram which shows the communication with a “publisher” as equivalent in importance to the role of engineers, technical consultants and clients.

This is not to suggest that the structure of Diller, Scofidio + Renfro’s practice is not innovative or, for that matter, dependent upon Skunk Works for its creative impetus. It is a recognition that the transformation of architecture in the last two decades, and the concentration on marketing and reproducible images, has limited the opportunities for creativity and innovation in the built environment, and truly radical creative practices would necessarily need to establish the autonomy from these systems in order to engage non-linear models of working which can draw from expertise and collaboration outside of the pressures for marketability. While Diller, Scofidio + Renfro’s practice has been praised in recent architectural theory for its ability to escape the pressures of autonomy on the form and production of buildings (Hays, 2004; Vidler, 2003) it is becoming increasingly clear that its trajectory is bound up in the networks of success that have limited innovation in architecture and complicated the avenues towards multidisciplinary collaboration. Even within the discourse of management, skunkworks, as an idea, has retained the necessity of autonomy from institutional structures and a freedom to behave outside of the expected models of practice and experience. The migration of skunkworks into architecture retains only the romantic connotations of the idea: embodying its innovative laboratory characteristics but without the conditions of autonomy or teamwork, except at the senior levels. As Davidson concludes from his experience of the practice, despite their creative intentions, they belong to “a business that costs a quarter million dollars a month to run and that depends heavily on its partners’ ability to bring in new commissions” (Davidson, 2007). More importantly, however, as the practice has become more established, so have the opportunities to refute the
intrinsic management structures specific to architecture, resulting in a gentrification of creativity and a deliberate reduction of its tactics.

The current discourse on management and creativity has placed a considerable emphasis on the operational aspects of architectural practice, the pressures of the building industry and the role of the architect in coordinating disciplinary knowledge within a framework of economic rationalism. While, from the outset, Diller, Scofidio + Renfro describe themselves as a “deviant” practice, operating outside of the traditional constraints of architectural production, the research reveals that, the more their organization aspires to the freedom of Skunk Works, it comes to resemble the economic rationalism of skunkworks: a financial, rather than radical, strategy that delimits architectural practice rather than empowers it. When Elizabeth Diller describes the importance of a “money-losing division” of research and development as the backbone of their practice, she is equally acknowledging the limitations of creativity in architecture and, even for creative practices, the pressure for financial and managerial rationalism. The cross-hairs, that feature in Martin’s (2007) analysis of the practice are not only an acknowledgment of the multi-disciplinary intentions, but the economic and political pressures that have positioned architectural practice as a site of production, rather than innovation, in building. They also mark the practice as an organization positioned at the edge of the hegemonies of architectural production.

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