Buchanan's Matrix: A Framework for Strategic Alliance

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Abstract
The relationship between design and business management becomes critical when contexts change and new problems emerge. Some new problems in the design industry are a redefinition of disciplinary boundaries, new technologies and shifts in business thinking and client expectations. Design educators need to understand current demands and anticipate the future requirements of design clients when devising courses and content. This requires conceptual flexibility and continued scenario planning.

In this paper a matrix formulated by design theorist and educator, Richard Buchanan, is explored as a functional framework to assist design educators align design and management thinking. Buchanan describes the matrix as the history of the "character and disciplines of design thinking as they are formed through encounters with new problems". In the matrix designer ability and design thinking intersect, moving design through four orders. An expansion of the orders allows for the simultaneous historical and theoretical comparison of design and management. Three critical aspects that penetrate both management and design are detailed so that the alignment between the two disciplines is made apparent, providing a useful model for decision making and planning in design education.

Introduction
The professional world of business management has long been marked by change. Changes to the contemporary business environment include: shifts in theoretical approaches; a redefinition of discipline and trade boundaries; the manner clients think about and formulate their expectations of business organisations; and in South Africa, a major change in corporate culture brought about by a new political dispensation. For the last decade, local and international business practice and strategy have been dominated by accelerated transformation.

The professional practice of design, and by implication, fundamental design thinking and design education, cannot be conducted without acknowledging general business practice and management theory. The question of how design is positioned in the management context has direct relevance to the planning, structure and content of design education. This is particularly pertinent when one keeps in mind the rapid speed of change in the business world and the relatively slow reaction time of educational institutions.

The above mentioned factors indicate the need for design educators to timely anticipate changing client and industry needs and expectations. Design educators should search for and develop models and theory to assist in decision making and insightful planning. A model that could possibly guide design educators is a matrix developed by Prof. Richard Buchanan, head of the School of Design at Carnegie Mellon University in Pittsburgh, United States and one of the most respected design thinkers today. Buchanan's matrix is a schematic representation that facilitates an understanding of the nature and development of design.

The objective of this paper is to explore Buchanan's matrix as a framework that may assist in the evaluation and evolution of design education, specifically graphic design education. The matrix will be described and briefly placed in historical contexts. It will then be expanded as a means to position and align graphic design thinking and practice with management theory and

business practice. The paper will finally comment on the pragmatic value of the expanded matrix for South African design educators.

The Four Orders of Design
In his matrix, Buchanan categorises design into four broad areas or orders, namely *communication, construction, strategic planning and systemic integration* (figure 1). Clarification of the matrix appears in several of Buchanan's articles (Buchanan 1995a, 1995b, 1998).

Buchanan's Matrix

	Communication Signs & Words	Construction Things	Strategic Planning Action	Systemic Integration Thought
Inventing	Signs, Symbols & Images	→	→	→
Judging		Physical Objects	→	→
Deciding			Activities, Services & Processes	→
Evaluating				Systems, Environments, Ideas & Values

Figure 1. Human abilities and design thinking according to Buchanan's matrix (Buchanan 1998:13)

Buchanan describes the four orders of the matrix as the history of the "character and discipline of design thinking as formed through encounters with new problems" (Buchanan 1998:13). The orders may thus be viewed as fields or periods when design theory and practice have had to adjust to new problems. According to Buchanan, orders should not be seen as areas of traditional disciplinary practice or specific outcomes (e.g. graphic vs. product design), but as four broad areas of design thinking that are common to all design professions. The demarcation of transition from one period to another is difficult, but can be assisted by the identification of catalysts that helped to initiate and shape changes. Buchanan sites these catalysts within the wide scope of culture and global history.

Despite the view that the four orders should not be interpreted in terms of disciplinary practices, they nevertheless provide a convenient mechanism for plotting developments in graphic design practice. As a comprehensive consideration of graphic design developments is beyond the scope of this paper, a brief and selective orientation to historical business contexts and graphic design practice in each of the orders will be presented.

The First and Second Orders: Communication and Construction
The first and second orders of the matrix can be historically sited during the Industrialisation period, from approximately the 1750's to 1950. This period may be simplistically represented by the development of rail transport, steel, electricity, the internal combustion engine, plastic and synthetic materials. During the first half of the twentieth century, more than 50% of Americans were employed in mass production whereas today only 15% are employed in this sector (Sunter 1999:9). Industry was led by big stable market leaders. Business was often conducted internationally, but the focus was on local competition and market share. Business

plans were developed for periods of 10 years and longer and planning was strictly done by executive management (Ferreira 2000, Sunter 1996).

Designers followed clear directives or guidelines according to fixed theories and principles such as the International Style or Dada. Within the commercial arena, designers generally worked in a modernist paradigm, with the focus on aesthetics and functionality. According to Sauthoff (1999:6), the designer was employed at the border of a client's organisation and was often thought of as a stylist or decorator. Studio activity was limited to problem-solving for a specific project with few direct links to strategic operations in an organisation.

Third order: Strategic planning
The third order, or *strategic planning*, commenced at the end of World War II. The start of this era coincides with the fourth Kondratieff wave of economic development as described by Russian economist Kondratieff, who attributed change to catalysts in world history. Sunter (1996:58) identifies 1948 as the start of the fourth Kondratieff wave with the catalysts being the Bretton Woods Agreement and the Marshall Plan aimed at stabilising the world monetary fund and providing financial aid for war torn European countries.

The word strategy first appeared in management literature in 1950's. Questions such as "What is our business? What should it be? [and] What is our distinctive competence in relation to competitors?" were asked by management leaders like Drucker and Selznick (Long & Vickers-Koch 1995:9). In 1962, management theorist Chandler defined strategy as "the determination of the basic long-term goals and objectives of an enterprise, and the adoption of action and the allocation of resources necessary for carrying out these goals" (Long & Vickers-Koch 1995:9). Focus was placed on external evaluation and action plans. Capabilities and the development of internal potential, that would enabled organisations to deal with competitive environments, were second in priority and only became integral components of business strategy in 1978 (Long & Vickers-Koch 1995:10). Value was determined by the shareholders' perceptions and not by the customer/end user. Attention was on the allocation of financial resources to strategic business units (SBU's) and on the balance of portfolios rather than on "growing the company as a whole" (Long & Vickers-Koch 1995:11). Strategic plans were made by executive management and delegated down through a corporate hierarchy.

Major design clients in post-war America were large industrial giants such as IBM who developed corporate identity programmes that set international standards. Organisations like IBM saw design as a powerful communications tool and as a means to promote their public images and the aims of the organisation. Design was considered a strategic resource and designers were expected to apply it and manage the process in a systematic and coherent fashion (Jobling & Crowley 1995).

The development of international standards, the definition of "good design" and the articulation of a rational basis for design were popular themes in design writing. An influential voice during this period was the Swiss School with its clearly set out international norms for design evaluation (Jobling & Crowley 1995). Within the design industry itself an increasing emphasis was placed on professional values and responsibilities, design management, the importance of research and the flow of information between designer and client. Design was seen as a pragmatic problem-solving activity, bound by technical parameters and resource allocation.

Fourth order: Systemic Integration
The fourth order is marked in management theory by an evolution of the question: "What businesses are we in? [to] What *capabilities* do we need to develop and nurture to take full advantage of … changes?" (Long & Vickers-Koch 1995:11). Commencing in the 1980's, a major catalyst for fourth order *systemic integration* was technology with the development of the microcomputer and the immediate availability of information (Sunter 1996:59). Digital technology was widely introduced and implemented so that it cut across all departments and functions within an organisation.

Over the last two decades, graphic design has come to play an increasingly important role in organisations that make optimal use of the digital medium, and where communication is thought of as synergistic and holistic. It has become progressively integrated into key organisational activities with client-designer interaction occurring at the senior management level. The designer's role includes the provision of insight and knowledge, not only technical skill and isolated project management. Design writing in the fourth period has moved from a consideration of the object and the design management process to the psychological and cultural contexts that give meaning and value to designs and the various disciplines of design (Margolin & Buchanan 1995). The consumer/end user is placed in the spotlight and user feedback is regarded as an active learning tool. Teams and mutually beneficial alliances are formed to deal with tasks that are too complex to deal with on an individual basis.

Expanding the Matrix
If design thinking and graphic design practice are to be aligned with management theory and business practice, then changes in fundamental ideas and operational roles within each discipline and each of the four orders must be identified. In expanding the matrix, three critical aspects that penetrate both management and design, have been taken into account. These are: *underlying assumptions; organisational structures and processes; and value determinants.* Selected characteristics of each aspect are detailed and tabulated within the third and fourth orders so that the alignment of management theory and design is made apparent.

Underlying assumptions

Third order: strategic planning		Fourth order: systemic integration	
Management	**Design**	**Management**	**Design**
Quantitative, linear thinking – numerical forecasting	Analytical approach, guided by logic and research	Qualitative thinking – scenario planning	Consideration of the widest context of design, synergistic, humanistic, comprehensive
Leadership through mass and size	Leadership through management of the design process and technical skill	Leadership through flexibility	Leadership through provision of design information and future vision
Fit the firm to the environment – lock markets	Practice guided by client and market needs	Create environments and markets to fit the firm	Anticipation of client and market needs
Outcomes predictable	Systemisation of design methods and process	Outcomes changing and unpredictable	Integrative and broad vision – systems, cultures, values
National and international markets	Closed system – technologies exclusive	Global markets	Open system – democratised technologies

Organisational structures and processes

Third order: strategic planning		Fourth order: systemic integration	
Management	**Design**	**Management**	**Design**
Hierarchical, fixed organisational boundaries	Industry with clear differentiation between specialities e.g. printing, reproduction, typesetting	Skills-based, boundaryless structures	Specialist areas fade, designer in full control of design and production
Employees distant from strategic decision-making and activities	Contact with designated line manager only	Participation and communication, employees empowered	Client is part of the team – access to all levels from top management to employees
Supplier given only necessary information for task. Critical information back-stage	Receive fixed brief, design limited to tasks set out in brief	Suppliers function as an extension of the organisation. Information front-stage, dialogue	Learning brief with continuous dialogue between designer, client and user
Segmentation and expansion into non-core areas of operation. SBU's	Compartmentalisation of design services	Focus on core activities. Small and manoeuvrable. Outsourcing	Multi-disciplinary configurations for complex tasks
Marketing information covert	Task specific marketing information	Marketing information overt	Share in strategic planning – designer extension of client organisation
Demographic view of the market	Predominance of mass media	Consumer seen as individual to learn from	Introduction of customised media

Value determinants

Third order: strategic planning		Fourth order: systemic integration	
Management	**Design**	**Management**	**Design**
Fixed assets (Tangibles)	Fixed evaluation criteria	Perception and positioning (Intangibles)	Contextually guided evaluation
Alliances based on cost reduction	Project restricted by client's strategy and specifications	Alliances based on partnerships from which new insights can be learnt.	Diverse input, knowledge, informed decision making, motivated choice, trust
Accountability based on cost factors	Accountable for specific task	Accountability stretches beyond the given task	Broad spectrum – advocacy, clarification, explanation and counselling

Conclusion

Buchanan's expanded matrix confirms the correlation between design and management thinking. It clearly shows how the role of design and the designer have changed over time in keeping with management and business thinking. It supports the idea that the planning of design education should not be undertaken without due regard for current management trends and future business scenarios. At the same time, the matrix allows design educators to

position and systematically evaluate the structure and content of their current courses relative to developments in the business and professional design arenas.

The matrix is not only a useful mechanism to plot parallels between two disciplines and evaluate course offerings, but it provides the design educator with a synoptic overview of the development of design thinking and the practice of design. In the view of Golsby-Smith (1996) one order never really replaces another order but builds on it, thus describing the widening domain of design practice (figure 2).
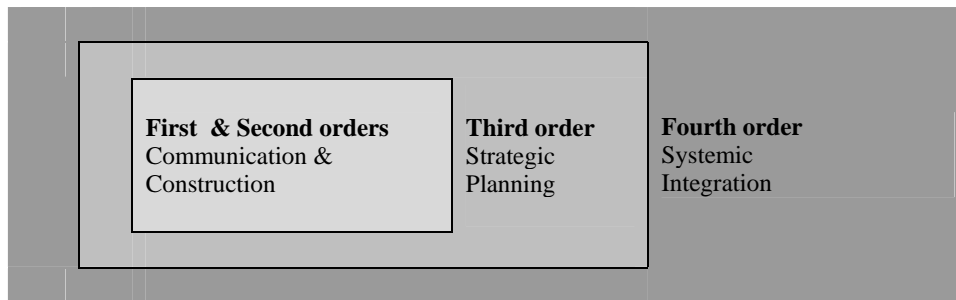

| First & Second orders | Third order | Fourth order |
| Communication & Construction | Strategic Planning | Systemic Integration |

Figure 2. Widening the design domain, adapted from Golsby-Smith (1996:5).

Movement from the first order to the fourth order is part of the development of every designer. Fourth order designers need knowledge and insights that only come from maturity and a progressively comprehensive level of design thinking. By implication, design education cannot start at the fourth order, but needs to move systematically through all four orders. This idea could assist educators define the focus of course content in any year of study, and delineate course structures and exit points. For instance, strategically orientated content (third order) and holistic systemic integration (fourth order) are probably best suited to advanced studies in design and so should theoretically form the respective bases for final year and post-graduate levels of study.

The expanded matrix has been introduced within a broad international perspective. It is important, however, that design educators appreciate the need to understand and anticipate situations unique to South African historical and organisational contexts. Hofstede, Dutch Emeritus Professor of Organisational Anthropology and International Management, who is known for his pioneering research into organisational culture and the management of cultural diversity, comments that management in this century will not be basically different from the last century. However, "… we can expect a breakthrough in the development of theories of management which will become more adapted to national cultural value systems in different parts of the world." (1999:online). A good example of this direction in South Africa is current research being undertaken into the practical application and implications of western management techniques and styles drawing on the deep-rooted *Ubuntu* principles of African culture (Prinsloo 1998). The *Ubuntu* tradition is based on ideas of participation, dialogue, cooperation and the spirit of man where a focus is placed on humanity. Although there are apparent similarities with features of fourth order management, *Ubuntu* is still not widely accepted as a viable option for dealing with complex dilemmas in the field of business (Prinsloo 1998). Design educators would do well to inform themselves of the ethical debates and argumentation surrounding this topic and to keep abreast of the unfolding descriptions and analyses of *Ubuntu* appearing in the literature.

Buchanan's matrix facilitates a useful and pragmatic interface between theory and practice and encourages a wider engagement with issues related to the nature and character of design. It illustrates how basic design theory is being worked upon and moulded to a nascent

discipline with a growing degree of confidence. The extension of the matrix provides an interesting example of how design theory may confront the complexity of the contemporary environment and assist researchers identify themes and nodes around which intellectual inquiries into design may be organised.

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