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The Relevance of Rigour for Design Practise

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Abstract

Design is an inverted discipline. The concept of rigour, as understood within the natural sciences, cannot be applied to Design Practice.

Rigour for the natural sciences is a quality assurance mechanism ensuring that the knowledge bases of the disciplines are developed to an accepted set of standards. Design's ontology is not like the natural sciences and as such an understanding of rigour for Design must proceed from an appropriate standpoint about the nature of Design Practice.

This paper builds upon Harfield's [1] ontological assessment of Design, Schön's [2] [3] work on Reflective Practice and Spencer's [4] investigation into the experience and practise of designing to develop a standpoint about Design Practice and make a proposition about the relevance of rigour for Design Practise.

This paper considers how individual Reflective Practice practitioners, within the context of Design Practice, manage and ensure quality control through the application of care and thoroughness. This paper argues that rigour for Design Practise is the personal and phenomenological quality control of a design inquiry: a process of managing expanding mental chaos and restricting order.

Key words: Rigour, Design Practice, Experience and Designing.

Introduction

Within the context of the practise of design, this paper explores the concept and meaning of rigour. Building upon, and in support of, Harfield's [1] ontological assessment of the discipline of Design, Schön's [2] [3] work on Reflective Practice and Spencer's [4] work on the experience of designing, it is argued that rigour for Design Practise is the personal and phenomenological quality control of a design inquiry.

In this paper it is suggested that:

- a. A designer's thinking structure is a chain of ideas that provides a rationale for a design proposition leading from a standpoint about the situation of practice (the personalised design problem) to the creation of value, for an intended audience, through the intervention that is the design proposition; and
- b. Rigorous Design Practise is exposing and exploring ones ideologically conditioned thinking structure, developed by managing of the thinking structure's coherence, through an iterative process of undermining stability - creating chaos events by propositional exploration and exposure to feedback - and reforming the thinking structure by engaging creative and critical thinking to integrate insight and develop a refined understanding of the situation of practice.

This paper's argument is developed by drawing upon critical design literature and structured by four statements, which lead and punctuate the discussion and presentation of ideas.

The terms ‘rigour’ and ‘rigorous’ have various meanings and in order to clarify the subject of this paper both will be considered briefly. In its unfettered derivation, rigour refers to the quality of being extremely thorough and careful and has positive connotations. However, the term rigour can also be used to describe the strictness or severity of something and can, in this context, be associated with demanding harshness and pedantry. The adjective, rigorous, commonly refers to strictly applied or adhered to rules, systems or codes of practice. Intellectual rigour has a more specific meaning. In short, intellectual rigour refers to applied consistency, manifesting as the quality control of information, which implies: an appropriate standard of accuracy and scepticism applied to accepting anything on trust; keeping convictions and claims in proportion to valid evidence; and questioning the assumptions of methodology, methods, and practices while applying them consistently and precisely. The title of this paper, ‘The Relevance of Rigour for Design Practise’, could, to be clear about the use of the term rigour, be extended to read: ‘the value and role of care and thoroughness for Design Practise’.

Another term that would benefit from clarification at the outset of this work is Design Practise; the difference in the definition between practice and practise helps to refine the focus of this paper (Table 1 is intended to support this distinction). Design Practice classifies a particular professional activity. Reflective Practice [2] [3] classifies a particular kind of investigative activity. Design Practise [4] describes the actions and experience of a practitioner who is professionally involved in Reflective Practice in the context of Design Practice. In this paper Design Practice refers to the profession and endeavour of design and Design Practise refers to the actions and experience of designing. The title of this paper, ‘The Relevance of Rigour for Design Practise’, could, to be clear about the use of the terms Design Practice and rigour, be extended to read: ‘the value and role of care and thoroughness for the practise and act of designing’.

Table 1: Practice and Practise

	PRACTICE	PRACTISE
Linguistic type	Noun	Verb [with obj.]
Basic Definition	(Mass noun) The carrying out or exercise of a profession (Count noun) The business or premises of a profession	Perform (an activity) or exercise (a skill) repeatedly or regularly in order to acquire, improve or maintain proficiency in it
Design Specific Definition	The endeavour, profession and business of Design (Design Practice)	The actions and experience of designing (Design Practise)
Reflective Inquiry Specific Definition	Reflective Practice is a form of reflective inquiry pioneered by Schön	The actions and experience of undertaking a reflective inquiry

Statement One:

Understanding the role of rigour within any sphere of endeavour is an ontological quest that requires an understanding and standpoint about the nature and purpose of an endeavour.

Discussions about rigour are inextricable interwoven with discussions about the accepted and codified standards, rules, procedures and processes that pertain to particular disciplines or types of endeavour. Therefore, to progress a discussion about the relevance of rigour for Design Practise, one needs to clarify the discipline's (Design Practice's) accepted structures and rules. This task immediately hits two barriers; what is being referred to by Design Practice and arguable even more elusive, what are its (or any of its sub-groups) accepted standards, skills, processes, key goals etc? In order to place and understand rigour within the context of Design Practise one needs an understanding and standpoint about the nature of the endeavour Design Practice.

By considering the meaning and role of rigour for an established discipline we can learn what kind of framework is traditionally used to judge the purpose and quality of rigour. Within the natural sciences there are unifying elements that structure the state of the discipline and guide the meaning and relevance of rigour. Those unifying elements are: a coherent knowledge base; sets of agreed practices, skills and intentions; and importantly, that at any point in time, there are agreed conceptual difficulties at the boundaries of knowledge within the discipline or its sub-disciplines - there is a shared understanding of, and commitment to, certain key questions which, should they be successfully answered, would advance knowledge within the discipline, generate a new set of questions, and thus advance the discipline itself [1].

Rigour, for the natural sciences, plays a vital quality assurance role that guards and protects the knowledge bases of the disciplines as its agents attempt to develop them; the concept, rigour, is given meaning and relevance by the common purpose shared by those that belong to the discipline. To satisfy that common purpose, to unify efforts and to ensure the quality of the discipline, standards are codified (while being continually argued over), best practice is agreed and the efforts of agents within the discipline are measured and judged against these benchmarks. Rigour results from operating to, and attempting to advance, the shared standards laid down by the discipline. If Design Practice has a similar disciplinary structure to that of the natural sciences then we should find the relevance of rigour understood, defined and valued in a similar manner.

Statement Two:

Design is not a knowledge generating explanatory discipline. Design is a practice-based normative knowledge-utilization service discipline [1].

In an analysis of Design's disciplinarity, Harfield argues that the ontology of Design is not like that of the natural sciences. He advances three propositions, which he proposed to account for the undisciplined nature of Design Thinking and Design Practice. These propositions help explain why understanding the relevance of rigour for Design Practice is different to understanding the relevance of rigour for the natural sciences. Harfield proposed that:

1. Each designer 'problematizes' and individuates the 'problem-as-given'. Design proceeds by internalising and moulding the explicit elements of problems to 'fit' the individual designer, creating a revised and personalised problem that both subsumes the original problem and imposes upon it a

range of designer references, prejudices and expectations. This is a similar proposition to English's [5] explanation of problem space.

2. 'Design', while replete with personal problems, has no problems at all as an agreed set of conceptual difficulties at the boundaries of knowledge within the field. The purpose of Design is not to build knowledge, it is to forward propositions about how the world could, and perhaps, should be.
3. In place of agreed, discipline wide, problems that direct the thinking and efforts within the discipline, ideology is the central driver of design intentions and Design Practice. 'Design is, at any given time, directed by, conceived within, and thus constrained by, a set (or competing set) of ideas, beliefs, assumptions and preconceptions which structure not only how the designer will think about design, but, more significantly, how s/he could not have thought otherwise' [6].

What Harfield suggests is that Design is different in its nature – its structure and purpose – to traditional disciplines, and as such the meaning and relevance of rigour for Design is also different. Design does not have an agreed set of conceptual difficulties at the boundaries of knowledge within the field, nor does it have (or need) neutrality and rationally determined problem-solving processes: Design is a personal and ideologically determined discipline. Design is not a knowledge generating discipline, that responds to the structure and content of its own knowledge base, drawing from and aiming to explain the world as it can be observed. Design uses current advances in knowledge and technology to respond to the way it internalises and understands the shifting impermanence of life, people, situations and problems; its relations with the 'real world', with society, culture and its people is contingent – based upon propositional experimentation with how things could be and the consequences these changes have for the elements of life under question. Compared to the natural sciences Design can be viewed as an inverted discipline. Harfield suggests that designers' personalised explorative activity is framed by ideology and in pursuit of 'the new' feedback is used from the boundaries and resistance of ideology.

Expanding from Harfield's ontological analysis of the discipline of Design, the rigour of Design is not defined centrally and externally by 'the discipline', because the discipline is inverted – distributed and personalised – the relevance of rigour for Design Practice is defined by the actions of designers as they explore the boundaries of ideology in the act of designing in the context and situation of practice given form by their current 'problem'. An understanding of the relevance of rigour for the discipline of Design cannot follow the pattern established by the traditional disciplines because the nature of Design is different; it is an inverted discipline. Rigour cannot be understood by examining the external standards, codes of practice, and rules of Design as they do not exist in any explicit, codified, and agreed form. If, compared to the natural sciences, the framework of the discipline of Design is inverted then the question is not, what is the relevance of rigour for Design Practice, rather it is, what is the relevance of rigour for the practise of designing, i.e. what is the relevance of rigour for Design Practise.

Statement Three:

Rigour for Design Practise is phenomenological.

Harfield's depiction of Design as an activity that personalises problems is not new, but does relate to a traditional argument, for those involved in Design Methodology, about rigour and relevance. In Design Methodology there has developed two fundamentally different ways of describing Design, formalised into two

paradigms: 'rational problem solving' (also known as technical rationality) [7] and 'reflective practice' [2] [3]. The difference between these two paradigms goes beyond the observation that some problems are structured while others are ill-structured. The major difference lies in the epistemological stance and the ontological assessment of the activity, which radically alters the methodologies and methods of action and assessment [8]; therefore, conditioning the relevance of rigour.

For a design practitioner these two descriptions of Design are not a duality that requires a philosophic stance to the exclusion of one viewpoint. If a practitioner is even aware of these theoretical debates, it appears to matter little to their day to day practice, the practitioner simply responds to the context and the task and operates dependent upon their training, ideology, experience, knowledge and abilities in a way that allows them to move the project forward. However, for the purpose of this paper, the difference is important because our understanding of the relevance of rigour for Design Practise does depend upon the nature of the endeavour and as such it is important that we are clear about the standpoint being argued.

From the perspective of Design as Technical Rationality, Simon describes stable, well-structured, small to medium scale design problems and a positivist epistemology where designing is considered instrumental problem solving, viewed as a technical procedure, performed in stable knowable conditions, measured by its effectiveness in achieving a pre-established objective. Rigorous practise, within this paradigm, can be seen as the application of research-based theories and techniques derived from the method of controlled experiment, which aims to create 'things' that function technically well and perform in predictable ways when placed in certain predetermined conditions of use. In this view of designing the designer does not influence the nature of the problem but simply applies the relevant logic and theory to defined parameters, action is an implementation and a test of technical decisions. The relevance of rigour for Design as Technical Rationality is similar to that of the natural sciences, which is not surprising as Simon argued for a science of the artificial. However, the description of Design as Technical Rationality is in conflict with Harfield's analysis of Design. Design as Technical Rationality and Design as Reflective Practice are very different forms of problem solving that operate very differently, a difference that Dorst [8] highlighted in his research, which concluded that the Design as Reflective Practice paradigm is a more accurate description of how industrial designers operate.

Schön [2] [3] criticised the prevailing positivist paradigm, of Technical Rationality, stating that it failed to account for practical competence in divergent situations. Schön's theory of Design as Reflective Practice, attempted to address the dilemma and balance between rigour and relevance, focusing upon acts of intelligence within situations of uncertainty and developing an epistemology of practice, which places technical rationality within a broader context of reflective inquiry. In the constructionist paradigm of Design as Reflective Practice the designer is placed in a central role in design activities. Harfield's ontological analysis of Design resonates with Schön's theory of Reflective Practice where the designer – the designing agent – is the locus of activity and problem formation.

Schön presents a mechanism of design, which describes design activities on a detailed level. Reflection-in-action, initiated by the experience of surprise, is employed by practitioners when knowing-in-action fails to proceed and is a process of: simplifying a situation's complexity (consciously or unconsciously naming the elements to be attended to); arriving at a standpoint about the situation and its problems and issues (framing);

exploring the standpoint through action, experimentation and solution propositions (making moves); and considering implications and consequences in two directions, 1) forwards, to consider the value and consequences of the propositions and the barriers to successful implementation, and 2) backwards, to consider the restrictions and relevance of their naming and framing and the appropriateness of their investigative actions (reflection). The concept reflection-in-action implies that the practitioner is aware and engaged because the term reflection describes the act of careful consideration and dialectic; therefore, when one's awareness has disengaged from the task situation reflection-in-action has ceased, the conversation with the environment has broken-off, and consequently one is no longer designing.

If it is accepted that the paradigm of Design as Reflective Practice, as defined by Schön, is an accurate description of the mechanism of designing, the action-orientated steps in a reflective inquiry employed by industrial design practitioners, what then does this indicate for the concept of rigour; how is thoroughness and care demonstrated by practitioners in their practise; how do design practitioners ensure quality control?

Reflective Practice, as defined by Schön, and the ontological analysis of Design, by Harfield, can help structure an understanding of the relevance of rigour for Design Practise by considering the relevance of rigour for Reflective Practice. The following propositions, about the relevance of rigour for Reflective Practice, are conditioned by the premise that: as designers explore their situations of practice ('the personalised design problem') - framed passively by ideology and actively by naming, framing, making moves and reflection - they develop insight into the situation and their constructing ideology and increase their understanding of relevant issues and considerations i.e., problems and solutions co-evolve/emerge [9] [10]. Rigour has a particular meaning for Design in the relationship between, a designer's investigative activity, and their cumulative understanding of the situation of practice and exposure to ideological influences upon their thinking and cultural understanding. Based upon the arguments of this paper, the following are forwarded:

1. Rigour for Reflective Practice requires the personal effort and commitment to assess and reassess the value and appropriateness of naming and framing activities based upon a developing understanding of the situation of practice – 'the problem'.
2. Rigour for Reflective Practice requires an ongoing consideration of solution propositions' ability to resolve and inform the issues as identified and understood within the evolving understanding of the situation of practice.
3. Rigour for Reflective Practice requires the personal acceptance of naming, framing and propositional experimentation inadequacies when recognised as the designer's understanding of their situation of practice expands.
4. Rigour for Reflective Practice requires that designers, within their designing activities, actively explore the boundaries of discipline, cultural and personal ideology in their naming, framing, propositional exploration and reflective consideration in order to explore new forms of value creation, within the context of the current situation of practice.
5. Rigour for Reflective Practice requires that designers engage and re-engage their attention, ensuring the active exploration implied by reflection-in-action.

Considering how individual Reflective Practice practitioners manage and ensure quality control through the application of care and thoroughness can help further an understanding of the concept rigour, and its relevance for Design Practise. To develop an understanding of this activity it is useful to consider the experiences and processes of expert design practitioners.

Statement Four:

A useful understanding of rigour can be achieved by examining the practise of Reflective Practice design practitioners.

Examining the practise of reflective design practitioners can inform two elements of this discussion, it can: 1) help define a practitioner's ideology and pre-structured thinking; and 2), illustrating how practitioners manage and undertake a reflective inquiry. In this paper the second of these elements is considered.

The work of Spencer [4] illustrates what it is like, experientially, to design. Through eight case studies, with expert design practitioners, designing is portrayed in a manner that populates Schön's mechanism of design with humanity, with effort and struggle, pain and joy. While not intended, nor claimed, to be a complete picture Spencer's investigation into the experience of designing is significant in developing our understanding of Design from the perspective of the designer.

Spencer's standpoint was that the praxis of professional designers represents a valuable body of knowledge that demonstrates how, in the personalised endeavour of Design, designers develop clarity and order complex situations, deliver commercial benefits for their clients/employing company and create experiential value for product customers. His thesis describes an embedded multiple-case study with multiple units of analysis, where qualitative data about the experience of designing were obtained from eight semi-structured interviews with expert designers. Based upon the process of conjecture and refutation the thesis presents a discourse analysis to test theoretical propositions and draw conclusions about the experience of designing.

Schön's Reflective Practice theory describes a mechanism that professions employ to order and make sense of ambiguous situations of practice. Spencer argues that expert designers not only construct and impose order on their situations of practice but also actively stimulate the uncertainty they experience. According to Spencer designers stimulate their uncertainty by accepting particularly complex projects, by the way they frame their design situation and by their attitude of inquisitive and critical discontent. Once a design challenge is engaged the designer resolves to escape that uncertainty and the situation's ambiguity through their creative and critical thinking and solution proposition activities. Spencer highlights that, in addition to creative events – moments of realisation when a designer reframes his/her situation of practice – chaos events are also significant in reflective inquiries. 'Chaos events, initiated by people other than the designer, unsettle the designer generating uncertainty, anxiety and fear by disrupting the coherence that they established' [11]. Chaos events, although deeply unsettling and stressful occasions provide (or force) an important opportunity, they provide an opportunity to better understand the design situation and its context, to reflect, reframe and reconsider. In Spencer's portrayal of Design:

Expert designers are willing to and iteratively face their feelings of dissatisfaction and psychological discomfort in order to: iteratively generate more refined design proposals [and a more refined understanding of the situation of practice]; manifest the ideal that they are positively contributing to progress; see the product or project through to a point of resolution; feel the thrill of the uncertainty resolving creative moment; and to enforce and build professional pride [12].

Spencer found that expert designers continuously strive for better personal and professional performance and that their experience of designing was formed by active involvement in uncertainty generation and resolution. He concluded that:

- a. The design process of uncertainty resolution generates emotional fluctuation and disquiet. When operating in situations of volatility and ambiguity, expert designers use creative thinking as a coping mechanism to escape their fear and uncertainty. Creative thinking is used to frame and reframe the design situation in an attempt to create conceptual certainty and synthesis explored through propositional change experiments.
- b. Contextualised by the challenge of the design situation the creative element of the design experience is stimulated by: iterative attempts to escape the discomfort of uncertainty and manifest clarity through the creative moment; attempts to protect the conceptual certainty and joy of a design proposition; and the need to do better and have their propositions accepted and considered valuable by other people [13].

It appears that expert designers use Reflective Practice in a particular way. A designer's thinking structure is a chain of ideas. The chain of ideas provides a rationale for a design proposition leading from a standpoint about the situation of practice (the personalised design problem) to the creation of value, for an intended audience, through the intervention that is the design proposition. Expert design practitioner's appear to use Reflective Practice as a mechanism for developing and refining their thinking structure within the constraints of a commercial project. Developing and refining the thinking structure requires that designers use Reflective Practice not only to order an ill-structured situation, but, to test the thinking structure through genuine efforts to refute it. This suggests:

1. As a design inquiry progresses, a reflective practice practitioner's (designer's) rigorous practise is a management process between expanding mental chaos and restricting order, between mental uncertainty and certainty. Rigour demands that designers unfold into broader contexts and unfold from their own view on the world, using creative thinking and proposition informed by research and feedback to reframe situations and engage with multiple viewpoints. Personal empathy, commercial empathy and discipline empathy, structured by ideology, provide three channels through which designers undertake disciplined and rigorous inquiries.
2. Rigour requires that designers develop opportunities that expose their thinking structure to feedback that provides the opportunity to undermine the conceptual coherence they have constructed (a chaos event).

This suggests that, rigour for Design Practise, in the context of Reflective Practice, is the personal and phenomenological quality control of a design inquiry: exposing and exploring ones ideologically conditioned

thinking structure, developed by managing the thinking structure's coherence, through an iterative process of undermining stability - creating chaos events by propositional exploration of the situation of practice and exposure to feedback - and reforming the thinking structure by engaging creative and critical thinking to integrate insight and develop a refined understanding of the situation of practice.

Summary and Further Research

Within the context of the practise of design, this paper has explored the concept and meaning of rigour. Harfield's work on the nature of the Design discipline, Schön's work on the mechanism of designing, and Spencer's work on the experience of designing have been used to develop an understanding of the relevance of rigour for Design Practise.

Harfield argued that the nature of the discipline of Design is not like that of the natural sciences; it does not have sets of common problems; it does not have codified standards and practices; it is not knowledge generating; it is not theory-based; it is not descriptive. Because the structure and purpose of Design is different to the natural sciences the concept rigour cannot meaningfully be applied in the same way.

Harfield and Schön help develop a standpoint about the nature and purpose of Design Practice. Harfield and Schön both place the designer – the designing agent – as the locus of activity and problem formation. Harfield suggests that designers' personalised explorative activity is framed by ideology and in pursuit of 'the new' feedback is used from the boundaries and resistance of ideology. Schön describes the steps of a reflective inquiry used to develop meaningful structure to ambiguous situations of practice. By considering Schön's mechanism of design suggestions were made for the relevance of rigour for Reflective Practice.

Spencer portrayed designers as continuously striving for better personal and professional performance where their experience of designing was formed by active involvement in uncertainty generation and resolution. According to Spencer, designers oscillate between: attempts to escape uncertainty and manifest clarity through the creative moment; and attempts to protect the conceptual certainty and joy of a design proposition and the need to do better and have their propositions accepted and considered valuable by other people. It was argued that this oscillation allows designers apply Reflective Practice to test and refine their thinking structure and that, rigour for Design Practise, in the context of Reflective Practice, is the personal and phenomenological quality control of a design inquiry.

The idea that rigour for Design Practise (the experience and act of designing) is the phenomenological quality control of a design inquiry: exposing, exploring and refining ones ideologically conditioned thinking structure, highlights a very important question, which currently the author can not answer. What are the sets of ideas, beliefs, assumptions and preconceptions that define a practitioner's ideology?

Further research will attempt to make explicit designers' thinking structures in order to investigate Design Practice ideology. Lawson's [14] work on Design Thinking – schemas, gambits and underlying principles – will help structure the investigation.

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