

# **The use of aesthetic knowledge in decision making processes in mega projects**

**A thesis submitted in fulfilment of the requirements for the degree of**

**Doctor of Philosophy**

**by**

**Thomas M. Keenan**

**Bachelor of Business Communication (Honours Class I) (University of  
Queensland)**

QUT Business School

School of Advertising, Marketing and Public Relations

Queensland University of Technology

Brisbane, Australia

2016



To Maurie – father, educator, mentor, guide, friend – gone but not forgotten.

***Keywords***

Aesthetic knowledge, decision making processes, mega project management,  
qualitative research

## ***Abstract***

This thesis examines the use of aesthetic knowledge in decision making processes in mega projects. Specifically, it addresses the research question

### **What are the ways in which aesthetic knowledge is used in decision making processes in mega projects?**

Mega projects are large scale, complex projects which have extensive budgets, long completion time frames, multiple stakeholders, innovative technologies, and important national or international economic, social, and political implications. Decision making processes are extremely important in mega projects, as these projects succeed or fail based on the efficacy of the decisions made by project stakeholders. Existing theory suggests that *aesthetic knowledge* plays an important role as an aid to choice in decision making, particularly in complex and uncertain contexts like mega projects. ‘Aesthetic knowledge’ refers to sensory-derived (i.e., sight, hearing, touch, taste, smell and ‘gut feel’) tacit, non-rational, symbolic and experiential knowledge which emerges from people’s embodied sensory experience of, and embedded relationships with, phenomena. This role is predicated on its foundation for all cognition, and in providing decision makers with the capacity to give holistic meaning to complex phenomena through the intuitive application of their knowledge of coherence or harmony.

This research examines this function of aesthetic knowledge in the context of mega projects through a qualitative study based on 24 semi-structured interviews with mega project managers. The analysis of the data demonstrates how various forms of aesthetic knowledge (i.e., visual, aural, olfactory, gustatory, tactile and ‘gut feel’) are used by project decision makers in their decision making processes at

different stages of the mega project process, including as a means to deal with the complexity that is inherent in decision making contexts in these projects.

Specifically, the study establishes that project decision makers use aesthetic knowledge to establish and communicate for both themselves and others the meaning of objects, relationships, and abstract concepts in complex mega project decision making contexts. The application of aesthetic knowledge to the interpretation of sensory cues, the creation of sensory objects, and the use of metaphor provides decision makers with the ability to link information and create connections to existing sensory maps or schemas as a way of creating and communicating meaning. This meaning is then relied upon as the justifiable basis for the selection of action options.

## ***Table of Contents***

<b><i>Keywords</i></b> .....	<b><i>iii</i></b>
<b><i>Abstract</i></b> .....	<b><i>iv</i></b>
<b><i>Table of Contents</i></b> .....	<b><i>vi</i></b>
<b><i>List of Tables</i></b> .....	<b><i>x</i></b>
<b><i>List of Figures</i></b> .....	<b><i>xiii</i></b>
<b><i>Statement of Authorship</i></b> .....	<b><i>xiv</i></b>
<b><i>Acknowledgements</i></b> .....	<b><i>xv</i></b>
<b><i>Glossary of Terms</i></b> .....	<b><i>xvii</i></b>
<b><i>Chapter 1 Introduction</i></b> .....	<b><i>1</i></b>
<b>1.1 Setting the scene</b> .....	<b>1</b>
<b>1.2 Guiding conceptual framework</b> .....	<b>6</b>
<b>1.3 Research questions</b> .....	<b>10</b>
<b>1.4 Contribution to theory and practice</b> .....	<b>10</b>
<b>1.5 Definitions</b> .....	<b>12</b>
<b>1.6 Thesis Outline</b> .....	<b>13</b>
<b><i>Chapter 2 Literature Review</i></b> .....	<b><i>15</i></b>
<b>2.1 Mega project management</b> .....	<b>16</b>
2.1.1 Mega project management defined .....	16
<b>2.2 Decision making in mega project management</b> .....	<b>20</b>
2.2.1 The dominance of the rational decision making model .....	21
2.2.2 The criticisms of the rational decision making model .....	26
2.2.3 Current research on decision making in mega projects .....	37
2.2.4 Summary .....	39
<b>2.3 Aesthetic knowledge</b> .....	<b>40</b>
2.3.1 The philosophical foundations of aesthetic knowledge .....	42
2.3.2 Aesthetic knowledge and the philosophy of art .....	46
2.3.3 The experiential and relational sources of aesthetic knowledge .....	48
2.3.4 The tacit nature of aesthetic knowledge .....	49
2.3.5 The non-rational nature of aesthetic knowledge .....	52
2.3.6 The symbolic and experiential content of aesthetic knowledge .....	52
2.3.7 The aesthetic knowing process .....	53
2.3.8 Distinguishing aesthetic knowledge from other concepts .....	55
2.3.9 The functions of aesthetic knowledge .....	56

2.3.10 Examples of aesthetic knowledge .....	62
2.3.11 Aesthetic knowledge in organisational research .....	64
2.3.12 Aesthetic knowledge and decision making research .....	66
2.3.13 Aesthetic knowledge and decision making in mega project management research.....	71
2.3.14 Summary .....	73
<b>2.4 Conceptual framework .....</b>	<b>74</b>
<b>2.5 Research questions.....</b>	<b>82</b>
<b>2.6 Conclusion.....</b>	<b>83</b>
<b><i>Chapter 3 Methodology .....</i></b>	<b><i>86</i></b>
<b>3.1 Research paradigm – Critical Realism.....</b>	<b>86</b>
<b>3.2 Methodology.....</b>	<b>87</b>
<b>3.3 Method .....</b>	<b>90</b>
3.3.1 Source of evidence .....	90
3.3.2 Participants and sampling procedures .....	93
3.3.3 Data analysis.....	98
<b>3.4 Quality of the research.....</b>	<b>103</b>
3.4.1 Credibility.....	104
3.4.2 Dependability.....	104
3.4.3 Transferability.....	105
3.4.4 Confirmability.....	106
<b>3.5 Limitations of the research .....</b>	<b>106</b>
<b>3.6 Ethical considerations.....</b>	<b>107</b>
<b>3.7 Background of the researcher .....</b>	<b>108</b>
<b>3.8 Conclusion.....</b>	<b>109</b>
<b><i>Chapter 4 Aesthetic Knowledge and Decision Making at the Conceptualisation Stage of Projects.....</i></b>	<b><i>110</i></b>
<b>4.1 Visual aesthetic knowledge .....</b>	<b>111</b>
4.1.1 Visual aesthetic of proposed project outcomes .....	112
4.1.2 Visual aspects of decision making .....	121
4.1.3 Image.....	127
4.1.4 Summary .....	133
<b>4.2 Key insights from other aesthetic knowledge types .....</b>	<b>135</b>
4.2.1 Tactile aesthetic knowledge.....	136
4.2.2 Gut feel.....	138
4.2.3 Metaphorical use of aesthetic knowledge concepts.....	144
4.2.4 Summary .....	146
<b>4.3 Conclusion.....</b>	<b>148</b>
<b><i>Chapter 5 Aesthetic Knowledge and Decision Making at the Actualisation Stage of Projects.....</i></b>	<b><i>150</i></b>
<b>5.1 Visual aesthetic knowledge .....</b>	<b>152</b>
5.1.1 Visual aesthetic of proposed project outcomes .....	152
5.1.2 Visual aspects of decision making .....	158

5.1.3 Image.....	167
5.1.4 Summary .....	182
<b>5.2 Gut feel.....</b>	<b>184</b>
5.2.1 Sensory properties of project outcomes.....	185
5.2.2 Project processes.....	187
5.2.3 Presence.....	191
5.2.4 Data assessment .....	195
5.2.5 Routine decision making .....	206
5.2.6 Fit.....	208
5.2.7 Summary .....	212
<b>5.3 Key insights from other aesthetic knowledge types .....</b>	<b>214</b>
5.3.1 Aural aesthetic knowledge.....	215
5.3.2 Tactile aesthetic knowledge.....	221
5.3.3 Metaphorical use of aesthetic knowledge types .....	223
5.3.3 Summary .....	226
<b>5.4 Conclusion.....</b>	<b>228</b>
<b><i>Chapter 6 Aesthetic Knowledge and Decision Making at the Realisation Stage of Projects.....</i></b>	<b>229</b>
<b>6.1 Visual aesthetic knowledge .....</b>	<b>231</b>
6.1.1 Visual aesthetic of project outcomes.....	231
6.1.2 Visual aspects of decision making .....	237
6.1.3 Image.....	238
6.1.4 Summary .....	240
<b>6.2 Key insights from the discussion of other forms of aesthetic knowledge .....</b>	<b>243</b>
6.2.1 Tactile aesthetic knowledge.....	243
6.2.2 Metaphorical use of aesthetic knowledge concepts.....	244
6.2.3 Summary .....	246
<b>6.3 Conclusion.....</b>	<b>248</b>
<b><i>Chapter 7 Discussion.....</i></b>	<b>249</b>
<b>7.1 Real world problems and theoretical insights – the issue of decision making in mega projects.....</b>	<b>250</b>
<b>7.2 How you know when you can't 'know': Establishing and communicating meaning in complex, uncertain, and ambiguous decision making contexts.....</b>	<b>251</b>
7.2.1 The interpretation of sensory cues .....	253
7.2.2 The creation of sensory objects.....	261
7.2.3 The use of metaphor.....	262
7.2.4 The role of experience in the use of aesthetic knowledge in decision making processes	263
7.2.5 The contribution of aesthetic knowledge to project success or failure .....	266
<b>7.3 The benefits of the C-A-R analysis .....</b>	<b>268</b>
7.3.1 Visual aesthetic knowledge across the C-A-R stages of mega projects.....	271
7.3.2 Gut feel across the C-A-R stages of mega projects .....	273
7.3.3 Tactile aesthetic knowledge across the C-A-R stages of mega projects .....	275
7.3.4 Aural aesthetic knowledge across the C-A-R stages of mega projects .....	276
7.3.5 Olfactory & gustatory aesthetic knowledge across the C-A-R stages of mega projects ..	276
7.3.6 Summary .....	277



7.4 Conclusion.....	278
<i>Chapter 8 Conclusion.....</i>	<i>280</i>
8.1 Implications for theory .....	283
8.1.1 Aesthetic knowledge theory .....	283
8.1.2 Decision making theory.....	284
8.2 Implications for practice.....	285
8.3 Areas for future research.....	288
8.4 Limitations of the research .....	290
8.5 Conclusion.....	291
<i>Appendices .....</i>	<i>294</i>
Appendix 1: Final Interview Schedule.....	294
Appendix 2: Participant Information Sheet .....	296
Appendix 3: Transcriber Confidentiality Agreement .....	297
<i>Reference List.....</i>	<i>298</i>

## ***List of Tables***

Table 1.1: Definitions .....	13
Table 2.1: The key attributes of, and sources of complexity in, mega projects .....	19
Table 2.2: Summary of decision making models .....	24
Table 2.3: Key attributes of aesthetic knowledge .....	54
Table 2.4: Operationalising aesthetic knowledge – key attributes .....	78
Table 3.1: The suitability of interviews for the study of the use of aesthetic knowledge in decision making processes in mega projects.....	93
Table 3.2: Interview participant profile.....	97
Table 3.3 Respondent ID Codes and corresponding Thesis Identification Codes .....	97
Table 3.4: Open coding sources and references per aesthetic knowledge type category ...	100
Table 3.5: Number of interview extracts per aesthetic knowledge type per project stage..	100
Table 3.6: Details of the focused coding of the data by stage, aesthetic knowledge types, focus of aesthetic knowledge use, and stakeholders considered.....	102
Table 4.1: Number of interview extracts relating to types of aesthetic knowledge used at the Conceptualisation stage of projects.....	110
Table 4.2: Aesthetic knowledge types applied, foci of use, and stakeholders considered in decision making processes at the Conceptualisation stage of projects .....	111
Table 4.3: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to the visual aspect of proposed outcomes at the Conceptualisation stage of projects .....	113
Table 4.4: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to the visual aspect of decision making at the Conceptualisation stage of projects .....	122
Table 4.5: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to ‘image’ at the Conceptualisation stage of projects .....	127
Table 4.6: Summary of aesthetic knowledge types beyond visual aesthetic knowledge used in decision making processes at the Conceptualisation stage of projects, the focus of their use, and the stakeholders considered by participants in their discussion of the use of these types of aesthetic knowledge .....	136
Table 5.1: Number of interview extracts relating to aesthetic knowledge types used at the Actualisation stage of projects .....	150
Table 5.2: Aesthetic knowledge types applied, foci of use, and stakeholders considered in decision making processes at the Actualisation stage of projects .....	151

Table 5.3: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to the visual aspect of proposed project outcomes at the Actualisation stage of mega projects .....	153
Table 5.4: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to the visual aspect of decision making at the Actualisation stage of mega projects .....	158
Table 5.5: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to ‘image’ at the Actualisation stage of mega projects .....	167
Table 5.6: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to the sensory properties of project outcomes at the Actualisation stage of mega projects .....	185
Table 5.7: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to project processes at the Actualisation stage of mega projects .....	188
Table 5.8: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to the interpretation of ‘presence’ at the Actualisation stage of mega projects .....	192
Table 5.9: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to data assessment at the Actualisation stage of mega projects .....	196
Table 5.10: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to routine decision making processes at the Actualisation stage of mega projects .....	206
Table 5.11: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to project processes at the Actualisation stage of mega projects .....	208
Table 5.12: Summary of aesthetic knowledge types beyond visual aesthetic knowledge and ‘gut feel’ used in decision making processes at the Actualisation stage of projects, the focus of their use, and the stakeholders considered by participants in their discussion of the use of these types of aesthetic knowledge.....	215
Table 6.1: Number of interview extracts relating to types of aesthetic knowledge used at the Realisation stage of projects .....	230
Table 6.2: Aesthetic knowledge types applied, foci of use, and stakeholders considered in decision making processes at the Realisation stage of projects .....	231
Table 6.3: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to the visual aspect of proposed project outcomes at the Realisation stage of mega projects .....	231
Table 6.4: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to the visual aspect of decision making at the Realisation stage of mega projects .....	237
Table 6.5: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to ‘image’ at the Realisation stage of mega projects .....	238

Table 6.6: Summary of aesthetic knowledge types beyond visual aesthetic knowledge used in decision making processes at the Realisation stage of projects, the focus of their use, and the stakeholders considered by participants in their discussion of the use of these types of aesthetic knowledge ..... 243

Table 7.1: Summary of the aesthetic knowledge types used, and the purpose of applying aesthetic knowledge for each stage in the C-A-R model for mega projects. .... 271

Table 7.2 Summary - variations in aesthetic knowledge types used, purpose of the use of aesthetic knowledge types, focal stakeholders, and key project processes across the C-A-R model ..... 278

## *List of Figures*

Figure 1.1: C-A-R model – aesthetic knowledge and decision making processes in mega projects .....	9
Figure 2.1: The rationality of decision making continuum.....	23
Figure 2.2: Decision making model matrix .....	34
Figure 2.3: A comparison of Ancient Greek and Enlightenment epistemology incorporating aesthetics.....	45
Figure 2.4: A model of the aesthetic knowing process.....	55
Figure 2.5: The functions of aesthetic knowledge.....	57
Figure 2.6: Conceptual framework – situating aesthetic knowledge in the organisational decision making context .....	77
Figure 2.7: C-A-R – aesthetic knowledge and decision making processes in mega projects	79
Figure 7.1 Summary of research findings.....	253

***Statement of Authorship***

The work contained in this thesis has not been previously submitted to meet the requirements for an award at this or any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

QUT Verified Signature

Thomas M. Keenan

\_\_\_\_\_

1 August 2016

\_\_\_\_\_

Date

## *Acknowledgements*

I would like to acknowledge the outstanding support and guidance I have received from my supervisory team, Associate Professor Jennifer Bartlett and Adjunct Associate Professor Anne Pisarski. Their academic and personal assistance throughout the doctoral program has been exceptional – especially given the trying personal circumstances they have both faced during this period. My heartfelt thanks go to you both; and I certainly would not have been able to complete this journey without you.

I would also like to thank Dr Judy Matthews, Professor Caroline Hatcher, and Associate Professor Stephane Tywoniak for the additional insight and input they have provided for this thesis.

This thesis represents the culmination of many years of effort and it would be remiss of me not to mention the formative work done by my various colleagues and mentors at the University of Queensland. Thank you for getting me started on this long and winding road.

Special thanks are extended to the 24 participants who gave of their time and insights so freely as part of this study. I hope their willing participation will be repaid with useful insights that will assist their professional lives as project managers.

The doctoral journey can be a long and lonely one. I have been very fortunate to have two particularly good friends and colleagues to share my PhD student life with – Dr Anne-Maree Dowd (UQ) and Dr Alicia Mazur (QUT). Thank you both for your invaluable support and for keeping me (relatively) sane.

Finally, I would like to thank my family and friends for their consistent love, encouragement and patience during the doctoral process. In particular, I would like to thank my brother, Mel, for his editing and proofreading work (it is greatly appreciated). I would also like to thank my dear friends, Karen Adamson and her family, for the support they have provided – especially in terms of child-minding! While the PhD journey is difficult for the candidate, it is also especially taxing for the candidate’s immediate family. To my long-suffering wife, Kate (who has been with me since the start of my academic career, hence the long-suffering!) – words cannot express my gratitude to you and to our two young and wonderful children, Timothy and Amelia (Millie), for your love and support. Thank you for enduring my surliness, mood swings, and constant self-doubt; and for keeping me grounded while also helping me to realise what is truly important in life. Commensurate with the ‘curse’, it has been an ‘interesting time’ – but we have made it!

This thesis is dedicated to my late father, Maurice (known as Maurie – he hated his name!) – a teacher, guide, and mentor to not only his three children, but also to thousands of children over his 43 year teaching career. He instilled in me a lifelong love of learning; and also the understanding that it is necessary for us all to use the talents we have been given to their fullest – an important insight which I hope to be able to pass on to my own children. Here’s another one up on the wall, Dad – finally, I can talk!



## ***Glossary of Terms***

**Aesthetic knowledge:** sensory (i.e., sight, hearing, touch, taste, smell, and gut feel) derived tacit, non-rational symbolic and experiential knowledge which emerges from people's embodied sensory experience of, and embedded relationships with, phenomena (e.g., themselves, other people, animate and inanimate objects, social and other situations, etc.).

**Decision:** a commitment to a course of action that is intended to yield results that are satisfying for specified individuals.

**Decision making process:** the method used by decision makers to establish and then choose among various options relating to the matter under consideration, thus enabling a commitment to a course of action to be made.

**Gut feel:** the physical abdominal and related metaphorical manifestations of intuitive felt meaning derived from sensory based interpretations of phenomena which is relied upon as a justifiable basis of action.

**Intuition:** a tacit knowing process involving the application of tacit knowledge leading to immediate (non-inferential) understanding and learning without conscious reasoning or formal scrutinizable analysis.

**Knowledge:** the result of the interrelated processes of knowing, which are an evolving and variable constellation of, for example, the conceptual, cognitive, intuitive, aesthetic, emotional, spiritual, axiological, political and motor bases to

achievement that are an emergent property of relations, and that are justifiably regarded as a reliable basis for action.

**Mega project:** large scale, complex, and often transformational projects involving multi-million (or multi-billion) dollar budgets, long completion time frames, multiple stakeholders, and innovative technologies which have important national or international economic, social, and political implications.

**Mega project management:** an activity which involves the management of an open, emergent, and adaptive system aimed at employing various resources (human, knowledge, material, financial, etc..) in a novel, dynamic, interdependent, and evolving way to achieve flexible and emergent objectives within the specified time and budgetary constraints associated with mega projects.

**Project:** an endeavour in which human material and financial resources are organised in a novel way, to undertake a unique scope of work of given specification, within constraints of cost and time, so as to achieve a unitary, beneficial change, through the delivery of quantitative and qualitative objectives.

**Project manager:** a member of a project organisation who has the ultimate responsibility to make decisions about the goals and objectives to be met within a project time frame, and to plan, organise, and secure resources to enable the successful attainment of those goals and objectives.

**Tacit knowledge:** ‘subjective’ knowledge which is derived from people’s experience, ideals, values, and emotions. It is highly personal and context specific, and is often difficult to formalise, express, or share with others.

**Unstructured decision making context:** a decision making context which is characterised by high levels of uncertainty, complexity, and ambiguity in relation to goals, decision making procedures, action options, and outcome consequences.

## ***Chapter 1 Introduction***

### **1.1 Setting the scene**

The purpose of this research is to explore the ways in which aesthetic knowledge is used in decision making processes in mega projects. In particular, this thesis focuses on how the use of aesthetic knowledge, as indicated through research participants' discussion of sensory concepts (i.e., sight, hearing, taste, smell, touch, and 'gut feel' (Taylor, 2003)) in relation to their experience of participating in various project decision making processes, provides a means to understand the ways in which decision making occurs in mega projects. Mega projects are large scale, complex, and often transformational projects involving multi-million (or multi-billion) dollar budgets, long completion time frames, multiple stakeholders, and innovative technologies which have important national or international economic, social, and political implications (Flyvbjerg, 2014; Kardes, Ozturk, Cavusgil, & Cavusgil, 2013). Mega projects are undertaken within a broad range of industry sectors, including infrastructure development, construction, information technology, mining, defence procurement, urban regeneration, and international events management (Baccarini, 1996; Flyvbjerg, 2014; Hobday, 2000; Kardes, et al., 2013; Wilford, 2011). Given the cost, completion timeframes, complexity, uncertainty, ambiguity, and political, social and economic significance of mega projects, they are necessarily characterised by a significant level of risk; and the consequences of their failure (e.g., non-delivery, significant cost and/or completion time over-runs, failure to meet anticipated revenue targets, etc.) are considerable (Chang, Chih, Chew, & Pisarski, 2013; Flyvbjerg, 2014; Flyvbjerg, Bruzelius, & Rothengatter, 2003; Kardes, et al., 2013; Mazur, Pisarski, Chang, & Ashkanasy, 2014; Turner, Zolin, &

Remington, 2009). The significance of these types of projects, and the issues associated with their risk profile and failure consequences, have resulted in extensive research interest in mega projects (Flyvbjerg, 2014). This study contributes to this field through an exploration of decision making processes within the mega project context. Further research into decision making in mega projects is necessary because current research does not address adequately how decision makers manage the complexity inherent in mega project decision making, which limits the applicability of traditional rational-based approaches to project decision making owing to the absence of the predictability and order assumptions which underpin these approaches (Drummond, 2001; Geraldi & Adlbrecht, 2007; Jaafari, 2003; Simon, 1960, 1979, 1993; Snowden & Boone, 2007; Thomas & Mengel, 2008; Uhl-Bien, 2011). Exploring decision making in such contexts requires the consideration of how decision making processes occur in the absence of predictability and order; and how factors which are not rationally- based (such as aesthetic knowledge) affect project decision making processes.

Decision making processes are extremely important in mega projects, as these projects succeed or fail based on the efficacy of the decisions made by project stakeholders (Eweje, Turner, & Müller, 2012). On this basis, decision making processes in this context are highly worthy of investigation (Flyvbjerg, 2014). Decision making in mega projects is in itself a complex and multifaceted issue, particularly given the general complexity of these projects, and the need to address the often conflicting interests of multiple stakeholders (Flyvbjerg, 2014). Decision making is a significant area of interest in mega project management research. Geraldi and Adlbrecht (2007, p. 34) suggest that understanding the efficacy of

decision making processes is particularly important in mega projects because “there are only a few constraints, and many options, and hence decisions have to be made”.

Although a range of possibilities exists for the exploration of decision making within the mega project context, this study focuses on the insights provided by a specific group of decision makers – project managers. Project managers are particularly important in mega projects, as they are directly involved in decision making processes aimed at establishing both the goals and objectives to be met within the project time frame; and how resources will be secured, planned and organised to enable the successful attainment of these goals and objectives (Ireland, 2006). Their central role in project management also enables them to provide useful insights into the observed decision making processes of other stakeholders<sup>1</sup> during the project (Ireland, 2006).

It is essential for effective decision making that project managers are able to cope with the level of complexity with which they are confronted (Baccarini, 1996; Remington, Zolin, & Turner, 2009). Factors such as leadership and emotional intelligence have been established as important for enabling effective decision making in these complex circumstances (Wilford, 2011). Wilford (2011) argues that effective decision making in mega projects requires project managers to approach the project in a holistic manner. He suggests that complexity in mega projects is:

...often treated as a mere series of first order problems in a reductionist attempt to strip it down into simple tasks and ‘get on with the job’. Such simplification leads to a loss of granularity of information, creating a succession of processual or side effects which can undermine the project,

---

<sup>1</sup> Here, the term ‘stakeholder’ is used in accordance with the definition provided by the Project Management Institute (PMI), which suggests that stakeholders are “persons and organisations such as customers, sponsors, performing organisation and the public, that are actively involved in the project, or whose interests may be positively or negatively affected by the execution or completion of the project. They may also exert influence over the project and its deliverables” (PMI, 2004, p. 376).

particularly if the resulting weak signals of distress are ignored in a hasty attempt to complete the task (Wilford, 2011, p. 17).

Rather than attempting to understand the “whole through an understanding of the parts”, the goal in mega projects should be to “understand the whole through the interaction of the parts” (Antoniadis, 2011, p. 17). This necessitates the adoption of a holistic approach, which requires a deep level of task-focused and environmental understanding, and the ability to recognise and act on problems as they arise (Wilford, 2011). To do this effectively, project managers must apply the explicit and tacit knowledge they have gathered through “learning, training, practice and feedback” (Wilford, 2011, p.19). The application of knowledge, particularly tacit knowledge gained through experience, enables managers to focus on the overarching goals and objectives of the project without getting ‘bogged down’ in the fine-grained analysis of individual project elements.

The research literature establishes that tacit knowledge drawn from project managers’ lived experience is an important resource for effective decision making in mega projects. However, the use of aesthetic knowledge (a particular form of tacit knowledge) has not been studied explicitly in the context of mega projects. Aesthetic knowledge is sensory (i.e., sight, hearing, touch, taste, smell, and gut feel) derived tacit, non-rational, symbolic and experiential knowledge which emerges from peoples’ embodied sensory experience of, and embedded relationships with, phenomena (e.g., themselves, other people, animate and inanimate objects, social and other situations, etc..) (Cijssouw & Jorna, 2003; Davey, 1989; Ewenstein & Whyte, 2007; Fine, 1992; Gagliardi, 2006; Hansen, Ropo, & Sauer, 2007; Strati, 1992, 2003, 2007; Taylor, 2003; Taylor & Hansen, 2005; Tsoukas & Mylonopoulos, 2004; Warren, 2002; Whitfield, 2005). It refers to any knowledge which is derived from direct sensory experience and not from abstract intellectual processes of

knowing. It encompasses a broad range of knowledge, from knowledge of abstract concepts traditionally associated with aesthetics such as beauty, ugliness, gracefulness, cohesion, harmony and elegance, to knowledge grounded in more tangible sensory experience, such as the feel of a particular type of material, the aroma of a specific brand of perfume, or the look of a chicken pox spot (Davey, 1989; Dobson, 1999; Hansen, et al., 2007; Ramirez, 2005; Simon, 1993; Strati, 2003; White, 1996). Aesthetic knowledge is a universal attribute of humans; and one which is applied on an everyday basis to commonplace practices, including decision making (Davey, 1989; Dean, Ottensmeyer, & Ramirez, 1997; Edman, 1939; Featherstone, 2007; Hammermeister, 2002; Saito, 2001; Taylor, 2000).

Existing theory suggests that aesthetic knowledge plays an important role as an aid to choice in decision making, particularly in complex and uncertain contexts, because of its role as the foundation for all cognition (Davey, 1989; Gagliardi, 2006; Hansen, et al., 2007; Whitfield, 2005); and in providing decision makers with the capacity to give holistic meaning to complex phenomena through the intuitive application of their (aesthetic) knowledge of coherence or harmony (Agor, 1986; Davey, 1989; de Montoux, 2007). The latter view was originally proposed by Kant, in whose epistemic theory it is the decision maker's aesthetic knowledge which enables the recognition of patterns and the conceptualisation of wholeness and coherence which in turn allows effective action options to be chosen (de Montoux, 2007). This knowledge of coherence and harmony provides meaning in complex and uncertain environments, and is relied upon as a justifiable basis for action. Aesthetic knowledge schemas facilitate the interpretation of environmental cues and are the basis of the judgement of their importance and their relationships. It is the felt meaning that is derived from the effective application of aesthetic knowledge in



complex, ambiguous and uncertain situations (such as mega projects) that provides the decision maker with a sense of harmony and the intuitive sense that the ultimate action option choice ‘feels right’. It is for this reason that Kant’s philosophical position on the role of aesthetic knowledge as the foundation of coherent and holistic thinking in relation to decision making needs to be explored explicitly within the mega project context. No current empirical research explores this function of aesthetic knowledge within this decision making context.

## **1.2 Guiding conceptual framework**

This study examines the ways in which aesthetic knowledge is used in decision making processes in mega projects using existing aesthetic knowledge theory. The existing theory suggests that effective decision making requires decision makers to apply their aesthetic knowledge to make choices that are coherent with (i.e., ones that are harmonious with or ‘fit’) the desired outcome (Agor, 1986; Davey, 1989; de Montoux, 2007). The application of this knowledge enables decision makers to identify, and make judgements about, the functionality of the various relationships which affect the decision making process and the ability to achieve desired outcomes. Choices are then based on these functionality assessments. The ultimate success or failure of the outcome is, at least in part, determined by how well the choices made throughout the decision making process fit the desired nature or purpose of the outcome.

The Kantian notion of the function of aesthetic knowledge in decision making (de Montoux, 2007), and the discussion in the literature on the role of tacit knowledge and intuition in decision making (e.g., Brockmann & Anthony, 2002; Klein, Calderwood, & Clinton-Cirocco, 2010; Simon, 1978), suggest that the use of

aesthetic knowledge in decision making may be most beneficially explored in unstructured decision contexts (i.e., contexts characterised by high levels of uncertainty, complexity and ambiguity – Buchanan & O'Connell, 2006; Choo, 1998; Cray, Inglis, & Freeman, 2007; Drummond, 2001; Klein, 2003; Langley, et al., 1995) in which traditional, rationally-based approaches to decision making are often ineffectual (Uhl-Bien, 2011). It is the purpose of this research to explore mega project management as an example of an unstructured decision making context. This context is a particularly fruitful one for the exploration of the use of aesthetic knowledge in decision making processes in organisations. The selection of this research context is justified further below.

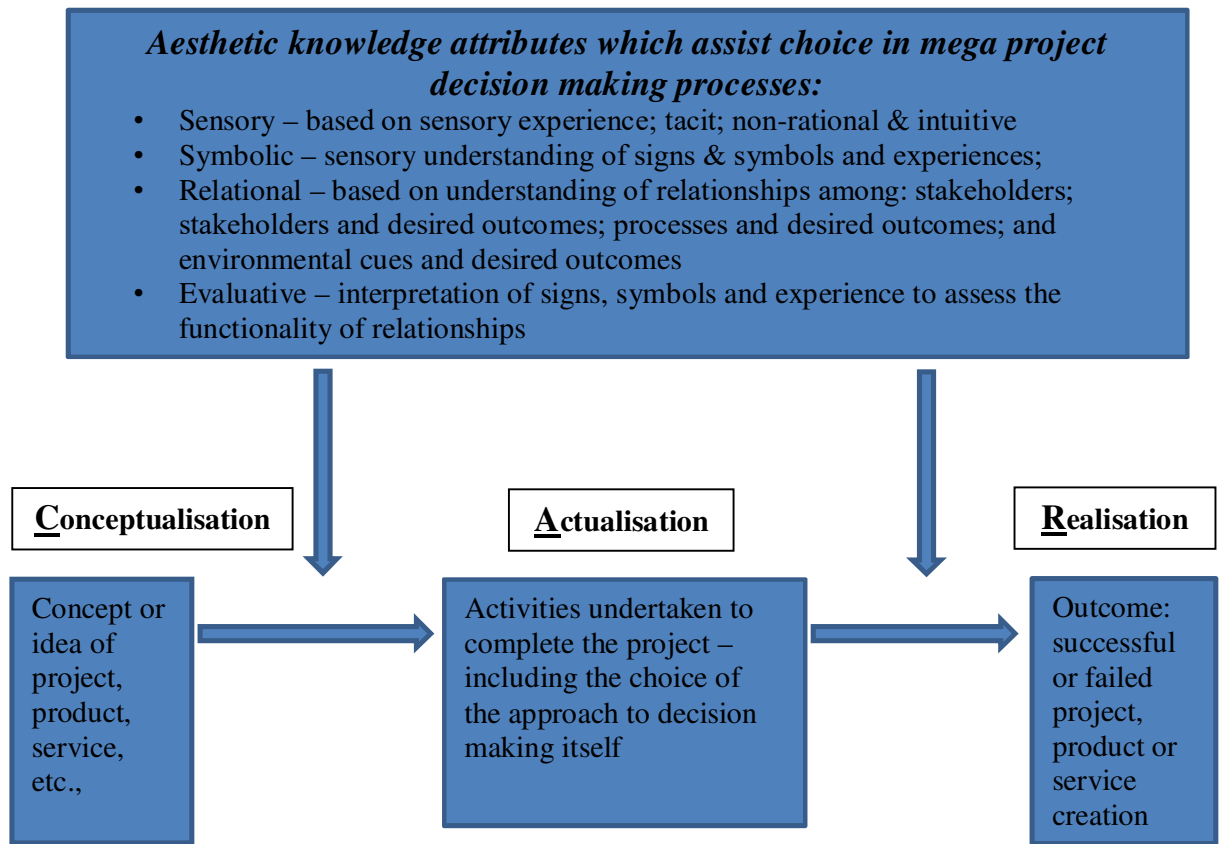
The intuitive application of sensory and experientially derived knowledge of signs and symbols, and of experiences (i.e., aesthetic knowledge), to decision making processes enables decision makers to identify and judge holistically the significance and functionality of the many and varied relationships which are evident in decision making processes in complex environments, and to make effective choices accordingly. Potential examples of these varied relationships among project inputs and outputs in mega project contexts include relationships among environmental cues and past experiences; goals and the methods to achieve those goals; goals and outcome action options; outcome action options and the objectives of external stakeholders; and outcome action options and the objectives of internal stakeholders (Flyvbjerg, et al., 2003; Kardes, et al., 2013). The effective use of aesthetic knowledge by decision makers results in choices which lead to functional relationships<sup>2</sup> and effective outcomes. This function of aesthetic

---

<sup>2</sup> In this context, 'functional' refers to a sense of 'fit' or coherence within a relationship. An example would be where the means to achieve a goal 'fit' with the nature of the goal.

knowledge in decision making processes has not been specifically examined empirically to date.

The function of aesthetic knowledge is to assist decision makers to make choices throughout the project process, from the conceptualisation of the nature of the specific outcome (project, product, service, etc., – the ‘**C**onceptualisation’ stage), through the activities undertaken to produce the specific outcome (the ‘**A**ctualisation’ stage), to its final creation (the ‘**R**ealisation’ stage) (see Figure 1.1). These three stages involve different stakeholders and foci of decision making, and the pursuit of different types of specific outcomes; they are therefore worthy of independent investigation. The three-staged approach to the project process proposed in this model is based on the concept of the ‘project lifecycle’ (Aaltonen & Kujala, 2010; Morris, 1982). In reality – particularly in the context of mega projects – the project lifecycle is rarely this linear, and the stages are not this clearly delineated (Geraldi & Adlbrecht, 2007; Jaafari, 2003; Thomas & Mengel, 2008). However, this staged concept has been used as the basis of the guiding framework for the analysis of the data. It is particularly beneficial to assess whether the use of aesthetic knowledge differs throughout the project process.



**Figure 1.1: C-A-R model – aesthetic knowledge and decision making processes in mega projects**

Mega project management provides an important example of an organisational situation characterised by uncertainty, complexity and ambiguity in which aesthetic knowledge may be used in decision making processes. The nature of these types of projects requires decision makers to operate in complex and unstructured decision making environments owing to (a) the complexity of the subject matter and the project's organisational, social, cultural, political, environmental and technological contexts; and (b) the uncertainty and unpredictability about goals and the success of possible choice options that are often characteristic of such projects (Baccarini, 1996; Geraldi & Adlbrecht, 2007; Kallinikos, 1998; Wilford, 2011; Williams, 1999). The holistic and cohesive focus of aesthetic knowledge (de Montoux, 2007) suggests that its application can enable decision makers in mega projects to cope effectively with complex and uncertain

environments, assisting them to make choices that lead to the achievement of project goals. The exact nature of the use of aesthetic knowledge in decision making processes in this context has not been examined empirically.

### **1.3 Research questions**

The purpose of this research is to understand the ways in which aesthetic knowledge is used in decision making processes in mega projects. To achieve this purpose, this thesis focuses on the research question:

**What are the ways in which aesthetic knowledge is used in decision making processes in mega projects?**

To assist in addressing this primary research question, a series of sub-research questions was also considered:

1. What types of aesthetic knowledge are used in decision making processes in mega projects?
2. How does the use of aesthetic knowledge types vary by project stage?
3. What is the role of the experience of decision makers in the use of aesthetic knowledge in decision making processes in mega projects?
4. How does the use of aesthetic knowledge in decision making processes in mega projects contribute to project success or failure?

Chapter 2 provides a detailed discussion and analysis of the literature which led to the development of these research questions.

### **1.4 Contribution to theory and practice**

This research differs from existing research of aesthetic knowledge within the context of organisations. It explores how aesthetic knowledge is applied to an

process which occurs within organisations (i.e., decision making), rather than focusing on the aesthetic elements of organisations (i.e., office layout, organisational artefacts, etc.) (e.g., Strati, 1992), workers' aesthetic experience of organisations (e.g., Warren, 2008), or the relationship between ethics and aesthetics in organisations (e.g., Kersten, 2008).

The research makes a number of important contributions to theory and further enhances our understanding of the role of non-rational human factors in decision making processes in organisational contexts. In particular, it introduces the Kantian perspective on aesthetic knowledge into intuitive decision making theory, highlighting how the intuitive application of aesthetic knowledge enables decision makers to arrive at a felt sense of coherence and meaning about the relationships among disparate decisions inputs. This felt sense is then relied upon as a justifiable basis of action. The research identifies various types of aesthetic knowledge (visual, aural, olfactory, tactile, gustatory, and gut feel) and how these knowledges are used by project decision makers in various types of decision making at different stages of the mega project process.

The research also contributes to the practice of decision making within mega project contexts. The primary practical outcome of the research is that it assists with the understanding of how project decision makers deal with the complexity that is inherent in decision making contexts in mega projects. It also reinforces the importance of effective stakeholder relationship management for successful decision making in mega projects by highlighting the need in certain circumstances for project decision makers to access the aesthetic preferences of other stakeholders so that effective decisions can be made. The research suggests the need for project organisations to consider ways in which to address the potential problems associated

with the loss of tacit knowledge (in this case aesthetic knowledge) given its importance for effective decision making.

## 1.5 Definitions

Term	Definition	Key Authors
<i>Aesthetic knowledge</i>	sensory (i.e., sight, hearing, touch, taste, smell, and 'gut feel')-derived tacit, non-rational, symbolic and experiential knowledge which emerges from peoples' embodied sensory experience of, and embedded relationships with, phenomena (e.g., themselves, other people, animate and inanimate objects, social and other situations etc.). It refers to knowledge of abstract concepts such as beauty, ugliness, coherence, harmony, form and elegance, as well as more 'grounded', tangible forms of knowledge (e.g., knowledge used in medical diagnosis, such as the knowledge of the look of chicken pox spots, the sound of respiratory illness, or the feel of a cancerous growth)	(Cijssouw & Jorna, 2003; Davey, 1989; Ewenstein & Whyte, 2007; Gagliardi, 1996; Hansen, et al., 2007; Strati, 1992, 2003, 2007; Taylor & Hansen, 2005; Warren, 2002; Whitfield, 2005)
<i>Decision</i>	a commitment to a course of action that is intended to yield results that are satisfying for specified individuals	(Langley, et al., 1995; Yates & Tschirhart, 2006)
<i>Decision making process</i>	the method used by decision makers to <i>establish</i> and then <i>choose</i> among various options relating to the matter under consideration thus enabling a commitment to a course of action to be made	(Choo, 1998)
<i>Gut feel</i>	the physical abdominal and related metaphorical manifestation of intuitive, felt meaning derived from sensory based interpretation of phenomena which is relied upon as a justifiable basis of action.	(Taylor, 2003)
<i>Intuition</i>	a tacit knowing process involving the application of tacit knowledge leading to immediate (non-inferential) understanding and learning without conscious reasoning or formal scrutinizable analysis	(Betsch, 2008; Rooney & Schneider, 2005; Salas, Rosen, & DiazGranados, 2010)
<i>Knowledge</i>	the result of the interrelated processes of knowing, which are an evolving and variable constellation of, for example, the conceptual, cognitive, intuitive, aesthetic, emotional, spiritual, axiological, political and motor bases to achievement that are an emergent property of relations, and that are justifiably regarded as a reliable basis for action	(Rooney & Schneider, 2005; Vygotsky, 1986; Whitehead, 1978)
<i>Mega project</i>	a large scale, complex and often transformational project involving multi-million (often multi-billion) dollar budgets, long completion time frames, multiple stakeholders, and innovative technologies which has important national or international economic, social, and political implications	(Flyvbjerg, 2014; Kardes, et al., 2013)
<i>Mega project management</i>	the management of an activity which involves the formation of an open, emergent and adaptive system aimed at employing various resources (human, knowledge, material, financial, etc.) in a novel, dynamic, interdependent, and evolving way to achieve flexible and emergent objectives within specified time and budgetary constraints	(Jaafari, 2003; Kallinikos, 1998; Turner, 2008; Whitty & Maylor, 2009; Williams, 1999)
<i>Project Manager</i>	a member of a project organisation who has the ultimate responsibility to make decisions about the goals and objectives to be met within a project time frame, and to plan, organise and secure resources to enable the successful attainment of those goals and objectives	(Ireland, 2006)

<i>Tacit knowledge</i>	'subjective' knowledge which is derived from peoples' experience, ideals, values and emotions. It is highly personal and context specific, and is often difficult to formalise, express, or share with others	(Nonaka & Takeuchi, 1995; Polanyi, 1967)
<i>Unstructured decision making context</i>	a decision making context which is characterised by high levels of uncertainty, complexity, and ambiguity in relation to goals, decision making procedures, action options, and outcome consequences	(Buchanan & O'Connell, 2006; Choo, 1998; Cray, et al., 2007; Drummond, 2001; Klein, 2003; Langley, et al., 1995)

**Table 1.1: Definitions**

## 1.6 Thesis Outline

The thesis is structured in the following manner:

*Chapter 2* provides a review of relevant literature relating to mega project management, decision making, and aesthetic knowledge in order to provide further detail about the background of the research; to explain the conceptual framework underpinning the research; and to identify the gap in the existing literature. This establishes the significance of the research and its contribution to the theory and practice of mega project management. At the end of this chapter, details are provided of the research questions which formed the basis of investigation.

*Chapter 3* provides the rationale for, and the details of, the qualitative methodology used to address the research questions listed in Chapter 2. In particular, the critical realist foundation of the research is discussed; and a demonstration of the appropriateness of a qualitative methodology for both the research topic and its paradigmatic foundation is provided. Further, this chapter presents details of the study's participants, sampling techniques, data collection methods, and analysis procedures. It concludes with a discussion of the processes engaged in to ensure the quality of the research; and an assessment of the study's ethical implications and limitations.



*Chapter 4* examines specifically the results from the analysis of the data which discuss the use of aesthetic knowledge in decision making processes at the **Conceptualisation** stage of mega projects.

*Chapter 5* explores the results from the analysis of the data which discuss the use of aesthetic knowledge in decision making processes at the **Actualisation** stage of mega projects.

*Chapter 6* details the results from the analysis of the data which focus on the use of aesthetic knowledge in decision making processes at the **Realisation** stage of mega projects.

*Chapter 7* discusses the key findings of the research. It also addresses the role of experience in, the contribution to the success or failure of projects of, and the insight provided by the C-A-R model for, the use of aesthetic knowledge in decision making processes in mega projects.

*Chapter 8* provides an overall conclusion for the thesis. It also presents details of the theoretical and practical implications of this research; proposed areas for further study; and the limitations of the study.

## ***Chapter 2 Literature Review***

This chapter presents a review of relevant existing literature on mega project management, decision making, and aesthetic knowledge as a means of supporting the discussion of the research background and conceptual framework provided in Chapter 1. It begins with an exploration of the literature on mega project management to establish both the context for the research and the importance of effective decision making for the successful management of these projects. It then examines the literature on decision making in the mega project context. This review includes a discussion of decision making theory more broadly as a means of establishing the relevance for mega project management of approaches to decision making which are intuitive, holistic, and rely on the application of tacit forms of knowledge. These approaches are important owing to the complexity, uncertainty, and ambiguity that is characteristic of the decision making context in mega projects. It then considers the literature on aesthetic knowledge to demonstrate the theoretical role of aesthetic knowledge (as a form of tacit knowledge) in these intuitive and holistic approaches to decision making. This review includes a consideration of the existing literature of direct relevance to the application of aesthetic knowledge to decision making in the mega project context. It then presents a detailed discussion of the conceptual framework developed from the literature to provide an initial focal point for the research. Finally, the chapter concludes by stating the research questions that flow from the preceding discussion of the literature and which have been addressed through the research methodology detailed in Chapter 3.

## 2.1 Mega project management

Mega project management provides an important setting for research examining the use of aesthetic knowledge in decision making processes. This section explores the meaning of mega project management and its evolution as an important topic in the field of organisational studies; examines its core characteristics, its sources of complexity, and the role of project managers in dealing with this complexity; and considers the importance of decision making for the successful management of mega projects.

### 2.1.1 Mega project management defined

Projects are a widely used method of achieving goals in organisations (Whitty & Schulz, 2007). A project is:

...an endeavour in which human material and financial resources are organised in a novel way, to undertake a unique scope of work of given specification, within constraints of cost and time, so as to achieve a unitary, beneficial change, through the delivery of quantitative and qualitative objectives (Turner, 2008).

Projects generally move through various stages of the “project lifecycle” (Aaltonen & Kujala, 2010; Morris, 1982), which is conceptualised in this research as a process which has three interconnected phases:

- (a) the initial development of the nature of the specific outcome (project, product, service, etc., – the ‘**C**onceptualisation’ stage);
- (b) the undertaking of activities designed to produce the specific outcome (the ‘**A**ctualisation’ stage); and
- (c) final creation of the project outcome (the ‘**R**ealisation’ stage).

Project management refers to the activities undertaken to manage this project lifecycle process. Various decisions are made by project stakeholders during the

different stages of the project process in attempt to ensure that a successful project outcome is achieved. Project management is an important area of both research and practice in organisational studies, as projects are seen as a “key enabler of business change and a vital contributor to future business success” (Whitty & Maylor, 2009, p.304).

The traditional approach to project management is based on rationalist management principles and is focused on achieving certainty in relation to both project goals and the methods of achieving those goals (Jaafari, 2003; Thomas & Mengel, 2008). Project management from this perspective involves “detailed long term planning, rigid structures, precise work breakdown structure definition and elaborate control rules” (DMO, 2011, p. 34). It is a linear, progressive and mechanistic approach to managing projects, based on the assumption that goals and project processes are known and well understood prior to the commencement of the project (Geraldi, 2008; Jaafari, 2003; Thomas & Mengel, 2008).

The linear and mechanistic assumptions of this traditional approach to project management have been the subject of repeated criticism in the project management literature since the mid-1990s (Geraldi & Adlbrecht, 2007; Jaafari, 2003; Thomas & Mengel, 2008). The traditional approach is seen as inappropriate for modern project management, which is increasingly focused on the management of ‘mega’ projects – that is, large scale, complex and often transformational projects involving multi-million (often multi-billion) dollar budgets, long completion time frames, multiple stakeholders, and innovative technologies which have important national or international economic, social and political implications (Flyvbjerg, 2014; Kardes, et al., 2013). Mega projects are particularly prevalent in fields such as infrastructure development, construction, defence procurement, aeronautics,

information technology systems, urban regeneration, and international events management (Baccarini, 1996; Flyvbjerg, 2014; Hobday, 2000; Wilford, 2011).

It is the scale and complexity of mega projects that sets them apart from other types of projects (Flyvbjerg, 2014; Kardes, et al., 2013). The increasing complexity of project tasks, inputs, and operational (social, political, ecological, legal, etc.) environments (Thomas & Mengel, 2008), the growing application of complexity theory (Stacey, 2001) to project management research, and the importance and propensity for failure of these types of projects (Thomas & Mengel, 2008), have led to significant research interest in mega projects (Geraldi & Adlbrecht, 2007).

One of the key issues in the mega project management literature is the lack of an agreed upon approach to what ‘complexity’ means in this context (Cooke-Davies, 2011; Williams, 1999). Complexity is often defined either by its “common sense or dictionary” meaning (e.g., “consisting of many different and connected parts” – COED, 2008) or in the “theoretical context of complexity theory” (Thomas & Mengel, 2008, p. 307). In terms of complexity theory, ‘complex’ refers to a characteristic of a system (Whitty & Maylor, 2009). Complex systems are “open, emergent and adaptive systems that are characterised by recursiveness and non-linear feedback loops” (DMO, 2011, p. 34). This conceptualisation of ‘complex’ enables a more sophisticated understanding of mega projects (Antoniadis, 2011). Mega projects necessarily consist of many different and interconnected tasks, inputs (both material and knowledge-related), and project team members and other stakeholders (as do large and complicated projects – Whitty & Maylor, 2009; Williams, 1999). However, the acknowledgement that mega projects form open, emergent and adaptive system allows researchers to explore other *sources* of

complexity (e.g., uncertainty and frequent change in relation to goals and methods of achieving them, internal and external environmental turbulence, instability of relationships among stakeholders, etc.) (Jaafari, 2003; Kallinikos, 1998; Remington, et al., 2009). Given this understanding of ‘complex’, and Turner’s (2008) conceptualisation of ‘project’, mega project management is defined in this thesis as an activity which involves the management of an open, emergent and adaptive system aimed at employing various resources (human, knowledge, material, financial, etc.) in a novel, dynamic, interdependent, and evolving way to achieve a flexible and emergent objective within specified time and budgetary constraints. This definition reflects both the systemic nature of mega projects and the key sources of project complexity. The key attributes of mega projects and the sources of complexity in mega projects are summarised in Table 2.1.

<b>Mega Projects</b>		
	<b>Details</b>	<b>Key Authors</b>
<b>Key Attributes</b>	extensive scales, budgets, and levels of risk	(Crawford, 2005; Flyvbjerg, 2014; Wilford, 2011)
	long completion timeframes, multiple stakeholders, innovative technologies, national/international economic, social, and political implications	(Flyvbjerg, 2014; Kardes, et al., 2013)
	high levels of uncertainty, ambiguity and unpredictability in relation to scope, goals and objective achievement pathways	(Crawford, 2005; Flyvbjerg, 2014; Kallinikos, 1998; Remington, et al., 2009; Snowden & Boone, 2007; Turner & Cochrane, 1993; Wilford, 2011; Williams, 1999)
	high levels of interconnectivity and interdependency among project tasks, team members, internal and external stakeholders, technologies, and material and knowledge inputs	(Baccarini, 1996; Flyvbjerg, 2008, 2014; Hobday, 2000; Jaafari, 2003; Luhman & Boje, 2001)
<b>Sources of Complexity</b>	uncertainty: ambiguity and vagueness about goals, implementation methodologies, stakeholder objectives, and risk allocation	(Gerald & Adlbrecht, 2007; Kumar, Rangan, & Rufin, 2005; Remington, et al., 2009)
	structural complexity: the extent and level of interdependence among the structural elements of the project (i.e., stakeholders, material, financial, human, knowledge and other inputs, time constraints, and the social, political, and ecological environment)	(Gerald & Adlbrecht, 2007; Kumar, et al., 2005; Remington, et al., 2009; Sutterfield, Friday-Stroud, & Shivers-Blackwell, 2006)

**Table 2.1: The key attributes of, and sources of complexity in, mega projects**

This understanding of the complexity associated with mega projects is important, as it is the level of project complexity that determines the management practice employed in the project in terms of co-ordination and control; the initial identification of goals and objectives; and the selection of both the form of the project and the necessary inputs (Baccarini, 1996). It is the role of project managers of mega projects to make decisions (often in conjunction with other important stakeholders) about the goals and objectives to be pursued within the planned project time frame; and to plan, organise, and secure the resources that are required to achieve the desired project outcomes (Ireland, 2006). These decision making processes are extremely important in mega projects, as the success or failure of the project relies on the effectiveness of the decisions made during the project process (Eweje, et al., 2012). Consequently, these decision making processes are highly worthy of investigation in the context of mega projects (Flyvbjerg, 2014).

## **2.2 Decision making in mega project management**

Decision making is a key focus area of research in the existing literature on mega project management. Geraldi and Adlbrecht (2007, p. 34) suggest that decision making processes are particularly vital in mega projects because “there are only a few constraints, and many options, and hence decisions have to be made”. Decision making in mega projects is in itself a complex and multifaceted issue, particularly given the general complexity of these projects, and the need to address the often conflicting interests of multiple stakeholders (Flyvbjerg, 2014). To understand both the importance of decision making for mega projects, and why it is a complex issue in this context, it is necessary to locate decision making in mega project management within the broader theory of decision making in organisations. To achieve this aim, the following sections consider the key aspects of decision making

theory, including the traditional dominance of the rational model of decision making in organisational studies, and the attempts in the existing literature to address the conceptual and contextual limitations of this model. The purpose of this discussion is to establish the limitations of this model for complex decision making contexts, such as mega project management. Section 2.2.3 discusses the extant literature which explores specifically decision making in the mega project management context.

### **2.2.1 The dominance of the rational decision making model**

Decision making has been a central topic of interest throughout the history of research in the field of organisational studies (Gore, Banks, Millward, & Kyriakidou, 2006). This focus is based on the assumption that all organisations and their activities are derived from decisions made by the members of organisations (Choo, 1998). A decision is “a commitment to a course of action that is intended to yield results that are satisfying for specified individuals” (Yates & Tschirhart, 2006, cf. Langley, et al., 1995, p. 261, Klein, 2008). A decision occurs when deliberation regarding a course of action ends and action commences (Buchanan & O'Connell, 2006). To arrive at a commitment to action, decision makers must engage in processes aimed at *establishing* and *choosing* among various options relating to the matter under consideration (Choo, 1998). Decisions may take many different forms; they may be ‘one-off’ or part of a series; and they may involve individuals or groups (McKenzie, van Winkelen, & Grewal, 2011). An extensive variety of decisions regarding every aspect of an organisation is made by individuals and groups within organisations on a moment-by-moment basis.

Research into decision making in organisational contexts has been conducted from a broad range of theoretical perspectives, including psychology, sociology,



economics, anthropology, and management (Gore, et al., 2006). Although Barnard (1938) argues that there is a difference between personal and organisational decision making (which, he suggests, explains why “some employees act in the firm’s interest rather than their own” – Buchanan & O’Connell, 2006, p. 37), the study of decision making in organisations has been heavily influenced by research exploring individual, personal decision making.<sup>3</sup> In particular, the research of decision making in organisations has been dominated primarily by theories of economic rationality, in which human decisions are seen as “intendedly rational” (March, 1997, p. 10) choices of action options which lead to maximum utility (i.e., primarily, economic utility) for the decision maker (Dane & Pratt, 2007; Langley, et al., 1995; March, 1997; Simon, 1993). The focus on rationality in decision making in an organisational context is also related to the desire among organisational scholars to ‘legitimise’ organisational decision making research by modelling the theoretical underpinnings and research methodologies of the field on the ‘scientific method’ of the natural sciences (Simon, 1979, 1993).

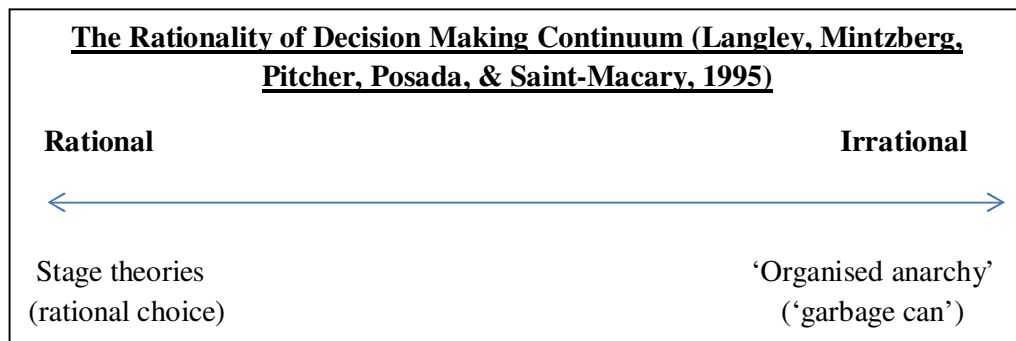
Langley et al. (1995, p. 260) argue that the various theoretical models<sup>4</sup> that have emerged from organisational decision making research have “been stuck along a continuum between the cerebral rationality of the stage theories at one end and the apparent irrationality of the theory of organised anarchies at the other” (see Figure 2.1). ‘Stage’ or ‘rational’ decision making models are derived primarily from the work of Barnard (1938). These models involve the use of reason in decision making processes to arrive at a result which produces the optimal (or maximum utility) outcome as identified by the decision makers (Cray, et al., 2007). The primary

---

<sup>3</sup> This is not surprising given that human beings are the decision makers within organisations.

<sup>4</sup> Refer to Table 2.2 for a summary of these models. Space restrictions limit a detailed consideration of each model. The table is organised in accordance with Langley et al.’s (1995) continuum concept, from the rational model proposed by Barnard (1938) to the ‘garbage can’ model of anarchic decision making suggested by Cohen, March and Olsen (1972).

rational model is based around a clearly defined and staged decision making process involving defining a problem and attending to it, identifying appropriate decision criteria, allocating weight to each criterion, developing alternative solutions to the problem, evaluating each solution against the weighted criteria, and selecting the ‘best’ (i.e., optimal) alternative (Dane & Pratt, 2007; Harrison, 1999; Simon, 1993). This process is summarised by Simon (1960) as “intelligence-design-choice”. This model focuses on decision making as “a cognitive process that can be decomposed into a sequence of simple, programmed steps” (Langley, et al., 1995, p. 262). It is based on a particular set of assumptions, namely that the nature of the problem that is identified is apparent; the solution options are known and understood; the decision criteria preferences of decision makers are clear and consistent; there is an absence of time constraints; and the ‘best’ alternative is that which results in “maximum payoff” (March, 1994).



**Figure 2.1: The rationality of decision making continuum**

<b>Decision Making Model</b>	<b>Key Author(s)</b>	<b>Appropriate Decision Making Context</b>	<b>Processes at Play</b>	<b>Skills Set(s) Required</b>
Rational	Barnard (1938)	Structured	Cognitive processes of reason	Analytical
Bounded Rationality	Simon (1957)	Structured	'Bounded' cognitive processes of reason	Analytical
Satisficing	March (1994); Simon (1979)	Unstructured	Choice of action option that is 'good enough', not optimal, based on the choice criteria	Analytical, judgement
Convergence	Langley et al. (1995)	Unstructured	Multiple stages of decision making by people collectively in organisations converging on a final action	Political, judgement, intuitive, 'insight'
Intuitive (e.g., Recognition-Primed-Decision – RPD)	Klein (2003, 2008) Klein et al. (2010)	Unstructured	Tacit, unconscious identification and interpretation of environmental cues by applying tacit knowledge to arrive at appropriate action options	Intuitive, judgement
Political	Pettigrew (1973)	Unstructured	Negotiation processes aimed at controlling communication of information and framing of decision criteria	Political, rhetorical, negotiation
'Design Attitude'	Boland & Collopy (2004)	Unstructured	Looking for the best solution to an issue by questioning the underlying assumptions of the nature of the 'problem'	Intuitive, creative
'Garbage Can'	Cohen, March & Olsen (1972)	Unstructured	Anarchical and serendipitous linking processes	Political, rhetorical

**Table 2.2: Summary of decision making models**

Choo (1998, p.13) argues that it is important that decision making in an organisational context is perceived as “rational in spirit (and appearance) if not in execution”. This is because rational decision making in organisations is viewed as

indicative of ‘soundness’ – that is, as one criterion on which perceptions of external legitimacy can be formed in terms of issues such as the extent of procedural justice evident in an organisation, and its economic security. The appearance of rational decision making in organisations equates to “behaving responsibly and with accountability” (Choo, 1998, p.17). Klein (2003) maintains that:

...there is something very appealing and reassuring about it [i.e., rational decision making]. It is based not on whims or hunches, but on solid analysis and logic. It is methodical rather than haphazard. It guarantees that you won’t miss anything important. It leaves nothing to chance. It promises you a good decision if you follow the process properly. It allows you to justify your decision to others. There is something scientific about it.

This ‘comforting’ aspect of the rational model explains partially its persistence in organisational studies, even in the face of repeated criticism. As Klein (2003) suggests, “[w]ho would not want to be thorough, systematic, rational and scientific?”. It also supports the claim that rationality is often retrospectively established in organisational decision making processes (Straw, 1980). March (1997) argues that the desire to be perceived as acting rationally results in situations where the “post decision elaboration of justification often seems to be considerably more extensive than the exploration of reasons before a decision” (cf. Drummond, 2001).

Cabantous and Gond (2011) have also attempted to explain what they refer to as the “*eternal retour*” (the “eternal return”) of rationality in organisational decision making research. They maintain that rational decision making in the context of organisations refers to “performative praxis, that is, a set of activities whereby organisational actors collectively produce rational decisions and thus grant social reality to rational choice theory” (Cabantous & Gond, 2011, p. 574). Therefore, rational decision making is not a process as traditionally defined, but

rather “a purposeful effort of managers in search of rationality” (Cabantous & Gond, 2011, p. 577). They argue that managers engage in this “purposeful effort” owing to three key factors: (a) the *conventionalisation* of rationality, which results from its promotion as the basis of “good decisions” and business success in managerial education (particularly in business schools); (b) the *engineering* of rationality, through its use as in the basis of most decision making tools and technologies; and (c) the *commodification* of rationality by academics, consultants and other practitioners who “sell” it and its benefits to organisations (Cabantous & Gond, 2011).

### **2.2.2 The criticisms of the rational decision making model**

The rational decision making model has been the subject of repeated and varied criticism. This criticism can be divided into three key streams: the inability of humans to behave and act in the completely rational manner which underpins the model (e.g., Buchanan & O'Connell, 2006; Choo, 1998; Cray, et al., 2007; Langley, et al., 1995; Simon, 1957); the failure of the rational model to consider the role that non-rational human factors play in organisational decision making (e.g., Andrade & Ariely, 2009; Betsch, 2008; Burke & Miller, 1999; Cohen, et al., 1972; Dane & Pratt, 2007; Drummond, 1999; Fritzsche, 1991; Gottlieb & Sanzgiri, 1996; Kahneman & Klein, 2009; Klein, 2003; Langley, et al., 1995; Simon, 1987; Sinclair & Ashkanasy, 2005); and the limited applicability of the model in decision making contexts characterised by complexity and uncertainty (e.g., Buchanan & O'Connell, 2006; Drummond, 2001; Jaafari, 2003; Klein, 2003; Langley, et al., 1995; Thomas & Mengel, 2008).

***(a) The inability of humans to be completely rational***

One of the primary criticisms of the rational model is the rejection of the assumptions on which it is based. This model is perceived as being based on the ‘myth of rationality’ – that is, the untenable belief in the ability of humans to act in a completely rational manner. Simon (1957) was the first theorist to suggest that humans make decisions under the constraints of “bounded rationality”. He argued that:

...[t]he capacity of the human mind for formulating and solving complex problems is small compared with the size of the problems whose solution is required for objectively rational behaviour in the real world – or even for a reasonable approximation to such objective rationality (Simon, 1957, p. 198).

In particular, limited time and mental capacity, together with incomplete knowledge, render complete rationality impossible (Buchanan & O’Connell, 2006; Choo, 1998; Cray, et al., 2007; Langley, et al., 1995). Rather, decision makers often attempt to simplify decision making processes by relying on “routines, rules and heuristics... in order to reduce uncertainty and cope with complexity” (Choo, 1998, p. 12, cf. Tversky & Kahneman, 1974) to arrive at a ‘satisficing’ solution – that is, one that is ‘good enough’, as opposed to ‘optimal’ (Simon, 1979). In an organisational context, these “routines, rules and heuristics” are often derived from expertise in a particular field (Gore, et al., 2006).

***(b) The failure to consider the role of non-rational factors in decision making***

In an attempt to reflect more accurately how decision making occurs in organisations, and to address more effectively the influence of humans in decision making, theorists have explored the role of non-rational factors in organisational decision making processes. The desire to achieve these objectives has led to an extensive body of research, including studies focused on a broad range of topics such as emotions (e.g., Andrade & Ariely, 2009; Coget, Haag, & Gibson, 2011;

Maitlis & Ozcelik, 2004; Simon, 1987), ethics (e.g., Fritzsche, 1991; Gottlieb & Sanzgiri, 1996), and intuition (e.g., Agor, 1986; Betsch, 2008; Burke & Miller, 1999; Dane & Pratt, 2007; Drummond, 1999; Kahneman & Klein, 2009; Klein, 2003; Salas, et al., 2010; Shapiro & Spence, 1997; Simon, 1987; Sinclair & Ashkanasy, 2005).

Research into intuition as a non-rational aspect of decision making is of particular importance for this research. Intuition refers to an unconscious method of processing information which is based on experience, including sensory experience (Boland, Collopy, Lyytinen, & Yoo, 2008; Burke & Miller, 1999; Dane & Pratt, 2007; Klein, 2003; Simon, 1987). Our experiences of phenomena over time become “unconsciously linked together to form a pattern” (i.e., “a set of cues that usually chunk together so if you see a few of the cues you can expect to find others”) (Klein, 2003). The nature of our experience affects how intuition is developed. For example, training plays a key role in the development of intuition as it determines the type of knowledge and skills to which we are exposed (Fernandes & Simon, 1999). Both training and subsequent experience in a field assist in the development of expertise, which enables people to make intuitive decisions based on the complex, domain relevant schemas (i.e., “knowledge about a concept or type of stimulus, including its attributes and the relations among attributes” – Dane & Pratt, 2007, p. 42) they have developed over time. Simon (1978, p. 503) argues that this results in decision makers achieving outcomes “that are very nearly optimal in situations to which their experience is pertinent”, but which may be “of little help when genuinely novel situations are presented”.

Intuition became a credible aspect of decision making research in organisational studies in the 1980s. This arose from the need to consider alternatives

to traditional rational approaches, which do not lend themselves to situations in which decisions have to be made in “a climate characterised by rapid change and at times also laden with crisis events” (Agor, 1986, p. 6, cf. Burke & Miller, 1999; Dane & Pratt, 2007). Simon (1987) was one of the early theorists to consider the role of intuition in decision making, exploring how rational (analytic), non-rational (intuitive), and irrational (emotional) factors affect decision making processes in organisations. He concludes, in accordance with Barnard (1938), that, in terms of decisions made by managers in organisations, senior managers tend to rely more on intuition than logic or reason (cf. Agor, 1986). However, these apparently ‘non-logical’ decisions are based on knowledge derived through both implicit and explicit learning and experience (Dane & Pratt, 2007; Rooney & Schneider, 2005).

Intuition acts as an important link “between the automatic operations of perception and the deliberate operations of reasoning” (Kahneman & Lovallo, 2003, p. 697). It relies on cognitive patterns, and judgements about the significance and value of those patterns (Rooney & Schneider, 2005; Salas, et al., 2010). The application of these patterns is a natural process which often results in highly effective decisions, the reasons for which may be difficult to articulate in formal rational language (Ambrosini & Bowman, 2001; Betsch, 2008; Burke & Miller, 1999; Salas, et al., 2010). Rooney and Schneider (2005, p. 25) highlight the importance of intuition for complex decision making in particular, suggesting that it is often used “to access and make sense of or link together vast sets of one’s own and collective knowledge”.

Intuition requires the *application* of tacit knowledge (Betsch, 2008). Knowledge is often conceptualised as having two distinct, but interrelated, forms – *tacit* and *explicit* (Nonaka & Takeuchi, 1995; Rooney & Schneider, 2005). Tacit



knowledge is ‘subjective’ knowledge which is derived from peoples’ experience, ideals, values and emotions; it is highly personal and context specific, and therefore often difficult to formalise, express, or share with others (Cijssouw & Jorna, 2003; Nonaka & Takeuchi, 1995; Polanyi, 1967; Taylor, 2007). Explicit knowledge is ‘objective’ knowledge which has been codified in a formal and systematic manner (e.g., as a technical instruction manual) (Nonaka & Takeuchi, 1995). It is knowledge which is easily expressed in representational forms (i.e., as words, numbers, diagrams, etc.) and able to be communicated; and which readily lends itself to electronic processing, storage, and manipulation (Nonaka & Takeuchi, 1995; Taylor, 2007). All knowledge can be classified according to these two broad dimensions. Tacit knowledge is generally recognised as important in effective decision making (Brockmann & Anthony, 2002, p. 436; Klein, et al., 2010). Brockmann and Anthony (2002) argue that tacit knowledge is particularly useful in complex and unstructured decision making processes (e.g., as occur in mega projects). It is used by decision makers to “fill in gaps of missing information, make sense of the complex and abstract, distil numerous alternatives, and provide structure” (Brockmann & Anthony, 2002, p. 440). Tacit knowledge “results in a feeling of familiarity or an increased liking for a previously seen stimulus without conscious recollection of having seen it [which is] synonymous with the *gut feeling* that it seems ‘right’” [emphasis added] (Shapiro & Spence, 1997, p. 64).

It is important for the purposes of this thesis to reiterate that intuition is a *process of knowing* which requires the *application* of tacit knowledge (e.g., domain, aesthetic, procedural, etc.) (Betsch, 2008). It is not a term referring to a type of tacit knowledge. For intuition to be effectively utilised in decision making processes, the tacit knowledge applied by decision makers must be relevant to the situation at hand

– that is, the learning and patterns of experience from which the tacit knowledge is derived must be applicable to the specific decision making context (Simon, 1987). The intuitive application of applicable tacit knowledge is particularly useful for assisting decision makers to make sense of, and to select the appropriate action option in, unstructured (i.e., complex, ambiguous, and uncertain) decision making contexts (Brockmann & Anthony, 2002; Shapiro & Spence, 1997).

Although intuition can be “powerful and accurate” (Kahneman & Lovallo, 2003, p. 698), it is important to recognise that it is not a panacea for all of the problems associated with other decision making models. Kahneman and Klein (2009) argue that intuition works well only when the decision maker recognises a valid cue within the environment, and then has the opportunity to act on it. If a cue is invalid – perhaps because it is the result of a misleading irregularity – then the use of intuition will not result in an effective decision. Further, relying on intuition may not lead to effective decisions when the intuition is based on heuristics. Heuristics are simple mental schemas which are aimed at reducing complexity and which do not rely on domain knowledge (e.g., ‘rules of thumb’) (Dane & Pratt, 2007; Tversky & Kahneman, 1974). The use of heuristics can result in biases and errors (e.g., appearance bias, attribution error, isolation error, overconfidence, risk aversion, anchoring, confirmation bias, escalation, problem framing, etc.) which affect the quality of the decision made (Kahneman & Klein, 2009; Kahneman & Lovallo, 1993; Kahneman, Lovallo, & Sibony, 2011; March, 1997; McKenzie, et al., 2011; Tversky & Kahneman, 1974, 1986). However, this does not mean that intuitive decisions based on heuristics are “necessarily wrong” (Kahneman & Klein, 2009); rather, they are perceived as more prone to error and, therefore, as less trustworthy (Klein, 2003). Shapiro and Spence (1997) suggest that effective decision making

requires a mix of both intuition and intellectual skills, advocating the use of intuition followed by cognitive analysis to avoid some of the problems associated with “faulty heuristics” (cf. Bennett, 1998; Burke & Miller, 1999). However, despite the potential problems associated with using intuition to make decisions, it is still highly effective in situations in which the tacit knowledge applied is relevant to the decision making context and where the decision maker recognises a valid cue within the decision making environment.<sup>5</sup>

*(c) Contextual factors which affect the appropriateness of rationality*

Another key criticism of rational approaches to decision making is that their efficacy is based on the existence of a particular set of contextual factors. However, in an organisational context, there are very few situations which conform to the stability, predictability, simplicity, clarity, and temporal assumptions on which rational approaches are based. Rather, decisions are often made in complex and unstructured situations, characterised by incomplete knowledge and high levels of uncertainty relating to both the goals being pursued and the consequences of choice options (Buchanan & O'Connell, 2006; Drummond, 2001; Klein, 2003; Langley, et al., 1995). Mega projects are important examples of unstructured decision making contexts where the assumptions on which rational decision making approaches are based are not applicable (Jaafari, 2003; Thomas & Mengel, 2008). Drummond (2001) suggests that the rational perspective:

...assumes that we live in a world where two and two equal four and where problems arrive on decision makers' desks one at a time, neatly labelled and marked 'for attention'. In contrast, an important theme of this book is that ambiguity always lurks. Decisions are rarely clear. Feedback tends to be slow to arrive, and is invariably equivocal. Moreover, the people on whom we rely for our information may exaggerate, dissimulate and even tell lies.

---

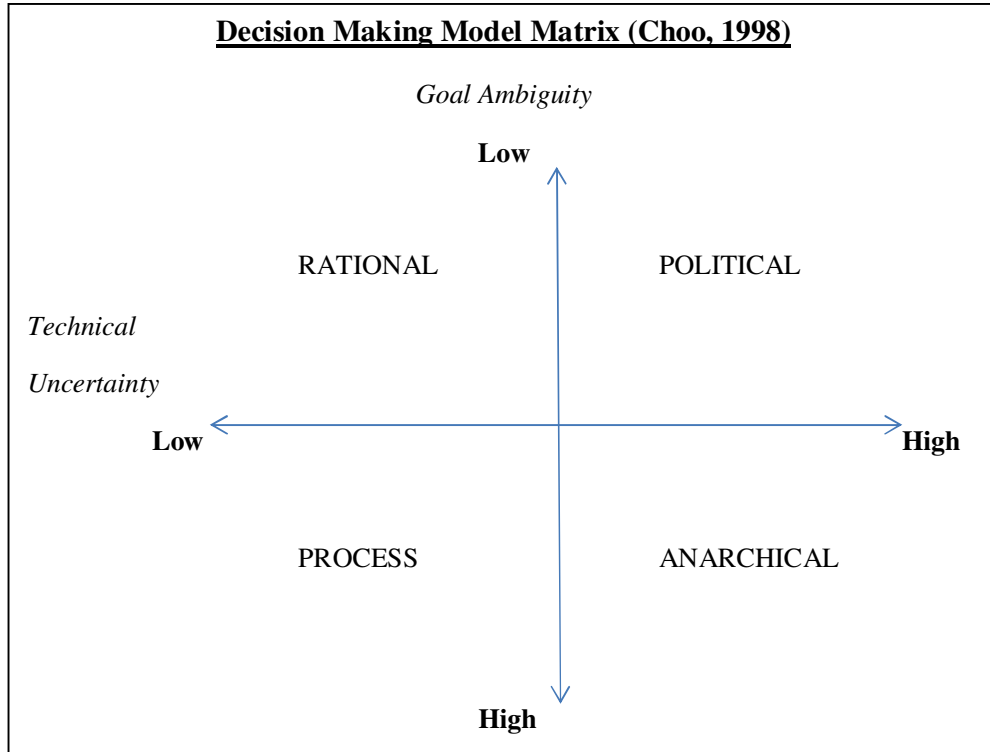
<sup>5</sup> Importantly for this research, in many instances the ability to recognise valid cues in the environment to enable effective decision making relies on the ability of the decision maker to maintain a high level of *sensory* presence in the decision making context (cf. Klein, et al., 2010).

Contextual factors, such as multiple decision participants, ambiguity of goals, value and purpose conflicts and biases among decision participants (especially in an organisational context), together with the complexity of many decision situations render complete rationality impossible.

The nature of the decision making context determines to a great extent the applicability of particular decision making models. Choo (1998) suggests that different decision making models can be generally located in a matrix which accounts for the level of goal ambiguity or conflict (i.e., uncertainty about what to achieve) and the level of technical uncertainty (i.e., uncertainty about how to achieve the required goal) relating to the particular decision context (see Figure 2.2). Rational models are most suitable for more structured decision making situations where goal ambiguity/conflict is low and where technical uncertainty is also low; while anarchical models (such as the ‘garbage can’ model) are more representative of unstructured situations where levels of both goal ambiguity and technical uncertainty are high. Choo (1998) argues that political models of decision making<sup>6</sup> tend to be apparent in situations when goal uncertainty is low, but technical uncertainty is high. In these instances, negotiation and tactics to attempt to control information and communication are used to determine the nature and framing of decision criteria (Cray, et al., 2007). In instances where technical uncertainties are high, but goal uncertainties are low, process models tend to be appropriate. Choo (1998) discusses the three stage model (*identification* of issue parameters, *development* of possible solutions, and the *selection* of the most appropriate solution) developed by Mintzberg et al. (1976) as an example of a process model.

---

<sup>6</sup> See Pettigrew (1973) whose work on the politics of decision making in organisations suggests that conflicts of interest form the background of decision making contexts in organisations. He argues that organisational decision making processes are essentially about bargaining and establishing ways to “materialise the preference of the most powerful actor” (Cabantous & Gond, 2011, p. 574).



**Figure 2.2: Decision making model matrix**

The existing literature suggests that the use of intuitive models of decision making is appropriate in particular circumstances. For example, intuition tends to be more useful in unstructured decision contexts in which people are affected directly by the outcomes of the decision; when time pressures are evident; when there are high levels of uncertainty, risk and complexity; when there is no clear direction for action and no precedent; in instances characterised by environmental uncertainty; and when substantive information is unavailable or is of limited use (Agor, 1986; Bennett, 1998; Burke & Miller, 1999; Coget, et al., 2011; Dane & Pratt, 2007; Shapiro & Spence, 1997; Simon, 1993). The use of intuition is also seen as more effective by decision makers who have extensive knowledge of a relevant domain and/or the characteristics of tasks associated with the particular decision context

(Dane & Pratt, 2007). Klein (2003) argues that intuition is essential for effective decision making, maintaining that the overreliance on formal and technological approaches to decision making reduces decision quality. He suggests that while these methods have their place, they “can’t substitute for intuition when it comes to business decisions or career decisions or political decisions” (Klein, 2003). For example, the lack of clear and accepted rules for dealing with strategic issues (as in other ill-, or un-, structured situations) necessitates the use of a more intuitive approach based on tacit knowledge (Dane & Pratt, 2007; Shapiro & Spence, 1997). Buchanan and O’Connell (2006, p. 40) suggest that according to Henry Mintzberg, one of the leading theorists in the field, decision making in the strategic context “cries out for creativity and synthesis and thus is better suited to intuition than to analysis”.

*(d) Summary*

Rational approaches to decision making have dominated decision making research and practice in organisational studies. However, the applicability of these approaches to decision making is limited by both human and contextual factors.

Two key human-related factors which limit the applicability of rational models of decision making in organisational contexts are: (a) the inability of humans to act in the completely rational manner that underpins rational approaches, owing to limited time, inadequate mental capacity, and incomplete knowledge; and (b) the influence on decision making of non-rational factors such as emotions, ethics and intuition.

Contextual factors such as uncertainty, ambiguity, and value and purpose conflicts about goals and the means to achieve those goals, also affect the applicability and efficacy of rational approaches to decision making in organisational contexts.

Rather, approaches to decision making that make allowance for these limitations are more effective. In particular, intuitive approaches to decision making are particularly

important in circumstances characterised by uncertainty, ambiguity, complexity, and goal and methodology conflicts. Intuitive decision making involves a process of knowing which relies on the application of tacit knowledge. Tacit knowledge is experientially derived knowledge that is highly personal and difficult to articulate and codify, but which enables decision makers to recognise valid environmental cues, and interpret those cues in light of patterns of relevant experience, to enable effective decision making to occur (cf. Bateson, 1979). Tacit knowledge may refer to domain specific knowledge, or other types of knowledge, such as aesthetic (i.e., sensory-derived) knowledge.

This thesis explores the use of the aesthetic form of tacit knowledge on decision making processes in mega projects. The use of aesthetic knowledge in decision making processes in unstructured decision making contexts (such as mega projects) allows decision makers to establish the connections among complex phenomena (e.g., project tasks, inputs, operational environments, and the relationships among these) which provide the sense of holistic and coherent ('felt') meaning on which a choice of a course of action can be based (Agor, 1986; Davey, 1989; de Montoux, 2007; Dobson, 2007). This use of aesthetic knowledge in decision making process in the context of mega projects has not been examined empirically previously. Section 2.3 substantiates further the particular applicability of aesthetic knowledge for mega projects as an example of an unstructured decision making context.

### **2.2.3 Current research on decision making in mega projects**

Snowden and Boone (2007) maintain that decision making in organisational theory has been based traditionally on the rationalist assumptions of predictability and order. This has resulted in rationality as being perceived as “the only defensible basis for decision making”, even in the context of mega projects (Drummond, 1999, p. 464). Drummond (1999, p. 464) argues that managers often search for ‘objective’ data on which to base decisions, as it “confers respectability” on decision making processes; furthermore, they will rely on this ‘objective’ data even in the face of accurate alternative information from non-rational (e.g., intuitive, emotional, etc.,) sources (Drummond, 1999). Drummond’s (1999) research indicates that this focus on objectivity and rationality has led not only to the problems of decision escalation in mega projects, but, ultimately, their failure.

The complexity of mega projects results in decision making circumstances which involve “multiple unknown variables”, and an inability to foresee accurately or predict the outcomes of the decision made (Thomas & Mengel, 2008, p. 307, cf. Geraldi & Adlbrecht, 2007; Snowden & Boone, 2007). This forces project decision makers to recognise that decision making occurs in a “non-linear, interactive and emergent” manner; and that it is not based on the actions of individuals in isolation (Uhl-Bien, 2011, p. 78). Uhl-Bien (2011) acknowledges that effective decision making in mega projects involves a move away from rationalism towards approaches that more accurately account for the contextual factors which limit the applicability of rational decision making models in this context.

Consideration has been given in the literature to the way in which effective decisions may be made by project managers in the face of complexity. Wilford (2011) argues that effective decision making in mega projects requires managers to



approach the project in a holistic manner. He suggests that complexity in mega projects is:

...often treated as a mere series of first order problems in a reductionist attempt to strip it down into simple tasks and 'get on with the job'. Such simplification leads to a loss of granularity of information, creating a succession of processual or side effects which can undermine the project, particularly if the resulting weak signals of distress are ignored in a hasty attempt to complete the task (Wilford, 2011, p. 17).

Rather than attempting to understand the "whole through an understanding of the parts", the goal in mega projects should be to "understand the whole through the interaction of the parts" (Antoniadis, 2011, p. 17). This focus on this interaction necessitates the adoption of a holistic approach, through which an understanding of the nature and quality of the relationships among the "parts" of the project can be established (cf. Polanyi, 1967). Effective holistic understanding of project components and their interactions requires a deep level of task-focused and environmental understanding, and the ability to recognise and act on problems as they arise (Wilford, 2011). To do this effectively, project managers must apply the explicit and tacit knowledge they have gathered through "learning, training, practice and feedback" (Wilford, 2011, p.19). The application of knowledge, particularly tacit knowledge gained through experience, enables managers to focus on the overarching goals and objectives of the project without getting 'bogged down' in the fine grained analysis of individual project elements.

Geraldi and Adlbrecht (2007) argue that project managers need to use their intuition to apply tacit knowledge drawn from their experience to deal with the complexity caused by time and information problems (cf. Drummond, 1999). They argue that project managers "do not have enough time to collect, analyse, and internalise information, and have to make decisions and act without properly

understanding every piece of information necessary” (Geraldi & Adlbrecht, 2007, p. 35). The use of intuition drawing on tacit knowledge enables project managers to establish the nature and functionality of the relationships between various project inputs in a holistic manner. The key to success is to maintain this holistic focus and not to get lost in the detail of the project. While the detailed aspects of the project are undoubtedly important and need to be considered, attending to them should be handled via delegation and the effective use of technology so that project managers can continue to focus on the larger picture (Geraldi & Adlbrecht, 2007).

The research literature establishes that tacit knowledge drawn from project managers’ experience is an important resource for effective decision making in mega projects. However, the role of aesthetic knowledge as a particular form of tacit knowledge has not been studied explicitly in the context of mega projects. This is problematic, given the potential importance of the role of aesthetic knowledge in dealing with complexity (Agor, 1986; Davey, 1989; de Montoux, 2007; Hansen, et al., 2007).

#### **2.2.4 Summary**

Despite the pervasiveness of rationality, the literature clearly suggests that the rational ideal is unachievable given the limitations and nature of humans as decision makers, and the properties of the decision making contexts in which they operate. Langley et al. (1995) argue that accepting other options for decision making (such as the anarchical position) is also flawed. Dobson (1999) maintains that, given that humans are the decision makers in organisations, both rational *and* non-rational forces play a role in decision making in organisations.<sup>7</sup> This perspective highlights

---

<sup>7</sup> Cf. Ariely (2009) who argues that not only are a large percentage of the decisions humans make not rationally based, they are, in fact, predictably irrational. His work in behavioural economics stands in

the importance of exploring the impact of non-rational (i.e., not based on the abstract processes of reasoning) aspects of decision making in an organisational context. The studies that have considered these non-rational aspects have focused primarily on intuition (e.g., Agor, 1986; Dane & Pratt, 2007; Klein, et al., 2010; Simon, 1987) and emotions (e.g., Coget, et al., 2011; Maitlis & Ozcelik, 2004; Simon, 1987). This focus of the existing research provides an opportunity to examine empirically the use of aesthetic knowledge as a non-rational aspect of decision making processes to explore how decision making occurs in unstructured decision making contexts – such as mega projects – in which the applicability of rational models is limited. Aesthetic knowledge is a valuable focus of research in the mega project context given the theorised function of aesthetic knowledge as the basis for the effective sensory recognition and interpretation of cues and patterns (and of their significance and value) in complex contexts which enables a decision maker to arrive at a ‘felt’ sense of coherence and meaning (cf. de Montoux, 2007).

### **2.3 Aesthetic knowledge**

Aesthetic knowledge provides a potential opportunity for gaining important insights into how decision makers deal with complexity in decision making processes in mega projects. As the focus of this study is on aesthetic knowledge, it is necessary to establish what is meant by the term in the context of this research. Aesthetic knowledge is a complex concept which does not have a universally accepted definition in the research literature. Drawing on the work of Cijssouw and Jorna (2003), Davey (1989), Ewenstein and Whyte (2007), Fine (1992), Gagliardi (2006), Hansen et al. (2007), Strati (1992, 2003, 2007), Taylor (2003), Taylor and Hansen

---

stark contrast to the traditional ‘homo economicus’ view of human decision making which forms the basis of the rational decision making perspective in organisational studies.

(2005), Tsoukas and Mylonopoulos (2004), Warren (2002) and Whitfield (2005) relating to the epistemological basis of the term 'aesthetic', aesthetic knowledge is defined as sensory-derived tacit, non-rational, symbolic and experiential knowledge which emerges from peoples' embodied sensory experience of, and embedded relationships with, phenomena (e.g., themselves, other people, animate and inanimate objects, social and other situations, etc.). In this thesis, the term 'sensory' refers to the physical human senses of sight, hearing, touch, taste, and smell (Davey, 1989; Fine, 1992); and 'gut feel', which is the physical abdominal and related metaphorical manifestations of intuitive felt meaning derived from sensory based interpretations of phenomena<sup>8</sup> (Taylor, 2003).

Aesthetic knowledge refers to any knowledge which is formed through direct sensory experience<sup>9</sup> and not through abstract intellectual processes of knowing. Therefore, its epistemological basis is sensory, which necessarily makes aesthetic knowledge different from knowledge based on logico-rational knowing processes (Davey, 1989). Aesthetic knowledge ranges from the knowledge people have of abstract concepts such as beauty, ugliness, coherence, harmony, form and elegance, to more 'grounded', tangible forms of knowledge (e.g., knowledge used in medical diagnosis, such as the knowledge of the look of chicken pox spots, the sound of

---

<sup>8</sup> It is important to consider what is meant by the metaphorical manifestations of intuitive felt meaning. For example, a person may have a 'gut feel' reaction to a situation which results in his or her expressing that they have 'cold feet'. The person may or may not *literally* have cold feet; however, the use of this phrase provides a sensory-based metaphorical explanation of the resultant felt feeling of uncertainty about the situation. Further, the metaphoric use of sensory terms is not limited to those related to 'gut feel'. For example, the phrase 'smell out trouble' refers to the process of searching for indications of a particular problem, rather than a literal use of the word 'smell'. It is the context of the use of such terms which determines whether their meaning is literal or metaphoric (cf. Leddy, 1995).

<sup>9</sup> Cf. the discussion of 'presence' by Senge (2004) who highlights the importance of sensory awareness and the application of knowledge derived from sensory experience for the detection and subsequent effective interpretation of sensory (particularly visual and aural) cues in interpersonal interactions to enable the pursuit of appropriate and productive action options (cf. Klein, et al., 2010). The necessity for effective sensory engagement is also a key tenet of the burgeoning research of the physical and mental health benefits of the Buddhist concept of 'mindfulness' (see, e.g., Langer, 1989).

respiratory illness, or the feel of a cancerous growth) (Davey, 1989; Dobson, 1999; Ewenstein & Whyte, 2007; Hansen, et al., 2007; Ramirez, 2005; Simon, 1993; Strati, 2003; White, 1996).

Aesthetic knowledge is generally recognised as an instinctive, universal human attribute that is shaped within each individual's historical, social and cultural context (Davey, 1989; Hammermeister, 2002; Ingram, 1991; Ottensmeyer, 1996; Paxman, 1992-93). Commonalities in individuals' historical, social, professional, and cultural contexts provide a basis for common aesthetic experiences and shared aesthetic understanding (Bourdieu, 1984; Ewenstein & Whyte, 2007; Ottensmeyer, 1996). Although aesthetic knowledge is a universal aspect of being human, it may, as with other knowledges, be more fully developed in some people than in others (Kieran, 2010; Paxman, 1992-93).

To substantiate the conceptualisation of aesthetic knowledge provided above, the following sub-sections review the philosophical foundations of aesthetic knowledge; examine its experiential and relational sources; explore its tacit and non-rational nature; and consider its symbolic and experiential content. They also explore the functions of aesthetic knowledge, including examples of its enactment in organisational contexts; and review the existing research literature on aesthetic knowledge within organisations broadly, in the specific context of decision making in organisations, and in decision making in mega project management.

### **2.3.1 The philosophical foundations of aesthetic knowledge**

Before considering the nature of aesthetic knowledge as a specific form of knowledge, it is important to establish the position adopted in this research on what is meant by 'knowledge'. The traditional epistemological definition of knowledge per se is "justified true belief" (Nonaka, Toyama, & Konno, 2000; Steup, 1996).

However, in applied terms, this definition is insufficient, as it fails to address even the most fundamental cognitive, social, and cultural issues of what knowledge ‘is’ and how it ‘comes to be’ (Nonaka, et al., 2000). Rooney and Schneider (2005) suggest that knowledge is the result of the interrelated processes of knowing, which are an evolving and variable constellation of, for example, the conceptual, cognitive, intuitive, aesthetic, emotional, spiritual, axiological, political, and motor bases to achievement that are an emergent property of relations, and that are justifiably regarded as a reliable basis for action. The definition of aesthetic knowledge adopted for this thesis is consistent with that relational and processual definition of knowledge proposed by Rooney and Schneider (2005) .

The term ‘aesthetic’ is derived from the Greek word *aisthesis* meaning ‘theory of perception’ (Bolz & Van Reijen, 1996; Leet, 2004; Strati, 1992; White, 1996). *Aisthesis* was used by the Ancient Greeks to describe sensory or perceptual knowledge, as opposed to intellectual or linguistic knowledge (*noesis*) (Whitfield, 2005). Dean et al. (1997, p. 420) argue that the Ancient Greek concept of aesthetics has two main elements, “the first, ‘purer’ one, relates to the study of beauty and ugliness – regardless of their manifestation (i.e., it can entail sunsets, smiles, gestures , or whatever); the second, more ‘applied’ one, concerns the study of art”.<sup>10</sup> An example of this focus on aesthetics can be found in the writings of Plato and Aristotle, who maintained that ‘knowledge of the beautiful’ was essential for the success of creative or artistic endeavours (Beardsley, 1966).

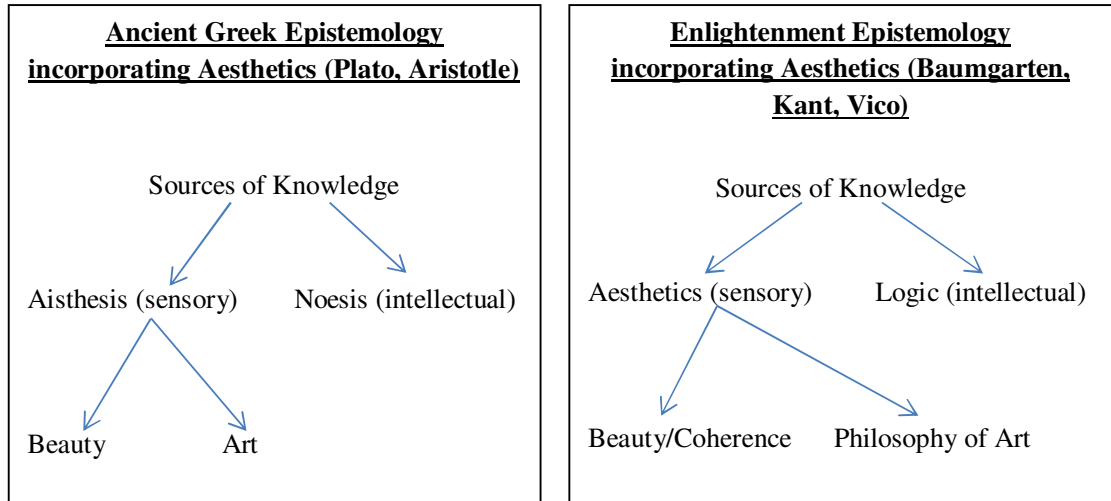
The development of aesthetics as a movement in modern philosophy is credited to the eighteenth century German Enlightenment philosopher Baumgarten,

---

<sup>10</sup> ‘Applied’ aesthetic knowledge in the context of the study of art refers to the application of this knowledge to aspects such as proportion, form, colour, texture, etc., rather than more esoteric critiques.

who “developed aesthetics as one of the two components of [his] theory of knowledge. On one hand was logic, which looked at intellectual knowledge, and on the other hand was aesthetics, which looked at sensory knowledge” (Taylor, 2000, p. 304). Although Baumgarten’s aesthetics was originally designed as an extension of rationalism and as an aid to logic, he eventually distanced his aesthetics from reason and sought to assert the legitimacy of aesthetic knowledge within the dominant logico-rational knowledge framework of his time (Carr & Hancock, 2002; Davey, 1989; Elgin, 1997; Hammermeister, 2002). He argued that aesthetics was the “science of knowing sensitively” and that this sensory form of knowledge was quite different from logic in that it involved the active reception and interpretation of sensory (i.e., sight, hearing, smell, taste, and touch) data, rather than the abstract cognitive processes of logical thought (Davey, 1989, p.107). Hammermeister (2002, p. 4) maintains that for Baumgarten, aesthetics “refers to a theory of sensibility as a gnoseological faculty, that is, a faculty that produces a certain kind of knowledge. Aesthetics is taken very literally as a defence of the relevance of sensual perception”. Therefore, Baumgarten’s conceptualisation of aesthetics presents it as a sensory epistemology – that is, a way of knowing the world through sensory experience (Dean, et al., 1997; Taylor & Hansen, 2005). This places Baumgarten’s conceptualisation of valid knowledge at odds with the Cartesian dualist position (a key driving force behind rationalism), which advocates the supremacy of the intellectual (mind) over the sensual (body) as a source of knowledge (Hansen, et al., 2007). The understanding of aesthetic knowledge applied in this research is based on Baumgarten’s conceptualisation of the concept (and Rooney and Schneider’s (2005) conceptualisation of ‘knowledge’) as knowledge derived from any form of sensory experience which is regarded as a reliable basis of action. The research explores how

this type of knowledge (as opposed to intellectual knowledge) is used as a reliable basis of action by decision makers in the context of decision making in mega projects.



**Figure 2.3: A comparison of Ancient Greek and Enlightenment epistemology incorporating aesthetics**

For research examining aesthetic knowledge and decision making, the Kantian position on the epistemic role of aesthetic knowledge is particularly important. Kant’s epistemology supports Baumgarten’s assertion of the legitimacy of sensory knowing (Strati, 2000). de Montoux (2007) maintains that Kant believed that aesthetic knowledge was necessary for effective decision making. Kant argues that for effective decision making to occur, the decision maker must have a concept of coherence or harmony, as “[w]ithout this faculty the world becomes a chaotic mess of facts and data that don’t fit together and lack meaning and structure” (de Montoux, 2007, p. 133). It is the role of aesthetic knowledge to create this harmonious structure which provides context and meaning. Aesthetic knowledge creates “images, visions, understanding of how different facts and different puzzle pieces of information fall into place” (de Montoux, 2007, p. 133). The historical focus of aesthetics on what is pleasing or beautiful is actually related to the



perceiver's ability to "comprehend totalities" and give meaning to phenomena based on the sense of coherence and harmony that the derived meaning evokes. de Montoux (2007, p. 134) provides an example of this concept of coherence, suggesting that the "exquisite formula in a physicist's research summarises in a pleasing manner all of the observations into a theory that gives meaning to the work". The Kantian position on aesthetic knowledge, as expounded by de Montoux (2007), suggests that the application of aesthetic knowledge by decision makers establishes context and meaning by enabling an holistic appreciation of the relationships between different aspects of complex phenomena, such as those encountered in mega projects. This understanding of the function of aesthetic knowledge forms the fundamental philosophical basis of this research, the validity of which is examined empirically in the study.

### **2.3.2 Aesthetic knowledge and the philosophy of art**

Aesthetic knowledge is often equated solely with the philosophy of art and art criticism which is, in reality, only a subset of the phenomenon. The understanding that aesthetic knowledge is sensory and perceptual explains why this error is often made, as knowledge of art is considered not to be based on logic or reason, but rather on the perceptions of beauty or taste its sensory aspects evoke (Hammermeister, 2002). Strati (1992, p. 568) suggests that contemporary aesthetic knowledge theory has moved beyond this exclusive focus on the theory of art to "encompass the aesthetic conceptualisation of all social practices". In fact, 'aesthetics' has been increasingly recognised as an 'activity' that humans engage in on an everyday basis, which involves the development of aesthetic sensibilities and their application to commonplace experiences of people, material objects, processes,

institutions, and social practices and situations, and which may have “serious consequences that affect everybody’s lives” (Saito, 2001, p.94, cf. Fine 1992).

The rise of reason as the dominant philosophical force in modernity has contributed to the relegation of aesthetic knowledge to the focus on art and art criticism. Whitfield (2005, p. 5) maintains that the exclusion of aesthetics as a valid epistemology is a particularly modern phenomenon, arguing that prior to the twentieth century, epistemic theories were “essentially perceptual, in which images and sensory meaning provided the foundation of knowledge. The emergence of language theorists and behaviourism in the early twentieth century, followed by the cognitive revolution in the mid-twentieth century, effectively undermined the perceptualist position”. Leet (2004, p. 11) agrees with this perspective, arguing that prior to the modern period the cognitive, moral, and aesthetic realms of understanding were closely related in such a way that “truth, goodness and beauty reciprocally defined one another”. However, the acknowledgement of this relationship is still evident in modern times. For example, Penrose (1974, p.267) suggests in his work on aesthetics in pure and applied mathematical research that it “is a mysterious thing in fact how something which looks attractive may have a better chance of being true than something which looks ugly”.

It is important to acknowledge that aesthetic knowledge is not limited to ‘knowledge of the beautiful’. The focus on beauty in aesthetics is attributed to Hegel (Weggeman, Lammers, & Akkermans, 2007). Beauty *is* a significant concept in aesthetics, and in epistemology in general,<sup>11</sup> but in reality the focus on beauty is limiting, as aesthetic knowledge is related to many other aesthetic experiences (e.g.,

---

<sup>11</sup> See, for example, Weggeman et al. (2007) who explore Einstein’s views on beauty in scientific thought. They suggest that Einstein maintained that “the only physical theories that we are willing to accept are the beautiful ones”; and, further, that “physical laws should have mathematical beauty”.

harmony, disgust, coherence, revulsion, elegance, sublimity, gracefulness, balance, pleasure, etc.) (Dobson, 1999; Hansen, et al., 2007; Honderich, 1995; Ramirez, 2005; Sibley, 1959; Strati, 1992). Aesthetic knowledge may be derived from any sensory experience, not just the experience of the 'beautiful' (Gagliardi, 1996; White, 1996). Further, aesthetic knowledge may be applied to various phenomena. This thesis relies on this broader conceptualisation of aesthetic knowledge, rather than one focused narrowly on the theory of art, art criticism, or perceptions of beauty.

### **2.3.3 The experiential and relational sources of aesthetic knowledge**

The sources of aesthetic knowledge are both experiential and relational, and, as such, aesthetic knowledge is both "personal and socially constructed at once" (Strati, 2003, p. 55, cf. Bourdieu, 1984) and is related to each person's "different abilities, preferences, and embeddings" (McGonigal, 2006, p. 340). Warren (2008, p. 561) argues that one of the primary sources of aesthetic knowledge is the "continual stream of sense impressions that provide the backdrop to everyday life" which forms the basis of personal experience, and which results in the almost infinite interplay of aesthetic experience and judgement (cf. Carmichael, 1961; Ewenstein & Whyte, 2007; Hansen, et al., 2007; Jones, 1996).

Aesthetic knowledge is also derived from an individual's historical, cultural, educational, and social backgrounds (Davey, 1989; Reich, 1993; Warren, 2002). Bourdieu (1984, p. 3) suggests that aesthetic knowledge "is a product of history reproduced by education" (cf. Kieran, 2010). Current cultural trends are also seen as sources of aesthetic knowledge (Aspers, 2006). In an organisational context, Maitland (1976, p. 397) maintains that this aesthetic "sense" or knowledge is derived from an individual's "years of work, training, theories, habits and

foreknowledge” which is applied to organisational processes (cf. Carmichael, 1961; Humphreys, Brown, & Hatch, 2003). In particular, the expertise and access to discourse communities gained via training and working within a field provide important knowledge of the aesthetic aspects of particular work practices (Durgee, 2004; Humphreys, et al., 2003; Kieran, 2010; Porcello, 2004). While each individual’s aesthetic experience is subjective and individually embodied, the interpretation of that experience is socially influenced (Warren, 2008).

Strati (2007) acknowledges the relational aspect of aesthetic knowledge by highlighting that the knowledge that is gained through the senses is not a passive ‘collection’ of understanding, but rather is derived from the experience of interacting with the person, object, or situation in question (cf. Gouldner, 1970). He states that “[s]ensation, as said, is not the mere capacity to receive the sensible qualities of people and artifacts – their presence/absence, visibility/invisibility, materiality/immateriality – but rather the capacity to enjoy them and understand them by experiencing them with ourselves” (Strati, 2007, p. 63). This understanding of the relational nature of aesthetic knowledge is consistent with the relational definition of knowledge proposed in this research.

#### **2.3.4 The tacit nature of aesthetic knowledge**

Aesthetic knowledge is a form of tacit knowledge (Gagliardi, 1996; Strati, 2003, 2007). A key feature of tacit knowledge is that it is derived primarily from the process of “subception” – that is, subliminal perception (Polanyi, 1967). People develop tacit knowledge through their exposure to, and experience of, phenomena, without conscious awareness of its development (Polanyi, 1967). It is a natural process of implicit learning through experience which results in the development of mental models which are deeply ingrained and embedded, and generally taken for

granted (Ambrosini & Bowman, 2001; Brockmann & Anthony, 2002; Gourlay, 2004). This subception process explains why it is often difficult for people to articulate the content, basis, or source of their various tacit knowledges (Polanyi, 1967). In the case of aesthetic knowledge, people develop their aesthetic understanding primarily through their subliminal sensory perception of phenomena.<sup>12</sup>

Strati (2007, p. 70) argues that the tacit nature of aesthetic knowledge is particularly evident in terms of everyday activities and practices in which “we are often aware of being able to do something but unable to describe analytically how we do it, to explain it scientifically, and thereby turn it into explicit rather than implicit and entirely personal knowledge”. This tacit quality of aesthetic knowledge can pose particular problems for aesthetic knowledge research. Taylor (2002) suggests that one of the primary challenges for researchers is to overcome the “aesthetic muteness” of research participants, whether it is derived from a lack of individual reflexivity on the part of the participant, or from the perceived illegitimacy of the consideration of aesthetic concepts within a particular arena (e.g., organisations).

Polanyi (1967, p. 10) argues that tacit knowing always involves a relationship between two “terms” – a “proximal” term and a “distal” term. He suggests that:

...in an act of tacit knowing, we attend *from* something for attending *to* something else; namely, *from* the first *to* the second term of the tacit relationship. In many ways the first term will prove to be nearer to us [i.e.,

---

<sup>12</sup> However, this subliminal perception may be influenced or reinforced in other ways. For example, particular occupational disciplines have distinct approaches to aesthetics which are reinforced and legitimised through training and practice, and in the evaluation of work or process outcomes (see e.g., Carmichael, 1961; Ewenstein & Whyte, 2007; Fine, 1992; Humphreys, et al., 2003; Kieran, 2010; Maitland, 1976; Porcello, 2004).

proximal – a term borrowed from anatomy], the second further away from us [distal] (Polanyi, 1967, p. 10) [emphasis in original].

Polanyi (1967) uses the example of face recognition to explain these aspects, suggesting that while people recognise faces, they are often unable to explain why they recognise them. He maintains that in this example, the tacit awareness of facial features enables us to attend to “the characteristic appearance of a face. We are attending *from* the features *to* the face, and thus may be unable to specify the features” (Polanyi, 1967, p. 10) [emphasis in original]. Although the knowledge of, and meaning ascribed to, the subsets of a phenomenon contribute to the knowledge of the whole phenomenon, the conscious focus is on the whole rather than the parts.<sup>13</sup> The knowledge of the parts exists, but it remains tacit. This facet of tacit knowledge has particularly important implications for research focusing on complex decision making environments. Polanyi (1967, p. 18) maintains that:

... [w]e can see now how an unbridled lucidity [e.g., as is arguably called for in rational decision making theory] can destroy our understanding of complex matters. Scrutinize closely the particulars of a comprehensive entity and their meaning is effaced, our conception of the entity is destroyed... We can lose sight of a pattern or physiognomy by examining its several parts under sufficient magnification.

Polanyi's (1967) understanding of the importance of holistic approaches to complex phenomena is consistent with the relational definition of knowledge adopted for this research. Knowledge emerges from the relationships among aspects of phenomena, not from an isolated, fine grained analysis of each individual aspect. This integration of aspects of phenomena relies on the “tacit operation of the mind... [which] produces an effect in the knower and not some thing” (Gourlay, 2004, p.95). This effect is related to felt meaning (i.e., aesthetic knowledge – Taylor's (2003) “knowing in your gut”) which is relied upon as a basis for action.

---

<sup>13</sup> Cf. Gagliardi (2006, p. 712) who argues that aesthetic knowledge “relies more on synthesis and recognition of the global context, entails recognition or creation of the form – without concern for the elements which constitute it – and is not completely describable”.

### **2.3.5 The non-rational nature of aesthetic knowledge**

Aesthetic knowledge is a non-rational form of knowledge as it is not derived from the abstract cognitive processes of reason, but rather represents felt meaning derived through direct sensory experience (Ramirez, 2005; Warren, 2008). Aesthetic knowledge involves the “meanings we construct based on feelings about what we experience by our senses, as opposed to the meanings we can deduce in the absence of experience, such as mathematics or other realist ways of knowing [i.e., logical, rational, instrumental or intellectual knowing processes]” (Hansen, et al., 2007, p. 545).

The generation of aesthetic knowledge through sensory experience results in the development of “sensory maps”, which Gagliardi (2006, p. 712) defines as a “set of patterns of classification, interpretation and reaction to perceptual stimuli”. This sensory mapping process further delineates aesthetic knowledge from cognitive processes. Gagliardi (2006, p. 712) argues that cognitive maps “can be conscious or unconscious but are ‘knowable’; sensory maps are learned instinctively through intuitive and imitative processes over which the mind exercises no control, and integrated automatically into life daily”.

### **2.3.6 The symbolic and experiential content of aesthetic knowledge**

Ewenstein and Whyte (2007) highlight two dimensions of the content of aesthetic knowledge: the *symbolic*, “consisting of knowledge in the form of signs and symbols”; and the *experiential*, “consisting of feelings and embodied experiences” (Ewenstein & Whyte, 2007, p. 689). Thus, aesthetic knowledge consists of the knowledge of both the meanings of signs and symbols, and the meaning of experiences, as derived through the senses. This knowledge is then applied both to

assist in the interpretation of further aesthetic experiences and as a justifiable basis for action (Whitfield, 2005).

It is also important to acknowledge that the content of aesthetic knowledge may be applied either descriptively or evaluatively (Kieran, 2010). Descriptive content may be used to describe the aesthetic features of a phenomenon (e.g., person, object, situation, etc.) without imposing a value judgement on that phenomenon. For example, the aesthetic concept of ‘symmetry’ may be applied to an object without any evaluative intent, but rather as a way of merely describing its physical features. Aesthetic knowledge content is more often recognised in its evaluative form. The knowledge underpinning concepts such as ‘beauty’, ‘ugly’, ‘graceful’ and ‘sublime’ clearly contains an evaluative element. The context of the application of aesthetic knowledge determines which form of content is salient (Kieran, 2010).

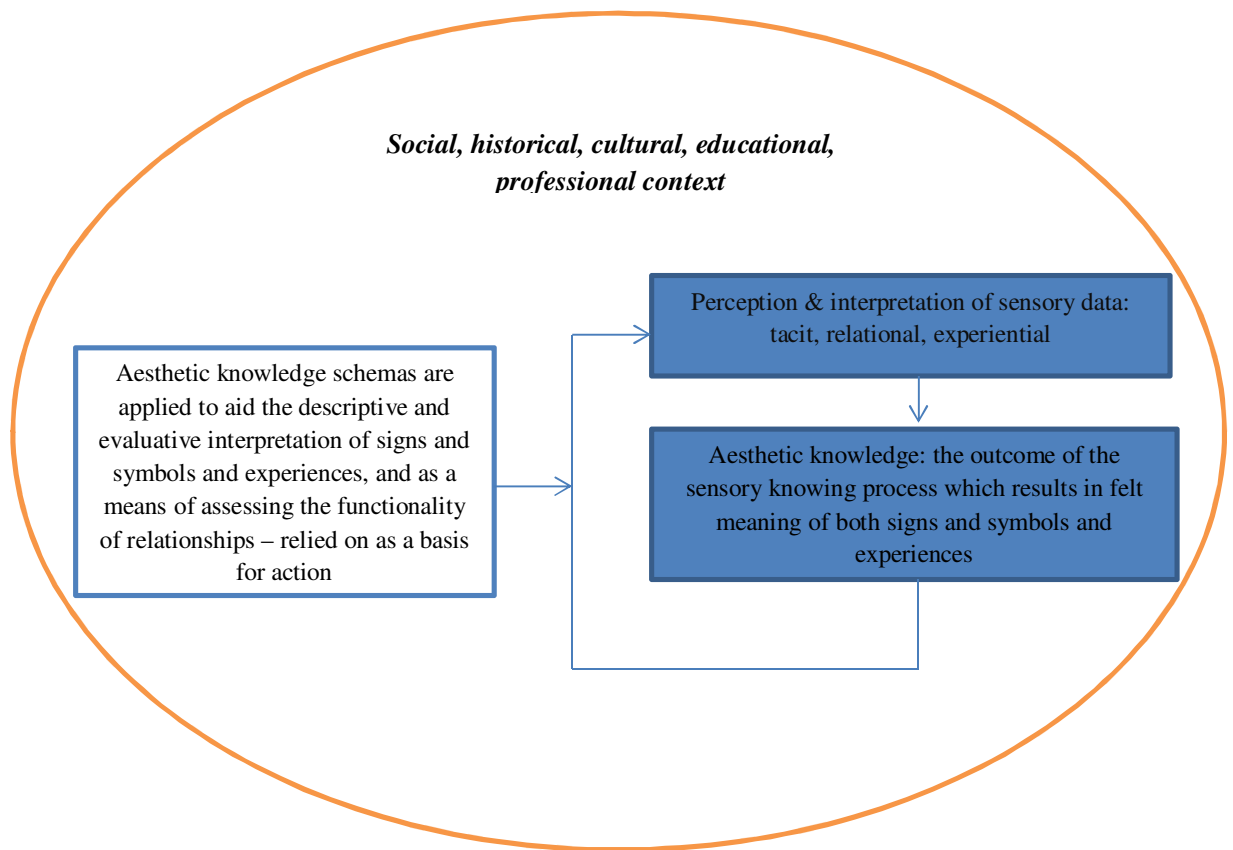
### **2.3.7 The aesthetic knowing process**

Based on the preceding discussion, Table 2.3 summarises the key attributes of aesthetic knowledge and Figure 2.4 summarises the manner in which aesthetic knowledge is developed and enacted. Figure 2.4 identifies that individuals perceive and interpret sensory data through their experiences of, and relationships with, phenomena. The outcome of this process is aesthetic knowledge, which may be in the form of the felt meaning ascribed to either signs and symbols, or experiences. Aesthetic knowledge schemas are then used as aids to the descriptive or evaluative interpretation of subsequent signs and symbols or experiences, and to determine the functionality of relationships, which are then relied on as a justifiable basis for action. The whole process occurs within, and is influenced by, the individual’s social, historical, cultural, educational, and professional context.



<i>Attribute</i>	<i>Characteristics of Attribute</i>	<i>Key Authors</i>
Sensory	Derived from the senses (sight, hearing, taste, touch and smell) as opposed to rational/intellectual thought. This sensory aspect is evident in terms such as ‘felt’, ‘feel’, ‘look’, ‘view’, ‘smell’, ‘taste’, ‘sound’, ‘form, ‘shape’, ‘structure’, etc... It establishes the basis of the ‘felt meaning’ of phenomena.	(Davey, 1989; Dean, et al., 1997; Hammermeister, 2002; Hansen, et al., 2007; Strati, 2000; Taylor, 2000)
Tacit	A ‘subjective’ form of knowledge which is derived from peoples’ experience, ideals, values and emotions, and which is highly personal and context specific, and often difficult to formalise, express or share with others.	(Cijssouw & Jorna, 2003; Gagliardi, 1996; Nonaka & Takeuchi, 1995; Polanyi, 1967; Strati, 2003, 2007; Taylor, 2007)
Non-rational	Not derived from the abstract processes of reasoning, but rather through direct sensory experience.	(Hansen, et al., 2007; Ramirez, 2005; Warren, 2008)
Symbolic	Involves the perception of the symbolic (signs and symbols) aspect of phenomena and the understanding of their meaning for both self and others within a particular context.	(Ewenstein & Whyte, 2007; Whitfield, 2005)
Experiential	Based on the experiences people have of signs and symbols, social interactions, and interactions with other phenomena. A person’s personal, familial, social, educational, professional, and physical environmental histories determine the extent, content and salience of their aesthetic knowledge. Experiences form the basis of relationship assessments.	(Bourdieu, 1984; Davey, 1989; Ewenstein & Whyte, 2007; Reich, 1993; Strati, 2003; Warren, 2008; Whitfield, 2005)
Relational	Emerges out of relationships, and involves establishing and judging the value of relationships between phenomena. Key terms associated with aesthetic knowledge (such as ‘fit’, ‘balance’, ‘harmony’, ‘coherence’, ‘patterns’, and even ‘beauty’) are relational terms. These refer to holistic assessments or judgements of functional relationships.	(de Montoux, 2007; Strati, 2003, 2007)

**Table 2.3: Key attributes of aesthetic knowledge**



**Figure 2.4: A model of the aesthetic knowing process**

### **2.3.8 Distinguishing aesthetic knowledge from other concepts**

When defining a research concept it is important to distinguish that concept from other concepts which may be related to, or often confused or conflated with, the concept. In this case, to establish effectively what aesthetic knowledge *is*, it is important to determine and explain what it *isn't*.

To reiterate, aesthetic knowledge is not limited to either perceptions of beauty or to the philosophy of art (Budd, 2000; Hansen, et al., 2007; Strati, 1996; White, 1996). These aspects are only subsets of aesthetic knowledge. Aesthetic knowledge as conceptualised in this research is derived from all sensory experience (cf. Hansen, et al., 2007; Strati, 1996; White, 1996).

Aesthetic knowledge does not equate to tacit knowledge – it is a *form* of tacit knowledge. While aesthetic knowledge, like tacit knowledge, is “drawn from

experience, guides action and is difficult to codify” (Hansen, et al., 2007, p. 546), it is not that same phenomenon, as “the focus of aesthetic knowledge is skewed toward knowledge derived drawn from more aesthetic experiences or knowledge used to construct, represent and interpret the felt meaning and sensory experiences” of a person’s life (Hansen, et al., 2007, p. 546). Other forms of tacit knowledge may have their foundation in rational or intellectual thought (Nonaka & Takeuchi, 1995).

Aesthetic knowledge is also not the same as ‘intuition’. Intuition refers to the “immediate (non-inferential) understanding and learning that occurs without conscious reasoning or formal scrutinizable analysis” (Rooney & Schneider, 2005, p. 24). Intuition is a tacit *knowing process* which requires the *application* of tacit knowledge, such as aesthetic knowledge (Betsch, 2008; Rooney & Schneider, 2005; Salas, et al., 2010), and which is engaged in by people “automatically and without conscious awareness” (Betsch, 2008).

Aesthetic knowledge is a non-rational form of knowledge, as it is not derived from the processes of reason (Ramirez, 2005; Warren, 2002). It is not, however, irrational. Irrationality is often linked to emotions (Simon, 1987). While aesthetic knowledge and emotions are related (e.g., the aesthetic aspects of a phenomenon may evoke an emotional response, or aesthetic knowledge may result from an emotional response to stimuli), they are not the same concepts. Emotion forms only part of the aesthetic experience (Taylor, 2002).

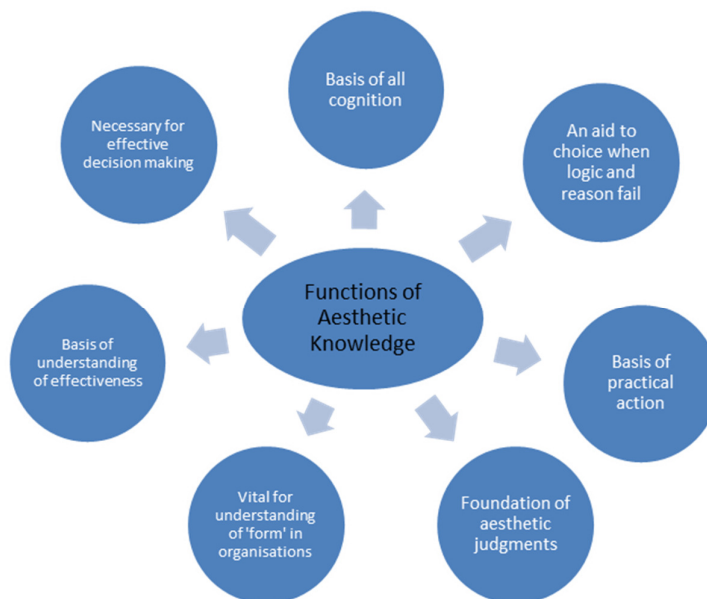
### **2.3.9 The functions of aesthetic knowledge**

Having established what aesthetic knowledge is (and what it is not), it is necessary to consider explicitly its function, both at the level of the individual and within the broader specific context of organisations. The existing literature argues that aesthetic

knowledge performs a variety of functions in the everyday experience of humans, both as individuals and in groups, namely as:

- the basis of all cognition;
- an aid to choice when logic and reason fail;
- the basis of practical action;
- the foundation of aesthetic judgements;
- the basis of understanding of ‘form’ in organisations;
- the basis of the understanding of effectiveness; and
- as an essential aid to decision making (which is being explored specifically in this thesis in the context of mega projects).

Figure 2.5 provides a representation of these functions. While each of these functions of aesthetic knowledge is important to acknowledge, its roles as the basis of all cognition, an aid to choice when logic and reason fail, and an essential aid to decision making are especially important for decision making in unstructured decision making contexts such as mega projects.



**Figure 2.5: The functions of aesthetic knowledge**

***(a) Aesthetic knowledge as the basis of all cognition***

Drawing on the philosophical work of Husserl and Langer, Hansen et al. (2007, p. 546) argue that aesthetic knowledge is a universal human property (although one that may be more fully developed in some people – Kieran, 2010; Paxman, 1992-93) which provides the foundation for all effective cognition, as “aesthetic [sensory] experience shapes and precedes all forms of knowledge” (cf. Ramirez, 2005; Taylor, 2013; Taylor & Hansen, 2005). Taylor (2002, p. 831) agrees with this assertion, suggesting that “modern philosophic thought almost universally agrees that aesthetic experience is the basis of all experience. For all phenomena, we first have a felt sense which is the basis of our intellectual experience” (cf. Davey, 1989; Taylor, 2013). Gagliardi (1996, p. 574) argues that this understanding of the function of sensory-derived (i.e., aesthetic) knowledge lies at the heart of Polanyi’s (1967) theory of tacit knowledge, suggesting that for Polanyi, “to know intellectually is to discover what one already knows unconsciously and tacitly at the perception of the body” (cf. Strati, 2003).

***(b) Aesthetic knowledge as an aid to choice when logic and reason fail***

Aesthetic knowledge is also important in situations which defy logical and rational analysis (Davey, 1989; Rooney, McKenna, & Keenan, 2006). Davey (1989, p. 110) maintains that aesthetic knowledge is, in fact, where humans turn to when logic and reason fail, suggesting that in “a realm where there is no logical terminus to interpretation, there can be no rational ground to decide between the many possibilities”. In these instances in which “an infinitely analysable set of possible meanings generated by and between which reason cannot decide, only an intuitive sense of aesthetic wholeness could pick out, structure and represent coherent wholes” (Davey, 1989, p.110). Davey (1989, p. 112) argues that the application of aesthetic knowledge enables people to make a choice among “endless rational

possibilities” by allowing them to select the choice which is the most aesthetically pleasing – that is, the one “in which, like Wittgenstein’s form of life, everything coherently fits” (cf. the discussion of Kantian philosophy in de Montoux, 2007). This understanding of the role of aesthetic knowledge as an aid to decision making processes necessarily has important implications for this research.

*(c) Aesthetic knowledge as the basis of practical action*

Hariman (1998, p. 17) maintains that aesthetic knowledge is “a principle of practical action”. Whitfield (2005, p. 5) extends this conceptualisation of the purpose of aesthetic knowledge, arguing that as a form of knowledge that preceded the evolution of language, “the function of aesthetics is to elaborate the categories by which we understand the world, by attaching emotion to sensory perceptions. Before the evolution of language, this function would result in the creation of ‘affective knowledge’ that would ‘motivate appropriate action’ to objects in the external world” (Whitfield, 2005, p. 5).

*(d) Aesthetic knowledge as the foundation of aesthetic judgements*

Aesthetic knowledge also functions as the basis of the aesthetic judgements humans make about phenomena. Our judgements of the aesthetic value and characteristics of people, places, objects, and situations are based on the aesthetic knowledge we have developed over time (Strati, 2003). This explains the variation in the aesthetic judgements people make about phenomena. While the ability to make aesthetic judgements is universal, the basis of those judgements differs from person to person, as the development of aesthetic knowledge is based on people’s (necessarily) unique personal experiences and social histories (Davey, 1989; Hammermeister, 2002; Ingram, 1991; Ottensmeyer, 1996; Paxman, 1992-93).

*(e) Aesthetic knowledge as the basis of the understanding of 'form' in organisations*

Aesthetic knowledge performs a variety of functions within the specific context of organisations. Edman (1939) maintains that the use of aesthetic knowledge forms part of our everyday existence. As such, aesthetic knowledge forms a valid object of research in organisational studies, because organisations are comprised of people who do not leave their aesthetic knowledge at home when they come to work. In fact, our experience of the beautiful, the ugly, the sublime, the graceful, the comic, the sacred, or the picturesque often “compensates for the drudgery of workaday life” (Ingram, 1991).<sup>14</sup>

Gagliardi (1996) argues that in the context of organisations, “our experience of the real is first and foremost sensory experience of a physical reality”. The aesthetic knowledge derived from this sensory experience provides “the basis of other experiences and forms of cognition which constitute the usual object of organisational studies [which] therefore implies that aesthetic experiences have a profound influence on the life and performance of the organisation” (Gagliardi, 1996, p. 566).

Both Ramirez (1996) and Dean et al. (1997) specifically consider the role of aesthetic knowledge in organisations. Ramirez (1996) argues that the aesthetic concept of ‘form’ is an integral part of organisations. He suggests that:

... [w]e cannot even conceive of organisations without evoking (thinking of or perceiving) form. The very language we use to depict organisational phenomena is full of references to ‘form’. Thus we *reform* institutions, *transform* work practices, enhance or measure *performance*, *formalise* procedures, analyse *informal* behaviors, *formulate* strategies, request personnel to wear *uniforms*, fill out *forms*..., and we *inform* and *form* people (Ramirez, 1996, p. 234) [emphasis in original].

---

<sup>14</sup> Cf. Dean et al. (1997, p. 420) who suggest that aesthetic knowledge is “relevant to organisational phenomena, as it is relevant to all phenomena”.

It is people's aesthetic knowledge which enables them to appreciate and value form in these varied meanings of the concept. Aesthetic knowledge, therefore, plays a vital role in the way members of organisations understand and value organisations.

*(f) Aesthetic knowledge as the basis of the understanding of effectiveness*

Dean et al. (1997) argue that there is a relationship between the aesthetic concept of beauty and organisational effectiveness. They suggest that an understanding of this link may be beneficial in organisations, in that "a keenly developed aesthetic capacity may be a useful early warning system for managers, and may represent a possible explanation for the intuition or 'sixth sense' that some managers seem to possess in anticipating when things go wrong" (Dean, et al., 1997, p. 431).

*(g) Aesthetic knowledge as necessary for effective decision making*

The Kantian position on the function of aesthetic knowledge suggests that it plays an important role in decision making in organisational contexts (de Montoux, 2007). Kant argues that it is the understanding of the concepts of coherence and harmony provided by aesthetic knowledge which create the meaning and structure required for effective decisions (de Montoux, 2007, cf. Davey, 1989). This function of aesthetic knowledge in decision making in organisations has not been examined empirically in the organisational studies literature. Hansen et al. (2007, p. 546) acknowledge this gap, suggesting that researchers have failed to approach "decision-making aesthetically, even though we know we make important decisions using aesthetic judgement as opposed to rationality. Leaders have 'gut feelings' that they trust in spite of objective reports and data models that draw different logical conclusions". Gagliardi (2006, p. 714) calls for recognition of the aesthetically derived "perceptual premises" on which decisions in organisations are based, arguing that organisation theory has been preoccupied with exploring other



“informative premises” (e.g., logical and ideological premises) at the expense of the equally important perceptual premises, which are based on sensory-derived aesthetic knowledge. It is the specific aim of this research to address this gap.

Dobson (1999) also acknowledges the lack of consideration of aesthetic knowledge in the context of decision making in organisations. He argues for the coming of the ‘aesthetic manager’, suggesting that “successful decisions must now be based on aesthetic criteria rather than technical or moral ones” (Dobson, 1999). For this to occur, ‘success’ needs to be redefined, as it can no longer be focused primarily on profit maximising, but rather must be linked to aesthetic concepts (e.g., ‘beauty’ and ‘harmony’). Therefore, aesthetic knowledge will be required to determine the criteria for success. Dobson (2007) maintains that this need to consider aesthetic criteria in decision making has resulted from a broader cultural shift, with aesthetic considerations becoming increasingly important. He suggests that in organisations, “[m]anagers must value what society values, and society values aesthetics” (Dobson, 2007, p.45).

### **2.3.10 Examples of aesthetic knowledge**

When defining a research concept, it is important to provide examples to illustrate further its nature and usage. Examples of aesthetic knowledge include individuals’ understanding of the meaning of different types of aesthetic experiences which are applied to phenomena and used as a basis for action (Taylor & Hansen, 2005). These experiences include (but are not limited to) ‘harmony’, ‘beauty’, ‘ugliness’, ‘coherence’, ‘balance’, ‘serenity’, ‘gracefulness’, ‘pleasure’, ‘displeasure’, ‘form’, ‘repulsion’, ‘elegance’, and ‘sublimity’ (Budd, 2000; Davey, 1989; Dobson, 1999;

Hansen, et al., 2007; Honderich, 1995; Paxman, 1992-93; Ramirez, 1996, 2005; Sibley, 1959; Strati, 1992; White, 1996).

It is important to consider practical examples of aesthetic knowledge in organisational context. As mentioned previously, Strati (2003) argues that aesthetic knowledge is vital in medicine, citing the activities of listening (sense of hearing) to a chest or palpating an organ (sense of touch) as examples of sensory activities which rely on aesthetic knowledge and which are extremely important as diagnostic tools. Klein et al. (2010) explore the use of aesthetic knowledge by fire fighters to determine the fit between their current experience of environmental cues (e.g., visual cues such as heat waves and steam levels as indicators of changes in temperatures of a chemical storage tank) and their previous experience of the sensory nature of typical fire contexts as the basis for their decisions about action options in particular situations. Ewenstein and Whyte (2007, p. 389) suggest that “[m]anagement consultants enact aesthetic knowledge when they employ PowerPoint to communicate a strategy and advise a client to adopt it”. The aesthetic knowledge applied about the visual appeal of the PowerPoint design is an important component of the communication strategy employed. Dean et al. (1997, p. 425) speculate that “[p]erhaps potential investors are even influenced by aesthetic considerations in making investment decisions”, suggesting that aesthetic knowledge may be applied by these investors to determine and compare the ‘beauty’ of their various investment options.

It is also necessary to consider an example of how aesthetic knowledge may be enacted in relation to decision making within the context of mega project management. In a mega project context, decision makers need to apply their aesthetic knowledge (as developed through both their disciplinary training and

interactions with stakeholders) to the design decisions they make as part of a tender process to ensure that the design appeals to the aesthetic sensibilities of key stakeholders (e.g., the client) in order to increase the likelihood that the tender will be awarded. In this instance, it is important that there is a functional relationship between the aesthetic features of the design and the aesthetic requirements of the client – that is, they must ‘fit’. The application of aesthetic knowledge by decision makers to decisions made during the development of the design is important to ensure that this ‘fit’ occurs. This is just one example of the potential application of aesthetic knowledge to decision making processes within the context of mega project management. However, this conceptualisation of the use of aesthetic knowledge in decision making processes in mega project management has not been considered at all in the existing literature. It is the aim of this research to address this gap.

### **2.3.11 Aesthetic knowledge in organisational research**

There has been a burgeoning interest in the study of aesthetics in various fields in the past three decades. This is related to the perception of an aesthetic “boom” in the modern world, in which “[m]ore and more elements of reality are being aesthetically mantled and reality as a whole is coming to count increasingly as an aesthetic construction” (Welsch, 1996, p. 1). This recognition of the importance of aesthetics in everyday life is reflected in the growing body of research exploring aesthetics in an organisational context (e.g., Brady, 1996; Dean, et al., 1997; Dobson, 2007; Feldman, 2000; Fine, 1992; Gagliardi, 1996; Guillen, 1997; Hatch & Jones, 1997; Kersten, 2008; Mack, 2007; Martin, 2002; Ottensmeyer, 1996; Ramirez, 1996, 2005; Ropo & Sauer, 2008; Strati, 1990, 1992, 1996, 1999, 2000; Strati & de Montoux,

2002; Taylor, 2000, 2002; Taylor & Hansen, 2005; Warren, 2002; White, 1996; Witz, Warhurst, & Nickson, 2003).

Given the nature of aesthetic knowledge as a universal human attribute, its functions in relation to cognition, action, decision making and judgement, and Witz et al.'s (2003) assertion that "[a]esthetics and organisation are inseparable", it is perhaps disappointing that it has not been more fully researched in an organisational context. Taylor and Hansen (2005, p.1213) suggest that "[a]esthetic knowledge, like tacit knowledge, is routinely in use in organisations but has lacked adequate attention". In fact, the consideration of aesthetic knowledge in organisational studies is a relatively recent phenomenon, and one that is often not taken seriously (Dean, et al., 1997). This is because aesthetics is viewed as a 'soft' topic that does not fit within the logico-rational conceptual framework that has traditionally dominated organisational research (Gagliardi, 1996). Despite Barnard's (1938) suggestion in his seminal work *The Functions of the Executive* that management in organisations is "aesthetic rather than logical", serious consideration of aesthetics in organisational studies began only in the 1980s, primarily as a reaction to the dominance of rationalism and positivism in the field, and the resultant "mentalisation of organisational life" (Strati, 2007, p.65), but also as a result of an increasing interest in arts organisations and the insights they may hold for organisational theory (Ropo & Sauer, 2008). Strati and de Montoux (2002, p.763) argue that the exclusion of aesthetics from the study of organisations is a social construction which denies the fundamental humanity associated with both aesthetics and organisations. This is necessarily problematic if the goal of research in organisations is to arrive at as complete an understanding as possible of organisational phenomena.

### **2.3.12 Aesthetic knowledge and decision making research**

Some specific consideration of aesthetics and decision making has occurred in an organisational context. Warren (2002, p. 228) maintains that in organisations, as in all aspects of human life, “our value judgements, preferences, tastes, choices and *decisions* are heavily influenced by aesthetic considerations” [emphasis added]. Dobson (2007, p. 41) argues that aesthetics form a “holistic justificatory mechanism for business decisions”; and, further, that the key decision criteria for modern business organisations should be “Is it profitable? Is it ethical? Is it beautiful?” (Dobson, 2007, p. 45). Drawing on Plato, he argues that good decisions are those which have a sense of beauty, and “which enhance the quality of life” (Dobson, 2007, p. 44, cf. Brady, 1996). For Dobson, the failure of decision makers to accept the need to apply aesthetics to decision making in organisations amounts to a denial of both the role of aesthetics in assisting decision makers to cope with the “chaotic and unpredictable” nature of reality, and the limits of applying purely rational processes to decisions (Dobson, 2007, p. 19). However, neither Warren (2002) nor Dobson (2007) has specifically considered the application of aesthetic knowledge to decision making processes through empirical research.

Strati (2000) also considers aesthetics in relation to decision making. He discusses the use of aesthetics as part of rhetorical strategies in strategic decision making, suggesting that both the aesthetics of place and of the presentation of ideas may influence the outcomes of decision processes. While he also considers aesthetics in relation to an actual decision (which, e.g., may be characterised as a “beautiful decision” or “kitschy and tasteless”), he does not explore specifically the use of aesthetic knowledge in decision making processes.

Klein (1998) argues that the recognition of patterns depends on the perception of critical sensory cues in the environment. Importantly, the perception of these cues often relies on aesthetic knowledge. For example, Klein (1998) suggests that critical cues in the detection of heart problems are based on aesthetic knowledge: “The skin gets less blood and turns grayish. That is one of the best signs. The wrists and ankles show swelling. The mouth can look greenish”. In this instance, doctors use their aesthetic knowledge to make diagnostic decisions based on the visual and tactile input they receive from patients during an examination.

The existing research into intuitive decision making processes in the context of organisations provides important insights for the purposes of this study. Klein and his colleagues (Klein, 2003, 2008; Klein, et al., 2010) have conducted extensive research of intuitive decision making processes as part of the movement in the organisational studies field aimed at exploring “natural decision making” (i.e., decision making as it actually occurs in natural settings, especially complex and uncertain contexts – Kahneman & Klein, 2009), as opposed to the laboratory-based approach that is often characteristic of human decision making research (Klein, 2008). This research has important implications for the relationship between aesthetic knowledge and decision making. One of the key decision making models that has emerged out of this research is the Recognition-Primed Decision (RPD) model (Klein, 2003). This model is aimed at demystifying the role that intuition plays in decision making, especially intuitive decisions made by experts in dynamic and unstructured situations characterised by time pressures, extreme levels of risk, a lack of pertinent information, and ill-defined goals and procedures (Klein, 1998). The RPD model suggests that environmental cues prompt pattern recognition by experts in a field, which subsequently prime the decision making process, resulting

in the activation of “action scripts” which are then tested by “mental simulation” (Klein, 2003). The interpretation of these environmental cues relies on tacit knowledge, which often makes it difficult for decision makers to articulate the basis of their decisions when queried (Kahneman & Klein, 2009, p. 516). This model represents a knowledge-based approach to decision making that recognises the importance of the “perception and recognition of situations, as well as [the] generation of appropriate responses, not just choice from among given options” (Klein, 2008). Importantly for the purposes of this research, it acknowledges that intuition relies on tacit knowledge “to synthesize isolated bits of data and experience into an integrated picture, often in an “ ‘aha!’ experience” (Klein, 2003). This understanding of the role of intuition and tacit knowledge clearly provides a link to the Kantian perspective on the role of aesthetic knowledge as the basis of pattern recognition which allows for the effective holistic analysis of decision making situations (de Montoux, 2007).<sup>15</sup>

Agor (1986, p. 10) argues that the application of intuition leads to decisions which often leave the decision maker with “a feeling of total harmony”. Further, he suggests that decision makers will often feel excited or euphoric when effective decisions have been made based on intuition, and suffer from “discomfort” and “sleepless nights” when they have disregarded their intuition when making a decision (Agor, 1986). As ‘harmony’ is an aesthetic concept (Adorno, 1997; Boden, 1992; Engler, 1990; White, 1996), and feelings of ‘euphoria’ and ‘discomfort’ necessarily have a sensory dimension, it would appear that ‘good’ intuitive decisions are those which appeal to the aesthetic knowledge of the decision maker as applied

---

<sup>15</sup> Cf. Simon (1993) who provides an example of aesthetic knowledge (although he does not identify it as such) in the form of the visual recognition by medical professionals of chicken pox spots when discussing how contextual cues are an important part of expert knowledge.

to the decision making process. Kahneman et al. (2011, p. 52) also suggest that aesthetic knowledge underpins intuition in the context of decision making, arguing that our “visual system and associative memory are designed to produce a single coherent interpretation of what is going on around us”. This concept of the role of intuition in providing coherence in decision making necessarily relates to the Kantian notion of the function of aesthetic knowledge in decision making (de Montoux, 2007). However, this function has not yet been considered empirically at all in the field of organisational studies. This lack of focus is related to Taylor and Hansen’s (2005) argument that despite the prevalence of the application of aesthetic knowledge within organisations, the traditional rationalist focus of organisational studies has resulted in a failure by organisational researchers to take aesthetic knowledge seriously.

Dean et al. (1997, p. 429) focus on the aesthetics of decision making processes themselves, which, they maintain, “may be seen as an aesthetic creation of the people enacting them”.<sup>16</sup> They argue that decision makers may experience beauty in terms of the decision process, suggesting as an example, that “the complexity, order and symmetry of spreadsheets and other representations of alternatives and information about them may be a source of pleasure to decision makers”. They call for further research on decision making from an aesthetic perspective, particularly focusing on the role of aesthetics as well as of reason and politics in decision making processes.

The work of Fine (1992) provides highly important insights for this research. Fine’s (1992) research focuses on aesthetics from a sociology of work perspective within the context of restaurants. The study explores the role of aesthetics in

---

<sup>16</sup> Cf. Kersten (2008, p. 195) who suggests that “[o]rganisational decision making is affected by people’s aesthetic preferences for how decisions should be made”.



culinary production, and the ways in which organisations both facilitate and constrain an individual's application of aesthetic knowledge to creative work. Fine (1992) argues that the aesthetic aspects of creative work output (i.e., its sight, sound, smell, taste, and touch) act as both a demonstration of the creative skill and competence of the worker, and a determinant of the perceived quality of the output. Therefore, restaurant workers must apply their aesthetic knowledge to the decisions they make in creative work processes to be evaluated as 'quality' 'creative' workers through their production of 'quality' output. Fine (1992, p.1288) suggests that this concept extends beyond the confines of his research setting, arguing that:

... a concern with the sensory qualities of products and production applies to all work life, not just restaurants. Much of what we mean by quality has this sensory (aesthetic) dimension; we suggest that the object (or performance) transcends functional requirements.

This role of the application of aesthetic knowledge as a quality control or evaluative mechanism is supported elsewhere in the literature (see e.g., Anderson & Hausman, 1992; Maitland, 1976). However, the application of aesthetic knowledge by culinary workers in this manner is not free of constraint. Fine (1992, p. 1269) argues that aesthetic choices in these contexts are affected by "organisational, market and client constraints". The various relationships in which workers find themselves with their organisations, markets, and clients constrain the level of aesthetic control, discretion, and autonomy they enjoy in relation to the production of their aesthetic output (cf. Rosenblum, 1978).

Although Fine's (1992) work does not consider decision making processes explicitly, it does provide insight into the sensory basis, and constraints, of aesthetic choice in organisational contexts. Workers apply their aesthetic knowledge of the sensory aspects of their work to produce output that is appealing and in which

workers can take pride. However, this application of aesthetic knowledge is not unbounded; workers must incorporate their understanding of the aesthetic preferences of others (managers, clients, ‘the market’, etc.) to ensure that the outcome is aesthetically acceptable for relevant stakeholders. These personal and relational aspects of the application of aesthetic knowledge become an important consideration in their decision making processes. Decisions are based on more than “purely instrumental and efficient choices: workers care about ‘style’ and not only about technical quality” (Fine, 1992, p.1270). However, this consideration of style must be appropriate for the context and its relevant stakeholders if the outcome is to be judged successful. This research examines whether aesthetic knowledge is used in decision making in mega projects in a similar fashion by exploring in the data evidence of the sensory (i.e., sight, sound, smell, taste, and touch) basis of decision making within the context. The analysis will expand on Fine’s (1992) work in two significant ways. First, by looking at the use of aesthetic knowledge in decision making processes beyond decisions about the aesthetic aspects of outcomes, this study explores the sensory basis of decision making more broadly than Fine (1992). Second, this study examines a context not as readily associated with the application of aesthetic knowledge as restaurant settings. The exploration of this setting will test Fine’s (1992, p. 1288) assertion of the importance of the sensory aspects to “all work life”.

### **2.3.13 Aesthetic knowledge and decision making in mega project management research**

There is no extant research that explores specifically the relationship between aesthetic knowledge and decision making in the context of mega projects. The existing research does, however, examine the role of knowledge more broadly in

mega project management. Several studies provide useful insights for the purposes of this research. Sufficient and appropriate explicit and tacit knowledge in the form of the skills, experience, and technology possessed by individuals and groups is essential for the success of mega projects (Cooke-Davies, 2011; He, Butler, & King, 2007). Thomas and Mengel (2008) argue that highly skilled mega project managers manage complexity effectively by drawing on the intuitive and holistic knowledge they have gained through their experience (cf. He, et al., 2007). Santos (2012, p. 28) maintains that it is vital for the success of mega projects to apply and share this knowledge, as it “affects the development of innovative ideas, the way project members deal with changes, cope with crisis, deal with coordination and complex tasks, define plans and make decisions”. Therefore, the literature establishes that holistic, intuitive knowledge plays a key role in the effective management of mega projects.

Jaafari (2003, p.54) agrees with this assertion, suggesting that project managers must apply “intelligent intuition” to deal with complexity. In instances of high levels of structural complexity and uncertainty, project managers need to engage in activities which “transcend that of a rational process-driven approach to that of a creative approach through which they are able to achieve breakthrough solutions to optimally respond to both environmental and project complexity” (Jaafari, 2003, p. 55). Leybourne and Sadler-Smith (2006) explore the role of intuition in project management in depth. They argue that intuition and “improvisation” play an important role in mega project situations which are typically characterised by time pressures and limited information. Improvisation is a “combination of intuition, creativity and bricolage that is driven by time pressures” that results in project managers “moving away from an agreed plan in order to

accelerate the implementation of actions” (Leybourne & Sadler-Smith, 2006, p. 484). Intuition and improvisation are perceived as important ways of addressing the limitations of rationality. Leybourne and Sadler-Smith (2006, p.486) maintain that in mega projects:

...crucial decisions are often executed by highly skilled individuals who possess high levels of expertise acquired through explicit and implicit learning. Such expertise manifests itself as the capacity to intuit responses in complex decision scenarios with speed and flexibility.

Explicit and implicit learning results in the tacit knowledge that is the foundation of both intuition and improvisation (Leybourne & Sadler-Smith, 2006). Leybourne and Sadler-Smith (2006) suggest that role-modelling and observational learning are key sources of this tacit knowledge.

The role of improvisation in mega project management is also discussed by Lindahl (2007). Importantly, Lindahl (2007) identifies improvisation as an aesthetic concept. The role of improvisation is to assist project managers to be creative in finding solutions which fall outside of the formal rules and control structures in order to address the change, uncertainty, and temporal problems associated with mega projects (Lindahl, 2007). Lindahl (2007) argues that the ability to improvise is not possessed by “novice” project managers, as its efficacy is based on the extent of the experience of a project manager. Although Lindahl (2007) does introduce aesthetics into the mega project management literature, the focus of his research is not specifically on the use of aesthetic knowledge in decision making processes, and it therefore differs from this study.

#### **2.3.14 Summary**

Aesthetic knowledge is the sensory-derived tacit, non-rational knowledge of signs and symbols and experiences which emerges from people’s relationships with

phenomena. It is a universal attribute of humans which is applied to many aspects of their organisational experience. Despite this, the research on aesthetic knowledge within organisational contexts is only a recent phenomenon and one which requires further exploration, especially given its potential to enhance the understanding of effective decision making processes in unstructured decision making contexts. Both Dean et al. (1997) and Hansen et al. (2007) have called for further research into decision making from an aesthetic perspective. Research of this nature is important given the particular function of aesthetic knowledge as the basis of all cognition; as an aid to choice in situations when the application of logic and reason is limited; and in providing the foundation for holistic and coherent approaches to decision making in complex environments. This use of aesthetic knowledge in decision making processes in mega projects has not yet been addressed. This study addresses this gap in the literature.

## **2.4 Conceptual framework**

The preceding discussion has provided a review of relevant literature pertaining to mega project management, decision making processes, and aesthetic knowledge. This section consolidates this detailed review into a clear statement of the conceptual framework which underpins the research. The purpose of clearly outlining a conceptual framework in qualitative research is to provide an understanding of the focus for, and boundary of, the study (Jabareen, 2009).

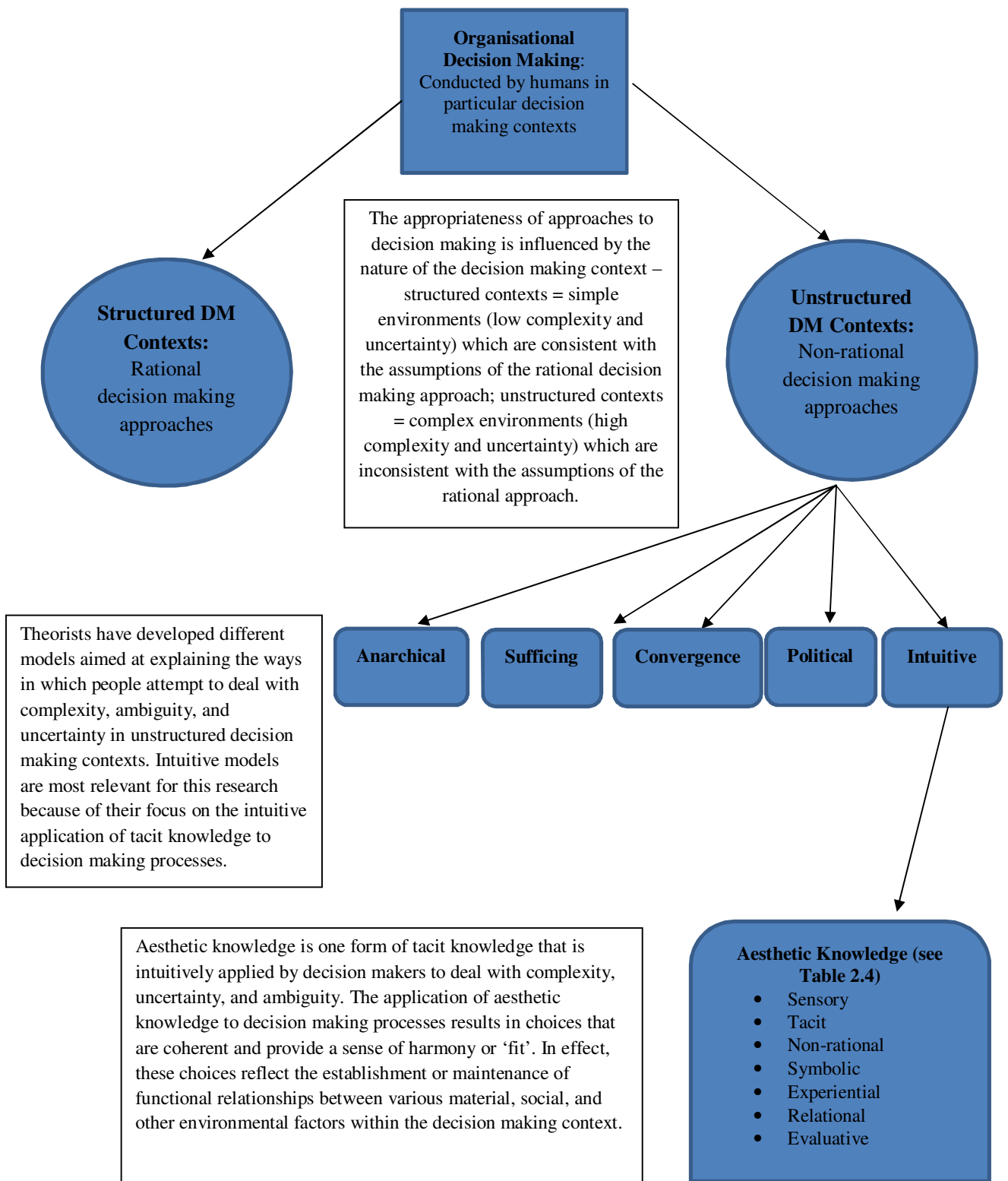
The study's conceptual framework is outlined in Figures 2.6 and 2.7, and Table 2.4. It is necessarily informed by the review of aesthetic knowledge and decision making theory. In particular, it is influenced by Baumgarten's and Kant's epistemological and aesthetic theories (Carr & Hancock, 2002; Davey, 1989; de

Montoux, 2007; Dean, et al., 1997; Elgin, 1997; Hammermeister, 2002; Hansen, et al., 2007; Strati, 2000; Taylor, 2000, 2003), tacit knowledge theory (Nonaka & Takeuchi, 1995; Polanyi, 1967), and intuitive decision making theory (Agor, 1986; Betsch, 2008; Kahneman & Klein, 2009; Klein, 1998, 2003; Klein, et al., 2010).

Decision making within organisations is an activity undertaken by humans within particular decision making contexts (Fernandes & Simon, 1999; McKenzie, et al., 2011). The nature of these contexts is influenced by a number of factors, including the level of uncertainty about goals, methods of achieving those goals, and the consequences of decision outcomes; the level of risk associated with the decision; the complexity of the organisation's social, political, legal, and ecological environments; the timeframe within which a decision is required; the availability of relevant information; and the importance of the decision for the organisation and its members (Buchanan & O'Connell, 2006; Choo, 1998; Cray, et al., 2007; Dane & Pratt, 2007; Drummond, 2001; Fernandes & Simon, 1999; Harrison, 1999; Klein, 2003; Langley, et al., 1995; March, 1994; McKenzie, et al., 2011; Simon, 1993). For example, structured decision making contexts are characterised by problem clarity; a lack of goal ambiguity; clear decision making procedures; known outcome options and consequences of those options; limited impact of social, political, legal, and ecological factors; the ready availability of pertinent information; low levels of risk; and an absence of time pressures (Choo, 1998; Dane & Pratt, 2007; Harrison, 1999; March, 1994; Simon, 1993). Conversely, unstructured (or ill-structured) decision making contexts (e.g., as occur in mega projects) are characterised by high levels of ambiguity about the nature of the problem and desired goals; a lack of precedent and clear decision making procedures; uncertainty about action options and the consequences of action choices; complex social, political, legal, and ecological

environments; incomplete or excessive amounts of information relating to the issue; and limited time for decision making (Buchanan & O'Connell, 2006; Choo, 1998; Cray, et al., 2007; Drummond, 2001; Klein, 2003; Langley, et al., 1995).

The nature of these contexts determines the appropriateness of different decision making models. For example, rational models are more appropriate for structured decision making contexts, as these contexts provide the stability, predictability, simplicity, clarity, and temporal conditions required for the model to work effectively (March, 1994). The complexity, ambiguity, and uncertainty of unstructured decision making contexts render the reliance on rational models problematic, as they do not conform to the conditions which underpin these models. Various theorists have developed different decision making models aimed at explaining the ways in which people attempt to deal with complexity, ambiguity, and uncertainty in unstructured decision making contexts. Intuitive models are most relevant for this research because of their focus on the intuitive application of tacit knowledge to decision making processes.

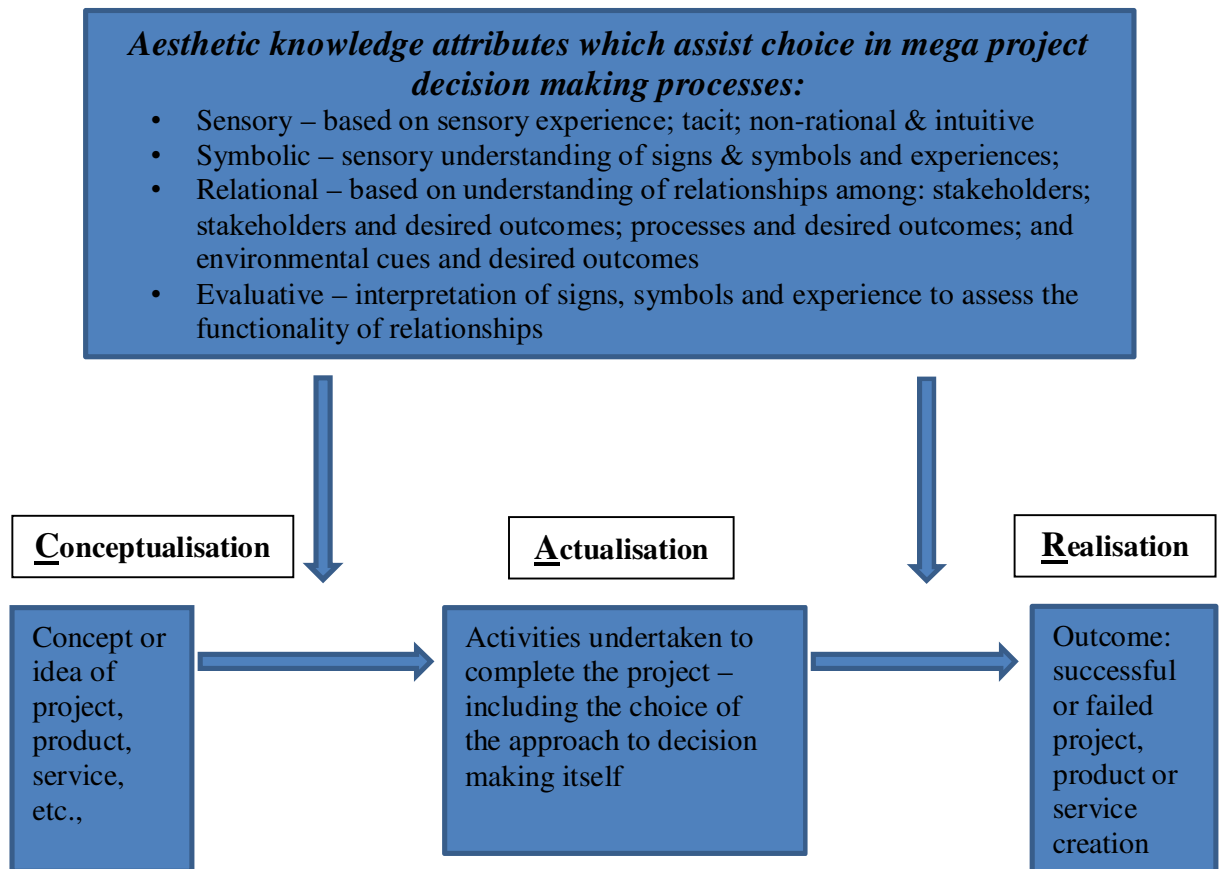


**Figure 2.6: Conceptual framework – situating aesthetic knowledge in the organisational decision making context**



<i>Attribute</i>	<i>Descriptors</i>	<i>Example in a Mega Project Context</i>
<b>Sensory</b>	Sight, sound, smell, touch, taste, and gut feel as the basis of felt meaning of phenomena	Knowledge of what is required to ensure the visual appeal of project outcomes for end users
<b>Tacit</b>	Personal/subjective Implicit Context specific Difficult to formalise/codify Derived unconsciously	Being able to identify project problems and prioritise how they are to be attended to without formal analysis and without being able to express formally the reasoning for these decisions
<b>Non-Rational</b>	Not cognitive Not derived from abstract reasoning Drawn from direct sensory experience resulting in felt meaning	A project manager's gut feel as to why one team member would be more suitable to another equally qualified team member for a particular project task
<b>Symbolic</b>	Perceptual Knowledge of signs and symbols Communication through metaphor	Knowledge of the meaning project clients attach to their branding symbols
<b>Experiential</b>	Developed through individual lived embodied experience (personal, professional, organisational, cultural, etc.) of phenomena	Knowledge of aesthetic conventions of engineering gained through direct participation as a member of the engineering community over time
<b>Relational</b>	Interactional Emerges from relationships with others, objects, etc., Involves establishing the nature of relationships	Using visual drawings of project variables to assist project team members to establish the nature of the relationships among the variables
<b>Evaluative</b>	Involves assessing value (fit, coherence, patterns) and functionality of relationships	Gaining knowledge of the level of functionality of project organisation/client relationships through engaging in direct interpersonal interactions

**Table 2.4: Operationalising aesthetic knowledge – key attributes**



**Figure 2.7: C-A-R – aesthetic knowledge and decision making processes in mega projects**

Aesthetic knowledge is one form of tacit knowledge which is used intuitively in decision making processes, especially in unstructured decision making contexts. Effective intuitive processes require the holistic application of tacit knowledge. In organisational contexts, it is important that this tacit knowledge is domain relevant (i.e., relevant to a particular organisation and/or profession, technical or occupational field); however the application of aesthetic knowledge is also essential. According to Kantian epistemic theory, it is the decision maker’s aesthetic knowledge which enables the recognition of patterns, and the conceptualisation of wholeness and coherence, which allows effective action options to be selected (de Montoux, 2007). This knowledge of coherence and harmony provides meaning in complex and uncertain environments, and is relied upon as a justifiable basis for

action. Aesthetic knowledge schemas facilitate the interpretation of environmental cues and are the basis of the judgements as to their importance and their relationships. It is the felt meaning derived from the effective application of aesthetic knowledge in complex, ambiguous, and uncertain situations that provides the decision maker with a sense of harmony and the intuitive sense that the ultimate action option choice ‘feels right’. For this reason, Kant’s philosophical position on the function of aesthetic knowledge as the foundation of coherent and holistic thinking in relation to decision making needs to be explored explicitly within the organisational studies context. No current empirical research explores this function of aesthetic knowledge within these decision making contexts.

Based on the preceding discussion, a model of the use of aesthetic knowledge in decision making processes in mega projects to be explored in this study is proposed in Figure 2.7. The function of aesthetic knowledge is to assist project decision makers to make choices throughout the project process,<sup>17</sup> from the conceptualisation of the nature of the specific outcome (project, product, service, etc., – the ‘**C**onceptualisation’ stage), through the activities undertaken to produce the specific outcome (the ‘**A**ctualisation’ stage), to its final creation (the ‘**R**ealisation’ stage). The existing literature suggests that effective decision making at different stages of the project process requires project decision makers to apply their aesthetic and domain knowledges to make choices that are coherent with (i.e., ones that are harmonious with or ‘fit’) the desired outcome. The application of this

---

<sup>17</sup> As indicated in Chapter 1, the three-staged conceptualisation of the project process proposed in this model is based on the concept of the ‘project lifecycle’ (Aaltonen & Kujala, 2010; Morris, 1982). In reality, particularly in the context of mega projects, the project lifecycle is rarely this linear and the stages not so clearly delineated (Gerald & Adlbrecht, 2007; Jaafari, 2003; Thomas & Mengel, 2008). However, this staged concept has been adopted to provide a guiding framework for the analysis of the data. It is particularly beneficial in assessing whether the impact of aesthetic knowledge differs throughout the project process.

knowledge enables project decision makers to identify, and make judgements about, the functionality of the various relationships which affect the decision making process and the ability to achieve desired outcomes. Choices are then based on these functionality assessments. The ultimate success or failure of the outcome is determined by how well the choices made throughout the decision making process fit the desired nature or purpose of the outcome. These choices are many and varied – from the selection of an appropriate type of decision making process (e.g., rational/non-rational) and the means of achieving desired goals, to the aesthetic aspects of the desired outcome (e.g., colour, texture or other design attributes). The function of domain knowledge in this process (as conceptualised here) has been explored explicitly in the research on the role of tacit knowledge in the context of organisational decision making (e.g., Brockmann & Anthony, 2002; Klein, et al., 2010; Shapiro & Spence, 1997). However, the role of aesthetic knowledge has not been considered. Therefore, this research explores explicitly the use of aesthetic knowledge in these decision making processes.

The Kantian notion of the function of aesthetic knowledge in decision making, together with the discussion in the literature on the role of tacit knowledge and intuition in decision making, suggest that the use of aesthetic knowledge in decision making in organisations may be explored best in unstructured decision contexts. Unstructured decision making contexts require the intuitive application of tacit knowledge to deal with the complexity and ambiguity that arise from the lack of clear goals, procedures, action directions, and outcome consequences that are symptomatic of such contexts. This research seeks to explore mega project management as an example of an unstructured decision making context. This context is a particularly fruitful one for the exploration of the use of aesthetic

knowledge in decision making processes, given the high level of complexity evident in the decision making environment in mega projects.

## **2.5 Research questions**

This literature review has highlighted several existing gaps in the literature regarding the use of aesthetic knowledge in decision making processes in mega projects. Based on this analysis, this research addresses the following primary research question:

***What are the ways in which aesthetic knowledge is used in decision making processes in mega projects?***

To assist in addressing this primary research question, a series of sub-research questions was also considered:

1. What types of aesthetic knowledge are used in decision making processes in mega projects?
2. How does the use of aesthetic knowledge types vary by project stage?
3. What is the role of the experience of decision makers in the use of aesthetic knowledge in decision making processes in mega projects?
4. How does the use of aesthetic knowledge in decision making processes in mega projects contribute to project success or failure?

These sub-research questions provide an opportunity to establish not only the ways in which aesthetic knowledge is used in decision making processes, but also which types of aesthetic knowledge are employed in mega projects, and their relative importance across each project stage (i.e., Conceptualisation, Actualisation, Realisation); the role of decision maker experience in the use of aesthetic knowledge

in these processes; and the effect of the use of aesthetic knowledge in decision making process on project success or failure. Chapter 3 provides a detailed description of the methodology used to address these research questions.

## **2.6 Conclusion**

This chapter contextualises, and provides the rationale for, this research through an exploration of the existing literature on mega project management, decision making, and aesthetic knowledge. By doing so, it highlights the gaps in the existing literature as a means of demonstrating the significance and value of this research. However, the chapter was not designed to develop a definitive theoretical framework or a series of hypotheses for empirical testing – to do so would be inconsistent with the proposed qualitative methodology (Creswell, 2003). Rather, it has led to the development of research questions which have been addressed through the research methodology detailed in Chapter 3.

Mega project management is an important area of research. Mega projects are large scale, time-consuming, and costly projects which have significant economic, social, and political implications. The risks associated with failure in these project contexts (e.g., substantial economic loss, the failure of project organisations, significant negative political consequences, etc.) are considerable. Therefore, it is important that they are managed effectively to ensure their successful completion. One of the key determinants of mega project success is effective decision making. The context for decision making in mega projects is unstructured – that is, decision making occurs in an environment in which the nature of goals to be achieved, and the means to achieve those goals and their consequences, are uncertain, complex and ambiguous. In such circumstances, existing theory suggests

that approaches to decision making which rely on the intuitive and holistic application of tacit knowledge are beneficial for effective decision making. Aesthetic knowledge is one form of tacit knowledge that is important for effective decision making. According to Kantian theory, aesthetic knowledge is applied in decision making processes to enable decision makers to make an assessment of the coherence among disparate aspects of unstructured decision making environments which, in turn, provides a sense of both context and meaning through which effective choices of action options can be made. This function of aesthetic knowledge in relation to decision making processes has not been examined empirically before.

This research addresses a number of gaps in the existing literature that, once addressed, will contribute not only to theory, but also to practice. It contributes to the study of aesthetic knowledge as a phenomenon in organisations, which is an important, yet under-researched, topic within the field. It addresses the use of aesthetic knowledge as a non-rational aspect of decision making, an issue which has not been considered explicitly as part of the existing theorising about decision making in organisations. Finally, it considers the relationship between aesthetic knowledge and decision making within the context of mega project management, an area of research which previously has not been explored empirically in the organisational studies field. By addressing the existing gaps in the literature identified above, this research provides a significant contribution to the theory of aesthetic knowledge and decision making within the field of mega project management. Further, the recognition and understanding of the relationship between aesthetic knowledge and decision making will provide managers with valuable insights into reality of decision making processes as they actually occur in

organisations; and enable them to consider ways in which the aesthetic knowledge of organisational members can be developed and its effective use encouraged and achieved.



### ***Chapter 3 Methodology***

The purpose of this chapter is to provide details of the qualitative methodology employed to address the research questions posed in this study. The preceding chapter provided a review of the literature relating to mega project management, decision making processes, and aesthetic knowledge which led to the research questions which have guided the completion of the study. I begin this chapter with a discussion of the ontological and epistemological assumptions of my research paradigm – namely, critical realism – and justify the appropriateness of the chosen qualitative methodology given this paradigmatic position. I then provide practical details of the study's participants and sampling methods, and the methods of data collection and analysis procedures utilised in the research. Finally, I address the procedures used to ensure the quality of the research; and assess the ethical implications and limitations of the study.

#### **3.1 Research paradigm – Critical Realism**

Although the primary focus of research methodological choices should be on their suitability to the purpose of the research questions (Roberts, 2010), the reality is that design decisions are influenced heavily by the researcher's particular paradigmatic position (Schutt, 2001). A paradigm is a person's assumptions about the nature of reality (i.e., their ontological position) and how they come to know about that reality (i.e., their epistemological position) (Hussey & Hussey, 1997, p. 47). Bordow and More (1991) argue that one of the major problems with research in organisational studies is the failure of researchers to clarify their paradigmatic position. They suggest that researchers focus more on study methods rather than on openly enunciating the equally important philosophical underpinnings of their work

(Bordow & More, 1991). It is essential for the critical evaluation of research output that researchers outline clearly the fundamental premises on which their work is based.

My approach to research is anchored in the critical realist tradition (Ackroyd, 2004; Ackroyd & Fleetwood, 2000; Bhaskar, 1978, 1989, 1998; Fleetwood & Ackroyd, 2004; Sayer, 2004). Critical realism maintains an ontological realist position (i.e., the belief in the existence of a mind-independent, pre-existent reality – Bhaskar, 1989, p. 13) and an epistemological relativist position which acknowledges the subjective, socially constructed nature of knowledge (Johnson & Duberley, 2000). The critical realist paradigm is not associated with any particular research methodology. It assumes a more pragmatic approach to research, in which the key determinant of the appropriateness of a research methodology is its suitability in terms of the nature of the research question, and the mind independent ontological, and socially mediated and subjective epistemological, basis of the paradigm (Ackroyd, 2004; Bryman, 2008; Sayer, 2004). Ackroyd (2004, p. 137) suggests that this aspect of critical realism “allows researchers to be selective in their choice of investigatory tools”.

### **3.2 Methodology**

I have employed a qualitative methodology for this research. Qualitative research focuses primarily on “words rather than quantification in the collection and analysis of data” (Bryman, 2008, p. 366). It represents a naturalistic form of inquiry, in which people are studied in their real-life settings without any attempts to manipulate environmental conditions (Roberts, 2010). The purpose of qualitative research is to gain an holistic and in-depth understanding of phenomena by engaging

directly with research participants to access their experience and interpretations of the research topic (Bryman, 2008; Creswell, 2003; Flick, 2007; Mason, 1996). It often involves flexible methods of data collection (Mason, 1996); and an emergent, inductive and iterative approach to data analysis (Bryman, 2008; Flick, 2007; Mason, 1996).

Although qualitative research is often associated with both relativist ontological and epistemological positions (Creswell, 2003), Ackroyd (2004) maintains that qualitative research is not inconsistent with critical realist philosophy (cf. King & Horrocks, 2010). It is possible to engage in a research process which accepts that the meaning of phenomena is socially constructed and mediated (as in qualitative approaches) without subscribing to the belief in a subjective reality. The ontological assumption of this research is that the primary topics of interest (i.e., aesthetic knowledge and decision making processes) exist – that is, they are objectively real and exist independently of any one person's existence. Bell (1996) agrees with this position on the ontological status of research interests, as he suggests that the belief in the mind-independent nature of reality is important for social science to make sense. However, this does not deny that the perceptions of, and the meaning ascribed to, these phenomena are socially constructed (Berger & Luckmann, 1966). Consequently, the way in which we are able to come to know about and understand aesthetic knowledge and decision making processes is through engaging directly with decision makers in an attempt to access the meanings they ascribe to their pre-existing, objective reality (Brewer, 2000; Kvale, 1996).

A qualitative approach is also consistent with my research topic. Qualitative research is suitable for exploratory research such as this study. Exploratory research is necessary when there is little existing empirical research on the subject matter

(Creswell, 2003). As there is no empirical research which examines explicitly the use of aesthetic knowledge in decision making processes in mega projects, an exploratory approach is warranted. When there is little empirical research available on a topic, it is important to engage directly with relevant research participants to gain their insight into their experience of “everyday practices and everyday knowledge referring to the issue under study” (Flick, 2007, p. 2, cf. Kvale, 1996). The purpose of this engagement is to develop a ‘thick description’ (Geertz, 1973; Lincoln & Guba, 1995) of the research concepts and the relationship that exists between them, rather than causal theory development.

Qualitative approaches are also appropriate for aesthetic knowledge and decision making processes as research concepts. Aesthetic knowledge is a form of tacit knowledge. Tacit knowledge is, by definition, subjective and difficult to articulate in formal language (Nonaka & Takeuchi, 1995). In terms of researching aesthetic knowledge in organisational contexts, Taylor (2002) refers to this difficulty as “aesthetic muteness”. However, the complexity presented by this ‘muteness’ can be overcome by engaging directly with subjects through qualitative techniques such as interpersonal interviewing (Richards, 2005). Brockman and Anthony (2002, p. 440) argue that “individuals, if so tasked [e.g., through direct interviewing], can recall their use of tacit knowledge” (cf. Sternberg & Lubart, 1995). Further, given its subjective nature, it is reasonable in an organisational studies context to engage in research methods, such as qualitative interviewing, which attempt to understand aesthetic knowledge from the perspective of organisation members (Taylor, 2002, cf. Wellington & Szczerbinski, 2007). Taylor (2002) suggests that direct questioning is an accepted way of accessing organisational members’ understanding of aesthetic concepts. A qualitative approach is also appropriate for the research of decision

making processes in organisations. Bryman (2008, p. 288) argues that qualitative methods enable the understanding of such processes by encouraging participants to “reflect on the processes leading up to or following an event” (cf. Barbour, 2008, p. 31; Roberts, 2010, p. 143). Finally, qualitative methods incorporating interviews have been used in other studies which explore aesthetic knowledge in organisational settings (e.g., Fine, 1992).

### **3.3 Method**

#### **3.3.1 Source of evidence**

Semi-structured interviews provide the sole source of data in this research.

Interviews are a widely used method of data collection in qualitative research (Bryman, 2008; King & Horrocks, 2010; Kvale, 1996; Mason, 1996); and can, as in this research, be used as the sole source of data (Flick, 2007, p. 81; Kvale, 1996, p. 6; Marshall & Rossman, 2006, p. 101). Hopf (2007, p. 203) argues that it is not uncommon for interviews to form the “main empirical base” of research, especially when the research is approached from an epistemological relativist position, and when the goal of the research is to access how the participants, rather than the researcher, understand the subject matter (cf. Marshall & Rossman, 2006).

The purpose of conducting interviews in qualitative research is to “understand the world from the subjects’ points of views, to unfold the meaning of peoples’ experiences, [and] to uncover their lived world prior to scientific explanations” (Kvale, 1996, p. 1). Mason (1996, pp. 39-40) suggests that interviews are an appropriate data collection method when the researcher believes that the primary way to understand the phenomena of interest is by interacting directly with people to “access their accounts and articulations”; when consideration of contextual

and situational factors is particularly important for understanding the phenomena; and instances when the research topic “may be complex, or may not be clearly formulated in [the] interviewees’ minds in a way which they can simply articulate in response to a short standardised question” (cf. Mason, 1996; Richards, 2005). These three bases for the use of interviews as a data collection method are applicable for my research. Given the exploratory nature of the research, it is appropriate to engage directly with research participants about the use of aesthetic knowledge in decision making processes in mega projects; and to examine through this interaction the contextual and other factors which may affect its use in these processes. Further, as aesthetic knowledge is a complex topic which is not observable, nor often reflected upon or easily articulated by people given its tacit nature, it is necessary to engage directly with decision makers to explore with them their experiences of decision making in mega projects in order to determine the use of aesthetic knowledge in these processes (cf. Keats, 2000; Seidman, 1991).

While aesthetic knowledge research in organisations may involve the study of the artefacts of organisations (Rafaeli & Pratt, 2006; Strati, 2000, 2007), or the aesthetic perspectives of participants through methods such as video diaries (Ellis & Flaherty, 1992), these methods were not appropriate for this study. This study revolved around the retrospective reflection of participants on the many and varied decision making processes they *had previously* engaged in through their participation in mega projects. This meant that identifying, or gaining access to,

applicable artefacts was difficult, if not impossible; and video diaries were not possible<sup>18</sup>.

Semi-structured interviews involve asking participants key (often pre-determined) questions based around the topics of interest, and encouraging them to provide open responses to these questions (Minichiello, Anoni, Timewell, & Alexander, 1995). This method is not as limiting as structured interviews, and consequently provides in-depth information about the phenomena of interest (Brewer, 2000). It is also more focused than the completely unstructured interviewing method, thus restricting the amount of potentially erroneous data provided by the participants, and enabling the researcher to collect “relevant, valuable and analytically rich data” (Barbour, 2008, p. 114). This tighter structure assists the data coding process, and enables more effective analysis and comparison of data than would occur with completely unstructured interview methods (Keats, 2000). Flick (2007) argues that semi-structured interviews are a particularly appropriate data collection method when the researcher is looking to access the subjective viewpoint of the research participants. A summary of the key reasons for the suitability for this study of semi-structured interviews and the relevant key authors is provided in Table 3.1.

---

<sup>18</sup> Further, apart from the potential issues with ethical clearance, given the commercial and military sensitivity of a number of the participants’ work sites, it is unlikely that permission for video diary data collection would have been granted.

<b>Reasons for the Suitability of Semi-Structured Interviews for this Study</b>	<b>Key Authors</b>
Appropriate for exploratory research	(Flick, 2007; Mason, 1996)
Appropriate for research approached from an epistemological relativist position	(Hopf, 2007; Marshall & Rossman, 2006)
Appropriate when the goal of the research is to understand the research topic from the participants' points of view	(Hopf, 2007; Kvale, 1996; Marshall & Rossman, 2006; Mason, 1996; Taylor, 2002; Wellington & Szczerbinski, 2007)
Appropriate when consideration of contextual and situational factors is important	(Mason, 1996)
Appropriate for complex research topics which are not observable directly	(Keats, 2000; Mason, 1996; Seidman, 1991)
Appropriate to access participants' use of tacit knowledge and to overcome 'aesthetic muteness'	(Brockmann & Anthony, 2002; Jones, 1996; Sternberg & Lubart, 1995; Taylor, 2002)

**Table 3.1: The suitability of interviews for the study of the use of aesthetic knowledge in decision making processes in mega projects**

### **3.3.2 Participants and sampling procedures**

The sample for this study is individual decision makers (i.e., project managers) in the context of mega project management. These subjects were chosen because of their relevant experience as identifiable central decision makers in mega projects given the important role they play in the management of these projects (Ireland, 2006). Given this experience and their role in mega projects, these participants were important sources of data on the use of aesthetic knowledge in decision making processes in mega project organisations as (a) they are participants in decision making processes in unstructured decision making environments within their organisations; and (b) they are the people who apply aesthetic knowledge in these processes. Further, given their role in mega projects, they were also important sources of perceptual insights of the use of aesthetic knowledge in decision making processes by other project decision makers (e.g., project team members, clients, end users, etc.,).

Participants were sampled primarily using 'purposeful' sampling techniques (Patton, 1990). Purposeful sampling is a standard initial method of sampling in



qualitative research (Bryman, 2008). It involves the purposeful selection of “participants or sites (or documents or visual material) that will best help the researcher understand the problem and the research question” (Creswell, 2003, p. 185). It is used particularly to identify “information-rich cases who will illuminate the questions under study” (Patton, 1990, p. 169). This was certainly the point of the selection of project managers for this study given their involvement in, and experience of, decision making contexts in mega projects. In essence, the sampling process represents a form of “intensity” sampling, in that the sample selected “consists of information-rich cases that manifest the phenomenon of interest intensely (but not extremely)” (Patton, 1990, p. 171).

Access to participants was facilitated through my participation as a member of the research team working on QUT’s Defence Materiel Organisation (DMO) Australian Research Council linkage project (LP 0989705) exploring various aspects of mega project management; through the contacts I had made as a guest presenter to QUT’s Executive Master of Business Administration program; through introductions from colleagues involved with QUT’s Master of Complex Project Management program and the International Centre for Complex Project Management; and through my own professional contacts external to QUT. These various participant contact streams provided access to a wide range of industries and to participants with differing experiences. I sought participants who had current or recent experience of decision making within mega project management environments. The selection of further research participants was then guided by the principle of ‘theoretical’ sampling. Theoretical sampling involves the selection of research participants based on “their (expected) new insights for the developing theory” (Flick, 2007, p. 65). This process of sampling continues until the point of

“theoretical saturation” is reached – that is, when “nothing new emerges any more” from the analysis of the data (Flick, 2007, p. 66). In this study, this point was reached when the analysis of the interviews conducted in the latter stages of the data collection phase confirmed what was found through the analysis of the earlier interviews, without eliciting any new or beneficial insights<sup>19</sup>.

All participants were contacted either by email or telephone to seek permission to conduct the interview, and to arrange an appropriate time and location for interviewing. Interviews were conducted in person, both in Brisbane and Canberra. Prior to each interview, participants were provided with an information sheet detailing the nature of the research, their role and rights as participants, and contact details should they have any further queries or concerns (See Appendix 2). This was required as in part fulfilment of the terms of the ethical approval for the project granted by QUT.

Four pilot interviews were conducted. On the basis of the preliminary analysis of these interviews, the interview schedule was shortened and re-focused on the participants’ specific experience of decision making in mega projects and the sensory elements of these projects. The remaining interviews were conducted in accordance with this final interview guide (as provided in Appendix 1). Interviewing continued until the initial coding of the interviews indicated that theoretical saturation was reached. Interviews were audio recorded via a MP3 recorder and subsequently transcribed in all instances except one, in which the participant declined to be recorded. In this instance, I made detailed notes of the interview. The

---

<sup>19</sup> See Bryman’s (2008, p. 462) discussion of theoretical saturation criteria. Bryman (2008) suggests that objective criteria (e.g., in terms of the sufficient number of interviews) for the point of saturation do not exist. Rather, ‘saturation’ is more effectively conceptualised in interview-based studies as the point at which the researcher achieves a “reliable sense of thematic exhaustion and variability” within his or her data set. This was the case with this study.

checked and verified transcripts (and interview notes) were then used as the data that was analysed.

In total, 24 semi-structured interviews were completed. A profile of the participants is provided in Table 3.2. The interviews were conducted between September 2012 and February 2013; they lasted between 33 minutes and 2 hours and 5 minutes, with an average time of just over one hour. This gave a total of slightly less than 24 hours of recorded data, which, when transcribed, led to a corpus of just over 204,000 words. Participants were predominantly male (male –  $n = 22$ ; female –  $n = 2$ ), which is consistent with the male domination of the project management field (Gale & Cartwright, 1995). All participants were at least 30 years old; and the largest age bracket was 35-40 ( $n = 7$ ). Given the management positions of the participants (low level through to senior executive), the extent of their experience in project management was not surprising, with over 70% ( $n = 17$ ) having 10 or more years' experience. Participants were drawn from a range of industry sectors in which mega projects are common: aeronautics, construction, defence, government, information technology, infrastructure development, and urban planning (cf. Baccharini, 1996; Hobday, 2000; Wilford, 2011). For ease of identification of participants' responses throughout the analysis chapters, each respondent has been allocated an identification code from 'Participant 1' through to 'Participant 24' (see Table 3.3). This allocation enables a more effective tracking of participants and their data extracts across the chapters.

Respondent ID	Interview Date	Gender	Age Range	Experience Years	Industry	Level in Organisation	Interview Length
A120927D	27/09/2012	F	<35	5-10	Industrial Design	Mid-Level Manager	43'18"
A130114H	14/01/2013	M	41-45	15-20	Defence	Director	34'24"
A130118M	18/01/2013	M	51-55	20+	Aerospace/Defence	Senior Executive	N/A
B121002M	2/10/2012	M	41-45	15-20	Industrial Design	Senior Manager	1h32'03"
B121219M	19/12/2012	M	41-45	15-20	Industrial Design	Senior Manager	1h31'57"
B130115R	15/01/2013	M	60+	20+	Aerospace/Defence	General Manager	1h23'23"
B130130R	30/01/2013	M	<35	5-10	Aerospace/Defence	Mid-Level Manager	44'50"
B130131G	31/01/2013	M	<35	<5	Maritime/Ports	Low-Level Manager	55'40"
D121002P	2/10/2012	M	35-40	<5	Emergency Services	Senior Manager	1h04'21"
D121127S	27/11/2012	M	56-60	20+	Aerospace/Defence	Mid-Level Manager	39'20"
G121122F	22/11/2012	M	51-55	10-15	Defence	Senior Manager	57'11"
G130206G	6/02/2013	M	35-40	10-15	Maritime/Ports	General Manager	47'53"
J121129H	29/11/2012	M	35-40	5-10	Defence	Mid-Level Manager	33'06"
J130212B	12/02/2013	M	60+	20+	Urban Planning	Consultant	2h05'04"
K121219P	19/12/2012	M	<35	5-10	Information Technology	Mid-Level Manager	54'43"
L121004D	4/10/2012	M	35-40	5-10	Construction	Mid-Level Manager	58'29"
L121129B	29/11/2012	M	56-60	20+	Defence	Director	46'35"
L121206D	6/12/2012	M	35-40	15-20	Defence	Program Manager	1h12'28"
L130207T	7/02/2013	M	35-40	15-20	Construction	Senior Manager	56'02"
L130214G	14/02/2013	M	35-40	15-20	Construction	Partner	1h08'25"
M121130F	30/11/2012	M	51-55	15-20	Defence	Senior Executive	1h03'21"
P121127A	27/11/2012	M	41-45	10-15	Aerospace/Defence	Senior Manager	41'47"
P121217S	17/12/2012	M	<35	10-15	Aerospace/Defence	Mid-Level Manager	1h15'32"
T121129G	29/11/2012	F	46-50	10-15	Defence	Senior Executive	48'19"

**Table 3.2: Interview participant profile**

Respondent ID Code	Thesis Identification Code
A120927D	Participant 1
A130114H	Participant 2
A130118M	Participant 3
B121002M	Participant 4
B121229M	Participant 5
B130115R	Participant 6
B130130R	Participant 7
B130131G	Participant 8
D121002P	Participant 9
D121127S	Participant 10
G121122F	Participant 11
G130206G	Participant 12
J121129H	Participant 13
J130212B	Participant 14
K121219P	Participant 15
L121004D	Participant 16
L121129B	Participant 17
L121206D	Participant 18
L130207T	Participant 19
L130214G	Participant 20
M121130F	Participant 21
P121127A	Participant 22
P121217S	Participant 23
T121129G	Participant 24

**Table 3.3 Respondent ID Codes and corresponding Thesis Identification Codes**

### **3.3.3 Data analysis**

The approach I adopted to the analysis of the data in this study was consistent with the process suggested by Creswell (2003) as important for ensuring the rigour of the research. It included preparing the data for analysis; reading through the prepared data to form a general impression of its content and meaning; coding the data into categories or labels to organise the data and to assist with theoretical development; generating descriptions of settings, subjects and/or themes for analysis; representing these descriptions and themes in a narrative form; and interpreting their meaning by addressing the key questions of “what were the lessons learned” from the research (Creswell, 2003, pp. 192-194). This process is detailed below.

The analysis of the data began with my reading of the interview transcripts to re-familiarise myself with their content with a view to forming a general impression of how the data addressed the research questions posed. Throughout this process, I made various hand-written theoretical and methodological notes on the hard-copies of the transcripts in an attempt to follow the development of my overall impression over time. I used the computer-assisted qualitative data analysis program NVivo 10, as well as Microsoft Excel, as tools to assist with the organising, coding, and presentation of the data (Miles & Huberman, 1994). As part of my preparation of the data for analysis, all electronic versions of the interview transcripts were uploaded into NVivo 10 to enable them to be coded within the program. Microsoft Excel proved useful for both the finer grained coding of the data in a manner which was easily comparable across the C-A-R stage framework.

The entire data set was coded into six aesthetic knowledge categories – visual, aural, olfactory, tactile, gustatory, and gut feel. These categories represent an amalgamation of Fine’s (1992) and Taylor’s (2003) sensory epistemological bases

of aesthetic knowledge.<sup>20</sup> Given the tacit nature of aesthetic knowledge, it is important to explore instances of the use of language pertaining to senses as indicators of the application of aesthetic knowledge (cf. Taylor, 2002; Warren, 2008). Fine's (1992) study of the use of aesthetic knowledge in the decision making processes of professional cooks relied upon research participants' use of language relating to these "sensory modalities" (Fine, 1992, p. 1274). Taylor's (2003) conceptualisation extends Fine's (1992) base five senses concept to include "embodied knowing" (p. 273). I argue that this 'sense', while necessarily linked (at least at its origins) to the standard five senses model, goes beyond it. 'Gut feel' is more closely linked to the Kantian perspective on aesthetic knowledge as a sensory-derived understanding of coherence or harmony (de Montoux, 2007). In the decision making literature context, 'gut feel' can be seen to be more closely aligned with the concept of 'intuition', a subject of a considerable research in the field (e.g. Agor, 1986; Betsch, 2008; Dane & Pratt, 2007; Dane, Rockmann, & Pratt, 2012; Klein, 2003; Leybourne & Sadler-Smith, 2006; Salas, et al., 2010; Shapiro & Spence, 1997; Simon, 1987; Sinclair & Ashkanasy, 2005). The combination of these two approaches as the basis of my analytical framework introduces the 'gut feel' concept into the study of the application of aesthetic knowledge to decision making processes in organisations (as in Fine, 1992) and the direct (five sense model) sensory impact on decision making processes into the decision making literature, thus providing a broader and more complete perspective on the impact of sensory-based knowledge on decision making processes within organisational contexts.

The data set was open coded into paragraph level extracts within the NVivo 10 program based on the participants' statements associated with these aesthetic

---

<sup>20</sup> See also Ewenstein and Whyte's (2007) discussion of the sensory epistemological bases of aesthetic knowledge.

knowledge categories. This occurred for both the obvious use of sensory terminology (e.g., “look” for visual aesthetic knowledge, “smell” for olfactory aesthetic knowledge, “listen” for aural aesthetic knowledge, etc.) and for instances where sensory aspects were less obviously discussed (e.g., the description of the project team physically visiting a work site to gain direct sensory experience of the work environment in which the project outcome was to be used). Both the literal and metaphorical use of this terminology was included in these codes<sup>21</sup>. This process yielded a total of 404 extracts which formed the data set. The number of interview sources and individual data extract references per sense category is provided in Table 3.4. Of these 404 extracts, a total of 232 were able to be identified as being related to a specific project stage. The number of extracts per sense code per project stage is provided in Table 3.5.

Categories	Sources (Interviews)	References (Data Extracts)
Visual	24	197
Aural	14	29
Olfactory	3	10
Tactile	12	23
Gustatory	2	2
Gut Feel	24	143
	<b>Total References</b>	<b>404</b>

**Table 3.4: Open coding sources and references per aesthetic knowledge type category**

<i>Sense</i>	<i>Stage</i>		
	Conceptualisation	Actualisation	Realisation
Visual	37	72	13
Aural	2	11	0
Olfactory	1	0	1
Tactile	3	9	2
Gustatory	0	0	1
Gut Feel	9	70	1
<b>Total Extracts</b>	<b>52</b>	<b>162</b>	<b>18</b>

**Table 3.5: Number of interview extracts per aesthetic knowledge type per project stage**

<sup>21</sup> Refer to Footnote 8 for a discussion about the metaphorical use of aesthetic/sensory language.

I then engaged in an inductive focused coding process (Emerson, Fretz, & Shaw, 1995) for each sense code to determine how each aesthetic knowledge type was used in decision making at different stages of mega projects. This process involved exploring the foci of the use of the aesthetic knowledge type, and the stakeholder considered by participants in their responses. Stakeholders identified were:

- (a) 'project team members': people working for the project organisation on the specific project to which participants were referring;
- (b) 'end users': people who would engage directly in the use of the project outcome once it was completed;
- (c) 'clients': organisations and their representatives who engaged the project organisation to complete the project on their behalf;
- (d) 'managers': members of project organisations who are not directly involved in the management or completion of specific projects discussed by participants, but who were responsible more broadly for the effective management of the project organisation;
- (e) 'external stakeholders': individuals and organisations who were not part of the project organisation, or clients or end users, but which have an interest in, and influence over, the project (e.g., government departments).

This stage of the coding was completed in Microsoft Excel to enable the simple comparison, (particularly in relation to different stages of the C-A-R model) and the easy tabulation (where appropriate), of the data. Relevant data excerpts were attached to each of the codes.



Project Stage	Aesthetic Knowledge Type	Focus of Use	Stakeholders Considered
Conceptualisation	Visual	Actual visual aesthetic of proposed outcome	Project team members, end users, clients
		Visual aspects of decision making	Project team members, end users, clients
		Image	Managers, end users, clients
	Olfactory	Metaphoric	Project team members, managers
	Tactile	Tactile user experience of outcomes	Project team members, end users
		Decision to proceed	Clients
		Metaphoric	Project team members
	Gut feel	Decision to proceed	Project team members
		Data assessment	End users, managers, clients
Actualisation	Visual	Actual visual aesthetic of proposed outcome	Project team members, end users
		Visual aspects of decision making	Project team members, external stakeholders
		Image	Project team members, managers, end users, clients, external stakeholders
		Metaphoric	Project team members
	Gut feel	Sensory properties of outcomes	Project team members
		Project processes	Project team members
		Presence	Project team members
		Data assessment	Project team members, external stakeholders
		Routine decision making	Project team members
		Assessment of fit	Project team members
	Aural	Aural aspects of proposed outcomes	Project team members, end users
		Aural aspects of decision making	Project team members, clients, managers
	Tactile	Tactile aspects of proposed outcomes	Project team members, end users
		Tactile aspects of decision making	Project team members
		Metaphoric	Project team members
Realisation	Visual	Actual visual aesthetic outcome	Project team members, end users
		Visual aspects of decision making	End users
		Image	Managers, end users
		Metaphoric	Project managers
	Tactile	Tactile aesthetic of outcomes	End users
	Gustatory	Metaphoric	Clients, end users, others

**Table 3.6: Details of the focused coding of the data by stage, aesthetic knowledge types, focus of aesthetic knowledge use, and stakeholders considered**

Chapters 4 to 6 examine each of these codes in detail by project stage, providing extracts from the data as examples of each aesthetic knowledge type, the focus of their use, and the stakeholders considered. It is important to note that only four respondents discussed the use of aesthetic knowledge across all three stages of the C-A-R model. The implications of this are discussed in Chapter 7. Further, it is also necessary to note that particular respondents (e.g., Participants 4, 5, 13, 14 and 17) were rich sources of data who provided well thought out and relevant responses to the interview questions. Such responses (and other such responses provided by the remaining participants) were relied upon as evidence for the claims made in the research.

The further detailed exploration of this data identified that aesthetic knowledge is used by decision makers in mega projects to establish and communicate for both themselves and others the meaning of objects, social relationships, and abstract concepts in complex mega project decision making contexts. This meaning is then relied upon as the justifiable basis for the selection of action options. This key finding is discussed in detail in Chapter 7.

### **3.4 Quality of the research**

Qualitative research is often criticised for not conforming to quantitative standards of 'good' research (Creswell, 2003). However, the reality is that these standards of judging the quality of research are not appropriate for qualitative approaches.

Lincoln and Guba (1995) argue that the focus of quality and rigour in qualitative research should be to establish the trustworthiness of the research, both in terms of research process and output. They propose four key standards against which qualitative research should be judged, namely credibility, dependability,

transferability, and confirmability. I have engaged in a number of activities to address these criteria.

#### **3.4.1 Credibility**

Credibility refers to ensuring that the research is credible for both the research subjects and output audience by making certain that the research topic is “appropriately identified and described” (Marshall & Rossman, 2006, p. 201). This is achieved primarily by providing an in-depth, “thick” description (Geertz, 1973) of the research topic based on the data drawn from an appropriate context. It may also be derived from data triangulation, peer debriefing, negative case analysis, and participant validation (Bryman, 2008; Flick, 2007; Marshall & Rossman, 2006). I have addressed the credibility quality criterion by engaging in a thick description of my research topics (i.e., aesthetic knowledge and decision making processes) in my analysis chapters, using data drawn from my research context to support my analysis. I have also employed data triangulation, particularly through the use of data drawn from multiple informants (Marshall & Rossman, 2006). Further, I have presented “negative or discrepant information” where applicable (Creswell, 2003, p. 196). Including an examination of evidence from the data which questions the validity of the findings and interpretations enhances the credibility of the account (Creswell, 2003, p. 196).

#### **3.4.2 Dependability**

Dependability refers to attempts by the researcher to “account for changing conditions in the phenomenon chosen for study and changes in the design created by an increasingly refined understanding of the setting” (Marshall & Rossman, 2006, p. 203). This is achieved by maintaining accurate and complete records of the research process, and through peer assessment of research procedures and theoretical insights

(Bryman, 2008; Lincoln & Guba, 1995). As part of my rigorous approach to the dependability of the research, I maintained detailed records of the data collection stage and the data analysis process to enable replication of the procedures if necessary (Lincoln & Guba, 1995). Further, my coding of the data was directed by the coding principles provided by Strauss and Corbin (1998); and my approach to data presentation was influenced by the methods presented by Miles and Huberman (1994). I also employed peer review as a means of peer assessment of the research. Peer review involved engaging an appropriately experienced colleague to review the research process (including the coding of the data) in an attempt to ensure the accuracy of the findings and that the “account will resonate with people other than the researcher” (Creswell, 2003, p. 196).

### **3.4.3 Transferability**

The goal of the transferability criterion is to demonstrate that the specific findings are applicable to similar situations. While King and Horrocks (2010) suggest that transferability is essentially an issue for those wishing to rely on the findings of the research, the task for the researcher is to provide sufficient detail about the research topic and context to enable this determination to be made (Marshall & Rossman, 2006). This is generally achieved by providing a ‘thick description’ of the research setting(s) and the theoretical context of the research to give readers “a database for making judgements about the possible transferability of findings to other milieux” (Bryman, 2008, p. 378). I have addressed this criterion by providing a detailed description of my research topics and research contexts; and by explicitly stating the theoretical boundaries of this research in this thesis document.

#### **3.4.4 Confirmability**

Finally, ensuring the confirmability of the research involves making the logic of the interpretations of the research sufficiently obvious to people apart from the researcher (Lincoln & Guba, 1995). The two key methods of achieving this goal are through employing peer review processes; and by providing sufficient detail of the data collection and analysis techniques in the research report to enable readers to determine the reasonableness of the interpretations made and conclusions reached by the researcher (King & Horrocks, 2010). I have employed a peer review process in this research. The nature of a doctoral thesis also ensures that sufficient details of the data collection and analysis procedures have been provided in this thesis document to enable readers to make a confirmability determination.

#### **3.5 Limitations of the research**

As with all research, this study has its limitations. In exploratory research such as this, it is impossible within the confines of the requirements of a doctoral program to cover all instances of the phenomena of interest. At the broadest level, my research is necessarily limited to the context I have chosen. However, it has been my aim to attempt to develop theoretical insights which will be able to be explored in further contexts. I see this as the beginning of a process, rather than the definitive explanation of the use of aesthetic knowledge in decision making processes in organisations.

Further, again owing to time and resource constraints, this research was conducted with project managers only. This resulted in a focus on the nature of decision making within the mega project context from the perspective of project managers. Future research in this area could incorporate more fully perspectives of

the other decision making groups discussed by participants (i.e., project team members, clients, end users, managers, external stakeholders). This would provide a broader analysis of the use of aesthetic knowledge in decision making processes within the mega project context.

In this thesis, I make claims about the reality of the research subject I have investigated. My analysis of the data is my interpretation and is necessarily fallible. However, I have put in place procedures to ensure that the narrative presented represents an accurate portrayal of research context and phenomena. In the thesis I have provided a detailed description of the methodology I used and the actions I engaged in to ensure the quality of the research in order to assist the reader of the text to determine the plausibility of the account presented.

### **3.6 Ethical considerations**

This research was conducted in accordance with the standards required by the Queensland University of Technology (QUT) in relation to the ethical treatment of research subjects. Ethical clearance for the study was granted under University Human Research Ethics Committee (UHREC) approval number 120000495. The primary ethical issues associated with this research were based around informed consent, the confidentiality of participants, and data security. Interviewees were fully informed about the nature of the research and their role as participants in it through the provision of an information sheet detailing the nature of the research; their role and rights as participants; their ability to withdraw from the research at any time; and contact information to obtain further details if required (See Appendix 2). Each participant was asked to sign a consent form acknowledging that they agreed to be part of the research project. No participant has been identified in any research

output associated with this study. Non-identifying codes have been used to refer to interviewees and their responses in all reporting. Further, data (whether recordings or typed transcripts) has been kept securely in password protected electronic systems or in locked filing cabinets (in the case of hard copies of transcripts). The only people other than me who have had access to the recording or transcript data were my supervisors and the QUT appointed transcriber (who signed a confidentiality agreement – see Appendix 3). Again, non-identifying codes were used to conceal the identity of the participants in these instances.

### **3.7 Background of the researcher**

It is common in qualitative research for researchers to provide short descriptions of their backgrounds, and the path that led them to the research they are reporting on, to further contextualise the research for the reader (Barbour, 2008). My interest in both aesthetic knowledge and decision making theory developed throughout my undergraduate and Honours programs at the University of Queensland. Knowledge management is one of my key areas of interest. In my Honours thesis, I examined the role of civility in knowledge processes in a creative industries organisation. Aesthetic knowledge emerged as one of the key knowledge types reported on in my thesis. As both a student and tutor in Organisational Behaviour, I was exposed to an extensive body of research on both the theory and practice of decision making in organisational contexts. Decision making was also examined in my Honours research. When I was offered the opportunity to participate in QUT's Defence Materiel Organisation (DMO) Australian Research Council linkage project (LP 0989705), I eagerly accepted the chance to explore some of the areas for further research which emerged from my Honours study in the exciting and important context of mega projects.

### **3.8 Conclusion**

A qualitative methodology from a critical realist perspective was chosen to explore the use of aesthetic knowledge in decision making processes in mega projects. The qualitative analysis of the data gathered through semi-structured interviews conducted with project managers was based on a primary analytical framework developed from the conceptualisation of aesthetic knowledge provided by Fine (1992) and Taylor (2003). In Chapters 4 to 7, the results from this analysis are presented. These chapters are centred on the C-A-R conceptual framework model presented in Chapter 2; and on an exploration of the central themes which emerged from the analysis. Chapter 8 discusses explicitly how these results address the study's research questions. It also explores the implications of the results for both theory and practice; the limitations of the research; and avenues for future research.



## ***Chapter 4 Aesthetic Knowledge and Decision Making at the Conceptualisation Stage of Projects***

This chapter considers the evidence in the data of the ways in which aesthetic knowledge is used in decision making processes at the Conceptualisation stage of mega projects. Decision making processes at this stage of a project focus primarily on conceptualising the purpose of the project; identifying project objectives; and designing project outcomes (Aaltonen & Kujala, 2010; Morris, 1982). The Conceptualisation stage of projects ‘sets the scene’ for the Actualisation stage, during which project tasks are executed, resulting ultimately in the Realisation stage, in which project outcomes are realised and evaluated. The Conceptualisation stage was the second most extensively-discussed stage of the project process by participants, with 52 interview extracts coded to this stage.

	<b><i>Stage</i></b>
<b><i>Sense</i></b>	Conceptualisation
Visual	37
Aural	2
Olfactory	1
Tactile	3
Gustatory	0
Gut Feel	9
<b>Total Extracts</b>	<b>52</b>

**Table 4.1: Number of interview extracts relating to types of aesthetic knowledge used at the Conceptualisation stage of projects**

The analysis of the data presented in this chapter explores project managers’ insights into the ways in which various types of aesthetic knowledge are used in decision making processes at the Conceptualisation stage of mega projects. As visual aesthetic knowledge was the most widely discussed aesthetic knowledge type by participants (n = 37), this chapter will focus primarily on the use of visual aesthetic knowledge in various types of decision making processes at this stage of

mega projects. This dominance of the visual aspect of aesthetic knowledge is consistent with the research exploring human senses (see, e.g., Colavita, 1974). It will also explore key insights from the data about the use of other forms of aesthetic knowledge in decision making processes at this stage – particularly tactile aesthetic knowledge and gut feel – as well as the metaphoric use of both olfactory and tactile aesthetic knowledge concepts. The purpose of this discussion is to address the study’s primary research question – that is, what are the ways in which aesthetic knowledge is used in decision making processes in mega projects?

<b>Project Stage</b>	<b>Aesthetic Knowledge Type</b>	<b>Focus of Use</b>	<b>Stakeholders Considered</b>
Conceptualisation	Visual	Actual visual aesthetic of proposed outcome	Project team members, end users, clients
		Visual aspects of decision making	Project team members, end users, clients
		Image	Managers, end users, clients
	Olfactory	Metaphoric	Project team members, managers
	Tactile	Tactile user experience of outcomes	Project team members, end users
		Decision to proceed	Clients
		Metaphoric	Project team members
	Gut feel	Decision to proceed	Project team members
		Data assessment	End users, managers, clients

**Table 4.2: Aesthetic knowledge types applied, foci of use, and stakeholders considered in decision making processes at the Conceptualisation stage of projects**

#### **4.1 Visual aesthetic knowledge**

The use of visual sensory language by participants in their discussion of decision making processes at the Conceptualisation stage is indicative of the application of visual aesthetic knowledge to these processes (cf. Fine, 1992). In total, 37 of the 52 interview extracts coded to the Conceptualisation stage were coded to the visual category. The data extracts demonstrate that visual aesthetic knowledge in three key ways in decision making processes at the Conceptualisation stage:

- (a) as an aid to decisions required about the actual visual aesthetic of proposed project outcomes (section 4.1.1);
- (b) as part of the actual process of making decisions (section 4.1.2); and
- (c) as the basis of decisions made about 'image' - that is, the personal, professional, and/or organisational reputational implications of undertaking the proposed project (section 4.1.3).

The analysis of the data indicates that the use of aesthetic knowledge in these instances is influenced by both relational considerations (i.e., which project stakeholders project managers are engaged with directly or are targeting as part of the decision making process) and/or the type of decision making process (e.g., intuitive, political, satisficing, etc.) undertaken. It is important to note that although the extant theory (e.g., Agor, 1986; de Montoux, 2007; Kahneman & Klein, 2009; Klein, 2003) suggests that the use of aesthetic knowledge is particularly applicable for intuitive decision making processes, this research demonstrates that it is also used in decision making processes which are more congruent with other decision making models (e.g., political decision making).

#### **4.1.1 Visual aesthetic of proposed project outcomes**

It is perhaps unsurprising that aesthetic knowledge is used in decision making processes about the actual visual aesthetic aspects of proposed project outcomes during the design phase of the Conceptualisation stage of projects. Depending on the nature of the project, participants identified that the visual aesthetic appeal of the proposed outcome is an important determinant of stakeholders' perceptions of the success of the outcome. Therefore, there is a requirement that the visual aesthetic of the outcome is congruent with stakeholders' expectations of that aesthetic. This is

particularly essential in instances where stakeholder acceptance of the outcome is a key measure of success (cf. Fine, 1992). Participants considered three groups of stakeholders in their discussion of decision making about the visual aesthetic aspects of project outcomes during the Conceptualisation stage: project team members, end users, and clients.

Stakeholder(s) Considered	Purpose of Aesthetic Knowledge Use
Project team members	Achieve broader social goals
	Link to broader physical environment and social history
	Achieve congruency with functional goals
End Users	Matching expectations
	Encourage use of outcomes
Clients	Predication of future aesthetic appeal of outcomes
	Assessment of functionality of outcomes

**Table 4.3: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to the visual aspect of proposed outcomes at the Conceptualisation stage of projects**

In the context of this discussion, it is important to clearly identify the difference between the ‘visual aesthetic of outcomes’ and ‘visual aesthetic knowledge’. The ‘visual aesthetic of outcomes’ refers to the actual visual aesthetic aspects of proposed outcomes (i.e., colour, shape, proportion, etc.); therefore, it refers to the visual properties of the *outcome itself*. Conversely, ‘visual aesthetic knowledge’ refers to a property of a *stakeholder*, in that it is a knowledge applied by a stakeholder in some manner to the visual aesthetic properties of the outcome.

**(a) Project team members**

Participants suggested that in their experience, visual aesthetic knowledge is used by project team members in the decisions they make about the visual aspects of projects outcomes to ensure that these project outcomes realise particular goals that go beyond the traditional interpretation of the ‘iron triangle’ success criteria of on time, budget and quality (Gardiner & Stewart, 2000; Shenhar & Levy, 1997; Turner, et al., 2009). For example, the visual aesthetic may be used as a means to achieve broader social goals:

At the same time, the involvement of the university would mean that this would have a particular character of a new neighbourhood, which we could, in the public housing authority, take advantage of in delivering attractive private housing as a basis also for partnering with low income housing.

**PARTICIPANT 14**

The key element of this example is the attempt to ensure that the visual aesthetic of the private housing component of a major urban redevelopment – which contained a mix of public and private housing as well as commercial and educational spaces – appealed to the private residential buyers. The consideration of the visual aesthetic and application of appropriate aesthetic knowledge by project team members to the design decisions they made at the Conceptualisation stage of the project was essential for achieving this broader integrative social policy goal.

Further, project team members may utilise the visual aesthetic of a project to increase acceptance of the project among broader stakeholders:

You know, one project I was doing down in Victoria had a half a, oh I don't actually know how much, a very expensive green roof, it was an industrial project but it had a very expensive living roof on it. **PARTICIPANT 16**

Although this example comes from an industrial space, the project's visual aesthetic was important primarily because of the image a 'green' roof projects to stakeholders. The cost of the roof was seen as justifiable in an attempt to make the industrial site more appealing to stakeholders by visually displaying its 'green' aspect. This decision to attempt to enhance the acceptance of the project through the addition of 'green' space required the application of aesthetic knowledge by project team members at the project's Conceptualisation stage to achieve the desired goal of increasing the acceptance of the project among stakeholders. This is, in essence, an example of the use of aesthetic knowledge to support political decision making processes (Pettigrew, 1973), given that the construction of the 'green' was aimed at

controlling the communication of information about the project outcome among stakeholders, rather than being an integral part of the design of the project outcome.

In some instances, the visual aesthetic of the proposed outcome may be used by project team members to increase project acceptance by providing stakeholders with a visual cue which links the project with the broader physical environment and social history of a project setting:

I'm all in favour of colour... I think colour is important. We live in a – we don't live in a southern Australian environment, full of steely grey, silvery, olives in the landscape; we are in a much more sub-tropical [area] where the darker colours are much more around us and the nature of the tropics is colour; bright colourful things; I think it is one of the ways we need to connect and I think increasingly neuroscience is proving that we have an evolutionary need to connect to nature and to tribe and to history and to things like that ... **PARTICIPANT 14**

Where this connection to place and history is important for stakeholders, it is necessary for project team members to apply to the design decisions they make at the Conceptualisation stage of the project their aesthetic knowledge relating to issues such as colour and its potential meaning for stakeholders (cf. Fine, 1992). Failing to adequately consider this relationship between aesthetics and place/history may reduce stakeholders' acceptance of project outcomes.

It is important for the ultimate success of a project outcome that project team members engage directly with clients to determine the appropriateness of the visual aesthetic of the proposed outcome in terms of its congruency with the functional goal of the outcome:

For us that decision was a turning point as an organisation; and its yielded very, very different, the conversations we were having three years ago with clients to the conversations we are having today are very, very different. It's not do you like blue or green, it's now should this thing even have colour? **PARTICIPANT 4**

Engaging with clients at the Conceptualisation stage enables project team members to both ascertain and challenge clients' perceptions of the aesthetic requirements of the project outcome; and to apply their aesthetic knowledge to decisions they make about those aesthetic elements to ensure that they support the client's desired functional results. This represents the function of aesthetic knowledge as the foundation of aesthetic judgements (Strati, 2003).

Further, depending on the nature of the project, one of the key aspects of the project manager role is to ensure the appropriate application of aesthetic knowledge by project team members to the design of project outcomes. This generally involves ensuring that the aesthetic aspects of the outcome support its functional aspects rather than dominating them:

Of course; I mean we are human beings, we're not computers; yes, of course; and you get trapped – and as young students you get trapped by the creativity stuff and you have a nice idea as a young architectural student or a young designer – you get a nice idea that is really sexy little idea for part of the building and the big trap is that you become so trapped by that, that everything else is jemmied into making that work; and so you engage in tricks of throwing it away or turning the tracing paper upside down or back to front or whatever, just to break your fixation with a particular outcome; and you learn over time to do that.

**PARTICIPANT 14**

In this extract, the participant is referring to the design of major urban redevelopment projects. The role of project managers is to ensure that the design of the outcome developed by project team members supports, rather than supplants, the functional aspects of the outcome. While the data suggests that aesthetic appeal is often important for project success, the participant argues that in most instances it should not be the primary consideration. He expanded on this point further:

This is about structuring the total canvas of the urban environment and, therefore, how people respond when they see it becomes important. I would not, for any – at any time – say that the aesthetics, the way that it looks and the extent to which it

gives pleasure, which is a highly cultural and psychological notion, the way that it gives pleasure, they are important attributes, but I would strongly depart from what I think is the tendency of the current architectural profession, my architectural profession, which I think has got absolutely hung up with the aesthetic side of it.... I find that absolutely at odds with my view, which as I come out of a modernist era in which form follows function, that I'd take delight in a post-modernist or subsequent sense in fun, enjoyment, cultural reference, all the rest of it.

**PARTICIPANT 14**

Therefore, while the application of aesthetic knowledge is important at the Conceptualisation stage of projects to ensure that the project outcome appeals – especially in a visual sense – to end users, project managers must ensure that it does not dominate the approach to decision making. This is especially the case in instances where functional outcomes are important for the stakeholders who will be determining project success.

*(b) End Users*

Participants suggested that ensuring that the visual aesthetic aspects of proposed project outcomes matched ultimate end user expectations of those aesthetic aspects is often important for ensuring that the final outcomes of projects are judged by end users as successful:

So coming back to the aesthetic, yes, it's fundamentally important but to me it's only one of a number of dimensions, but you would be unwise – you would always be unwise to design stuff without acknowledging that what we didn't want to end up with something that looked bloody ugly and people would recoil from it. **PARTICIPANT 14**

Here, the participant acknowledges that in the context of major urban redevelopment projects, the aesthetic aspects of the design of the project outcome play a “fundamentally important” role in the ultimate acceptance of the outcome; and that these aesthetic elements need to be considered at the Conceptualisation stage. Consequently, it is necessary for project managers to apply their aesthetic knowledge to the design of project outcomes at the Conceptualisation stage of



projects so that effective decisions about these aesthetic aspects can be made. In terms of decision making processes, the implication of this data extract is that the application of aesthetic knowledge may actually form part of rational decision making processes (Dane & Pratt, 2007; Harrison, 1999; Simon, 1993) in instances where the need for the positive visual appeal of outcomes is necessary for project success.

The requirement to apply aesthetic knowledge to ensure the visual appeal of outcomes again represents the function of aesthetic knowledge as the foundation of aesthetic judgements (Strati, 2003). This need is perhaps unsurprising in the context of architecture, which is a heavily aesthetically-focused field (Ewenstein & Whyte, 2007). However, the importance of the visual aesthetic for the acceptance of project outcomes was noted by participants in other fields:

Some things we just pack in a brown box and go OEM and they assemble it onsite so there's really very little aesthetics on that at all, although I suppose the end product itself we do keep the design in mind... we don't want it to look like a spaceship, we want it to look like a compact, neat product so there would be some aesthetic in that as well. So yeah, I think it plays a role.

**PARTICIPANT 1**

This participant suggests that even for projects which are not undertaken in aesthetically-focused fields, and which are targeted at limited numbers of specific end users, the visual aesthetic aspects of the outcome play a role in determining the success of the outcome. In this instance, the visual aesthetic is important for end user selection of the outcome; and, therefore, it is important that aesthetic knowledge is applied by project team members at the Conceptualisation stage to ensure that the design of packaging of the outcome appeals to potential users. From a decision making perspective, this function of the visual aesthetic is consistent with more tacit, intuitive approaches to decision making, as the choice sought based on the visual

appeal of the outcome is not a rational approach, but rather is derived from a felt meaning associated with the visual sensation the look of the outcome engenders (Agor, 1986; Burke & Miller, 1999; Dane & Pratt, 2007; Rooney & Schneider, 2005).

*(c) Clients*

Participants also considered the role of visual aesthetic appeal of project outcomes in the context of their experience of client decision making processes. For example, in mega projects, project completion timeframes are often extensive (Flyvbjerg, 2014; Kardes, et al., 2013). This can present problems for project clients when attempting to ensure the visual appeal of a project outcome for future users and other stakeholders:

I think the nerves were more about the fact that a lot can happen in six years. Is this going to be as attractive as it looks now in six years' time? **PARTICIPANT 5**

In this example, decisions had to be made about the aesthetic appeal of an eventual project outcome several years in advance of its ultimate delivery, owing to the nature of the project timeframe. This resulted in intuitive, predictive decision making on behalf of the client as to the future attractiveness of the project outcome, which caused some nervousness on their part about the accuracy of their prediction. Decisions of this sort require the application of aesthetic knowledge that not only taps into end users' current perceptions of what is visually appealing, but which also anticipates future perceptions of users' aesthetic desires. This calls for a creative approach to the application of aesthetic knowledge which is both grounded in an understanding of the aesthetic history of users, but which also anticipates (or drives) future aesthetic trends. This cannot be achieved in isolation; rather, it requires a relational understanding of the organisation, its clients, markets, and industry which

is enabled through the relational aspect of aesthetic knowledge (cf. de Montoux, 2007; Fine, 1992; Strati, 2003, 2007).

While the form (i.e., the aesthetic aspect) of project outcomes is important, participants suggested that is necessary for clients not to let concern with form dominate their approach to decision making at the expense of functional considerations. Interestingly, participants identified that an inappropriate focus on form has occurred in a setting in which concern with form is, *prima facie*, surprising – that is, military hardware acquisition:

Okay, so yeah, it was replacing a major platform relevant probably to your thesis; one of the issues that often occurs is that there's an awful lot of preconceptions about almost every major platform in existence, this was in the land environment so I can safely say if you look at the aircraft space, there are a gazillion random punters with strong opinions on the Super Hornet vs. the Joint Strike fighter vs. the F22 and even within the Air Force there is a shitload of strong opinions and most of them uninformed and most of them based on fairly superficial judgements. **PARTICIPANT 13**

These “superficial judgements” are, by definition, not based on extensive analysis of the actual benefits of the capabilities of (in this instance) an aircraft, but rather on assessments made at the superficial level – primarily of the visual aesthetic and the psychological meaning associated with the aesthetic. These assessments are generally made by viewing the capability in action:

Now that gives each party a very different viewpoint and level of analysis in decision making. [Stakeholder name] don't have a lot of time to devote to analysing systems in detail but they have strong preconceptions. Aside from anything else, they see equipment on operations and either like it or don't. **PARTICIPANT 13**

These preconceptions based on visual assessment of capability are not necessarily valid. The validity of the knowledge of an outcome based on the sensory experience

of that outcome is affected by a number of factors, including the context in which the sensory experience occurs:

Firstly, it's just looking at how it works; secondly and there is a big complication here, they see it in one context, so a system could be great in Afghanistan but might be crap in I don't know Antarctica or wherever. That's not a really likely war zone. And so there is an inherent problem and gap between 'is best in this context' and is 'best for all possible contexts'. **PARTICIPANT 13**

Regardless of this perhaps obvious complication associated with the isolated sensory experience of an outcome in a single context, the participant suggests that resultant 'knowledge' of the outcome is relied upon as a basis for the selection of action options. This is particularly the case when clients are engaged in decision making processes at the Conceptualisation stage of projects. Therefore, sensory-derived knowledge does have an impact on clients' decision making processes, albeit one that is not necessarily positive.

#### **4.1.2 Visual aspects of decision making**

Existing theory argues that there is a visual aspect to decision making processes (e.g., Kovalerchuk, 2004). The participants in this research support this perspective, suggesting that in their experience project team members, end users, and clients all use aesthetic knowledge in various ways to assist in this visual aspect of decision making at the Conceptualisation stage of projects. Aesthetic knowledge is applied particularly to assist in the interpretation of observations, such as the observation of the operating environment of proposed outcomes, or the observation of body language and facial expressions when engaging directly in interpersonal interactions with stakeholders. The participants also suggest that these interpretations feed directly into project decision making processes at the Conceptualisation stage of mega projects.

Stakeholder(s) Considered	Purpose of Aesthetic Knowledge Application
Project team members	Interpretation of physical observations to inform briefs
	Basis of decisions to proceed
	Inform design of project outcomes
	Interpretation of sensory cues provided in direct interpersonal interactions with clients
End Users	Encourage pre-purchase of project outcomes
Clients	Basis of decision to proceed

**Table 4.4: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to the visual aspect of decision making at the Conceptualisation stage of projects**

It is important to clearly highlight the difference between the ‘visual aspects of decision making’ and ‘visual aesthetic knowledge’. The ‘visual aspects of decision making’ refers to a property of decision making processes, while ‘visual aesthetic knowledge’ refers to a property of a decision maker.

*(a) Project team members*

Participants considered the use of visual observation by project team members in several ways in terms of the decision making processes in which they engage at the Conceptualisation stage of projects. For example, visual observation is used by project team members when they are developing project briefs:

...here are the insights that have been collected or here are the observations we’ve made, this is our recommendation for the ingredients going into the brief. **PARTICIPANT 4**

Physically observing relevant phenomena enables project team members to achieve insights which can then be applied to the decisions they make about the contents of client briefing documents. This may be done in a systematic way; and can form part of a rational approach to decision making at this stage (Dane & Pratt, 2007; Harrison, 1999; Simon, 1993)<sup>22</sup>. Therefore, it represents a potential use of sensory-based knowledge in rational decision making processes.

Depending on the nature of a project, visual observation may also be used by project team members as part of the decision making process to actually undertake a

---

<sup>22</sup> Such observation may form part of the problem identification and/or decision criteria stages of the rational decision making process.

project. For example, physically attending and viewing a potential development site can be a key aspect of project team members' decisions to proceed with a development:

So we saw this as a big opportunity to jump in; so within 2 weeks of very first seeing the site, we had committed to buying it. We had started our marketing campaign and we had sold the first 116 blocks of land; all within the first 2 weeks of seeing it. Obviously the very first thing that we did – normally a project you look at and it will take you a good month to say do I want to do it or not; whereas this one the first time we were there it was let's get going, let's get going quickly and the quicker we were in the quicker we were out type of thing. **PARTICIPANT 20**

This is an important extract in the context of this research. A significant strategic investment decision was made based on the felt meaning induced by direct physical experience of viewing a development site (cf. Dean, et al., 1997; Ramirez, 2005; Warren, 2008). The participant goes on to identify a “love at first sight” feeling among the project team on their first visit to the site. Although previous development experience necessarily played a role in the choice to proceed with the project, the actual investment decision was still based primarily on the interpretation of the sensory cues provided through the visit to the site.

Physical observation of the operating conditions under which project outcomes will be used is also important for project team members' decision making processes at the Conceptualisation stage of projects. This observation enables the aesthetic knowledge gained thereby to be applied to design decisions:

In our particular world it's all about users, it's very user driven type of industry so we might deliberately decide to put off a decision to go off and collect some insights, go and try and put yourself in the user's shoes, like for argument's sake, one of our mining clients, again without breaking any confidentiality, we send a few of our guys down underground, a kilometre underground because we were asked to design a device that was going to be used down there. **PARTICIPANT 4**

This extract highlights the importance of project team members' gaining direct sensory insight into end users' experience of the circumstances in which project outcomes will be used when in the project design phase of the Conceptualisation stage so that these insights can be effectively incorporated into the design of the outcome. This is necessary for the ultimate assessment of the functional success of the outcome by its users.

Participants identified the importance for project team members of maintaining situational awareness or 'presence' (cf. Klein, et al., 2010; Senge, 2004) when interacting directly with clients during the Conceptualisation stage of projects. Attending to visual sensory cues is one important way in which this sense of presence can be maintained:

Those are quite often unfiltered to a large degree, and we just literally start talking, we're not just picking up on a tick in the box, we're picking up on body language and whatever we can get, to get a positive response out of a particular concept from either the client or in a lot of cases, their client. **PARTICIPANT 4**

In this context, attending to sensory cues provided by clients in meetings (such as visual cues provided through body language), and subsequently applying aesthetic knowledge to interpret those cues, enables project team members to make decisions about which design concepts clients prefer. This understanding provides project team members with the opportunity to tailor subsequent design offerings to focus on the clients' needs, potentially saving significant time and cost.

*(b) End users*

Participants suggested that, depending on the nature of the project, visual aids may be used at the Conceptualisation stage of projects to encourage early buying activity among potential end users. These aids provide a visual representation of project outcomes which is designed to encourage pre-purchase of the outcome:

That was a huge 2 weeks; great result where we booked out a restaurant, threw up a quick PowerPoint of what it might look like and said unlike the [Previous Developer], we are actually going to get in and build it and we need everyone in the room to buy and that will underwrite the success of the project and it's going to go. So it was quite a fever created out of that.

**PARTICIPANT 20**

In this extract, the developers of a major residential project used PowerPoint as a visual aid to demonstrate to potential investors what the proposed development “might look like”. This was such a powerful tool that many investors committed to the project immediately, despite the fact that the content of the PowerPoint presentation represented only a very preliminary conceptual interpretation of the development (cf. Ewenstein & Whyte, 2007). Thus, important financial decisions were made based primarily on the intuitive interpretation of artists' impressions of the potential ‘look’ of the project outcome rather than on objective financial analysis.

*(c) Clients*

Participants identified a direct visual sensory element of decision making in relation to clients at the Conceptualisation stage of projects. The ability to see or directly experience an outcome is important for some decision makers. This is obviously difficult in instances (such as in mega projects) where something comparable to the desired outcome simply may not exist, or where the outcome is completely novel (Crawford, 2005; Flyvbjerg, 2014; Kallinikos, 1998; Snowden & Boone, 2007; Turner & Cochrane, 1993; Wilford, 2011; Williams, 1999). It is the role of the project manager to manage this inability to provide a tangible example of a proposed outcome through the skilful ‘selling’ of the concept of the outcome to clients:

That's a horrible mix because you're trying to sell someone on something that you can't show them an example of, they need to experience it, and the decision making processes from a customer point of view that I see going on there are wide and varied, but I'm still trying to get my head around... Because it's effectively



my role to sell this stuff to our existing and new clients... It's really interesting. Some people get it and see it really early; some people don't get it at all... So it's really the interesting sort of decision making process behind that. **PARTICIPANT 5**

This participant suggested that one way to counteract the problems associated with this lack of a physical object is to develop a highly realistic representation of the outcome in another medium (e.g., high resolution, photo-like computer-aided-drawing output).

We use quite advanced CAD software that comes out with pretty photo realistic renderings... People like seeing this, and I like showing it... So that first milestone is usually putting a series of concepts or a couple of concepts, whatever's agreed, in front of a client... when you put something in front of them that for all intents and purposes looks like a photograph of what their product could look like, very early in their organisational set up... especially in that sort of incubator type space, the excitement levels go through the roof. Unbelievably so. I often I guess try and prepare clients for that. I say "look you really need to try and separate a little bit from the emotive reaction you are going to have with this, and really try and come to conclusions". Because at that stage, we haven't designed... It's not fully CADed up, it's just the absolute minimum we had to do to get a decent looking image together. We can't put it out to get quotes on what it might take to get made or tooling lead times or anything of that, it's really basic level CAD, it looks good. So at that stage they haven't got information like how much is it going to cost, how long is it going to take, and all those sorts of things. They might have ball parks, but that would be it. I see commitments being made on the strength of that. And I would call that, as an outsider looking in to our clients, I would call that an emotive based decision rather than a fiscal or data driven decision. **PARTICIPANT 5**

The effect of these visual representations is considerable. They result in heightened emotional connections with project outcomes, which in turn increase the likelihood that decisions to proceed beyond the Conceptualisation stage will be made by clients<sup>23</sup>. The participant clearly identifies that in his experience commitments to proceed with projects are made on the basis of an emotional response to the visual

---

<sup>23</sup> Cf. Taylor's (2002) discussion of the relationship between the aesthetic aspects of phenomena and emotional responses to phenomena.

aesthetics of a CAD drawing of a potentiality, rather than on the basis of financial or other ‘objective’ analyses. Therefore, it is important for project managers to understand the power of the visual aesthetic for decision making and facilitate its appropriate use.

#### 4.1.3 Image

‘Image’ is a visual aesthetic concept relating both to perceptions of individuals and concepts related to individuals (e.g., organisations to which one belongs, professions of which one is a member, etc.), and to perceptions of groups and other entities (e.g., organisations) (Schulz, 2008; Witz, et al., 2003). Participants noted the importance of image for decision making at the Conceptualisation stage of projects, especially the effect that the desire to maintain a positive image for themselves and their organisations has on the decision making processes of managers, end users, and clients.

Stakeholder(s) Considered	Purpose of Aesthetic Knowledge Application
Managers	Interpretation of the meaning of participating in a project for an organisation
	Interpretation of the effect of a project’s visual aesthetic on the brand of an organisation
End users	Determination of effect of use of outcome on personal image
Clients	Interpretation of positive/negative perception of proposed project
	Determinations of consistency of project with existing brand
	Determination of how visual aesthetic design of project outcomes relates to existing brand

**Table 4.5: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to ‘image’ at the Conceptualisation stage of projects**

##### *(a) Managers*

‘Image’ has several potential meanings relating to the visual aesthetic aspects of projects. Participants suggested that perceptions of image play a role in managers’ decision making processes at the Conceptualisation stage of projects. For example, the decision even to go through the process of tendering for a project may be

affected by managers' perceptions of what that project might mean for the image of an organisation:

So for us it's been very much about taking the business into a new space in terms of size and capacity. In other states, particularly Queensland, which is where our business is from, we are very much a top-tier contractor on CBD work and we're a must-have on the tender list. In NSW we've been around a far shorter period of time than that so very much this job was about getting us into a new space in the market; proving to a group of clients there that we belonged in that space but a space that was six times bigger than what we'd built before so it was very much about redefining our business and getting us into a new space in the market. **PARTICIPANT 19**

The strategic decision made by managers to pursue this particular project represented a significant risk for the organisation, as the project was six times larger than any it had completed previously. However, it was decided that the risk was worth it given the longer term benefits for the positive perception of the organisation (i.e., its image – Schulz, 2008) in its new market arising from the successful completion of the project. Strategic decisions are often based more on intuitively-felt beliefs about the benefits of the decisions for the organisation (as is evident in this example) rather than extensive objective analysis (Buchanan & O'Connell, 2006; Dane & Pratt, 2007; Shapiro & Spence, 1997).

Branding is an important way in which organisations attempt to manage their organisational image (Park, Jaworski, & MacInnis, 1986). In some organisations, managers actively cultivate a 'coolness' factor to their branding efforts to attract particular types of clients. This factor is linked closely to the visual aesthetic – both in terms of the organisation's branding activities and the project outcomes produced by the organisation:

So from our perspective, that element of coolness in some cases is the reason we get a project. It's also I would say 95% of the time expected of us. Regardless of whether it's said in a brief or... It's just expected of us. That we would come up with

something that is more attractive, cooler, more interesting than what they've got.... So yeah, it is very much an element, in our business in particular... on an organisational level of being involved in I guess the cool end of a business... yeah. I think in a lot of ways, a lot of people we work with... and it's part of our persona, and the image we give out as well... We don't wear suits and ties. We have a very open, collaborative environment.

**PARTICIPANT 5**

The decisions made by managers to pursue this strategic direction are both influenced by, and have implications for, the visual aesthetic in particular. 'Coolness' is closely linked to visual aesthetics (Pountain & Robins, 2000; Southgate, 2003), and is represented in this instance both by the attractiveness of the ultimate project outcomes delivered by the organisation, and its approach to conducting business, down to the physical appearance of staff ("we don't wear suits and ties") and the visual aesthetic of the office space ("we have a very open, collaborative environment"). This is a deliberate attempt on the part of managers to influence the decision making processes of clients through the pursuit of a particular type of corporate (especially visual) aesthetic.

**(b) End users**

Participants discussed how the perceived effect on the personal image of an end user of a project outcome affects decision making at the Conceptualisation stage, especially in instances where positive image judgements are valued by the user:

There is also and this sounds pretty lame, a huge wow, those guys are awesome, we want what they have thing, so in the personal equipment space for instance for soldiers, a lot of the time they don't want what is best, they want what the SAS have, or what the US Green Berets have some other sexy, glamorous organisation because they must be inherently be better. And strangely enough...well not strangely at all, that's obviously a factor in the kinds of things they specify and suggest. But that's not necessarily a bad thing, because they have quite good equipment at their end, we have government rules on whether we can just say we're going to buy this system, we have to compete openly and fairly most of the time, but I think that's definitely a huge factor in what the Army and the users want.

**PARTICIPANT 13**

The participant identifies end users' desires to be associated with positive referent groups (i.e., "the SAS" and "the US Green Berets") as heavily influencing their decisions about personal equipment in the military context (cf. Hogg & Abrams, 1988, re the influence of referent groups on decision making processes). End users want the "awesome" and "sexy" equipment, not necessarily the "best" for them or the context in which they may be operating. Although what is desired and what is most appropriate may coincide (because the referent group often have "quite good equipment"), this is not necessarily the case. Here, the aesthetic perception of the equipment and its effect on the image or 'look' of the user overrides other functional factors, even personal safety; and influences the input decisions made by end users at the Conceptualisation stage.

*(c) Clients*

Participants identified in this study that the visual aesthetic appeal of potential project outcomes has a direct impact on client decision making processes at the Conceptualisation stage of projects. In particular, their wish to be associated with outcomes which are highly positively perceived influences clients' approaches to the development of projects:

[The Client] has a very similar cultural slant and also has a built in desire to simply want to have the best and shiniest stuff; but contrary to that, they don't have what the [Project Organisation] has, which is the responsibility for actually delivering it. So they are a lot less gun-shy than the [Project Organisation] is when it comes to risky developmental approaches. The [Project Organisation] by contrast has to deliver it so it has less of a vested interest in maximising performance and much more of a vested interest in having a reliable, solid outcome. **PARTICIPANT 13**

Here, the client is seeking what they perceive to be the "best and shiniest" project outcome. However, unlike the project organisation, they do not have the responsibility for delivering the project outcome. Therefore, clients are often more interested in pursuing the most appealing outcome, regardless of what it takes to

actually deliver it; and they are willing to make decisions about project development approaches at the Conceptualisation stage of projects that represent a much higher risk profile than those favoured by the project organisation. The participant observed in his interview that this desire to have the “best and shiniest” outcome is linked to perceptions of the potential outcome gained through direct experience of that outcome in use by similar organisations – a ‘keeping up with the Jones’s’ approach. Both the knowledge of the actual aesthetic appeal of the outcome and its symbolic meaning impact on decision making processes in this instance, encouraging greater risk taking and the potential to pursue suboptimal courses of action.

Branding forms an important part of what Witz et al. (2003, p. 414) refer to as the “aesthetics of organisation”, which is related to “expressive forms which signify the identity of the organisation” and which are designed to have a positive effect on perceptions of the image of the organisation<sup>24</sup>. For many clients it is important that project outcomes are consistent with their brand image. To achieve this aim, project team members need to apply their aesthetic knowledge to match the interpreted corporate image of clients in order to assist them to achieve their business objectives, rather than imposing the project team organisation’s own ‘style’ on clients:

No, we’ve tried to avoid that to be honest [i.e., imposing a ‘style’ on clients], some consultancies do have it, there are a couple of consultancies in Sydney and Melbourne that have and sometimes to be honest they lose a client based on that style. We try to adopt, and we refer to it as, a company’s or an organisation’s 3D language or 3D form. We try and adopt a corporate identity of the client and make an appropriate product, be it an aesthetic form or functional or whatever it be to suit that particular agenda.

#### **PARTICIPANT 4**

---

<sup>24</sup> It is important to note the difference between identity and image in this context. ‘Image’ refers to the perceptions people hold of an organisation; ‘identity’ is how the organisation *wishes* to be perceived (Schulz, 2008).

This is a particularly important aspect of working with clients at the Conceptualisation stage of a project. Project team members need to engage with clients to understand their branding and the strategic intent that is depicted by this aesthetic representation of the organisation in order to ensure that the design of the project outcome is consistent with the company's branding strategy.

Participants suggested that there is a connection between the visual aspect of project outcomes and a client organisation's branding strategy. This connection has an impact on decisions made at the Conceptualisation stage of projects. For example, design decisions may be made in such a manner as to enhance or reinforce an organisation's existing brand:

This developer's called [Company name] and they're a Singapore based company. They have a group of Asian investors, mainly mainland Chinese that follow them from job to job and often invest in their project site unseen. So they've built up an expectation of quality in these investors' minds and that quality makes jobs viable for them that other developers, particularly in this market, aren't viable. So they protect that – and that's a competitive advantage for them.... So that means they protect that quality and the market knows that... y'know it's all very, very high end quality apartments, and [it's] part of their brand and their quality is part of their brand and there's a big rich group of mainly Chinese just turn up and buy their apartments...

**PARTICIPANT 19**

In this instance, the aesthetic knowledge of the client organisation of what its market is looking for – especially in terms of the visual aspect of the outcome design – plays a vital role in decision making at the Conceptualisation stage. For the continuing financial viability of the organisation it is important that the aesthetics of the outcome and the related level of build quality match what is expected by their existing investors – that is, there must be congruency or fit between the aesthetic and investor expectations, which necessitates the effective application of aesthetic knowledge (cf. Agor, 1986; Davey, 1989; de Montoux, 2007). Failure to address

adequately this aesthetic aspect may result in extensive damage to the client's branding of itself as a developer of high quality residential accommodation. This is also related to Fine's (1992) assertion that aesthetic knowledge must be applied appropriately to decisions about outcomes to ensure their success when these aesthetic elements are important to relevant stakeholders.

Similar consideration of the aesthetic aspects of outcomes is required for other aesthetically-focused client organisations, such as those in the automotive industry. Decisions about diversification of product offerings and the aesthetic aspects of those offerings involve assessments of the risk to the client's brand:

In the early days, they were really very concerned, and their metric was all about making sure that the [client name] brand wasn't somehow going to be damaged with the introduction of the vehicle, or its accessories, or how it was marketed... All of those sorts of top level conversations involved, which I gave them lots of kudos for, but involved their top level supply chain... And it still does. But [client Name] had at the time a very... This is pre GFC... Very, very strong growth; very, very strong brand presence. This was a really risky move on their behalf. To go away from their main stable of sedans and hatches and luxury cars, to putting a workhorse into the market place. That was not what [client name] does. **PARTICIPANT 5**

Attending to how project outcomes will 'look' to a market, both in terms of their aesthetic appearance and psychological symbolism, is an important consideration in project decision making processes (cf. discussion of "aesthetics of organisation" in Witz, et al., 2003). In particular, organisations need to be cognisant of the effect that decisions about the project outcome will have on the client organisation's existing brand image.

#### **4.1.4 Summary**

The experience of participants in decision making processes during the Conceptualisation stage of mega projects indicates that visual aesthetic knowledge is



used in multiple ways by decision makers. The application of aesthetic knowledge to design decisions to ensure the visual appeal of ultimate project outcomes is a key concern of both project team members and clients. Visual appeal is required primarily to ensure the acceptance of project outcomes by relevant stakeholders, especially end users. Project team members and project managers are focused on ensuring that aesthetic knowledge is applied during the Conceptualisation stage to ensure that the aesthetic aspects of proposed project outcomes are appropriate for the function of the outcome. However, other stakeholders not directly involved in the delivery of the project demonstrated a greater concern for form over function, sometimes to the detriment of the functionality of the project outcome. This suggests that the use of aesthetic knowledge in decision making processes at the Conceptualisation stage of projects may, in some instances, have negative consequences for the project.

Visual observation is used by project team members at the Conceptualisation stage to inform the development of client briefs and the design of project outcomes; and, depending on the nature of the project, as an important determinant of the decision to actually undertake a project. Image plays multiple roles in decision making at the Conceptualisation stage. Participants suggested that managers' decisions to pursue project tenders are influenced by their perceptions of what securing the project will mean for the image of the project organisation. Image also plays a role in user and client evaluations of potential project outcomes at the Conceptualisation stage. Maintaining positive brand images through successful projects plays an important role in project team members', managers' and clients' decision making processes at this project stage.

Ensuring that they attend to visual sensory cues provided by clients in meeting situations is an important consideration for decision making for project team members at the Conceptualisation stage. Finally, visual aids (e.g., CAD drawings of proposed project outcomes, PowerPoint presentations, etc.,) are used by project managers and project team members to encourage project approval decisions by clients and purchase decisions by potential users.

The data presented in this section highlights primarily the function of aesthetic knowledge as the foundation of aesthetic judgements (Strati, 2003). It also supports the importance of aesthetic knowledge for design decisions at the Conceptualisation stage of projects. In terms of decision making theory, the data demonstrates that depending on the context, aesthetic knowledge is applied not only in intuitive decision making processes (Agor, 1986; Burke & Miller, 1999; Dane & Pratt, 2007; Rooney & Schneider, 2005), but also rational (Dane & Pratt, 2007; Harrison, 1999; Simon, 1993) and political (Pettigrew, 1973) decision making processes.

#### **4.2 Key insights from other aesthetic knowledge types**

The vast majority of participants' discussions of the ways in which aesthetic knowledge is used in decision making processes at the Conceptualisation stage of projects focused on the application of visual aesthetic knowledge. However, important and interesting insights were also provided into the use of other forms of aesthetic knowledge in decision making at this project stage. In particular, participants discussed the use of tactile aesthetic knowledge and gut feel, and the metaphoric use of both gustatory and tactile aesthetic knowledge concepts. For each aesthetic knowledge type, the focus of the use of the particular form of aesthetic

knowledge, and the stakeholders discussed in relation to the decision making processes involving these forms of aesthetic knowledge, were identified.

<b>Aesthetic Knowledge Type</b>	<b>Focus of Use</b>	<b>Stakeholders Considered</b>
Tactile	Tactile end user experience of outcomes	Project team members
	Decision to proceed	Clients
	Metaphoric	Project team members
Gut feel	Decision to proceed	Project team members
	Data assessment	End users, managers, clients
Olfactory	Metaphoric	Project team members, managers

**Table 4.6: Summary of aesthetic knowledge types beyond visual aesthetic knowledge used in decision making processes at the Conceptualisation stage of projects, the focus of their use, and the stakeholders considered by participants in their discussion of the use of these types of aesthetic knowledge**

#### **4.2.1 Tactile aesthetic knowledge**

The use of tactile aesthetic knowledge in decision making processes at the Conceptualisation stage was indicated by participants' discussion of concepts related to the sense of touch (cf. Fine, 1992). Three extracts relating to project team members' perceptions of the user experience of potential project outcomes, clients' decision to proceed with projects, and the metaphorical use of tactile aesthetic knowledge by project team members were coded to this category. The use of tactile aesthetic knowledge in a metaphoric sense is discussed in section 4.2.3 (b).

##### *(a) User experience*

For some projects, the ability for project team members to experience at the Conceptualisation stage the tactile environment in which the ultimate project outcome will be operated by end users is vital for the success of the project:

In our particular world it's all about users, it's very user driven type of industry so we might deliberately decide to put off a decision to go off and collect some insights, go and try and put yourself in the user's shoes, like for argument's sake, one of our mining clients, again without breaking any confidentiality, we send a few of our guys down underground, a kilometre

underground because we were asked to design a device that was going to be used down there<sup>25</sup>. **PARTICIPANT 4**

The capacity for project team members to engage in the direct physical experience of user working conditions in a mine a kilometre underground enabled them to apply the sensory knowledge gained from that experience to the decisions they made about the design of the project outcome. This is related to the function of aesthetic knowledge as the basis of aesthetic judgements about the characteristics of objects and places (Strati, 2003). This example highlights the importance for the success of project outcomes of gaining direct sensory insight into end users' experience of the circumstances in which products will be used (by "putting yourself in the user's shoes") at the Conceptualisation stage when the outcome requires a human response, so that this insight can be effectively incorporated into the design of the outcome (cf. Fine, 1992).

*(b) Decision to proceed*

Touch can have an important, yet perhaps surprising, impact on clients' decisions to proceed with projects at the Conceptualisation stage. For example, the ability to touch a prototype of a project outcome (where one can be produced) can enhance the possibility that a 'go ahead' decision will be made by clients:

So it's that sort of difference; it's the difference between being... seeing something in a flat 2D medium, as opposed to being able to touch and feel it. So that emotive response goes through the roof as well. It's also backed up with a bit of data, for want of a better description. But I still see... this is my opinion anyway... I still see quite a lot of the decision I think being made on that emotive side of the equation, rather than the data side. Wow this is cool, we've been working on this for 9 months, and now I finally get to use one and touch one, and it's exactly what I wanted it to be, let's make it! And how much is it?  
**PARTICIPANT 5**

---

<sup>25</sup> It is important to note that there are necessarily other sensory elements which have an effect on design outcomes in this example (e.g., visual inspection of the usage site).

Being able to touch something that up until that point had only been a concept for the client created an emotional relationship with the outcome through the aesthetic engagement with its prototype. This encouraged the client to make a decision to continue on to production, even without detailed consideration of the financial implications of the decision to proceed.<sup>26</sup> This example demonstrates the problematic nature of the rational model of decision making that still dominates organisational research, in that it highlights the model's failure to take into account how human decision making *actually* occurs (cf. Langley, et al., 1995). Decisions are not limited to the analysis of objective data with a view to maximising economic utility. Rather, human decision making involves all facets of humanity – including the aesthetic and emotive aspects. The prescriptive nature of the rational model becomes redundant if it is not related to reality of decision making in organisational contexts (cf. Klein, 2008; Langley, et al., 1995).

#### **4.2.2 Gut feel**

The use of gut feel as a form of aesthetic knowledge in decision making processes at the Conceptualisation stage of mega projects was evident in the use of terms related to this form of knowledge, such as 'gut feel' itself, 'feel' and 'felt'. In total, nine interview extracts were coded to this category for the Conceptualisation stage. These extracts were related primarily to decisions about whether or not to proceed with projects, and decisions relating to various aspects of the assessment of data – such as making decisions in the absence of 'objective' data; judgement calls on the nature and accuracy of 'objective' data; and the assessment of the risk associated with undertaking a project.

---

<sup>26</sup> See Taylor (2002) for a discussion of the role of aesthetics in creating an emotional response to phenomena.

*(a) Decision to proceed*

Participants suggested that they and their team members rely on their gut feel perceptions when making decisions about whether or not to proceed with a proposed project. Gut feel provides project team members with an assessment of their level of comfort with proceeding with a project:

Our gut feel... We often have to put ourselves into a position where we decide whether we are going to be forceful about it, and say 'no sorry Mr Client, you're just wrong...' And we've walked away from projects because of that feeling. We've just gone – don't think that's got legs, really think we should be doing something else, or nothing at all in some cases. And that hasn't been received well, and we've just agreed to part ways. There's no point in getting our studio... Because they are a passionate bunch, involved in something they don't love. If they don't love it, they're going to drag their feet, outcomes are going to be mediocre, client's not going to be happy, there's no point. We'll have a chance if we say no, of that client coming back in three months' time when it didn't work... We've got another idea. That's a better outcome for us organisationally, and we're mature enough to realise that's the case. So we had to make a decision though, as to how much we believe in that gut feel early on. And if we really think it's negative, just tell the client. A really, really important decision to make for us organisationally. So we use that quite a bit, that does it feel right, does it feel wrong? But it's usually in the earlier stages of a decision making process. And in some cases even are we going to take the project on?

**PARTICIPANT 5**

Here, the participant suggests that gut feel operates intuitively at the Conceptualisation stage of projects as a determinant of both the nature of the belief in the project as one worth pursuing, and its level of fit with the project organisation's staff's interests and passions. Decisions about whether or not to proceed with a project are based on positive gut feel assessments by project team members of the merits of the client's proposed project and how well it fits with the focus and skills of the project organisation. Pursuing a project that is not believed in, and for which project team members are not "passionate", results in suboptimal outcomes for both clients and the project organisation. The application of gut feel in

this manner is consistent with its function as the basis of decisions in the absence of specific objective evidence based on logic or reason (Davey, 1989; de Montoux, 2007).

Gut feel may also be used in relation to decisions to proceed when assessing the likelihood of the successful outcome to a tender process:

So I guess you could look at any large projects that we've done; we did the [project names] so at the start up phases of those, of those works out of any proposal activity, we have what's called the 'Go or No-Go' which is part of the business procedure which basically you get the relevant people in the rooms and say are we going to go for this proposal or not? And when you think, when you know, when you've got a feel... I'm not sure, they can have different levels of formality to them but if you start to think well we've got more than sixty percent chance of winning this, we've worked with the client before, the project doesn't have any huge risk factors then you get the go and you go ahead and you invest your own time because you are working for free at proposal stage, to win the work and then all the successful jobs we've had, we've gone the go. **PARTICIPANT 16**

Project team members rely on "a feel" for whether engaging in the unbillable work to develop a tender is worth the effort. This experientially-derived felt meaning is based on previous experience of similar projects ("we've got more than sixty percent chance of winning this") and of working with the proponent ("we've worked with the client before"); and involves an assessment of the risk associated with pursuing the project ("the project doesn't have any huge risk factors"). This felt meaning is relied upon as a basis of action in the absence of the ability to engage in extensive analytical processes to establish the cost/benefit of pursuing a tender owing to time and financial constraints (cf. Davey, 1989; de Montoux, 2007).

*(b) Data assessment*

Participants suggested that they often rely on gut feel in the absence of data. For example, user reaction to a project outcome is difficult to gauge when the outcome itself does not exist. However, depending on the nature of the project, the ultimate

perception of the project outcome among end users may be an important determinant at the Conceptualisation stage of whether or not the project proceeds. Therefore, assessing this perception is important:

You have a situation where you've got one of those early incubator clients, they've had an attempt at putting a brief together because they had to put one together in the first place as part of a business plan or whatever, to attract funding and investment. So they'll have a brief that appeals and got them investments... And that success that happened over there, it gives kudos, don't get me wrong; but I think it sometimes gives too much kudos to the contents of the brief.... So they'll come to us and we'll start challenging the contents. And it's because we know there's something not quite right about the usability of, or the way this technology might be received by a user at the end. Because a lot of the stuff we do is consumer based. And we feel as designers anyway, that we have a great empathy with our end-users. Especially if they are just general consumers. We design a lot of products for them, we think about them a lot. We interact with them a lot. We do a lot of post process with them. So our gut reaction initially to a... in our world anyway, initially to a brief... we think has a lot of currency; because of that background. If it's got a human interaction point somewhere through it, we think that we've got a lot of kudos at that table for informing some decisions around that. We often challenge those briefs, saying 'are you really sure that the user's going to use it in that way? Tell us a little bit about how you came to that decision. What were the insights you used to inform that decision?' And we'll often, even though our gut is telling us that it's wrong, we'll often suggest, so that the client can learn with us... **PARTICIPANT 5**

Project managers in this context rely on their gut feel about both the nature of the project outcome itself and the potential response of end users to that outcome. This intuitive gut feel is based on previous experience which the participant argues provides project managers with "a great empathy" with the project's identified ultimate users. This experience is drawn from the project managers' perceived relationships with end users, which has resulted from research of, and direct interaction with, end users over time; and results in perception of a close affinity with end users which feeds into the project managers' design processes. This use of



gut feel is related to the function of aesthetic knowledge as the foundation of aesthetic judgements (Strati, 2003).

Participants suggest that managers rely on gut feel at the Conceptualisation stage of projects when they are required to make a 'judgement call'. This is often the case in relation to decisions to actually proceed with a project:

Nothing formalised as in weighted criteria or anything like that, they make a judgement based on their knowledge of what's going on in the business, and what they feel is right and I have to say that our...we have a very charismatic leadership, and he's done a lot of things on instinct, this is at the executive level which have been very successful but some decisions are made purely on his instinct and his judgement. **PARTICIPANT 1**

In this extract, the participant is referring to how managers make decisions when they are presented with data about a number of possible action options. The instinctive judgements made by managers are clearly based on domain knowledge (in this instance, domain knowledge of "what's going on in the business"), but also rely on forces beyond domain knowledge ("what they **feel** is right"). Felt meaning (Taylor, 2003) about, for example, issues such as compatibility of the project with the strengths, skills, and strategic direction of the project organisation, is an important consideration in the decisions made by managers about proceeding with projects. Aesthetic knowledge (in the form of gut feel) is applied to determine this level of congruency between the proposed project and the project organisation (cf. Davey, 1989; de Montoux, 2007)

Further, participants maintained that managers rely on intuitive, experientially-derived gut feel to make decisions at the Conceptualisation stage, even if such decisions conflict with the choice of decision options that would appear to be supported by objective data:

We might be doing a pre-feasibility study and that's going to determine whether something is feasible. And we might do a certain amount of engineering and that might come out as really quite high, but then what you might find happens is... it's like that with a lot of these dollar figures, a proposal value, a senior person has a figure in mind, intuitively this new road from A to B is going to cost \$20 million but you've had your staff work it through and it comes up as costing \$40 million and then I would say in those cases, often we would tend to go back to the intuitive... **PARTICIPANT 16**

This aspect of decision making supports Hansen et al.'s (2007) assertion that gut feel is relied upon even given the existence of 'objective' data. This extract highlights that experiential knowledge of managers is relied upon even when decisions are technical ones (i.e., decisions about project costing) which are, prima facie, based on technical domain knowledge. This is an important insight, as technical decisions are often perceived of as exclusively rationally based (cf. Langley, et al., 1995; March, 1994; Simon, 1960). The 'feel' for what project costs should be based on prior experience is an important basis of choice in decision making in this context.

Participants identified that clients use gut feel as a source of felt meaning about the risks associated with particular aspects of projects when they make an assessment of the data available to them at the Conceptualisation stage of projects. This application of gut feel is manifest in participants' use of the word 'comfortable' when discussing clients' perceptions of project risk:

It's making sure that everyone is comfortable. That they're signing off, it's stage-gated from a project management point of view, that everyone is signing off and happy from their personal risk or liability point of view. So from a decision making process from the customer's side... so in other words the people we were I guess working with... Their decision making drivers were very much based around risk management. **PARTICIPANT 5**

The participant observes that at the Conceptualisation stage the basis of decision making from a client perspective is risk management, especially in relation to the decision maker's level of personal risk. Part of the role of project team members is

to ensure that they engage in activities that ensure that decision makers are “comfortable” with the level of risk associated with a decision, especially through the provision of relevant and sufficient information about the decision to enable an acceptable level of comfort to be reached. The use of the term ‘comfortable’ in this instance denotes felt meaning about the level of risk, and is, therefore, consistent with Taylor’s (2003) conceptualisation of gut feel as a manifestation of the application of aesthetic knowledge.

#### **4.2.3 Metaphorical use of aesthetic knowledge concepts**

An interesting aspect of this research is participants’ discussion of aesthetic knowledge concepts in metaphoric terms in relation to decision making processes in mega projects. Participants identified the metaphoric use of both olfactory and tactile aesthetic knowledge concepts in their discussion of decision making processes at the Conceptualisation stage of projects.

##### *(a) Olfactory aesthetic knowledge*

The use of language relating to the sense of smell by participants in their discussion of decision making processes at the Conceptualisation stage of mega projects is indicative of the use of olfactory aesthetic knowledge by project managers. The use of this form of aesthetic knowledge was limited at this stage, with only one participant using olfactory language metaphorically in relation to the way in which project team members and managers engage with clients at the Conceptualisation stage.

Project team members and managers engage with clients at the Conceptualisation stage of projects – particularly in meeting contexts – to ascertain important information such as the purpose of a project, the nature of the desired

outcome, and the key target market. Part of the purpose of this interaction is to assess the potential of the client as a business partner:

So yes, aside from me trying to **sniff** if out whether they're the time bandits, whether they've got the budget, whether they're the type of client that we could do, with work with, all of that sort of stuff; once it's potentially on the edge of being in the door and probably earlier to be honest, he [manager] then has a **sniff** at it to make sure it's actually in line with where he sees the company being, not just what we are now, where were going to be in ten years' time. **PARTICIPANT 4**

This participant used olfactory terminology in a metaphorical sense on a number of occasions throughout his interview. Although the term “sniff” is used metaphorically in these examples, the participant is really using this metaphor to communicate the importance of sensory engagement as part of the “situational awareness” of the interaction environment when dealing with clients in person (cf. Klein, et al., 2010). Effective sensory engagement enables reliable intuitive decisions about the nature and functionality of potential client relationships to be made (cf. Klein, et al., 2010; Senge, 2004). This awareness allows project team members to detect and interpret sensory cues in the environment which may provide insight into the potential economic, cultural, and reputational value of the client. It is also important as a time management tool. This level of sensory engagement assists project team members and managers to make decisions about a number of factors including whether the client relationship is worth pursuing; whether or not a cultural fit exists with the client; whether the client has the financial capital to proceed; and whether the work sits well with the project organisation's strategic direction. This ultimately influences the decision of whether or not to proceed with the project. This use of aesthetic knowledge is related to its function as the basis for effective decision making, as it is related to establishing coherence between the attributes of

the potential client and the requirements of the project organisation (Davey, 1989; de Montoux, 2007).

*(b) Tactile aesthetic knowledge*

Touch was also identified as being applied by project managers and their team members in a metaphorical sense, particularly in relation to the assessment of the potential economic outcomes of a project in the absence of ‘hard’ economic data:

They had no clue how many they were going to make. They thought they were going to set up two or three factories around the world. In those early days, putting a business case, that’s based on numbers, forward to anyone, internal or external, was sticking your finger in the wind. **PARTICIPANT 5**

Here, the participant’s use of metaphor relates to the common practice of wetting one’s finger and putting it in the air to establish via the sensory cue provided which direction the wind is coming from. He is suggesting that ‘exact science’ is not possible when relevant objective information about the project and its potential for economic return are not available; and, therefore, attempting to build a business case based on economic data is futile. In such instances, decisions revert to gut feel – that is, the application of project team members’ experientially derived knowledge about economic potentialities and probabilities to arrive at a decision to continue with the project. This is related to the function of aesthetic knowledge as the place to where decision makers turn where logical and rational analysis are simply not possible (Davey, 1989; Rooney, et al., 2006). In such instances, intuitive decision making processes based on felt meaning are relied upon (Agor, 1986; Betsch, 2008; Dane & Pratt, 2007; Klein, 2003; Simon, 1987).

#### **4.2.4 Summary**

Participants provided insights into how various forms of aesthetic knowledge (in addition to visual aesthetic knowledge) are used in decision making processes at the

Conceptualisation stage of projects. Tactile aesthetic knowledge is used in different ways by project team members and clients at this stage. Project team members use the knowledge gained from the tactile experience of project outcome operating conditions to inform their design decisions at this stage. Clients were identified as using tactile aesthetic knowledge as the basis of their decisions to proceed with projects. The ability to physically touch a project outcome prototype creates an emotional relationship with the outcome which encourages intuitive decisions to undertake projects even without the benefit of objective analysis pertaining to issues such as cost and return on investment. This is related to the function of aesthetic knowledge as the fundamental basis of practical action (Hariman, 1998; Whitfield, 2005).

Gut feel is used by project and their team members, managers and clients in various ways at the Conceptualisation stage of projects. In most instances, gut feel is used as the basis of intuitive forms of decision making. This gut feel is primarily derived from the decision makers' professional experience (e.g., in the case of project team members' gut feel decisions about decisions to proceed with projects; project managers' approaches to decisions in the absence of objective data; and managers' judgment calls in the presence of data). In particular, the example of the use of gut feel by managers represents a direct application of aesthetic knowledge by managers to deal with the complexity which results from multiple options and potential outcomes. This is a particularly important finding in the context of the research questions posed for this study. Clients' assessment of risk is derived more from their personal experience and is based on the gut feel of what level of risk they are 'comfortable' with assuming. The data relating to gut feel also supports the functions of aesthetic knowledge as an aid to choice when logic and reason fail

(Davey, 1989; de Montoux, 2007); and as the foundation of aesthetic judgements (Strati, 2003).

Participants discussed the metaphoric use aesthetic knowledge concepts in decision making processes at the Conceptualisation stage of projects. “Sniff”, an olfactory aesthetic knowledge concept, was used metaphorically to represent the assessment of potential relationship and project value when projects team members were engaged in direct sensory interaction with potential clients. Tactile aesthetic knowledge concepts were used metaphorically to describe the intuitive decision making processes required for business case development in the early stage of a project in which limited objective data is available.

The data presented supports the decision making theory which suggests that aesthetic knowledge is applied primarily in intuitive decision making processes (Agor, 1986; Burke & Miller, 1999; Dane & Pratt, 2007; Rooney & Schneider, 2005). Importantly, however, it provides evidence of the use of these more sensory and intuitive approaches to decision making in areas which have traditionally been associated with rational decision making processes (e.g., technical decision making). This lends further weight to the need for the reality of decision making in organisational contexts to be examined if organisational decision making research is to remain valid (cf. Klein, 2008; Langley, et al., 1995).

### **4.3 Conclusion**

This chapter provided a detailed discussion of the data that are relevant for the Conceptualisation stage of mega projects. In particular, the discussion of the Conceptualisation stage focused on the different types of aesthetic knowledge (i.e., visual, olfactory, tactile, and gut feel) used by participants in their decision making

processes at this stage. Data was presented which supported the functions of aesthetic knowledge as an aid to choice when logic and reason fail, as the foundation of aesthetic judgements, as the basis of practical action, and as necessary for effective decision making. It is also evident that aesthetic knowledge is applied to other forms of decision making beyond intuitive decision making processes, including rational and political approaches to decision making. The discussion of the overall implications of the results for this project stage is contained in Chapter 8. Chapter 5 examines the results that pertain to the Actualisation stage of projects.



## ***Chapter 5 Aesthetic Knowledge and Decision Making at the Actualisation Stage of Projects***

This chapter explores the evidence in the data of the ways in which aesthetic knowledge is used in decision making processes at the ‘Actualisation’ stage of projects. Decision making processes at this stage of a project focus primarily on how the project will be progressed to achieve the desired project outcomes established in the Conceptualisation stage (Aaltonen & Kujala, 2010; Morris, 1982). The decisions made at this stage have a considerable effect on the success or failure of the project at the Realisation stage.

The data presented in this chapter represents participants’ viewpoints on the ways in which aesthetic knowledge is used as the basis of action choices at the Actualisation stage of projects. The Actualisation stage was the most extensively discussed stage of the project process by participants, with 162 interview extracts coded to this stage. This is consistent with the literature which suggests that project managers tend to focus primarily on the actual ‘doing’ of projects, rather than the planning (‘Conceptualisation’) or completion and evaluation (‘Realisation’) of projects (Skulmoski & Hartman, 2009).

	<b><i>Stage</i></b>
<b><i>Type</i></b>	Actualisation
Visual	72
Aural	11
Olfactory	0
Tactile	9
Gustatory	0
Gut Feel	70
<b>Total Extracts</b>	<b>162</b>

**Table 5.1: Number of interview extracts relating to aesthetic knowledge types used at the Actualisation stage of projects**

The data provides considerable insight into the use of various types of aesthetic knowledge in decision making processes at this stage. However, participants' responses suggested that visual aesthetic knowledge (n = 72) and gut feel (n = 70) were the dominant types of aesthetic knowledge used in decision making processes at this project stage. Consequently, the chapter is focused primarily on the use of these two forms of aesthetic knowledge. It also considers interesting aspects of participants' discussions of other types of aesthetic knowledge in decision making processes, specifically aural and tactile knowledge, and the metaphoric use of both visual and tactile aesthetic knowledge concepts. This examination of the data assists in addressing the study's primary research question by establishing the ways in which aesthetic knowledge is used in decision making processes at the Actualisation stage of mega projects.

Project Stage	Aesthetic Knowledge Type	Focus of Use	Stakeholders Considered
Actualisation	Visual	Actual visual aesthetic of proposed outcome	Project team members, end users
		Visual aspects of decision making	Project team members, external stakeholders
		Image	Project team members, managers, end users, clients, external stakeholders
		Metaphoric	Project team members
	Gut feel	Sensory properties of outcomes	Project team members
		Project processes	Project team members
		Presence	Project team members
		Data assessment	Project team members, external stakeholders
		Routine decision making	Project team members
		Assessment of fit	Project team members
	Aural	Aural aspects of proposed outcomes	Project team members, end users
		Aural aspects of decision making	Project team members, clients, managers
	Tactile	Tactile aspects of proposed outcomes	Project team members, end users
		Tactile aspects of decision making	Project team members
		Metaphoric	Project team members

**Table 5.2: Aesthetic knowledge types applied, foci of use, and stakeholders considered in decision making processes at the Actualisation stage of projects**

## **5.1 Visual aesthetic knowledge**

In accordance with Fine (1992), this section examines the use of visual sensory language by participants in their discussion of decision making processes at the Actualisation stage of projects as indications of the use of visual aesthetic knowledge. In total, 72 of the 162 interview extracts coded to the Actualisation stage were coded to the visual category. As with the Conceptualisation stage, these extracts demonstrate that project managers use visual aesthetic knowledge in three key ways in their decision making at this stage:

- (a) as an aid to decisions required about the actual visual aesthetic of proposed project outcomes (section 5.1.1);
- (b) as part of the actual process of making decisions (section 5.1.2); and
- (c) as the basis of decisions made about the personal, professional, and/or organisational reputational (i.e., ‘image’) implications of undertaking the proposed project (section 5.1.3).

### **5.1.1 Visual aesthetic of proposed project outcomes**

Depending on the nature of the project, it is often necessary for project managers to consider the visual aesthetic appeal of the proposed outcomes during the Actualisation stage, as it can be an important determinant of stakeholders’ perceptions of the success of the outcome and the overall project itself. Therefore, it is crucial that the visual aesthetic of the project outcome matches stakeholders’ expectations. Participants considered two groups of stakeholders in their discussion of decision making about the visual aesthetic aspects of project outcomes during the Actualisation stage: project team members and end users.

Stakeholder(s) Considered	Purpose of Aesthetic Knowledge Use
Project team members	Ensure that the visual aesthetic supports the utility or functionality of a project outcome
	Enhance the likelihood that a project outcome is used, purchased, or accepted
	Demonstrate the advanced technological nature of a project outcome
End Users	Matching expectations of the aesthetic

**Table 5.3: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to the visual aspect of proposed project outcomes at the Actualisation stage of mega projects**

*(a) Project team members*

Participants identified three important roles that the visual aesthetic of the proposed project outcome often plays in securing the success of the project: (i) it affects the utility or functionality of the outcome; (ii) it may encourage stakeholders to use, purchase, or accept the presence of, the outcome; and (iii) it may demonstrate the advanced technological nature of the outcome. For these roles to be realised effectively, it is necessary for project managers and their team members to apply their aesthetic knowledge to the decisions they make about the visual aesthetic aspects of the outcome during the Actualisation stage.

Participants suggested that the visual aesthetic of a project outcome has an impact on stakeholders' perceptions of the utility and functionality of the outcome. Consequently, aesthetic knowledge must be applied appropriately by project team members to ensure positive perceptions of both utility and functionality:

...there are a lot of small aesthetic decisions that were made along the way, again even with the contents of the kit, a lot of things to help the installers... just basic little things, like labels and things like that, an instinctive thing about, that will help them, this will help them, it's not necessary for them to do their job but it's that sort of thing to make life easier for them and that will work better for them. **PARTICIPANT 1**

In this example, throughout the Actualisation stage decisions requiring the application of aesthetic knowledge were made by project team members in relation to the presentation of the project outcome to end users. Although these aspects were

not essential for end users to “do their job”, they were basic elements that would greatly assist the utility of the outcome for end users. These decisions required knowledge of both the requirements of the end users and the aesthetic appeal of the “labels and things like that” which were designed to assist them (cf. Fine, 1992). In terms of the assessment of the functionality of outcomes, participants suggested that project team members need to ensure that the application of their aesthetic knowledge during the Actualisation stage of projects is appropriate. In particular, a balance is required between the consideration of the aesthetic form of project outcomes and their function. This is necessary for a project to be judged to be successful, especially by end users:

I can actually use cheaper bricks on this and we could drop the price if we use cheaper bricks; and the minister wouldn't know that we had, in fact, worked very hard to get the right bricks because of undertakings we had given to the council or whatever, in the planning approval process, and so on, and so we were constantly having to remain vigilant about attempts at changing the bid that was there on the ground and to the outside world, you might well say, you weren't in the neighbourhood, why would you care about the brick being an ugly brick as opposed to a nice brick? Cheaper, \$200,000, yeah and spend that somewhere else. So there were interesting questions about values in this, and aesthetics gets into that, much of the more recent public housing is incredibly cautious and tame in terms of where it sits in the spectrum of style, we did some radical stuff earlier on, but it sat – we got away with it and it didn't upset people and it didn't get into that peculiar dimension, but we did very good stuff early on and we continued to get architectural awards. **PARTICIPANT**

**14**

In instances such as this public housing and urban redevelopment project, the aesthetics of the buildings which are built need to support the project's social functionality, not dominate it. This requires an application of aesthetic knowledge which demonstrates an understanding of this social functionality, and the role of aesthetics in ensuring this functionality is achieved. The visual aspect of the buildings must fit with the desired social outcome. The role of aesthetic knowledge

in ensuring this fit is evident in the Kantian perspective on the function of aesthetic knowledge in effective decision making (de Montoux, 2007).

The visual appeal of the outcome may also be an essential aspect which attracts eventual users of the outcome to use or purchase it:

The process we go about to market to the right people and attract the right people means you've got 'like' [i.e., similar] people around you, and then delivering the parks and footpaths and things is a step above what you would expect for a high quality development but if it's a low price point development therefore you don't have the money to go over the top on those things, but still delivering well and polished and the best of what it can be.

**PARTICIPANT 20**

This participant proposes that there is a relationship between aesthetics and economics in relation to the delivering of land developments. Depending on the price point of the development, potential users expect a certain level of quality in terms of the aesthetic presentation of aspects of the development (“parks and footpaths and things”) (cf. Fine, 1992). Regardless of the price point, these aspects are required at an appropriate level to attract the “right people” to purchase property in the development. The participant suggests further that the visual aesthetics of a development may also be important for its acceptance by broader stakeholders, not just potential buyers:

The key drivers for the community support was that the project had started, the land had been cleared and it was an eyesore because it had been half developed so if that hadn't been done we wouldn't have had any chance. **PARTICIPANT 20**

Here, the participant identifies that the improvement of the aesthetics of the site from a half-developed “eyesore” to a fully developed residential community enhanced broader community support for the project. The attention to rectifying the negatively perceived visual aesthetics of the project site was important as, without it, the development “wouldn't have had any chance” of success.

In some instances, aesthetic knowledge needs to be applied by project team members to ensure that the ‘look’ of an outcome matches the technological advances evident in the outcome. This is important to enable the selling of a product to internal or external stakeholders, or to both. Therefore, appropriate decisions about the aesthetic aspects of the outcome need to be made by project team members to enable this to occur:

The brief came down from the CEO saying I’m going to do a big reveal day, this is like six months before the reveal day happened... I really need it to look cool; I need it to look as cool as the words I’m describing, that it is technically cool. So we got all these great technology advancements, I need the look to match. And his closing words were the ones that stuck with us when he was briefing us up on this. He said ‘I want it to look like something NASA built’. **PARTICIPANT 5**

For this CEO, it was necessary for the communication of the technologically advanced nature of the project outcome that it looked “cool” – that is, that it looked like “something NASA built”. Therefore, he clearly identifies the relationship between the look of an outcome and stakeholders’ perceptions of the outcome. In this instance, it was important that the project team members associated with the design of the visual aesthetic of the outcome applied their aesthetic knowledge of what it was to look “cool” to the design of the outcome to ensure this link between the aesthetic of the outcome and its technological aspects.

***(b) End users***

As discussed, the visual aesthetic of certain project outcomes is particularly important for their positive acceptance by stakeholders; consequentially, it is something to which project team members must apply their aesthetic knowledge when making project decisions if that acceptance is to occur. This is particularly the case for end users of the project outcome. For example, participants indicated that decisions made about the visual interface of technology must take into account end

users' expectation of the 'look' of that interface if the technology is to be accepted by the end users. Decision makers must therefore take steps to ensure that they understand (a) the needs of end users and (b) the aesthetics of similar technology available in the market place:

You'll find that what will happen is that the mission system which dictates a lot of this stuff because it's out of the operators' interface with the computers, a lot of that is a bit old-fashioned because the people who wrote that were thinking this is how they operate at the time and they used examples that were around at the time, like [System Name] models, and they were all good, they all work, but you know the way that screens have gone, GUIs have changed over the years so there's much more efficient ways to display information, switchology, symbology, all that stuff, it never ends, it's... as the boffins think of cleverer ways to do stuff and obviously [Organisation Name] wants to support the aircraft through life. **PARTICIPANT 6**

Another good example too would be where you would have quite senior operators who sit in the [Organisation Name] group, so these would be your kind of 30 to 40 year old squadron leader, wing commander types, who have been a unit commander or an operational commander, and would have their view of how the system should work, and what it should do, versus when we deliver the system, the actual guys and girls who are sitting on the system day-to-day, are the Gen Y 19 to 25 year olds who have grown up with i-Phones and PlayStation... And so they have quite different views about how things should be and how they should work, and to some extent they don't know a lot. And so the guidance of seniors is certainly set up in that structure. But by the same token, there's not enough incremental feedback to apprise that group of what the reality of operations is these days, compared to when they maybe were behind the scope and controlling things. **PARTICIPANT 18**

Importantly, this need to match user expectations can be difficult if not considered carefully, as those making decisions in project teams are not necessarily current users of the technology – or even in the same generation as current users – and may have a vastly different experience to end users. This may be problematic for the acceptance of the outcome from an end user perspective. It would be necessary for project team members to engage directly and effectively with end users to gain the



sensory and other knowledge required to ensure that the technology interface matches end users' expectations.

### 5.1.2 Visual aspects of decision making

Again, the data coded to the Actualisation stage supports the existing research which maintains that there is a visual aspect to human decision making processes (e.g., Kovalerchuk, 2004). Participants considered project team members and external stakeholders in their discussions of the use of aesthetic knowledge as part of the actual process of decision making at the Actualisation stage of projects.

Stakeholder(s) Considered	Purpose of Aesthetic Knowledge Application
Project team members	Interpretation of workplace aesthetics
	Interpretation of visual cues provided in the decision making environment
	Establish nature of, and relationships among, project variables
	Managing project complexity
External stakeholders	Sharing of information and ideas
	Creation of shared understanding of project goals and processes

**Table 5.4: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to the visual aspect of decision making at the Actualisation stage of mega projects**

#### *(a) Project team members*

A number of issues were identified by participants in relation to the importance of the application of the aesthetic knowledge to decisions about aspects of the project process during the Actualisation stage of projects. For example, decisions about the visual aesthetics of office spaces were seen as important as they reflect feelings about projects and people's passion for the project:

For me, the way I probably rather initially answer the question, that's why I was interested in talking about it was for me the feel of a project that I work on has a large importance. I went over to New Zealand for two months this year to work on [Location Name] Power Station and we were talking about the sensory feel of what's built; there's pictures all around the walls of what stage of construction it's at, you're in with a close knit team that's working towards one outcome, you get the feeling that they are quite passionate about what they're doing, they're passionate about how they deliver it and ultimately the end result for the

client, which is [Location Name] Power Station. So the office is decorated with that sort of thing, and that to me you know can help with a positive feel that's more of an internal project feeling and it does impact. **PARTICIPANT 16**

For this participant, the visual aesthetic of the office environment is seen as a representation of the culture of the work team (“a close knit team that’s working towards one outcome”) and their passion for the project. Having pictures of construction decorating the office reinforces this culture for both project team members and other stakeholders who visit the site. The visual aesthetic creates a positive “feel” towards the project which influences positively stakeholders’ perceptions of the project and its progress; their commitment to it; and their desire to engage in effective decision making processes about it, during the Actualisation stage.

Another participant identified the role of the visual aspect of office environments in encouraging creativity as a means to assisting effective decision making during the Actualisation stage:

Secondly, as much as we are working here, this is hot-desking, I suppose, but this is constrained and equally when I had my office, my walls were covered with the plans, photographs of nice places, very little in my terms of photographs of my beloved, but photographs of places, plans, buildings, questions, big bloody quotes, my walls were covered in them and occasionally my colleagues, senior colleagues, would walk in the door, sigh, grimace, make a rude remark and walk out again but that was the working environment for me; I work in a visual world of 3 dimensions, 4 dimensions; I want stuff around me that is changing all the time; reminding me, challenging me; not bland walls. **PARTICIPANT 14**

Conducting decision making processes in a work space in which the visual aesthetic inspired and challenged the decision maker is seen as important for effective decision making for this participant. This participant is an architect by training who inhibits from his perspective a “visual world of 3 dimensions, 4 dimensions” and

who needs visual stimulus “not bland walls” to be creative and to make decisions effectively.

In terms of the process of delivering the project during the Actualisation stage, participants suggested that direct interpersonal interaction among team members was important for decision making. The ability for project team members to physically see each other assists with the development of interpersonal relationships and the positive aspects of these relationships (e.g., trust), and also enables effective knowledge sharing to occur:

It would say it's very important. I don't particularly like being on the phone or an email; if I have an opportunity instead of sending an email to go and chat with them, you know one of the challenges around particularly if there's an exchange of data, obviously I will use email to back it up, but if I've got the chance to go and see someone then I will and I'll have a chat with them.

**PARTICIPANT 7**

While electronic communication is important and appropriate in many circumstances, the benefits for communication and relationship building of being physically present with other team members when engaging with them is recognised by this participant. This is even the case when the “exchange of data” is the primary reason for the interaction. Physically interacting with project team members allows for the attending to, and interpretation, of sensory (particularly visual) cues. These are essential for effective communication, and form the basis of trust and relationship development (Hartley, 1999).

Further, staffing decisions, especially suitability for particular project roles during the Actualisation stage, are also assisted by attending to, and interpreting, visual cues from the work environment:

Okay, I've acted, I'll apply somebody else to it, watch them, in the knowledge that that wasn't being done properly, then watch

the new person. Is it working out? Good, leave it. It's not working out? Righto, okay why is it not working out? Let's adjust. And that might sound like a fringe issue but it's not. The central issue in projects is people. Because people are constantly stuffing things up or bringing baggage to the table or whatever else. So if the centre of gravity of a project is the people, then that's where your focus has to be. **PARTICIPANT 11**

The need to “watch” to see if a team member is “working out” in a particular role is seen as a vital part of ensuring that project tasks are completed effectively during the Actualisation stage of the project. This is primarily the case because project team members are “the centre of gravity of a project”, and consequently, “that’s where your focus has to be”. The term “focus” in this instance is used by the participant in both a literal and a metaphorical sense in that he suggests that the suitability of staff for tasks is determined literally by visually engaging with them, and, further, that project team members and their activities should form the centre of cognitive attention to the progress of the project at this stage.

Participants also identified the role of visual sensory knowledge derived from previous experience of similar situations as an important aid to decision making at the Actualisation stage of projects:

So that’s one person but there’s a couple of others within our organisation that have quite a bit of experience as well as some of our consultants as well that have the experience of seeing things happen, seeing things built, that then provide the ability to challenge certain decisions or outcomes or assumptions that lead to better outcomes. **PARTICIPANT 12**

The experience of actually “seeing things happen, seeing things built” and the resultant knowledge gained based on this visual sensory experience enables knowledge holders to be critical of decision making processes and their results. This ability to be critical results in “better outcomes” in the opinion of this participant (cf. Klein, et al., 2010).

Another key insight provided by participants was the importance for project team members to maintain sensory (including visual) presence during interpersonal interactions in the Actualisation stage, to determine stakeholder perceptions about the project and its process. This is particularly essential for picking up on sensory cues provided during interactions, including interpersonal interactions with stakeholders such as clients, end users, and managers:

It's just intuitive leaps from what might have been observed or what might have been picked up to what they might actually do as behaviour when they then start working on the project.  
**PARTICIPANT 4**

If people get engaged and are vocal and have an opinion and argue with you at least you know you've got someone there. If they are like stunned mullets then they are a mirror into how the project is perceived in the wider community.  
**PARTICIPANT 17**

A lot of what I do is just seeing what's going on and just engaging myself in a particular issue where I see fit... on a complex project you draw above that process and see it happening and then just engage in between the gaps where you need to... I get invited to a whole lot of meetings, most of them I'll just dip my toe in – I'll come in halfway through the meeting, I'll sit down for ten minutes just to understand what's going on and then either I'll stay or that'll be enough and that'll just generate some conversations later.  
**PARTICIPANT 19**

Like you can walk into a room and make a pretty close to successful decision on what is happening and why just by looking based on your experience and things like that.  
**PARTICIPANT 9**

Visually attending to cues and subsequently applying aesthetic knowledge to interpret those cues enables critical decisions to be made about a number of aspects relating to stakeholders' thoughts about the project. These range from their perceptions about outcome designs to their overall level of engagement with the project. These aspects may be vital for the success or failure of the project; and, therefore, the ability to recognise and interpret these sensory cues, and to then act accordingly, is essential for project team members.

The failure to maintain the necessary level of sensory presence is highly problematic and may even contribute to the failure of a project. One participant highlighted this issue in relation to the absence of the application of the visual sense to meetings with clients:

They certainly knew and how they responded to their lack of interest was just do their own thing and not turning up to meetings or not being fully engaged. Having one of the big indicators crossed now looking back was that we'd have a very serious project board meeting and they'd send very junior representatives to attend. And we should have realised, hang on why haven't we got the buy in, why haven't we got the interest, why aren't they putting the resources in. And when we did detect that their interest was less than it should be we said, don't worry they'll get over that, we'll just keep pushing, pushing, pushing. But of course that didn't happen. **PARTICIPANT 17**

In this instance, the failure to correctly interpret visual signals of a client's level of interest in a project (e.g., not visually picking up on the lack of senior client representatives and on their general lack of engagement) led to an escalation of commitment to a project decision from which the client had completely disengaged. This project eventually failed, resulting in a considerable waste of time and money. The outcome may have been different had the project team members correctly attended to and interpreted the visual cues they were provided with when meeting with clients.

A lack of experience can affect the ability of project team members to pick up on sensory cues in the decision making environment. This can result in incorrect decisions about project progress being made:

I think we've either missed the nuances the client was trying to get through to us and hindsight is an incredibly powerful tool so this might be unfair on the people involved and even more worrying for me, is the opportunities to potentially do either sister projects or other projects along the way because that intuition either hasn't been built, it's probably an experience based thing, or it just isn't there.... we often compare notes after a meeting and say did you spot when Barry did x? I don't know that our entire

team and we're not all very good at that, so those sorts of things are very important in our game anyway. You need to be able to pick up on those things; your radar needs to be really strong.

**PARTICIPANT 4**

In this example, the participant is discussing the failure of his organisation to secure repeat business from a client because they “missed the nuances the client was trying to get through” to them in meetings in relation to the project outcome design. The participant attributes this failure to a lack of experience in interpreting sensory cues among certain members of the project team. He also clearly identifies the importance of attending to the sensory cues provided by clients, particularly the visual cues (“we often compare notes after a meeting and say did you **spot** when Barry did x?”), for interpreting client reactions to the project.

Participants highlighted the importance of the use of visual aids for decision making when an understanding of the nature of specific variables and the relationships among them was important for the decision. Such aids assist choice through the establishment of a visual representation of the decision making process and the choice alternatives:

What we originally went around with the whole positives, negatives, opportunities things like that, so we used to do a high level project with each of our decisions. I guess at the end of the day we do it democratically, I always try to write it up so there's a visual aspect for us all, but then just make that process so it's the write up, the positives and negatives attached to where our project is going to go. I try and keep a Gantt chart as well so we can keep on line with it and we can just adjust that where needed. And if there are any additional issues we can just write it up.

**PARTICIPANT 9**

Although initiated by the project manager, these visual representations provided a means of establishing a shared understanding among the project team of the various aspects relevant to the decision they are facing.

The visual representations of the decision space are not only useful for documenting variables and their relationships and for creating a shared understanding among team members; they are, for some participants, a key way of managing complexity:

Particularly the best thing is mapping stuff helps a lot. For example I've been trying to get some guys to explain what they do. (Laughter) And what all their relationships were with various players in their space. You know they've been getting paid for two years and they can't explain what they do... And my adjutant is baffled so we sat down with the baffled people and we drew maps of relationships and it wasn't what they thought and confirm that with other people and so on. And you can go back over it and say does this look like what it is? Here's a map at the end of it with layers and lines going to various joints and so on. But mapping stuff. Because then it's a shared mental model because if I'm trying to explain to you a complex web of different players doing different things, then it's very hard. It's probably going to be random and not end up with the same model of what's going on but if you draw it...Yep. And using this sort of thing for managing complexity, if you're not doing it, you're mad. Just that map itself, can you imagine trying to do things like... hang on... too hard. **PARTICIPANT 11**

So I'll get them into a room, most of the time a board, god I love boards, just chuck it up, just through it up, they visualise and I visualise and we go through the process. So it will be a meeting room somewhere with a board etc., If it's something where it's quite complicated I'll get everything and again a board, like even use a mirror at home, anything that's clear, start drawing stuff. I just like anything with peace and quiet. And then I draw it up and then if it's some really complicated stuff, after I draw it up I try to make a hub between things and almost sometimes stare at it for hours going, okay what can we do or can't I do. Go through the processes and then sometimes I go crazy. **PARTICIPANT 15**

These participants clearly identify the role of visual stimulus as an aid for managing complexity. There is a link evident between the visual representation of complex phenomena and the ability to make effective decisions about those phenomena. The ability to physically see variables and the hypothesised relationships among them assists decision makers to create a holistic 'picture' of the issue and to, subsequently, determine the most appropriate action option choices to be made. This



process relies on aesthetic knowledge in the Kantian sense to enable decision makers to determine the relationships between the various aspects of the issue and to construct the 'picture' accordingly (de Montoux, 2007).

*(b) External stakeholders*

The ability of stakeholders to engage in direct interpersonal interaction was cited by participants as an important facilitator of effective decision making at the Actualisation stage of projects. In particular, direct sensory presence within a meeting environment facilitates decision making by enabling interaction and the sharing of information and ideas. Visual sensory engagement is important for this:

Now, that seems to be the first time ever that senior departmental bureaucrats across a range of transport planning and other disciplines had to sit in a room with senior bureaucrats and politicians from the city and talk about city planning of a large slab of inner suburb; and it was very, very good while it lasted and very sad that it got demolished after 2 or 3 years, but it did good work in the meantime. That was about breaking down silos, even the department of transport sitting next to Premier, sitting next to planning, in the same room and seeing the Director-General of Planning agreeing with what council was saying and seeing the Director-General of Transport cringing, this is what it's about. **PARTICIPANT 14**

In this instance, effective decision making for a major urban renewal project was facilitated by senior politicians and bureaucrats sitting in the same room, able to physically see each other's reactions to proposals. According to this participant, that level of direct physical engagement enabled stakeholders to disseminate information in an efficient and authentic way, which enabled important decisions to be made more effectively.

The ability for stakeholders to interact directly with each other is also important for the creation of a shared vision of the project and its progress during the Actualisation stage of projects. This interaction is highly effective for the management of stakeholder expectations:

Obviously good decision making during the process is having the right people in the room at the right times and managing expectations. So if the right people weren't there managing, oh we'll just have a bit of a chat and give you an update. Suddenly that disarms people, we are not going to take minutes, don't worry about that. Just disarms them a little bit. You might get the same, exactly the same content. You might take some minutes for yourself. But you're not going to publish it and sign it. So they're probably key elements for me which are quite different, but again each role is as I'm sure is very different in terms of how you illicit good agreement. Which I guess is, for me, part of a good decision is shared vision on two sides of the fence that are not always... same project but have different objectives. **PARTICIPANT 23**

Decision making is enhanced when relevant stakeholders agree on the nature of project outcomes and the means to achieve those outcomes (cf. Ireland, 2006; Jaafari, 2003). This participant suggests that the ability to arrive at this level of agreement is facilitated through direct personal engagement among stakeholders.

### 5.1.3 Image

Participants discussed the role of image (a visual aesthetic concept – Witz, et al., 2003) in decision making processes at the Actualisation stage. In particular, they noted the effects on decision making processes of the desire for project team members, managers, end users, and clients to maintain a positive image for themselves, their projects, and their organisations.

Stakeholder(s) Considered	Purpose of Aesthetic Knowledge Application
Project team members	'Courier Mail' test of potential decisions
	Personal impression management
Managers	Organisational impression management
	Organisational impression management
	Personal impression management
End users	Brand protection or enhancement
	Determine effect of visual aesthetic of outcome on image
Clients	Brand protection or enhancement
External stakeholders	Impression management

**Table 5.5: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to 'image' at the Actualisation stage of mega projects**

*(a) Project team members*

Project team members' understanding of the potential impact on the image of a project of media reports about the project can have an effect on project decision making processes. In particular, participants identified that decisions were affected by anticipating the likely response to the decisions if details about them were to appear in the media:

The media doesn't help. We are constantly subjected to what is called the Courier Mail test; yes, we know we should do this, but if the Courier Mail challenges it we couldn't defend it. Great! So there's that process, and yes, I fear for a situation in the future where everything is capable of being quantified.

**PARTICIPANT 14**

It's obviously task dependent or project dependent but I guess the biggest one we have to have a look at is, I guess as a government you've always got to look back and sort of say, is it, it's a basic Courier-Mail test, is our decision making process going to have an effect? **PARTICIPANT 9**

And often that's not ideally productive especially for low-risk stuff, but it happens anyway because no one wants a slammed audit report and negative media coverage. **PARTICIPANT 13**

Concerns about media portrayal of decisions and their subsequent potential negative impact on the image of projects and project organisations operate as a potential constraint on choices made as part of the decision making process in projects. A focus on public image protection may result in decisions which are perceived as more publically palatable rather than ones which are effective and appropriate for the project. Image in this case may be a driver for decisions beyond the dictates of economic or social benefit or even common sense. This potential effect requires further research as a topic in itself in the context of project management.

Image as a personal visual aesthetic concept is most evident in organisation contexts in the form of impression management (Witz, et al., 2003). In the context of decision making at the Actualisation stage of projects, participants identified that

impression management involves decision makers engaging in decision making with the aim of protecting their own image in eyes of management, peers, and potential employers. In essence, this often results in their manipulating decision making situations to reflect well on themselves:

I would say yes, because we're quite hierarchical and bureaucratic and I think a lot of decisions are made because they want to look good. **PARTICIPANT 24**

This desire to “look good” in the eyes of others can be problematic as it may lead to sub-optimal decisions based primarily on self-interest rather than what is best for the project. It may also result in indecision, as people may not want to make a decision if they feel that it will result in others having a negative opinion of them:

And so people sometimes would rather, then, sit on the fence and keep the status quo than putting their name to a decision that may have some blow back. **PARTICIPANT 17**

Indecision in a project context is often as undesirable as making an incorrect decision because it may result in the stagnation of project and the failure to meet project objectives and deadlines (Drummond, 2001).

Participants also suggested that project team members' decision making processes are sometimes influenced by their perceptions of what will look good on their résumés. This self-interest approach to decision making affects the quality of decision making process outcomes:

In one sense they were looking for dealing with a newer technology, so I think to some extent being able to put on their resume that they had delivered a newer technology would make them more marketable at the end of the project. I think to be able to say that they had delivered more than the project was originally asking for, again would... From a kind of self-praise perspective, would put them into a position where they could, I guess command more respect out of delivering that capability... But you can definitely see the self-interest being a driver there. And then the self-interest of one affecting enough of a peer group of self-interests, that are kind of a movement forms, and then away you go. **PARTICIPANT 18**

The drive to deliver a “newer technology” rather than what was actually appropriate for the project led to time and cost overruns. Interestingly, the participant identifies that this self-interest must be combined with the ability to persuade others (especially peers – either explicitly or covertly) of a shared self-interest in a particular course of action for that action to be adopted. This level of self-interest and its effect on project decisions is something that has not been considered in the project management decision making literature previously. Associated with this is the desire to be connected with projects that are perceived as enhancing project team members’ career prospects:

Well I suppose certain aircraft are sexy. Aviation tends to be a bit like that because it’s high cost, high profile, political, lots of scrutiny. Peoples’ career can either sink or swim. So I think if I was to put my cynical hat on, which I’m pretty good at, it depends on the maturity of the project manager or the directors, and what their motivation is. And I think we had a lot of... you know whether this is cultural or not, we had a lot of people with egos. Had to be right, had to be seen to be right. And therefore it wasn’t about what is best for the project, or what is best for the company. I suppose in that order, what is best for the company, and ultimately, what is best for the project; because if the project succeeds, it’s best for the company. So I think the sexiness is about that attention, if I could put it in very raw terms, it’s about how much attention is on me, how much do I control, I’m the big decision maker, what I say goes. And if there was an activity that didn’t promote that, it wasn’t very sexy. Someone else could do it. **PARTICIPANT 22**

The participant identifies that this ego driven approach to impression management has a direct impact on decision making within a project. Decision making in the particular aviation project he used as an example was focused more the self-promotion of project team members than on “what is best for the project, or what is best for the company”.

Preservation and enhancement of personal image also extends to project team members' desire to use and be associated with "cool" tools and technology during the Actualisation stage of projects:

Yep. Definitely. Absolutely. Yep. I think in terms of... One of the big things on [Project Name] was the selection of the programming language. And the selection of the programming language driving our ability to recruit software engineers in that discipline. So whilst I think you could have probably argued a number of different ways at the time for more appropriate languages, that certainly was the language of that period. Everybody was programming in that, and if you were a half marketable proper engineer that was the one to have in your cap. And that's what people were coming out of Uni with; that's what they wanted to work on; that's what was cool. So sexy, cool... Very similar. And I think definitely in terms of the weapon system as well, the emerging technology at the time was [Technology Name] which was a much more rich, significant interface between a weapon and the aircraft. And it's exactly seen as that. That's something cool that we can deliver. People will look at that and go wow, that old aircraft has that new capability, that's really something special; as opposed to there's an umbilical with 15 discreet lines that nobody unless they've got a oscilloscope can read these days, as opposed to your Ethernet plug coming out of the aircraft and into the weapon.

**PARTICIPANT 18**

Again, this discussion highlights the importance of decision making enhancing project team members' experience of the project rather than what might have been appropriate for the project itself. Thus, image activities do have an effect on decision making, and as this is an aesthetic concept, the application of aesthetic knowledge by project team members has an impact. This is not necessarily a positive impact; but it is still an impact.

As alluded to previously, the nature of the project itself as an opportunity for project team members to engage in impression management (e.g., the desire to be associated with "sexy" aviation projects) affects decision making processes in projects. Another participant provided additional insight into this process:

So [Project Name 1] and [Project Name 2] have always been...yeah, it's interesting, [Project Name 1] we have always joke internally that [Project Name 1] is the golden child..... and [Project Name 2] has always been the ugly cousin, but for a while there when [Project Type] got pulled off the table..... spotlight really did from politically, media and even internally, everyone started looking at [Project Name 2], and it is interesting you know, you talk about decisions, it was really good nobody was, when we were the ugly cousin, because we were able internally to make decisions, report on those decisions, and keep moving forward, but when [Project Name 1] got stalled, I mean it's now, it's now apex, and that's good, we've got two terminals there, we've gone out for EOI on, yeah but when it was just [Project Name 2], everyone was like what's going on over here, I can't really contribute anymore to [Project Name 1], what's been going on with [Project Name 2], so really it was 3-4 months of briefings internally just to catch everybody up, which was a little frustrating because again it was a big project within the company, but it's good now, everyone's up to speed, and they can participate in the decision making, and be more informed when we actually give them approval requests and whatnot. What was I saying... **PARTICIPANT 8**

The 'sexiness' of the project has an interesting effect on decision making in that it may have the opposite effect to what might be expected. The participant suggests that when the spotlight is not on a project, decision making is fairly straight forward and progresses accordingly. Once the project becomes more prominent, processes are subject to more scrutiny and the image management activities of project team members become more prominent. The projects may also be subject to interference from more senior members of the organisation. Project Name 1 had been the "golden child" or the 'sexy' project and Project Name 2 the "ugly cousin". When one stalled, the focus shifted. According to this participant, this shift actually stalled the decision making process. While the spotlight was off, project team members could just get on with the job. Once that changed, a whole different level of complexity was created, particularly dealing with other members of the project organisation who were now very interested in what was going on. Sexiness (or coolness) is an aesthetic concept (Pountain & Robins, 2000). This aspect of

aesthetics has not been considered previously in relation to its effect on decision making processes in projects.

However, being associated with high profile projects can provide focus and can ease the path through a project. When a project is of major (e.g., international) significance and popular (e.g., the Olympics), project team members remain focused and display a high level of interest in project tasks:

Once we had the actual formal project approval, and we had the 35 odd sub-projects it was reasonably easy to get focus from people, and keep them to the approval and get the actual contracting documents and all those sorts of things developed for this activity. And we streamlined a lot of that, we had templates that we developed and all those sorts of things to make it reasonably easy and again it was that focus, you could focus people in on August 20, 2000 and that's not changing, so we really need to force it. And you know it was sort of...I suppose it was interesting stuff too for people and it was appealing to people being involved with the Olympics even if it was only a very small degree. So those approvals generally flowed pretty well again according to the procedures and policies we had at that point in time... I think also there was that bit of national pride. When you think back running up to the Olympics it was a big thing and justifiably so, and I think a lot of the people involved were motivated by probably 2 factors; 1) it was supporting the Olympics so they were doing their little bit, 2) it was ...most of the subcapabilities were interesting little projects, they managed to progress them reasonably quickly because they had a year or two to do these things, whereas sometimes if you're in a major project, especially in uniform, you might be in a project for 2-3, or 4 years, and not actually see any end product at the end of that unless you happen to be at the right stage of that project, so if you give them some wins and those sorts of things....so I think those things helped progress it. **PARTICIPANT 21**

In this instance, effective decision making was facilitated because of the visibility of the project and the importance of its successful completion. Project team motivation was high, as they felt they were playing a small part in a major national project. Issues such as contracting and approval processes were made straightforward because of the nature of the project and its significance for "national pride".



Participants identified that the culture of a project has a bearing on the impression management concerns of decision makers:

I would say yes, because we're quite hierarchical and bureaucratic and I think a lot of decisions are made because they want to look good. Realistically you've got to know who your audience is and you have to pitch whatever you are doing to that audience for that to be...you're not brown nosing or buttering them up but you've got to understand what they're after, so that's where you might put an aesthetics spin on what you're actually doing, you might say the same thing, but you might say it differently to HasD then you would to your DG, then you would to your boss or to your staff, so you change your message or how you deliver your message, maybe not what you want the message to achieve but how you actually deliver your message, you will change it and I think that's a form of aesthetics in how you deliver. **PARTICIPANT 24**

Because of the cultural of the participant's organisation – that is, hierarchical and bureaucratic – decisions are often made to manage the perceptions of the decision makers among more senior staff. This form of impression management also affects the way in which decisions are communicated to senior staff. The participant suggests that the tailoring of messaging (the “aesthetics spin”) is a key tenet of impression management in relation to decision making in projects.

Participants also discussed the role of ‘saving face’ as an impression management technique in decision making in the Actualisation stage of project:

Really did a pretty poor job of that process. And I really think that the personal opinion of that appointment was more for... to save face, to let him be part of the team and to not make any waves. However it meant in the last week, the two leads, the operator and the commercial leads basically wrote it. **PARTICIPANT 23**

In this example, an inappropriate appointment decision was made to ‘save face’ for a particular team member and to “not make any waves” for the project manager who made the appointment. This meant that this work was not completed by the

appointee and had to be done at the last minute by other staff. This was not an ideal use of time and resources.

The prominence of the aesthetic aspects of the project itself may actually drive perceptions of the importance of the project and, consequently, the extent to which project organisations focus on the completion of the project:

No, never had a failure. When I moved into this aerospace area, I inherited a project that had been trying to get approved for quite some time, and it was a training support device very important, a flight simulator, very important but not actually a nice shiny aeroplane that goes and flies, so a lot of people...it had a second tier aspect to it. **PARTICIPANT 21**

The lack of a “nice shiny aeroplane that goes and flies” limited the project organisation’s focus on the training support device, even though it was still an important piece of equipment that was being developed as part of overall project task. The approval process had stalled because this aspect of the project was not high profile and did not have the same tangible aesthetic qualities as the primary aircraft development section of the project task. This focusing on the “high visibility” aspects of a project and not looking at the entire project in a holistic fashion can lead to a lack of decision making about more mundane issues:

And what’s gone on is that the main game, the high visibility stuff has been on the aircraft. The production is late, the delivery is late, quality is late. Oh let’s all focus on that and let’s all argue about that. And all supporting stuff from outside, scant notice is taken. So it becomes tunnel vision looking at that. And then it’s like so now we’ve got a wonderful airframe but we can’t start it. We need a power cart. Why haven’t we got a power cart? Because nobody has bothered to sort it out. I’m exaggerating for clarity there. **PARTICIPANT 11**

In both of these extracts, focusing on the high profile, ‘sexy’ aspects of the project was problematic. In the first extract, it led to a delay in the development of an important training device; and in the second extract, although the main platform was delivered, it could not be used, because important ancillary items had not been

considered as part of the project. These aspects of the project are certainly not as ‘sexy’ or ‘cool’ as the actual aircraft, but they were necessary for its functioning.

Maintaining positive perceptions among peers and the general public can also be important decision drivers in major projects:

They knew in a modern environment that they needed that sort of capability... East Timor had happened...Electronic warfare was a war fighting right of entry. The Americans had all their aircraft fitted with electronic warfare; we didn’t so we had to do something. The fact that we ended up doing this sort of Taj Mahal approach to electronic warfare one size fits all, bigger than Ben Hur, more than they ever wanted, was the zealotry, the EW community thought they knew better. And we built this... I wish I had an example ...built the Taj Mahal and they wanted was a bloody room in a local hotel because we were... I mean we were zealots. So I think the zealotry. **PARTICIPANT 17**

This extreme version of ‘keeping up with the Jones’s’ on behalf of members of the project team led to the development of a solution that went far beyond what was necessary or sufficient from an operational perspective. This divergence from the requirements of the project proponents ultimately led to a failure of the project. The actions of the project team members represents an almost pathological version of Fine’s (1992) ‘pride’ concept. Concerns about the effects of project decision making on the public perceptions of stakeholders also drive decision making processes in projects:

And it’s probably part of the public perception as well, so the [Project Outcome Name] billion dollar termination, had they spent another billion dollars or two billion dollars trying to get that platform to the point of where it needed to be, it would be interesting to see what the public’s reaction would have been, versus the notion... And it all comes around that sunk cost. So you’ve already invested a billion dollars... And that’s where making the decision as to well how much it is going to cost to go and get another capability versus what I’ve already sunk. **PARTICIPANT 18**

Making decisions on the basis of the perceived public reaction resulted in a significant escalation of commitment to a project that was destined to fail. This

concern about the political fallout from a decision to cancel a project that was bound to fail despite a billion dollar cost to date resulted in a continuing commitment regardless of the known outcome.

*(b) Managers*

Participants suggested that the image of a project has an important effect on a project organisation. Managers are keen to control this effect and to ensure that it is positive. One participant identified that this management process may involve managers stepping in to take control of a project in an attempt to avoid its failure:

This was a mid-sized project, and I think you could say the whole project was a bit of a flop. There was sort of crisis meetings going on, not called crisis meetings obviously but ...it's hard, one way of telling is if you're on a project and then say you've got a manager X one day, and the next day you've got manager Z comes in who is actually considered to be 2-3 levels higher in the organisation, he comes in to try and take control and tries to steer it, and that happened on that one, you had higher level management coming in and trying to steer things to completion and I've seen that happen a couple of times but no, I don't think anything has really been publically characterised as a failure.

**PARTICIPANT 16**

Here, avoiding a "publically characterised" failure was the key aspect of the decision to replace a project manager with a more senior manager in the organisation. Obviously project failures bring with them a number of potential problems (e.g., economic, political, etc.), but the damage to an organisation's image for being associated with a failed project can be considerable (Kanda, 2010). It is the role of managers to protect this image and to make decisions with regards to projects of concern accordingly (cf. Gray & Balmer, 1998).

This desire to protect an image (to 'save face') extends beyond the image of the organisation to the image of managers themselves. This focus can have significant ramifications for an organisation:

Difficulty purely comes from... It isn't the delivery of the outcomes. It's people's careers, it's their legacy. It's all those other things outside of what it's meant to do. It's people's associations and feelings, etc., etc., with them. So there are some classic examples... To be the person that said look it's going to fail so I pulled it, say the department had put something in place, rather than just riding it out and then covering it up and then moving onto my next thing, it's a hard call to make. Because you could actually end your career, he's a person associated with a failure, whether you can deliver it and then if you cover it up well enough, and who's to say otherwise, and you're all friends because your other buddies are the ones that helped you screw it up in other departments or you know private firms etc., and they're like, yeah man we'll just bring you on board and you can come and be a sales guy for us because you are really good at talking crap. Those kinds of things. **PARTICIPANT 15**

This participant suggests that there is such a stigma associated with project failure that managers make decisions to continue with projects even in the face of objective evidence which suggests that a more prudent course of action would be to abandon the project altogether. Ultimately, he argues, concern for personal image and the potential negative career consequences of project failure drive managers' decision making in instances of project problems more than a desire to secure sound outcomes – particularly financial ones – for the organisation.

While an organisation's brand is necessarily linked to its image, it represents a specific aspect of that image: it is a visual representation of the organisation, its goals and its values (Kiel & McColl-Kennedy, 2000). The impact of a project outcome on an organisation's brand was cited by one participant as an important consideration for managers in project decision processes:

“Sexiness” – for the participant, a project is “sexy” if it is for a worthwhile purpose. It is also something that “looks schmick” and which allows his organisation to “tie [it's] own brand image to” it. It is a project that you would like to succeed. It is a project that you are interested in. In terms of decisions, you take more time to make better decisions in these types of projects. **PARTICIPANT 3 [Interview Notes]**

Outcomes which are “sexy” or which “look schmick” command more decision making attention from managers. This participant suggests that better and more considered decisions are made by managers in these instances to enhance the connection between the organisation’s brand and the project outcome. Therefore, projects which have a perceived high aesthetic and image enhancing value attract more interest from stakeholders, and a greater level of focus is placed on decision making because of the potential for image enhancement provided by the project outcome.

*(c) End users*

Participants acknowledged the importance of considering at the Actualisation stage of projects the relationship between the visual aesthetic aspects of an outcome and the image those aspects will portray for end users of the outcome:

Part of it was actually acknowledging the perspective of the users and trying to cater to it, so I mean in terms of aesthetic stuff, if you imagine an Army soldier getting issued a whole lot of stuff one by one by a quartermaster and then seeing a website or a stall run by an arms importer going look at this awesome stuff in this great packaging with these shiny logos on the stuff, that creates an inherent disadvantage to the military stuff, so in terms of user satisfaction, some thought was even put into user presentation, we deliberately bought very sexy assault carrier bags for the stuff to be issued with, in, as a kit, so it looked good. **PARTICIPANT 13**

It is interesting that aesthetic considerations play a role in context of military equipment procurement as this would not, *prima facie*, appear to be a context in which the aesthetic aspects of outcome would be important. However, the participant clearly identifies that for an outcome to be considered a success by end users, its aesthetic aspects must be perceived positively by them, especially in comparison with other available options. To achieve this aim, it is important that project team members apply their aesthetic knowledge to the visual aesthetic of the outcome during the Actualisation stage. This understanding is consistent with Fine’s

(1992) assertion that aesthetic knowledge must be applied to the decisions made about the aesthetic elements of outcomes in instances where those aspects are important to relevant stakeholders.

*(d) Clients*

Participants suggest that decisions made by clients at the Actualisation stage also are influenced by branding considerations:

Some of the things we know and understand, a lot of it's got to... they've sold most of the apartments, so any other developer: "you've sold the damn things. The apartment owner isn't really going to care what colour the lift lobby carpet is because he's already bought the unit." But for them it's all part of their brand and when their investor comes, if he comes out of the lift lobby, "oh hang on." So there's all that... **PARTICIPANT 19**

For some clients, the perception of quality as manifest in the aesthetic presentation of an outcome is inextricably linked to their brand and forms an integral part of their competitive advantage (cf. Witz, et al., 2003). Therefore, decisions about these aesthetic elements are highly important and require the application of aesthetic knowledge to ensure that the decisions match the client's requirements for quality (cf. Fine, 1992).

*(e) External stakeholders*

A concern for image has been evident as a key issue for a number of decision makers at the Actualisation stage, including broader project stakeholders. The concern for image maintenance among stakeholders may result in outcomes which are not beneficial for the project:

Yeah. A lot of issues. There's disquiet and the disquiet has to go to concern and then the concern has to go to no thank you. And then it says no bloody way. That takes time. So the young pilot trying to make this thing land on the thing is unsafe and he'll persevere because of professionalism or pride or whatever. So you add up all that inertia the next thing you get the Chief of the Navy in the [name of capability] case saying this thing is not safe to fly. He doesn't say kill it - not safe to fly. So everybody tries to

fix the not safe to fly thing. Well of course you can't. Then it goes to Government and Government says, oh shit a billion dollars and lose the election and, oh God, newspaper articles and so on and so forth. **PARTICIPANT 17**

This participant highlights a number of stakeholders whose image was affected by this particular project, from the pilot flying the project aircraft through to the Defence Minister and other government officials. In this instance the decision to “kill” the project was delayed despite the objective and known problems with the project outcome for a number of image related reasons – “professionalism or pride” on behalf of the pilot; face-saving on behalf of the Defence Force Chief; and media image maintenance on behalf of the government. Stakeholders’ desire to maintain a positive image directly affected the decision making processes in this example. The decision to maintain the commitment to a project that was obviously a failure was driven by-and-large by a need for stakeholders to save face – either personally or collectively.

Given the political and economic importance of major projects (Chang, et al., 2013; Flyvbjerg, 2014; Flyvbjerg, et al., 2003; Kardes, et al., 2013; Mazur, et al., 2014), it is unsurprising that political considerations relating to image maintenance play a role in decision making during the Actualisation stage of projects. Decisions made on this basis can lead to significant escalation of commitment issues:

Yeah, I guess it was, because it was our frontline aeroplane at the time, it would have had to have from a political point of view, you didn't want to have a lot of jets unserviceable and the issue with the damn thing was it was relatively unserviceable before it had the mods and so the thing was to try and get this modification in so the serviceability went up, that was the promise, and it took us a long time to actually realise that promise. But yes, there were political implications but it was eventually sorted. **PARTICIPANT 10**

In this example, decisions were made to continue with a project on an aircraft platform which was due to be scrapped because of the political implications of *not*



continuing with the project, despite the cost of the project and its ultimate futility. This was linked not only to saving political 'face' but also to an attempt to project an image of capability for the public and potential foes. The project in question was very costly in terms of actual dollars and labour time; and was finalised only a few months before the aircraft was retired from service.

#### **5.1.4 Summary**

Participants identified that visual aesthetic knowledge is used in decision making processes in several ways in the Actualisation stage of projects. Decisions about the visual aesthetic appeal of project outcomes require the application of visual aesthetic knowledge by project team members to ensure the outcomes support the utility and functionality goals of the outcomes. Visual aesthetic knowledge is also applied to project decision making processes to enhance the likelihood that project outcomes are used, purchased or accepted by stakeholders, particularly targeted end users. It is especially important for the ultimate success of outcomes that the visual aesthetic of those outcomes match end user expectations. The aesthetics of outcomes are also used to communicate specific attributes of those outcomes to stakeholders (e.g., the technological advanced nature of the outcome, the broader social goals of a projects, etc.,). Project team members must apply their visual aesthetic knowledge to the aesthetic aspects of the outcome to ensure that this communicative goal is achieved.

Visual aesthetic knowledge has an effect on decision making at the Actualisation stage in other ways. The visual look of an office space has an impact on both the culture of the work team and stakeholder perceptions about the project. Direct visual engagement among project team members and external stakeholders enhances communication, information exchange, and relationship development, which in turn assists effective decision making. Direct engagement with

stakeholders enables team members to recognise and interpret sensory cues through the application of aesthetic knowledge which can assist decision making in areas such as the clients' perceptions of project outcome designs and their level of engagement with the project. This source of information for decision making is not available without this level of sensory engagement. Direct visual engagement also assists in staffing decisions. These are all very important aspect of human decision making processes in project contexts which are not considered sufficiently in the traditional approach to project decision making (cf. Langley, et al., 1995).

Visual aids are another important sensory-based tool used in decision making processes in the Actualisation stage of projects. They are used to clarify project variables and their relationships for project team members; and as a stimulus for project managers' decision making creativity. They are also a key tool for creating shared meaning among project team members; and are employed as a way of managing the complexity associated with mega projects.

Image, and the related processes of impression management, has a particularly important effect on decision making at the Actualisation stage of projects. Project decisions made by project team members are often influenced by the desire both to avoid negative media coverage of projects and project organisations, and to enhance or maintain personal and/or corporate image. This reflects a political aspect to project decision making which is not effectively considered in the current project management literature on decision making (cf. Langley, et al., 1995; Pettigrew, 1973).

Attempts to protect both corporate and personal image also affect managers' decision making process at the Actualisation stage. This may lead to the

downplaying of project failures or, perhaps more disconcertingly, to the escalation of commitment to projects which appear destined to fail. There is also a connection between perceptions of the benefit of a particular project for an organisation's brand and the amount of decision making attention paid by managers to that project. As high profile projects have more senior management attention, one participant maintained that this results in better decision making.

Participants also suggested that end users apply their aesthetic knowledge to judge the aesthetics elements of project outcomes and the relationship between those elements and the personal image. This application affects their decisions about the acceptance of these outcomes. Further, the desire to protect perceptions of personal, corporate, or political image based on the aesthetic understanding of what it is to 'look good' is highlighted by participants as the basis of escalation of commitment decisions in projects when the failure of a project seems likely.

## **5.2 Gut feel**

Concepts relating to the use of gut feel in decision making processes in the Actualisation stage of projects were discussed extensively by participants in their interview responses. To reiterate, gut feel is used to refer to the physical abdominal and related metaphorical manifestations of intuitive, felt meaning derived from sensory based interpretation of phenomena relied upon as a justifiable basis of action (cf. Taylor, 2003). In total, 70 of the 162 interview extracts coded to the Actualisation stage were related to gut feel. These extracts discuss decision making processes about the sensory properties of project outcomes, project processes, concepts related to 'presence' in interpersonal interactions, the assessment of data, routine decision making, and the determination of various forms of 'fit'.

### 5.2.1 Sensory properties of project outcomes

Participants discussed the ways in which gut feel is used in decision making about the actual sensory (i.e., aesthetic) properties of project outcomes at the Actualisation stage of projects. In particular they focused on their perceptions of the ways in which project team members used gut feel to determine end user preferences for the visual aesthetic of project outcomes; to make assessments of the overall aesthetic appeal of project outcomes; and to match project outcomes to end user needs.

Stakeholder(s) Considered	Purpose of Aesthetic Knowledge Use
Project team members	Determination of end user visual aesthetic preferences
	Assessment of overall aesthetic of outcome
	Matching of project outcomes to end user needs

**Table 5.6: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to the sensory properties of project outcomes at the Actualisation stage of mega projects**

#### *(a) Project team members*

Participants suggested that gut feel was applied by project team members to particular properties of project outcomes during the Actualisation stage of projects. For example, one participant identified that decisions about the appearance of a user interface and the likelihood of the success of that appearance, were based on project team members' gut feel about user preferences:

We were talking last week about a project and a particular decision point made around a direction to go for a particular functionality and probably enough to say it's also a graphical news interface, all the data, and we're using some quite complex tracking tools, eye tracking software and all sorts of stuff, the data was suggesting one particular direction; the rest of us, all for whatever reason and we can't explain it, just felt this was a nicer experience, that this was the way to go, don't know why, all the data and all the tools, everything seemed to suggest we should go down this path. So we decided to go down this path and for some reason, and none of us could explain why, but it was clearly the winner, not sure why that one was getting all the votes, but that's the winner. **PARTICIPANT 4**

Perhaps most interestingly, this participant suggests that the gut feel of the project team members was relied on despite objective data suggesting that another interface

would have been more appropriate. This occurred based on their shared felt meaning about the properties of the preferred interface. This collective gut feel had a direct impact on the user interface decision. The fact that the team members knew that the option they chose was “clearly the winner” but could not explain why this was so is a clear indication of the application of tacit knowledge in this process (Nonaka & Takeuchi, 1995; Polanyi, 1967). Given that the decision was explicitly about the look of an interface, and how users were going to relate to that look, it is specifically an example of the tacit application of aesthetic knowledge by project team members.

Participants also discussed the use of gut feel in the context of decision making about the overall aesthetic of a project outcome:

The other decision that is a gut feel decision is the aesthetic of what something’s going to look like; you get guided by the architect; you get guided by the sales person, but that’s probably, that’s inbuilt in us as developers and goes back to the days where I was saying that at 5 years of age I used to study the real estate pages on a Saturday morning. I know what people want if they are in a certain area or whatever so you then make a gut feel decision and something like – if it’s a land subdivision aesthetics play such a little outcome on someone’s decision to buy it, but when you’re building apartments or buildings or whatever then it makes up a huge proportion of what they are. Our [Location name] project was a very distinct architecture, very avant-garde, very different to what had been built over there at the time we were doing stuff, but we made the decision very early to go for the style that we went for because it reflected beach house living and [Location name] living from 40 years before and that became the sales pitch. You remember your holidays when you were a kid, how much more relaxed they were and those sorts of things; so it actually followed the marketing route and was a sales success. **PARTICIPANT 20**

Although this participant identifies the decision about the aesthetic of the outcome as a gut feel decision, it is quite clear from his discussion that these gut feel choices are based on both lived experience and research (cf. Dane & Pratt, 2007; Fernandes & Simon, 1999; Rooney & Schneider, 2005; Simon, 1978). The participant’s experience is evidenced in terms of the decision about the importance of aesthetics

for purchase decisions (i.e., in the case of land sub-division, aesthetics “play such a little outcome” on purchase decisions, whereas with apartment purchases, they are a “huge proportion” of the influences to purchase), and in the discussion of the childhood holiday experience and its influence on both the architectural experience and the relationship to the marketing of the development to prospective buyers. Research is evident in his discussion of his scouring of the real estate pages since he was a child. Both of these phenomena assisted in the development of the tacit aesthetic knowledge required to underpin the gut feel decision (cf. Kahneman & Klein, 2009).

It is important for the success of the project outcome that project team members are attuned to end +user needs and to how properties of the outcome must match these needs. Being attuned in this manner can result in felt meaning-based (gut feel) decisions about the aesthetic and functional aspects of the outcome:

Even though you [the client] like this direction; we really feel your end-customers or end-users need this, want this, must have this. **PARTICIPANT 5**

Importantly, this level of understanding of the end user is of considerable benefit to the client, even if it does contradict their own thoughts about these aspects of the outcomes. Project team members require credibility and effective communication skills to convince clients that their feelings about the outcome accurately reflect the wants and needs of end users based on their professional experience of, and interaction with, end users over time (cf. Fine, 1992).

### **5.2.2 Project processes**

Participants also highlighted the manner in which gut feel is used in relation to decisions made about specific aspects of project processes. In particular, they discussed how gut feel is used to determine the relationship between project

outcomes and broader human values during the project process; to inform the choice of work tools, styles and products used during the process of completing projects; to form and evaluate subcontractor relationships; and to establish project priorities.

Stakeholder(s) Considered	Purpose of Aesthetic Knowledge Use
Project team members	Determination of relationship of project outcomes to broader human values
	Inform choice of work tools, styles, product brands
	Basis of selection of subcontractors
	Establishment of project priorities

**Table 5.7: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to project processes at the Actualisation stage of mega projects**

*(a) Project team members*

Participants identified the impact that gut feel has on decisions made in the Actualisation stage of projects which relate to direct human interaction with the eventual project outcome. Gut feel is often used to make decisions that rely on the experience of human/outcome interaction, particularly in instances where project team members ‘know’ something is right, but do not wish to justify the decision to others:

I mean, it’s not – decision making is not a purely rational decision, how can it be, how can you separate yourself off from those other things? On the other hand, if it’s absolutely limbic and sort of who gives a fuck about what the data says, that’s why I object to the students standing up after lunch, scratching their stomachs and saying I felt like it was a good thing to do. Give me a break. I’m so – look, it’s in me. I mean, it would be a scary world if we made decisions that were unconnected to who we are as human beings; how we feel about others involved; how we empathise with them; and try to project ourselves into their situation; and cut ourselves off from values. Values are highly, surely limbic, they are not sort of – there’s a sense, it’s all in there. These are human decisions and so it’s there. We might take shorthand and say my gut feeling is we ought to do this and that’s like saying, I don’t really want to write out a 5 page explanation of this and balance it up, but equally, it allows us to place – to order our priorities. **PARTICIPANT 14**

This participant clearly acknowledges that sensory elements are important for decision making, especially in cases where a particular project outcome has a direct

human impact. These sensory elements are connected to human values in that the gut feel reflects a belief in how well a particular outcome reflects essential human values. The participant does, however, acknowledge that gut feel cannot always be relied upon – there is a place for data and for rational, cognitive justification; and the experience which underpins a gut feel decision must be domain relevant (cf. Kahneman & Klein, 2009). The appropriateness of the application of the gut feel based knowing is the key issue.

Gut feel is also evident in the decisions project team members make about their preferences for things such as work styles, tools, and product brands. Decisions to adopt these are often made on the basis of gut feel:

Oh well, I used the example [of a gut feel decision] that if we're designing a... I used the example that if it's something that's our bread and butter is designing pipe work to pump water somewhere we would typically go, you know it's just quite common to, we can't analyse every decision that we make it... there's a certain number that we analyse and other ones that just, okay which is the right kind of pump? And you might jot down different options or you might talk to other people, or you might just know that this is the kind I used last time and this is kind I'm going to use next time and yeah you might have your preferred brand I guess, you've got your preferred way of doing your engineering and that's what, to a certain extent, that's what we do at times we go with our, you know whatever we might prefer or other times, cause that's always the quickest way of doing it for us just going with what we prefer... **PARTICIPANT 16**

The participant suggests that while these decisions are often made out of expedience (they are “the quickest way of doing it”), they are nonetheless based on experience (“this is the kind I used last time”) and/or consultation (“you might talk to other people”). Therefore, the felt meaning relied upon is derived not ‘out of nothing’ but via lived experience and communication (Dane & Pratt, 2007; Fernandes & Simon, 1999; Rooney & Schneider, 2005).



Another example of the application of gut feel to decisions made as part of the process of conducting the project at the Actualisation stage is the manner in which subcontractors are selected. One participant suggested that he applies his “tummy rub” (i.e., gut feel) to decisions about choice of subcontractor:

Yeah. I call it the tummy rub and being able to explain some of those decisions is hard and I can't think of an example but 9 times out of 10 your tummy rub's right. So I'm happy to back my judgement on a lot of those issues, not because I think I'm a superstar but just because I've got a level of experience, I'm in a position in an organisation, the organisation trusts me and I've got confidence in the tummy rub. That's born out over years of probably not making decisions that you wish you had have, so you get more confident in your tummy rub (which is my term) and a lot of that's often around a relationship... “I don't know what it is about this contractor, let's pay a little more and go for the other one” now you can do that in an organisation that trusts you once you've proven yourself, and you don't know what it is, it's like “I don't know what it is, I don't like the way he parts his hair, let's just go with this guy”. **PARTICIPANT 19**

The participant suggests that he often relies on his experience and on gut feel approaches when making decisions about engaging in interpersonal relationships with stakeholders (e.g., in this instance, with subcontractors). This is relied upon even when objective criteria such as cost would suggest a different outcome. The participant also clearly identifies the experiential basis of gut feel. This is consistent with the existing literature (cf. Dane & Pratt, 2007; Fernandes & Simon, 1999; Simon, 1978). This is a very important insight in that it clearly identifies that sensory elements play a role even in an industry such as construction, which is not commonly linked with sensory-based elements. This sensory-derived feeling is used in these projects to make decisions either in the face of the rational data or as a basis of choice when the rational data is not providing a clear outcome choice.

Participants suggested that gut feel is also used to determine decision priorities in projects. It is employed to establish what should and should not be the

focus of decision making activity, especially in terms of determining priorities based on what will or will not “hurt” if it is not attended to:

There’s a whole bunch of stuff in there. But I think a lot of people don’t see the hurt of a situation. They don’t see the train wreck down there. Lack of experience or not strategic thinkers don’t know what it is. Whereas I am very good at walking into a situation and, well fuck that’s not going to hurt. But I tell you what, this thing on the side here is going to hurt if you don’t fix that. That’s what I can say about that... So what I do... my experience is sufficient and my desire to make projects well founded in a framework box to make good decisions on key things that are really... and I tell my guys you don’t have to worry about the things that won’t hurt you. What are the things that will hurt you and decide to fix those. And so when I go to... for example that change from the big turret to the small turret was my decision because the guys in the fog of project war couldn’t see their way around it. And I got up one day and said we are changing. How do we do it? Because we just knew that’s what we had to do. **PARTICIPANT 17**

These priority decisions are gut feel decisions because they are based on the project manager’s understanding of “what we had to do”. This understanding is derived from experience and the ability to think holistically (or to be “strategic thinkers” as this participant proposed). This ability enables the participant to focus on what is important – and what needs to be attended to – in a timely fashion to avoid or deal with problematic issues effectively.

### **5.2.3 Presence**

Maintaining sensory presence in interpersonal interactions during the Actualisation stage of projects has emerged as an important theme in the data. In the context of this research, ‘presence’ refers to the maintenance of a level of sensory awareness which enables the detection and subsequent interpretation of sensory (particularly visual and aural) cues provided during direct interpersonal interactions among stakeholders (cf. Klein, et al., 2010; Senge, 2004). Participants discussed how gut feel assisted both their own level of presence and the determination of the presence

of others at the Actualisation stage of projects. In particular, gut feel is used to establish the level of stakeholder engagement with a project; as the basis of ‘situational awareness’; and to enable the understanding of the project organisation, the state of the project, and the nature of project relationships.

Stakeholder(s) Considered	Purpose of Aesthetic Knowledge Use
Project team members	Establish the level of stakeholder engagement with a project
	Basis of situational awareness
	Enables an understanding of the project organisation, the state of the project, and the nature of project relationships

**Table 5.8: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to the interpretation of ‘presence’ at the Actualisation stage of mega projects**

*(a) Project team members*

One way in which participants identified the use of gut feel in decision making in the Actualisation stage of projects is through project team members’ application of this form of aesthetic knowledge to determine level of stakeholder engagement with the project:

Communications and engagement. And it’s not just communications because you can talk about what you want... and if you don’t get the engagement back. We had a meeting yesterday, I don’t mind saying, that we were very disappointed in, on one project, not these two, where we detected a sentiment, a lack of interest. And we thought, oh it’s changed, we were terribly interested previously, they’re now just... now it’s changed for two reasons, they’ve got other things to do, we’re low priority because we were just pushing on. But also there’s been a change in priorities and they will continue with this because they know that they need it for the long term but their short term priorities aren’t the same as it was. **PARTICIPANT**

**17**

This is an important example of presence – that is, sensory ‘being there’ to pick up on sensory cues provided by stakeholders in interpersonal interactions. Sensing the ‘vibe’ of the meeting is vital for determining how engaged stakeholders are. A lack of engagement can have a considerable negative effect on project success (Miller &

Oliver, 2015). Detecting this lack of engagement quickly may limit the potential problems.

Another gut feel related concept mentioned by participants which affects decision making in project contexts is 'situational awareness'. Participants view situational awareness as essentially referring to the application of gut feel to analyse a situation and assess decision and action priorities:

I guess in my role, first and foremost I'm a paramedic which I still... so when I talk about that intuition, that gut instinct that you have, is massive. And you ask any paramedic that's been out there with experience under their belt, and that's the key, the experience is intuition, this experience is the gut feeling that you talk about, it's 99 per cent of your job. Like you can walk into a room and make a pretty close to successful decision on what is happening and why just by looking based on your experience and things like that. **PARTICIPANT 9**

So for me it's... I don't know a clear rule. There's no check list that I go through and say, oh that's interesting, timeline is four out of ten, and the importance is six, oh I need to think about it. It's reaction for me. It's reading the situation and being exposed to knowing I should be paying attention to this decision, or this decision doesn't really matter as long as a decision is made. **PARTICIPANT 23**

Gut feel is used in these instances to make decisions in different contexts based on an awareness (or 'reading') of a particular situation. The participants clearly identify that the ability to make effective gut feel decisions is based on experience, which results in both the ability to determine what is occurring in a particular context and, based on that determination, to react appropriately. Knowing what you should be "paying attention to" is related to being fully sensorially present in a situation, enabling the detection of relevant sensory cues which can assist effective decision making (Dane, 2013; Klein, 2003; Klein, et al., 2010; Senge, 2004).

This type of situational awareness can be particularly important when assessing power relationships in a meeting context:

...but in the calmness of a meeting, those first ten minutes, you can generally get a feel for how confident they introduce themselves and speak during the round table. And if they have a particular topic that they are passionate about and no one else seems keen about anything then that's generally a clue. There are exceptions. I worked with a very senior engineer who didn't say very much, but when he did everyone listened, and they should, because he was brilliant. So you also have to not lose sight of those changes that you can't really read in the first five minutes, you can't get that because they haven't expressed themselves yet. Again there's no check list... I'd be horrible at writing a textbook because I just, yeah, feel it, and I'm not perfect at it by any means. But knowing who has influence in the other team. They might not themselves sign off on the decision but they might make it.

**PARTICIPANT 23**

The ability to “get a feel” as to who are in fact the key decision makers in these contexts is highly important for influencing decision making processes at the Actualisation stage. Armed with this information, communication efforts can be effectively targeted at the stakeholders who make the decisions, thus enhancing the likelihood that the desired decision outcome is achieved.

Participants suggested that being able to attend to and interpret sensory cues provided by various stakeholders (e.g., clients, peers, managers, etc.) impacts significantly on the efficacy of project decision making processes:

And having an understanding of the department and everything, you see where you're at and you understand the dynamics of what really needs to happen to get to the end line. And you have, mentally, an understanding of this is where we are and based on the situation, this is how sticky the situation is. **PARTICIPANT 15**

But again it's having situational awareness of not only the technical and operational aspects but also the human network that goes behind these people and trying to deal with it. But again that's a little bit of knowledge of human nature then overlaying your actual experience of these people over the years. **PARTICIPANT 11**

The participants highlight that maintaining sensory presence in interpersonal interactions assists the understanding of the project organisation, the state of the

project itself, and the various interpersonal relationships which exist within the project. Broadly, it enables the type of situational awareness required for effective decision making to occur in the project context (cf. Klein, et al., 2010). The participants maintain that an understanding of human nature more broadly and of the specific nature of individuals involved in the project, enhances the understanding provided by maintaining sensory presence in interpersonal interactions.

Importantly, being present in an effective manner in an interpersonal interaction situation requires project team members to be fully cognisant of the context, and to attend to and interpret their gut feel responses to sensory cues appropriately:

I think yes in a lot of ways. And just felt right can be taken a few different ways and I suppose the first way that I think about is that a lot of the times when things just felt right it's supported by experience where you've gone through an understanding about having a good context for whether you've been in that situation before, you've had similar environments, or you've got at least the documentation to support you moving forward. And I think it also comes into the environment as well. So like something that just feels right now in a different environment might not just feel right from that point of view. **PARTICIPANT 12**

In this extract, the participant argues that gut feel is highly contextual. What might feel 'right' in one context, may be completely different to what feels 'right' in another. Being aware of the context situation as well as the sensory cues provided from the environment assist project team members to assess appropriate interpretations and responses accordingly (cf. Kahneman & Klein, 2009).

#### **5.2.4 Data assessment**

The nature of mega projects means that participants (as project managers) are faced with decision making contexts which are often characterised either by a challenging amount, or a complete dearth, of relevant data (Flyvbjerg, 2014; Kardes, et al.,

2013). In each instance, an assessment of the data available or missing must be made. Participants suggest that gut feel is used to assist in these assessments in the Actualisation stage of projects. Gut feel is applied by decision makers in a myriad of ways when faced with either the presence or the absence of objective data, namely:

- to assist with strategic decision making in relation to the project;
- as the foundation of decisions which rely on experience;
- when the timeliness of decision making is important; and
- to assess the levels of risk associated with the project at this stage.

Participants considered both project team members and external stakeholders in their discussion of the use of gut feel at the Actualisation stage.

Stakeholder(s) Considered	Purpose of Aesthetic Knowledge Use
Project team members	Basis of judgement calls
	Basis of decisions in the absence of data
	Assist in strategic decision making
	Basis of decisions which rely on experience
	When timely decisions are required
	Risk assessment
External Stakeholders	Basis of decisions in the absence of data

**Table 5.9: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to data assessment at the Actualisation stage of mega projects**

*(a) Project team members*

Participants identified the use of gut feel by project team members when judgement calls were required. Interestingly, it appears gut feel is applied both in instances where objective data exists and when it is absent (cf. Hansen, et al., 2007). When objective data does exist, gut feel responses are used to make judgement decisions on its utility:

I think it's probably fairly fundamental in a lot of decisions, I mean even when you've got the data in front of you, you've still got to make a judgement on that data, whether it's good or not good, so yeah, intuition plays a role. **PARTICIPANT 1**

In instances where there are a lot of options and it is difficult to clearly establish the benefits of various options, judgement is used to choose the option that is felt to add the most value to achieving the desired outcome. These judgement calls require both experience and the ability to recognise that experiences are imperfect. **PARTICIPANT 3 [Interview Notes]**

Again, the ability to utilise gut feel effectively is linked to the experience of the project team member. It is important for the efficacy of the gut feel decision that this experience is directly relatable to the decision at hand (Kahneman & Klein, 2009).

The application of gut feel to judgement calls often occurs in instances where objective data is absent for some reason. For example, it may be applied to decisions where technical approaches are not required or appropriate. Where technical accuracy is not considered important, or an option, gut feel is applied to decision making:

I'm a bit more anal at some times. We like things to be rigorous, we like to check things, it's got to follow a formula, procedures and be technically accurate and that sort of thing whereas in other areas that's not so important; in other areas it might be more about feel and that kind of thing whereas we do tend to have decision making processes based on data. **PARTICIPANT 1**

This is an important extract for highlighting the effect of background on decision making processes. The “we” the participant is referring to is “engineers”. She suggests that engineers have a preference for rigorous procedural approaches to decision making which tend to be highly appropriate for engineering projects, which requires precision to alleviate potential real-world problems (e.g., the collapse of a bridge). The extract does, however, demonstrate that these preferences are not completely inflexible, but are, rather, contextual.

Gut feel is evidenced as the basis of decision making in multiple instances where objective data is unavailable. For example, it is used in situations where it is not really possible to obtain objective data (e.g., decisions about the aesthetics of an



outcome, or in the development of novel technology), or when the possibility of gaining sufficient objective data to assist decision making is questionable:

There's quite a few examples, especially in this current role, especially with those incubator style emerging companies that we are working with. You don't have a lot of information to base your decisions on. And that's lots of different decisions, not just the aesthetic decisions that might be driving it. Quite often you can't verbalise why you want to head in a particular direction, or why you are heading in a particular direction. And we find ourselves in those situations quite often saying 'trust us'. It's a word that is in our vocabulary. It's one I'm not particularly comfortable with, but... I'm sure our clients are even less comfortable with. But it is what it is. And in those situations it is... Especially to a few of us, probably the senior managers in our company, when we are... Because we'd often review these directions.... Often, almost always.... Review these directions before we'd tell a client that this is the direction we want to go in. We all know or agree for some reason that it's right. None of us can verbalise why. **PARTICIPANT 5**

It's really just a gut feel on how you think you should go, should you make a decision with not having all the details, but then when are you going to get all the details? Will it cost more money to get all those details, will it cost more time? And what's the risk...basically do a risk assessment, and what's the risk of going forward with that limited knowledge or information to make the decision and go forward, so there is risk involved there as well, risk and opportunity. **PARTICIPANT 10**

Consistent with the literature about decisions based on tacit knowledge (e.g., Klein, et al., 2010), participants identified that it is difficult to articulate the basis of their gut feel decisions. Of interest in these extracts is one participant's acknowledgement that this tacit basis of agreement can be collective (“[w]e all know or agree for some reason that it's right. None of us can verbalise why”) (cf. Collins, 2007). Also, making a decision on gut feel without data relies on an assessment of the risk of not making a decision versus that of making a decision without objective data; and a cost-benefit analysis of attempting to get objective data versus making a decision in its absence.

Gut feel is also applied to technical and relational decisions in the absence of specific relevant data. Judgement decisions about 'objective' issues such as costings and even engineering matters are often based on what the decision maker feels will work based on past experiences:

Potentially but the thing is a lot of the time is the objective data doesn't really exist in ...in the one I was just talking about, do we ever have hard objective data. I mean there just isn't objective data for the case ...basically what we were doing was putting together a cost estimate... So a lot of our, you know if we are talking about what fee do we go in for, okay so what did we do the last one for? How has the market changed? What are our competitors doing ... so it's really, and when I said, and that's a decision that we look at past experience and then we make I guess inferences and judgements, so I said that. And we also do that a lot in the engineering itself, we can use a lot of work from previous projects, what's worked here, what's worked there and then really pulling it all together. **PARTICIPANT 16**

I think yeah, we do have situations like that come up, you can't have perfect data anyway, you can only make do with what you have done, so you might a concept and at the end of the day you might base it on your gut feel on your experience levels or you talk with other people who might be in the situation...you can do that as well, so sometimes you've just got to make a decision and you live with the consequences. And that's just the way it goes. **PARTICIPANT 24**

So whilst you might have made gut calls, okay we'll do this, one that comes to mind is the original draft that talked about the aircraft needs to be delivered within I think it was 30 days of the agreed delivery date otherwise the [Entity Name] might cancel, I said, no, no we want 5 days on that, so why 5? Why 30? Why 2 or why 20? But when I go forward to the boss I'd be quite happy to say well we picked 5 days because it seems like a reasonable couple of days grace because on the way over it might have a flat tyre or something, I don't know. **PARTICIPANT 21**

Decisions often have to be made in circumstances in which objective data is not "perfect" or simply does not exist. In these cases, employing approaches to decision making based on the rational model is not possible. In such instances, gut feel is relied on (Davey, 1989; Taylor, 2003). When specific objective data is not available, and a decision is required, participants identified that they rely on their "gut calls" of

what seems “reasonable”. Even in organisations which demonstrate a preference for technical and rational approaches to decision making, some gut feel calls are still required in the absence of any data leading towards a specific answer. The ability to make effective judgement calls based on gut feel relies on the embeddedness of the decision maker in the history of the project organisation and its processes, as well other relevant areas such as markets, client relationships, intra-team relationships and end user experiences. Therefore, the experience of decision makers in the particular domain is very important for their ability to make these gut feel judgement calls effectively (cf. Kahneman & Klein, 2009).

The ability to make decisions in the absence of ‘hard’ – that is, ‘objective’ – data is also linked to the ability to think holistically in relation to the project:

Yeah definitely. I always... I rarely will just rely on the facts and data, and if all the facts and data aren't there, then I am comfortable making decisions because I'm generally trying to think more bigger picture, longer term. **PARTICIPANT 18**

There are times, especially in large scale, complex projects where “the facts and data” are simply not available. However, the participant suggests here that as a project manager he “rarely” relies on “the facts and data” as they are in essence meaningless unless considered within the context of the project as a whole (i.e., by focusing on the “bigger picture, longer term”). This requirement for contextualisation provides an important role for the application of aesthetic knowledge in the Kantian sense to enable the project manager to interpret the information provided by effectively connecting it to the overall goals and timeframes of the project (cf. de Montoux, 2007).

Consistent with the literature on decision making (e.g., Buchanan & O'Connell, 2006; Dane & Pratt, 2007; Shapiro & Spence, 1997), participants identified that gut feel decisions are often made at the strategic level:

Well I think most of the decisions are soft. So we don't need data. We just need to realise the situation we are in. That A we're not engaged, or B we don't have the training skills. Like I don't need to know that I've got a lack of experience in the team to know that I've got buy in a contractor for example. It's not often you need data to make a strategic decision. Yes, intuition. That's what a good project director I think has and experience, backed up by experience. **PARTICIPANT 17**

For this participant, strategic decisions are intuitive and are based primarily on a project manager's relevant experience. He also suggests that "soft" – that is,, non-technical – decisions are often based on gut feel primarily because they are not technical decisions and therefore are not required to be based on 'hard' data.

Even when organisations have a preference for data-driven decision making, project managers often rely on gut feel in project decision making processes:

No. I like data but I seem to not need it. But in doing so, the decisions to me are so obvious I don't need data. And the accepting that you are accountable for that decision is part and parcel of that. I will wear the hurt if it goes pear shaped. To date I've made plenty of decisions that have gone pear shaped including continuing on with that project at the time. But that was almost a collective zealotry decision. I didn't go up one day and say they're not going to take it but we are going to charge forward. But other decisions, if you make them at the strategic level you really don't need data I find. But at the more nuanced decisions, things that you are going to buy you 5% efficiency here or a couple of month's early delivery or if you do that, you better mitigate that because that's going to hurt. Those ones, you probably do need more data. Surprisingly even though we're one of Australia's biggest project management organisations and we don't have much data to make decisions on a lot of the time. **PARTICIPANT 17**

This participant suggests that despite his preference for data, he does not often require is for his decisions because "the decisions to me are so obvious". This is linked to his domain level experience and, as he identifies, the fact that he is

generally making more strategic decisions, which tend to be more intuitively based (Buchanan & O'Connell, 2006; Dane & Pratt, 2007; Shapiro & Spence, 1997). He also maintains that accepting accountability for decisions is a key aspect of making decisions in circumstances where objective data is absent. Most interestingly, he identifies that “even though we’re one of Australia’s biggest project management organisations... we don’t have much data to make decisions on a lot of the time”. This makes a study such as this vitally important. The literature suggests that rational decision making models, which are the basis of perceived legitimate approaches to decision making in organisational context (cf. Cabantous & Gond, 2011), require objective data to function effectively. It is important that decision making where such data is absent is examined to explain how it occurs.

Participants suggested that gut feel was relied upon when decision making timeframes are limited. This is consistent with the literature on intuitive decision making processes which rely on the application of tacit knowledge (e.g., Agor, 1986; Bennett, 1998; Burke & Miller, 1999; Coget, et al., 2011; Dane & Pratt, 2007; Shapiro & Spence, 1997; Simon, 1993). In some instances decisions need to be made in a timely fashion – time is ‘of the essence’. In these cases, even if it is warranted, there is often not time to perform extensive analysis. Project managers apply gut feel in these situations:

Probably the times that I have made decisions where it was on your feet and you had to go quickly was the Cairns project. During construction of that – after all the drama and even during the drama – everything was time critical; so in those 2 weeks you just had to pick prices and do that and do this so asking a lot of people what prices we were going to be at and asking the locals what are you going to pay – bang, bang, bang – 350 is the sale price, here we go – that was something we’d collaborate and get going so the success of that project was quick decisions, couldn’t wait, couldn’t do anything, so there were probably times in there that decisions were made probably with the motivating factor of

getting on and doing stuff is better than waiting; so the decision normally took the path of we are moving forward; we're on a win anyway. If it's a wrong decision it might cost a little bit of money, but delaying is probably going to cost a lot more money. So that's probably different to every other project we've done. Every other project you do get time to make those decisions.

**PARTICIPANT 20**

I think a lot of the times as well... when things are very busy and the amount time to spend on detail in some areas that could also impact on things feeling right or not. So if things are busy that you don't have the time to actually look into and provide the evidence that you might fall back on your experience or feeling right rather than actually sort of trying to line up all the evidence to support those conclusions. **PARTICIPANT 12**

Again, although these decisions are based on gut feel, the participants clearly identify the experiential basis of this form of aesthetic knowledge. This is consistent with the literature which discusses the bases of aesthetic knowledge (e.g., Bourdieu, 1984; Davey, 1989; Ewenstein & Whyte, 2007; Reich, 1993; Strati, 2003; Warren, 2008; Whitfield, 2005) . For these gut feel decisions to be effective, they must be based on relevant experience (Kahneman & Klein, 2009; Simon, 1978). This experience is generally specific to a domain, but it may also be broader depending on the nature of the decision being made.

Participants identified that gut feel is used by project managers when assessing certain aspects of risk associated with a project. For example, when estimating risk, managers interpret the felt meaning of their level of 'comfort' as an indicator of the level of risk:

Personal and professional... absolutely. it's everything that I based decisions on, it's my experience level, what decisions I'm comfortable making, what decisions I go for advice on, and what review level I require. If I'm delivering something to a client, I might be perfectly happy with it, I might have an appreciation of what kinds of risks are involved, I don't feel like I need to be reviewed, it does ultimately get reviewed but I can push that different ways depending on how much review I want or how much ....so if it's a big one, it's just how comfortable people feel with it, how ....you know, if you've seen the ultimate outcome of

what happens with your work, then that's a big one, and you get an appreciation of you are within your bounds of risk management, of when not. **PARTICIPANT 16**

Whether it was good or bad, he didn't know or care. He just needed to make sure that I felt comfortable, or I didn't feel comfortable that we were on the right track. And I guess he would be able to read me and I'd go, yeah I'm a bit nervous about this, ok let's talk about that for a little bit longer. And he'd be able to get that from me even if it wasn't volunteered. So with him managing my team on that project it was making sure everyone has got something to do. **PARTICIPANT 23**

Decision makers will feel more 'comfortable' with some decisions than others. This is a felt meaning (gut feel) response to a risk assessment which affects the decision as to whether or not they will undertake a certain activity. This assessment of risk provides a direct link between felt meaning and justifiable bases of action. Gut feel assessments of levels of comfort with action options are derived from the experiential knowledge of the manager in relation to their professional history and competency.

Often, gut feel assessments of risk are the only ones available to project managers, especially in complex situations where the outcomes of particular action options are unknowable, for example, because there is no precedent – such as in the case of completely innovative technology – or because of extended time frames:

We make it as hard as we can, but to the extent we can't and often you can't, especially with long term fuzzy risks, it's as much in your head as possible. To a great extent, I think emotions and gut feelings kind of influence it, possibly more than they should. Because a lot of it is just what risk you are comfortable with, and what risk you aren't comfortable with. So I mean culturally for instance we are very, very gun-shy about the level of risk we'll accept a contractor absolving themselves of...and that's in the sense of if a major strategic program goes horribly wrong, they could in theory be billions in liability which could bankrupt a small-to-medium company, or even a reasonably large one. Companies are usually fairly gun-shy about the level of liability that they are willing to expose themselves to; we in theory as a huge principal could take on more risk than we do, and we do take on a fair bit, we're not total bastards, and

probably that's for cost savings but culturally and for central policy reasons, we are very reluctant to.... there's risk that you are comfortable with, and risks that you aren't. And that colours your decision making more than I think it should.

**PARTICIPANT 13**

This participant identifies that the culture of the organisation “colours” the gut feel responses to the levels of risk decision makers are willing to accept. In his opinion, his organisation is culturally risk adverse, looking to divest itself of risk wherever possible. This risk aversion affects individual decision makers approaches to risk assessments, especially in terms of “long term fuzzy risk” which apply more on comfort assessments (i.e., felt meaning/gut feel) than on objective, cognitive assessments.

*(b) External stakeholders*

Participants provided instances of when gut feel was employed by stakeholders to make decisions at the Actualisation stage in the absence objective data. For example, gut feel is seen as important in situations when quantification is not possible or appropriate:

We so often fail to get the right decision because there are some things we cannot quantify which ought to be taken as more important. They get reflected as gut feeling or whatever.

**PARTICIPANT 14**

For this participant, decisions need to be made about certain aspects of projects (e.g., the aesthetics of design) that are unquantifiable. In these instances, gut feel is relied upon. Approaching decision making about such aspects from a rational perspective involving quantification results in a failure to “get the right decision”. In these instances, non-rational decision making approaches are appropriate (cf. Davey, 1989).



Moreover, in some instances, objective data simply may not exist or might not be practical to gather. In these cases, stakeholders often rely on gut feel to make a decision:

So it's a bit of a parametric type approach... we've looked at what's happened in the past, so again a parametric historic review, gut feel like. The tenth element of project management is hope! **PARTICIPANT 10**

Here, the participant identifies that stakeholders rely on their experientially-derived knowledge of similar situations to arrive at a gut feel decision (cf. Dane & Pratt, 2007; Kahneman & Klein, 2009; Simon, 1978). While he acknowledges that this may be a process relying on “hope”, the relevant decisions that are made are based on stakeholders’ historical experience of “what’s happened in the past”. The gut feel reaction occurs when a particular action option resonates positively with stakeholders’ previous experience (cf. Agor, 1986; Hansen, et al., 2007).

### 5.2.5 Routine decision making

Participants identified that routine decision making at the Actualisation stage of projects is based primarily on gut feel. These decisions are characterised by an absence of rigour and in-depth analysis, and are made based on experience of similar situations and the resultant acquired tacit domain and processual knowledge (cf. Fox, 1998). Gut feel is employed to assist the making of non-significant project decisions; and the ability to employ it effectively is often derived from extensive training in a particular field.

Stakeholder(s) Considered	Purpose of Aesthetic Knowledge Use
Project team members	Basis of non-significant project decisions
	Application of knowledge gained via training

**Table 5.10: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to routine decision making processes at the Actualisation stage of mega projects**

*(a) Project team members*

Participants identified that gut feel is often used at the Actualisations stage as the basis for decisions which would not have a significant impact on the project. These included day-to-day management decisions:

I would think the vast majority of decisions that I've made have felt right. Many of those you can support with some sort of rational thinking; a few of those were probably more subjective, gut feeling type solutions. I think generally the significant decisions are reasonably well thought through, reasonably well debated, reasonably well supported by some sort of logic. It's probably more the day-to-day management ones that perhaps have less rigour to them, more around about keeping the thing progressing, those sorts of things. **PARTICIPANT 21**

For this participant, most significant decisions are “rational” and are “well supported by some sort of logic”. It is the routine management decisions required to keep “the thing progressing” that are based on gut feel. This participant suggests elsewhere that the structure, processes, and culture of his organisation leave little room for gut-based decision making in any instance except for routine decision making.

Training also plays a role in the ability of project managers to apply gut feel to routine decisions. The application of the tacit knowledge gained through training enables effective routine decisions to be made when the training is applicable to the decision making context (cf. Dane & Pratt, 2007; Fernandes & Simon, 1999; Kahneman & Klein, 2009):

Yeah just do shit based on your gut feel because that's what you're trained for. **PARTICIPANT 11**

Effective training results in the ability of decision makers to apply gut feel to make decisions in routine circumstances without extensive analysis of those decisions. The training experiences result in the ability to make intuitive decisions that ‘feel right’ because the current circumstances relate to those experienced during the training situation. This is the theoretical basis of all training – repeated exposure to

particular circumstances results in the replication of correct actions in similar future circumstances (Fernandes & Simon, 1999).

### 5.2.6 Fit

The Kantian concept of the role of aesthetic knowledge in determining ‘fit’ is evident in the gut feel decisions project team members make. To reiterate, de Montoux (2007, p. 133) suggests that Kant argues that for effective decision making to occur, the decision maker must have a concept of coherence or harmony, as “[w]ithout this faculty the world becomes a chaotic mess of facts and data that don’t fit together and lack meaning and structure”. Participants highlight the use of gut feel in decisions making processes at the Actualisation stage of projects as the means through which decision makers determine this sense of ‘fit’. Gut feel is used to determine the ‘fit’ of project aspects such as supplier relationships and project resources inputs; as the basis of the assessment of person/job fit; to determine whether data about the project meets their expectations derived from experience and the project’s strategic objectives; to determine the level of compatibility among stakeholders; and to establish the plausibility of data presented as ‘objective’.

Stakeholder(s) Considered	Purpose of Aesthetic Knowledge Use
Project team members	Assessment of relationships and project resource inputs
	Assessment of person/job fit
	Assessment of relationship between objective data and expectations/strategic objectives
	Determination of stakeholder goal compatibility
	Plausibility check

**Table 5.11: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to project processes at the Actualisation stage of mega projects**

#### *(a) Project team members*

Participants indicated that they rely on gut feel to make decisions about ‘fit’ in a number of different ways at the Actualisation stage of projects. For example, decisions about the connections between aspects of projects such as supplier

relationships and specific resources employed are based on gut feel assessments of how well these aspects ‘fit’ with the project organisation or desired outcome:

Engineering specific I think we tend to use things that we have a good emotional fit with; we will specify a certain manufacturer of pump, or a certain type of pump; that’s one of the things that we do. There is a decision there based on our past experience with that brand, or we’ll specify a certain material. I mean that’s what we’re trained to do based on our training and past experiences. And then we have to make calls. **PARTICIPANT 16**

The concept of ‘fit’ as discussed by this participant essentially describes project team members’ perceptions of objects based on their past experience of, and interaction with, them. The assessment of fit for this participant is based on the positive previous experience gained with an object or supplier.

Another key area in which gut feel is applied is in determining person/job fit when assessing the team members required fulfilling specific roles in the project:

Yes. But I think the two people that I chose were the right people. It just felt intuitively right. Yep. Technically speaking there probably could have been better people put on, but it was a combination of many other factors rather than just the technical competence. **PARTICIPANT 22**

We do have a lot of decisions that are made that are gut feel decisions and that’s probably more around the consultant teams that we pick. Who has performed, who has experience, whatever, again, a list of parameters, list of criteria to tick off to go okay because they are the foot soldiers that are out doing the work so you have to pick them well. If you pick the wrong one of those you’re still going to get an outcome, you’re going to get 98 per cent, not a hundred per cent and it’s not critical; it’s not going to cause the project to stuff around. **PARTICIPANT 20**

Yes definitely, more related around decisions on sending people overseas and getting them involved in tasks. There was a recent case where the particular person we were sending to Turkey, it’s a bloody long way to get to Turkey from here, he doesn’t really travel all that well, and my gut feeling was that we shouldn’t have sent him, but it was he’s part of the team, we had no back up and as it turned out he had an issue, a medical condition, blah, blah, blah, and yeah, he spent most of the time there in hospital and then we almost had to medivac him back, so yeah, it’s that sort of thing that at the time you know you’re making the wrong decision

but you do it for the good of the program and then as it turns out, you shouldn't have made that decision, because it didn't help the program at all, it hindered it, and it's amazing what that gut feeling is, whatever that is. **PARTICIPANT 10**

Decisions are made intuitively about the 'right' people to fulfil specific positions.

Project managers adopt a holistic approach to these types of decisions, and do not base them assessments of technical competency alone. Felt meaning judgements of other factors such as communication skills; personality; understanding of physical, social, and cultural contexts and stakeholder relationships are equally important in determining fit.

Gut feel also affects strategic decision making at the Actualisation stage of projects. In particular, gut feel is applied to assessments of objective data/facts to see if they fit participants' expectations and the project's strategic objectives:

And it depends on the type of decision maker you are, whether you do rely a lot on facts and data, or whether you take a more holistic approach. And certainly when the facts and data or the more strategic outcomes align with your expectations, then the decisions generally feel like they are the right decisions to make. **PARTICIPANT 18**

It's often hard to identify when the actual decision's made. Certainly, internally to my own brain and maybe unofficially, there's been decisions made which just make total sense and very intuitive and I guess, I can easily think of a couple now. One very recently and it's a decision that's been in the process of being made to some extent over the last 3 or 4 months, and it's still not finalised yet. But I guess what happened was, very early on it was like, that's a good fit, let's do that and now we are going through the process of continuously checking that assumption and working that through, what it all means. That was one where it just makes a lot of sense to a lot of people and it's really become the null hypothesis. It will take real evidence to dissuade us, I think, me personally included. **PARTICIPANT 7**

Making decisions feels 'right' when there is an alignment (fit) between the data, strategic objectives, and expectations. This is a holistic approach that goes beyond

the data itself and which is linked to the experience and decision making process preferences of the decision maker.

A lack of fit within a project was highlighted by participants as problematic. One participant discussed the outcome of a gut feel realisation of a lack of alignment or fit between client and project team goals:

And we were not exposed to... there was a double sided... they'd come to meetings and be adequate enough and then go home and plot. So the plotters. There was not wanting to believe, there was the arrogance thing that we knew better. But eventually the penny would drop, and that's a good saying for this. When you find out... and I can remember clearly today when I turned to the guy that walked in there and went, they're going to kill us. The penny will drop, we're screwed here. And what's wrong with that is you need to be a champion for your projects but you're doing it for them. To have the arrogance that we had, it's all about EW when it's really not it's about them coming home after a flight. Misaligned expectations. And then we accepted it because I think we were out on a ledge and we knew the divergence was happening and the lack of engagement. Ok, so, how to we make the best out of this, how do we recover most out of the project? How do we waste least? How do we get something out of what we've done? And we start working with them. And that's what happened. In fact towards the end of the project we were doing joint submissions to Government. So helping them get the business case to kill us. **PARTICIPANT 17**

In this example, the application of gut feel through meeting presence resulted in the decision to end a project, based on the realisation of a misalignment between project team and client goals. Unfortunately, this sensory presence was too late. Had the project manager been more present earlier, the warning signs might have been detected more effectively and earlier remedial action may have been implemented:

But emergence I think ...the life cycle of projects is such that time is our enemy sometimes. And of course when you're running late and also when you are not smart about what you are doing. That's the other thing that killed us. We were so arrogant on this project that we thought that EW would be enough to get it through. But it came with costs and the costs were significant to an operator that we undervalued and we weren't reading the warning signs. And we were imposing ourselves on an operator at great penalty they didn't have total buy in to the capability. So for us, it was all plus.

For them it was all minus. And it wasn't going to happen. We were totally misaligned at the end, totally. **PARTICIPANT 17**

The participant acknowledges that a mixture of time constraints, arrogance, and a misunderstanding of the level of importance of the project to the client resulted in a lack of presence in direct interpersonal interactions. This meant that sensory cues provided by the client were not attended to or interpreted correctly, that is, “we weren't reading the warning signs”. This led to a total lack of alignment between the project and client goals, and ultimately, the failure of the project.

Using gut feel to identify a lack of fit may have less dramatic, yet nonetheless important, consequences:

This response was made in the context of engineer trade studies. These studies use complex criteria to evaluate products and suppliers and to arrive at a “number at the end”. On several occasions the participant has “intuitively” known that the numbers he has been presented with have been “contrived”.  
**PARTICIPANT 3 [interview Notes]**

In this example, the participant applied his experiential domain knowledge, and then meta-aesthetic knowledge in a Kantian sense (de Montoux, 2007), to determine that the outcome presented as a rational, objective solution did not fit the reality of the situation. Both knowledge types are based on the participant's experience of engineer trade studies and the likely outcome of these studies.

### **5.2.7 Summary**

Participants recognised many ways in which gut feel is used in decision making processes at the Actualisation stage. Gut feel is relied on by project team members to determine how the visual aesthetic appeal of project outcomes matches the aesthetic requirements of end users, and in their assessment of the overall aesthetic

properties of project outcomes. It is also used by project team members to ensure that project outcomes match stakeholder needs, especially the needs of end users<sup>27</sup>.

Gut feel is also applied to decisions relating to project processes. It is used when project team members assess the relationship between project outcomes and broader human values. It also informs choice of work tools and styles, and the use of particular products as project inputs. Gut feel is relied on by project managers throughout the project process to assess the nature and value of interpersonal relationship (e.g., with subcontractors) and to determine decision priorities. Participants suggested that gut feel is used by project team members as the basis of their 'situational awareness'. This in turn enables them to appraise levels of stakeholder engagement with a project and facilitates an understanding of the project organisation, the current state of a project, and the nature and functionality of project relationships.

Gut feel functions in several important ways in the assessment of data by both project team members and external stakeholders at the Actualisation stage of projects. In the absence of objective data, it is used as the basis of judgement, where multiple 'objective' action options exist (cf. Davey, 1989), and when timely decisions are required. It is also often relied upon even when objective data does exist. This challenges the rational approach to decision making (cf. March, 1994, 1997; Simon, 1957, 1979) which dominates decision making approaches in the project management context.

The use of gut feel by project managers is also evident in their strategic decision making at the Actualisation stage. Further, consistent with its use by other

---

<sup>27</sup> Cf. Muller and Turner's (2010) discussion of project success criteria.



decision makers in the other project stages, project managers apply their gut feel to the assessment of the level of risk associated with projects. A key understanding provided by participants is that the effective use of gut feel relies on decision makers having relevant experience in terms of the content and context of the decision required (cf. Kahneman & Klein, 2009).

Participants suggested that gut feel is the basis of routine decisions made by project managers which rely on experience and the tacit application of domain and other knowledges. The ability to apply gut feeling in this manner is related to the training the project manager has received.

Finally, gut feel is often used to determine the level of fit between various project inputs and the project organisation and project goals. It is also used as the basis of assessing 'fit' in other ways within a project at the Actualisation stage, including person/job fit, and fit (or lack thereof) between data and expectations and project objectives. Project managers often use it as a means of checking the plausibility of objective data presented to them.

### **5.3 Key insights from other aesthetic knowledge types**

Despite the majority of interview extracts discussing the Actualisation stage of projects focusing on the actual use of both visual aesthetic knowledge and gut feel, participants did provide interesting perspectives on the use of other forms of aesthetic knowledge in decision making processes at this stage. Their discussions included the use of both aural and tactile aesthetic knowledge, and the metaphorical use of visual and tactile aesthetic knowledge concepts, in these decision making processes. This section considered each of these aesthetic knowledge types in terms

of the focus of their use; the stakeholders considered by participants in the discussion of their use; and the purpose of their use.

Aesthetic Knowledge Type	Focus of Use	Stakeholders Considered
Visual	Metaphoric	Project team members
Aural	Aural aesthetic of proposed project outcomes	Project team members, end users
	Aural aspects of decision making	Project team members, clients, managers
Tactile	Tactile aesthetic of proposed project outcomes	Project team members, end users
	Tactile aspects of decision making	Project team members
	Metaphoric	Project team members

**Table 5.12: Summary of aesthetic knowledge types beyond visual aesthetic knowledge and ‘gut feel’ used in decision making processes at the Actualisation stage of projects, the focus of their use, and the stakeholders considered by participants in their discussion of the use of these types of aesthetic knowledge**

### 5.3.1 Aural aesthetic knowledge

#### *(a) Aural aesthetic of proposed project outcomes*

Although there is limited reflection on the aesthetic aspects of outcomes by participants outside of the visual aesthetic, the use of aural aesthetic knowledge was identified as important in eleven (11) interview extracts in total. For example, the use of aural aesthetic knowledge was perceived as particularly essential for effective decision making in the development of simulated environments:

They basically provided the simulator and for the Wedgetail, if you walk into the simulator it looks like a Wedgetail so where the aeroplane has been changed with all the military specific equipment, like air-to-air refuelling, so there’s extra switches and stuff in the cockpit, electronic warfare, extra switches and sounds and alarms and lights and things in the cockpit, all those things are put into the simulator to satisfy the spec. **PARTICIPANT 6**<sup>28</sup>

It is important for the success of a simulated environment project outcome that it actually represents the ‘real’ environment. This includes end users’ aural experiences (e.g., “sounds and alarms”) of the simulated environment. For project

---

<sup>28</sup> It is important to highlight that this extract also has implications for the application of visual and tactile aesthetic knowledges, in addition to aural aesthetic knowledge, at the Actualisation stage of mega projects. Participants’ discussions of the use of multiple examples of aesthetic knowledge types in particular decision making processes are examined in Chapter 8.

team members to ensure that this occurs, it is necessary during the Actualisation stage of projects to gather aural aesthetic knowledge about the ‘real’ environment which can be interpreted and applied to the project. This ensures that effective decisions are made about the aural experience of the simulated environment.

*(b) Aural aspects of decision making*

Participants suggested that listening is important during the Actualisation stage, especially when engaged in direct interpersonal interactions with clients. They stressed the need to listen carefully to the aural sensory cues provided by clients in meeting contexts, and not just to the content of the conversations. This assists project team members to judge whether or not the project is on track from the perspective of the clients, and to adapt decision making processes accordingly if changes are required:

It’s often one little sigh that a client gives when they’re reviewing something, that many people miss, that is the key ingredient to the entire two hours you’ve spent with them... You need to be able to pick up on those things; your radar needs to be really strong. **PARTICIPANT 4**

This participant identifies the importance of project team members maintaining a sensory presence (cf. Senge, 2004) in meeting situations to enable the detection of sensory cues, even minor aural (e.g., “one little sigh”) ones. These split-second cues can be the key to understanding the meaning of an entire meeting (“the entire two hours you’ve spent with them”). Failing to maintain this level of presence can lead to problematic outcomes (even in terms of time and cost) if the essential point of the meeting is missed due to inattention to the sensory cues provided by clients.

Listening is also an essential way for project team members to gain information during the Actualisation stage:

Always we had a weekly meeting where everybody...finance manager, commercial manager, everybody came in, heard what

was happening, summarised the week, looked at the week in front. It was good. **PARTICIPANT 2**

Physically interacting in meetings with the entire project team enables individual members to listen to, and be “heard” by, other team members as an effective means of keeping up-to-date on project progress. Effective sensory presence is required for this interaction process to be effective.

Maintaining sensory engagement in meeting contexts via effective listening is also important for determining the level of stakeholder engagement with a project:

If people get engaged and are vocal and have an opinion and argue with you at least you know you’ve got someone there.  
**PARTICIPANT 17**

Listening to the level and enthusiasm of stakeholder participation in meetings enables project team members to assess the level of stakeholder engagement with the project and to make effective decisions about that level of engagement. This assessment is particularly important as a lack of stakeholder engagement with a project can have serious consequences, including – potentially – the failure of the project (Johansen, Eik-Andresen, & Ekambaram, 2014).

Listening to the vocal tone used by project team members during direct interpersonal interactions is also necessary for project managers to ensure that effective decision making occurs during the Actualisation stage of projects.

Detecting cues provided through vocal tone which indicate that problems exist enables project managers to take corrective action in a timely manner:

You’ve just got to remember to do it. There’s no tick sheet, there’s no ... I mean again you have your plan but you can’t plan to the nth degree. You just need to know that the last time I spoke to Doug he sounded a bit put out so I probably need to give him another call to make sure... It’s just sense and act.  
**PARTICIPANT 11**

Here, the participant acknowledges the importance of attending to sensory cues provided by team members (i.e., in this instance, the aural sensory cue which suggested that the team member “sounded a bit put out”), and acting on those cues as an adjunct to extensive project planning. Although planning is important in large scale and complex projects, the need to be attentive to sensory information and to act in relation to the sensory cues provided by project team members (“sense and act”) is equally important to ensure that the project remains on course.

Effective listening involves the interpretation and evaluation of aural sensory input (Jones, 1986). Participants suggested that listening to information provided by knowledgeable and trusted others increases the knowledge base on which decisions are made and provides a useful (and often vital) way to gain access to different perspectives on the issues requiring decisions from project managers:

I use my husband as a sounding board, so I've got a lot of respect for him, so we use each other as a sounding board. I know he won't bullshit to me, he won't help me, or tell me what decisions to make, but he'll say have you thought of this, if I've missed something; just different viewpoints to have a look at.

**PARTICIPANT 24**

For this participant, the perspective of her husband as a trusted other is important for her decision making process. She uses him as a “sounding board” for her ideas, and as a source for different perspectives on the issue at hand. The participant continues by highlighting the important role played by listening to her project team members when engaged in project decision making processes:

I'm a collaborative decision maker and sometimes that can be viewed quite negatively as people will go, oh you can't make a decision by yourself but I generally believe if I involve my team in what has to happen I get the best buy in to it, so I will sit down and I'm quite democratic, I'll listen to my team and get their input because I think different viewpoints help, and it just broadens your experience. **PARTICIPANT 24**

In this discussion, the participant identifies that listening to project team members not only increases their “buy in” with regard to the decision making process, but it also allows access to broader experiences and viewpoints. The importance of this access is that it enables multiple perspectives to be considered as part of the decision making process. This may lead in turn to more effective decision making as it increases the likelihood that relevant experience and knowledge will be drawn upon when making project decisions.

Interestingly, participants also identified that the *limiting* of aural sensory input plays a significant role in their decision making processes. The need for “quiet” to enable thought was particularly important:

Yeah, sometimes I go for a bit of a jog and stuff but then shortly after I think about how to breathe. So yeah I ... sometimes a quiet moment sometimes some quiet music, sometimes... enough to unplug a little bit enough to let my subconscious work.

**PARTICIPANT 23**

When it’s a complex set of drivers that might feed the decision, I find... And this might be a generational thing, I’m not getting any younger... I find I need a little bit of quiet space.

**PARTICIPANT 5**

The removal of aural stimuli provides the participants with the opportunity to “breathe” and to focus on the “complex set of drivers that might feed the decision”. This focus allows “subconscious work”. This subconscious activity is the space in which the Kantian perspective of the role of aesthetic knowledge suggests the tacit connecting of disparate ideas occurs which results in the formation of an holistic and effective response to the matter at hand (de Montoux, 2007).

Listening involves the careful attention to aural cues provided in the decision making environment. In the case of managers and their decision making processes in

a project context, one participant identified the importance of listening for collaborative decision making at the Actualisation stage of a project:

I think there's pretty good collaboration, I mean I think I work in a place where executives definitely listen to what I've got to say, they might have their own conversations and then we make a combined choice. **PARTICIPANT 16**

In this instance, the participant recognises that managers listen to the arguments that he as a project manager puts forwards regarding action options at the Actualisation stage. He believes that he has effective input into decision making in his organisation because he is listened to by his managers. This listening results in collaborative "combined" decisions.

For managers, listening to *how* a message is being delivered as well as to *what* message is being conveyed also plays a role in decision making at the Actualisation stage of projects. One participant suggested that the way in which a message is aurally portrayed to managers affects their action option choice if they are paying attention to the sensory cues present in the decision making environment:

And you try to make it sound... make it that they have to make a decision because next week it's actually not going to be easier, it's going to be harder. So I try to make them realise the situation they're in is actually better than the situation they're going to be in down the track. **PARTICIPANT 15**

Here, the participant is using the term 'sound' both literally and metaphorically. The sound of the tone of voice used by the participant to convey a message about a project decision to his managers is produced in such a way as to make the need for a decision imperative to avoid further problems in the future. It is also used in a metaphorical sense to refer to the structure of the content of the message. Again, the purpose is to create an urgent impetus to make a decision.

### 5.3.2 Tactile aesthetic knowledge

#### *(a) Tactile aesthetic of proposed project outcomes*

The use of tactile aesthetic knowledge in decision making processes at the Actualisation stage was discussed in nine (9) interview extracts in total. For example, participants suggested that, in some instances, it is important for the success of a project outcome that project team members actually physically engage with the outcome as it develops through the Actualisation stage of the project:

But for us we don't always go there and touch it, you know if we are on a project team you might have 5% of the project team go to site and touch whatever is ultimately done, so I guess you've gotta... I don't know it's definitely important the aesthetics, essentially the feel of it are very important. **PARTICIPANT 16**

This participant was discussing project outcomes in the context of major engineering projects. He suggests that it is important for the success of projects for at least a proportion of the project team to engage directly with the physical manifestation of a project so that they “touch” it. Coming into direct physical contact with the outcome enables a vital assessment of it which is not possible through other media.

Participants identified how users' perceptions of decision making priorities in a project were driven by the desire for a positive tactile experience of the use of the outcome:

Well [Organisation Name] priority was the oxygen system because there were failures with the oxygen system, if you don't breathe boys, if you don't have oxygen, you don't breathe. The pilots' perspective was that they wanted sheepskin covers on their seats because the other covers were a bit uncomfortable and then another priority was that they wanted a cupholder so that they could have their cups of coffee, because they're buses, they are big trucks in the sky, so they wanted a cupholder so that they could have coffee there, because one of the guys said the Hercs have them, so if the Hercs have them, we should have them. Well, you're sitting there thinking boys we don't care. But then again, from their point of view, that's what they have to live with. The oxy system from their point of view, they knew that would get taken care of, because that's a safety issue, the other stuff is



the aesthetics for them is what makes it pretty uncomfortable for them so if you're sitting in an aircraft for 6 hours, then those things are important. But yeah, you've got to negotiate and work out what can be done, so they got their sheepskin covers, but they didn't get the cupholder. **PARTICIPANT 24**

Here, end users' physical, tactile comfort levels during their operation of the aircraft were their primary focus during the Actualisation stage of the project. They knew that the safety aspects of the aircraft would be considered as a matter of course as part of the project, and therefore, they were not the end users' main concern. This need for comfort ultimately had to be taken into consideration by the project team for the project outcome to be deemed successful by the end users. A level of negotiation and compromise was required between project team members and end users to achieve a result which was satisfactory for both parties.

Apart from the potential comfort aspects of an outcome, tactile responses to an outcome may be important in other ways:

Also and coming back to saving the money, within the flight simulator world there is a qualification of the simulator to act as a certain level of training device, which means that it needs to look, feel, smell like the aircraft, it was decided that they wouldn't do that and over time the simulator and the aircraft diverged; the simulator probably stayed the same, the aircraft developed so it got to the stage a few years ago where it was significantly different to the aircraft which compounded those problems of "we don't like it". **PARTICIPANT 21**<sup>29</sup>

In this extract, the participant is discussing the development of an aircraft flight simulator that was undertaken as part of a major aircraft procurement project. He highlights the necessity for the simulated environment to create a sensory experience which effectively represents the real environment, if it is to be deemed to be successful from an end user perspective. This includes the 'feel' of the simulator – that is, the tactile aesthetic of the simulator must match the tactile aesthetic of the

---

<sup>29</sup> Again, there are multiple aesthetic elements evident in these extracts. This aspect of the use of aesthetic knowledge in decision making processes in mega projects will be addressed more fully in Chapter 8.

actual aircraft if the simulated experience is to be effective. It is important, therefore, that project team members gather and apply aesthetic knowledge about the tactile experience of the aircraft as part of the simulator development process during the Actualisation stage of the project. Again, this extract is consistent with Fine's (1992) perspective on ensuring that aesthetic aspects are taken into consideration when making decisions about project outcomes when they are important to stakeholders.

*(b) Tactile aspects of decision making*

The ability to touch physical objects was identified by participants as an important decision aid when engaged in decision making at the Actualisation stage of projects. In particular, physically putting pen to paper and being able to touch electronic devices were highlighted as key thought enablers:

So in that scenario for me personally... and this is my interesting example... When I've got a decision to make where the buck stops with me, and it's an important decision, I often find myself hunting for a quiet space. And I'll spend a bit of time literally tactile, putting it to paper, because it helps with my thought process. **PARTICIPANT 5**

What I do like is gizmos. Where's that map [on iPad] and go, look there it is. That sort of stuff. It's a real enabler when you can reach out and touch stuff pretty easily. **PARTICIPANT 11**

The participants suggest that a direct connection to a tangible, sensory reality assists their ability to operate in the intangible realm of thought. The physicality of these experiences is of benefit to the thought processes that underpin decision making in the project context.

### **5.3.3 Metaphorical use of aesthetic knowledge types**

*(a) Visual aesthetic knowledge*

Visual aesthetic concepts were referred to metaphorically by participants in relation to project team members' decision making processes at the Actualisation stage of projects. One such use refers to rigidity in decision making. Decision makers often

fail to adequately consider alternatives in terms of processes and outcomes when completing project tasks. Decision failure may occur when outcomes and paths to outcomes are rigidly adhered to resulting in “tunnel vision”:

So I think yeah you're right maybe there were gaps in our education and our ideas, did we get tunnel visioned, did we look back and with hindsight were we tunnel visioned with our goal and where we wanted to go, did we convince each other or through our discussions maybe talk each other into this path, this practice, whereas maybe we needed another external person to come in and review our process or review our project and put us back on the right path. Yeah, good question. I think I've probably learnt more out of this than you. **PARTICIPANT 9**

The participant identifies that “tunnel vision” may have been an issue in a project failure in which his organisation was involved. From his perspective, not considering other viable outcome options and means to achieve options – coupled with active reinforcing of the tunnel vision through intra-team communication (“did we convince each other or through our discussions maybe talk each other into this path”) – contributed to the failure of the project.

Participants also used visual aesthetic terms to discuss ‘holism’, in particular the problems associated with the inability of project team members to conceptualise projects holistically:

The participant becomes frustrated when people are unable to see the bigger picture. He has witnessed situations such as staff selection processes, where people are sometimes involved in a “spiral of indecision” and are overly focused on details. Sometimes it is important to step back and take a risk based on an understanding of bigger picture. **PARTICIPANT 3 [Interview Notes]**

The failure to “see the bigger picture” and being overly focused on details results in indecision and a risk averse approach to decision making. Both of these factors are potentially problematic in the Actualisation stage of projects, because they can result in project stagnation and a failure to meet project targets (Drummond, 2001).

*(b) Tactile aesthetic knowledge*

Tactile aesthetic knowledge concepts also were used in a metaphorical sense by participants to discuss the approach project team members take to risk management:

So it's a bit of a parametric type approach that we make and go for it if the consensus is that it sounds good, the wet finger in the air thing, if it sounds good then we'll put it in... **PARTICIPANT 10**

Here, while there are obvious metaphorical aural elements to the participant's response (e.g., "if it sounds good"), touch is also used metaphorically through the "wet finger in the air thing" metaphor. This metaphor relates the practice of wetting one's finger and putting it in the air to establish via the sensory cues provided from which direction the wind is blowing. Essentially, this is a means of describing the approach team members take to estimating the risk associated with a project when complete and objective data is unavailable. It involves an assessment of risk based on past experience.

One participant used tactile sensory concepts in a metaphorical sense in relation to his curiosity about, and direct involvement in, project team decision making:

I think it's important to keep part of it scratching an itch in terms of getting involved in an issue, just because it's more fun solving that stuff than dealing with other stuff, but I think it also keeps you match fit in terms of some of the technical side of things, which I think at the level of project delivery you just can't necessarily let go of. **PARTICIPANT 19**

The use of the metaphor "scratching an itch" denotes the ability of the project manager to maintain an appropriate level of interest and involvement in day-to-day project decision making during the Actualisation stage of projects. This "scratching an itch" essentially involves limited time attending various project decision making meetings, listening to discussions, and becoming involved where appropriate.

Keeping up to date with the project in this manner enables the project manager to

maintain a holistic level of knowledge about the project without becoming bogged down in the day-to-day project management minutiae. This holistic perspective is an important way of dealing with complexity in mega project environments (Wilford, 2011).

### **5.3.3 Summary**

Although participants' responses were heavily weighted towards the use of visual aesthetic knowledge and gut feel in decision making at this stage, other forms of aesthetic knowledge were also discussed. Applying aesthetic knowledge to decisions about the aural aesthetic of project outcomes is essential in instances (such as simulated environments) where those aspects are important to project stakeholders. Aural sensory concepts are also relied upon as part of the actual process of making decisions at the Actualisation stage of projects. Paying attention to the sensory cues provided through vocal tone of project team members enables project managers to assess the progress of the project and the wellbeing of team members; and to take corrective action in a timely manner if necessary. Listening to trusted others provides project managers with access to broader domain and processual knowledge bases upon which they can then draw as part of their decision making processes. Listening effectively to both the content of a message and its delivery is required for effective decision making at the Actualisation stage of projects. As well as providing information and the ability to engage in collaborative decision making, the tone with which a message is delivered can be an important impetus for action. Finally, for some participants, the removal of aural sensory input facilitates their decision making by giving them the quiet space to 'focus' and deliberate subconsciously without distraction.

Tactile elements also influence end users' decision making processes at the Actualisation stage of projects. The desire for positive tactile experiences with outcomes drives decision making in instances where end users anticipate they will come in direct physical contact with that outcome. Tactile experiences are also important in simulated environment project outcomes. It is important for end users' assessments of the success of the outcome that their tactile experience of the simulated environment matches their experience of the real environment. This assessment is based on the application of their experientially and sensory-derived knowledge (i.e., aesthetic knowledge) of the tactile aspects of the real environment. Touch was referred to by participants in both a literal and metaphorical way in relation to project decision making processes at the Actualisation stage of projects. The physical touch of pen to paper or of an electronic device (like an iPad) facilitates decision making for some participants who see it as an enabler of more abstract thought.

Both visual and tactile aesthetic concepts were used metaphorically by participants to describe aspects of decision making processes at the Actualisation stage. For example, "tunnel vision" was used as a term to describe problems of rigidity in decision making; and "see the bigger picture" was employed to describe the importance of holistic thinking in project decision making at this stage. Further, touch was used metaphorically by one participant to describe his process of keeping abreast of various meetings and issues relating to the project he was managing. He described his brief attendance at multiple meetings in a day, and becoming directly involved in decision making process only when necessary, as "scratching an itch".

## **5.4 Conclusion**

This chapter explores the results in the data that are relevant for the Actualisation stage of projects. The data demonstrates that visual, aural, tactile, and gut feel aesthetic knowledge types are used in decision making processes in various ways at this stage. Although most forms of aesthetic knowledge (other than olfactory and gustatory aesthetic knowledge) were discussed by participants, the bulk of the discussion concentrated on the use of visual aesthetic knowledge and gut feel in decision making processes during the Actualisation stage. Project team members were the stakeholders considered primarily by participants in their discussions of decision making processes at this stage. This is perhaps not surprising given that the purpose of this stage is the completion of the project, which is the primary role of project team members. The discussion of the implications of these results for this research is contained in Chapter 8. Chapter 6 examines the results that pertain to the Realisation stage of projects.

## ***Chapter 6 Aesthetic Knowledge and Decision Making at the Realisation Stage of Projects***

This chapter focuses on the evidence in the data of the use of aesthetic knowledge in decision making processes at the ‘Realisation’ stage of projects. In particular, it explores the types of aesthetic knowledge applied, the foci of the use of this knowledge, and the stakeholders considered when applying this knowledge at this project stage.

Decision making processes at this stage of a mega project focus primarily on assessments of the success or failure of the project (Aaltonen & Kujala, 2010; Morris, 1982). Traditional assessments of project success or failure emphasise the perceived objective ‘iron triangle’ criteria of completion on time, on budget, and to the required level of quality (Gardiner & Stewart, 2000; Shenhar & Levy, 1997; Turner, et al., 2009). Although the evaluation of ‘quality’ often involves sensory aspects, and the application of aesthetic knowledge to these sensory aspect (Fine, 1992), the ways in which aesthetic knowledge is used in decision making at this project stage has previously not been examined empirically.

The Realisation stage was the least extensively discussed stage of the project process by participants, with only 18 interview extracts coded to this stage (see Table 6.1). This demonstrates the relatively limited use of aesthetic knowledge at this stage of the project process, compared with the Conceptualisation and Actualisation stages (cf. Skulmoski & Hartman, 2009). However, the data does provide pertinent insights into the use of aesthetic knowledge in decision making processes at the Realisation stage.



	<i>Stage</i>
<i>Sense</i>	Realisation
Visual	13
Aural	0
Olfactory	1
Tactile	2
Gustatory	1
Gut Feel	1
<b>Total Extracts</b>	<b>18</b>

**Table 6.1: Number of interview extracts relating to types of aesthetic knowledge used at the Realisation stage of projects**

The chapter explores visual aesthetic knowledge as the type of aesthetic knowledge which was most prevalently discussed by participants as being used at the Realisation stage of mega projects (n = 13). It examines the various foci of this use in decision making processes (i.e., the visual aesthetic of project outcomes, visual aspects of decision making processes, and image); and the stakeholders considered by participants in their discussion of the application of this knowledge (i.e., project team members, managers, and end users), at this stage of mega projects. Again, this dominance of the visual aspect of aesthetic knowledge is consistent with the research exploring human senses (Colavita, 1974). The chapter then considers important insights gained from the participants' discussions of other types of aesthetic knowledge applied by decision makers at this project stage, particularly the use of tactile aesthetic knowledge, and the metaphoric use of both visual and gustatory aesthetic knowledge concepts.

Project Stage	Aesthetic Knowledge Type	Focus of Use	Stakeholders Considered
Realisation	Visual	Actual visual aesthetic outcome	Project team members, end users
		Visual aspects of decision making	End users
		Image	Managers, users
		Metaphoric	Project managers
	Tactile	Tactile aesthetic of outcomes	End users
	Gustatory	Metaphoric	Clients, end users, others

**Table 6.2: Aesthetic knowledge types applied, foci of use, and stakeholders considered in decision making processes at the Realisation stage of projects**

## 6.1 Visual aesthetic knowledge

Participants suggested that visual aesthetic knowledge was applied to decisions about the visual aesthetic aspect of project outcomes; to the visual aspects of project decision making processes themselves; and as a means of determining how particular projects and their outcomes affect the image of certain stakeholders (i.e., managers and end users). This application affects the determination of the success or failure of projects by stakeholders at the Realisation stage.

### 6.1.1 Visual aesthetic of project outcomes

Participants identified that for the outcomes of mega projects to be perceived as successful, visual aesthetic knowledge needs to be applied to decisions made about the visual aesthetic aspects of those outcomes. Further, this application must occur while giving consideration to needs and wants of particular stakeholders – namely project team members and end users.

Stakeholder(s) Considered	Purpose of Aesthetic Knowledge Use
Project team members	Matching the requirements of project stakeholders
	Achieve congruency with functional goals
End Users	Determine level of congruency with aesthetic aspects required

**Table 6.3: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to the visual aspect of proposed project outcomes at the Realisation stage of mega projects**

*(a) Project team members*

The nature of a project outcome determines the extent to which project team members need to focus on decisions about the visual aesthetic of the outcome, and therefore, the extent to which aesthetic knowledge must be applied to ensure that the outcome matches the requirements of project stakeholders, particularly users. If the project requires a “human response”, then for an outcome to be deemed to be successful, its visual aesthetic appeal is a key decision making consideration for project team members:

So we had some projects that were literally plastic widgets that no-one would necessarily see. They had a function; but not necessarily a need for a human response so to speak. But the majority of that company’s business was... had a heavy impact on the aesthetics of the vehicle. Much of its business came from things like body kits and spoilers and all that sort of stuff.

**PARTICIPANT 5**

The participant identifies in the context of vehicle design that the ultimate location of the design outcome determines the required focus on aesthetics. In instances where humans are not going to engage with the outcome (e.g., “plastic widgets” that “no-one would necessarily see”), then the visual appeal of the outcome is not important. However, in more obvious locations, the appeal is essential, and project team members must apply their aesthetic knowledge accordingly (cf. Kumar, Townsend, & Vorhies, 2014). Relationships between team members and other stakeholders (e.g., end users, clients, the ‘market’), are therefore highly important, as it is through these relationships that team members acquire knowledge of the aesthetic preferences of those stakeholders who will determine the success of the outcome at the Realisation stage (cf. Fine, 1992). This knowledge can then be applied to decisions about the visual aesthetic of the outcome.

An important consideration for mega project managers is to ensure that the aesthetic aspects of a project outcome support, rather than supplant, its functional purpose:

This is about structuring the total canvas of the urban environment and, therefore, how people respond when they see it becomes important. **PARTICIPANT 14**

This participant observes that aesthetics are important considerations for project managers in the context of urban planning, requiring them – and their team members – to apply their aesthetic knowledge to the project given the need for a human response to project outcomes. However, it is vital that the aesthetic of the project outcome does not override the consideration of its functionality. Rather, aesthetic “form follows function” to enhance both the functionality and stakeholder acceptance of the outcome. For example, aesthetics may be used to support broader functional goals, such as social policy outcomes:

That is true in Adelaide when I was there and it’s true here of trying to do that so it was elegant, it was liveable, highly liveable in passive design terms and relationships to street, but not weird so that you could say to a tenant we’re going to make you live in a weird house that all your friends who come and visit will say god, this is weird; but we want them to come and say gee this is really nice housing and nobody will feel ashamed of living there. **PARTICIPANT 14**

We had many projects here that deserved – we got planning awards, we got architectural awards for good designs that wasn’t excessive, value for money stuff, sat well, did good things for the reputation of the department; removed old slabs of NIMBY responses off the table... in fact, the quality of public housing – the elegance, let me use the word “elegance”. I’m not interested in expensive design, I’m not interested in expensive materials, I’m not interested in weird design, but I’m interested in elegant design that sits comfortably, the proportions are good, you resolve the detailing in a nice way, it works in the longer term but it’s good upfront and makes you feel good looking at it, rather than there’s something uncomfortable about that, it looks like they’ve tried but they haven’t quite pulled it off. **PARTICIPANT 14**

In these examples, the aesthetic aspects of public housing projects were designed specifically to align with social policy values of inclusivity. Rather than further marginalising those who require social housing assistance, the project design elements were used to make people feel part of the broader community by deliberately avoiding producing dwellings that have a “weird” design which immediately identifies them as public housing.

The same participant suggests that in terms of sustainable architectural design, the aesthetics of outcomes can be used to evaluate the functionality of the design:

We’ve got this terrible mannerist – I argued to a meeting that there are 4 types of architecture when it comes to sustainable design, there’s good design which you can look at tell that it works, delivers climatic outcomes and you can tell by looking at it; there’s the reverse, bad design, you can look at it like the Tuscan house and it don’t work, you know it doesn’t work; and there are 2 other categories, one is called spiv, which is looks like it works but it doesn’t; it’s all sham and then there’s nerd, which is like the guy in the T-shirt has actually written the super bloody software program for Apple and he’s the one that’s made the money, but you can’t tell by looking at him; so there’s nerd architecture which actually works bloody well, but you can’t tell by looking at it, for some reason, not easy to find examples of that. **PARTICIPANT 14**

Therefore, it is important the project managers ensure that the aesthetics of the design reflect its functionality. Decisions about these aesthetic aspects must be made by project managers and team members through the application of aesthetic knowledge to ensure that this relationship between form and function exists.

**(b) End users**

One of the primary determinants of project success, related to the ‘iron triangle’ concept of ‘quality’, is user satisfaction with the project outcome (Gardiner & Stewart, 2000; Muller, Geraldi, & Turner, 2012; Shenhar & Levy, 1997).

Participants suggested that depending on the nature of the outcome, this satisfaction can have an important sensory basis beyond perceptions of its visual appeal. One such instance is when an outcome is designed to produce a simulated experience of a real environment, such as an aircraft flight deck:

They basically provided the simulator and for the Wedgetail, if you walk into the simulator it looks like a Wedgetail so where the aeroplane has been changed with all the military specific equipment, like air-to-air refuelling, so there's extra switches and stuff in the cockpit, electronic warfare, extra switches and sounds and alarms and lights and things in the cockpit, all those things are put into the simulator to satisfy the spec. **PARTICIPANT 6**

For the simulated experience to be perceived as a 'quality' experience, it must match the complete experience of being in the actual aircraft – that is, it must not only match the technical aspects of the experience, it must also match the visual, aural, olfactory and tactile experience of flying the 'real thing'. It is extremely important for the ultimate success of the outcome from the perspective of the end user that project team members understand this sensory necessity; and that they apply their aesthetic knowledge to ensure that the simulated sensory environment corresponds with the real setting.

Another participant highlighted the importance of user feedback about the actual aesthetic aspects of a project outcome for determining the success of the outcome:

[D]ecisions made not by my staff, but by the people they were moving to, to reduce costs and took capabilities out that saved cost in the project but actually diminished the final product as a training system. So when it was actually delivered the end user didn't like what they got. Simple little things like they changed the seat from a representative aircraft seat to a seat that would do the job. Well flight simulation is about creating the illusion of being in the aircraft, you have a different seat in the simulator, then you're not in the aircraft. Pilots understand that. So air crew offside... So we had the user who didn't like it, we had the management who reduced the capability and I think part of the problem was too because we bought the off the shelf item, it was

aligned to what American aircraft was, not the Australian aircraft, so there was all those things together. **PARTICIPANT 21**

The success of the final outcome of this project was diminished from an end user perspective because the simulator did not match the sensory experience of the actual aircraft. For the project outcome to be judged as successful, the sensory expectations of the Australian aircrew needed to be taken into consideration by the project team members. If the outcome does not match the visual (as well as aural, tactile, and olfactory) expectations of the user, then it will be deemed to have failed to meet the quality standards expected by end users, regardless of the whether other 'iron triangle' success measures, such as on time and on budget, were achieved.

Failing to address adequately the aesthetic aspects of such simulated environments can have serious implications beyond the dissatisfaction of users with outcomes. In the extract below, the participant describes the result of cost cutting measures associated with a simulator project:

I think the budgetary problems...it was a sub-set of a much larger, much more expensive project, most of which was being spent on the aircraft and when the budget became tight on the aircraft, they looked anywhere to save money and the simulators...because it's only a training device it's an easy way to save money...but it's a short term focus in that they're now bringing it up to speed at probably much greater cost. If you can't transfer hours out of the aircraft into the simulator an aircraft flying hour, maybe it's very difficult to calculate how much they cost, but you're talking \$50,000, \$100,000 one hour in the aircraft, and you save \$500,000 on a simulator, okay that might be one day's aircraft training use flying. **PARTICIPANT 21**

The project team made the decision to focus on cost savings, and consequently cut back on certain aspects of the simulated experience (e.g., the pilot seat did not match the seat type in the actual aircraft). This led to dissatisfaction with the simulator device among end users, and limited its use, which ultimately increased costs dramatically as pilots were training in the actual aircraft rather than in the simulator.

An initial spend to make the simulator fully representative of the aircraft would have saved several millions of dollars in costs associated with the use of the actual aircraft.

### 6.1.2 Visual aspects of decision making

The use of visual aesthetic knowledge in decision making processes at the Realisation stage of projects goes beyond its application to decisions about the visual aesthetic of project outcomes. Participants suggested that they apply visual aesthetic knowledge to their actual decision making process at this stage – particularly to assist them to determine user perceptions of the success or failure of an outcome.

Stakeholder(s) Considered	Purpose of Aesthetic Knowledge Application
End users	Provision of sensory feedback

**Table 6.4: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to the visual aspect of decision making at the Realisation stage of mega projects**

#### *(a) End users*

Determination of the success of projects by project managers and their team members is facilitated through direct sensory interaction with, and feedback from, end users of project outcomes:

I look at success as feedback that I get from the customer, and that customer is the [Company Name] as my direct customer, and also the end user customer, especially when, because our trainers were face-to-face with the end user customer, and got great kudos for the training that they did both for the [Client Name] and for the [Client Name]. **PARTICIPANT 10**

Here, both company level feedback and direct face-to-face contact with project end users were important determinants of success for the participant’s section of a major air warfare project. Feedback in person in a training context provides immediate access to end user perceptions of the success of the project, and its value for them as users of the project outcome on which they are being trained.



### 6.1.3 Image

Participants also identified that visual aesthetic knowledge is applied to decisions about how the outcome of a project will affect the image of particular stakeholders. The determination of this effect drives decisions about the success or failure of the outcome by these stakeholders.

Stakeholder(s) Considered	Purpose of Aesthetic Knowledge Application
Managers	'Spin' failures
End users	Evaluation of image enhancing nature of project outcomes

**Table 6.5: Summary of stakeholders considered and the purpose of applying aesthetic knowledge to 'image' at the Realisation stage of mega projects**

#### *(a) Managers*

It is important for the continuing viability of project organisations that they are associated with the successful completion of projects, as project failure poses many (particularly economic and reputational) problems (Jugdev & Muller, 2005). This need to project the image of success may lead to managers 'celebrating' even moderate successes, or putting a positive 'spin' on failures, to avoid negative perceptions of the organisation:

At the same time I don't know if things have really been characterised as successes in some ways... I guess success is probably over-rated... I know I've been to one lunch where the tone was this wasn't the most successful project ever but still important to celebrate but it's still not very popular to publically recognise it as a failure, explicitly speaking. **PARTICIPANT 16**

This contrived celebration of 'success' and the seemingly corresponding inability to adequately face failure pose potential problems for decision making within a project environment. The ability to learn from errors and to reflect on problematic issues associated with decision making processes in failed projects are important steps on the road to improving project management practice (Schindler & Eppler, 2003). Over-focus on image maintenance activities limits the capacity for organisations to learn from mistakes and avoid similar errors in the future.

*(b) End users*

Participants identified that, depending on the nature of the outcome, end users use their aesthetic knowledge to evaluate project outcomes. This evaluation occurs not only in terms the functional and visual aesthetic aspects of outcomes, but also on the personal image enhancing capability and the perceptions of the level of reputational risk associated with the use of the outcome.

The perception of the potential effect of the use of a project outcome on the personal image of end users was identified by the participants as a key evaluative criterion for particular types of project outcomes:

Yeah. That was probably something that clouded the perceptions of the project office as well, ah all they wanted to look cool, they're not concerned about their own safety. There were products that the soldiers were adamant they should have that according to the data we had in front of us weren't going to protect them as much. So it is very hard as a project office where you've got to manage the technical side as the design authority, so to speak, it is very hard to turn around say now let's go and pursue another course of action when everything in that sense you're doing right. You're providing a safe product, you're providing a product that meets the requirements and meets all the standards and you can shoot it to hell and it will protect their eyes, yet they want to go and buy something that we know, we have the data that says it's not going to do that. It's very difficult.

**PARTICIPANT 7**

In this example, the participant is discussing the development of protective eyewear for Australian combat soldiers that was undertaken as part of a project to re-design combat warfare clothing and accessories for modern warfare environments. In this instance, end user perception of 'form' (i.e., the visual and social appeal of the outcome) outweighed the benefits of 'function' (i.e., the ability of the outcome to be shot "to hell" and still provide protection) in terms of their evaluation of the success of the outcome. This 'coolness' factor (described by another participant as being related to a 'keeping up with Jones's' scenario – that is, "the SAS" or "the

Americans”) is based on the application of aesthetic knowledge by end users as part of their evaluative process, and was taken into account by the project team members when developing the eyewear. To do this, the aesthetic knowledge of team members had to be applied to determine what would be perceived as ‘cool’ by the end users. This was important to ensure that the visual aesthetic matched the end users’ requirements. The participant acknowledges the problematic issues associated with having to address this end user requirement, especially when it conflicts with the objective data available about the safety of the outcome. The strength of the end users’ desire to ‘look the part’ and to be seen to be associated with positively valued others played a significant role in their evaluation of the outcome.

#### **6.1.4 Summary**

The data suggests that the application of visual aesthetic knowledge is important at the Realisation stage of projects in several ways. In instances where project outcomes require a “human response”, it is important for the success of the outcome that visual aesthetic knowledge is applied by project team members to that outcome to ensure that its aesthetic aspects engender the positive response desired. This knowledge is gained via the relationships team members have with clients, end users, and the market in which clients operate.

Further, project managers apply their aesthetic knowledge at the Realisation stage of projects to ensure that the aesthetic aspects of outcomes are appropriate for the functional requirements of the outcome. Importantly, this is necessary because assessments of the functionality of the outcome may actually be made based on the evaluation of the aesthetic elements of the outcome. In projects which involve simulated experiences, project team members must apply the aesthetic knowledge gained from their experience of the sensory elements of the actual environment and

apply that knowledge to the simulated environment for the simulator outcome to be perceived as successful by end users.

Project team members' perceptions of project success are associated with direct sensory engagement with, and feedback from, users. Aspects of success determination influenced in this way include the success of the aesthetic elements of the outcome. End users can deem (and convey directly to project team members) that a project has been unsuccessful based on problems associated with the project outcome's aesthetic elements even when other project success measures (such as on time and on budget) have been achieved. In fact, end users apply their aesthetic knowledge to decision making processes about the outcomes of projects in various ways. In some instances, the visual aesthetic appeal of an outcome is a more important determinant of the success of the outcome than its functionality, even in cases where the functionality is lifesaving. Therefore, the image preferences of end users must be factored into project managers' decision making processes; and they must apply their aesthetic knowledge accordingly to these processes if outcomes are to be deemed to be successful.

The data suggests that factors relating to image also determine managers' perceptions of project outcomes. Participants propose that the desire to be associated with successful projects in order to either protect or enhance their own or their organisation's image results in managers downplaying, or even covering up, project failure. This has considerable implications for the ongoing success and viability of project organisations.

These results are interesting from a decision making theory perspective. Perhaps most importantly, this analysis suggests that decisions relating to the

success or failure of projects made by project stakeholders are not limited to assessments about whether or not the project met the established objective, rationally-derived 'iron triangle' criteria of on time, on budget, and to the level of quality required (Gardiner & Stewart, 2000; Shenhar & Levy, 1997; Turner, et al., 2009). For example, part of the judgment of project success is based on stakeholders' intuitive and subjective assessment of the aesthetic aspects of the outcome. This is particularly evident for project outcomes which engender some form of "human response". For this to happen effectively, project managers and their team members must apply the knowledge they have of the aesthetic preferences of relevant stakeholders to the aesthetic aspects of the outcome. This is an important point, as participants suggested that stakeholders' assessments of the success of not only the 'beauty' of outcomes, but also the functionality of those outcomes, are made based on the aesthetic properties of the outcome.

The role of image in decision making at the Realisation stage is also important from a decision making theory perspective. Decision making in the mega project research context is still dominated by rationalist perspectives, despite the problems associated with rational approaches in contexts characterised by complexity and ambiguity (Drummond, 1999). The participants in this research demonstrate that rather than judging outcomes based solely on objective realities (e.g., whether or not a budget was met, or whether the outcome was delivered on time), certain stakeholders make subjective decisions about project success based on how being associated with, or using the outcome of, a project might reflect on their personal or professional image. This represents a more political approach to decision making, in that the ultimate meaning of success is a negotiated process – either with self or other (Pettigrew, 1973). The understanding of this image-related process

affects project managers' approaches to decision making, and encourages them to apply different facets of their aesthetic knowledge to these processes accordingly.

## 6.2 Key insights from the discussion of other forms of aesthetic knowledge

While participants' insights about the ways in which aesthetic knowledge is used in decision making processes at the Realisation stage of mega projects were focused primarily on the use of visual aesthetic knowledge, other forms of aesthetic knowledge were discussed. The identification of the use of tactile aesthetic knowledge, and the metaphoric use of both visual and gustatory knowledge, in decision making provide further understanding of the different ways in which aesthetic knowledge is applied at this project stage.

Aesthetic Knowledge Type	Focus of Use	Stakeholders Considered
Visual	Metaphoric	Project team members
		External stakeholders
Tactile	Evaluation of project success or failure	End users
Gustatory	Metaphoric	Clients, users, external stakeholders

**Table 6.6: Summary of aesthetic knowledge types beyond visual aesthetic knowledge used in decision making processes at the Realisation stage of projects, the focus of their use, and the stakeholders considered by participants in their discussion of the use of these types of aesthetic knowledge**

### 6.2.1 Tactile aesthetic knowledge

Participants identified that the sense of touch may be employed by end users to evaluate the success or failure of the outcome of certain types of projects:

Whether or not it was about looking cool or whatever, a lot of it was probably just they have a lot of kit they have to work with and they know what that stuff is and the last thing they want is in a really high stress environment having some itch or discomfort that's completely unnecessary. **PARTICIPANT 7**

In this case, I'll pick the tiered body armour system... that was bragged about as a success. You will have seen a lot of media coverage some years ago about how crap our equipment in

Afghanistan was and a lot of that was the those guys have a sexier thing than us, and it was also the specific operational thing that I mentioned earlier, the body armour system for instance, modular combat body armour system, as it was called at first, was designed for a different operating environment than in Afghanistan, it was designed specifically for Iraq's requirements so it was great, super heavy body armour for standing on stationary guard, it's really bad for fast manoeuvring. In concert with that, CSIRO research was done into a new body armour system which was lighter, and more modular, so you could gradually build it up by inserting heavier plates, or adding different attachments to a central chest plate carrier and that wound up being very successful. **PARTICIPANT 13**

In the first extract, the participant identifies that he believes that in the case of combat kits for soldiers, the physical feel of the kit is important for positive evaluations by end users, particularly in high stress environments. He suggests that the kit issued must be comfortable for them to wear so that it is not a distraction from the task at hand. In the second extract, the participant highlights that the actual tactile aspect of the outcome must be appropriate for the specific operating conditions it will be used in. This aesthetic aspect of the outcome is not related to form; rather it is specifically linked to the operational functionality of the outcome.

### **6.2.2 Metaphorical use of aesthetic knowledge concepts**

Participants also discussed aesthetic knowledge in the context of decision making processes at the Realisation stage of projects in metaphoric, rather than literal, terms. This was the case for both visual and gustatory knowledge. In particular, this represented the only use of a gustatory concept identified in the entire corpus, which is one of the primary reasons it is worthy of note.

#### ***(a) Visual aesthetic knowledge***

Visual aesthetic knowledge was used in a metaphorical sense in relation to evaluation of the failure of projects on the part of project managers:

In hindsight what we should have done was taken the prototype activity and even done that at Amberley and done it and it be

done on a, and of course we did a bucket load of money on this program, it was not pretty. **PARTICIPANT 10**

“Hindsight” is a metaphorical sense concept involving ‘looking back’ after an event to determine what decisions should have been taken to avoid project failure. In this instance, to avoid failure it would have been more effective for the decision to be made to undertake prototype development activities relating to a military aircraft upgrade project locally on an Australian combat version of the aircraft rather than overseas on a non-combat version. Further, the participant uses the visual aesthetic term “pretty” in a metaphorical sense to describe the nature of the failure of the project, particularly in terms of its perceived wastage of a significant amount (“a bucket load”) of money.

Participants identified that project stakeholders beyond themselves play an important role in determining the success or failure of a project (cf. Johansen, et al., 2014). They suggested that stakeholders apply their aesthetic knowledge as part of their evaluation of project outcomes; and that decisions about the success or failure of a project depend on both the positioning of the stakeholder in relation to the project and how they ‘look’ at it – both in physical visual terms and perceptually:

Oh, come on, stop being so tied. Success is absolutely according to who is looking; and you’d like to believe that in any project there are a wide range of criteria that have been used to judge success; and they will be relative. **PARTICIPANT 14**

In instances where the positive evaluation of the visual aesthetic of an outcome is a success criterion for stakeholders (e.g., in the context of the extract above, urban design), then perceptions of the physical ‘look’ of the outcome will be important. In other instances, the perceptual, rather than physical, ‘view’ of the stakeholder is more vital for the evaluation of success – that is, how effectively the outcome aligns with the values and goals of the stakeholder. This more metaphorical use of the term



‘look’ is linked to aesthetic knowledge in the Kantian sense (de Montoux, 2007), in that it is associated with the ability of aesthetic knowledge to enable effective connections between phenomena – in this case, between project outcomes and stakeholder values and goals.

*(b) Gustatory aesthetic knowledge*

As noted, the only use in the corpus of a term relating to the sense of taste was related to the Realisation stage of projects. One participant used the taste concept of “palatable” metaphorically when discussing how project team members communicate about the outcomes of projects:

And we’ve done that too. And you’ve just got to try and package it so it’s more palatable and it’s not they’re dipsticks by saying well, you’ve got it wrong and we’re doing it anyway.  
**PARTICIPANT 17**

The participant suggests that the role of communicating about project outcomes in some instances is to couch the reasons for decision that clients, end users, or external stakeholders may not be pleased with in terms that are at least acceptable to them. This is a deliberate activity on the part of project team members to apply their aesthetic knowledge to their communication activities so that project outcomes are ultimately accepted by parties external to the project team. This becomes a relationship management activity as well. Even if the decisions made by the project team are correct, it is important for the relationship between the project team and the external parties that reasons for decisions are provided in a manner which does not belittle (i.e., in a way in which they are not made to feel like “dipsticks”) the other party.

### **6.2.3 Summary**

Participants highlighted the use of tactile aesthetic knowledge, and the metaphoric use of visual and gustatory aesthetic knowledge concepts, in relation to decision

making processes at the Realisations stage of mega projects. For example, the physical feel of a project outcome maybe an essential determinant of success in instances where end users come in direct contact with the outcome and its level of physical comfort is important to them. This represents an important functional aspect to aesthetics, and demonstrates that aesthetic concepts are not limited exclusively to the consideration of 'form'.

The metaphoric use of visual aesthetic concepts was identified as one way in which project managers assess project failure – for example, through the 'lens' of 'hindsight'. Further, the term 'view' was used metaphorically by participants to describe how stakeholders' perceptions of project success are determined by how closely the project is 'seen' to align with their goals and values. This concept of 'view' is related to the Kantian perspective on aesthetic knowledge (de Montoux, 2007). Taste was used metaphorically by one participant to describe how decisions about project outcomes which may not please stakeholders are communicated to them in a way which is "palatable" (i.e., acceptable). This metaphorical use of aesthetic knowledge concepts to convey meaning is an interesting aspect of the use of aesthetic knowledge in project contexts. It has not been noted in the literature previously.

Again, these insights are interesting from a decision making theory perspective. The concept of aesthetics extending beyond form to function adds another aspect of complexity to the decision making processes of particular projects. Thus the application of aesthetic knowledge about the actual aesthetic aspects of outcomes, and in a Kantian sense to assist with the management of complexity, are both required. The metaphoric use of aesthetic knowledge is also indicative of its Kantian aspects, as the data suggests it is being used to enable understanding of

complex facets of projects (such as the evaluation of failure or the communication of information that is likely to be unwelcome) at an intuitive, unconscious level; and to use this understanding as a mechanism to describe these processes, both to self and other.

### **6.3 Conclusion**

This chapter has explored the evidence in the data of the ways in which aesthetic knowledge is used in decision making processes at the Realisation stage of mega projects. Although the extent of the data in this chapter is limited in comparison to the Conceptualisation and Actualisation stages, it does indicate that visual, tactile, and gustatory aesthetic knowledge concepts are used by project managers in their decision making processes at the Realisation stage. This is particularly evident in their own – and their perceptions of other stakeholders’ – determination of project success or failure. However, despite being specifically asked about the determinants of success or failure of projects, participants often found it difficult to provide detailed responses about their understanding of this aspect of the Realisation stage, both from an aesthetic perspective and more generally. The next chapter of the thesis, Chapter 7, provides another level of analysis of the data, exploring specifically how the study data provides insight into the three fundamental theoretical aspects of aesthetic knowledge – that is, the symbolic and experiential, the descriptive and evaluative, and the relational aspects of aesthetic knowledge

## ***Chapter 7 Discussion***

The aim of this thesis was to examine – through a qualitative study of mega project managers – the ways in which aesthetic knowledge is used in decision making processes in mega projects. The research suggests that aesthetic knowledge is used by project decision makers to establish and communicate for both themselves and others the meaning of objects, relationships (especially social relationships), and abstract concepts in decision making contexts in which the meaning of these phenomena cannot be established effectively through other means. The application of aesthetic knowledge to the interpretation of sensory cues, the creation of sensory objects, and the use of metaphor provides decision makers with the ability to link information and create connections to existing sensory maps or schemas as a way of creating and communicating meaning. The meaning which results is then relied upon as the basis of decision makers' choice of action options to pursue. The purpose of this discussion chapter is to explore these findings in more depth, thereby addressing the study's primary research question:

***What are the ways in which aesthetic knowledge is used in decision making processes in mega projects?***

Chapters 4 to 6 presented an analysis of the types, and relative importance, of aesthetic knowledge used by project decision makers at the various stages of the C-A-R model – that is, the Conceptualisation, Actualisation, and Realisation stages – of mega projects. This chapter begins with a brief review of both the 'real world' problem examined in this study (namely, 'how does decision making occur in complex mega project contexts characterised by uncertainty, unpredictability, and ambiguity?') and the insight provided by existing theory into this issue. It then

discusses the key findings of the research in depth by exploring the ways in which the meanings of objects, relationships, and abstract concepts are manifest in the mega project context; and examining exactly *how* aesthetic knowledge enables decision makers to determine and communicate these meanings. The chapter concludes by considering the benefits of analysing the variations in the use of aesthetic knowledge in the Conceptualisation, Actualisation, and Realisation stages of mega projects.

### **7.1 Real world problems and theoretical insights – the issue of decision making in mega projects**

Mega projects are costly, complex, and inherently risky undertakings characterised by uncertainty and ambiguity in terms of decision making and project task processes, and project outcomes. Effective decision making is particularly important for both for the risk management, and successful completion, of projects (Eweje, et al., 2012). Decisions have to be made in mega projects in complex circumstances characterised by limited available knowledge, and an absence of ‘objective’ evidence. Phenomena which are relevant for decisions remain unknown, or objectively unknowable, because of the novelty, complexity, uncertainty, and ambiguity inherent in mega projects. This limits the applicability of certain approaches to decision making, particularly rational decision making processes. The problem is – given the limits on knowledge, and the related inability to engage in certain types of decision making processes, how *are* decisions made in these circumstances?

The existing theory suggests that logico-rational approaches to decision making in these contexts are not effective because the contexts do not provide the necessary conditions of certainty and predictability on which these approaches are

based (He, et al., 2007; Jaafari, 2003; Leybourne & Sadler-Smith, 2006; Lindahl, 2007; Thomas & Mengel, 2008). Therefore, other, *non-rational* approaches are required. The use of aesthetic knowledge to aid decision making is one such non-rational approach. Existing theory suggests that aesthetic knowledge (i.e., sensory-derived, rather than rationally-derived, knowledge) is useful as an aid to decision making in complex, uncertain, and ambiguous contexts where logic and reason fail (e.g., Davey, 1989; de Montoux, 2007). Aesthetic knowledge is used by decision makers to effectively establish relationships among diverse phenomena at the sub-conscious level. This structuring effect enables them to establish meaning and make choices in the absence of ‘objective’ data or in instances where the application of logic and reason is not possible. This is the essential theoretical basis of this research.

## **7.2 How you know when you can’t ‘know’: Establishing and communicating meaning in complex, uncertain, and ambiguous decision making contexts**

Aesthetic knowledge was shown in this research to be used by project decision makers in their decision making processes to derive meaning for both themselves and others about objects, relationships, and abstract concepts in decision making contexts which are not amenable to logico-rational analysis<sup>30</sup>. It is used as a means

---

<sup>30</sup> In this context, ‘objects’ refer to physical entities which are related to a project and its decision making processes, particularly project ‘outcomes’, which are the physical manifestations of the goals of the project (e.g., an airplane, an urban integrated housing and retail development, a major road infrastructure project, etc.). The conceptualisation of ‘relationships’ in this study is associated with the relational definition of knowledge adopted for the research (Rooney & Schneider, 2005). Consequentially, ‘relationships’ in this context are not limited to interpersonal relationships; but may also include relationships with the self, among ideas, with and among animate and inanimate objects, or with and between locations. In the context of mega projects, relationships may also be conceptualised as existing among project inputs and outputs including, among environmental cues and past experiences; goals and the methods to achieve those goals; goals and outcome action options; outcome action options and the objectives of external stakeholders; and outcome action options and the objectives of internal stakeholders (Flyvbjerg, et al., 2003; Kardes, et al., 2013). ‘Abstract concepts’ refer to phenomena such as ‘risk’ and an organisation’s ‘brand’, which have no

through which project decision makers can ‘know the unknowable’; and, as such, provides a basis for decision making and action in mega project decision making contexts characterised by a lack of ‘objective’ explicit knowledge, order, and predictability. In these complex, uncertain, and ambiguous decision making contexts, decision makers rely on aesthetic knowledge as the justifiable basis of the decisions they make. The application of aesthetic knowledge allows them to make sense of relevant objects, relationships, and abstract concepts both for themselves and others, through:

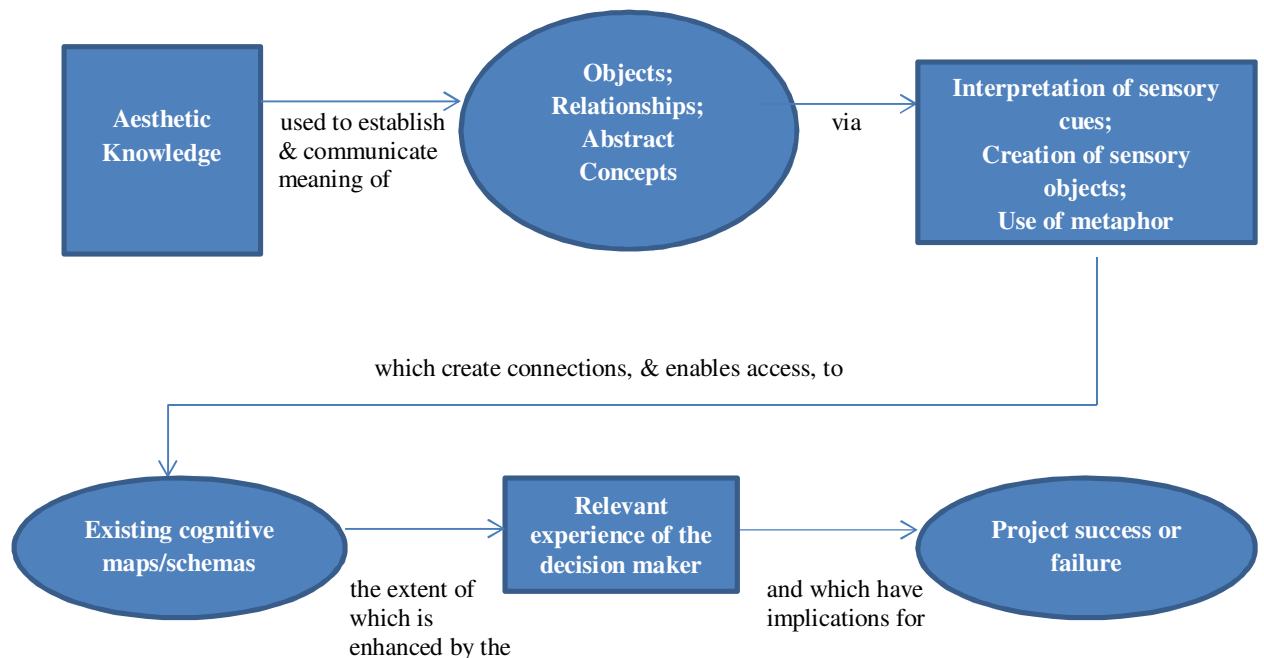
- (a) enabling the **interpretation of sensory cues** encountered through the embodied experience of phenomena (i.e., particularly, objects and relationships). The application of aesthetic knowledge forms the basis of the judgement of the importance of sensory cues and the relationships among them. It enables the recognition (or not) of familiar patterns of sensory cues to determine decisions about appropriate courses of action;
- b) the application of aesthetic knowledge to the **creation of sensory objects** through which meaning is created and shared; and
- (c) the **use of metaphor** to create shared meaning about complex and tacit concepts which are difficult to articulate. Metaphor is used a means to communicate the tacit, sensory knowledge relied upon as the justifiable basis for the choice of action options.

Figure 7.1 summarises these findings. These uses of aesthetic knowledge all provide ways of linking information and creating connections to existing sensory maps or schemas as a way of creating understanding or meaning. Aesthetic knowledge acts

---

(or limited) physical characteristics, and whose meaning may be highly fluid and contestable, and, therefore, difficult to establish ‘objectively’.

in a structuring way in relation to creating “images, visions, understanding of how different facts and different puzzle pieces of information fall into place” (de Montoux, 2007, p. 133). Its use results in the associated felt meaning being relied on as the justifiable basis for the choice of action options. Importantly, this research found that the felt meaning derived from the application of aesthetic knowledge is relied on even when 'objective' knowledge does exist. The remainder of this section considers each of these uses of aesthetic knowledge in more depth in relation to their role in establishing and communicating the meaning of objects, relationships, and abstract concepts in decision making processes in mega projects. It also explores the role of experience in the use of aesthetic knowledge in these decision making processes; and the contribution of aesthetic knowledge to the success or failure of mega projects.



**Figure 7.1 Summary of research findings**

### 7.2.1 The interpretation of sensory cues

Aesthetic knowledge is used by project decision makers to enable the interpretation of sensory cues relating to objects, relationships, and abstract concepts encountered



as part of their embodied experience of the project decision making environment. This interpretation is then used as the basis of the judgement of the importance of these cues and the relationships among them, which ultimately enables the establishment of the meaning of specific objects, relationships, and abstract concepts.

Aesthetic knowledge is applied to the interpretation of sensory cues in various ways to create and communicate the meaning of objects both for decision makers themselves and for others. These include the interpretation of sensory cues relating to: (a) the operating environment of project outcomes; and (b) the aesthetics of project outcomes and their link to particular factors relating to an outcome, such as (i) project stakeholders' aesthetic expectations, the functionality, the technological advancement, and the environmental credentials of the outcome; (ii) their role as a price-point marker; and (iii) their ability to demonstrate how the outcome achieves broader social and other goals.

Aesthetic knowledge is used as the basis of the interpretation of visual cues received through observation at the Conceptualisation stage. Participants suggested that aesthetic knowledge is gained through project team members' observation of the physical operating environment of a proposed project outcome. The sensory knowledge gained from physically attending a site in which an outcome will be used is materially different from that gained through other ways of knowing about the operating environment (e.g., reading about its features). For the project outcome to be ultimately deemed successful, the knowledge gained from the direct, personal experience of the operating environment has to be incorporated effectively into the design of the outcome. The sensory experience of the operating environment is used to establish the meaning of that environment and its implications for the

project outcome, which is then applied to the design of the outcome to effectively establish its meaning as a useful and appropriate outcome for end users.

Aesthetic knowledge may be applied either descriptively or evaluatively (Kieran, 2010). The context of the application of aesthetic knowledge determines which application is salient (Kieran, 2010). Aesthetic knowledge is used in the Conceptualisation, Actualisation and Realisation stages of mega projects to evaluate the relationship between the aesthetics of project outcomes and the various aesthetic expectations of project stakeholders. For example, stakeholders (such as end users) apply their aesthetic knowledge to the actual aesthetic (especially the visual, aural, and tactile) aspects of outcomes to determine if they match their expectations of the aesthetic. These evaluative judgements relate to both the physical aspects of the aesthetic itself (colour, shape, etc.,) and the perceptual judgement of what the aesthetic represents for the stakeholder (e.g., in an instance of military equipment, the desire to have equipment which matches perceptions of ‘coolness’ regardless of its protective function). In instances where the aesthetic aspects of outcomes are important for stakeholders, aesthetic knowledge must be applied by project decision makers to ensure that stakeholders’ expectations about these aesthetic aspects are met (cf. Fine, 1992). This is necessary for a positive evaluation of the outcome. Failure to adhere to these expectations may result in a negative evaluation of an outcome (e.g., in the case of a flight simulator project which did not match the aesthetic characteristics of the actual aircraft), and, ultimately, the rejection of the outcome.

Another evaluative use of aesthetic knowledge is its application to the determination of the connection between the aesthetics of project outcomes (or objects) and the functional goals of those outcomes. It is the evaluation of the

functionality of this relationship which (a) leads to the choice and pursuit of action options in decision making processes in the Conceptualisation and Actualisation stages of mega projects (cf. de Montoux, 2007; Klein, et al., 2010); and (b) has an impact on the determination of the success or failure of the project outcome at the Realisation stage of mega projects. An example of a failure to create this connection between form and function was provided in the data in context of the design of urban development projects. It was identified that in these types of projects, an over-focus on the aesthetics of project outcomes at the expense of the functionality of the design of buildings ultimately results in the evaluation of the project as a failure by key stakeholders, particularly end users who have to manage the ongoing problems associated with dysfunctionality.

The actual visual aesthetic of a project outcome may be used as a sensory ‘cue’ in itself to communicate a specific aspect of the outcome, or a particular message about the project or project organisation, to end users or other stakeholders. This use was evident at the Actualisation stage of mega projects. One example in the data was the instance in which a project team was instructed by the owner of a project organisation to ensure that the design of a project outcome looked ‘cool’ as a means of communicating the advanced technology contained in the outcome to stakeholders. The ability for project team members to achieve an association between the visual aesthetic and the advanced technology contained in the outcome required an understanding of the broader social meaning of the design elements (including what was meant by ensuring that the outcome looked “like something NASA built”), and the ways in which they can be used as signs and symbols to communicate technical aspects of an outcome. The effective use of aesthetic

knowledge is necessary for this to occur (Ewenstein & Whyte, 2007; Whitfield, 2005).

The visual aesthetic may also be used as a sensory cue to communicate the beneficial aspects of project outcomes to relevant stakeholders to increase their ultimate acceptance by stakeholders. One example provided in the data involved the application of aesthetic knowledge to the visual aesthetic of a major industrial project at the Conceptualisation stage of the project. Here, the inclusion of a 'green' roof was used by the project organisation to communicate a 'green' image to make the outcome more appealing to, and thereby acceptable for, stakeholders. Project team members required to apply their aesthetic knowledge to project design decisions to ensure that the visual aesthetic of the outcome communicated effectively the desired message about the project's 'green' credentials. Other examples of the use of the visual aesthetic as a communicative sensory cue to increase the appeal and acceptance of project outcomes for stakeholders include its use as a price point marker (i.e., for residential property); as a means to integrate a urban development into the history of an area; as a way of achieving social policy goals in relation to an outcome; or as a means of connecting the outcome to stakeholders' senses of place and history. Each of these instances requires the application of aesthetic knowledge by project decision makers to achieve the desired goals. This discussion of the use of aesthetic knowledge to establish and convey the meaning of objects in decision making processes in mega projects generally represents a deliberate use of this form of knowledge to influence the ultimate positive perception of the outcomes of a project among project stakeholders.

The use of aesthetic knowledge was also evident in the interpretation and assessment of sensory cues pertinent to relationships within the mega project

decision making context, particularly social relationships. Participants identified many types of sensory signs and signals that may be gathered primarily through their embodied experiences of engaging directly in interpersonal interactions with various stakeholders as part of decision making processes in mega projects (e.g., in the context of formal meeting environments, visual cues, such as body language and facial expressions; and aural cues, such as tone of voice). Participants suggested that decision makers (when they are fully ‘present’ in interpersonal interactions – cf. Senge, 2004) apply their aesthetic knowledge schemas to relevant detected sensory cues, which facilitates the interpretation of those cues (cf. de Montoux, 2007; Whitfield, 2005). This interpretation then forms the basis of the judgement of the importance of the cues and the relationships among them (cf. Klein, et al., 2010). This application of aesthetic knowledge increases decision makers’ situational awareness and the knowledge available to them on which to base the selection of action options; and establishes the functionality of interpersonal relationships which are relevant to the project. The felt meaning that results from this use of aesthetic knowledge provides the decision maker with a sense of coherence and holistic understanding of the decision context and the action options to be pursued (cf. de Montoux, 2007). This use of aesthetic knowledge was evident in each stage (i.e., Conceptualisation, Actualisation, and Realisation) of the project process.

Direct sensory interaction is an important factor in the creation of effective relationships among project team members, especially as the primary basis for the development of interpersonal trust at the Actualisation stage of projects. Project managers rely on this understanding to build effective relationships within their teams (and also with other stakeholders). These sorts of relationships are vital for the success of mega projects (cf. Chang, et al., 2013; Johansen, et al., 2014; Kardes, et

al., 2013; Zhai, Xin, & Cheng, 2009). One example of this understanding in the data is the acknowledgement of the limitation of electronically-mediated communication for effective communication and relationship development compared with being physically present with other team members. Physically interacting with project team members allows for the attending to, and interpretation, of sensory (particularly visual) cues. These are essential for effective communication, and form the basis of trust and relationship development (Hartley, 1999). Further, the felt meaning derived from direct interpersonal interaction is relied upon for establishing whether or not project team members are willing to engage in working relationships with other stakeholders (e.g., clients, subcontractors, etc.). The resultant 'gut feel' is particularly relied upon by project team members to evaluate the functionality of their relationships with stakeholders. The felt meaning derived from engaging directly with potential clients is used as the basis of decision making about whether or not to pursue projects at the Conceptualisation stage. This felt meaning is relied upon even when objective criteria about the benefits of potential relationships (e.g., lower cost) imply that engaging in the working relationships would be beneficial (cf. Hansen, et al., 2007).

Another important way in which aesthetic knowledge is used in decision making processes in mega projects is to determine how both decisions themselves, and their potential action outcomes, impact on the social meaning of the personal or professional image of decision makers, or the image of their organisations. This represents a particular form of the evaluative use of aesthetic knowledge (Kieran, 2010) by project decision makers to determine both the perceptual meaning of signs, symbols and experiences, and the associated social impact on the impressions formed of people and organisations (cf. Witz, et al., 2003). This research suggests

that decision making in mega projects is particularly affected by the desire for project decision makers to maintain a positive image either for themselves or for their organisations.

The perception of the potential effect of the use of a project outcome on the personal image of end users was identified by the participants as a key evaluative criterion for project outcomes with which end users are easily identified. In instances in which the visual aesthetic appeal of an outcome has an impact on the image perception of end users, attending to how project outcomes will 'look' to a market, both in terms of their aesthetic appearance and psychological symbolism, is an important consideration in project decision making processes at the Conceptualisation and Actualisation stages of projects (cf. Fine, 1992). Project decision makers must apply their aesthetic knowledge of market expectations about these aspects of project outcomes to the decisions they make about project outcomes if they are to be evaluated positively (cf. the discussion of "aesthetics of organisation" in Witz, et al., 2003).

The use of aesthetic knowledge to interpret sensory cues relating to abstract concepts was also evident in this research. One such concept is the 'risk' associated with mega projects. Risk is heightened in the mega project context by the structural, technological, and relational complexity inherent in these projects; as well as the inability to accurately predict the results of decision processes, which are often not objectively knowable at the time decisions are required (cf. Klein, 2003). In such cases, decision makers rely on the interpretive and sense-making function of aesthetic knowledge to establish the relationship between the level of risk and the benefits associated with proceeding or continuing with a project (cf. de Montoux,

2007; Klein, et al., 2010). The resultant felt meaning (gut feel), sensory response to a risk assessment affects decisions as to whether or not certain courses of action will be followed. This manner of assessing risk provides a direct link between the felt meaning derived from the application of aesthetic knowledge and justifiable bases of action (cf. Taylor, 2003).

### **7.2.2 The creation of sensory objects**

Decision makers rely on aesthetic knowledge in situations where aspects of decision making contexts are objectively unknowable. This is consistent with the function of aesthetic knowledge as an aid to decision making when logic and reason fail (cf. Davey, 1989; de Montoux, 2007). In the absence of evidence and rational facts upon which to base a decision, decision makers seek to construct shared meaning about aspects of projects, such as the design of potential project outcomes. This can occur through the creation of sensory representations that various stakeholders can see and experience, such as the initial CAD drawings, or a prototype, of a proposed project outcome which may be developed at the Conceptualisation stage of a project. This construction of a shared representation or symbol of an object results in important outcomes, such as the decision to proceed with projects – in the absence of objective data about project completion times, costs, and anticipated financial returns – based on the excitement engendered by the aesthetic experience of seeing concepts brought to life, and the meaning this creates (for clients in particular). Another example of this use of sensory objects at the group level was the use of PowerPoint to display visual representations of a proposed residential development to potential investors. The presentation of a quickly developed concept design of the development had the effect of generating great excitement and interest in the project,



resulting in extensive financial commitments from investors without their engaging in detailed financial analysis.

Aesthetic knowledge is also used to deal with the complexity of decision making in the mega project environment through the development and interpretation of visual representations of project variables and their relationships which enable project decision makers to determine and maintain a holistic understanding of the project and to make choices accordingly (cf. Antoniadis, 2011; de Montoux, 2007; Wilford, 2011). Visual aids are particularly important in this process. Physically seeing representations of variables and their relationships on a whiteboard, or on an electronic device such as an iPad, enables the use of aesthetic knowledge to establish a holistic, creative, and congruent understanding of project inputs based on existing sensory maps (Gagliardi, 2006). These visual representations are used in the Actualisation stage of projects by both individual project decision makers to assist their decision making processes, and by project managers to create shared understanding of project variables and their relationships at the group level (i.e., among project team members as a group).

### **7.2.3 The use of metaphor**

The metaphorical use of aesthetic knowledge concepts is relied upon to create a relational understanding of particular aspects of decision making in mega projects. It is one way in which decision makers attempt to verbalise the tacit, sensory knowledge relied upon as the justifiable basis of the choice of action options.

Aesthetic knowledge has been relied upon by human individuals and groups as the basis of decision making for millennia (Whitfield, 2005). Unlike a shared verbal and written language, the ability to receive and interpret sensory information is the one thing we have in common as humans. Sensory knowledge precedes language and is

the basis of all cognition, which since the rise of language, has been conceptualised in terms of language (Whitfield, 2005). This fundamental aspect of our shared humanity is not currently considered effectively in decision making models (cf. Langley, et al., 1995). Metaphor is employed to create a shared understanding of complex facets of mega projects, such as the evaluation of failure, or the communication of information that is likely to be unwelcome. The metaphoric use of visual (e.g., “tunnel visioned”) and gustatory (e.g., “palatable”) aesthetic knowledge concepts occurs at an intuitive, unconscious level. Metaphor is used as a mechanism to describe and explain these processes, both to the individual using the metaphor and to others.

Aesthetic knowledge concepts were also used metaphorically to describe project team members’ assessments of key project relationships. Project team members “sniff out” potential clients at the Conceptualisation stage to determine their level of ‘fit’ with the project organisation’s culture, work style, and strategic objectives. In this example, the metaphorical use of olfactory aesthetic knowledge-related terminology is employed to communicate relationship evaluation techniques which are essentially tacit and difficult to verbalise.

#### **7.2.4 The role of experience in the use of aesthetic knowledge in decision making processes**

Aesthetic knowledge provides an important means through which people can connect their experiences of objects, relationships, and abstract concepts in the here and now to their former experiences to create meaning. Aesthetic knowledge has a strongly relational aspect, as it is not developed through the senses in a passive way, but rather is derived from the *experience* of interacting with others, objects, or situations (Strati, 2003, cf. Gouldner, 1970). The resultant knowledge of the

meanings of signs and symbols, and of experiences, as derived through the senses is applied both to assist in the interpretation of further aesthetic experiences and as a justifiable basis for action (Whitfield, 2005). As Kant identifies (de Montoux, 2007), aesthetic knowledge is used to effectively establish relationships among diverse phenomena at the sub-conscious level. This structuring effect enables decision makers to (i) establish meaning and make choices in the absence of ‘objective’ data or in instances where the application of logic and reason is not possible; (ii) validate data presented as ‘objective’ based on the experience of similar data and contexts; and (iii) reach decisions and take action in instances when time is limited by enabling them to make intuitive connections between disparate variables based on their relevant personal and professional *experience* (cf. Agor, 1986; Bennett, 1998; Burke & Miller, 1999; Coget, et al., 2011; Dane & Pratt, 2007; de Montoux, 2007; Klein, et al., 2010; Shapiro & Spence, 1997; Simon, 1993; Strati, 2007).

Experience is a particularly important concept in this research. The more experienced a person is within a context, the more exposure they have had to people, places, ideas, objects, language, and other phenomena related to that context; and the greater the opportunity they have had to establish the aesthetic knowledge schemas which can be relied upon more effectively to make connections and create meaning. In the case of mega projects, this results in a number of outcomes, including a reduced reliance on technical knowledge as the basis of decisions (e.g., in the case of routine decision making); and a greater ability to make decisions at the intuitive, gut feel level, resulting in an ability to know what to do in instances where others do not (e.g., knowing what can “hurt you”, and what will not, in a project context).

When the objective data required to engage in rational approaches to decision making is absent (e.g., in the creation of new technology at the Conceptualisation stage of projects; where technical data is missing or unattainable, as is often the case in risk assessment; where the issue is not objectively determinable, such as the aesthetics of project outcomes; etc.), project decision makers rely on intuitive decision making processes. These intuitive decision making processes require both the application of relevant tacit domain and processual knowledges (which have been developed through personal, professional, and organisational life experience), and of aesthetic knowledge in a Kantian sense to establish the nature of the relationships among decision variables (Agor, 1986; Betsch, 2008; Burke & Miller, 1999; Dane & Pratt, 2007; Dane, et al., 2012; de Montoux, 2007; Kahneman & Klein, 2009; Salas, et al., 2010; Simon, 1987; Sinclair & Ashkanasy, 2005). Decision makers' experientially-based understanding of these connections results in their achieving a holistic appreciation of the relationships among variables. This then enables the effective choice of action options to be made. Effective choices of action options in these circumstances are those which are most congruent or harmonious with the desired project outcome (Agor, 1986; Davey, 1989; de Montoux, 2007; Dobson, 2007; Wilford, 2011).

Even when objective data is available, aesthetic knowledge may be used by project decision makers in two ways: (a) as the basis of experientially-derived decisions; or (b) to determine the relationship between information presented as objective and their experience of similar situations. In these instances, data is either not needed or is disregarded owing to the level of experience of decision makers. A prime example of this is routine decision making, in which the repeated experience of making decisions in a particular context leads to decision makers knowing

intuitively what decisions are required. Intuitive understanding results from the tacit application of the decision maker's aesthetic knowledge, which enables the recognition of familiar patterns in the sensory cues received from the decision making environment (cf. de Montoux, 2007; Gagliardi, 2006; Klein, et al., 2010). Further, decision makers rely on experiential domain knowledge, and then aesthetic knowledge, to establish the relationship between data presented as rational and objective, and their perceptions of the reality of decision making situations. In such instances, decision makers rely on their professional and technical experience to make effective, intuitive choices as to whether or not the 'objective' data should be relied upon as a justifiable basis of action (cf. Hansen, et al., 2007).

The data suggests that the effective detection and interpretation of even a small sigh, minor changes in body language, or variations in meeting attendees may mean the difference between project success and failure; and, further, that this ability is closely related to the level of relevant project experience of a project decision maker (cf. Kahneman & Klein, 2009). This is because the aesthetic knowledge applied is a tacit knowledge, which is developed over time through repeated embodied engagement in similar, relevant situations (cf. Ambrosini & Bowman, 2001; Brockmann & Anthony, 2002; Gourlay, 2004; Kahneman & Klein, 2009; Polanyi, 1967). Once detected, these cues can then be interpreted in a more mindful way to enable effective decisions to be made about their meaning, and their implications for the choices of action options to be adopted.

#### **7.2.5 The contribution of aesthetic knowledge to project success or failure**

This research suggests that the use of aesthetic knowledge in decision making processes in mega projects may have a positive or negative impact on project outcomes. It is the *appropriateness* of the application of aesthetic knowledge to

decision making processes which determines its impact in terms of the success or failure of a project. It is appropriate for project decision makers to apply aesthetic knowledge to certain aspects of decision making (e.g., to the aesthetics of project outcomes when they matter to stakeholders and/or where an outcome has a degree of human interaction (cf. Fine, 1992); the maintenance of sensory presence in direct interpersonal interactions; the application of aesthetic knowledge to design decisions to match market expectations; etc.) to attempt to ensure positive evaluations of project outcomes. However, the research suggests the use of aesthetic knowledge for the purposes of personal or organisational impression management may be an inappropriate application, as it may lead to negative outcomes for a project or a project organisation.

Participants identified that decision makers may arrive at decisions based on their perceptions of what will be the best outcome for *them* in terms of personal impression management. The desire to make decisions on the basis of ‘looking good’ to others often results in a more political approach to decision making (Pettigrew, 1973). This approach can be problematic, as decision making situations may be manipulated to enable the pursuing of courses of action – and the delivery of outcomes – which reflect well on the decision maker, rather than being in the best interests of the project. In instances where the self-interest of the decision maker and the requirements of the project do not align, sub-optimal project decisions may result.

Basing decision making around the pursuit of a positive image also has implications in terms of project risk for organisations. The desire to be ‘in the market’ (or to ‘keep up with the Jones’s’) is often associated with an understanding of the actual aesthetic appeal of a potential project outcome, and its symbolic

meaning. For example, the data suggested that, from a client perspective, adopting this approach to decision making encouraged greater risk-taking and enhanced the potential to pursue suboptimal courses of action. The pursuit of brand enhancement is another image-related issue which has an impact on the level of risk associated with projects. The data identifies that senior people in project organisations are often willing to take significant risks in pursuing or persevering with projects that they perceive will result in positive brand attention for their organisation in the markets in which they want to operate.

Maintaining or enhancing a positive image for an organisation affects decisions about the nature of project ‘successes’ at the Realisation stage of projects. Participants suggested that organisations actively engage in ‘spin’ about the nature of project failures, portraying them as a ‘success’ (at least on some dimension) to avoid negative reflections on the reputation of the project organisation. This ‘spin’ activity has the potential to limit the examination and reflection on project failures; and ignores the potential long term benefits of incorporating effective learning from failure into future project tasks (cf. Drummond, 1999).

### **7.3 The benefits of the C-A-R analysis**

It would have been possible in this thesis to present the data in a variety of ways (e.g., the aesthetic knowledge types alone could have been the primary focus). The C-A-R model and structure were adopted because considering the data through this lens demonstrates that although similarities exist in terms of the use of aesthetic knowledge in decision making processes across the three stages of mega projects, there are important differences evident, particularly in terms of the focus of use, and the stakeholders considered. Importantly, the analysis shows that the inherent differences associated with different stages of mega projects (e.g., the variation in

the salience of stakeholders, and the project processes, involved) requires a modification in the use of aesthetic knowledge to make sense of stage-relevant objects, relationships, and abstract concepts.

The analysis presented in Chapters 4 to 6 identified by project stage the types of aesthetic knowledge used in decision making processes in mega projects, the foci of their use, the stakeholders considered by participants in their discussion of the use of these types, and the purpose of the use of the specific aesthetic knowledge type. This analysis identified that visual, aural, tactile, gustatory, olfactory, and gut feel aesthetic knowledge types are all used by project decision makers in various ways across the different project stages as part of their decision making processes in mega projects<sup>31</sup>. For the purposes of the analysis of the interview transcripts, data extracts were coded to specific aesthetic knowledge types and discussed accordingly.

However, it is important to note that in some instances, participants discussed the use of multiple types of aesthetic knowledge in particular extracts. This was perhaps most evident in the discussion of the development as part of a military aviation project of a flight simulator, in which it was necessary for the project team to apply their visual, aural, tactile, and even olfactory knowledge of the ‘real’ environment to the design and construction of the simulated environment to ensure that the project outcome was perceived as successful by end users. This suggests (correctly) that

---

<sup>31</sup> It is important to note that the study demonstrated that visual aesthetic knowledge and gut feel were relied on more than the other aesthetic knowledge types, given that the vast majority of the data extracts (i.e., 197/404 – visual; 143/404 – gut feel) were coded to these types. This is not overly surprising, given (a) the general dominance of the sight as a human sense (Colavita, 1974); and (b) the ability provided to people by the term ‘gut feel’ (and other language associated with the concept) to describe the application of a tacit form of sensory knowledge, which is, by its very nature, difficult to articulate in formal language, but which is vital for the holistic understanding required for effective decision making in mega project contexts (cf. Polanyi, 1967; Strati, 2003; Wilford, 2011). Further, the research into the role of intuition in unstructured decision making contexts (e.g., Dane & Pratt, 2007; Dane, et al., 2012; Kahneman & Klein, 2009; Klein, 2003; Simon, 1987) suggests that it would be surprising *not* to find a significant discussion of gut feel in a study examining decision making in the context of mega projects.



various forms of aesthetic knowledge may be applied together in decision making processes in mega projects rather than in isolation.

The data also demonstrates that multiple types of aesthetic knowledge are used to achieve similar decision making outcomes. For example, the data highlights that visual, aural, and gut feel aesthetic knowledges are all used by project decision makers in various ways to determine the level of stakeholder engagement with a project during direct interpersonal interactions with stakeholders. In these instances, multiple approaches to the interpretation of sensory cues received during direct interpersonal interaction are important, as a high degree of sensory *presence* is required to detect and interpret effectively the often complex and subtle signals presented.

Table 7.1 provides a summary per project stage of the types of aesthetic knowledge used in decision making processes in mega projects, and the purpose of the use of each aesthetic knowledge type as identified in the analysis of the data. It represents summary of the analysis presented in Chapters 4 to 6. Considering the data in this way allows greater insight into the phenomena by enabling a comparison of the use of aesthetic knowledge across the various stages of mega projects.

<i>Aesthetic Knowledge Type</i>	<i>Project Stage</i>		
	<b>Conceptualisation</b>	<b>Actualisation</b>	<b>Realisation</b>
<b>Visual</b>	Evidence for decision making Relationship assessment Visualisation for decision making Image of decision makers	Evidence for decision making Relationship assessment Engagement assessment Visualisation for decision making Image of decision makers Metaphoric	Evidence for decision making Relationship assessment Image of decision makers Metaphoric
<b>Gut Feel</b>	Decision making rationalisation	Decision making rationalisation Relationship assessment Engagement Assessment Routine decision making	
<b>Tactile</b>	Evidence for decision making Decision making rationalisation Metaphoric	Evidence for decision making Aid to thought	Evidence for decision making
<b>Aural</b>		Evidence for decision making Relationship assessment Engagement Assessment	
<b>Olfactory</b>	Metaphoric		
<b>Gustatory</b>			Metaphoric

**Table 7.1: Summary of the aesthetic knowledge types used, and the purpose of applying aesthetic knowledge for each stage in the C-A-R model for mega projects.**

### **7.3.1 Visual aesthetic knowledge across the C-A-R stages of mega projects**

Visual aesthetic knowledge is used in various ways across the different stages of mega projects. For example, visual aesthetic knowledge was identified as being used across all three stages of mega projects as the evidentiary basis of decisions about how well the visual aesthetic of project outcomes matched (or will match) end users' expectations of that aesthetic. Similarly, it is used to determine the congruency between the aesthetics of project outcomes and the functional goals of the project across all three stages.

However, differences in its use are also evident across the stages, particularly in terms of its use in visualisation for decision making, the image maintenance activities of decision makers, the assessment of stakeholder engagement, and its metaphoric use. For example, at the Conceptualisation stage, the data demonstrates that aesthetic knowledge is used as part of the visual aspect of decision making to inform design decisions made by project team members; and as the basis of decisions to proceed made by both project team members and clients. At the Actualisation stage, it is used by project team members to establish the nature of, and relationships among, project variables; and as a mean of creating a shared understanding of projects goals and processes among external stakeholders. At the Realisation Stage, end users use visual aesthetic knowledge to provide feedback on the degree of success of project outcomes. Each of these different purposes of the use of aesthetic knowledge are related directly the stage of the project in which decision making occurs; and the different stakeholders involved reflect the relative importance of stakeholders for the commencement, completion, and evaluation of a project across the stages (e.g., project teams members and clients at the Conceptualisation stage; project team members and external stakeholders at the Actualisation stage; and end users at the Realisation stage).

Similarly, although the use of aesthetic knowledge in decision making processes for image maintenance purposes occurred across all three stages, the exact nature of its use, and by whom, varied. At the Conceptualisation stage, managers and clients were perceived as being concerned with the impact of a project on the reputation and brand of a project organisation; and consideration was given to end users' perceptions of the effect of the use of the project outcome on their personal image. At the Actualisation stage, the focus shifted to project team members' and

managers' perceptions of the personal and organisational image effects of project decision making; and managers' desires to maintain or enhance their organisation's brand. At the Realisation stage, managers were involved in 'spin' activities to protect their own and their organisations' images in the case of project failure; while end users were once again concerned about the effect of the use of a project outcome on their personal image. Again, the stage in which project decision making occurs determines how aesthetic knowledge is used in relation to image, and which stakeholders are the foci of that use.

Table 7.1 highlights that the use of visual aesthetic knowledge to assess stakeholder engagement, and its metaphoric use in decision making process in mega projects, were evident only in particular stages of the project process. The interpretation of visual sensory cues provided by stakeholders to establish their level of engagement with the project was evident only in the Actualisation stage. The fact that this is the stage in which the vast majority of stakeholder interaction occurs may explain why this use of visual aesthetic knowledge was identified by participants only at this stage. The metaphoric use of visual aesthetic knowledge concepts was identified at the Actualisation stage in participants' discussion of the problems associated with project team members' rigidity in decision making processes, and the inability to view projects holistically; and at the Realisation stage, in project managers' reflections on decisions which resulted in project failure. This use is related to the ability of the use of aesthetic knowledge to provide meaning to complex phenomena.

### **7.3.2 Gut feel across the C-A-R stages of mega projects**

The use of gut feel was evident in both the Conceptualisation and the Actualisation stages of mega projects. At the Conceptualisation stage, the data suggests that

project team members and managers base decisions to proceed with a project on gut feel. This is particularly the case when objective data about the decision to proceed is not readily available or is not attainable. Further, clients rely on gut feel in their assessments of end user reactions to proposed project outcomes; and both clients and managers rely on gut feel in their assessments of the validity of 'objective' data, and of the risk associated with a project.

Gut feel is used predominantly by project team members at the Actualisation stage of projects. This is not surprising given the nature of the types of decisions which are required to be made at this stage; and the role of project team members as the primary decision makers during this project stage. Gut feel is used as the basis of decisions about the relationship between the aesthetic and functional aspects of a project outcome; and the aesthetic expectations of end users. Similarly to the Conceptualisation stage, it is also used by both project team members and external stakeholders as the basis of decisions in the absence of 'objective data'; and in their assessments of project risk. It is also relied upon by project team members in decision making about the nature of various relationships which are evident in this stage, including the relationship of project outcomes to broader human values; the relationship between subcontractors and the project organisation; and in the assessment of 'fit' (e.g., person/job fit, stakeholder goal compatibility, etc.). Gut feel is also often used as the basis of project team members' assessment of the level of stakeholder engagement with a project; and of their understanding of the project organisation, the state of the project, and the nature (and functionality) of various project relationships. Finally, its use is evident in project team members' routine decision making during the Actualisation stage, where non-significant project

decisions are made at the gut feel level based on the application of tacit knowledge gained through training and experience.

### **7.3.3 Tactile aesthetic knowledge across the C-A-R stages of mega projects**

The data highlighted the use of tactile aesthetic knowledge across all three stages of the mega project process. It is used as the evidentiary basis for decisions at all three stages, particularly by project team members to determine the tactile aesthetic requirements of end users, and to ensure that the final project outcome meets these requirements. End users use their aesthetic knowledge to evaluate the congruence between these tactile aspects of the project outcomes and their expectations of these aspects.

The use of tactile aesthetic knowledge in decision making process also varies across the project stages. At the Conceptualisation stage, the data suggests that tactile aesthetic knowledge may form the basis of the decision to proceed with a project for a client (e.g., through the touch of a prototype of a project outcome). It is also used in a metaphoric sense at the Conceptualisation stage to make assessments of the potential economic outcomes of projects when objective economic data is not available (e.g., a “wet finger in the air” assessment). At the Actualisation stage, the data suggests that tactile aesthetic knowledge plays a role in the facilitation of thought for project decision makers, especially project team members (e.g., through being able to physically touch a pen and piece of paper, a whiteboard, or an electronic device like an iPad). Again, these functions of aesthetic knowledge are closely linked to the activities and stakeholders that are prominent in the specific stage of the project.

#### **7.3.4 Aural aesthetic knowledge across the C-A-R stages of mega projects**

The use of aural aesthetic knowledge in decision making processes was discussed in the data in relation to the decision making processes which occur in the Actualisation stage of projects. This form of aesthetic knowledge is used by project team members as the basis of the evidence to determine the congruence of the aural aesthetic aspects of proposed outcomes with the expectations of stakeholders, particularly end users. Aural aesthetic knowledge is also used by project team members to assist in the sensing and interpretation of aural sensory cues on which assessments of relationships and stakeholder engagement are made. Ensuring that the aesthetic requirements of stakeholders are met is particularly vital during the Actualisation stage, as this is where a project outcome is actually produced, and therefore, these aspects must be taken into account at this stage to ensure congruence is achieved. The Actualisation stage also involves a considerable amount of direct interpersonal interaction between project team members and other stakeholders; which provides a greater opportunity for the use of aural aesthetic knowledge to aid the detection and interpretation of sensory cues.

#### **7.3.5 Olfactory & gustatory aesthetic knowledge across the C-A-R stages of mega projects**

There is limited discussion of aesthetic knowledge concepts relating to both smell and taste in the data. This is not surprising given the nature of the types of projects discussed by participants in this research. However, it is important to note that both terms were used metaphorically in the data. Olfactory aesthetic knowledge concepts were used to describe the process of assessing the nature and functionality of potential client relationships at the Conceptualisation stage (i.e., to “sniff” clients out). Gustatory aesthetic knowledge concepts were used at the Realisation stage to

describe how project managers and their team members communicate ‘bad’ news to clients, end users, and other stakeholders (i.e., how they make such news “palatable”). This metaphoric use of aesthetic knowledge is one of the key insights provided by this research.

#### **7.3.6 Summary**

This discussion demonstrates that the timing of decisions within particular project stages, and the key project processes involved inherent to each stage, do have an impact on the use of aesthetic knowledge in decision making processes in mega projects. In particular, they affect the types of aesthetic knowledge used, purpose of the use of the aesthetic knowledge, and the stakeholders involved in its use (see Table 7.2). Therefore, a consideration of the C-A-R model in the analysis of the data provided useful insights. Further, the purposes of aesthetic knowledge use summarised in Table 7.1 supports the claim made in this research that project decision makers use aesthetic knowledge to establish and/or communicate the meaning of objects, relationships, and abstract concepts for themselves and others.



	<i>Project Stage</i>		
	<b>Conceptualisation</b>	<b>Actualisation</b>	<b>Realisation</b>
<b>Aesthetic knowledge types</b>	Visual Gut feel Tactile Olfactory	Visual Gut feel Tactile Aural	Visual Tactile Gustatory
<b>Purpose of the use of aesthetic knowledge types</b>	Evidence for decision making Relationship assessment Visualisation for decision making Image of decision makers Decision making rationalisation Metaphoric	Evidence for decision making Relationship assessment Engagement assessment Visualisation for decision making Image of decision makers Decision making rationalisation Routine decision making Aid to thought Metaphoric	Evidence for decision making Relationship assessment Image of decision makers Metaphoric
<b>Focal stakeholders</b>	Clients Project team members Managers End users	Project team members External stakeholders Managers End users	End users Managers
<b>Key project processes</b>	Design Project planning Project commencement	Project completion tasks	Project outcome evaluation

**Table 7.2 Summary - variations in aesthetic knowledge types used, purpose of the use of aesthetic knowledge types, focal stakeholders, and key project processes across the C-A-R model**

## 7.4 Conclusion

This chapter presented a brief review of both the ‘real world’ problem examined in this study relating to decision making in mega project contexts characterised by complexity, ambiguity, and uncertainty, and the insight provided by existing theory into this issue. It then focused on exploring the key findings of the research, which suggest that aesthetic knowledge is used by project decision makers to establish and communicate for both themselves and others the meaning of objects, relationships (especially social relationships), and abstract concepts in complex mega project decision making contexts. The application of aesthetic knowledge to the interpretation of sensory cues, the creation of sensory objects, and the use of

metaphor provides decision makers with the ability to link information and create connections to existing sensory maps or schemas as a way of creating and communicating meaning. This meaning is then relied upon as the justifiable basis for the selection of action options. Finally, the chapter concluded by examining the benefits of analysing the variations in the use of aesthetic knowledge in the Conceptualisation, Actualisation, and Realisation stages of mega projects, highlighting that the inherent differences among the stages in terms of the salience of stakeholders and project processes results in aesthetic knowledge being applied in different ways to determine the stage-relevant meaning of objects, relationships, and abstract concepts. Chapter 8 provides an overall conclusion for the thesis, as well as considering its implications for theory and practice; highlighting areas for future research; and identifying the limitations of the study.

## ***Chapter 8 Conclusion***

Decisions have to be made in mega projects in complex circumstances which limit the amount and type of relevant knowledge available, resulting in an absence of ‘objective’ evidence on which to base the choice of action options. This research has demonstrated that in these novel, complex, uncertain, and ambiguous circumstances, project decision makers often rely on aesthetic knowledge as the justifiable basis for the decisions they make. The application of aesthetic knowledge allows them to make sense of relevant objects, social relationships, and abstract concepts, both for themselves and others, through:

- (a) enabling the **interpretation of sensory cues** encountered through embodied experience, the importance of, and relationships among, can be judged based on the recognition (or not) of familiar patterns of sensory cues to determine decisions about appropriate courses of action;
- (b) the application of aesthetic knowledge to the **creation of sensory objects** through which meaning is created and shared; and
- (c) the **use of metaphor** to create shared meaning about complex and tacit concepts which are relied upon as the justifiable basis for the choice of action options.

These uses of aesthetic knowledge all provide ways of linking information and creating connections to existing sensory maps or schemas as a way of creating understanding or meaning. Aesthetic knowledge acts in a structuring way in relation to creating “images, visions, understanding of how different facts and different puzzle pieces of information fall into place” (de Montoux, 2007, p. 133). Its use results in the associated felt meaning being relied on as the justifiable basis for the

choice of action options. The efficacy of this use is related to the level of experience of decision makers. The appropriate use of aesthetic knowledge assists to facilitate project success, particularly in terms of the positive evaluation of project outcomes. The inappropriate application of aesthetic knowledge has implications for project failure and organisational learning.

This research adopted a staged approach (i.e., Conceptualisation-Actualisation-Realisation or 'C-A-R') to mega projects as a tool to assist in the analysing and structuring of the study's data. The benefit of adopting the C-A-R approach in this research is that it demonstrates that inherent differences associated with different stages of projects require a variation in the application of aesthetic knowledge by decision makers. Changes in the salience of stakeholders, and the project processes, involved in the different project stages require a variation in the use of aesthetic knowledge to make sense of stage-relevant objects, social relationships, and abstract concepts.

This research introduces aesthetic knowledge into decision making theory in the mega project management context. One of the major contributions of this work is the implication for intuitive decision making of the Kantian perspective on aesthetic knowledge. Understanding that it is the tacit application of aesthetic knowledge in intuitive knowing processes that enables decision makers to arrive at a felt sense of context and meaning about the relationships among disparate decision inputs further demystifies intuition and its role in decision making in organisational contexts.

The research also challenges further the mechanistic and linear assumptions which have traditionally underpinned much of the project management literature,

and the literature which considers decision making in project management. The research identifies decision makers' use of aesthetic knowledge as the basis of the choice of action options in both the absence and presence of objective data; and also in instances which have previously been considered the exclusive domain of rationally-derived, objective data (e.g., technical decisions). This further challenges the dominance of rational models of decision making in project management. It also highlights the need for decision making theory to acknowledge the role that decision makers' humanity plays in determining the decision making approaches pursued; and the importance of acknowledging the reality of decision making as it actually occurs in the context of mega projects if theory is to be relevant for the practice of decision making in that context. It is important to acknowledge that (despite limited consideration in the literature – cf. Langley, et al., 1995), rationality and rational decision making processes themselves have been social constructed as both ontologically and normatively *the* approach to decision making in project contexts (cf. Cabantous & Gond, 2011). This research challenges the purported notion that rationality *is* and *should be* the basis of decision making in mega projects, identifying that forces beyond rationality do have an effect in decision making in projects – necessarily so in contexts characterised by complexity, uncertainty, and ambiguity.

The findings of this research are consistent with existing aesthetic knowledge theory, particularly the theory which suggests that aesthetic knowledge is the basis of all cognition, an aid to choice when logic and reason fail, and the basis of practical action (Davey, 1989; de Montoux, 2007; Dean, et al., 1997; Dobson, 1999, 2007; Gagliardi, 2006; Hansen, et al., 2007; Hariman, 1998; Ramirez, 2005; Strati, 2003; Taylor, 2002, 2003, 2013; Taylor & Hansen, 2005; Whitfield, 2005). The

findings also clearly support the Kantian notion of aesthetic knowledge as the basis of the recognition of patterns and the conceptualisation of wholeness and coherence which allows effective action options to be chosen in decision making processes (de Montoux, 2007). Further, the research supports Fine's (1992) assertion that aesthetics and aesthetic knowledge are important concepts beyond work and organisational settings which are traditional associated with aesthetic production.

The remainder of this chapter considers further the implications of the research for both aesthetic knowledge and decision making theory, and the practice of mega project management. It also suggests areas for further research; and identifies the limitations of the current study.

## **8.1 Implications for theory**

This research is situated in two key areas of theory – namely, aesthetic knowledge theory and decision making theory. The findings of the research support, extend, and challenge various aspects of these bodies of theory. Therefore, the research has important implications for theory.

### **8.1.1 Aesthetic knowledge theory**

This study extends the existing theory of aesthetic knowledge through its addition of Taylor's (2003) concept of 'gut feel' to Fine's (1992) approach to the sensory bases of aesthetic knowledge, and its subsequent consideration of the combined impact on decision making in organisational contexts. The combination of both perspectives also provides a connection between aesthetic knowledge concepts and intuitive decision making research.

This research has also identified various types of aesthetic knowledge (visual, aural, olfactory, tactile, gustatory and gut feel) and how these knowledge

types are relied upon differently by project decision makers at different stages of the mega project process. This is something that has not been done previously in the aesthetic knowledge or decision making literatures. The identification of the metaphorical use of aesthetic knowledge concepts is also an aspect of aesthetic knowledge which has not been considered previously in the aesthetic knowledge literature.

Another important insight from this research for aesthetic knowledge theory is the issue of intergenerational differences in aesthetic understanding. Although the literature clearly identifies that the content of aesthetic knowledge is shaped by each individual's historical, social and cultural context (Davey, 1989; Hammermeister, 2002; Ingram, 1991; Ottensmeyer, 1996; Paxman, 1992-93), a consideration of the effect of this in terms of different experiences across generations has not been discussed. This intergenerational aspect was evident in this study in terms of the issues associated with the design of GUI interfaces being conducted by engineers who were from different generations with differing aesthetic experiences and requirements to users of the interfaces.

### **8.1.2 Decision making theory**

As well as introducing the concept of aesthetic knowledge into the theory which addresses decision making in the mega project context, this research also identified that aesthetic knowledge is used in multiple approaches to decision making within the context of mega projects. The existing theory suggests that because of its tacit nature and its ability to enable decision makers to find patterns among, and connect, phenomena, aesthetic knowledge is most appropriate for intuitive decision making processes (cf. Agor, 1986; Bennett, 1998; Burke & Miller, 1999; Coget, et al., 2011; Dane & Pratt, 2007; Davey, 1989; de Montoux, 2007; Dobson, 2007; Shapiro &

Spence, 1997; Simon, 1993) . However, this research suggests that it is used in other processes, such as political decision making (especially in terms of assessing the impact of decisions on personal, project, and organisational image) and in routine decision making. Its use in the political processes of image management may be seen as a dysfunctional application of aesthetic knowledge, particularly if project decisions are ultimately based on assessments of self-interest, rather than what is in the best interests of the project.

Interestingly, the research suggests that major project organisations often have a limited reliance on objective data. This is important from a decision making theory perspective, especially from the point of view of the efficacy of most decision making tools and technologies, which are engineered based on the assumptions of rationality and the importance of ‘objective’ data (Cabantous & Gond, 2011).

The research also confirms the existing theory which suggests that intuitive approaches to decision making are often employed in relation to strategic decisions (Buchanan & O'Connell, 2006; Dane & Pratt, 2007; Shapiro & Spence, 1997). Participants clearly identified their reliance on ‘gut feel’ when it comes to strategic decision making, owing often to a lack of relevant objective data on which to base such decisions.

## **8.2 Implications for practice**

As well as providing key theoretical insights, this research has relevant implications for the practice of decision making within the mega project context. One of the key implications is how aesthetic knowledge is used by project decision makers to deal with complexity in mega projects (e.g., the use of visual aids to deal with complex relationships among variables). Understanding the role played by aesthetic



knowledge in enabling the coherent and holistic understanding of the nature of, and patterns among, project inputs is vital for understanding how project decision making occurs in complex situations characterised by the absence of predictability and order. The research also demonstrates how aesthetic knowledge may not be applied for the benefit of the organisation; but may in fact be used to benefit the self-interest of the decision maker through the processes of image or impression management. This insight necessarily has important practical implications for organisations.

This study also reinforces the importance of effective stakeholder relationships for successful project outcomes. It is important for project organisation staff to be able to engage in effective relationships with stakeholders in order to gain knowledge of their aesthetic preferences so ensure that the aesthetic appeal of outcome matches their requirements. Therefore, effective stakeholder relationship management skills are vitally important. In particular, the study highlights the important role of 'presence' in direct, physical interpersonal interactions among stakeholders for the detection and interpretation of sensory cues which can be used as the basis of decisions in areas such as the level of stakeholder engagement in a project, and their requirements in terms of the aesthetic and functional properties of project outcomes. This has considerable implications for organisations in a world in which communication and stakeholder interaction is increasingly electronically mediated.

This research suggests that there is a relationship between the actual visual aesthetic of organisations and the decisions made by members of project organisations about the culture of the organisation, and by other stakeholders about their feelings towards projects. The prime example provided by participants was the

visual aesthetic of office spaces. Members of the organisation use their aesthetic knowledge to interpret the meaning of the office aesthetic; and base their decisions about aspects of the project and project organisation on this interpretation (cf. Strati, 1999). Therefore, it is important that the nature of the visual aesthetic of office spaces in which team members interact, and which may be visited by other important stakeholders, is taken into practical consideration.

There are a number of insights provided in the research for the ways in which effective decision making can be facilitated practically based on the understanding of the use of aesthetic knowledge in project decision making. For example, the research suggests that the provision of visual aid equipment and/or quiet reflection rooms for project team members and project managers may assist their ability to deal with the complexity that is characteristic of decision making environments in mega projects. This has implications for the training and skill sets of project managers. For example, training is required in the effective use of visual aid equipment; and in self-reflection techniques to assist in understanding preferred approaches to the aesthetic environment of decision making (e.g., quiet spaces versus social noise) to enable project decision makers to develop some of the skills required to engage in effective decision making.

The research also highlights the potential problem of the loss of tacit knowledge for project organisations. The effective application of aesthetic knowledge in decision making processes clearly relies on the level of experience of the project decision maker, especially project managers and team members. Thus, project organisations need to consider the best way in which to transfer this tacit knowledge (e.g., through mentoring) to address this issue; and to acknowledge the important differences between experienced and novice project managers and team

members in terms of the ability to effectively apply aesthetic knowledge (cf. Lindahl, 2007).

The research also has implications for how an understanding of the ways in which aesthetic knowledge is used in decision making processes in mega projects can assist to mitigate project failure. For example, failing to maintain sensory presence in meeting context was identified as one potential contributor to project failure. Providing practical training for decision makers in mindfulness techniques (Langer, 1989) may alleviate this problem. Further, participants identified that a focus on personal image related goals rather than project goals was also a potential source of project failure. Attending effectively to the consistent and effective communication of project goals, and to relevant processes of Human Resource Management (including project team member selection and reward systems), may address this issue.

One of the key benefits of this research is that it examines what actually happens in decision making processes in the mega project context and offers insights into the reasons for these approaches to decision making, rather than focusing on what is espoused as the 'right' or legitimate approach to project decision making. This understanding of the actuality of decision making is much more beneficial from a practical viewpoint.

### **8.3 Areas for future research**

This study has raised a number of areas for future research. Given the nature of the sample (i.e., project managers), discussion about decision making processes and the use of aesthetic knowledge in these processes tended to focus on the perspectives of project managers and team members. Future research could expand on this and

include the specific perspectives of managers, clients, end users, and other stakeholders.

The importance of image and impression management for decision making in this context has opened up the prospect of exploring factors related to these concepts (e.g., social identity theory – Hogg & Abrams, 1988; Hogg & Ridgeway, 2003; Hogg & Terry, 2000; Tajfel & Turner, 1979; Terry & White, 2000) and their relationship to the use of aesthetic knowledge to evaluate project outcomes. This also relates to the need for further research on the effect of self-interest on decision making processes in this context, particularly on how decision making is affected by individuals' desires to maintain a positive self-image among their peers, managers, and prospective employers.

The metaphorical use of sensory based terms (e.g., to “sniff” out problems, issues associated with “tunnel” vision, making ‘bad’ news “palatable, etc.) requires further investigation. While metaphor certainly has been an area of interest in the organisational studies field (see, e.g., Grant & Oswick, 1996), its application in decision making in this context has not been studied before. There were a number of interesting metaphorical uses of aesthetic knowledge concepts in the corpus (e.g., to explain complex concepts, to create shared meaning, etc.), the impact of which could be more fully explored in a dedicated study of metaphor in this project context.

The effect of collective tacit knowledge in decision making (e.g., as evidenced in the group felt meaning decision made about the properties of a graphic user interface at the Actualisation stage) has not been considered in this context. The focus of this study has been on individuals. Future research could be designed to

explore the use of aesthetic knowledge in decision making processes at the broader group level.

Certain sections of the data raise issues of fairness, inclusiveness, and equity (e.g., in relation to the aesthetic aspects of the design of public housing as part of an urban development project – see pages 233-234). These issues, though beyond the purpose of this thesis as an exploration of the use of aesthetic knowledge in decision making processes in mega projects, are certainly worthy of further investigation, especially in terms of the effects on the nature and interpretation of project outcomes.

Finally, it must be noted that a number of relevant and interesting findings in this study were supported by limited evidence in the data. Further specific investigation of these issues would clarify their importance in the context of the use of aesthetic knowledge in decision making processes in mega projects.

#### **8.4 Limitations of the research**

While this study has provided important insights for both theory and practice in relation to the use of aesthetic knowledge in decision making processes in mega projects, it does, like all research, have its limitations. One of the key limitations of this study is that the data was drawn exclusively from project managers, who are, in reality, not the sole decision makers in a mega project context. Further direct insight from other decision makers would strengthen the claims made in this thesis. The scope and timing of a doctoral program resulted in the need to focus the research on a particular sample of participants. Project managers were chosen owing to their importance in the context of project management generally and project decision making more specifically (Ireland, 2006).

There are also limits to the ability to generalise the results of the study. Although participants were drawn from a wide range of mega project contexts, the sample size prohibits a definitive application of the findings across all settings. This limitation could be addressed in future research designed specifically to enhance the generalisability of insights about the use of aesthetic knowledge in decision making processes in the mega project context.

It must also be noted that in some instances there is a limited amount of data to support some claims. Essentially, in these cases, these insights were included because they were of interest and were particularly relevant to this study. It is hoped that these insights will form the basis of future research investigation of the different ways in which aesthetic knowledge is used in decision making processes, especially in the context of mega projects.

As noted in the Methodology chapter, the analysis presented in this thesis is built upon my interpretation of the theory on which the study was based, and the transcripts of the interviews conducted. It is, therefore, *my interpretation* and necessarily fallible. However, I have attempted to deal with this limitation through the steps to ensure the quality of the research through the steps outlined in the Methodology chapter.

## **8.5 Conclusion**

This thesis examined the primary research question “What are the ways in which aesthetic knowledge is used in decision making processes in mega projects?”

Through a qualitative study based on semi-structured interviews with mega project managers, the study has identified the different ways in which project managers use their aesthetic knowledge (as indicated by their discussion of the sensory bases of

this knowledge) at the various stages (i.e., Conceptualisation, Actualisation, Realisation) of the project process. The analysis of the data indicates that visual, aural, tactile, gustatory, olfactory and gut feel aesthetic knowledge types are all used by project decision makers as part of their decision making processes in mega projects. However, visual aesthetic knowledge and gut feel are applied more frequently than the other types across the various stages of the mega project process. Given the economic, social and political importance of mega projects, it is vital to understand the factors which contribute to their success or failure. Effective decision making is essential in mega projects, as these projects succeed or fail based on the efficacy of the decisions made by project decision makers. This study supports the existing theory that suggests that aesthetic knowledge plays an important role as an aid to choice in decision making in complex and uncertain contexts like mega projects, particularly through its function of enabling the recognition of patterns, and the conceptualisation of wholeness and coherence, which allows effective action options to be selected. This knowledge of coherence and harmony provides meaning in complex and uncertain environments, and is relied upon as a justifiable basis for action. Ultimately, the research establishes that aesthetic knowledge is used by project decision makers in decision making processes in mega projects to establish and communicate the meanings of objects, social relationships, and abstract concepts for both themselves and others in complex mega project decision making contexts. The application of aesthetic knowledge to the interpretation of sensory cues, the creation of sensory objects, and the use of metaphor provides decision makers with the ability to link information and create connections to existing sensory maps or schemas as a way of creating and communicating meaning. The felt

meaning which results from this process is then relied on as the justifiable basis of action.





- Who or what defines success or failure?
  - Any sensory/aesthetic aspects?
4. What influenced your decision to proceed with the project (or to stop)?

*Follow up/probe considerations:*


- Influences (what did you take into account) – training; ‘gut’; stakeholders (internal or external) or other relationships, knowledge bases, ‘fit’ with project goals/business objectives/stakeholder requirements/company culture
5. What decisions were made in terms of proceeding (or stopping)? How were these decisions made?
6. What aided or hindered quality decision making in terms of a successful or failed outcome?
7. Have you made a decision in a project that “just felt right”?
- (a) If so, can you describe a specific example?
- (b) What specifically was it about this example that “felt right”?
8. Is there any particular place, person, knowledge or environment that you feel helps you to make decisions?

*Follow up/probe topics:*


- E.g., green spaces, physical activities, mentors, domain knowledge (use academics and books example if required)
9. Would you be willing to participate in a short follow up interview either in person or via the telephone if further information or clarification is required?

YES NO

## Appendix 2: Participant Information Sheet

 Queensland University of Technology Queensland Australia	<b>PARTICIPANT INFORMATION FOR QUT RESEARCH PROJECT</b> <i>Interview</i>
<b>The Role of Aesthetic Knowledge in Decision Making Processes in Organisations</b> QUT Ethics Approval Number 120000495	
<b>RESEARCH TEAM</b>	
Principal Researcher:	Thomas Keenan, PhD Student, Queensland University of Technology (QUT)
Associate Researchers:	A/Prof Anne Pisarski and A/Prof Jennifer Bartlett, QUT
<b>DESCRIPTION</b>	
This project is being undertaken as part of a PhD study for Thomas Keenan.	
The purpose of this project is to explore what knowledge you use to inform the choices you have available to you when making decisions.	
You are in a unique position to assist us to understand more about how good and poor decisions are made because of your management responsibilities.	
<b>PARTICIPATION</b>	
Your participation in this project is entirely voluntary. If you do agree to participate, you can withdraw from the project without comment or penalty. If you withdraw, on request any identifiable information already obtained from you will be destroyed. Your decision to participate, or not participate, will in no way impact upon your current or future relationship with QUT.	
Your participation will involve an audio recorded interview at your place of employment or other agreed location that will take approximately one (1) hour of your time. Questions will include 'describe how decision making processes occur in projects in your organisation' and 'on what basis are choices made as part of these processes?'	
<b>EXPECTED BENEFITS</b>	
It is expected that this project will not benefit you directly immediately. However, it may benefit you and other complex project managers in the future by providing greater insight in decision making processes in complex projects.	
<b>RISKS</b>	
There are no risks beyond normal day-to-day living associated with your participation in this project.	
<b>PRIVACY AND CONFIDENTIALITY</b>	
All comments and responses will be treated confidentially. The names of individual persons are not required in any of the responses.	
The project involves audio recording of question responses. These audio recordings will be transcribed to assist with data analysis. Please note:	
<ul style="list-style-type: none"><li>• the audio recording will be destroyed after the contents have been transcribed and verified;</li><li>• the audio recording will not be used for any other purpose;</li><li>• only the research team and the QUT appointed transcriber will have access to the audio recording; and</li><li>• interviewees may choose to participate in the project without being audio recorded – although audio recording is preferred.</li></ul>	
The project is funded by The Australian Research Council LP0989705 however the funding body will not have access to the data obtained during the project.	
<b>CONSENT TO PARTICIPATE</b>	
We would like to ask you to sign a written consent form (enclosed) to confirm your agreement to participate.	
<b>QUESTIONS / FURTHER INFORMATION ABOUT THE PROJECT</b>	
If have any questions or require any further information please contact one of the research team members below.	
Thomas Keenan – PhD Student	A/Prof Anne Pisarski – Supervisor
	School of Management – QUT Business School
+61 7 3138 6647 <a href="mailto:t.keenan@student.qut.edu.au">t.keenan@student.qut.edu.au</a>	+61 7 3138 5081 <a href="mailto:a.pisarski@qut.edu.au">a.pisarski@qut.edu.au</a>
<b>CONCERNS / COMPLAINTS REGARDING THE CONDUCT OF THE PROJECT</b>	
QUT is committed to research integrity and the ethical conduct of research projects. However, if you do have any concerns or complaints about the ethical conduct of the project you may contact the QUT Research Ethics Unit on +61 7 3138 5123 or email <a href="mailto:ethicscontact@qut.edu.au">ethicscontact@qut.edu.au</a> . The QUT Research Ethics Unit is not connected with the research project and can facilitate a resolution to your concern in an impartial manner.	
<i>Thank you for helping with this research project. Please keep this sheet for your information.</i>	

## Appendix 3: Transcriber Confidentiality Agreement

 Queensland University of Technology Lisbane Australia	<b>AGREEMENT TRANSCRIBER FOR QUT RESEARCH PROJECT</b>
<b>The Role of Aesthetic Knowledge in Decision Making Processes in Organisations</b> QUT Ethics Approval Number 120000495	

### RESEARCH TEAM CONTACTS

Thomas Keenan – PhD Student	A/Prof Anne Pisarski – Supervisor
School of Management – QUT Business School	
+61 7 3138 6647 <a href="mailto:t.keenan@student.qut.edu.au">t.keenan@student.qut.edu.au</a>	+61 7 3138 5081 <a href="mailto:a.pisarski@qut.edu.au">a.pisarski@qut.edu.au</a>

### THE AGREEMENT

As this research involves questioning individuals about their personal life and work histories, and the manner in which decision making occurs in their organisations, I, the Principal Researcher in this project, require you to sign this transcriber confidentiality agreement.

As the transcriber for this project you must:

- Keep all information related to this project secret and confidential.
- Not disclose to any person or make known in any manner any part of the project's information.
- Keep the project's information in a secure place so as to ensure that unauthorised persons do not have access to it.

### SIGNATURES

This Agreement shall be effective when signed and dated by all parties.

**Transcriber**      Name  
  
                                 Signature  
  
                                 Date

**Witness**              Name  
  
                                 Signature  
  
                                 Date

## **Reference List**

- Aaltonen, K., & Kujala, J. (2010). A project lifecycle perspective on stakeholder influence strategies in global projects. *Scandinavian Journal of Management*, 26(4), 381-397. doi: <http://dx.doi.org/10.1016/j.scaman.2010.09.001>
- Ackroyd, S. (2004). Methodology for management and organisation studies: Some implications of critical realism. In S. Fleetwood & S. Ackroyd (Eds.), *Critical realist applications in organisation and management studies*. London: Routledge.
- Ackroyd, S., & Fleetwood, S. (2000). Realism in contemporary studies. In S. Ackroyd & S. Fleetwood (Eds.), *Realist perspectives on management and organizations* (pp. 3-25). London and New York: Routledge.
- Adorno, T. W. (1997). *Aesthetic theory* (R. Hullot-Kentor, Trans.). London: Athlone Press.
- Agor, W. H. (1986). The logic of intuition: How top executives make important decisions. *Organizational Dynamics*, 14(3), 5-18.
- Ambrosini, V., & Bowman, C. (2001). Tacit knowledge: Some suggestions for operationalization. *Journal of Management Studies*, 38(6), 811-829.
- Anderson, D. R., & Hausman, C. R. (1992). The role of aesthetic emotion in R. G. Collingwood's conception of creative activity. *The Journal of Aesthetics and Art Criticism*, 50(4), 299-305.
- Andrade, E., & Ariely, D. (2009). The enduring impact of transient emotions on decision making. *Organizational Behavior and Human Decision Processes*, 109, 1-8.
- Antoniadis, D. (2011). Managing complexity of interactions in projects: A framework for decision making. In ICCPM (Ed.), *Complex project management: Global perspectives and strategic agenda to 2025 compendium of working papers* (pp. 105-120). Canberra: International Centre for Complex Project Management.
- Ariely, D. (2009). *Predictably irrational: The hidden forces that shape our decisions*. New York: HarperCollins.
- Aspers, P. (2006). Contextual knowledge. *Current Sociology*, 54(5), 745-763.
- Baccarini, D. (1996). The concept of project complexity - a review. *International Journal of Project Management*, 14(4), 201-204.
- Barbour, R. (2008). *Introducing qualitative research: A student's guide to the craft of doing qualitative research*. London: Sage.
- Barnard, C. I. (1938). *The functions of the executive*. Cambridge, MA: Harvard University Press.
- Bateson, G. (1979). *Mind and nature: A necessary unity*. New York: E. P. Dutton.
- Beardsley, M. C. (1966). *Aesthetics from Classical Greece to the present: A short history*. New York: Macmillan.
- Bell, W. (1996). The sociology of the future and the future of sociology. *Sociological Perspectives*, 39(1), 39-57.
- Bennett, R. H. (1998). The importance of tacit knowledge in strategic decision making. *Management Decision*, 36(9), 589-597.
- Berger, P. L., & Luckmann, T. (1966). *The social construction of reality*. Harmondsworth: Penguin.

- Betsch, T. (2008). The nature of intuition and its neglect in research on judgment and decision making. . In H. Plessner, C. Betsch & T. Betsch (Eds.), *Intuition in judgment and decision making*. Mahwah, NJ: Lawrence Erlbaum.
- Bhaskar, R. (1978). *A realist theory of science*. Sussex: Harvester Press.
- Bhaskar, R. (1989). *Reclaiming reality: A critical introduction to contemporary philosophy*. London: Verso.
- Bhaskar, R. (1998). *The possibility of naturalism*. London and New York: Routledge.
- Boden, M. (1992). *The creative mind: Myths and mechanisms*. London: Abacus.
- Boland, R. J., & Collopy, F. (2004). Design matters for management. In R. J. Boland & F. Collopy (Eds.), *Managing as designing*. Stanford, CA: Stanford Business Books.
- Boland, R. J., Collopy, F., Lyytinen, K., & Yoo, Y. (2008). Managing as designing: Lessons from the design practice of Frank O.Gehry. *Design Issues*, 24(1), 10-25.
- Bolz, N., & Van Reijen, W. (1996). *Walter Benjamin* (L. Mazzarins, Trans.). Atlantic Highlands, NJ: Humanities Press.
- Bordow, A., & More, E. (1991). *Managing organisational communication*. Melbourne: Longman Cheshire.
- Bourdieu, P. (1984). *Distinction: A social critique of the judgement of taste* (R. Nice, Trans.). Cambridge, MA: Harvard University Press.
- Brady, F. N. (1996). Aesthetic components of management ethics. *Academy of Management Review*, 11(2), 337-344.
- Brewer, J. D. (2000). *Ethnography*. Buckingham: Open University Press.
- Brockmann, E. N., & Anthony, W. P. (2002). Tacit knowledge and strategic decision making. *Group and Organization Management*, 27(4), 436-455.
- Bryman, A. (2008). *Social research methods* (3rd ed.). Oxford: Oxford University Press.
- Buchanan, L., & O'Connell, A. (2006). A brief history of decision making. *Harvard Business Review*, 84(1), 32-41.
- Budd, M. (2000). The aesthetics of nature. *Proceedings of the Aristotelian Society*, 100, 137-157.
- Burke, L. A., & Miller, M. K. (1999). Taking the mystery out of intuitive decision making. *The Academy of Management Executive*, 13(4), 91-99.
- Cabantous, L., & Gond, J.-P. (2011). Rational decision making as performative praxis: Explaining rationality's eternal retour. *Organization Science: A Journal of the Institute of Management Sciences*, 22(3), 573-586.
- Carmichael, P. A. (1961). Aesthetic knowledge. *The Journal of Philosophy*, 58(14), 378-387.
- Carr, A., & Hancock, P. (2002). Art and aesthetics at work: An overview. *Tamara Journal of Critical Organisation Inquiry*, 2(1), 1-7.
- Chang, A., Chih, Y.-Y., Chew, E., & Pisarski, A. (2013). Reconceptualising mega project success in Australian Defence: Recognising the importance of value co-creation. *International Journal of Project Management*, 31(8), 1139-1153. doi: <http://dx.doi.org/10.1016/j.ijproman.2012.12.005>
- Choo, C. W. (1998). *The knowing organization: How organizations use information to construct meaning, create knowledge and make decisions*. New York: Oxford University Press.
- Cijsouw, R., & Jorna, R. (2003). Measuring and mapping knowledge types. In H. W. M. Gazendam, R. Jorna & R. Cijsouw (Eds.), *Dynamics and change in organizations*. Boston: Kluwer Academic.

- COED. (Ed.). (2008) *The Concise Oxford English Dictionary* (12th ed.). London: Oxford University Press.
- Coget, J.-F., Haag, C., & Gibson, D. E. (2011). Anger and fear in decision-making: The case of film directors on set. *European Management Journal*, 29(6), 476-490.
- Cohen, M. D., March, J. G., & Olson, J. P. (1972). A garbage can model of organizational choice. *Administrative Science Quarterly*, 1(1), 1-25.
- Colavita, F. B. (1974). Human sensory dominance. *Perception & Psychophysics*, 16(2), 409-412.
- Collins, H. (2007). Bicycling on the moon: Collective tacit knowledge and somatic-limit tacit knowledge. *Organization Studies*, 28(2), 257-262. doi: 10.1177/0170840606073759
- Cooke-Davies, T. (2011). An environment of increasing complexity. In ICCPM (Ed.), *Complex project management: Global perspectives and strategic agenda to 2025 compendium of working papers* (pp. 21-22). Canberra: International Centre for Complex Project Management.
- Crawford, L. (2005). Senior management perceptions of project management competence. *International Journal of Project Management*, 23(1), 7-16.
- Cray, D., Inglis, L., & Freeman, S. (2007). Managing the arts: Leadership and decision making under dual rationalities. *The Journal of Arts Management, Law and Society*, 36(4), 295-313.
- Creswell, J. W. (2003). *Research design: Qualitative, quantitative and mixed methods approaches* (2nd ed.). Thousand Oaks, CA: Sage.
- Dane, E. (2013). Things seen and unseen: Investigating experience-based qualities of attention in a dynamic work setting. *Organization Studies*, 34(1), 45-78.
- Dane, E., & Pratt, M. G. (2007). Exploring intuition and its role in managerial decision making. *Academy of Management Review*, 32(1), 33-54.
- Dane, E., Rockmann, K. W., & Pratt, M. G. (2012). When should I trust my gut? Linking domain expertise to intuitive decision-making effectiveness. *Organizational Behavior and Human Decision Processes*, 119(2), 187-194. doi: <http://dx.doi.org/10.1016/j.obhdp.2012.07.009>
- Davey, N. (1989). Baumgarten's aesthetics: A post Gadamerian reflection. *British Journal of Aesthetics*, 29(2), 101-115.
- de Montoux, P. G. (2007). Aesthetic perspective: Hermeneutics of action. In G. Bangt (Ed.), *The principles of knowledge creation: Research methods in the social sciences* (pp. 131-146). Cheltenham, UK: Edward Elgar.
- Dean, J. W., Ottensmeyer, E., & Ramirez, R. (1997). An aesthetic perspective on organizations. In C. L. Cooper & S. E. Jackson (Eds.), *Creating tomorrow's organizations: A handbook for future research in organizational behavior* (pp. 420-437). New York: John Wiley & Sons.
- DMO. (2011). Complexity and project typology. In ICCPM (Ed.), *Complex project management: Global perspectives and strategic agenda to 2025 compendium of working papers* (pp. 34-40). Canberra: International Centre for Complex Project Management.
- Dobson, J. (1999). *Art of management & the aesthetic manager: The coming way of business*. Westport, CT: Greenwood Press.
- Dobson, J. (2007). Aesthetics as a foundation for business activity. *Journal of Business Ethics*, 72, 41-46.
- Drummond, H. (1999). Analysis and intuition in technological choice: the lessons of Taurus. *International Journal of Technology Management*, 17(4), 459-466.

- Drummond, H. (2001). *The art of decision making - mirrors of imagination, masks of fate*. Chichester: John Wiley & Sons.
- Durgee, J. F. (2004). The co-creation of meaning between marketers and consumers; step 1: How marketing creatives interpret consumer motivations. *Advances in Consumer Research*, 31, 162-167.
- Edman, I. (1939). *Arts and the man: A short introduction to aesthetics*. New York: W. W. Norton.
- Elgin, C. Z. (1997). *Between the absolute and the arbitrary*. Ithaca: Cornell University Press.
- Ellis, C., & Flaherty, M. C. (Eds.). (1992). *Investigating subjectivity: Research on lived experience*. Newbury Park: Sage.
- Emerson, R. M., Fretz, R. I., & Shaw, L. L. (1995). *Writing ethnographic field notes*. Chicago: The University of Chicago Press.
- Engler, G. (1990). Aesthetics in science and in art. *British Journal of Aesthetics*, 30(1), 24-34.
- Eweje, J., Turner, R., & Müller, R. (2012). Maximizing strategic value from megaprojects: The influence of information-feed on decision-making by the project manager. *International Journal of Project Management*, 30(6), 639-651. doi: <http://dx.doi.org/10.1016/j.ijproman.2012.01.004>
- Ewenstein, B., & Whyte, J. (2007). Beyond words: Aesthetic knowledge and knowing in organizations. *Organization Studies*, 28(5), 689-708.
- Featherstone, M. (2007). *Consumer culture and postmodernism*. London: Sage.
- Feldman, S. P. (2000). Micro matters: The aesthetics of power in NASA's flight readiness review. *The Journal of Applied Behavioral Science*, 36(4), 474-490.
- Fernandes, R., & Simon, H. A. (1999). A study of how individuals solve complex and ill-structured problems. *Policy Sciences*, 32, 225-245.
- Fine, G. A. (1992). The culture of production: Aesthetic choices and constraints in culinary work. *American Journal of Sociology*, 97(5), 1268-1294.
- Fleetwood, S., & Ackroyd, S. (2004). Editor's introduction: Critical realist applications in organisation and management studies. In S. Fleetwood & S. Ackroyd (Eds.), *Critical realist applications in organisation and management studies* (pp. 1-5). London: Routledge.
- Flick, U. (2007). *Designing qualitative research*. London: Sage.
- Flyvbjerg, B. (2008). Curbing optimism and strategic misrepresentation in planning: Reference class forecasting in practice. *European Planning Studies*, 16(1), 3-21.
- Flyvbjerg, B. (2014). What you should know about megaprojects and why: An overview. *Project Management Journal*, 45(2), 6-19.
- Flyvbjerg, B., Bruzelius, N., & Rothengatter, W. (2003). *Megaprojects and risk: An anatomy of ambition*. New York: Cambridge University Press.
- Fox, R. (1998). Knowledge and process for routine decision making. *Simulation*, 71(4), 289-292.
- Fritzsche, D. J. (1991). A model of decision-making incorporating ethical values. *Journal of Business Ethics*, 10(11), 841-841.
- Gagliardi, P. (1996). Exploring the aesthetic side of organisational life. In S. R. H. C. Clegg, C. Hardy & W. R. Nord (Eds.), *Handbook of organization studies* (pp. 565-580). London: Sage.
- Gagliardi, P. (2006). Exploring the aesthetic side of organisational life. In S. R. H. C. Clegg, C. Hardy & W. R. Nord (Eds.), *Handbook of organization studies* (Second ed., pp. 701-724). London: Sage.



- Gale, A., & Cartwright, S. (1995). Women in project management: Entry into a male domain? *Leadership & Organization Development Journal*, 16(2), 3-8. doi: 10.1108/01437739510082262
- Gardiner, P. D., & Stewart, K. (2000). Revisiting the golden triangle of cost, time and quality: The role of NPV in project control, success and failure. *International Journal of Project Management*, 18, 251-256.
- Geertz, C. (1973). *The interpretation of culture*. New York: Basic Books.
- Geraldi, J. G. (2008). The balance between order and chaos in multi-project firms: A conceptual model. *International Journal of Project Management*, 26, 348-356.
- Geraldi, J. G., & Adlbrecht, G. (2007). On faith, fact and interaction in projects. *Project Management Journal*, 38(1), 32-43.
- Gore, J., Banks, A., Millward, L., & Kyriakidou, O. (2006). Naturalistic decision making and organizations: Reviewing pragmatic science. *Organization Studies*, 27(7), 925-942.
- Gottlieb, J. Z., & Sanzgiri, J. (1996). Towards an ethical dimension of decision making in organizations. *Journal of Business Ethics*, 15(12), 1275-1285.
- Gouldner, A. W. (1970). *The coming crisis in Western sociology*. New York: Avon Books.
- Gourlay, S. (2004). Knowing as semiosis: Steps towards a reconceptualization of tacit knowledge. In H. Tsoukas & N. Mylonopoulos (Eds.), *Organizations as knowledge systems: Knowledge, learning and dynamic capabilities* (pp. 86-105). London: Palgrave Macmillan.
- Grant, D., & Osrick, C. (Eds.). (1996). *Metaphor and organizations*. Thousand Oaks, CA: Sage.
- Gray, E. R., & Balmer, J. M. T. (1998). Managing corporate image and corporate reputation. *Long Range Planning*, 31(5), 695-702. doi: [http://dx.doi.org/10.1016/S0024-6301\(98\)00074-0](http://dx.doi.org/10.1016/S0024-6301(98)00074-0)
- Guillen, M. F. (1997). Scientific management's lost aesthetic: Architecture, organization and the Taylorized beauty of the machine. *Administrative Science Quarterly*, 42(4), 682-715.
- Hammermeister, K. (2002). *The German aesthetic tradition*. Cambridge: Cambridge University Press.
- Hansen, H., Ropo, A., & Sauer, E. (2007). Aesthetic leadership. *The Leadership Quarterly*, 18, 544-560.
- Hariman, R. (1998). Terrible beauty and mundane details: Aesthetic knowledge in the practice of everyday life. *Argumentation and Advocacy*, 35, 10-18.
- Harrison, E. F. (1999). *The managerial decision making process* (5th ed.). Boston, MA: Houghton Muffin.
- Hartley, P. (1999). *Interpersonal communication* (2nd ed.). London: Routledge.
- Hatch, M. J., & Jones, M. O. (1997). Photocopylore at work: Aesthetics, collective creativity and the social construction of organizations. *Studies in Cultures, Organizations and Societies*, 3, 263-287.
- He, J., Butler, S. S., & King, W. R. (2007). Team cognition: Development and evolution in software project teams. *Journal of Management Information Systems*, 24(2), 261-292.
- Hobday, M. (2000). The project-based organisation: an ideal form for managing complex products and systems. *Research Policy*, 29, 871-893.
- Hogg, M. A., & Abrams, D. (1988). *Social identifications: A social psychology of intergroup relations and processes*. London: Routledge.

- Hogg, M. A., & Ridgeway, C. (2003). Social identity: Sociological and social psychological perspectives. *Social Psychology Quarterly*, 66(2), 97-100.
- Hogg, M. A., & Terry, D. T. (2000). Social identity and self-categorization processes in organizations. *Academy of Management Review*, 25(1), 121-140.
- Honderich, T. (Ed.). (1995). *The Oxford companion to philosophy*. Oxford: Oxford University Press.
- Hopf, H. (2007). Qualitative interviews: An overview (B. Jenner, Trans.). In U. Flick, E. Von Kardoff & I. Steinke (Eds.), *A companion to qualitative research* (pp. 203-208). London: Sage.
- Humphreys, M., Brown, A. D., & Hatch, M. J. (2003). Is ethnography jazz? *Organization*, 10(1), 5-31.
- Hussey, J., & Hussey, R. (1997). *Business research: A practical guide for undergraduate and postgraduate students*. London: Macmillan.
- Ingram, D. (1991). Habermas on aesthetics and rationality: Completing the project of enlightenment. *New German Critique*, 0(53), 67-103.
- Ireland, L. R. (2006). *Project management*. New York: McGraw-Hill Professional.
- Jaafari, A. (2003). Project management in the age of complexity and change. *Project Management Journal*, 34(4), 47-57.
- Jabareen, Y. (2009). Building a conceptual framework: Philosophy, definitions, and procedure. *International Journal of Qualitative Methods*, 8(4), 49-62.
- Johansen, A., Eik-Andresen, P., & Ekambaram, A. (2014). Stakeholder benefit assessment – Project success through management of stakeholders. *Procedia - Social and Behavioral Sciences*, 119(0), 581-590. doi: <http://dx.doi.org/10.1016/j.sbspro.2014.03.065>
- Johnson, P., & Duberley, J. (2000). *Understanding management research: An introduction to epistemology*. London: Sage.
- Jones, L. (1986). Effective listening. *Education + Training*, 28(2), 49-55.
- Jones, M. O. (1996). *Studying organizational symbolism*. Thousand Oaks, CA: Sage.
- Jugdev, K., & Muller, R. (2005). A retrospective look at our evolving understanding of project success. *Project Management Journal*, 36(4), 19-31.
- Kahneman, D., & Klein, G. (2009). Conditions for intuitive expertise: A failure to disagree. *American Psychologist*, 64(6), 515-526.
- Kahneman, D., & Lovallo, D. (1993). Timid choices and bold forecasts: A cognitive perspective on risk taking. *Management Science*, 39(1), 17-31.
- Kahneman, D., & Lovallo, D. (2003). Delusions of success: How optimism undermines executives' decisions. *Harvard Business Review*, July 2003, 56-63.
- Kahneman, D., Lovallo, D., & Sibony, O. (2011). Before you make that big decision.... *Harvard Business Review*, June, 51-60.
- Kallinikos, J. (1998). Organized complexity: Posthumanist remarks on the technologizing of intelligence. *Organization*, 5(3), 371-396.
- Kanda, A. (2010). *Project management: A life cycle approach*. New Delhi: Prentice Hall International.
- Kardes, I., Ozturk, A., Cavusgil, S. T., & Cavusgil, E. (2013). Managing global megaprojects: Complexity and risk management. *International Business Review*, 22(6), 905-917. doi: <http://dx.doi.org/10.1016/j.ibusrev.2013.01.003>
- Keats, D. M. (2000). *Interviewing: A practical guide for students and professionals*. Sydney: UNSW Press.

- Kersten, A. (2008). When craving goodness becomes bad: A critical conception of ethics and aesthetics in organizations. *Culture and Organization*, 14(2), 187-202.
- Kiel, G., & McColl-Kennedy, J. R. (2000). *Marketing: A strategic approach*. South Melbourne: Nelson Thompson Learning.
- Kieran, M. (2010). Aesthetic knowledge. In S. Bernecker & D. Pritchard (Eds.), *The Routledge companion to epistemology*. Hoboken, NJ: Routledge.
- King, N., & Horrocks, C. (2010). *Interviews in qualitative research*. London: Sage.
- Klein, G. (1998). *Sources of power: How people make decisions*. Cambridge, MA: MIT Press.
- Klein, G. (2003). *The power of intuition: How to use your gut feelings to make better decisions at work*. New York: Random House.
- Klein, G. (2008). Naturalistic decision making. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 50(3), 456-460.
- Klein, G., Calderwood, R., & Clinton-Cirocco, A. (2010). Rapid decision making on the fire ground: The original study plus a postscript. *Journal of Cognitive Engineering and Decision Making*, 4(3), 186-209.
- Kovalerchuk, B. (2004). Decision process and its visual aspects. In B. Kovalerchuk & J. Schwing (Eds.), *Visual and spatial analysis: Advances in data mining, reasoning, and problem solving* (pp. 3-30). Norwell, MA: Springer.
- Kumar, M., Townsend, J. D., & Vorhies, D. W. (2014). Enhancing consumers' affection for a brand using product design. *Journal of Product Innovation Management*, n/a-n/a. doi: 10.1111/jpim.12245
- Kumar, R., Rangan, U. S., & Rufin, C. (2005). Negotiating complexity and legitimacy in independent power project development. *Journal of World Business*, 40, 302-320.
- Kvale, S. (1996). *InterViews: An introduction to qualitative research interviewing*. Thousand Oaks, CA: Sage.
- Langer, E. J. (1989). *Mindfulness*. Reading, MA: Addison-Wesley.
- Langley, A., Mintzberg, H., Pitcher, P., Posada, E., & Saint-Macary, J. (1995). Opening up decision making: The view from the black stool. *Organization Science: A Journal of the Institute of Management Sciences*, 6(3), 260-279.
- Leddy, T. (1995). Everyday surface aesthetic qualities: "Neat," "messy," "clean," "dirty". *The Journal of Aesthetics and Art Criticism*, 53(3), 259-268.
- Leet, M. (2004). *Aftereffects of knowledge in modernity: Politics, aesthetics and individuality*. Albany, NY: State University of New York Press.
- Leybourne, S., & Sadler-Smith, E. (2006). The role of intuition and improvisation in project management. *International Journal of Project Management*, 24, 483-492.
- Lincoln, Y. S., & Guba, E. G. (1995). *Naturalistic enquiry*. Beverly Hills, CA: Sage.
- Lindahl, M. (2007). Engineering improvisation: The case of Wartsila. In P. Guillet de Monthoux, C. Gustafsson & S. E. Sjostrand (Eds.), *Aesthetic leadership: Managing fields of flow in art and business* (pp. 155-169). New York: Palgrave Macmillan.
- Luhman, J., & Boje, D. (2001). What is complexity science? A possible answer from narrative research. *Emergence*, 3(1), 158-168.
- Mack, K. S. (2007). Senses of seascapes: Aesthetics and the passion for knowledge. *Organization*, 14(3), 373-390.
- Maitland, J. (1976). Creativity. *The Journal of Aesthetics and Art Criticism*, 34(4), 397-409.

- Maitlis, S., & Ozcelik, H. (2004). Toxic decision processes: A study of emotion and organizational decision making. *Organization Science: A Journal of the Institute of Management Sciences*, 15(4), 375-393.
- March, J. G. (1994). *A primer on decision making*. New York: Free Press.
- March, J. G. (1997). Understanding how decisions happen in organizations. In Z. Shapira (Ed.), *Organizational decision making* (pp. 9-32). Cambridge: Cambridge University Press.
- Marshall, C., & Rossman, G. B. (2006). *Designing qualitative research* (4th ed.). Thousand Oaks, CA: Sage.
- Martin, P. Y. (2002). Sensation, bodies and the 'spirit of place': Aesthetics in residential organizations for the elderly. *Human Relations*, 55(7), 861-885.
- Mason, J. (1996). *Qualitative researching*. London: Sage.
- Mazur, A., Pisarski, A., Chang, A., & Ashkanasy, N. M. (2014). Rating defence major project success: The role of personal attributes and stakeholder relationships. *International Journal of Project Management*, 32(6), 944-957. doi: <http://dx.doi.org/10.1016/j.ijproman.2013.10.018>
- McGonigal, A. (2006). The autonomy of aesthetic judgement. *British Journal of Aesthetics*, 46(4), 331-348.
- McKenzie, J., van Winkelen, C., & Grewal, S. (2011). Developing organisational decision-making capability: a knowledge manager's guide. *Journal of Knowledge Management*, 15(3), 403-421.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded source book*. Thousand Oaks: Sage.
- Miller, D., & Oliver, m. (2015). *Engaging stakeholders for project success*. Newtown Square, PA: Project Management Institute.
- Minichiello, V., Anoni, R., Timewell, E., & Alexander, L. (1995). *In-depth interviewing: Principles, technique, analysis* (2nd ed.). Sydney: Longman.
- Mintzberg, H., Raisinghani, D., & Theoret, A. (1976). The structure of "unstructured" decision processes. *Administrative Science Quarterly*, 21(2), 246-275.
- Morris, P. W. G. (1982). Project organizations: Structures for managing change. In J. A. Kelly (Ed.), *New dimensions of project management* (pp. 155-179). Lexington, MA: D.C. Health & Co.
- Muller, R., Geraldi, J., & Turner, J. R. (2012). Relationships between leadership and success in different types of project complexities. *Engineering Management, IEEE Transactions on*, 59(1), 77-90. doi: 10.1109/tem.2011.2114350
- Muller, R., & Turner, J. R. (2010). *Project-oriented leadership*. Farnham: Gower Publishing Limited.
- Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. New York: Oxford University Press.
- Nonaka, I., Toyama, R., & Konno, N. (2000). Seci, Ba and leadership: A unified model of dynamic leadership. *Long Range Planning*, 33(1), 5-34.
- Ottensmeyer, E. (1996). Too strong to stop, too sweet to lose: Aesthetics as a way to know organisations. *Organization*, 3(2), 189-194.
- Park, C. W., Jaworski, B. J., & MacInnis, D. J. (1986). Strategic Brand Concept-Image Management. *Journal of Marketing*, 50(4), 135-145.
- Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury Park, CA.: Sage.
- Paxman, D. (1992-93). Aesthetics as epistemology, or knowledge without creativity. *Eighteenth Century Studies*, 26(2), 285-306.

- Penrose, R. (1974). The role of aesthetics in pure and applied mathematical research. *The Institute of Mathematics and Its*, July/August, 266-271.
- Pettigrew, A. M. (1973). *Politics of organizational-decision making*. London: Tavistock.
- PMI. (2004). *A guide to the project management body of knowledge*. Newtown Square, PA: Project Management Institute.
- Polanyi, M. (1967). *The tacit dimension*. Garden City, NY: Doubleday.
- Porcello, T. (2004). Speaking of sound: Language and the professionalization of sound-recording engineers. *Social Studies of Science*, 34(5), 733-758.
- Pountain, D., & Robins, D. (2000). *Cool rules: Anatomy of an attitude*. London: Reaktion Books.
- Rafaeli, A., & Pratt, M. G. (2006). *Artifacts and organizations: Beyond mere symbolism*. Mahwah, NJ: Lawrence Erlbaum.
- Ramirez, R. (1996). Wrapping form and organizational beauty. *Organization*, 3(2), 233-242.
- Ramirez, R. (2005). The aesthetics of cooperation. *European Management Review*, 2, 28-35.
- Reich, Y. (1993). A model of aesthetic judgement in design. *Artificial Intelligence in Engineering*, 8, 141-153.
- Remington, K., Zolin, R., & Turner, R. (2009). *A model of project complexity: distinguishing dimensions of complexity from severity*. Paper presented at the 9th International Research Network of Project Management Conference, Berlin.
- Richards, L. (2005). *Handling qualitative data: A practical guide*. London: Sage.
- Roberts, C. M. (2010). *The dissertation journey: A practical and comprehensive guide to planning, writing, and defending your dissertation* (2nd ed.). Thousand Oaks, CA: Sage.
- Rooney, D., McKenna, B., & Keenan, T. (2006). Copyright and cultural production: A knowledge and wisdom theory perspective on education policy. *Policy Futures in Education*, 4(4), 379-394.
- Rooney, D., & Schneider, U. (2005). The material, mental, historical and social character of knowledge. In D. Rooney, G. Hearn & A. Ninan (Eds.), *Handbook on the knowledge economy*. Cheltenham: Edward Elgar.
- Ropo, A., & Sauer, E. (2008). Dances of leadership: Bridging theory and practice through an aesthetic approach. *Journal of Management & Organization*, 14, 560-572.
- Rosenblum, B. (1978). Style as a social process. *American Sociological Review*, 43(3), 422-438.
- Saito, Y. (2001). Everyday aesthetics. *Philosophy and Literature*, 25(1), 87-95.
- Salas, E., Rosen, M. A., & DiazGranados, D. (2010). Expertise-based intuition and decision making in organizations. *Journal of Management*, 36(4), 941-973.
- Santos, V. R., Soares, A. L., & Carvalho, J. A. (2012). Knowledge sharing boundaries in complex research and development projects: An exploratory study on the perceptions of project managers. *Knowledge and Process Management*, 19(1), 27-38.
- Sayer, A. (2004). Foreword: Why critical realism? In S. Fleetwood & S. Ackroyd (Eds.), *Critical realist applications in organisation and management studies* (pp. 6-20). London: Routledge.

- Schindler, M., & Eppler, M. J. (2003). Harvesting project knowledge: A review of project learning methods and success factors. *International Journal of Project Management*, 21(3), 219-228.
- Schulz, M. (2008). Organizational Image. In S. R. H. C. Clegg & J. R. Bailey (Eds.), *International Encyclopedia of Organization Studies*. London: Sage. doi: <http://dx.doi.org.ezp01.library.qut.edu.au/10.4135/9781412956246.n371>
- Schutt, R. K. (2001). *Investigating the social world: The process and practice of research*. Thousand Oaks, CA: Pine Forge Press.
- Seidman, I. E. (1991). *Interviewing as qualitative research: A guide for researchers in education and the social sciences*. New York: Teachers College Press.
- Senge, P. M. (2004). *Presence: Exploring profound change in people, organizations, and society*. New York: Crown Business.
- Shapiro, S., & Spence, M. T. (1997). Managerial intuition: A conceptual and operational framework. *Business Horizons*, 40(1), 63-68.
- Shenhar, A. J., & Levy, O. (1997). Mapping the dimensions of project success. *Project Management Journal*, 28(2), 5.
- Sibley, F. (1959). Aesthetic concepts. *The Philosophical Review*, 68(4), 421-450.
- Simon, H. A. (1957). *Models of man: Social and rational*. New York: John Wiley.
- Simon, H. A. (1960). *The new science of managerial decisions*. New York: Harper and Row.
- Simon, H. A. (1978). On how to decide what to do. *The Bell Journal of Economics*, 9(2), 494-507.
- Simon, H. A. (1979). Rational decision making in business organizations. *The American Economic Review*, 69(4), 493-513.
- Simon, H. A. (1987). Making management decisions: The role of intuition and emotion. *The Academy of Management Executive*, 1(1), 57-64.
- Simon, H. A. (1993). Decision making: Rational, nonrational, and irrational. *Educational Administration Quarterly*, 29(3), 392-411.
- Sinclair, M., & Ashkanasy, N. M. (2005). Intuition: myth or a decision-making tool? *Management Learning*, 6(3), 353-370.
- Skulmoski, G. J., & Hartman, F. T. (2009). The progression towards project management competence. In T. T. Kidd (Ed.), *Handbook of research on technology project management, planning, and operations* (pp. 37-57). Hershey, PA: Information Science Reference.
- Snowden, D. J., & Boone, M. E. (2007). A leader's framework for decision making: Wise executives tailor their approach to fit the complexity of the circumstances they face. *Harvard Business Review*, November 2007, 69-76.
- Southgate, N. (2003). Coolhunting, account planning and the ancient cool of Aristotle. *Marketing Intelligence & Planning*, 21(7), 453-461. doi: 10.1108/02634500310504304
- Stacey, R. D. (2001). *Complex responsive systems in organizations: Learning and knowledge creation*. London: Routledge.
- Sternberg, R. J., & Lubart, T. I. (1995). *Defying the crowd: Cultivating creativity in a culture of conformity*. New York: Free Press.
- Steup, M. (1996). *An introduction to contemporary epistemology*. Upper Saddle River, NJ: Prentice Hall.
- Strati, A. (1990). Aesthetics and organizational skill. In B. A. Turner (Ed.), *Organizational symbolism* (pp. 207-222). Berlin and New York: Walter de Gruyter.

- Strati, A. (1992). Aesthetic understanding of organizational life. *Academy of Management Review*, 17(3), 568-581.
- Strati, A. (1996). Organizations viewed through the lens of aesthetics. *Organization*, 3(2), 209-218.
- Strati, A. (1999). *Organization and aesthetics*. London: Sage.
- Strati, A. (2000). The aesthetic approach in organization studies. In S. Linstead & H. Hopfl (Eds.), *The aesthetics of organization* (pp. 13-34). London: Sage.
- Strati, A. (2003). Knowing in practice: Aesthetic understanding and tacit knowledge. In D. Nicolini, S. Gherardi & D. Yanow (Eds.), *Knowing in organizations*. Armonk, NY: M.E. Sharpe.
- Strati, A. (2007). Sensible knowledge and practice-based learning. *Management Learning*, 38(1), 61-77.
- Strati, A., & de Montoux, P. G. (2002). Introduction: Organizing aesthetics. *Human Relations*, 55(7), 755-766.
- Strauss, A. L., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Thousand Oaks, CA: Sage.
- Straw, B. (1980). Rationality and justification in organizational life. In B. Straw & L. L. Cummings (Eds.), *Research in organizational behavior* (Vol. 2, pp. 45-80). Greenwich, CY: JAI Press.
- Sutterfield, J. S., Friday-Stroud, S. S., & Shivers-Blackwell, S. L. (2006). A case study of project and stakeholder management failures: Lessons learned. *Project Management Journal*, 37(5), 26-35.
- Tajfel, H., & Turner, J. C. (1979). An Integrative Theory of Intergroup Conflict. In S. Worchel & W. G. Austin (Eds.), *The Social Psychology of Intergroup Relations* (pp. 33-47). Monterey, CA: Brooks/Cole.
- Taylor, H. (2007). Tacit knowledge: Conceptualizations and operationalizations. *International Journal of Knowledge Management*, 3(3), 60-73.
- Taylor, S. S. (2000). Aesthetic knowledge in academia. *Journal of Management Inquiry*, 9(3), 304-328.
- Taylor, S. S. (2002). Overcoming aesthetic muteness: researching organizational members' aesthetic experience. *Human Relations*, 55(7), 821-840.
- Taylor, S. S. (2003). Knowing in your gut and knowing in your head: Doing theater and my underlying epistemology of communication. *Management Communication Quarterly*, 17(2), 272-279.
- Taylor, S. S. (2013). Little beauties: Aesthetics, craft skill, and the experience of beautiful action. *Journal of Management Inquiry*, 22(1), 69-81.
- Taylor, S. S., & Hansen, H. (2005). Finding form: Looking at the field of organizational aesthetics. *Journal of Management Studies*, 42(6), 1211-1231.
- Terry, D. T., & White, K. M. (2000). Attitude-behaviour relations: Social identity and group membership. In D. T. Terry & M. A. Hogg (Eds.), *Attitudes, Behaviour and Social Context: The Role of Norms and Group Membership*. Mahwah: Lawrence Erlbaum Associates.
- Thomas, J., & Mengel, T. (2008). Preparing project managers to deal with complexity - Advance project management education. *International Journal of Project Management*, 26, 304-315.
- Tsoukas, H., & Mylonopoulos, N. (2004). Introduction: What does it mean to view organizations as knowledge systems. In H. Tsoukas & N. Mylonopoulos (Eds.), *Organizations as knowledge systems: Knowledge, learning and dynamic capabilities*. Basingstoke: Palgrave Macmillan.

- Turner, J. R. (2008). *The handbook of project based management: Leading strategic change in organizations* (3rd ed.). London: McGraw-Hill.
- Turner, J. R., & Cochrane, R. A. (1993). Goals-and-methods matrix: Coping with projects with ill defined goals and/or methods of achieving them. *International Journal of Project Management*, 11(2), 93-102.
- Turner, R., Zolin, R., & Remington, K. (2009). *Monitoring the performance of complex projects from multiple perspectives over multiple time frames*. Paper presented at the 9th International Research Network of Project Management Conference, Berlin.
- Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185(4157), 1124-1131.
- Tversky, A., & Kahneman, D. (1986). Rational choice and the framing of decisions. *The Journal of Business*, 59(4), S251-S278.
- Uhl-Bien, M. (2011). Executive behaviours and decision making. In ICCPM (Ed.), *Complex project management: Global perspectives and strategic agenda to 2025 compendium of working papers* (pp. 73-79). Canberra: International Centre for Complex Project Management.
- Vygotsky, L. S. (1986). *Thought and language* (T. A. Kouzulin, Trans.). Cambridge, MA: MIT Press.
- Warren, S. (2002). Show me how it feels to work here: Using photography to research organizational aesthetics. *Ephemera*, 2(3), 224-245.
- Warren, S. (2008). Empirical challenges in organizational aesthetics research: Towards a sensual methodology. *Organization Studies*, 29(4), 559-580.
- Weggeman, M., Lammers, I., & Akkermans, H. (2007). Aesthetics from a design perspective. *Journal of Organizational Change Management*, 20(3), 346-358.
- Wellington, J., & Szczerbinski, M. (2007). *Research methods for the social sciences*. London: Continuum.
- Welsch, W. (1996). Aestheticization processes: Phenomena, distinctions and prospects. *Theory Culture Society*, 13(1), 1-24.
- White, D. A. (1996). 'It's working beautifully!' Philosophical reflections on aesthetics and organization theory. *Organization*, 3(2), 195-208.
- Whitehead, A. N. (1978). *Process and reality* (D. R. Griffin & D. W. E. Sherburne, Trans. Corrected ed.). New York: The Free Press.
- Whitfield, T. W. A. (2005). Aesthetics as pre-linguistic knowledge: A psychological perspective. *Design Issues*, 21(1), 3-17.
- Whitty, S. J., & Maylor, H. (2009). And then came complex project management (revised). *International Journal of Project Management*, 27, 304-310.
- Whitty, S. J., & Schulz, M. F. (2007). The impact of Puritan ideology on aspects of project management. *International Journal of Project Management*, 25, 10-20.
- Wilford, A. (2011). Why the era of complex project management has emerged. In ICCPM (Ed.), *Complex project management: Global perspectives and strategic agenda to 2025 compendium of working papers* (pp. 17-20). Canberra: International Centre for Complex Project Management.
- Williams, T. M. (1999). The need for new paradigms for complex projects. *International Journal of Project Management*, 17(5), 269-273.
- Witz, A., Warhurst, C., & Nickson, D. (2003). The labour of aesthetics and the aesthetic of organization. *Organization*, 10(1), 33-54.
- Yates, J. F., & Tschirhart, M. D. (2006). Decision-making expertise. In E. K.A., N. Charness, P. J. Feltovicj & R. R. Hoffman (Eds.), *The Cambridge handbook of*



*expertise and expert performance* (pp. 421-438). New York: Cambridge University Press.

Zhai, L., Xin, Y., & Cheng, C. (2009). Understanding the value of project management from a stakeholder's perspective: Case study of mega-project management. [Article]. *Project Management Journal*, 40(1), 99-109. doi: 10.1002/pmj.20099