



# Heart and mind: the role of time in design related decisions

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## Abstract

We make numerous decisions every day. Some decisions are based on a range of explicit and material alternatives, others are constructed from implicit ideas about the options we have in mind. In preparing a construction project, creating a vision on how the future would look like appears to be one of the most important activities. This is usually done through design sketches. This paper focuses on the interaction between people and the alternatives they face when make decisions that relate to the built environment. My argument is built upon two research traditions - valuing design from a cognitive perspective and psychological processes of decision making, and exemplary empirical observations from my previous work. First the concepts of architectural design quality and value dimensions of a product are addressed, bringing us back to the essentials of Vitruvius. Then I show how sensemaking and intuitive decision making do justice to the complexity and ambiguity of making design related decisions. In the conclusion I argue that value judgements should be considered as a result of the interaction between a product and an individual person in the context of a group or society. Consequently value judgements are essential in sensemaking processes leading to decisions. They integrate arguments from the heart and the mind, leading to particular preferences among individuals. Since decisions are often considered satisfactory for the moment, but outmoded the next, time plays an essential role in creating meaning of design related situations.

**Keywords: decision making, design, intuition, sensemaking, time**

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# 1. Introduction

We make numerous decisions every day. Some decisions are based on a range of explicit and physical alternatives, while others are grounded in implicit ideas. Somehow we have to find a way to communicate about our preferences and the direction of our decisions. This paper focuses on the design related decisions and the role of time. Many aspects of this process are intangible by nature. Social science can contribute significantly to the understanding of psychological processes of decision making in the context of architectural design. The insights from this field of science identify situational characteristics in the dilemmas that project managers, client representatives and other actors in the construction industry face when dealing with design. My argument in this paper is built upon two research traditions: valuing design from a cognitive perspectives and psychological processes of decision making. In both traditions the concepts of *perception* (e.g. Bell, Greene, Fisher, & Baum, 1996; Tversky & Kahneman, 1981), *intuition* (e.g. Dane & Pratt, 2007; Sadler-Smith & Sparrow, 2008), *judgement* (e.g. Gifford, Hine, Muller-Clemm, & Shaw, 2002; Hogarth, 1988), *expertise* (e.g. Hekkert & van Wieringen, 1998; Hutton & Klein, 1999), and *emotion* (e.g. Desmet, 2002; Simon, 1987) play an important role. These concepts all strongly relate to the use and perception of time. The line of reasoning and choice of research traditions are fed by empirical examples from my previous work on client decision making during architect selections (Volker, 2010). Throughout the text I refer to situations or quotes of decision makers in explaining their behaviour, therewith addresses the concepts of intuition, emotion and perception.

The paper is built around a theoretical argument about the strong influence of time in design related decisions. First I will address the architectural perspective on the dimensions of the value of a product, which can be traced back to the essentials of Vitruvius and product experience. Then I will show how sensemaking and intuitive decision making do justice to the complexity, temporality and ambiguity of making decisions about design.

## 2. Design judgements

### 2.1 Quality and value

Discussions in architecture often relate to actual buildings of bricks and stone or to designs as future representations of the buildings. Holistically, design quality can be seen as the achievement of an integrated totality that is more than the sum of the parts (e.g. Bártolo, 2002; Dijkstra, 2001). However, during communication and discussion, design quality is often decomposed. The oldest known operationalisation of architectural quality (about 25 BC) is that of the Roman architect Vitruvius, which distinguishes three aspects: 'Utilitas (commodity), Firmitas (firmness), and Venustas (delight)' (Gann, Salter, & Whyte, 2003). This trilogy has been a source of inspiration for architectural theory since then and continues to be so for several contemporary researchers. Every scholar appears to create his or her own version of the list of characteristics of a design, while at the same time these lists basically cover the same things. Macmillan (2006) for example distinguishes between exchange, use, image, social, environmental and cultural value for the built environment while Gann and Whyte distinguish 'functionality', 'build quality' and 'impact' (Gann et al.,

2003; Whyte, Gann, & Salter, 2004). Authors who not only consider the building but also include the development and management of a building often expand this trilogy with contextual factors and future perspectives, such as finances, time and resources (Gann & Whyte, 2003). *Quality* is strongly related to *value*. From this perspective Wandahl (2005) defines product value as the value which an individual places upon an object or outcome. The act of valuing is thus dissociated from the value itself. Also, it becomes possible to allow for the fact that different people may hold different beliefs or preferences based on the same value. Macmillan (2006) distinguishes several comparable main types of value of a mixture of tangibles and intangibles between stakeholder groups. These value types are related to the different building types described by Loe (2000): use, exchange, image and business value buildings. Finally Bucciarelli (1994) concludes that design is a social process and the objective reality of a technological artefact is in fact a social construct. The design object is consequently always alive, beholding uncertainties and ambiguity.

The distinction between quality and value appears to lie in the objective or subjective character of its judgement. Value assessments can be subjective when framed against an individual's values, while quality assessments can be considered objective when the relationship between benefit and expense is compared on a level of fulfilment of requirements (Thomson, Austin, Devine-Wright, & Mills, 2003). These same authors conclude that value is the relationship between positive and negative consequences for an individual (output and input, or benefits and sacrifices). "When a consumer asks him or herself 'is it worth it?', they are making a value judgement in light of their own, often tacit, values and comparing this with the market value assessment (typically expressed as a price)" (Thomson et al., 2003, p. 337). In this sense *value judgements* are seen as rational considerations of individual decision makers at a specific time among the different value types that can be addressed to (future) buildings. Yet, discussions about *architectural design quality* tend to focus on the qualities of the product itself and about architecture in relation to societal value. Functionality, impact and build quality imply a judgement about tangible and intangible product qualities from the perspective of a person experiencing objects in the built environment. There seems to be no real difference between discussions about realised objects or designs as projections of future buildings. In this respect time does not make a difference. However, in real life we do experience these kinds of differences. I argue this has to do with the fact that scholars in construction usually exclude other individuals than themselves in their reflections. This differs from the field of product design experience, which is based on the assumption that value assessments cannot be seen separately from the person perceiving the object. This will be discussed in the next section.

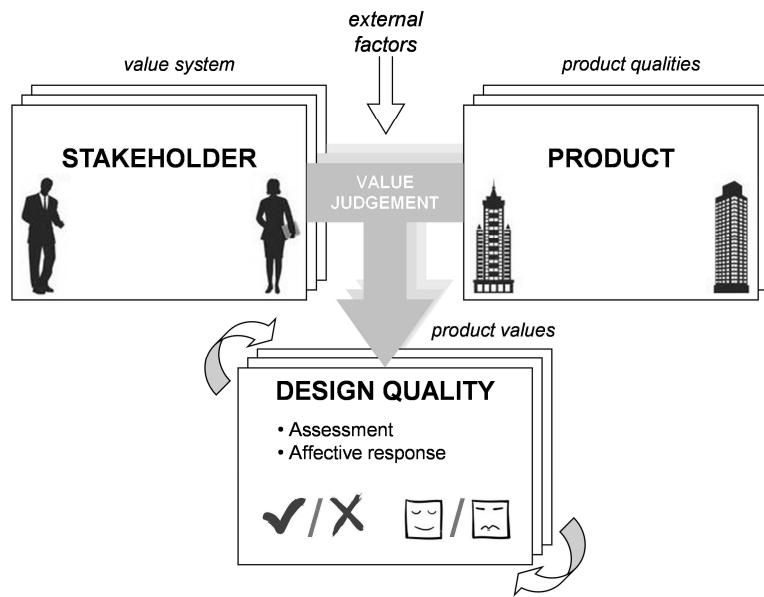
## **2.2 Product experience**

The field of product experience mainly originates from the field of cognitive psychology, emotion and perception (Schifferstein & Hekkert, 2008). In this field the interaction between the individual and the product is the main point of reference. From this perspective three components or levels of product experience are distinguished: aesthetic pleasure, attribution of meaning, and emotional response (Desmet, 2002; Desmet, Porcelijn, & van Dijk, 2007; Hekkert, 2006). At the *aesthetic level* a product's capacity to delight one or more sensory modalities is considered. The degree to which a person manages to detect structure, order,

or coherence and assess a product's novelty or familiarity typically determines the affect it generates. This can be explained by examining the evolutionary basis of the human perceptual system (Kaplan, 1987). In this sense time only changes the result of the interaction and not the character of the interaction. The *experience of meaning* concerns the cognitive processes of recognition, interpretation, association and assignment that attach a meaning to a product. These processes are subject to individual, cultural and physical differences (Hekkert, 2006) and thus dynamic in nature. The *emotional response* relates to the result of a cognitive, though often automatic and unconscious process caused by the interaction of the human with the product. According to Desmet (2002) an emotion is elicited by an evaluation (appraisal) of an event or situation as potentially beneficial or harmful in relation to the person's product concerns. It is the interpretation of an event (or product) rather than the event itself that then causes an emotion. Because appraisals mediate between the products, concerns and emotions, different individuals who appraise the same product in different ways and different times will experience different emotions. Product experience thus largely depends on emotions related to a specific person, a specific time and a specific place.

### **2.3 Valuing design**

Based on the preceding perspectives I argue that design quality actually is as an overall value judgement by an individual person, based on the interaction between a person and an object in the built environment (see Figure 1). The product experience literature teaches us that a judgement includes an assessment about the level of quality as well as an affective response. Only then a product is associated with a certain value. In this sense the product receives its value *after* its meaning is interpreted by an individual. Individuals act in the context of their personal value system of goals and expectations, which is applied during the judgement (Thomson et al., 2003). If assessments are made in groups, a value system is developed among the members of the group, which could again influence the individual value system (Kelly, Male, & Graham, 2004). Furthermore, the individual value system is influenced by personal, social, and external variables of the context. Differences in value judgements can thus be assigned to a difference in the weight of values (Mills, Austin, Thomson, & Devine-Wright, 2009), the amount and use of information during the judgement (Soane & Nicholson, 2008), or a difference in training of the expression or verbalisation of product experience (Hekkert, 2006). I presume that the stage which a product is in – a representation of a future product or a physical object – is part of the information that is available during value judgement. As such the process in time influences the value judgement process.



**Figure 1: The concept of design quality defined as value judgement**

### 3. Making design related decisions

#### 3.1 From value judgement to decision making

Talking about design related decisions suggests individual value judgement. Yet, real life situations often involve a consensus among members of a group. Following the literature from organisational psychology, decision making is a way to align expectations and needs to reach goals (Hodgkinson & Starbuck, 2008). As also addressed by Tzortzopoulos, Cooper, Chan, and Kagioglou (2006), actors in construction have to make decisions in a strategic, dynamic and elusive organisational context. Decision making in a design environment should therefore be considered as an iterative process of different kinds of value judgements, resulting in different kinds of product values. These values are not easy to sum up and justify as one 'truth' because they are based on perceptions of the group members at a specific time. The theories of *bounded rationality* (Simon, 1997), heuristics (Tversky & Kahneman, 1974), and *intuition* (e.g. Gore, Banks, Millward, & Kyriakidou, 2006) are different explanations of how decisions are made in complex situations with a lot of uncertainties. They show that not every decision is rational and conscious by nature (Hogarth, 2005; Sinclair & Ashkanasy, 2005). *Context and problem structure* play a crucial role in determining the appropriateness and efficacy of judgements (Klein, 2004). Affect, mood and emotion are other reasons that people could behave different from existing theories and models (Beach & Connolly, 2005). The concept of *sensemaking* (Balogun, Pye, & Hodgkinson, 2008; Weick, 1995) attributes to the understanding of decision processes and the importance of the justification of a decision in organisations (Vidaillet, 2008). In this argument I therefore take the concepts of sensemaking and intuition to address time and the iterative character of judgement processes in the built environment. These concepts will be illustrated by empirical findings from four case studies in which clients had to decide on the best architect for their future accommodation (Volker, 2010). These situations can best be compared to architectural competitions in which several architectural firms submit design

proposals in order to acquire a new job (Strong, 1996). The data was collected by (participatory) observations, interviews and secondary document analysis. The purpose of the examples used in this paper is to strengthen the argument and show why and how the concepts of intuition, emotion, time and perception can influence the perspective on design related decisions.

### 3.2 The role of sensemaking

Sensemaking involves the ongoing retrospective development of plausible images that rationalise what people are doing (Weick, 1995; Weick, Sutcliffe, & Obstfeld, 2005). It has its genesis in disruptive ambiguity and its mixture of retrospect and prospect. Aspects that directly relate to time and the perception of events by a decision maker. "Sensemaking pays attention to how people 'deal with' (whether unconsciously or otherwise) constraints imposed by the information processing limitations and their organisational context, delving into the socio-political nature of organisations to show that the answer to better decision making does not necessarily lie with the provision of greater quantities of 'more accurate', 'objective' and timely data, but rather requires an understanding of the social processes of negotiation involved in decision making" (Balogun, et al., 2008, p. 235). Central questions are how an event comes to happen and what does an event mean. Weick et al. (2005, p. 409) emphasize that sensemaking is about the interplay of action and interpretation rather than the influence of evaluation on choice – "it is a process that is ongoing, instrumental, subtle, swift, social and easily taken for granted". Present, future and past interchange, illustrated by a quote of one of the jurors: *'I finish this project in my mind... It has so much potential'*.

In each case it was found that in the process of selecting an architect in tender the design related decisions consist of four steps: 1) *initialisation* by interaction between the problem definition of the client (a brief) interpreted by the architect, 2) *confrontation* as the proposals of the architect were presented to the clients, 3) *communication* about the preferred parties based on a the perception, value judgement and decision making within the organisation, followed by 4) *confirmation* in case a contract is signed. An urban planner involved in one of the cases explained that interpretation relates closely to expectations of the clients: *'Clients hire an architect to visualise their ideas and therefore they are looking for an architect in line of their thinking'*. Especially between the confrontation and communication sensemaking takes place. Clients are suddenly confronted with a visual response to their requirements. Observations showed that they first started to evaluate how and to which extent the submissions fulfil their personal needs. This is partly done by explicitly evaluating the official tender criteria, but also relies on the positive surprise or affective response towards to the proposal as also described by Desmet et al. (2007). One of the jurors argued that a certain submission *'feels like a caravan exhibition hall'* instead of a faculty building. With a humoristic tone of voice a member of the Christian party described his argumentation to choose for a particular design during the public debate: *'It was love at first sight. First I wandered what it was; a bee hive, a space ship, maybe a centipede. But then I saw it: It is an Ark. The heart was touched...'*. These expressions not only illustrate the sensemaking process during the interpretation of the proposal but also the affective response triggered by it and the role of emotion in making decisions.

Balogun et al. (2008) define sensemaking as a social process of construction and reconstruction of meaning that enables individuals through interacting with others to collectively create, maintain and interpret the world. The intertwined concepts of 'framing' (shaping the meaning of a subject and sharing it with others), 'sensegiving' (attempts to influence sensemaking and construction of meaning toward a preferred redefinition of social reality), 'sensereading' (perception of circumstances and aligning of interpretations), and 'sensewrighting' (inheriting, shaping and reflecting the understanding of the world) are all related to the resource, process and meaning of power effects in organisational decision making (Balogun et al., 2008). All elements of this definition show the search of decision makers in time. One of the architect described why decision making is so hard for client organisations: *'A public client is in fact not a single client but a monster with many heads, a conglomeration of clients who does not know what she wants and always tries to find a solution in the middle.'* Yet, to sign a contract this quest needs to end in a clear decision. This is difficult since they *'feel responsible'* since the implications can be large: *'we have to act as decided'*. Fortunately, as an experienced jury members explains, *'almost every jury process eventually leads to a satisfying results'*. The term satisfying emphasises the temporarily and the relativity of the decision.

### **3.3 Rationality and intuition**

An underlying issue in decision theories is the level of rationality of decision makers. According to Simon (1997, p. 84) "rationality is concerned with the selection of preferred behaviour alternatives in terms of some system of values whereby the consequences of behaviour can be evaluated". This means a decision can be objectively, subjectively, consciously, deliberately, organisationally, or personally rational. Etzioni (1988, p. 136) defines rationality as "the concept of a man who acts wisely, and who chooses efficiently the means that advance his or her goals. Rationality entails deliberations; it is not automatic or non-conscious and can vary by degree. It is based on openness to evidence (an empirical orientation) and on sound reasoning (logic)". Yet, *'what sounds logical from one perspective, does not make sense from another'*, as rightfully notices during a validation workshop. Dean and Sharfman (1993) argue that a rational action is feasible if decision makers are in agreement about goals and cause and effect relationships and if they are aware of the environmental and other constraints. Yet, in many situations decision makers cannot rely exclusively upon rational methods due to complexity and uncertainty. Understanding conscious choice requires the knowledge of the perspective of the actor at the time of choice: an action that appears irrational after the fact, might have appeared perfectly rational when the actor chose it (Hodgkinson & Starbuck, 2008). An architect explained: *'one always selects who one trust, who makes one feel right. They just see what happens next'*.

People actively try to influence events in order to make their choice the right choice (Balogun et al., 2008). This results in strategic behaviour. During the jury deliberations a juror said: *'I notice what you are doing and I went along in your direction for a long time, but this is the limit'*. This does not only affect the direction of the decision but also the potential of the personal relationship: *'We will still be friends if you leave this one out but I still think it is a very strong project'*. The observations showed that experts were better at positioning arguments in the discussions. Their frame of references appeared to be more robust than



the novice decision makers, which also reflects on the power of decision makers in discussions: *'I just sat there with my eyes and ears wide open. I am a layman: I did not find time to say anything useful'*. Experts also communicate with little words in underpinning their preferences and posing arguments in favour of a certain submission. They convince each other by using short phrases such as 'interesting', 'not very realistic', or 'attractive scheme'.

According to Dane and Pratt (2007) there are two sets of factors that influence intuition effectiveness: domain knowledge factors (development of schemas by explicit and implicit learning) and task characteristics (intellective versus judgemental tasks, environmental uncertainty). Well-structured problems might be compared to tasks with objective criteria for success within a particular conceptual system, while ill-structured problems seem similar to judgemental tasks for which there is no objective criterion or demonstrable solution (Dane & Pratt, 2007). In tightly structured, intellective tasks in data rich, objectively quantifiable, and computationally complex domains, statistical models perform better than human judges (Sadler-Smith & Sparrow, 2008). It can therefore be concluded that in loose decision structures with moral, political, ethical, aesthetic or behavioural judgemental tasks, ill-structured strategic problems with little precedent and information to draw on and in situations with time pressure, dynamic conditions and experienced participants, intuition is favoured over analytical approaches (Hogarth, 2002; Klein, 2004). Making reasons explicit could lead to inferior decisions and less satisfaction about the decision (Wilson & Schooler, 1991). This is explicated by one of the committee members who openly stated that *'I only used the criteria because you have to be transparent and because you have to explain later on. But I did not look at the criteria during my judgement process; I would lie if I say so'*.

#### **4. Conclusion**

Real-time situations in construction are complicated: information is never complete, the context is dynamic and future perspectives continuously change due to increasing insights. Such uncertainties create an urgent need for time to give meaning to events, integrate the input from both the structured and rational-oriented mind and intuitive and emotion-driven heart, and actually make decisions about design related issues.

In this theoretical argument I have made an effort to integrate concepts from architecture, product experience, decision making and organization science and analyse the origin of design related decisions. Empirical exemplary observations have shown the role of affect, perception and emotion in making decisions. In line with Chan (2012) I consequently argue that it is the perception of time that allows people to make decisions in complex and conflictive situations. Whether these decisions have proven to be right is not easily said: an action that appears irrational after the fact, might have appeared perfectly rational when the actor chose it (Hodgkinson & Starbuck, 2008).

The illustrations also supported the argument that without the interaction between a design and an individual no value judgement can be made, and that without judgements decisions do not exist. Sensemaking is essential in interpreting the options and future value of objects in the built environment. Sensemaking is interwoven with time, just as perception is. They are both integrative activities of heart and mind. For people working in construction, it will be

beneficial to take the relativity and time-dependency of decisions into account when preparing and conducting activities. They also need to be aware that it is during the process of decision making that a decision receives meaning for the members of a group. This, in turn, increases the chance that a decision is implemented into action. In my opinion sensemaking is not something we can or should prevent, we can only facilitate. If we all know what to expect, we would not make mistakes.

Despite the fact that this paper provides an important fundament on temporality in construction, more research is needed to explore the differences in task conditions, the role of time perception and the influence of contextual factors. As indicated by Sadler-Smith and Sparrow (2008) due to the significant developments in cognition, neurology and neuroscience, a fruitful dialogue between intuition researchers from several fields is to be expected. Those studies should not only be based on self-report and experimental research, but also use the numerous opportunities for qualitative methods such as ethnographic work and action research. Another promising areas for empirical research is proposed by Dane and Pratt (2007). According to these authors we should look for the practical implications of the interplay between intuition and analysis and the link between creativity and intuition. Many situations in the realisation of infrastructure projects can be labelled as such. This means that the construction industry provides an excellent environment for time related research initiatives.

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