DESIGNERS' THINKING AND ACTING IN MEETINGS WITH CLIENTS

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ABSTRACT
The present research attempts to contribute to the understanding of how designers' thinking and acting enhance the value of the design process and delivers value to design results. The present study reports findings based on the analysis of video recorded meetings from a case study in a graphic design consultancy. This work is part of an empirical research study that aims to identify designers' practices of value delivery across design disciplines. Data were collected by means of non-participatory observation and half-structured interviews. A systematic categorization of six meeting has been done and by this insights into the characteristics and procedures of designers of different disciplines. Previous findings derived from this research delivered priority values for decision-making in design across disciplines based on interviews. The present study reports findings on how priority values are generated by designers' patterns of thinking and acting throughout six team meetings working on the design of an exhibition. Evidence is given to definitive and iterative instances of value judgment and how they change throughout the meetings, corresponding priority issues as well to commonalities and differences between the design team and client's team characteristics of thinking and acting in delivering value to design meetings and the creation of a combined model of such behavior. These results are intended for further study of its relevance in other design disciplines apart from the field of graphic design.

Keywords: designers, thinking, acting, values, priority, decision, model

1 INTRODUCTION
One of the main purposes of design research is to understand how designers' thinking and acting enhance the value of the design process and deliver value to design results [1] [2]. In designing, as in any other activity, the deliberate expression of value-driven judgments derives from the need to take a stance and make a choice. As a process of thought, designing inevitably entails the designer making decisions [3] either alone or in collaboration. Value in designing is defined as: "The designer or design team makes choices at every point in the design process and most of these are value laden. Every decision at each "choice point" will give priority to certain values over others" [4]. The present research attempts to provide insight into how designers use value judgment to make decisions. Previous findings derived from this research and based on the analysis of half-structured interviews were proposed as priority values for decision-making in designing [5]. Variant and invariant priority values were asserted across case studies in the design disciplines of graphic design, architecture, interaction design and engineering. n the graphic design office. A small part of this study is reported in this paper based on the analysis of six meetings in the graphic design office during the design of an exhibition. The explanation of the research question and how it was incorporated in this study is followed by the description of the methodological procedure and the results.

2 PRIORITY VALUES FOR DECISION-MAKING IN DESIGN
Research approaches to value comprise three main dimensions, namely, economic value, human values and value systems. Currently, values are seen as guiding principles that are not necessarily visible and may change over time. Values guide the selection of information, motivate and steer the action regulation and events as parts of a dynamic system with inherent contradictions [6]. A value system is regarded as an enduring organization of beliefs concerning preferable modes of conduct or end-states of existence along a continuum of relative importance [7]. Contributions to research into values unfold in terminal and instrumental values [8] that along with important value components, namely, motivational, cognitive, affective and behavioral, as well as the influence of internal and

external features [7], guide individuals' conduct and motivate action [9].

The topic of values in designing has been discussed in the recent years. Research into value in design addresses several issues, further developed. However a knowledge gap emerges from the literature survey. The study of value in design from designers' point of view has been neglected. On the other hand, the topic of values has been a pertinent element in research in decision-making. The process of decision is asserted to hinge upon evaluation on emergent criteria from the system of values attached to each consequential possibility and required choice. Choice is guided by value-indices, intermediate ends, which are in turn dependent on more final values [10]. In addition, it seems to be of importance to identify the conditions in which designers make value judgments and how do they prioritize values for decision-making in design. Designers' value systems guide individual and collective value judgments about the relative importance of the attributes for a certain result. These judgments most likely derive from value-based decisions and preference is shown towards solutions that most reflect designers' priorities [11] in the given context. Such conditions can only be observed in the social context of the designing activity, with all the critical situations inherent to the daily life environment of design consultancies.

2.1 Research on value in design

Studies have identified how designers' behavior ascertains different approaches to the design process framing the outcome and results [12]. Although emphasis has been placed on quality and value from a user's perspective through user value theories and models [13], values in computer-human interaction design [14], [15], and approaches to value in the building industry towards project management in architecture [16], [17], [18] such contributions neglect the designer's point of view. Few authors have tried to identify value from the designers' perspective on an empirical base. Design researchers have been contributing studies on value issues such as, affect-in-cognition [19], ethical thinking in designing [20] a plural value framework for a shared language supporting value management [21]. Such studies report results based on the analysis of meetings or approaches to value developed from experience. Insights from the literature on social mechanisms and patterns of discourse in value transfer in meetings [22], represent a meaningful study for this research that however, misses the identification of conditions and characteristics of how designers associate value to the design situation and narrative discourse. Although designers play an important role in adding value [23] to products, services and experiences furthering innovation little attention has been placed on the study in depth of how these activities occur, on an empirical base. An empirical based knowledge of such mechanisms might help to identify how designers express values in design. Moreover, this study contributes to the study of value in designing from designers' point of view in the context of team-based design in interaction with clients and other stakeholders.

2.2 Research on decision-making in design

Studies show that most of the designers' time is occupied making decisions. Therefore it is important to describe the conditions that surround and influence these decision points [3]. Research in decision-making in design has been done in different disciplines such as engineering design [24], [25], architecture [26], [27] or industrial design engineering [3]. In addition several issues have been addressed, such as: methods and tools for decision-making [24]; design decisions under uncertainty [28], [29]; context, task and institutional environment of decision-making [30]; patterns of decision making in design [25]; comparative studies on consensus and single leader decision-making [31]; and philosophy based models for ethical decision-making in design [32]. Summarizing different reported influences on decision-making we arrive at a bunch of factors and processes, such as: experience, use of information from previous projects, intuition, culture, personality, predicted or unforeseen elements of risk, chain of known and unknown design constraints, unknown design variables, interaction of alternative courses of action, validity of design concepts, design intentions, and further more [28]. Such factors of influence in decision-making in design are based in studies on a single design discipline, and not always supported by empirical studies. This research suggests that a transdisciplinary approach to decision-making in design based on empirical studies is necessary to overcome the sparseness of these contributions.

2.3 Priority Values as Variants and Invariants in design

The present piece of work investigates how do designers prioritize value judgment and its influence in

decision-making in design. This study is part of a major research concerned with the question of how far, designers' value judgments in different design disciplines share common and dissimilar characteristics. In previous studies data analysis was based on interview transcripts, which had been categorized according to the priority, which the interviewees gave to different values [5]. The same categorization system (see Table 3) has been used in the present study to analyze how value components develop among the designers and between them and the client and other stakeholders in design meetings. The issues of commonalities and differences in designing across disciplines have been asserted as of a major importance to design research [33] such distinction is addressed by as variants and invariants in design cognition [2]. Although focused in a single design discipline, the present study brings the opportunity to see in more depth how designers prioritize value judgment and how it changes across the observation of the development of the design of an exhibition, among other elements, through the analysis of audio and video record of six sequential design meetings. Thus, the present research focus on the main research question:

How do designers deliver value to the design process and design results in design meetings?

Such research question requests to identify what values do designers prioritize in design meetings, and how it happens. To reach this level of analysis other issues must be studied first. In the present study a first approach to data analysis is done on the identification of situations of statement of priority issues leading to value judgment and eventual decision. The dynamics of priority issues is shown across the meetings. Results derived from this study show similarities and differences between priority values stated in designers individual interviews and collaborative meetings.

3. RESEARCH PROCEDURE

The present study is based on data collected from the observation of the design process of an exhibition in the graphic design office study. Formal meetings and informal moments of discussion were audio and video recorded for further analysis [34]. A research diary supported collecting additional data. During the period of observation of six sequential weeks six formal meeting took place, as shown in Table 1.

Table 1. Overview of meetings during the period of observation

Week	1st	4th	5th			6th
Meeting	1	2	3	4	5	6
Duration	2h:21min	1h:59min	3h:48 min	42 min	1h:27min	1h:58 min
Topic	First concept ideas	Meeting of the client's team and the design team.	Detailed discussion of the content of the exhibition.	Visiting the place with construction team.	Presenting a final solution to the client.	Detailed discussion of production plan
Stage / Team members	Development of ideas	Task clarification	Analysis of requirements	Context analysis	Presenting final solution	Production planning
Client project manager	☑	☑			☑	
Client Historicist 1		☑	☑		☑	
Client Historicist 2		☑			☑	
Client design manager	☑	☑	☑	☑	☑	
Leading designer	☑	☑	☑		☑	☑
Graphic designer	☑	☑	☑		☑	
Designer 1 (Producer)	☑	☑	☑	☑	☑	☑
Architect				☑		☑
Designer 2 (Producer)		☑	☑	☑		☑
Designer (scenarios)			☑	☑	☑	☑
Construction team				☑		

The first three weeks were dedicated to the generation and development of ideas. The second meeting took place in the fourth week for tasks clarification. After meeting 2 the participants already knew each other better, the argumentation for discussion and the process itself were flowing, and the meetings exhibited more situations where the team members expressed the importance of certain

values over others leading to moments of decision. The meetings 3, 4, 5 and 6 took place in the last two weeks of the observation period, where the design process was in a further agile state of development. In meeting 3 the design team had a detailed discussion with the client main representatives about the content and structure of the exhibition. Issues such as conditional objects and set of elements to exhibit, fine-tuning costs and budgets, and contract details were discussed. In meeting 4 the design, client and construction teams met at the future exhibition place, to discuss the implementation and completion of the works. The meeting was focus in finding effective approaches to the construction of the exhibition to cope with undefined elements, timing and planning. In meeting 5 the final solution was presented to the client's team. The leading designer started to explain the exhibition concept and structure of the general solution, then he described each sub-solution in more detail giving a visual image of the solutions representations and content. During this meeting several sub-solutions were elaborated through team discussion. The design team required from the client to provide information about the contents of the exhibition. From the client's team, some requests about list of elements to provide and negotiate with other stakeholders were made. Issues such as following meetings, production planning, time schedule, deadlines and emergence of final decisions, awareness to risk failures due to technology conditions, outsourcing and costs control, protocol for information exchange and additional ideas that lead to the completion of the exhibition design are discussed. In meeting 6, five design team elements start the detail design stage, discussing and fine-tuning the materialization of sub-solutions fine-tuning the production plan of the exhibition, deadlines, schedules, project management, costs and budgets. In all of the 6 meetings a reflection regarding the design of the exhibition, the process or the meeting itself could be observed. The meetings 1, 2, 3, 4 and 5 provided insights into the interaction between the design team, the client's team and other stakeholders while meeting 6 provided insights on how interaction occurs within the design team. Value judgments became more frequent during the stages of analysis, more clearly expressed during the meeting to present the final solution and based in a more detailed discussion in the production planning meeting as the design evolves towards completion. Several members from the design team, the client's team and construction team were present throughout the meetings. The presence per meeting and background activity of each team member is shown in Table 1. Meetings video files were imported in Interact software (http://www.mangold-international.com/) for content analysis. The study was guided by the search for instances of explicit value judgments leading to moments of decision, paying specific attention to the following events: verbal exchanges based on value-laden arguments, causal relations and mechanisms of influence of priority values in the decision process. Results should provide a further understanding on how (in this case graphic) design practices incorporate values in the design process.

4. RESULTS
4.1 Communication

Meeting 1

Meeting 2

Meeting 3
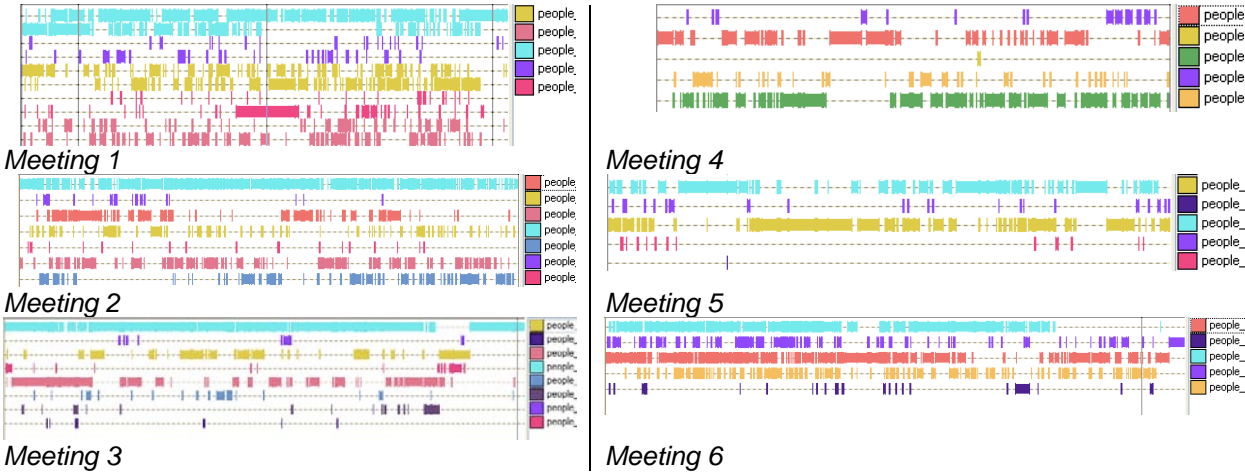
Meeting 4

Meeting 5

Meeting 6

Figure 1. Interact® charts showing the iteration between team elements in meetings

The first evident result can be seen in Figure 1: although at least five persons participate in the meetings mainly two members are active in terms of verbal communicating. Dialogues alternate with monologues by two main figures throughout meetings 1 to 6. The leading figures are not always the same, but deciders representing the client team, the design team and the construction team.

4.2 Instances of value judgment

Results from the analysis of the six meetings show that instances of value judgment are definitive or iterative. The definitive instances have immediate decision. The iterative instances are dependent on an iterative process between different but correlated instances of value judgment. The instances of value judgments occurred during the meetings under the following circumstances: each time a requirement is made an instance of value judgment is settle to which an output is given – an immediate or postpone decision. Some requirements lead to passive situations, that later on in the process became iterative. A sample shown in Figure 2, shows the dynamics of how the instances of value judgment evolve from passive to iterative to definitive.
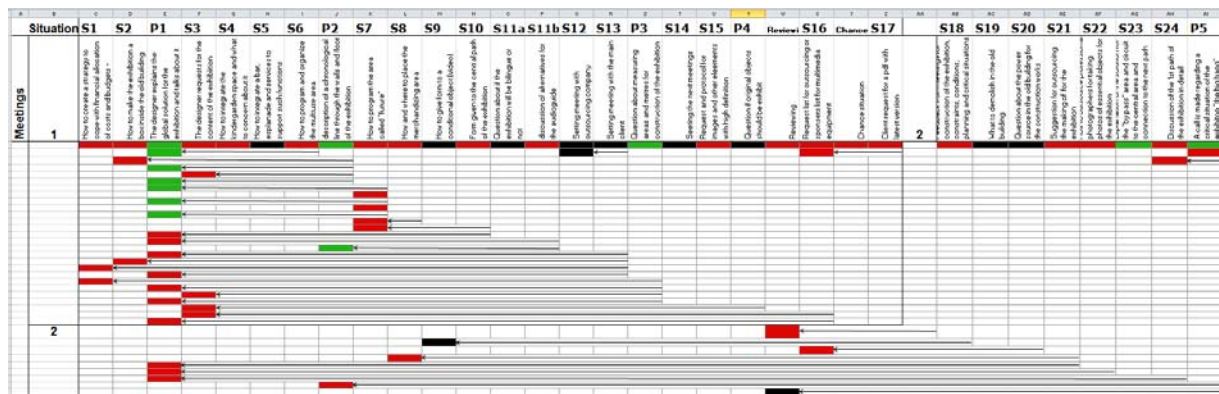

Figure 2. Example of how instances of value judgment evolve across meetings 1 and 2.
Passive ▮ *Iterative* ▮ *Definitive* ▮

Situations of value judgment evolved towards finding the matching solution to each design issue. Definitive and iterative value judgment situations and correspondent priority issues, exchange and frequency across the six meetings are shown in Table 2. Members of the design team or the client's team brought requirements to discussion. The leading designer or the client's main representatives mainly gave the output for each instance of value judgment. In each one of the referred instances of value judgments priority values have supported the discussion and settled lines of argumentation.

With exception for meeting 5, all the other meetings had more iterative than definitive value judgment situations. Definitive situations were based on more than seven priority issues per meeting, to a maximum of nine in meeting 3. Iterative situations were based in more than six priority issues per meeting, to a maximum of 24 in meeting 3.

In meeting 1 and 2 several requirements based on conditional objects, ideas, furthering mental images of the exhibition were exposed for open discussion. In meeting 3, value judgment instances were more iterative than definitive once sub-solutions for the exhibition design were still being proposed. In meeting 4 an effort was made by all persons to focus in essential priority values to assure the most effective as possible way to implement the exhibition. In meeting 5 value judgment situations have increased and definitive instances have prevailed over iterative ones due to the advanced state of the design of the exhibition and common agreement and consequent decisions. In meeting 6 iterative instances have prevailed over definitive instances due to the fact that detailed design stage had just started and sub-solutions needed further development.

In sum, meetings 1, 2 and 3 are dominantly about how value is prioritized to create the solutions; meeting 4 is about how value is prioritized to manage the development of building the exhibition; meeting 5 is about how value is prioritized to expose the solution; meeting 6 is about how value is prioritized to implement definitive design solutions, and regard the other solutions to come.

From a total frequency of 253 moments of value judgment across the six meetings of a total of 12h:06min, 48 had immediate decision, 128 were always iterative, and 71 moments led from iterative to definitive instances.

From data analysis, 21 priority issues had immediate definitive decision. Such issues are related to definition of program, scheduling meetings, design solutions, communication solutions, content and design solution of paths and sub-paths of the exhibition, next steps, contract details, effective implementation of solutions, and particular situations. 38 priority issues were always iterative.

Table 2. Dynamics of definitive and iterative instances of value judgments during the meetings. Repeated (R) and exchanged (Ex) value judgment situations. Frequency of instances per meeting.

Instances of value judgment

Frequency			Definitive Situations			Iterative Situations
Meeting 1 — 46	7 priority issues	a	Integration of a bar, esplanade and services	13 priority issues	1	Strategy to cope with financial allocation of costs/budgets
		b	Discussion about dual-language exhibition		2	How to make the exhibition a box inside the old building
		c	Schedule of meeting with outsourcing company		3	The designer explains the global solution for the exhibition
		d	Schedule of meeting with the main client		4	Request and discussion of the content of the exhibition
		e	Schedule of the next meetings		5	How to integrate and what to concern for kindergarten space
		f	Discussion of exhibiting original objects		6	How to program and organize the multiuse area
		g	How to give form to a conditional object		7	How to program the last path of the exhibition
					8	How and where to place the merchandizing area
					9	Form given to the central path of the exhibition
					10	Discussion of alternatives for the audio guide
					11	Request and protocol for images with high definition
					12	Requests list of elements to negotiate with other stakeholders
					13	Client request for a pdf file with latest version
Meeting 2 — 49	8 priority issues	**R**	**e**	13 priority issues	**R**	**1, 3, 4, 11, 12, 13**
		Ex	**9**		**Ex**	**G**
		h	Chronological line through the walls and floor of the exhibition		14	Providing awareness for the construction of the \exhibition, constraints, conditions, planning and critical situations
		i	What to demolish in the old building		15	Suggestion for outsourcing the making of for the exhibition
		j	Power source for the construction works		16	"by pass" to the central area and connection to the next path
		k	Discussion of the 1st path of the exhibition		17	Discussion regarding a critical situation of the exhibition
		l	Discussion of the 2nd path of the exhibition		18	Fine-tuning costs
		m	Discussion of the 3rd path of the exhibition		19	Discussion about outsourcing professional photographers
Meeting 3 — 74	9 priority issues	**R**	**d, g, k, l, m**	24 priority issues	**R**	**1, 3, 4, 5, 6, 7, 9, 11, 14, 17, 18, 19**
		Ex	**16**		**Ex**	**f, g**
		n	Designer asks for validation of some solutions		20	Measuring areas and meters for construction
		o	Next steps to the development of the design		21	Deliver for construction
		p	Contract details		22	Discussion of the 4th path of the exhibition
					23	Discussion of the 5th path of the exhibition
					24	Discussion of added value of intermediate editors
					25	Discussion of the young artists temporary exhibition space
					26	How to show a set of conditional elements
					27	How to filter the information content to show
					28	How to guarantee safe circuit
					29	Contact and information exchange with stakeholders
Meeting 4 — 26	4 priority issues	**R**	**-**	8 priority issues	**R**	**4, 9, 14, 18**
		Ex	**28**		**Ex**	**-**
		q	Effective way to build the exhibition		30	Explanation of the global solution in constructive terms
		r	Discussion of detail solutions for construction		31	Request and solution to define the high of the walls
		s	Implementing solutions, starting works		32	Strategy of construction to cope with the undefined elements
					33	Discussion of solution for acrylic walls
Meeting 5 — 36	9 priority issues	**R**	**e, d**	6 priority issues	**R**	**4, 12, 14, 24, 26, 27**
		Ex	**3, 9, 11, 17**		**Ex**	**-**
		t	Discussion of (14) sub-paths			
		u	Discussion of alternative paths for users			
		v	Line of argumentation to meet the main client			
Meeting 6 — 22	7 priority issues	**R**	**e, y**	8 priority issues	**R**	**24, 31, 33**
		Ex	**9, 21, 29, 32**		**Ex**	**-**
		w	Solution for the transport of conditional object		34	Request for detailed drawings
					35	Request the schedule for production planning and deadlines
					36	Request final set ups and drawings of light/sound/video
					37	Discussion of solution for curved walls
					38	Strategy to cope with the capacity of the construction team

Such issues are related to awareness to strategies to cope with different critical conditions, awareness for missing content of the exhibition, some paths that were not defined during the period of observation, awareness to production and construction planning, request for rigorous information to fine-tuning costs, awareness to content selection. 2 priority issues that were asserted as definitive became iterative due to missing aspects for a final decision. 9 priority issues went through several iterative situations before become definitive. Such issues are related to stabilizing a global solution, form given to objects, paths and sub-paths, deliver for construction, solution of circulation, outsourcing, definition of strategies to cope with critical situations.

4.3 Priority values across the design team and the client team

The categorization system of designers' priority values across disciplines from previous studies [5] has been applied for further analysis of the design meetings. Table 3 depicts the categorized priority values of the members of the design team and the members of the client's team.

Table 4.Priority values for decision making across design and client teams

Main-categories	Sub-categories	Design team	Client team
Emotion-based	Interest, like what I do	☑	☑
	The sensations to transmit to people	☑	☑
	Feeling of uncertainty	☑	☑
	Start seeing results	☑	☑
	Challenging opposition	☑	☑
	Personal and team emotional evaluation along the process	☑	☑
Intuitive-based	Feeling that something is wrong	☑	☑
	Feeling certainty about a choice without argument		-
	Feeling of certainty in changing priorities	☑	-
	Action driven experimentation	☑	-
	Individual or external sources of inspiration	☑	☑
Rational-based	Know-how, specific knowledge	☑	-
	Project management	☑	☑
	Design purpose, goals and direction of procedure towards the solution	☑	☑
	Ethics	☑	☑
	Users satisfaction	☑	☑
	Design problem context, situation and circumstances	☑	☑
	Redo, fine-tuning or reviewing	☑	☑
	Undeveloped Knowledge	☑	-
Experience-based	Framed design choices	☑	-
	Evaluation and association with results and processes from the past	☑	-
	Looking for references	☑	☑
	Open mind for new solutions	☑	☑
	Experiencing the design situations,	☑	-
	Foreseeing difficulties	☑	☑
Constraint-based	Time limitation	☑	☑
	Financial limitation	☑	☑
	Technology conditions	☑	☑
	New policies limitations	-	-
	Client restrictions	☑	☑
	Cultural conditions	☑	☑

Designers and other stakeholders from the client's team share 21 priority values from a total of 32. From this study the following priority values are specific of designers, namely:
1. Feeling of certainty in changing priorities
2. Action driven simulation
3. Know-how-specific knowledge
4. Undeveloped knowledge
5. Framed design choices
6. Evaluation and association with results and processes from the past
7. Experiencing the design situations.

Although the above mentioned priority values were not found in the discourses of the elements of the client team, some of them might be evident in other cases where, for example the client is also a designer or someone with design skills. However, and to give an example, the priority values of *know-how, specific knowledge* and *action driven simulation* are specific of designers once they have the training and knowledge to solve design problems and the task to create the simulations of solutions. The major difference between designers and clients' perspectives on these priority values is supported by the fact that designers have a holistic and more complete view of how to conceive and materialize the solutions while the clients have an assembled view and images of the process instead.

However, it became evident that a different level of priority values emerges from the analysis of the meetings that are not referred in interviews. It can be inferred that the priority levels stated in interviews relate to a more personal and lower resolution level than the priority issues that can be found in the meetings. A second approach to content analysis of the meetings, through the selection of specific instances might provide looking for patterns of how designers prioritize value judgment and influence decision-making.

4.4 Model of interaction in design meetings

Instances of value judgments and priority issues integrate the connections in designers' thinking and acting when delivering value to design meetings and results leading to decision-making in designing. From the present study such connections are proposed in a model of flow diagram as shown in Fig 3. The flow diagram of how designers' deliver value in design meetings has three main elements, namely an input, an instance of value judgment and an output.

- There is an input situation based on a requirement. Requirements can be based on a condition, a suggestion or a restriction what can be translated as 'need', 'wish' or 'must' in the terminology of design methodology [35].
- There is an instance of value judgment that follows a typical procedure. Starting with the analysis of requirements it evolves in two directions, one path follows an evaluation stage where priority values emerge and guide a narrative discourse, the other path follows the search for information through delegating activities to other members of the design team and consequent feedback that leads to the physical action of visualizing a possible solution, here named as action-driven simulation that interacts and reinforces the design team narrative discourse.
- There is an output situation where a team-based decision is made. Two things can happen, a final decision based on the agreement of a definitive solution, or a postponed decision based on alternatives of solution in preliminary stages such as a suggestion, advise or need for further development. The former situation leads to iterative value judgment instances that occur through the meetings until reach a final decision.
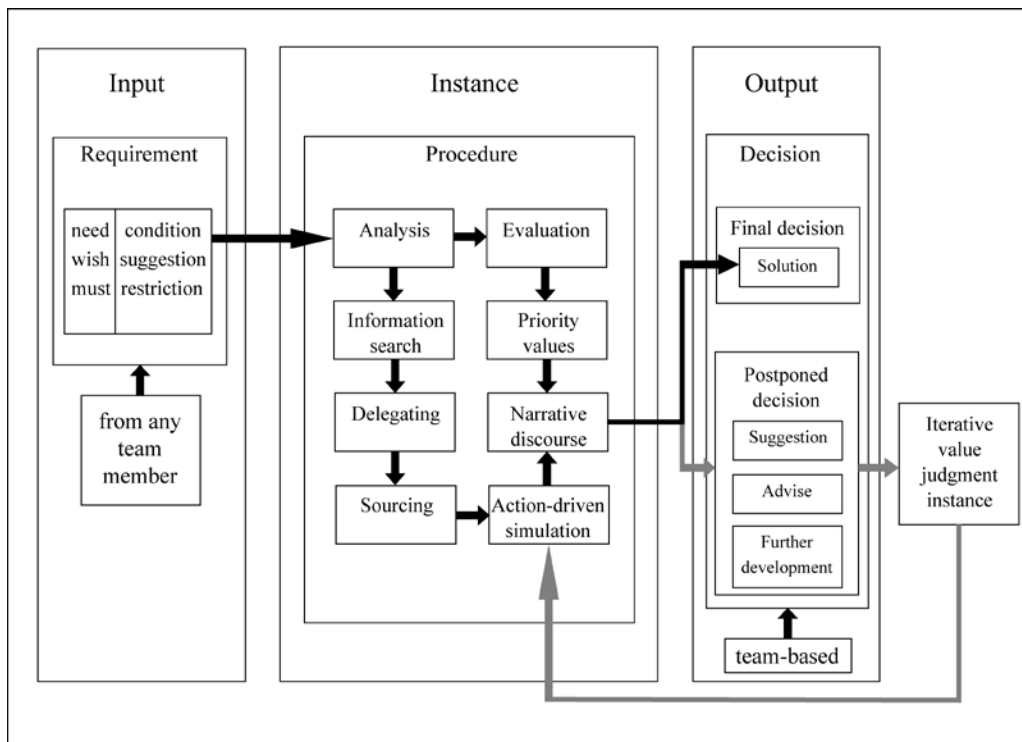
Figure 3. Flow diagram of how designers' interact when delivering value to design meetings

From this flow diagram some designers' specific characteristics can be inferred. Designers tend to search and find the solutions through its representation and simulation through drawing and sketching. The same flow diagram can be extended to the behavior of clients and other stakeholders when delivering value in design meetings. Stakeholders share the same three main elements, namely an input, an instance of value judgment and an output. The differences subsist in the following characteristics:

Non-designers make use of less priority values, they don't lead the process of solutions representation and materialization and for that they don't have so much influence in the final decisions. However, their input regarding the knowledge they have about the design problem context and purpose is a fruitful contribution for team-based discussion.

It was also observed that the narrative discourses between elements of the design team and client's team were based in two main criteria for choice. The minimization of input measured as cost, and the maximization of output measured in terms of product, or result. Finding a balance between these two criteria seems to be a leading goal of clients and other stakeholders in the process of defining value in team meetings.

5. RESULTS AND DISCUSSION

Results show commonalities and differences between designers and clients and other stakeholders in instances of value judgments in design meetings. The following characteristics of how designers think and act when delivering value to design meetings can be asserted

1. Designers share with clients and other stakeholders a model of interaction when thinking and acting in instances of value judgment.
2. Designers share with clients and other stakeholders' priority values that support value judgments in instances of request for a solution and decision
3. Designers share with clients and other stakeholders' the initiative to ask for requirements that lead to common kinds of instances for value judgment.
4. Designers share specific characteristics in thinking and acting when they evaluate requirements and solution. Designers' specific priority values and tasks provide them a holistic and more complete view of how to conceive and materialize the solutions while the clients have an assembled view and images of the process instead. Furthermore during the

search for solutions they show action-driven simulation by which they 'test' their assumptions.

The inference of such characteristics, priority values and model of interaction in designers' value judgment for decision-making in design contributes to the study of similarities and differences across designers [5], and between the elements of a collaborative team (present study). In spite of the diversity of people value systems, commonalities and differences can be inferred. Such results may help to establish a kind of support to a better understanding of language between disciplines and collaborative team elements at the moment they know they share commonalities in their value systems.

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