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# Symbolic Interactions in Design

Managing difference across intermediary objects and discourse.

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**Abstract:** This paper discusses the product design process from a social science perspective. We describe preliminary results from a PhD research pilot study, observing the interactions of 12 postgraduate Product Design students over the course of one semester of independent work. Viewing design activity as a social process, a novel theoretical framework is proposed suggesting the product design process be understood as a trajectory, involving a series of design episodes where physical prototypes, acting as intermediary objects, operate as silent actors in collaboration with other design actors. In order for the trajectory to progress, difference between actors must be managed.

**Key words:** *Design process, Actor-Network Theory, trajectory, design discourse, difference*

## 1. Introduction

Mitchell [11] outlines that the field of design has evolved over the past 40 years, successfully transitioning through three successive paradigms. This paper aims to construct an account of the third paradigm, design activity as a social practice, which necessitates a novel understanding of the design process, including who or what constitutes a design actor, the agency that the various actors possess, and the methods to impact these actors have in directing the product design process towards a successful resolution.

We draw on literature from sociology to establish a description of the design process as a trajectory, involving a variety of actors engaged in a series of episodes across a complex network, managing difference. Key concepts and terminology, including trajectories and episodes, actors and intermediaries, and talk and difference, are discussed.

This paper outlines a theoretical proposal, supported by observations from a pilot study, aimed at describing design trajectories, the impact of diverse actors during intermediate episodes, and the negotiation of difference between actors during episodes, in relation to design activities as social practice. The paper concludes by outlining future work for PhD research, allowing theoretical contributions to be tested in the wild.

### 1.1 Trajectories and Episodes

The term trajectory is introduced to describe design development activity, suggesting a view of the design process as being a disorderly, goal-oriented, social process based upon iterative practice. The concept has its foundation in the Corbin-Strauss Trajectory Framework [3] developed through a grounded theory approach to facilitate patient care strategies in the healthcare industry. Sociologist Anselm Strauss suggests trajectory "...refers to a course of action but also embraces the interaction of multiple actors and contingencies that may be unanticipated and not entirely manageable" [14]. Strauss' concept of trajectory is suggested as a useful

framework for understanding design activity, when seen as a social practice, since it takes into account goal intentions operating against unanticipated events, leading to multiple possible pathways toward a variety of future potential goals, none of which is clear in the present circumstance.

Critical to our understanding of the trajectory framework, we introduce the concept of the design episode; an event where a select group of actors come together to discuss previous work completed, review the current status of the design project, and uncover design intentions that may impact future work. Trajectories are constructed from series of episodes during the design process. Design episodes are intermediate steps in the overall process, and might not always include the same actors and agents. New knowledge and new understandings are negotiated and synthesized amongst actors during design episodes, enabling transition to a subsequent episode.

## **1.2 Actors and Intermediaries**

The design trajectory is seen as a complex social process, in part due to the variety of knowledge and understanding various actors bring at different points of the process, often initiating unintended shifts in pathways to goals. Ethnographic accounts of design activity provide insight into the social interactions involving designers and the various other objects, artifacts and structures present during design activity. [2, 10].

That designers themselves operate as actors in these networks is perhaps obvious. Actor-Network Theory (ANT) suggests that other material objects and constructions also operate as actors, and to differentiate, these are often described as actants. Latour [9] describes these actants through the concept of inscription devices, constructions which carry knowledge and information throughout the network, since they have the knowledge “inscribed” into them. The design research community has embraced ANT to describe inscription devices in additional ways, including: boundary objects [13, 15]; conscription devices [7] and intermediary objects [1, 16]. Of interest for this PhD research, intermediary objects are seen as the constructed objects generated during the concept development phase in product design process, intended to synthesize prior knowledge and future intentions, while also communicating understanding about future work to be done [5]. The ways in which these prototypical intermediaries impact design cognition and their role in structuring future design development is inadequately documented and poorly understood [6].

## **1.3 Talk and Difference**

The prototype becomes a silent actor participating in design development process, as it makes difference between the worlds of actors physically apparent and salient. Following its introduction, talk about the intermediary is situated around the multiple interpretations amongst actors, and as Kress [8] suggests, the emergence of discourse highlights the presence of difference.

Oak [12] has suggested that these two forms of symbolic interaction, the introduction of an intermediary object and the talk-in-action about it, requires greater attention by design researchers. While the literature demonstrates significant interest regarding social processes in design [4, 10], these studies analyze talk in an attempt to understand how meaning is exchanged and understood. Oak suggests language usage in the pragmatic sense, where meaning is also created between participants through its intentional usage, requires deeper investigation.

## **2. Designing from a social perspective**

Having constructed a theoretical account of designing as a social practice based on trajectories and episodes involving actors and intermediaries engaged in talk in order to manage difference, a pilot study was devised involving the observation of students engaged in design projects over an extended period of time. This study was structured on the premise that a series of symbolic exchanges (words, objects, texts) between designers might uncover the social aspects of design activity. Mixed methods were employed, primarily a comparative analysis of designers' discourse over intermediary prototypes, combined with visual analysis of images documenting changes to the intermediary prototypes.

## **2.1 Methods**

The pilot study was conducted over a period of 5 months from January until May 2012. This observational study focused primarily on studio product development, leading towards an exhibition quality prototype. Over 11 weeks, 12 postgraduate students were engaged in weekly design episodes as they translated their independent design research findings from a previous course into physical prototypes. Students ranged in age between 21 and 43, and are of mixed gender and ethnic background.

Initial, rough, proof-of-concept prototypes were introduced and discussed at the first design episode. Subsequent design episodes introduced changes and modifications to subsequent intermediary prototypes. Audio recordings of discussions with students during each design episode were captured using readily available laptops, enabling a running dialogue over 11 sessions. Photographs of intermediary prototypes presented were taken at the end of every second design episode, providing a visual timeline of a trajectory of design development over the period of the pilot study,

At the end of the study, students submitted the completed exhibition prototype for final evaluation. Each student was summatively assessed, including written feedback regarding perceived success in translating research into artifacts. Students were asked to self-assess and reflect on their own ability to successfully translate their initial design intentions into a final, physical, prototype form.

## **3. Preliminary findings and contributions**

Edelman and Currano [6] discuss physical models as shared representations and outline 4 classes of abstraction evident in shared models. Results from our pilot study observations confirm these findings, and suggest there may be more than 4 classes. Critically, however, evidence of inter-dependency between abstractions suggests shared representations between actors are difficult to achieve. From our study, we witnessed product designers engaged with intermediary objects constructed from intermediate materials (cardboard) during design episodes. These representations alluded to future material states, which are interpreted differently by actors. Various interpretations in materials abstraction in an intermediary prototype highlights difference between designers in their mutual understanding of the final design decisions, and in our analysis of conversations, it is evident that one class of abstraction invariably has an impact on other classes of abstraction. Audio recordings highlighted dialogue regarding intended materials clearly having influence and impact on designers' interpretations surrounding other classes of abstraction, such as form, process of manufacture, or intended function.

## **4. Future Plans**

Our observations suggest preliminary support for the trajectory framework proposal, where various actors during successive episodes manage inter-dependent differences on a variety of classes of abstractions, simultaneously suggested by the intermediary prototype. Future work to understand how designers manage difference across inter-related abstractions through the intermediary prototypes is anticipated. Observations in the wild, involving experienced design professionals would validate this theoretical perspective regarding design activity as social practice.

## 5. References

- [1] Boujut, J.F. and Blanco, E., *Intermediary objects as a means to foster co-operation in engineering design*. Computer Supported Cooperative Work (CSCW), 2003. 12(2): p. 205-219.
- [2] Blackwell, A.F., Eckert, C.M., Bucciarelli, L.L. and Earl, C.F., *Witnesses to Design: A Phenomenology of Comparative Design*. Design Issues, 2009. 25(1): p. 36-47.
- [3] Corbin, J.M. and Strauss, A., *Unending Work & Care: Managing Chronic Illness at Home*. 1988, San Francisco, CA: Jossey-Bass Inc.
- [4] Cross, N. and Cross, A.C., *Observations of teamwork and social processes in design*. Design Studies, 1995. 16(2): p. 143.
- [5] Eckert, C. and Boujut, J.F., *The role of objects in design co-operation: communication through physical or virtual objects*. Computer Supported Cooperative Work (CSCW), 2003. 12(2): p. 145-151.
- [6] Edelman, J. and Currano, R., *Re-representation: Affordances of Shared Models in Team-Based Design*. Design Thinking, 2011: p. 61.
- [7] Henderson, K., *Flexible sketches and inflexible data bases: Visual communication, conscription devices, and boundary objects in design engineering*. Science, technology & human values, 1991. 16(4): p. 448.
- [8] Kress, G.R., *Linguistic processes in sociocultural practice*. 2nd ed. ed. Language education. 1989, Oxford: Oxford University Press.
- [9] Latour, B., *Visualization and Cognition: Drawing things together*. Knowledge and society : studies in the sociology of culture past and present; a research annual., ed. R.A. Jones and H. Kuklick. Vol. Vol. 3. 1981, Greenwich, CONN: JAI Press.
- [10] McDonnell, J., *Collaborative negotiation in design: A study of design conversations between architect and building users*. CoDesign, 2009. 5(1): p. 35-50.
- [11] Mitchell, W.J., *Three paradigms for computer-aided design*. Automation in Construction, 1994. 3(2-3): p. 239-245.
- [12] Oak, A., *What can talk tell us about design?: Analyzing conversation to understand practice*. Design Studies, 2011. 32(3): p. 211-234.
- [13] Star, S.L., Gasser, L., and Huhns, M.N., *The Structure of Ill-Structured Solutions: Boundary Objects and Heterogenous Distributed Problem Solving*, in *Distributed artificial intelligence, volume II*. 1989, Pitman: London. p. 37-54.
- [14] Strauss, A.L., *Continual permutations of action*. Communication and social order. 1993, New York, NY.: Aldine de Gruyter.
- [15] Trompette, P. and Vinck, D., *Revisiting the notion of Boundary Object*. Revue d'anthropologie des connaissances, 2009. 3(1): p. 3-25.
- [16] Vinck, D. and Jeantet A., *Mediating and commissioning objects in the sociotechnical process of product design: A conceptual approach*. Management and new technology: Design, networks and strategies, 1995. 2: p. 111-129.