TOWARDS AN EXTENDED DESIGN SKETCH & VISUALISATION TAXONOMY IN INDUSTRIAL DESIGN EDUCATION

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ABSTRACT

Keywords: Design sketching, design education, design visualisation
1 INTRODUCTION

The visualisation and communication of problems and possible solutions are extremely important in the context of engineering and industrial design. The objective of this paper is to ask the question if industrial design and engineering educational curricula should extend their design sketch and visualisation taxonomy, based on emerging evolutions in the field of design.

2 THE IMPORTANCE OF SKETCHING

3 THE IMPACT OF SKETCH QUALITY
4 SKETCH TAXONOMY

It is not only the act of sketching or the quality of the sketches that has the impact, but also what the designer sketches is important. Hoftijzer et al [14] researched the communication factors of sketches and provided implementation guidelines for specific types of sketches. Lengler and Eppler [15] composed a Periodic Table of Visualization Methods for Management compiling 100 existing visualization methods with a proposition on how to use them. A ‘Taxonomy on Drawing for Design’ was proposed by Schenk [16], and similar to Schenk, Pei et al [17] compiled and categorised a taxonomy of all Visual Design Representations employed by industrial designers and engineering designers during a New Product Development design process. Based on this study, Evans, Pei and Campbell [18], in collaboration with the University of Loughborough, produced the ID-cards; a clear and visual synopsis of the compiled taxonomy where they distinguish four categories: sketches, drawings, models and prototypes. Figure 1 illustrates the different sketching and drawing types of ID-cards categories sketches and drawings, Figure 2 shows a few of the original ID-cards.

Figure 1. Illustration of the 16 ID-cards of the sketches and drawing categories

Figure 2. Three original ID-cards of the sketches and drawing categories by Evans, Pei and Campbell
New levels of complexity and abstraction in the field of industrial design require new powerful visualizations to analyse, discover, express and depict progressions, emotions, experiences, stories, scenarios and other intangible aspects involved in the system. A new vocabulary of sketching and visualisations should facilitate mutual communication between designers, engineers, users, specialists and all other stakeholders during this design processes. The taxonomy of Evans et al. thoroughly covers all sketches and drawings applied in object oriented industrial design projects, but the scope of industrial design constantly broadens, so the designer needs to extend his/hers sketch vocabulary with sketch types adopted from related fields.
6  NEW POWERFUL VISUALIZATIONS

Interaction or experience designers should be able to imagine and depict a person’s behavior as they interact with a system over time. Storyboard and animation sketches involve the ‘end user’ as an actor in the visual narrative, and illustrate not only the context of an interaction sequence, but can also express the experiences the user goes through while ‘using’ the product or service.
Systemic Design

Systemic Design, a recent discipline in the field of design, is located as a human-centred systems-oriented design practice with a strong inter- and trans-disciplinary approach [23]. It integrates systems thinking and human-centred design with the intention of helping designers cope with complex design projects. The recent challenges to design coming from the increased complexity caused by globalisation, migration, sustainability render traditional design methods insufficient. According to Pauli [24] future progress should embed respect for the environment and natural techniques that will allow production processes to be part of the ecosystem.

Gigamapping serves as a method that is both systemic and discovererly, and creates an information cloud for visualising complexity from which a designer can derive innovative solutions. It has proven to be an ultimate bridging device within groups of collaborators, and enables the development of a shared understanding of the construction systems.

One role of the designer in the systemic method is to stimulate and participate in co-creation sessions and to sketch/visualise on-the-spot contributions from the different stakeholders in order to facilitate mutual communication.
Another role of the designer is to visualise the synthesis of the analysis. The sketches made during the analysis and design process serve more as a visual thinking tool than a communication tool. The final GigaMap is a graphically well balanced infographic-mindmap communicating and summarising all discussed issues.

Illustration left: Lies Bosmans, Sébastien Demonie, Wouter Hendrickx, Karlien Meuleman & Hanne Vormeyerck Above: Daphne Brain, Brecht Vermeersch, Catho Van Den Bosch, Désirée Chambon, Michel de Vos & Nicolas Deemen

Sketchnoting seems to lower the inhibition threshold of putting pen on paper. In a multidisciplinary design team, the low fidelity visualisation technique allows designers with little sketch self-confidence to quickly synthesise what was heard and seen, making connections and discovering patterns and sharing information with others visually.

Evolution of the Design Team and a new role for the designer

One of the roles of the designer in these multi-disciplinary teams is to facilitate co-creation, stimulate mutual communication between the different members of the stakeholder teams and to visualise preliminary results and outcomes.
7 TOWARDS AN EXTENDED SKETCH AND DRAWING TAXONOMY

User experience sketches, process sketches, product service design sketches, customer journey illustrations are recently added to the spectrum of the designers’ sketch vocabulary. What these new sketches and visualisations have in common is the fact that they are mostly non-object related. Sketches made in the early stages of a New Product Development phase of complex systems designs depict more the mutual relations between the different stakeholders, the evolution of the project in time, the context of the problem, the different system design possibilities, than any possible hardware components involved.

8 CONCLUSION
If the goal of design educational programmes is to prepare students to become skilled creative people in a fast evolving industrial design and engineering landscape, students’ sketch competences should extend beyond merely object related sketches and drawings. For design schools this insight could mean a major revision of the sketch and drawing courses.

REFERENCES


