8 The Thoughtful Mark Maker – Representational Design Skills in the Post-information Age

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Skills – Past, Present And Future

Skill, technology, and design

The impact of computing confronts all professions, profoundly affecting the way that they function and challenging occupational relevance and survival. A common misperception is that emerging technologies automatically replace traditional skills, making many specialist skills redundant, effectively deskilling expertise. This chapter explores deskilling in the context of design representation and discusses the potential of new technologies as both a generator and absorber requiring new techniques, approaches, and thinking with which to create a new skills-base.

The application and definition of traditional skills are discussed, with a comparison of the differences that have taken place in the development of design practice between knowledge-based skills and the separation from implementation. This is followed by an analysis of the representational skill-base currently in use in design practice, together with comment on the effects of technological change. Lastly, strategies to develop appropriate representational skills for the future are proposed.

Skills through history

E.P. Thomson describes and evokes an era when the hand drove production and an individual's skills were a complex continuum of manual dexterity, a keen eye, knowledge of the task /role of the object in use, and often direct knowledge of their "clients":

> The skilled workman is taught by his materials, and their resources and qualities enter through his hand and thence to his mind. The artefact takes its form from the functions which it must perform, the "dish" of a wheel from the movement of the horses, the ruts in the tracks, the weight of an average load. These are not finely calculated on paper, they are learned through practice.
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> *(Thomson 1993, p. xi)*

Throughout history, skills have been delineated by socio-economics; the acknowledgement of skills was rooted in the language: "having a trade," "serving an apprenticeship," "having a vocation," and "being qualified." The application of the terms "skilled," "semi-skilled," and "unskilled" effectively delineated and defined a social caste system. Pre-industrial skills were predominantly manual with tangible outcomes. As machines replaced manual dexterity, unskilled workers became expendable. Skills became less visible and, with the advent of machine intelligence, eventually dispensable. Today, only advanced skills and knowledge are appropriate for maintaining sophisticated automated production. To achieve these skills, the growth of a fully equipped learning environment, rather than ill-equipped teaching, is increasingly viewed as a necessity.

Definitions of skill are imprecise, for, like "design," the word has been overused. Significantly, the obsolete meaning of skill is 'understanding'; however, skill is more commonly used to define a trade or technique, requiring special training or manual proficiency. McCullough acutely observed and accurately analyzed skill as being:

> Acquired by demonstration and sharpened by practice. Although it comes from habitual activity, it is not purely mechanical. This is evident not only in the fact that some skills are difficult to measure, but also in that skill can become the basis of a vocation.
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> *(McCullough 1996, p. 3)*

The schism in skills occurred during the Industrial Revolution because it disconnected design from production and origination from making. Many interconnected skills became redundant as the mechanisms of mass production first separated out the differing levels of skill, then began their systematic eradication, from low-level manual to advanced non-manual skills. More recently, many areas of skilled origination are no longer required professionally. In parallel, the general regard for skills diminished with the advent of "commercial idealism" engendering "better products for all." As a result, current definitions of skill tend to be narrow; typically, they are focused on subtasks, special abilities, and training, linked to learned ability with acquired knowledge. The holistic skills of making and doing, conceiving and realizing as a continuum, are consequently rarely addressed. The personal ownership of an integrated repertoire of "hands-on" skills used to make objects has been replaced by a fragmented, externally referenced skill-base.

In contrast to and separated from making artefacts, design skills had previously been focused on concept origination, representation, and productionization. Many of the varied skills previously associated with both designing and making became the exclusive skills of design, dominated by ideas translated through manual skills – drawing, rendering, and model-making – combined with the creative/inventive skills of information gathering and problem solving. Design skills became less visible and not automatically discernible in the final manufactured product.