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Industrial design digital technology

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Abstract

This paper is a reflective opinion piece suggesting that the Industrial Design discipline has an opportunity to react proactively to disruptive practices made possible by innovations in digital technology, by developing a field of practice in 'Industrial Design Digital Technology' that challenges the boundaries of the current Industrial Design discipline and potentially stimulates new directions for the profession and for graduates. This would also provide an opportunity for new research collaborations that are in line with the demand for more interdisciplinary work in higher education, creating genuinely transdisciplinary practice that will attract funding and attract students.

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1. Introduction

It is difficult to predict where technological innovation will take designers, how it will impact users' lives and the way businesses will operate. In his 2005 book *Fab – The coming revolution on your desktop – from personal computers to personal fabrication* [1], Neil Gershenfeld, the director of the MIT Centre for Bits and Atoms, draws a parallel between current attitudes towards digital fabrication technologies and the lack of understanding, at the time, of the impact of Claude Shannon's circuits work in the 1930s which provided a foundation for developing the capabilities of computers. He argues that digital fabrication is being regarded purely in terms of conventional thinking as an additional production process by many engineers and designers, when it needs to be considered in a much

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broader sense as a transformational technology in order to glimpse its potential: "To even call digital fabrication a manufacturing technology risks trivialising it, just as the original dry descriptions of thresholds in circuits for communication and computation hid their eventual implications in the creation of Web sites and portable music players and video games." [2]

Gershenfeld discusses the underlying principles informing digital fabrication as being similar to those driving the molecular assembly functions of ribosome in biological cell construction. He suggests that the challenges in effectively exploiting the recent developments in digital fabrication are a result of our limitations in design thinking: "One of the intellectual frontiers associated with the development of digital fabrication is the development of an associated design theory."[3]

However, breaking with conventional design thinking about digital fabrication to the extent argued by Gershenfeld requires a paradigm shift in the way Industrial Designers fundamentally view digital technologies, as it is misleading to consider digital fabrication in isolation. Rather, advances in digital fabrication over the last ten years, moving it from a prototyping technology to an end use technology are part of a wider set of digital developments that are impacting design practice and industrial design in higher education – and have the potential to not only impact, but disrupt the incremental evolution of the discipline that has occurred since the industrial revolution.

2. Digital Revolution

" [Referring to TV as 'Video'] Video won't be able to hold on to any market it captures after the first six months. People will soon get tired of staring at a plywood box every night." Zanuck, Exec. 20th Century Fox, 1946 [4].

When email became widespread in the mid nineties, the impact on working practices twenty years later would have been hard to predict. The changes in communication that have been brought about by the development of the internet over the last twenty years that have resulted in skyped interviews, you tube blogs superseding television for the younger generations, Facebook as a facilitator of social activism, and a myriad of other instances have challenged underlying assumptions about business as usual. For designers, the ability to interact with users through the internet has enabled not only an increase in participatory design in relation to embedded and ongoing consultation throughout a 'design thinking' branded approach to design, but in concert with additive manufacturing technologies and demonstrated through the work of companies such as Digital Forming and Nervous System, changed the very scope and nature of the role of the designer in designing products: "The designer of the future has to become a meta-designer, shaping environments in which unskilled users can design their own objects." [5]

Just as, for example, graphic design consultancies and the music industry have both had to face the unexpected impacts on their market brought about by online digital technologies and re-evaluate conventions in business practice, so all industries, even those considering themselves currently on the fringe in terms of being impacted by the tools of the digital revolution, would be wise to acknowledge the scope of advances in digital technologies and take a deliberate step back to consider the implications. However, as Zanuck's prediction – and the experience of the music industry or book sellers – suggest, it takes a considerable break with tradition to be able to conceive of what might be a radical change of direction needed by an industry or discipline in order for it to remain relevant in a digital age: "It would likewise be a mistake to assume the use of twentieth-century technologies in analysing and addressing a twenty-first-century threat." [6]

2.1. Taking a step back: The digital revolution and Industrial Design

Over the last ten years there have been major digital advances in technology that have the potential to significantly change practice in Industrial Design. These include, but are not limited to:

- Improvements in access to the internet worldwide – the expansion of the network, increased band width, improved communication tools supporting sophisticated interactions between designers, production companies and consumers.
- Advances in scanning technologies and the software to manipulate point cloud data.
- Developments in the use of RFID chips and the creation of digital tools to support an internet of things approach.
- Advances in additive manufacturing to include the use of metals, functional polymers and ceramics.