Identifying Disruptive Technologies in Design: Horizon Scanning in the Early Stages of Design

Technology development is accelerating, driving disruption. Design is seen as key differentiator in creating innovative offerings but few design methods consider future technologies explicitly. In this article, we explore how a foresight method, namely horizon scanning, may be applied in a design context to anticipate disruption of construction. By means of a 3-step horizon scan, we identify 133 potentially disruptive technologies from across industries. We find that when preparing for disruption, design may benefit from the future-oriented and technology-focused features of horizon scanning.

Is construction ripe for disruption?

The notion of ‘disruption’ and particularly that of ‘disruptive innovation’ is now widely used by researchers as well as management practitioners, and the construction industry is being described as ‘ripe for disruption’. By comparing this industry to healthcare (another massive, societally important industry also considered ripe for disruption), this paper applies the lens of disruption theory to analyse the current and anticipated status of the construction industry. To do so, we ask and answer three central questions: Why should construction be ripe for disruption? When will disruption potentially occur? How will disruption likely manifest? We find that both industries share a number of challenges, including a fragmented stakeholder network, complex incentive structures and a sense of being in a deadlock that makes change difficult. Furthermore, we find that in both industries the term ‘ripe for disruption’ describes a process rather than prescribe when disruption will occur. By applying central notions from disruption theory (disruptive technologies, low-end disruption, new-market disruption, and a focus on value creation), we identify several potential disruptors of the construction industry. To conclude, we discuss the benefits and limitations of applying disruption theory to the construction industry.
Learning from Digitalised Industries: Designing Value Propositions for Disruption

Digitalisation changes the way business is made. In some industries, digital disruption has been caused by companies like AirBnB and Netflix, whereas in other industries, the opportunities stemming from digitalisation have still not been fully utilised. In this article, we explore how companies from less digital industries may create digital business opportunities by learning from successful digital companies in other industries. A 3-hour workshop set-up is developed, and the findings from two workshops with 17 participants from the construction industry are described. It is shown how an analysis of the customer profiles of well-known companies facilitate cross-industrial learning and aid the creation of new ideas for digital value propositions. Although substantial further work is necessary before the full potential of the ideas may be harvested, we believe the described workshop method represents a tangible first step in creating digital business model innovation.

Reconceptualizing design risk management as a learning strategy

We observed how risk management (RM) is perceived to hinder radical innovation in companies. RM is perceived to kill good ideas too early before they were explored thoroughly or lead to cancellation of projects after several years of development time due to critical risks. This paper contributes an empirical investigation and shows that a multitude of value propositions for RM exist, among them innovation. The paper proposes 5 practices to reconcile risk management and innovation, and reconceptualise risk management as a learning strategy that supports innovation.
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Industrial PhD
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Award relations: Disruptive technologies in design
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Prizes:

The Paul Townsend Commemorative Award
Sidsel Katrine Ernstsen (Recipient), Christian Thuesen (Recipient) & Anja Maier (Recipient)
Department of Management Engineering, Engineering Systems

Description
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‘Tiny homes’ fra Airbnb kan disrupte byggeriet
Sidsel Katrine Ernstsen, Nina Koch-Ørvad & Christian Thuesen
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