
Learning from Digitalised Industries: Designing Value Propositions for Disruption

Sidsel Katrine Ernstsén*

Technical University of Denmark, Engineering Systems Division,
2800 Kgs. Lyngby, Denmark. E-mail: sern@dtu.dk

Nina Koch-Ørvad

Technical University of Denmark, Engineering Systems Division,
2800 Kgs. Lyngby, Denmark. E-mail: ninko@dtu.dk

Jakob Brinkø Berg

Technical University of Denmark, Engineering Systems Division,
2800 Kgs. Lyngby, Denmark. E-mail: jajoh@dtu.dk

Stig Brinck

NIRAS A/S, Sortemosevej 19, 3450 Allerød. E-mail: sbr@niras.dk

Christian Thuesen

Technical University of Denmark, Engineering Systems Division,
2800 Kgs. Lyngby, Denmark. E-mail: chth@dtu.dk

Anja Maier

Technical University of Denmark, Engineering Systems Division,
2800 Kgs. Lyngby, Denmark. E-mail: amai@dtu.dk

* Corresponding author

Abstract: 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.

Keywords: Digital disruption; disruption; digitalisation; industry; value proposition; customer profile; construction industry.

1 Introduction

Digital disruption is a challenge that impacts multiple industries. Stories of how digital companies like AirBnB and Netflix have disrupted the established way of creating value in their respective industries exemplify how digitalisation can have far-reaching consequences and can bear a range of new opportunities. To benefit from the opportunities of digitalisation, companies are often advised to focus on the customer (e.g. Ismail *et al.*, 2014; Thuemmler and Bai, 2017). Less often, companies are advised to learn from exemplar companies that have already succeeded in creating digital disruption.

In this paper, we will explore what and how companies may learn from established digital businesses when creating value propositions for their own context. The study focuses on one of the least digital industries of today, namely construction (Gandhi *et al.*, 2016). In construction, digitalisation is currently, among other things, enabling a switch from paper drawings to 3D (or 4D, 5D and 6D) models of building data. This further paves the road for new ways of communicating, changing contractual structures and new ways of doing business. However, construction is slower to reap benefits from the digital opportunities than other industries and has recently been labelled to be ripe for disruption (McKinsey Global Institute, 2017).

To explore how companies of the construction industry may utilise learnings from other industries to create new digital value propositions, we take the point of departure in a customer profile analysis (Osterwalder *et al.*, 2014). As a part of the value proposition design approach, the customer profile is used to describe customer's jobs-to-be-done as well as gains (desired outcomes) and pains (avoided outcomes).

Research has found that customers transfer their digital expectations from one industry to another, expecting, for instance, that it is just as easy to plan a visit to the doctor as it is to book a flight (Thuemmler and Bai, 2017). As digitalisation blurs the differences between industries, it is thus important that companies do not define their customers based on traditional industry boundaries. Instead, we argue that a tradition-bound industry, like construction, may benefit from analysing the customers found in other (more digital) industries and from translating these observations to create digital value propositions relevant to their own context.

Thus, the main research question guiding this paper is: How may the analysis of customer profiles of digitally disruptive companies aid the development of digital value propositions in less digital industries?

The remainder of the paper is organised as follows: The first two sections introduce the theories of digital disruption and value proposition design. Next, the set-up and process of two workshops with 17 participants from the construction industry is described. In the findings section following, we describe how the workshop participants gained a new way of looking at their customers and were inspired to learn from digital business models found in other industries while also creating ideas for new digital business opportunities in construction. We conclude the article by summing up the results and pointing to implications for theory and practice.

2 Disruption and digitalisation

Digital disruption is an emerging research field that builds upon traditional disruption theory (Christensen and Raynor, 2003) while taking the differences between physical and digital innovation into account (Haase *et al.*, 2017). Traditional disruption theory describes how disruptive innovations (typically offered by new entrants) create disruption by changing the bases of competition in a market. To tackle this threat of disruption, incumbent companies are advised to identify niches in the market in the form of over-served customers and current non-consumers (Christensen and Raynor, 2003). According to disruption theory, the currently over-served customers may be satisfied with a lower performing product/service, whereas non-consumers may be identified by looking into new markets.

Building upon the notion of disruption, literature on digital disruption (e.g. Ismail *et al.*, 2014) includes the effects of digitalisation. The traditional customer-company relationship changes as digital technologies enable new ways of engaging the users in co-creating the service. This has cradled the emergence of new digital business models entailing non-traditional ways of capturing value, e.g. by letting users share their own content or rank their customer experience. Companies like AirBnB and UBER have had remarkable success creating disruption from offering digital solutions in physical markets, causing researchers to speak of the trend as ‘uberisation’ of industries (Thuemmler and Bai, 2017).

Due to the standardised nature of digital information and the lack of physical assets, digital solutions are less constrained by the typical boundaries between industries (Tilson *et al.*, 2010). However, there are still significant differences between the levels of digitalisation across industries. Gandhi *et al.* (2016) found that the agriculture and hunting industry sector and the construction industry scored very low on digitalisation while information and communication technology, media, professional services, and finance and insurance scored very high in digitalisation. The gap between the level of digitalisation is expected to disappear in the coming years, as the wave of digitalisation will hit the tradition-bound industries next (Remane *et al.*, 2017), potentially causing digital disruption.

3 Digital business models and value proposition design

When companies strive to describe new innovative business models, a widespread approach is to use the Business Model Canvas (Osterwalder and Pigneur, 2010). The approach is used to describe nine core aspects of a business model, hereby clarifying how an organisation will create, deliver and capture value.

Analysing the business models of existing digital companies, the Australian Digital Transformation Lab proposed eight generic archetypes of digital disruption (Reimer *et al.*, 2015), namely: Digital Store (e.g. Amazon.com), Content Hub (e.g. Netflix), Sharing Hub (e.g. Youtube), Promoter (e.g. Groupon), Aggregator (e.g. Unimall), Discriminator (e.g. TripAdvisor), Crowd Sourcer (e.g. Kickstarter), and Matcher (e.g. Airbnb).

Reimer *et al.* (2015) based their archetypes on examples of digital business models from across industries, although none of the examples are from traditional industries. Recently, several researchers have studied how digitalisation is expected to affect traditional industries (Remane *et al.*, 2017; Thuemmler and Bai, 2017; Ernstsen *et al.*, 2018). Studying the healthcare sector – an industry that like construction is rather

tradition-bound – Thuemmler and Bai (2017) prescribe that digitalisation will enable users to be in charge of their own medical progress, creating significant changes to the entire value network of the industry. They describe how an increased focus on the customer is essential as digitalisation progresses.

Correspondingly, when seeking to create new business models, it is recommended to start by designing a value proposition that fits with the profile of the targeted customers (Osterwalder *et al.*, 2014). This fit is achieved by numerous iterations adjusting the value proposition to the targeted customer group. A good value proposition should be designed to match the customers' job(s), meet the gains desired by the customers, and diminish the pains customers seeks to avoid. Although comprehensive and readily applicable, the value proposition design approach does however not explicitly encourage learning from existing business models that have already proven successful. In this paper, we aim to address the gap in the literature by supplementing an important customer focus with the intent of learning from other industries.

4 Method

The study focusses on the construction industry which is found to be one of the least digitalised industries of today (Gandhi *et al.*, 2016; Kanjanabootra, 2017). The construction industry is extremely complex, for example due to the uniqueness of the projects, a heavily divided value chain, with numerous companies involved, low productivity overall and high internal competition focusing primarily on price (Winch, 1998; Dubois and Gadde, 2002).

In the study, we explore what stakeholders from the construction industry can learn from analysing customer profiles of well-known digital companies and transferring their findings to create ideas in their own context. The study was organised as two workshops for participants from the construction industry, using methods from value proposition design (Osterwalder *et al.*, 2014). The objectives of each workshop were threefold:

- inspiring learning from digital business models found in other industries
- creating ideas for new digital business opportunities in construction,
- looking at customers in a new way.

The first workshop had 12 participants representing different sections of the construction industry: Contractors, material suppliers, engineering students and construction researchers. The second workshop was carried out in a company setting with five participants from an engineering consultancy. In each workshop the participants were split into groups of about three people. The workshop approach is described in Table 1 and Figure 1. A picture from the first workshop can be seen in Figure 2.

Table 1 Outline of workshop programme

<i>Time</i>	<i>Workshop part</i>	<i>Exercise</i>
09:00 – 09:30	Introduction	Presentation of background and purpose. Introduction to archetypes. Splitting into groups.
09:30 – 10:15	Part 1: Analysis	Identifying jobs, pains and gains of customers in digital companies (group work).
10:15 – 10:45	Part 2: Idea generation	Creating ideas for new digital businesses in construction based on the essential pains, gains and jobs found in Part 1 (group work).
10:45 – 11:40	Part 3: Conceptualisation and presentation of ideas	Developing the best idea(s) into one final idea per group. Preparing a presentation (group work). Presentation of final idea and feedback.
11:40 – 12:00	Evaluation	Evaluation sheets and verbal feedback.

PART 1 - ANALYSIS



The workshops started by introducing the participants to the eight business model archetypes, including between two and four examples of well-known companies representative of each archetype. Each group then chose an archetype and a company example to base their group work upon.

Using the “customer segment” of a value proposition canvas, the groups selected a typical customer of the chosen company, and identified jobs, pains and gains of these customers.

This exercise was repeated with a new archetype and company until a number of jobs, pains and gains of all eight archetypes had been identified.

PART 2 - IDEA GENERATION

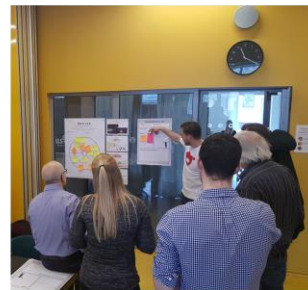


In the next phase of the workshop, each group chose one of the archetypes as a basis for idea generation.

Now, creativity was encouraged as the participants were asked to pick out the three most important jobs, pains or gains, and translate these to their own industry context asking, e.g. “Do we have customers with similar pains?” or “how would the corresponding gain be found in construction?”.

The ideas were described on sticky notes to create a mind-map of ideas for each group.

PART 3 - CONCEPTUALISATION AND PRESENTATION



In the last part of the workshops, the participants were asked to develop one of their ideas further and to describe the idea on a poster before presenting it to the group.

At the end of the workshop, the approach was evaluated both orally and by means of evaluation sheets. Moreover, the facilitators of the workshop shared their impressions from listening in on group work discussions.

Figure 1 For each of the three main parts of the workshops, there were poster templates to aid and guide the group exercises.

5 Findings

The authors took part in the workshops by facilitating the exercises and by listening to the discussions in the groups. The findings are thus based both on the oral feedback from the participants, their evaluation sheets, and the authors' observations and notes. In the following, findings are presented according to the three aforementioned objectives within each workshop:

Inspiring learning from digital business models found in other industries

Asking the participants to rate on a scale from 1 to 5 to which extent the archetypes inspired them to think in new ways, we obtained 15 answers with an average rating of 4.3. This suggests that the workshop succeeded in creating instances of inspiration for learning across industry boundaries. Based on the verbal feedback from the first workshop, we spent more time on introducing each archetype in Workshop No. 2 than in Workshop No. 1. This turned out to be a good decision. The participants in the second workshop said that the archetypes had given them a good, structured overview of the differences between existing, known business models. One participant described how the archetypes and company examples had made him realise that his every-day knowledge could be applied in a useful way for business development. The participants in the second workshop expressed that the approach could be a useful part of future strategy formulation processes, since the workshop had encouraged them to think about future opportunities rather than basing their ideas on status quo.

Creating ideas for new digital business opportunities in construction

Participant composition differed in the two workshops and this was found to impact the ideas created in the workshop. In the first workshop, the participants represented a range of stakeholders with different professional roles. The ideas generated focused on the end-user of construction projects, i.e. the person living in the buildings in the end. This corresponds with recommendations from digital disruption literature, where it is encouraged to take the point of departure in the end-user (Ismail *et al.*, 2014). The final ideas from the first workshop remained on a conceptual level, demanding substantial further work to qualify and anchor in a company. In the second workshop, the group of participants was smaller, came from one organisation, and had similar professional roles. Correspondingly, the final ideas in this workshop took the point of departure in challenges currently experienced in the company and building upon the current revenue model of the company. This could be seen as a limitation as the ideas focused less on creating or targeting new customer segments. Yet, the final concepts were more detailed than in the first workshop and was scoped by discussions on, e.g. to which extent the idea would not fit with company values. In this way, the amount of further work needed to develop the ideas into applicable business models was perceived to be smaller in the second workshop.



Figure 2 Workshop on creating digital business opportunities with 12 participants from the construction industry.

Looking at customers in a new way

Analysing the pains and gains of customers was a task that was easy to comprehend although not necessarily easy to execute. The facilitators aided groups who found it difficult, urging the participants to describing the pains and gains in concrete spoken language e.g. “not needing to speak to real people” rather than using abstract terms like “waiting time”. We found that the analysis was easier for groups who had first-hand experience with the company in question, and sometimes the pains and gains were more easily found by comparing the offerings to those of competitors (asking e.g. “what makes you choose Netflix rather than HBO or flow TV?”).

In both workshops we observed how it was difficult to separate customer value creation from revenue models. One group analysing YouTube started by defining the customer as the advertisers, since these are the ones creating revenue for YouTube. The group was afterwards asked to look upon the non-paying users as another group of customers, resulting in a vastly different customer profile. We believe that forcing the participants to look upon the customers, as more than just “the one who pays for products/services” made the participants consider ideas that would otherwise have been rejected at an early stage.

However, we also found that the revenue model is an important part of a business model that is difficult to ignore. Presenting the eight archetypes and company examples to the participants, we were, more than once, asked how a specific digital company make their money. Although it could be interesting to study and learn from the revenue models of the digital companies, it was out of scope of the workshop set-up to facilitate these kind of learnings. Considering that construction is a low-margin industry where innovation investments generally are rather short-termed, it may, however, be beneficial to let revenue streams play a more active role in digital value proposition design in this industry. This could be done through e.g. including an analysis of revenue models currently found in digital companies and encouraging the creation of similar types of non-traditional revenue models for construction.

To sum up, the customer profile analysis of known digital companies inspired the participants to contemplate new types of customers. Moreover, the workshop set-up gave rise to innovative thoughts and discussions on the possibilities of digital business models in the context of the construction industry. Nonetheless, the ideas all needed further qualification. This could be done using e.g. the business model canvas (Osterwalder and Pigneur, 2010) or lean start-up methodology to test the hypotheses about the customer needs, that the value proposition ideas are based upon (Ries, 2011). Whereas the approach showed to be useful in the construction industry, further work is necessary to test whether this approach is as useful in other less digitalised industries, such as agriculture or healthcare.

6 Conclusion

As digitalisation is creating significant changes across multiple industries, digital disruption literature recommends that companies focus on the customer. This article contributes to theory by arguing that companies should supplement a customer focus with an intent of learning from successful digital companies from other industries. Furthermore, the article contributes to innovation practice by proposing and demonstrating a workshop-based approach for creating ideas for new digital business opportunities through customer analysis. The approach was tested by means of two workshops in the construction industry, enabling the generation of plentiful ideas, gaining engagement, and identifying areas for further development. The devised workshop approach proposed and tested as reported in this paper may constitute the first step in a business model innovation process for digital disruption.

7 Areas for feedback & development

We invite any feedback on how less digital industries, such as construction, may benefit from digital experiences from other industries.

References

- Christensen, C. M. and Raynor, M. E. (2003) *The Innovator's Solution: Creating and Sustaining Successful Growth*. Harvard Business School Publishing Corporation.
- Dubois, A. and Gadde, L.-E. (2002) 'The construction industry as a loosely coupled system: implications for productivity and innovation', *Construction Management and Economics*, 20(7), pp. 621–631. doi: 10.1080/01446190210163543.
- Ernstsen, S. K. *et al.* (2018) 'Is construction ripe for disruption?', in *Association of Researchers in Construction Management (ARCOM) - Proceedings of the 34th Annual Conference*.
- Gandhi, P., Khanna, S. and Ramaswamy, S. (2016) 'Which industries are the most digital (and why)?', *Harvard Business Review*, april.

- Haase, L. M. *et al.* (2017) 'Characterizing digital disruption in the general theory of disruptive innovation', in *ISPIM Innovation Symposium*.
- Ismail, S., Malone, M. S. and Geest, Y. van (2014) *Exponential Organizations: Why new organizations are ten times better, faster and cheaper than yours (and what to do about it)*. New York: Diversion Books.
- Kanjanabootra, S. (2017) 'Improving Innovation Uptake Speed and Engineering and Construction Project Management - Is Disruption Theory Applicable?', in *15th Engineering Project Organization Conference*. Stanford Sierra Camp, California.
- McKinsey Global Institute (2017) 'Reinventing Construction: A Route To Higher Productivity', *McKinsey Quarterly*, (February).
- Osterwalder, A. *et al.* (2014) *Value Proposition Design*. Hoboken, New Jersey: Wiley. Available at: strategyzer.com/vpd.
- Osterwalder, A. and Pigneur, Y. (2010) *Business Model Generation*. Hoboken: Wiley.
- Remane, G. *et al.* (2017) 'Discovering digital business models in traditional industries', *Journal of Business Strategy*, 38(2), pp. 41–51. doi: 10.1108/JBS-10-2016-0127.
- Riemer, K. *et al.* (2015) *Digital Disruptive Intermediaries*.
- Ries, E. (2011) *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*, *Crown Business*. doi: 23.
- Thuemmler, C. and Bai, C. (2017) *Health 4.0: How virtualization and big data are revolutionizing healthcare*, *Health 4.0: How Virtualization and Big Data are Revolutionizing Healthcare*. doi: 10.1007/978-3-319-47617-9.
- Tilson, D., Lyytinen, K. and Sørensen, C. (2010) 'Digital Infrastructures: The Missing IS Research Agenda', *Information Systems Research*, 21(4), pp. 748–759. doi: 10.1287/isre.1100.0318.
- Winch, G. (1998) 'Zephyrs of creative destruction: Understanding the management of innovation in construction', *Building Research and Information*, 26(5), pp. 268–279.