Building Design-led Ambidexterity in Big Companies

Stoimenova, Niya; de Lille, Christine

Publication date
2017

Document Version
Final published version

Published in
Conference Proceedings of the Design Management Academy

HONGKONG DESIGN MANAGEMENT ACADEMY CONFERENCE 2017

RESEARCH PERSPECTIVES ON CREATIVE INTERSECTIONS

Building Design-led Ambidexterity in Big Companies

STOIMENOVA Niya; DE LILLE Christine*

Delft University of Technology
* Corresponding author e-mail: niya.stoimenova@gmail.com
doi: 133

Organisational ambidexterity is considered a crucial capability for long term firm survival and development. However, adopting and successfully implementing it presents multiple challenges. Furthermore, despite being increasingly popular in the last two decades, the role design can play in achieving it is notably missing from the discussion. This paper analyses the attempts to accelerate the innovation pace of two large international companies in the consumer electronics and healthcare and airline industries. Both attempt to combine design and agile elements in fast-paced environments, while working in multidisciplinary teams early in the NPD process. However, one is guided by designers, the other by people with a background in operational functions. As such, they provide a good foundation to study design's role and its implications in achieving ambidexterity in two large international companies. The collected insights helped us to define a new form of ambidexterity and devise a model for building ambidextrous organisations through design.

keywords: design-led ambidexterity, capabilities, Lighthouse Model

Introduction

In today's turbulent business environment, organisational ambidexterity is considered a crucial capability for long term firm survival and development (Oehmichen et al., 2016). Defined as "the ability to simultaneously pursue both incremental and discontinuous innovation… hosting multiple contradictory structures, processes, and cultures within the same firm" (Tushman & O'Reilly, 1996), organisational ambidexterity allows companies to be aligned and efficient in order to manage current business demands and adapt to

environmental changes (Mom et al., 2015). As such, the construct has become increasingly popular in the last two decades. Since its introduction in 1996, it has been addressed in hundreds of empirical studies, theory papers, special issues of journals devoted to the topic (Academy of Management, August, 2006; Organization Science, July-August, 2009), review articles and a large number of symposia at professional meetings (O'Reilly & Tushman, 2013). In fact, the articles addressing "organizational ambidexterity" in Google Scholar for 2016 only are 894, which implies it has a significant presence in the academic context.

Early studies on ambidexterity focus on its outcomes. More recent ones have shifted to its antecedents at industries, business units and senior manager level and its implementation in companies (Oehmichen et al., 2016). However, to our knowledge, notably absent from this discussion is the role of design and its influence on the construct. Therefore, the purpose of this paper is to advance the understanding in this field and to discern how design can help in building ambidextrous organisations. To do so, we discuss the innovation efforts of two big international companies. The first is one of the largest manufacturing firms in the world in the area of consumer electronics, lighting and healthcare. Their new innovation approach, X1, is created and led by the design department of the firm and has three main pillars: co-creation, multidisciplinary teams and reflection. The approach was established as an attempt to accelerate the innovation pace of the company. It ensures, through fast iterations, that ideas are feasible, viable and desirable early in the New Product Development (NPD) process. In addition, the firm has both a long-standing trandition with design and a large presence of designers in-house. The second is one of the oldest commercial airlines in the world. Their new innovation effort, X2, was created to check ideas' feasibility and desirability early in the NPD and thus accelerate the firm's pace of innovation. Based on principles of Lean Startup (LS) (Ries, 2011), Scrum (Schwaber & Beedle, 2002) and Design Thinking (Brown, 2008), the department was established together with the local airport a year ago. The basic premise of X2 is to conjure up ideas, prototype them in a matter of days and test as soon as possible with real passengers and employees either at the Departure hall, one of the three dedicated gates at the airport or during flights. However, unlike X1, neither the company nor the team has affinity with design (yet) and design skills were brought in by the first author of the paper.

This paper is structured as follows: first, the existing literature on different types of ambidexterity is reviewed. In addition, design's possible role is briefly reviewed, as well as three factors challenging its implementation. Then, the methodology of the research and the collected results are described. This is followed by a discussion of the results, concluded in a new model for achieving ambidextrous organisations through design. Last but not least, the article discusses possible limitations of the study and indications for future research.

Organisational Ambidexterity according to Literature

To achieve ambidexterity organisations have to undergo both exploration and exploitation activities (March, 1991). On the one hand, exploration is characterised by search, experimentation, play, flexibility and investigation, and can result in new knowledge (Tabeau et al., 2016). This new knowledge is essential for developing radically new solutions (Atuahene-Gima, 2005) and achieving [brand] relevance (Beverland et al., 2015).

However, its results are often distant in time, uncertain and ambiguously connected to the current context. As such, exploration is associated with looser controls and structures, more flexible processes and search behaviours (Duncan, 1976). Hence, the exploration subunits are organized to experiment and improvise. Exploitation, on the other hand, allows the firm to improve [brand] consistency (Beverland et al., 2015) and already present knowledge by performing "refinement, choice, production, efficiency, selection, implementation and execution" (Tabeau et al., 2016). Thus, it is associated with tight controls, structures and culture, and disciplined processes, carried out by units organized to be efficient (March, 1991). These activities improve present returns, which are relatively certain and closely related to the organisation's current actions (March, 1991). Thus, they are more likely to contribute to cost efficiency, profit gains and incremental innovation (O'Cass et al., 2014). Hence, there is an existing bias in companies favouring exploitation over exploration since it provides greater certainty of short-term success (O'Conor, 2008). Due to the different roles and influences on innovation outcomes (Tabeau et al., 2016) of the two activities, it's imperative that the tension between them is managed well (March, 1991) so balance can be achieved. Such balance is both feasible and beneficial to organizational performance (Jansen et al., 2009).

O'Reilly & Tushman, (2013) and Chebbi et al. (2015) define three types of organisational ambidexterity in regards to the interaction between exploration and exploitation. The first one, sequential, is a form of temporal separation. This type of ambidexterity is more useful in stable, slower moving environments. It occurs when companies shift from exploitation to exploration and vice versa by realigning their structures and processes to reflect the context they are in. Hence, the firm goes through periods of centralization to enhance cost efficiencies and decentralization to emphasize innovations (Raisch, 2008). Some scholars claim that overall decentralization followed by reintegration generates the highest organizational performance (O'Reilly & Tushman, 2013). Therefore, being able to develop process mechanisms and relationships that can enable the switch between exploration and exploitation is crucial with sequential ambidexterity (Wang & Rafiq, 2012).

The second is simultaneous or structural ambidexterity. Achieved either through spatial separation or parallel structures, it requires autonomous, structurally separated units for exploration and exploitation. Each unit has its own alignment of people, structure, processes and cultures managed in its unique way (Duncan, 1976). However, the spatial separation creates physical boundaries between the exploration and exploitation activities (Benner & Tushman, 2003). It also protects the former from the firm's existing inertia and thus allows to achieve both simultaneously (Jansen et al., 2009). Next to this, parallel structures can be used also by defining primary and secondary structures to carry out key tasks (Raisch & Birkinshaw, 2008). Primary structures are used for incremental innovation and for maintaining stability, while secondary structures such as project teams and networks are focused on exploratory activities (Raisch & Birkinshaw, 2008). Both mechanisms enable each unit to focus on its tasks more effectively (McDonough & Leifer, 1983). For this type of ambidexterity, integration and sharing knowledge and resources among the units is needed (Burgers et al., 2009) to ensure sustained growth (Durisin & Todorova, 2012). In order for the results of each activity to be well-integrated, they should be held together by a common strategic intent and dedicated leadership (O'Reilly & Tushman, 2013).

Both sequential and structural ambidexterity attempt to solve the exploration-exploitation tension through structural means. Contextual ambidexterity (Gibson & Birkinshaw, 2004), solves it on individual level. Such is achieved by creating a set of processes or systems,

which allow and support each individual to make her own judgement in regards to dividing her time between conflicting demands for alignment and adaptability. The ability to balance exploration and exploitation depends on the organisational context, characterized by “an interaction of stretch, discipline, and trust” and requires a “supportive organizational context” that “encourages individuals to make their own judgments”. Contextual ambidexterity can be clearly differentiated from the others in three ways. First, the emphasis is on individuals making the adjustment rather than on units. Second, ambidexterity is achieved when individuals agree that their unit is aligned and adaptable. Third, the organizational systems and processes are never concretely specified. According to O’Reilly & Tushman (2013), the most common example of such is workers being able to perform routine tasks (exploitation) but also continuously to optimise their jobs (exploration). This type, however, does not address the simultaneous and systematic conduct of exploration and exploitation (Kauppila, 2010).

As already mentioned, ambidexterity’s implementation, regardless of the type, continues to be challenging (Oehmichen et al., 2016). This calls for a different approach to it. Design and its role in creating ambidextrous organisational structures has not been examined yet. Nevertheless, we believe it to be a perfect match to guide firms in both their explorative and exploitative activities due to its proficiency in dealing with uncertainty and wicked-problems (Tabeau et al., 2016) and its user-centredness respectively. Furthermore, despite the documented challenges of implementing it in big companies, the popularity of design-based approaches such as Design Thinking and Design Sprint (Knapp et al., 2016) continues to grow (Carlgren et al., 2016). Moreover, relatively little is known of the specific mechanisms through which the use of design might improve innovation outcomes (Liedtka, 2015).

We base our research on three organizational challenges of design’s implementation we consider interconnected and amplifying each other: methods, mindset and infrastructure. First, due to their iterative nature and requirement of hands-on means (Sanders et al., 2010), design methods clash with the linear exploitation processes of a firm (Carlgren et al., 2016). Second, the existing mindset should be considered since radical innovation is only possible if the company is able to break out of the existing (old) mindsets and routines (Carlgren et al., 2016). Such mindsets and the inability to unlearn are some of the major barriers to design’s adoption (Assink, 2006) as well as to that of change processes within organzations (Lorsch, 1986). Finally, an infrastructure that allows for such methods and mindset has to be built. Providing collaborative structures and processes and connecting innovations with existing businesses is crucial for sustained innovation (Dougherty & Hardy, 1996). Furthermore, large organizations struggle with a lack of appropriate processes and/or routines for radical innovation (Carlgren et al., 2016). Therefore, our research is focused on better understanding the role of design and these three factors in achieving ambidexterity.

Method

This paper reports the result of an action research study in the already discussed two firms. The first author was embedded in both studies and acted as a participant in developing X1 and an action researcher in X2. The duration of the research in each entity and the freedom the researcher had differ. On the one hand, the research on X1 lasted 5 months. The methods, mindset and infrastructure were already established and the

researcher had no influence on their further development. The results of this are reported in Stoimenova et al. (2015). On the other hand, the research on X2 lasted for 10 months. The role of the researcher was to introduce and implement fundamental principles and values of design in their largely based on LS and Scrum way of working. As such she had the opportunity to influence the selection of methods, the formation of the desired mindset and the development of the infrastructure. The efforts on developing these are reported in Stoimenova, et al. (2016). In addition, interviews with the key stakeholders of both X1 and X2 were carried out and analysed in accordance with the Grounded Theory Method (Charmaz, 2008). The two studies will be discussed at the stage they were in while the researcher was embedded in them, not their further development, as there was no continued involvement.

Results

As already mentioned, the two companies are discussed on the basis of methods, mindset and infrastructure. The notion of ambidexterity is not used as none of the firms deliberately tried to achieve such. In Table 1 there is an overview on each of these factors paired with quotes, illustrating the findings.

Methods

Both X1 and X2 make use of participatory and traditional design methods. On the one hand, X1 uses design methods of discovery, ideation and rapid prototyping, carried out in quick iterations and in co-creation with other departments of the firm. To achieve that, they use tools such as sketches, models, demonstrators and videos to clearly visualize the idea and then test it with users. The approach is sped up with 3-to-5-day workshops resembling sprints. On the other, X2 uses ideation techniques and methods typical for co-design (with either their employees or passengers). However, their main emphasis and guidance comes from Scrum and LS and thus, they make use of methods typical for these approaches such as hypotheses testing, sprints and customer development (Blank, 2006).

Mindset

Both approaches receive executive support, but team members in X2 and participants in X1 and X2 face difficulties as the way of working of each approach is very different than the one in the rest of the company. Furthermore, the approaches' core teams are selected to have slightly different mindsets. On the one hand, the team members of X1 should be able to think on a more conceptual and abstract level and in the same time should "really master a certain aspect". On the other hand, the team members of X2 are "not people who like to keep talking or thinking about what can be but… think "let's do it"". In addition, stemming from the design methods they use, X1 and X2 have a different degree of exploratory mindset. Due to their background in design, the X1 team exhibits a mindset with an emphasis on search and exploration, while the X2 team's mindset is still shaping. Regardless, in the course of this research, there was a clear shift in X2 towards mindset that allows a certain degree of exploration and inclusion of users' ideas. Last but not least, each team mainly relies either on qualitative (X1) or quantitative (X2) data, which also affects accordingly their (initial) mindsets.

Infrastructure

As seen from Table 1, there are both similarities and differences between the two. First of all, the duration of X1 project varies from 3 days to 3 months, while X2 works in sprints of 2 weeks without a set duration for a project. The projects of X2 are in accordance with

Table 1 Results Overview

X1		X2	
Methods	Quotes	Methods	Quotes
Co-design methods; Rely on user research upfront; Rapid prototyping methods; Regular user testing; Design workshops from 3 to 5 days;	*"… we had the walls covered with brown paper and tried to externalize all the time, just draw continuously, write down everything they said continuously and it's completely trivial, but that really helped them to structure their thoughts."* *"Getting the context known and [establish] shared knowledge among [people] you've never met before…, so everybody knows what the context is, who are we dealing with, what the region is, what the issues are…"* *"…make people enthusiastic to create things, because a lot of people are just used to write mails, PowerPoints, Excels … and be sure that you've done some field research – consumers and internal stakeholders"* *"They have to understand what is the goal, you want to define valuable value proposition."*	Co-design methods; Following the principles of LS and using Scrum as a project management tool; Minimal viable product (MVP) building; User testing through qualitative and quantitative data; 5-day design sprints;	*"We give ourselves the room to really try to understand the problem… and not jumping to conclusions and we also involve others to do that…but the focus also lies on validating hypotheses."* *"We work with learning milestones, we really make our learnings explicit and every learning leads to adjustment or an ideation session or [quantitative] research. And eventually when the learning dries up… you probably have something that works and we validate it with data."* *"You have all those methods and ways of ideations and I don't know if this is design… but we definitely use the tools to come up with ideas…"* *"But if we already have an idea, maybe not involve the user [upfront], but just go and do it with the users and get some speed and learnings as soon as possible… but I believe you still need research upfront."*

Mindset	Quotes	Mindset	Quotes
Team: the team of designers has exploratory mindset; Presenting themselves as non-experts, not designers; Rely on user research; Doers who are able to think conceptually; *Company:* difficult to convince other departments; Requires paradigm shift; Executive support;	*"They [the team] have to be able to think on a … conceptual level, abstract level…. open-minded and … they should have clear opinion but not be forceful. They should not be such strong characters that they blow others away in a meeting… They should be able to listen to other people as well and be knowledgeable – they should really master a certain aspect."* *"So what I try to do is not playing the designer in the beginning. Then I'm neutral … and I'm not protecting the design community or any other program. It's just – you have some room to facilitate this process. And this works quite disarming."* *"But for some rational people… who think about step by step, A to B or A to D via B and C and not M or L and we are actually telling: I can define B but I cannot define C, we will find out – that's not comfortable."* *"… for some people feels uncomfortable, even annoying that you do it again and again and again."* *"It's against some people's paradigm that you cannot make prototypes if you have just started; it's impossible:*	*Team:* Development in their mindset from *"we already have the idea, why waste time"* to mindset favouring a certain degree of exploration; Rely on quantitative data; Doers; *Company:* difficult to convince other departments; Requires paradigm shift; Executive support;	*"I'm looking for people who are emotionally very strong, who dare, who really want to get results… not people who like to keep talking or thinking about what can be but really people who think let's do it, combined also with that you can kill your darlings very quickly … we don't have the people who dare to dream like that and who dare to do it."* *"… we don't know what the right solutions are, so we need to give ourselves the room to explore and it's pretty difficult because if we tend to just explore without a focus or a reason why, we tend to stay there too long."* *"So basically, it's [convincing other departments] about trust and about politics, but the trust is the most important thing."* *"The biggest change we've made in the past 2 months, we got [executive] support and now we have the confidence we're allowed to explore. And because we have that, we have more room to think and use [design] methods…"* *"What you see right now every department has their own goal, and this is strange as we as a company*

	it's like doing the interior design of the house before you have even built the house." *"It's quite a struggle to get people to use it and to overcome their unwillingness to sort of start playing with materials: sometimes they feel it's childish; they feel they are not qualified or capable."* *"They can think: why is this building doing it when this belongs to our sector and he is just a designer.... And then we say: we are not doing it, we are collaborating."*		*should have 1 goal or the same goals, at least and we don't have those. That's tricky."* *"… I always made the comparison between Star Trek and Indiana Jones. They both do exploration. Star Trek – it never ends. They always keep on exploring, it's all about the exploration itself. Indiana Jones – it's not about the exploration itself. The exploration is a tool, it's a way to eventually get to the goal, that's still unknown at the moment."*
Infrastructure	Quotes	Infrastructure	Quotes
Led by designers in the role of project lead and/or facilitators; Strong emphasis on exploration; Each project lasts up to 3 months and makes use of regular workshops; The project lead coordinates the team, which meets meets only when enough input is generated; Different teams for each project Using multidisciplinary teams (from all relevant departments of the firm);	*"To sum up the approach: learn fast, make iterations, be sure that every discipline that is present has learnt the same… and also be realistic on stopping with the exploration once you together concluded that it doesn't make sense or at least turn the proposition to 180 degrees."* *"… and sometimes it's the conflict with fitting into the system when we actually want to get out of it and form a team, make a few iterations and then if we are lucky, we have a solid value propositions, then it's*	Led by people with operational background in the role of product owners (PO); No designers; Trying to find the balance between exploration and exploitation; Working in 2-week sprints, no time limit per project; POs dedicated to a certain problem, supported by a team of part-time employees with operational background;	*"I want to create a space where people [customers and employees] together with smart people can co-create the next thing themselves and also as an infrastructure where startups can be innovative with having as less meetings as possible with as much freedom."* *"… you build the infrastructure, but you're not the one who per se comes up with all the new ideas, you give other people the opportunity to be innovative in your environment, but they can only be as successful as they*

Emphasis on reflection and learning; Act as the bridge among the different disciplines; Introduce the approach to the rest of the firm through workshops; Focus on continuous user research; Difficult to manage the collaboration; Difficult to have the right people on board (lack of resources); Problems handing-over a project to the company;	*getting serious and then we can fit into the organization."* *"… but then again, my comment was that the [project] was really well, but the hand-over to the business afterwards… was more difficult, because we were so quick and solid in the [project] and the business couldn't keep up."*	The same team; Involvement of employees through interviews and ideation sessions; Reflection carried out during Sprint Reviews; Introduce the approach to the rest of the firm through 5-day design sprints; 5-day design sprints to kick-off a project or overcome obstacles together with users (employees); Focus on incremental changes; Difficult to manage the collaboration; Difficult to have the right people on board (lack of resources); Problems handing-over a project to the company;	*are, because you have the environment."* *"… I don't think it will change top down, it also won't change bottom-up in the sense that if we ask the employees, then suddenly will become very innovative. We have to give people the room to just do what the hell they think is the next step and take the leap of faith."* *"We incorporate that [handing over] in the ideation phase, where we do the roast to involve the main stakeholders."* *"So it [the solution] has to be linked to a division… and you need a multidisciplinary team. If you have both those things, it will radically shorten the time between ideation and implementation."*

strategic ambitions defined by the company's CEO and thus present a strong fit with the company. In comparison, although X1 works on strategic projects for the company, it takes time to explore topics and then seeks the fit with the company's roadmap.

Second, they follow similar phases in their way of working. On the one hand, X1 goes through a (qualitative) research phase, followed by framing and reframing activities in multiple iterations, concluded by prototypes and demonstrators and user testing. Reflection is an integral part of this approach. Designers facilitate the process, but never present themselves as such. Nevertheless, the stages in their approach have design jargon names. X2, on the other hand, carries mainly quantitative research to better understand the problem upfront. Once this is done, the team goes through an ideation phase in several iterations and regularly involves users (employees). After the ideation phase is done, the team employs both LS and (participatory) design methods to build Minimal Viable Product (MVP), test and reflect on it. In addition, each stage is named after a cartoon or book character that best reflects the nature of the respective activity. For instance, the ideation phase is called "Mickey Mouse" and the testing phase – "Dummy".

Third, both approaches involve parties external to the company. X1 involves design agencies and software companies, while X2 only recently started working with a software startup. Both use design-led workshops as interventions. However, the workshops in X1 are carried out regularly when enough new insights are generated. X2 carries out such workshops (5-day design sprints) in the beginning of a project or when stuck. Both interventions serve as a great conversation starter on what the respective approach can achieve. As such, they are also used to convince the company in the power of each approach since the threshold for performing it is lower and results are achieved in 3 to 5 days.

Forth, the principles, on which they build the teams for each project also differs. For instance, in X1 designers play the role of facilitators and project leaders. Each team is constructed by interested parties from the company and evolves over the course of a project. There is a core team of four to five people who continue to work on the project between the workshops. There is also a business owner, who provides financial support. On the other hand, X2's team consists of four product owners and several part-time team members with operational background that work together on different topics each sprint. Other company employees are involved directly only during the design sprints. Design was brought to them by the first author, another designer and the tools they created for the team. In addition, both approaches make use of multidisciplinary teams, however the emphasis on multidisciplinarity is much stronger in X1.

Fifth, in their efforts to scale up, X1 is carrying out company-wide facilitation trainings and using their workshops as a means for people to get acquainted with the approach. X2 carries out the design sprint for this purpose, but also to implement the way of working in other parts of the company. To do so they use metaphors and easily understandable and relatable names for the phases of their way of working. They also spend time to create awareness among the company's staff by using them as participants in their tests.

Last but not least, the way they deal with the handing-over of a validated idea (project) to the organisation is different. X1 involves business owners early on. Sometimes, at the end of a project, they also involve people from the departments that will work on its further development. X2 turns to company stakeholders to critique the developed ideas during or

after the ideation phase. Here the stakeholders "should also give the support that… they're available for the hand-over". Regardless of their differences, both X1 and X2 experience difficulties to successfully hand over validated ideas.

Discussion

In this paper we discussed the innovation approaches of two large companies. Neither X1 nor X2 was created to achieve organisational ambidexterity. Their intended emphasis was on accelerating the initial stages of NPD and thus the overall pace of innovation in their respective company. As such, they mainly carry out exploratory (design) or accelerated exploitative (Agile/LS) activities, followed by the exploitation activities of the firm. Despite the many differences and similarities, however, the main distinction between them is that X1 carries out exploration with very few elements of accelerated exploitation, while X2 carries out accelerated exploitation with a few elements of exploration. Hence, they do provide a solid foundation to achieve ambidexterity since most of the ambidexterity elements are present.

However, none of them clearly fits into the ambidexterity types described in the literature review section of the paper. On the one hand, they can be categorised as secondary parallel structures, since their teams are (mainly) tasked either with exploration or accelerated exploitation. On the other, they regularly shift from exploration to (accelerated) exploitation, and thus also fall into the contextual ambidexterity category. Such is especially visible in X2 where the team carries out both exploration (e.g. gathering user insights) and applies the methods of LS and Scrum. However, unlike the contextual ambidexterity, the teams do not decide whether to switch between the two activities entirely on their own. They are guided by a specified way of working. Thus, to fill this gap, we propose a new type of ambidexterity we call design-led, since both approaches use design methods throughout their processes. In addition, while design is an obvious fit for the exploration phase, it can also contribute to exploitation activities such as building prototypes and user testing. Therefore, it can play the role of the common denominator across different types of activities.

Using the theory of ambidexterity as a prism, the design-led ambidexterity consists of five main elements, combined in what we call the Lighthouse Model (Figure 1). First, there's the wheel of Exploration, in which X1 excells and X2 has only elements of. Second, the Exploitation wheel, as in the other categorisations, represents the activities big companies usually carry out. Both companies are very good at that. However, when two wheels are put together, they turn in opposite directions. Thus, the results achieved during exploration will be counteracted by the exploitation structures. This is what happens when both approaches try to hand over Exploration projects to the Exploitation phase. Therefore, just like in a gear train, a wheel combining elements of both activities can ensure rotation in the same direction. We call it the Catalyst, as it not only ensures such rotation, but also increases the rate of collaboration between the two. Methods, which play this role well are LS, as it is based on the Lean and customer development methodologies, which accelerate exploitation, but also shares similar mindset with Design Thinking (Mueller & Thoring, 2012) or the Design Sprint, combining elements of Design Thinking and Scrum. These three wheels will not work unless a strong Executive Support is present. The last crucial element is Users (both employees and customers), who will trigger Exploration. Once all these elements are present, we believe the Lighthouse will work.

DESIGN-LED AMBIDEXTERITY

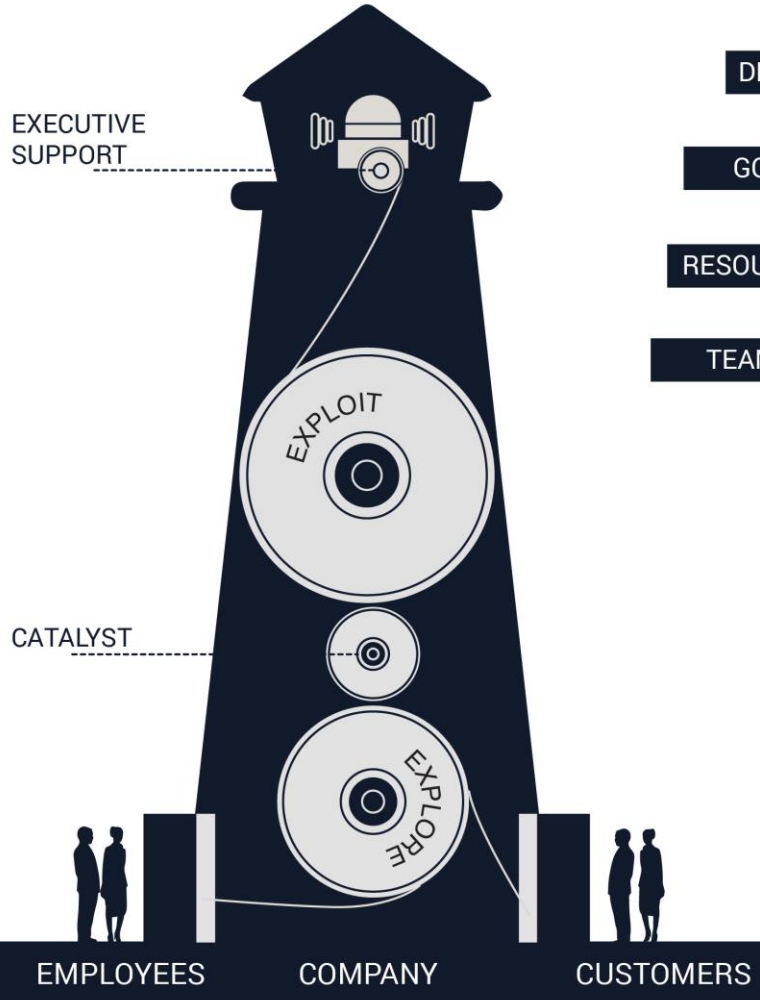

Figure 1: Lighthouse Model

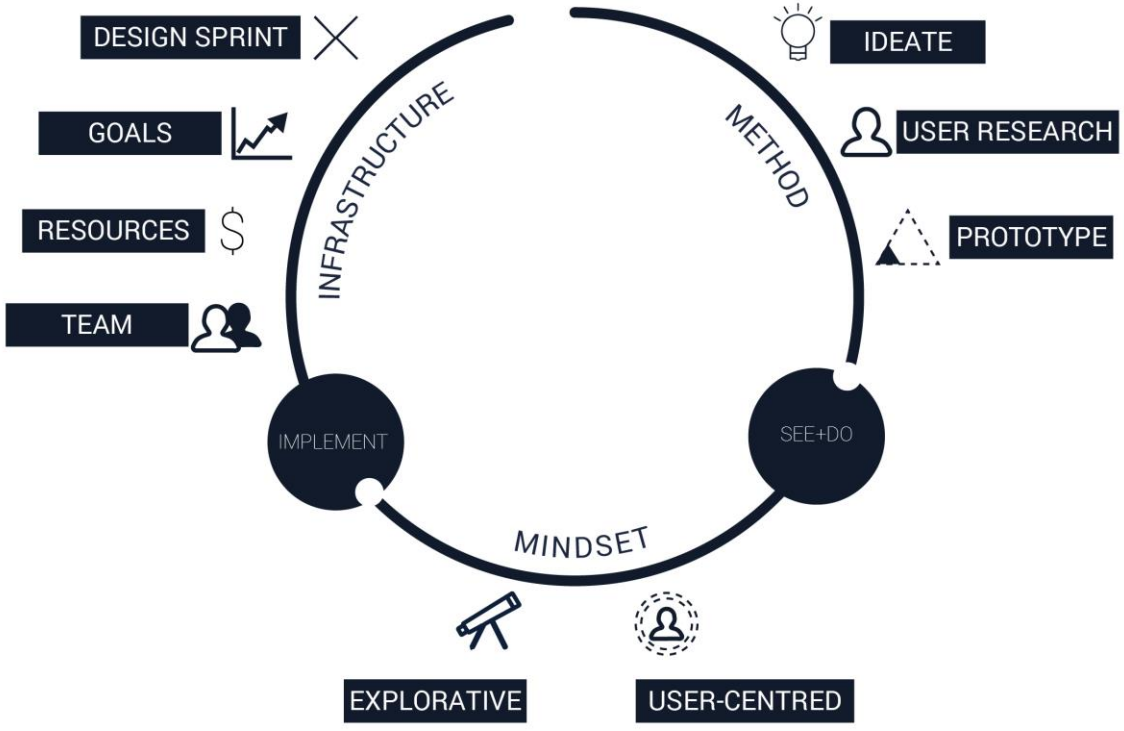

Figure 2: Design implementation and impact

Although the model is still in its inception phase, we believe it gives an initial indication and explanation of the main obstacles these two approaches face to achieve ambidexterity. For instance, the problem X1 has with hand-over: they have mastered the exploration phase and the company has well-developed exploitation structures. Although they implement Agile elements in their way of working and have a dedicated business owner, they're missing many of the exploitative elements of the Catalyst. On the other hand, X2 has the Catalyst figured out, but lacks a dedicated business owner and involves company stakeholders only at the end of the ideation phase. Furthermore, they lack truly multidisciplinary teams and miss some exploration elements and full involvement of their users.

Last but not least, initially X2's way of working was predominantly based on Scrum and LS principles. Therefore, we started by slowly introducing design methods by combining them with the ones they already used. After a few months of seeing and doing the methods on their own, we noticed a shift in their mindset. While at first they had an exploitative one due to their background, they adopted a mindset typical for co-design (Sanders & Stappers, 2008). Once the mindset was implemented in their day-to-day activities, the infrastructure also started changing – above all, the way they involve employees in their teams and a new element to their way of working (the 5-day design sprint). As such, both the infrastructure and the methods have to be flexible and open in order to react to the ever-changing environment (Figure 2). The only constant is the desired mindset that supports such development and the notion of design and design-led ambidexterity. Similar development was observed with participants in X1 workshops. However, the effect was less significant, possibly due to the little exposure time. The lack of influence of the researcher on X1's development and its later stage of development make it difficult to discern whether similar process occurred in X1. Regardless, these observations suggest the influence the three factors can have on establishing an optimal foundation for ambidexterity.

Conclusion

None of the reviewed approaches was developed to achieve organisational ambidexterity. Nevertheless, they do provide a solid foundation and a starting point for implementing such in their respective companies since most elements of ambidexterity are present. However, the way they approach it does not fit into any existing categorisations of the construct. Based on our insights, we created the Lighthouse Model and proposed a new type of ambidexterity – design-led – giving an initial indication on how to build such in mature companies. The diverse backgrounds and contexts of the two described situations give a solid foundation of the model. However, the aim of the model is to move from describing organisational ambidexterity towards prescribing design-led ambidexterity. As such, further research in other instances has to be carried out to validate it and make it applicable to a wider context.

To do so, despite the fact that this paper discusses mature companies, startups in a process of scaling up should be addressed, as they face fewer organisational constraints compared to established firms (Chen & Kannan-Narasimhan, 2015). Such companies deal with considerably less inhibitors to disruptive innovation such as excessive bureaucracy, unlearning the old processes, status quo and the risk-averse climate (Assink, 2006). In

addition, all startups start with an exploration or an idea of the founders. However, due to the adoption of Agile and LS methodologies, the focus quickly shifts to accelerated exploitation (Mueller & Thoring, 2012) to become a viable company. Therefore, in order to grow, sustainably scale up and create ambidextrous infrastructures, the balance between exploration and exploitation has to be found. The role of design in this is yet unexplored, too. Furthermore, since both X1 and X2 behave like startups within their organisational structures, we believe a better understanding of how such can be built in smaller scale could be later translated for mature companies as well.

In conclusion, although this paper reports two attempts to accelerate the pace of innovation early in NPD and lacks an insight on the longer term implications of such, it gives initial directions on how to achieve organisational ambidexterity. Further research on design-led ambidexterity and its implementation can yield interesting insights for startups and mature companies alike. Consequentially, it will improve our understanding of the role design can play in building organisational structures that can successfully carry out and balance both exploration and exploitation activities, expanding our body of knowledge on the strategic value of design.

References

Assink, M. (2006). Inhibitors of disruptive innovation capability: a conceptual model. *European Journal of Innovation Management*, *9*(2), 215-233.

Atuahene-Gima, K. (2005). Resolving the capability—rigidity paradox in new product innovation. *Journal of marketing*, *69*(4), 61-83.

Benner, M. J., & Tushman, M. L. (2003). Exploitation, exploration, and process management: The productivity dilemma revisited. *Academy of management review*, *28*(2), 238-256.

Blank, S. (2006). The four steps to the epiphany: Successful strategies for startups that win. *Foster City, Calif.: Cafepress.com.*

Brown, T. (2008). Design thinking. *Harvard business review*, *86*(6), 84.

Carlgren, L., Elmquist, M., & Rauth, I. (2016). The Challenges of Using Design Thinking in Industry–Experiences from Five Large Firms. *Creativity and Innovation Management*, *25*(3), 344-362.

Charmaz, K. (2008). Constructionism and the grounded theory method. Handbook of constructionist research, 397-412.

Chebbi, H., Yahiaoui, D., Vrontis, D., & Thrassou, A. (2015). Building Multiunit Ambidextrous Organizations—A Transformative Framework. *Human Resource Management*, *54*(S1), s155-s177.

Chen, R. R., & Kannan-Narasimhan, R. P. (2015). Formal integration archetypes in ambidextrous organizations. *R&D Management*, *45*(3), 267-286.

Dougherty, D., & Hardy, C. (1996). Sustained product innovation in large, mature organizations: Overcoming innovation-to-organization problems. *Academy of Management Journal*, *39*(5), 1120-1153.

Duncan, R. B. (1976). The ambidextrous organization: Designing dual structures for innovation. *The management of organization*, *1*, 167-188.

Durisin, B., & Todorova, G. (2012). A study of the performativity of the “ambidextrous organizations” theory: Neither lost in nor lost before translation. *Journal of Product Innovation Management*, *29*(S1), 53-75.

Gibson, C. B., & Birkinshaw, J. (2004). The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of management Journal*, *47*(2), 209-226.

Jansen, J. J., Tempelaar, M. P., Van den Bosch, F. A., & Volberda, H. W. (2009). Structural differentiation and ambidexterity: The mediating role of integration mechanisms. *Organization Science*, *20*(4), 797-811.

Kauppila, O. P. (2010). Creating ambidexterity by integrating and balancing structurally separate interorganizational partnerships. *Strategic organization*, *8*(4), 283-312.

Knapp, J., Zeratsky, J., & Kowitz, B. (2016). *Sprint: How to solve big problems and test new ideas in just five days*. Simon and Schuster.

Levinthal, D. A., & March, J. G. (1993). The myopia of learning. *Strategic management journal*, *14*(S2), 95-112.

Liedtka, J. (2015). Perspective: linking design thinking with innovation outcomes through cognitive bias reduction. *Journal of Product Innovation Management*, *32*(6), 925-938.

Lorsch, J. W. (1986). Managing culture: the invisible barrier to strategic change. *California Management Review*, 28(2), 95-109.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization science*, *2*(1), 71-87.

McDonough, E. F., & Leifer, R. (1983). Using simultaneous structures to cope with uncertainty. *Academy of Management Journal*, *26*(4), 727-735.

Mom, T. J., Fourné, S. P., & Jansen, J. J. (2015). Managers' work experience, ambidexterity, and performance: The contingency role of the work context. *Human Resource Management*, *54*(S1), s133-s153.

Müller, R. M., & Thoring, K. (2012). Design thinking vs. lean startup: A comparison of two user-driven innovation strategies. *Leading Through Design*, *151*.

Nielsen, S. L., & Christensen, P. R. (2014). The Wicked Problem of Design Management: Perspectives from the Field of Entrepreneurship. *The Design Journal*, *17*(4), 560-582.

O'Cass, A., Heirati, N., & Ngo, L. V. (2014). Achieving new product success via the synchronization of exploration and exploitation across multiple levels and functional areas. *Industrial Marketing Management*, *43*(5), 862-872.

O'Connor, G. C. (2008). Major innovation as a dynamic capability: A systems approach. *Journal of product innovation management*, *25*(4), 313-330.

O'Reilly, C. A., & Tushman, M. L. (2013). Organizational ambidexterity: Past, present, and future. *The Academy of Management Perspectives*, *27*(4), 324-338.

Oehmichen, J., Heyden, M. L., Georgakakis, D., & Volberda, H. W. (2016). Boards of directors and organizational ambidexterity in knowledge-intensive firms. *The International Journal of Human Resource Management*, 1-24.

Raisch, S. (2008). Balanced structures: designing organizations for profitable growth. *Long Range Planning*, *41*(5), 483-508.

Ries, E. (2011). *The lean startup: How today's entrepreneurs use continuous innovation to create radically successful businesses*. Crown Books.

Sanders, E. B. N., Brandt, E., & Binder, T. (2010, November). A framework for organizing the tools and techniques of participatory design. In *Proceedings of the 11th biennial participatory design conference* (pp. 195-198). ACM.

Sanders, E. B. N., & Stappers, P. J. (2008). Co-creation and the new landscapes of design. *Co-design*, *4*(1), 5-18.

Schwaber, K., & Beedle, M. (2002). Agile software development with Scrum (Vol. 1). Upper Saddle River: Prentice Hall.

Stoimenova, N., van Onselev, L., & Valkenberg, R., (2015). Four guiding factors for facilitators of multidisciplinary collaboration. In *Proceedings of 4th Participatory Innovation Conference 2015* (p. 51).

Stoimenova, N., de Lille, C. & Ferreira, C., (2016). Co-Designing Innovation in Fast-Paced Environments: Organizational Challenges and Implications. *In Proceedings of 20th DMI: Academic Design Management Conference Inflection Point: Design Research Meets Design Practice*. Boston, USA, 22-29 July (2016)

Tabeau, K., Gemser, G., Hultink, E. J., & Wijnberg, N. M. (2016). Exploration and exploitation activities for design innovation. *Journal of Marketing Management*, 1-23.

Tushman, M. L., & O'Reilly, C. A. (1996). The Ambidextrous Organization: Managing Evolutionary and Revolutionary Change. *California management review*, *38*, 4.

Wang, C. L., & Rafiq, M. (2014). Ambidextrous Organizational Culture, Contextual Ambidexterity and New Product Innovation: A Comparative Study of UK and Chinese High-tech Firms. *British Journal of Management*, *25*(1), 58-76.

About the Authors:

Niya Stoimenova is a second year Master's student in Strategic Product Design in TU Delft. Her research interests lie within the area of co-design, design-led ambidexterity and building organisations that create meaningful solutions.

Christine De Lille is an Assistant Professor at the faculty of industrial Design Engineering, TU Delft. Her research focuses on role of design, co-design and change in systems design.