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Framing activities and the co-evolvement of products and operations in new ventures

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Abstract

New ventures need to simultaneously develop both their first offering and the operations of the venture itself. This paper extends the notion of problem-solution co-evolvement from product design to venture design, presenting results from four new Finnish ventures in the midst of creating their first offering market-ready. Based on qualitative analysis of interviews of the entrepreneur teams of these ventures, it is suggested that differences in how the venture idea is initially approached translates into different types of co-evolvement between the offering and the operations of the new ventures. In two of the companies, the product frame had been collaboratively created and remained relatively stable. Development activities within product, business model and working practices did not require large changes in the other arenas. In contrast, the product frame was shifting in the two other ventures, and the co-evolvement of the product problem and solutions had major implications for the business model and operations, and vice versa. The entrepreneurs in these companies would have seemingly benefited from having more structured systematic micro-level working practices to balance the variance in the offering and operations. By conceptually linking venture formation to co-evolvement resulting from the initial frame of development efforts, the study serves to strengthen the link between product development and entrepreneurship research.

Keywords: new ventures, new product development, early design phases, framing, co-evolvement of offering and operations

1. Introduction

The significance of entrepreneurship and new ventures for national economies and industries has been widely recognized (Audretsch, 2002) with early-phase and small companies shown to be key contributors to innovation and economic growth (Carree and Thurik, 2010). Effective design and development of new products in early-phase companies is no less important - and perhaps more so - than for large, mature corporations, given the historically high product and firm-level failure rates (Marion, Friar & Simpson, 2012). This makes the investigation of design and development activities in new ventures relevant and topical.

While new ventures might operate in various different contexts and differ in their approaches and methods used, a common foundational element for design and new product development is the nature of the problems to be tackled. Design problems have been described as being

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"largely undetermined" (Dorst, 2006), "ill-defined or ill-structured" (Simon, 1973), or "wicked" (Rittel & Webber, 1973). Design problems are generally considered to be highly complicated and require a process of structuring and restructuring, in which solutions emerge only gradually through a process of defining external and internal constraints. Initial ideas need to be advanced within organizations in a time-consuming process (Björklund et al 2013). How the problem is formulated and interpreted has been noted to play a significant role in the overall process of design, with the co-evolvement of problems and solutions being a defining and fundamental aspect of design and development (Dorst & Cross, 2001).

The perception of the problem influences which solutions are considered relevant (Getzels, 1975). The creation of a fruitful frame has been identified as a key activity in design, where framing refers to the creation of a standpoint from which a problem can be successfully tackled (Dorst, 2011). Framing has been proposed as a key activity in design thinking (Dorst, 2015), a concept that has gathered significant attention and discussion during the past years (Hassi & Laakso, 2011) and has been linked to emergent strategies, and new ventures development (Kirjavainen & Björklund, 2011)

Following Simon (1969), design is not necessarily tied to physical artefacts or solely the right of trained professional designers, but is more generally about human action to solve problems. In his words "Everyone designs who devises courses of action aimed at changing existing situations into preferred ones" (ibid. p.111). In situations, where early-phase companies are developing their offering, the entrepreneurs are evidently immersed in design activity regardless of their professional background. Furthermore, similarities between designers and entrepreneurs in general have been noted in regards to their approaches and thinking patterns (Dorst, 2015, p.148-149). Specifically, the effectuation process has been linked to new frame creation in design literature (Dorst, 2011).

In start-ups and early-phase companies, the development of the first products and offering takes place simultaneously with the development of the venture itself. This includes e.g. the ways of working, external networks, and the business model. Therefore, frame creation does not only apply solely to the product or offering being developed, but also to the company development efforts taking place in new ventures. In this paper, we explore the interplay between different initial setups for venture creation, new venture practices and the co-evolvement of the company and its offering.

2. Methods

Data was gathered from four new ventures that were in the midst of developing their first offering. Companies were approached at a university-organized event for start-up companies. Four companies that had yet to launch their first product or service commercially and in which the team was willing to take part in interviews were selected for the study. The majority of the entrepreneurs were Finnish men in their thirties with degrees in technology.

All four ventures were located in the capital region of Finland and had been officially founded either during the year of the interviews or during the previous year. Product and service development had similarly been initiated in the year of the interviews or the previous year. Names of the companies have been changed for publication purposes to protect their identity. *HealthTrack* was a three-person spin-off company working to create a personal health monitoring device and service, *HomeSecure* a four-person team working to create a safety device for consumers, *FindIt* a four-person team developing a software and service for

locating items, and *CoGame* a six-person team creating an online multiplayer game for consumers.

2.1 Data collection

Data was collected in 15 in-depth semi-structured interviews. From three of the companies, the entire active entrepreneur teams were interviewed. In HomeSecure, however, two of the entrepreneurs were at the time working remotely and unable to participate in the interviews. In FindIt, while all four active members of the team were interviewed, two founding entrepreneurs were excluded due to not contributing towards the venture on a weekly basis at the time of the interviews.

The in-depth interviews centered around four themes: 1) what had happened up to the interview point in the enterprise, 2) what were they doing at the moment, 3) what opportunities, strengths, risks or challenges they perceived, and 4) what should be done or should happen next. Prompting questions were utilized to elaborate and clarify responses. All interviews were conducted in Finnish, the native language of the interviewees. The interviews lasted for an average of 57 minutes, ranging from 38 to 70 minutes. They were audio-recorded and transcribed verbatim for analysis.

2.2 Data analysis

The fifteen interviews were coded for reported development actions related to the company, its offering or work practices, as well as for interview segments related to the development attitudes and approaches. This coding resulted in 885 segments; 574 related to the development actions and 311 to the attitudes and approaches. Case descriptions were formed based on the identified development actions. The development attitude and approach segments were categorized inductively based on semantic-level thematic similarity (Braun & Clarke, 2006), separately for each of the four ventures. First, recurring content was grouped together, after which thematically similar segments were grouped into the same three categories for each venture: segments related to the process, to perceptions of how work is organized, and general approach to entrepreneurship. This categorization served to inform and strengthen explicating the perceived framing of the described development actions in the new ventures. Tables 1 to 4 in results section present the segment amounts and contents in the categories of attitudes and approaches. The segments related to development actions are presented in the results text, along with the distribution of segments between development actions related to the company, its offering or work practices.

3. Results

HealthTrack

HealthTrack was an academic spin-off company with three active entrepreneurs forming the core of the team. The company had been formed around an idea of commercialization of a technology through board member connections. The three entrepreneurs had previous experience from their relative positions (sales, management, design), but not directly related to the type of product or field HealthTrack operated in. One person in the team had previous entrepreneurial experience.

Software, hardware and service aspects of the offering were all still incomplete as was the business and revenue generation models of the company. Some pilot projects had been

secured, but no large-scale business-to-business sales had been reached at the time of the interviews.

Table 1: Categories of attitudes and approaches for HealthTrack

Categories (no. of segments)	Contents of the category
Process (16)	A lack of distinctive processes and/or clear roles (3), apart from a weekly meeting to start the week and allocate tasks (1), occasional development sessions (1). Product is developed cyclically (2), main guidelines are decided on together (2). Outsiders provide comments and help for developing (4), but the main partner is a considerable bottleneck in development (3).
How work is perceived (27)	A need for clearer responsibilities and concrete taking of responsibilities (5), knowledge has been left unshared due to lack of dialogue (3), perceptions of uneven work and responsibility distribution amongst team (3), difficulties in prioritizing (1). Learning from collaborating and experimenting (3), aiming to make work enjoyable (2), good team (2), can trust others to do their share (1) and giving the freedom to do so (1), energizing successes (1), exploration (1). Hoping for more entrepreneurial approach from others (3), work has become more employment-like (1).
Approach to entrepreneurship (13)	Freedom in doing and rewarding work (2), Entrepreneurship was an easy and natural decision (1), Had been contemplating other ventures prior to joining this one (1), Overall positive experience (1). Expecting to grow into a big venture (4) and then make an exit (3), self-driven pressure to succeed (1).

The majority of the development activity segments (58%) were related to development concerning the product, while 27% concerned the company and 15% were related to ways of working. There were several outside operators involved in the development work of HealthTrack. Most importantly, HealthTrack was still quite dependent on the parent organization for advancing the development of the initial technology leading to the spin-off. In addition, the software and hardware development were partially outsourced to other operators. To complement the expertise within the team, an outside CTO (chief technical officer) had been hired to work as a consultant to the team to manage the software development that was outsourced to other countries. The team was considering recruiting an in-house software developer to the team to reduce the dependency on external operators.

The development activities had proceeded driven by the business case and model for generating revenue, but it was acknowledged that type of clients that would be secured would have a significant impact to the resulting overall offering and the company should keep their strategy open to allow for this.

As what comes to strategy, I feel that we need to have a vision on which direction we are headed. A company such as us - who are still looking for our position and justification for our existence, looking for clients - needs to have an agile approach and strategy."

Product concepts were developed largely driven by the needs to the potential clients and customers and the comments related to concept development were typically connected to clients.

"In regards to innovating, it seems that it is increasingly important to interact with clients, as it not only brings a lot of feedback and reassurance that we are heading into the right direction with our concepts, but has also resulted in us managing to take things forward"

In regards to working, the team members identified a need to develop the ways of working and processes within the company, but no tangible actions had been taken. There were conflicting and incoherent perceptions among different team members regarding responsibilities, proactivity and individual performances within the team. The team members shared similar motivations and reasons for becoming an entrepreneur, but some felt that the ways of working had gradually developed to a wrong direction from this point of view.

HomeSecure

HomeSecure had been formed utilizing personal networks to create a team to come up with and develop a high potential idea. The idea chosen for development was decided on together and originally it came from one of the founders. The four entrepreneurs had experience on their relative positions (sales, design, product development), but not of the product type. Two team members had previous entrepreneurial experience.

The team started off with the aim of creating a venture that would develop a potential idea into a feasible product that could result in profit even over a short period of time. At the time of the interviews, HomeSecure was finalizing their product for certification (by a third party) and production. They had a preliminary contract with a distributor in Finland, and were about to start establishing distribution channels abroad.

Table 2: Categories of attitudes and approaches for HomeSecure

Categories (no. of segments)	Contents of the category
Process (11)	Shared responsibility of the product, the first to see a development need attends it (4), equal contributions in input even though not in hours (2) No formal processes but everyone know what they are doing (3), descriptions of prototyping and learning by doing (2).
How work is perceived (8)	Making things and creating new builds enthusiasm (3), achieving a good flow at work (1) A need to balance work and free time (2) Uncertainty and challenges are good (2)
Approach to entrepreneurship (10)	Expectations for the product are high (2), believing in being better than competitors (1). No outsider investments, the risk is personal having invested own money (3), will try again if this venture does not succeed (1). Feeling that talents are best utilized when creating new (1), need for bold action to transform the industry and succeed in business (1), not difficult to reach to new markets once it is done in one country (1).

The team's development efforts were product oriented, as 62 % of the segments related to development actions were concerned developing the product (compared to 31 % related to developing the company and 7 % to their ways of working). The product was the driving force also in developing the company. Only some specific tasks for designing for production and the production itself were outsourced. At the time of the interviews, the product was their bottleneck: while there were only details to be refined, they were not necessarily fast to fix. While there was still a possibility of surprises regarding the manufacturing, risks were related mainly to the final execution: getting - or not getting - the product out to market, getting it certified and fulfilling the quality and safety standards.

Part of the team was focused on developing distribution channels and planning marketing and visibility to promote sales. HomeSecure described their development approach as explorative, implementing their learnings to their concept. They described learning a lot from having postponed their goal for launching twice, and stated that looking back they could now foresee the things that slowed them down. The team members reflected also whether their skillset was sufficient in terms of developing their product or if they would need more experts. All team members had clear roles although they did not use time to discuss their processes or the business concept.

"Let's say that these very short term plans are to get it ready for sales. And to open channels to Europe. And for longer term - we're talking about spring now - properly, there's supportive functions for sales in Finland, like media, marketing, all supportive functions that we have to take care of here in Finland besides our own work."

FindIt

FindIt had been formed around the idea of one of the founders, utilizing personal networks. The four entrepreneurs had some previous experience of their relative positions (sales, product development), but not of the product type or domain. Three out of four interviewed team members had previous entrepreneurial experience.

The software component was completed for the FindIt offering, except for a little tweaking to make it optimal for use. The service and business model, however, were not yet developed. No business-to-business deals had been made.

Table 3: Categories of attitudes and approaches for FindIt

Categories (no. of segments)	Contents of the category
Process (21)	Venture being a 2nd job affects development work (6) this is not optimal but a compromise because of day jobs and families (1). No one is paid for their work (1). Weekly meetings where required decisions are made (5), held in changing locations as there is no office (2), Team members' ideas are further developed in meetings, with the leader or by email - the responsibility stays with the idea generator (3). Mentoring and help is seeked from outside (2) and it could be done even more (1).
How work is perceived (51)	Team members have their own responsibilities and domains (10), but many tasks are taken only half way and there are nobody's tasks (3), everyone does everything (2). Good team (9), eager, out-of-the-box but the pace could be even faster (5), team members take time to teach a new skill to a teammate (4). Making things quick and dirty and based on intuition (3), having a hobby-mentality to work (3). Lack of time or input (3), time should be used more efficiently to actions instead of coming up with visions (3), there is only time for "small input - big effect" actions (1), working in spurts (1), deadlines would be good to have (1). No strategic disagreements (1), disagreements advance the company (2).
Approach to entrepreneurship (20)	Belief in the concept (6), some are aiming for a fast exit while some question the feasibility (2). A will to create a service that contributes to common good (2). Drifting into the team (2), valuing colleagues in entrepreneurship (5), If this does not succeed, the biggest lost investment is the time contributed (2), cannot predicted the outcome of such venture efforts (1).

The majority of the development activity segments (53%) were related to development concerning the product, while 38% concerned the company and 9% were related to ways of working. Development efforts concerning the company were driven by the business case and

potential customers. The interviewees reported needing a customer and a pilot project in order to develop their product offering into a complete service. FindIt had ongoing negotiations with multiple possible customers that all would have a different effect on what kind of product offering they would develop. The team was considering having a big business client, but also direct consumer access.

"There will always be some changes, for example if we sell some service to someone - we haven't really gotten sales yet - some specific requirements will come, like how they deal with the items and what information they want. Those things are such that have to be done ad-hoc, but there are some bigger definitions of policy on to-do list, as what needs to be done. My own schedule delays these (things) a bit."

The team was deliberately formed with people from different backgrounds, interests and experience, which they saw as their advantage. However, they also acknowledged that working only part-time on the venture and having a hobby-like approach was not ideal but more likely limiting their ability to advance both the development of their service and the business model. However, some efforts were made to develop the team's ways of working.

" Many here has said, that if one would get paid for doing this, one would do this full time, of course. [...] That it's not the case that one's own job would be more attractive, but if that's what brings food to the table, then this remains as a hobby."

CoGame

CoGame had been formed around a team that wanted to start a company together. The product idea had been developed together. The six entrepreneurs had strong backgrounds in the product type and domain. Most had previous experience of their relative product development role in the company, but only one had any degree of previous entrepreneurial experience. At the time of the interviews, the software was still incomplete, and no sales efforts had yet been made.

Table 4: Categories of attitudes and approaches for CoGame

Categories (no. of segments)	Contents of the category
Process (62)	Following an iterative lean agile approach (7), having a Results Only Work Environment (4), with one team member acting as an aggregator for decision making (3). Tasks have leaders (3), to avoid confusion one doesn't want to get too involved in others' tasks (1). Processes and roles still developing (8), examples of meetings in sauna or social gatherings (4), brainstorming (1), ad-hoc meeting culture (1) and kick-off celebration (2). Distant work common and supported (8), e-mail conversations, idea boards and comments saved online (2). Lack of hierarchy, having autonomy and trusting others (7), everyone takes responsibility for the whole and their own work, and has freedom to choose how they work (10). Everyone has same share of ownership (1).
How work is perceived (38)	Strong, creative, agile team (11), believing in the idea and product (2), trusting the team (2). Strong motivation to develop and do (4), work and free time blend, need to guard against overworking on the long run (5) Good to have different personalities and opinions (2), decisions get made even if disagreements occur (1). Some needs to focus more mentioned (2), occasionally having to hurry others (1). Surprises are frequent but not a problem (1). Talking to others outside the company about the venture boosts enthusiasm and

	confidence (5), being open and getting feedback instead of being secretive (2).
Approach to entrepreneurship (34)	Believing in possibility for big profits and growth (2), but avoiding too strong pressure to succeed (1), valuable learning in any case (1). Will to create a better place to work (4), having a greater influence in one's own work and work schedule (6), doing what you like (3). Comfortable with uncertainty, curiosity (4), easy to make the decision to become an entrepreneur (5), wanted to eliminate the negative aspects of previous workplace (3). On the other hand, had to gather courage to resign (1), financial risk made the decision to become an entrepreneur hard (1), uncertainty and risks create stress (2), doing pioneering work in the field is a risk (1), every time someone says no, you have to be stronger in you belief in yourself (1).

CoGame reported clear goals for their product as well as for their business model. Their development actions mostly concerned the product (52%) but they also paid much more attention to developing their ways of working than the other three companies (28% vs. other companies 7%-15%). The development proceeded driven by the product, as the team had a clear and locked idea for how revenue would be generated. The development process was structured around the design of different components and parts of the product. The actions aimed for the release of a first beta version of the product to be utilized for gathering user feedback for further development. As resembled by the aim of creating a beta version as a base for improvement, the CoGame team had an explicitly iterative approach to development. The comments largely regarded tangible, concrete actions related to planning and execution, such as coding.

The segments related to the development of the company (20%) were for the main part related to funding and actions related to founding a company, while the segments describing developing the ways of working described how the team was set to create a good venture to work in. They paid attention to ways of working, work culture, communications and equality to mention some topics. The team named processes and principles that they wanted to utilize as the result from frustration in more traditional ways of working in their domain. Before creating the product idea or starting to develop the product, the team used time to plan their company and its ways of working.

"First we discussed, first meeting of the company - or we didn't even have a company yet - it was specifically about the ideology of this company, not even the product. We started from how we operate and then we started thinking of the product we could have, what would we the do when we have this awesome company. So in that sense, acknowledging that collaboration is important it helps the collaboration."

4. Discussion and conclusions

New ventures typically face the challenging task of having to develop their first offering simultaneously with their first operations. Failure rates are high in these precarious early stages (Wiklund, Baker & Shepherd, 2010). Previous research has addressed the co-evolvement of problems and solutions in design (Dorst & Cross, 2001, Wiltschnig, Christensen & Ball, 2013) and the significance of the initial framing of the problem (Björklund, 2013). This study extends the investigation of co-evolvement from product design to venture design, exploring how the entrepreneur teams of four newly created ventures approached developing their offering and operations, and how the framing of these influenced each other. The findings indicate that in the context of new ventures, the problem-solution co-evolvement is not isolated to the product being designed. Rather, the co-evolution loop

extends to the design of the venture and operating principles, the ways of working, and approaches to development. These, in turn, are likely to have an effect on the product design process.

In two of the companies, the main context and frame for the product was rather set from early on. Both companies were creating a consumer product, and mainly needed to execute the offering in a feasible and viable manner. The basic idea of the product or its consumer had not changed. These two companies differed in how systematically they organized and developed their ways of working, but were rather satisfied in their approach: HomeSecure reported little systematic processes or operations, but perceived no need to rethink or rework the basic approach of the company, business model, or team roles. Similarly, the basic operational approach of CoGame did not change, but this new venture had an explicit focus on developing their ways of working and the entrepreneurs could easily name different principles and approaches they were utilizing.

In contrast, the other two new ventures had not set clear boundaries or a stable frame for their offering, but were approaching their development rather opportunistically, aiming to create synergy benefits with potential collaborators. Both FindIt and HealthTrack somewhat oscillated between aiming for a consumer product and a business-to-business service. Developing the service offering and developing the business model went hand in hand in FindIt, with decisions on either one having profound implications for the other. This seemed to exacerbate the adverse effect of having most of the entrepreneurial team working only in addition to other employment or studies. On the other hand, while all entrepreneurs in HealthTrack worked full-time for their venture, maintaining multiple options to pursue with different potential collaborators required waiting for client and partner responses. Changing ideas of the business model had strong implications for the requirements of the offering and operations. Neither company reported much operational structure or processes, and both had some concerns over the efficiency and effectiveness of current operations.

It has been noted that there are substantial differences in how emerging ventures in different industries approach new product development (Marion, Dunlap, & Friar, 2012). However, with a lack of established best practices for new product development in new ventures, the differences across industries and domains can often be smaller than differences between companies within the same domain. Investigating the differences between design disciplines, Eckert et al. (2004) found that although the products designed are different, the processes of their creation are similar in many ways. In the studied companies, it seemed that with a stable frame for the product problem, both paying explicit attention to intentional development processes and approaches, as well as not having a clear defined process worked well. For companies with shifting frames for the product offering, there seemed to be a greater need and benefit to be had from clearer responsibilities, processes, and approaches. Thus the findings suggest that the clearer the initial framing of the product problem and the idea pursued, the less need there is to mitigate instability in the ways of working. Those new ventures that have a greater degree of interdependency with other stakeholders, resulting in more unstable frames, might be well off in placing more explicit attention to their processes and ways of working.

As the current study was based on only four ventures, one must be cautious towards generalizing any of the findings. In this study, the degree of familiarity in the product domain co-occurred with the stableness of the product frame. Future research should investigate a larger number of new ventures to assess the relationship between previous experience and product and venture framing. On the other hand, do companies aiming for a business-to-

business offering inherently require more co-evolvement than consumer-marketed products? The current research design did not allow for studying the effects of frame stability and the degree of co-evolvement on product and venture performance. Longitudinal studies assessing the dynamics and consequences of co-evolvement between the offering and operations of new ventures are clearly needed for evidence-based practice recommendations. Nevertheless, the current results suggest that new ventures would be well served by acknowledging the relation between frame stability and organization of their operations.

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