Eight Paths of Innovations in a Lean Startup Manner: A Case Study

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Abstract. Software companies face high pressure to develop innovative products and services at increasing speed. However, a traditional new product development (NPD) process is not always a sufficient means for doing this. We report experiences from an explorative multiple case study covering eight cases from four companies of different sizes and business characteristics. Each case aimed to streamline the development of a product or service innovation in a Lean startup manner as an alternative to the traditional NPD. We present eight life-cycle paths that together exemplify the use of the five organizational alternatives, such as internal startup and company subsidiary. Driving force to choose the organizational alternative is novel business endeavor rather than being depended on the company. Using even multiple organizational alternatives is possible during the innovation life-cycle as long as the speed and independence for the innovation is achieved.

Keywords: Internal startup · Lean startup · Subsidiary · Institutional entrepreneurship · Intrapreneurship · Case study · Industrial experience

1 Introduction

Software companies face high pressure to develop innovative products and services at increasing speed. The traditional *new product development (NPD)* process, such as presented by Cooper [1], seeks to enable the creation of new innovative products. However, the NPD process is fuzzy and difficult from the beginning [2]. In particular, NPD is a complex higher-order capability that involves multiple organizational functions, capabilities, and competencies [3]. However, forming a traditional NPD program may not be always a sufficient

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to take care of the full life-cycle of developing and commercializing a new software product — creating new innovations may require more flexibility in terms of experimentation and learning from failure than is characteristic of the traditional NPD process [4]. For example, fast-paced, revolutionary, or disruptive innovations could be done differently, as exemplified by startups.

Recently, new means have emerged to reshape the work done in the traditional NPD programs. For example, *Customer development* [5] and *Lean startup* [4] are methods that try to streamline the innovation development process. However, in order to be able to gain the benefits of such methods, software companies need to establish ways in which to carry out the Lean startup process. Different types of company ventures — seeking to efficiently capture and monetize new innovations outside established business lines — can be used for this purpose [6]: For instance, the software company can incubate the idea in a separate strategic unit and, later, form an internal startup or even a separate subsidiary to effectively search for new business [7].

However, the experiences on different types of company ventures are still scarce. The research problem addressed in this paper is the structures and life-cycles of means of going beyond the traditional NPD. To shed light on the topic from the industrial perspective, we carried out an explorative case study about NPD programs that decided adopt also the other than traditional NPD structures over their life-cycles. Based on the eight cases, we describe and synthesize (1) the structures that were established, (2) the points in the life-cycles when decisions were made about the structures, and (3) the justifications for the structures.

The paper is organized as follows. Section 2 describes the life-cycle of an innovation program as background. Section 3 outlines the research method. Section 4 provides the case accounts. Section 5 analyses the findings. Section 6 provides discussion in the light of related work. Section 7 concludes.

2 Background: The Life-Cycle of an Innovation

For the scope of an innovation project, the four stages can be mapped and summarized as follows (Fig. 1):

Idea stage: The innovation program should focus on gaining a detailed understanding of the problem or need that it wants to tackle. At the end of this stage, the startup should have a holistic understanding of the problem domain, and a minimal viable product (MVP) or concept to initiate concept validation with real customers and users. Ideas are handled as hypotheses that need to be validated using the MVP to collect customer feedback. The primary goal is learning.

Problem/solution fit: In this stage, the innovation program should focus on further developing the concept as an optimal solution for the first lead users and customers. The MVP offers a path of very rapid iteration of customer requirements followed by testing and validation. This stage is called 'going from 0 to 1' by Peter Thiel [9]. Experimenting with (innovative ways of) customer acquisition is the second key activity of this stage.

Fig. 1. Four stages of the startup life-cycle [8].

Product/market fit: Once the optimal solution for the lead users is ready and the innovation program has been able to acquire new customers and users, its focus should move to customer retention and further generation of the business model. In this stage, the innovation program should particularly focus on retention, the business model, and a pricing strategy.

Scaling: When the innovation program has found a scalable business model, the focus should shift to actual scaling. In this stage, the innovation program should focus on accelerating the business. The acceleration typically requires large investments in marketing and business development. This stage is called 'going from 1 to n' by Thiel [9].

The four stages form a value chain: No idea creates value until you embody it in a product or service; no product or service captures value until you embody it in a business model and pricing strategy; and no business model becomes sustainable until you figure out distribution.

The lengths of these phases vary largely, and the stages can partially overlap and are not clear-cut. It is also not possible to set a deadline for product/market fit. By moving from one stage to another, the risks are reduced because assumptions are validated. This is of paramount importance, because markets are simply unpredictable for innovative products and services. According to our experience from the field, the main focus of each innovation program typically follows these stages over the startup life-cycle. Furthermore, they are similar to other life-cycle models presented in [4,10,11]. If the project does not succeed, it will face its end and discontinue: That can take place during any of these phases.

3 Research Method

The research follows the explorative case study methodology, meaning a study about a contemporary phenomena in industry [12]. As the research topic is

emergent, the selection of cases was done opportunistically and purposefully on the basis of innovation programs that the authors were familiar with in order to explore different kinds of cases. The main criterion for selecting the cases was that they did not follow a traditional NPD program but started to apply some other kind of organizational alternative during the life-cycle. However, the idea stage started within an existing company rather than as an independent start-up in each case. The study was carried out to investigate the following cases: F-Secure's F-SOS, DF-Data, Freedome, Key, Lokki and Sense; Qentinel's Quality Intelligence (QI); Aptual's Johku; and OP Financial Group's Pivo. These are all Finnish companies developing software-intensive solutions.

The collected data was qualitative and relied mostly on interviews. The Johku and QI cases were each based on a one-hour interview with the CEO of the company. During the interview, the interviewee was asked to describe the life-cycle of the case. Additional clarification questions were asked during the interviews. Two researchers conducted the interviews and took notes. Sense, Freedome, KEY and Lokki are based on the interview with the responsible vice president at F-Secure as well as interviews with two representatives from each of these cases. Pivo is based on an interview with the head of New Business Development who has been responsible for Pivo from the start. All these interviews were carried out by researchers who did not work in the case company. F-SOS is based on a previous case study by one of the authors [13,14] complemented with re-analysis and an additional informal interview with a key person in F-SOS. Moreover, two of the authors have been a part of or had a supporting role in the five cases (Lokki, Key, Freedome, Sense, and DF-Data). These authors' participatory role in these programs were used to enrich the data. Furthermore, the authors have gained additional informal knowledge about the cases through personal collaboration.

Based on the acquired data, case accounts to summarize each case were constructed. The accounts were read for corrections by at least one representative of each case: Typically, the interviewee or alternatively someone equally familiar with the case read the account.

We analyzed each of the cases along the life-cycle as introduced in the previous section as follows. For each case, we identified the organizational alternatives that the case applied. Furthermore, we analyzed the decisions and justifications to understand the rationale for each decision. The analysis was carried out in a bottom-up manner, so that different organizational alternatives emerged and were formulated as we analyzed the cases. As different organizational alternatives emerged over the life-cycle, we were able to illustrate and synthesize the paths that the cases had taken in a two-dimensional space. Finally, we cross-analyzed and synthesized the rationales, decision points along the paths and benefits over different cases.

4 Case Descriptions

F-Secure F-SOS. F-Secure Corporation is an Internet and cyber security company. F-Secure founded a company subsidiary called F-SOS to establish a new

business concept and model. F-SOS used F-Secure's existing technology without developing the core technology further and even without direct access to the technology. Rather, the key idea was to build new service-oriented business and service concept based on the existing technology. The first release was not especially successful, but a year later the second solution's release showed major success. After being in operation for one year, the F-SOS service and solution were merged back into the F-Secure mother company and the solution became strategically important, and eventually the most important of F-Secure's business areas for several years. The key idea of the solution was to build a Software as a Service (SaaS) business model around F-Secure's existing technology. Around the same time, F-Secure reshaped its business by discontinuing other product offerings. Later, F-SOS operated inside F-Secure as its own unit and the cross-functional F-SOS team tried to establish other similar SaaS-type solutions that turned out to be moderate successes, at best.

F-Secure DF-Data. F-Secure has a subsidiary called DF-Data for testing and validating any new kinds of product or business concepts. Although products and services are developed and marketed under this incubating subsidiary's brand, these products are using the subsidiary as a test bed without generating any revenue. Overall, DF-Data operates as an incubator, for example to explore and test social media marketing practices; to test beta products; and to test concept products and technologies. All this is accomplished without the risk of sacrificing the mother companys brand name. The company has been used as the publisher of beta versions for several products, such as FS Cloud and FS Protection. Product concepts include Secure Selfie Camera, Funny Hat Stickers, and Snapwallet: Photo Safe, that are available as apps for Android smartphones.

F-Secure Lokki. Lokki was the first internal startup that F-Secure established within the business organization. The company strategy renewal in 2012 identified Family Protection to be a prospective new security product and business area. A new family location-sharing service concept was developed by a small concept design team. The company leadership team decided to productize the concept and bring it to the market with a rapid schedule, and the guidance from the company CEO to the concept creation team leader was to "work like a startup!". The Lokki service reached some tens of thousands of users through moderate marketing efforts but it was eventually ramped down as it did not fit well enough within the company's strategy framework. The learnings of the internal startup way of working, together with some of the software features are being deployed and further developed as part of current F-Secure consumer security and privacy products and services. The Lokki service itself was open sourced and Lokki is currently managed by University of Helsinki.

F-Secure Freedome. The second F-Secure internal startup, called Freedome, was founded within the company strategy unit. The startup's product leveraged

some existing technologies, while some parts were developed from scratch. After the commercial launch of the MVP, the internal startup was seen as a great success in terms of the defined objectives such as the number of downloads and new users, as well as positive reviews. The internal startup was later integrated into the F-Secure consumer business organization. More recently, the product has been adapted for business customers and has been subject to other kinds of market and channel extensions, e.g. from B2C to B2B. However, the scaling of the business from consumers to B2B customers has not been completely straightforward due to different customer needs and expectations.

F-Secure KEY. The idea of the third internal startup, KEY, was incubated as a technology proof-of-concept within the company strategy unit. After a strategic decision, the internal startup was transfered to the consumer security business organization. The initial hypothesis for the product was to compete in the direct consumer business (B2C), but after this was found to be an uphill battle against the dominant incumbent players, the more lucrative B2B2C channel was chosen as the primary business opportunity. At the moment, various business models are being experimented with, ranging from a standalone product to using the product as a tactical add-on in a larger security service bundle.

F-Secure SENSE. By the strategic decision of the company management, the fourth internal startup, called Sense, was founded at F-Secure. A significant investment is being made to develop a security software and hardware solution to protect new kinds of IoT (*Internet of Things*) devices in smart homes. The hardware product developed in-house is the first of its kind for F-Secure. However, an essential element of the total product has been developed using existing F-Secure software security technology. The product is currently available for preordering and the internal startup team is currently finalising the MVP to start commercial deliveries.

Qentinel Quality Intelligence (QI). Qentinel is a quality assurance company and most of its services are based on knowledge-intensive consulting. Around 10 years ago, Qentinel started to plan to shift its business toward a more sophisticated understanding of quality through the concept of value, resulting in a traditional NPD program (2007–2008) that eventually became known as QI. QI was a drastic change for Qentinel because the objective was to develop the company's own products and services with protected IPR that was different from Qentinel's existing consultancy-based business model. However, the project was not a business success at first, and the existing business of Qentinel continued to be successful, which hindered the concept development of the new business. In 2008 the strategy work of Qentinel resulted in establishing runtime quality monitoring in information systems as a new area as one of its three strategic areas. A company specialized in the technical monitoring of IT services was acquired in 2011. This technology-based service became a key part of the QI offering, and at

the same time was expected to finance the development of the other parts of QI. However, the QI project was still relatively time-consuming and used resources from the other profitable consultancy-based business with constant cash flow. The organizational culture hindered rather than boosted the development of QI. To clarify the role of QI, Qentinel ended up turning QI into an internal startup staffed with dedicated people. This somewhat clarified QI's identity. Less than a year later, Qentinel decided to restructure its organization. As part of this, the QI internal startup was moved to a separate corporate subsidiary. Although the move caused some uncertainties at first, things started to go better. QI obtained independence without the burden of the old organization and the QI employees realized that they had the sole responsibility for acquiring new prospects and customers. At the moment, QI is growing but its business is not yet making profit because of the heavy development investments.

Aptual Johku. Aptual is a small company that focuses on creating better marketing communications and exploring new frontiers for its customers. The company has historically carried out customer-specific projects that it has further developed and commercialized. This has resulted in a set of small solutions that have each had a good problem/solution fit for a single customer. However, a poor product/market fit has required a significant amount of customer-specific work with the next customers for scaling. Therefore, Aptual decided to narrow down its number of solutions to three. One of these three was Johku, which is today a software-based solution for travel service providers, such as cottage renters. The intial version of Johku was developed as a typical Aptual NPD project. However, Aptual carried out different kinds of analysis about the market, resulting in a decision that the value proposition of Johku needed reshaping and sharpening as a part of a significant development project. As a result, Aptual decided to establish an internal startup for Johku that was financed by the two other revenue-generating solutions. The essence of the internal startup was to make an explicit internal investment and clarify the role of Johku as an upfront investment in development rather than trying to productize existing projects. The internal startup developed an MVP and started to search for product/market fit. A startup that takes care of Johku was spun off very recently. While the startup considers the existing MVP to be ready for scaling, validation from larger markets is lacking.

OP Pivo. The OP Financial Group is the largest of the major players that dominate the Finnish banking market. Three to four years ago, the company recognized the importance of mobile payments but the topic did not find a clear owner in the organization. A team familiar with mobile payments was established and they started working on the problem. A new research and development unit was set up in the city of Oulu, far from the headquarters, because there was a lot of experience available due to the citys past life as one of Nokia's major sites in Finland. Most people were new hires, but the owner of the problem was an OP Financial Group veteran, bringing in a wealth of banking experience.

The team started using the Lean startup paradigm relatively strictly, and was a an internal startup inside the OP Financial Group. The Lean startup methodology was found to be successful, but it also became clear that if one follows the model strictly, it is a very disciplined model and one needs to be prepared for it. Initially the team created a set of assumptions, which looking back were all wrong, and they were changed later in the project. However, fast learning is key in the setup – being initially wrong does not matter as the Lean startup methodology tests the assumptions early and then brings in end-user feedback to re-direct the project. Currently, Pivo is its own company with its own management, being separated from the OP Financial Group so that the app can be used by customers from any banks.

5 Analysis

Decisions need to be taken at the company level regarding the types of innovation programs to be used. In particular, the decision-makers need to understand that a traditional NPD program is only one option, while other alternatives exist. In this section, we analyze the organizational alternatives to the traditional NPD program that were identified from the cases. As another orthogonal concern, we use the life-cycle phases of an innovation program from the stage of idea incubation to that of business scaling, and map the path through the phases and structures of the cases. The key decisions and rationales are also analyzed along these paths. Finally, we highlight the key benefits of applying other structures than the traditional NPD program that have emerged from the cases.

5.1 Organizational Alternatives

The following structures were observed in the cases. The difference between the alternatives is that the relative independence from the parent company increases as we progress through the list. The cases that apply each structure is summarized in Table 1.

– **NPD (new product development) project.** This is broadly any kind of traditional innovation or development project or programs for products or services within a company relying on established structures. It typically includes

Table 1. The structures and supporting cases.

Structure	Case
NPD	*(All)*
Internal startup	Freedome, Key, Lokki, Sense, Johku, Pivo
Company subsidiary	QI, F-SOS, Johku, Pivo
Company startup	Johku
Incubating subsidiary	DF-Data

the company's strategic work and follows the company's established practices and structures. We differentiate an NPD because all cases were selected so that the start was in an NPD.
- **Internal startup.** Internal startups take place within a company but work much more independently than an NPD, even entirely independently. As a results, internal startups have different levels of freedom from the companys standard policies.
- **Company subsidiary.** A company can found a child company to take care of an innovation program. A subsidiary is fully owned by the originating company. Such a subsidiary has more freedom, responsibilities and financial incentives than an internal startup.
- **Company startup.** Innovation programs can also take place in more independent startups of which the originating company has no full control. However, often the originating company or its owners have influence over or ownership of the company startup, and a company startup still has ties to the originating company: For example, employees can have working contracts in both companies or work through subcontracting arrangements.
- **Incubating subsidiary.** A variant of the company subsidiary is an incubatory subsidiary. The subsidiary is not founded for one particular innovation program, but the same subsidiary exists continuously and a series of innovation projects are carried out within it.

5.2 Rationales and Success Factors

There were varying rationales for establishing an alternative structure to the NPD program, but one common characteristic was that something novel or a significant change to the existing business was being planned. F-SOS developed a new SaaS-based business model. Sense had some new features such as including hardware and targeting new kinds of devices, although its main functionality was basically the same as other security products. DF-Data focused on different kinds of new concepts. Sense, Freedome, Key and Lokki each targeted new markets, although they were strategically in the same security business area. In general, these three products were considered internally as completely new offerings rather than features of existing products, even though some existing technology was utilized. The Aptual's internal startup Johku was a means to make an investment decision and to give Johku the independence, freedom and resources to develop the new solution as well as a change in business model. Similarly, gradually moving QI through the phases of traditional NPD program, internal startup, and subsidiary seems to have been a successful business model transformation and service development path. Nevertheless, founding a subsidiary does not necessarily explain the recent success of QI fully. During the transformation, the QI offering has also matured, the market seems to be more ready, and the technologies used within the major digitalization trend have shaped the business environment.

When establishing any of the alternatives to a traditional NPD program, a certain level of independence was looked for, and the independence seems to have been a prerequisite and a success factor in all cases. The structural alternatives

are not better or worse per se, but rather a means to an end. Independence needs to be realized by a clear mandate to be able to work toward the objectives. Independence also minimizes the disturbances of the existing organizational culture, resulting in less unnecessary interaction.

One means of establishing an organizational structure as well as a factor positively affecting success seems to be the use of external people such as new recruits in these organizational alternatives. The external people are not tied to the old organizational culture and business models. For example, F-SOS had many new recruits in the team and likewise Pivo recruited most of the team from outside of OP group.

There is a risk, especially in establishing an internal startup, that it may remain too close to the existing business areas whereas a corporate subsidiary, being relatively more independent, can be a means for assuring independence. Business lines do not seem to natively support novel or disruptive ideas that can even be destructive to their current business or ideas beyond their current goals. This is exemplified by the QI case, where the organization did not initially realize the value of QI. Established business organizations also tend to be primarily focused on the short term or quarterly business priorities, not allowing a new business or product entry to be developed and iterated sufficiently, and a revenue stream may be expected too soon, when the new product is still going through the Problem/Solution Fit phase, as with Lokki. Business lines seem to focus on evolutionary ideas and concepts rather than revolutionary ones. As the CEO of Qentinel stated, "The more successful your business is, the more likely your transformation is to fail". If the business is successful, there is less pressure to change or invent something new, and the organization may not necessarily want a change. However, there is then a risk that a competitor can establish a new business and take over the market. Thus, it seems that a strategic or research unit is a good choice for internal startups when business lines are inhibiting rather than catalyzing structures. The more radical or disruptive the innovation is, the better a corporate subsidiary or other means of being made independent can be, as indicated by F-SOS and QI. Even in more general terms, independence seems to be a good indication for good operations or freedom from existing hindering or controlling practices.

5.3 The Different Paths

Combining the organizational alternatives described above and the life-cycle phases results in a two-dimensional space through which each innovation program takes its path. This space and the paths of each program within the space are illustrated in Fig. 2. The horizontal axis shows the different phases as well as the progress but does not indicate the absolute length of the phases, e.g. in terms of months, but is roughly propositional in relation to the phase length, such as whether transformation was carried out at the beginning or end of the phase. For example, the life-cycle of Lokki and QI are presented in this same figure but the life-cycles were roughly one and eight years, respectively. The vertical axis lists the different organizational alternatives as described above. The vertical position of different paths within each box has no meaning. Due to the case

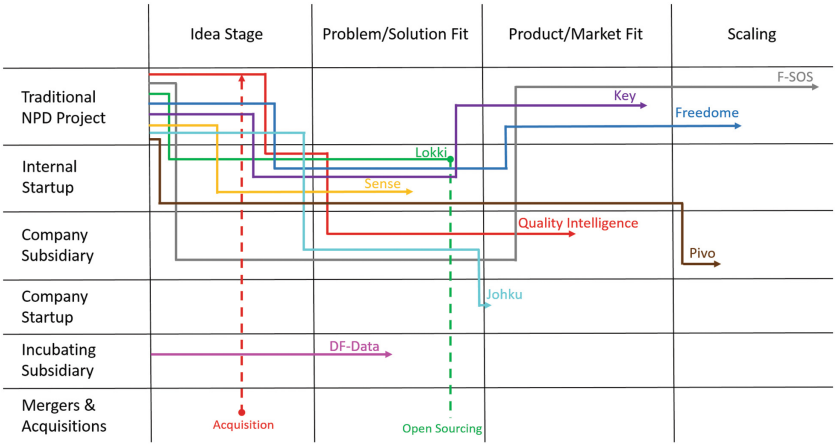

Fig. 2. The paths that different cases have taken through organizational alternatives over the life-cycle of the cases.

selection, all paths start as a traditional NPD program. Some of the cases apply several structures. Direct vertical lines over structures is used for illustrative purposes for changes while horizontal lines indicate that a structure is applied; for example, F-SOS that became a subsidiary from NPD without being internal startup in between. The end of a line as an arrow indicates that particular cases are still in progress, while Lokki has been discontinued at F-Secure and the code has been open sourced.

In the following, we elaborate key points of the phases and decision points along the paths.

Origins of the idea. As all cases represent an alternative means for structuring an NPD, the ideation phase was typically carried out as part of the strategic work within the company in the form of an NPD program or a pre-phase for such a program. After the idea had reached a certain degree of maturity, an alternative structure to the NPD program was established. An incubating subsidiary was also used in DF-data, but even then, the ideas followed the company's strategic initiatives due to its close links to the main company. QI relied partially on M&A for part of the technology, but even then the strategic work was the basis for the idea that the M&A decision supported.

When to make the change. It is feasible to even incubate the idea for a long time as a traditional NPD program but the idea phase seems to be a good point at which to make a change. That is, all of the cases resulted in an organizational alternative other than a traditional NPD program during the idea phase through the establishment of an internal startup or a subsidiary. However, the length of ideation and the maturity of the idea differed largely. For example, especially QI

but also Freedome and Key were ideated and were a part of strategic process for a long time as a traditional NPD program. On the one hand, the QI case indicates that delaying the decision does hinder the progress. On the other hand, it is unclear whether too immature a concept can survive on its own too early. In contrast, Lokki was established as an internal startup relatively quickly as the result of a strategic initiative.

Multiple changes. Although making several changes is not necessarily the optimal strategy, multiple changes can be a less risky method and suitable for certain situations. QI started as an NPD followed by an internal startup and finally ending up becoming a subsidiary; and Johku started similarly as an NPD followed by an internal startup but was finally spun off to an independent startup. The development of QI might have been slowed down as an NPD and internal startup, but the slow progress allowed the idea to mature and was not in the end that delaying to the progress. For Johku, the multiple changes were justified by investment decisions and the changes do not seem to have had too much of an effect. Moreover, unlike in the other cases, the leaders of QI and Johku were also the CEOs of their parent companies, and therefore, had more power to make decisions and changes.

The end of the life-cycle. The structural alternatives can be temporary. An internal startup in particular typically has a limited lifetime. At the end of the life-cycle, the developed innovation can be brought back into the main company or a spinoff company can be established, for example. However, only some of the studied cases are at the end of their life-cycle: F-SOS was turned into a scalable business within the existing business line, but F-SOS has later been able to repeat the success only moderately; Lokki was discontinued in F-Secure during the internal startup stage on the basis of a strategic decision and open sourced; DF-Data products have not been discontinued but not all of them are being developed actively and some are being used for other purposes such as testing and learning new marketing strategies; and Key and Freedome have been brought back to the business lines and are searching for a scalable business model within them.

It seems that after the end of the life-cycle of the alternative structures, being too closely related to business lines can be problematic, especially for novel innovations. A reason for this could be that, especially if the resulting innovation is not mature enough, it does not fit into the daily routines and objectives of the business line. In fact, one important consideration during the end of the life-cycle is whether the appropriate home for the developed concepts lies in the existing business lines, or is it worth establishing a new business line for the new innovation or a subsidiary to take care of the business, as is the case with QI and Johku.

The length of the life-cycle. The length of the life-cycle and phases can vary largely. Too fast progress in terms of finding solutions before fully understanding

the problem or aiming at scaling before appropriate market fit that is, rushing to the next life-cycle phase too early seems in general to not be recommended, as for any innovation program. For example, a too early search for a scalable model and merging into a business line might have taken place in Freedome before a proper market fit was found, whereas the long idea stage of QI matured and helped to clarify its value proposition. In particular, at the end of the life-cycle of an organizational alternative such as an internal startup, it seems that the solution should have completed the objectives of the phases properly in addition to finding a relevant home.

In general, it seems that internal startups should continue until at least the product/market fit stage has been reached properly, while corporate subsidiaries and other more independent entities should continue at least until the scaling stage.

5.4 Benefits

Effects to the innovation program. The experience from the cases show that, one the one hand, the alternatives to NPD, such as internal startups and subsidiaries, can be more undisciplined as well as radical and quicker to test something new. The independence of an innovation program means minimizing the disturbances from, e.g., other employees, management, and even customers. The existence of fewer such interfaces mean faster speed that then enables fast changes and faster learning. On the other hand, compared to startups that do not have any back-up from the originating company, they can be financially in a better position to not rush, for example starting scaling too early, which adds interfaces and naturally slows the team down.

Effects to the existing business. A successful innovation can even be a boost to the existing business. In the case of QI, the main business ended up with a new business area to complement their current business. F-SOS drastically changed the business models of F-Secure toward the SaaS model, even in other business lines. Although not everything results in flourishing new business, the cases show several other benefits and usages. Lokki continues its life as open source. Funny Hat Stickers from DF-Data was first developed as a funny add-on to cloud services, but once the F-Secure cloud services had been discontinued, there was no strategic use for Funny Hats. However, the Funny Hat Stickers app had users and worked on its own. Thus, Funny Hat Stickers was changed to be a testbed for trying new things such as learning and testing the usage of social media channels for various purposes.

6 Discussion

In recent years, new methods and models have been introduced to tackle the challenge of bringing new products to market in a timely manner. While digital

products can be distributed globally by even the smallest startups, competition to find scalable business models fast enough is getting tighter. Customer development [5] and lean startup [4] seek to answer to this need where methods like the NPD stage gate model [1] or the new concept model for Fuzzy Front End (FFE) [15] fall short. Emphasizing interaction and testing hypotheses with real customers to gain validation before investing heavily in development, Lean startup takes advantage of global digital markets as a test bench for new product innovations. However, these experimental methods also need specific attention to avoid biases that result in false validation [16]. Moreover, utilizing such methods in established companies often requires more freedom for the executing team in order for them to be able to react quickly to the insights gained. Company ventures can enable the development of new business with more freedom while fostering entrepreneurial culture [17] and also enable the recruitment of talent to complement the current skillset inside the company [6].

This paper introduced four alternative organizational structures for traditional NPD: Internal startup, company subsidiary, company startup, and incubating subsidiary. While none of the study's alternatives are novel, the findings from the selection and usage of each alternative offer practical insights from the Finnish companies. In fact, one of the alternatives, internal startup, was used in six out of eight of the study's cases during the life-cycle of new business endeavors. Indeed, there is a growing interest in initiating internal startups, or at least adopting the principles of the Lean startup method in software companies. To our knowledge, however, internal startups have not been widely studied (with that term) in the software business research field. On the other hand, the term and idea of the intrapreneur have been used in large software companies for over thirty years [18]. Edison et al. [19] have recently studied internal startups in one of the companies that is also part of our study. Their study focused on the characteristics and implementations of internal startups, whereas our findings emphasize that the internal startup seems to be a suitable but only a temporary organizational structure in the early and middle phases of NPD.

Previous work exists on the factors that determine whether new business opportunities are exploited by starting a new venture for an employer (i.e., nascent intrapreneurship) or independently (i.e., nascent entrepreneurship) [20]. In our study, the former refers to internal startups and the latter to company spinoffs, such as subsidiaries and startups. Individual, organizational, and product characteristics all affect the decision to exploit an opportunity via intrapreneurship or entrepreneurship [20]. Our findings highlight that the decision does not have to be one or the other. A software company can also begin a business endeavor with intrapreneurship and move to entrepreneurship later. Actually, one of the cases shows that the order can also be the other way around. This implies that decision-makers need to continuously evaluate, not just at the beginning, the alternatives for organizational structures over the life-cycle of NPD.

In the four cases of our study, spinoffs (either company subsidiaries or startups) were created. Interestingly, all of them have been successful business-wise so far. Based on our findings, however, we cannot draw the conclusion that

company subsidiaries or startups are always a better choice business-wise than, for instance, internal startups. However, Rice et al. [6] and Mazur [21] conclude that depending on business goals and available funding, spinning out can bring advantages in terms of more flexible funding possibilities as well as increased motivation through increased freedom, responsibility, and personal risk. In addition, it can be beneficial to recruit experienced venture capitalists and other experts to advise the new spinoff [6]. Chammanur and Yan also claim that spinoffs are associated with an increase in long-term operating performance [22]. According to them, however, an incumbent management team is required to give up control to a rival management team in the case of a spinoff, which may motivate the incumbent management team to work harder to avoid loss of control. Interestingly, however, companies are announcing increasing numbers of new but smaller and smaller spinoffs [23]. Indeed, a small spinoff will not take a lot of power from the incumbent management team. Our study's findings also showed that the parent company's CEO can become the leader of the new spinoff.

Our findings are exploratory and preliminary representing cases only in one country. Further studies on the same topic in different countries are recommended. Our findings also raise further research topics. First, what are the business performance differences between internal startups and company spinoffs over the NPD life-cycle? Secondly, if internal startups (or Lean startups inside corporations) are becoming increasingly popular, how can we better integrate the strengths of spinoffs, such as financial freedom and incentive mechanisms, into those internal startups?

7 Conclusions

We presented an explorative case study of innovation programs applying different organizational alternatives than traditional new product development (NPD). We outlined the life-cycle of such innovation programs along their path through the life-cycles of ideation, problem-solution, product/market fit and scaling the business. Along this path, we showed how an innovation program approach can apply different structures: internal startup, component subsidiary, company startup, or incubating subsidiary. Finally, we elaborated on the nature of different decision points, changes, and prevailing mechanisms.

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