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Business Modeling for Internal Corporate Ventures – The MagiTact Case Study

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Abstract: Developing customer-focused business models for innovations that originate from discovery-driven research in companies' research and development (R&D) facilities is a challenging task. The technology-push oriented approach makes it necessary to carefully consider market perspectives in business model design to reach a holistic view of the technology's potential. Based on a qualitative research approach, this paper presents the case study of MagiTact – a radical research-driven technology enabling around-device-interaction with mobile phones. The study describes MagiTact's path from idea generation through the market-oriented development of different use cases and business models for its commercialization as a corporate venture. Building on the insights from this case study, we investigate principles associated with business model development in corporate venturing processes and propose a set of trade-offs for corporate venture teams to consider in the process of internally advancing their venture towards commercialization.

Keywords: Business modeling; corporate venturing; mobile commerce; touchless mobile interaction, around-device interaction

1 Introduction

Defining business models to exploit the benefits of highly innovative products is a challenging task. This challenge is specifically prevalent for discovery-driven research results, which are developed by research and development (R&D) facilities, and commercialized in a corporate venture program. Oftentimes such technology-push oriented innovations initially lack a path for market commercialization and require careful evaluation of alternative business model options (Chesbrough & Rosenbloom 2002).

As the internal user driven innovation unit at the Telekom Innovation Laboratories, the R&D facility of Deutsche Telekom, we have supported several spin-off projects in the domain of information and communication technology (ICT). Applying methodology such as ideation sessions, user tests and user-oriented business model development workshops we help new venture leads to identify the striking value propositions underlying their products and guide them in exploring alternative business options.

This study builds on lessons learned from a two-year case study of a project named MagiTact - a highly innovative technology that enables gestural interaction with mobile devices through magnets. Allowing mobile phones to read out magnetic influences on the embedded compass sensors, the technology presents a novel interaction mechanism. MagiTact has received much recognition in technical communities, and was noted as a promising candidate for future mobile device interaction beyond touchscreen (Ketabdar et al. 2011; Ketabdar, Yüksel & Roshandel 2010).

MagiTact's degree of innovativeness, the dynamics of the mobile ecosystem and specifications of the technology created numerous commercialization options and challenges. For example, it enabled offering a novel type of mobile applications based on the technology and on the other hand allowed revenue generation by licensing its API to developers, selling or licensing the associated patents, or building a business around selling magnetic gadgets with the software. At the same time, the technology created unique challenges to solve, for example the need to distribute sufficiently strong magnets to be used in conjunction with the software.

Based on a qualitative research approach, this paper presents the advancement of MagiTact from the development of the idea to the exploration of a number of different business model options. Building on the insights from this case study, we will investigate principles associated with business model development in corporate venturing processes. The insights collected along this journey shall provide support to corporate entrepreneurs seeking to understand the dynamics of mobile markets, corporate venturing and business model specification.

2 Related Literature

Spin-Off Creation to commercialize corporate R&D results

Examples from the past have shown that in order to maintain a competitive, future-proof market position, large incumbent firms need to reach beyond the borders of their realm and reach out to additional opportunities opening up in adjacent or distinct markets (Mason & Rohner 2002, Block & MacMillan 2003). Corporate venturing describes an organization's efforts to either acquire external capabilities by investing into, or acquiring external start-ups, or to commercialize internally developed technologies through spin-offs, e.g. originating from internal R&D units. These two sources of new ventures are therefore referred to as internal and external corporate venturing (Covin & Miles 2007).

By applying corporate venturing practices, incumbent firms benefit, on the one hand directly from the creation of new business, growth and diversification, and on the other hand indirectly through strategic renewal, development of new competencies and technologies, promotion of diversity, and of an innovative corporate culture and learning through exploration (Backholm 1999). Challenges of corporate venturing can oftentimes be attributed to rigid routines of the parent company and different operating logics of parent and spin-off (Backholm 1999).

On the journey towards becoming a spin-off, internal corporate ventures are challenged to not only address the needs of the external market, but also to attract and maintain the interest of important stakeholders inside the parent company in order to secure future endorsement and access to resources. Compared to independent start-ups, corporate ventures have the advantage of access to the parent company's capabilities and assets, but on the other hand may be confronted with strong pressure exerted by the parent company (Backholm 1999).

Technologies developed in companies' internal R&D labs oftentimes have a strong future orientation and oftentimes result from experimentation. Initially lacking any path to market, project teams of radical innovations (Henderson & Clark 1990), are often challenged to develop a business model that identifies potential customer needs to cater to in the external market environment, but also is in line with the strategic agenda of the parent company.

Business Modeling in the Mobile Ecosystem

Business applies various means to deliver services and products, but its ends rely on the values it creates for people and society. An informed and systematic variation and extension of fundamental business aspects such as value proposition, user experience and partnering not only helps to focus new business, attract investors, and bring new products to the market, but also feeds back on the original concepts and design (Breuer & Ketabdar 2012). New technologies and usage patterns call for new business models to create and capture value from innovation. Accordingly, advances in human-computer interaction, the popularization of the internet, or the web 2.0 also fostered the creative exploration and elaboration of suitable new business models. The mobilization of interactive technologies fuels this development, and will do so even more once current limitations of small screens and keyboards have given way to new interaction paradigms.

Following trends towards miniaturization, personalization and ubiquitous wireless communication, interactive computing left the office spaces and home environments in order to enhance every context and fabric of public and private life impacting the associated worlds of business. While every situation of everyday life is revised with respect to potentials of interaction and related business, established models and reliable practices are missing.

Challenging the established division of labor and profits between device manufacturers, network operators, and application developers, powerful players are already setting de facto standards. On the one hand, new mobile ecosystems have emerged with respect to mobile application markets and operating systems such as Apple's iOS, Google's Android, Windows Mobile and, soon to come, Mozilla's operating system. These mobile operating systems, along with consumer-oriented platforms such as those developed by Amazon or Facebook, provide planks to new companies and enable new business. Quickly innovating, creating and dominating new markets (Simon 2011), platforms on the other hand also limit the potentials to create new business and become gatekeepers for new entrants to the marketplace. On the other hand, personal and organizational collaboration workflows, and networks required to operate business, need time to be established and to mature. The same is true for the developers, users, customers, and communities that are required for running a new business model.

While it is critical to start with a good assumption particularly on identifying the customer values to be addressed, recent literature on lean start-ups has stressed the need to iteratively test assumptions against feedback from customers in order to persevere or pivot specifications and product related decisions (Ries 2011). In the same line of reasoning, business model literature frequently discusses business model evolution as the iterative process of adjusting business models to market changes. The initial business model a company enters the market with is to be regarded as provisionary, rather than final (Afuah & Tucci 2003). However business model literature has also shown that the first business model a company employs may create internal rigidities, which make it difficult to make substantial changes once a business model is in place (Teece 2010, Chesbrough & Rosenbloom 2002).

3 Methodology

As suggested by Yin (2009), a single case study has been selected as a suitable approach for providing a rich, holistic account of MagiTact's business model development process. Through close interaction with practitioners a case study can be used to analyze real management situations and create relevant managerial knowledge (Gibbert et al. 2008). MagiTact was selected as the case for this study, because it exemplifies a research-driven, potentially radical innovation in technology in search of its marketplace. The evaluation and selection of application domains became crucial and drove the development of strongly differing business model alternatives.

In order to provide a detailed account of MagiTact's process from idea generation to business model development, semi-structured interviews were conducted with key individuals within the project team, including project managers, developers, and business analysts. The interviews addressed the following topics: Specifics of the technology

including its functionalities and comparable existing offers in the market, idea development, business model development, technical development, the corporate venturing process and specifics related to the commercialization as a spin-off. Additionally, internal and external documents have been reviewed to add to insights from the interviews. The outcomes were clustered and formulated into a comprehensive case description. Subsequently we analyzed existing literature to review specifics of the MagiTact case and derived a set of principles from the analysis of this case. These principles represent central trade-offs identified within the case and provide suggestions for future corporate venture leads to support them on their way to the market.

4 From Ideation to Strategy Development - The Journey of MagiTact

Background

In 2005 Telekom Innovation Laboratories (T-Labs) were established as the central R&D unit of Deutsche Telekom. Its research and innovation projects develop innovative services, products and infrastructures for Deutsche Telekom's customers. An internal corporate venturing program identifies and supports R&D results, which qualify as new venture candidates. This case study provides a review of the journey of one of these innovation projects and aims to identify opportunities and challenges that research-based new ventures face.

The following sections present an overview of the MagiTact technology and its advancement through different phases of technical and business model development (see Figure 1).

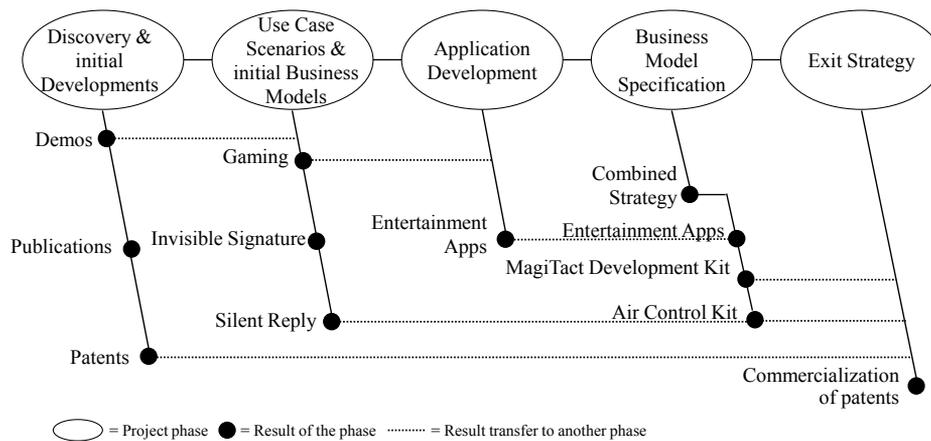


Figure 1 MagiTact Business Model Development Procedure

The MagiTact Technology

MagiTact is an innovative interaction technique that enables gestural interaction with mobile devices through magnets moved in the 3D space around them. MagiTact's technology influences the embedded compass sensor in a mobile device by moving a piece of magnet in the space around it. Software subsequently analyzes the temporal pattern of such magnetic influences in order to interpret it as a gesture class and a command.

Encouraged by positive feedback from technical communities, and by the boost in sales of motion controllers for video console games (The UK Association for Interactive Entertainment 2012), the project team expected that MagiTact has the potential to revolutionize motion interaction in the mobile domain. As to date no comparable approaches of magnetic field interaction are known, MagiTact, the project team hoped, may therefore define a new market. Relying on new scientific principles and the expected potential to create a new market and new potential applications (Henderson & Clark 1990), the team intended to develop a radical innovation in the mobile domain.

Still, from the very beginning unique challenges became evident, for example the need for widely available, sufficiently strong magnets. This prerequisite may be crucial due to the threat that disappointed first-time users may turn away after using too weak magnets that may not provide full functionality. Therefore bringing sufficiently strong magnets to users became a focal issue in later business model development stages and triggered the creation of a business around the provision of suitable magnets to end-users.

Discovery and Initial Developments

MagiTact was the result of research-based discovery, rather than diligent planning. In early 2009, one of the researchers was engaged in a project on indoor navigation, aiming to locate individuals inside a building using motion sensors and information obtained from the embedded compass integrated in a mobile device. One major problem was posed by misleading orientation information from the integrated compass. Pieces of metal or magnets in a building interfered with the magnetic field and corrupted the compass. While figuring out the specifics of these disturbances, one of the team members participated in a conference on mobile "around-device-interaction". The combination of the topic of magnetic influences on the internal compass in mobile devices and new insights gained in the domain of around-device-interaction, the team came up with the idea of using magnetic material to create controlled influences on the compass, and employ it as a means of interaction with a mobile device. The discovery-oriented internal corporate strategy gave the researchers freedom to further explore these ideas.

Soon after the initial idea, the team began developing a simple **demo** in order to ensure that the idea is in fact technically feasible. After several months of trying out new application fields and limitations of the technology, first findings and demos were presented in **publications** at scientific conferences and finally resulted in the creation of a **patent**. Positive feedback from the scientific community not only motivated the team, but also attracted the attention of the management to MagiTact.

At this early point in time, the primary focus of demonstrator development was to present the technology's feasibility to the management, in order to receive support for

further development. However, the early demos also helped the team to understand the specifics and limitations of the technology and served to convey its functionality to participants of usability tests.

Use Case Scenarios and Initial Business Models

In 2010 only rough ideas existed on how to use the magnetic interaction technology: The solution was looking for a user value or problem to solve. In cooperation with a “User Driven Innovation” unit a set of activities was defined to identify valuable usage scenarios and associated business ideas for touchless near device interaction. Initially desk research looked into technology-oriented trends in devices and applications on the one hand and on the other hand into environments and situations with special needs for touchless control (such as highly hygienic laboratory environments, darkness, sports or driving situations).

The results were used as creative triggers for an ideation workshop with lead users. During this workshop, 14 participants with interdisciplinary backgrounds generated a long list of ideas how to fulfill customers’ needs, wants and problems in different situational contexts.

A persona exercise was used to identify how MagiTact could support a defined user in a selected context. In the concept phase, participants reviewed and re-combined ideas and formulated them as comprehensive concepts. Following this exercise, the concepts were sharpened with regards to their benefits and challenges and evaluated regarding their unique selling proposition and feasibility. Throughout the ideation workshop 60 ideas were generated. Then the MagiTact business owners prioritized a long list of ten and a short list of three ideas. Then a “business modeling starter kit” was used to explore and design potential business models for novel technologies from a customer perspective (Breuer & Ketabdar 2012). Moderated workshops enhance this format by adding deep-dives into selected business model dimensions with supporting ideation methods (ibid.). The following usage and commercialization scenarios were deducted:

- **Silent Reply:** Through gestures the user controls basic functions, e.g. replies to incoming calls that he or she is busy, and the time when the call may be returned. Business model ideas included a freemium model for end customers, partnering to create and deliver a variety of magnets (and a user-competition to come up with new magnet designs), and licensing a Software Development Kit (SDK) for developers interested in creating new applications.
- **Gaming:** For an engaged niche of mobile gamers a wide variety of applications was envisioned. Distribution channels included special interest magazines with a free version to demonstrate the features. Revenue should arise from licenses to game developer firms and a Software Development Kit for a game developer contest to create new games and to acquire licensees.
- **Invisible Signature:** A unique gesture could be recognized for safe authentication of payments and transactions. Focusing on B2B (vendors, banks and developers) the unique value proposition related to safety and convenience for end users. Revenue was expected from licenses to system providers, transactions or fixed fees for small and medium enterprises and subscription fees for end customers. Still, substantial effort was expected for market preparation and customer education.

Of these three options, only gaming was followed up. The MagiTact business owners and business analysts came to the conclusion that the operation of security sensitive functionalities, such as basic mobile phone interaction and payments required a high amount of trust in the technology, which had yet to be established in users. Gaming applications on the other hand implied low risk and hence low adoption hurdles for a novelty seeking target group. The user perspective in investigating business models helped to specify the general benefit of the technology to end-consumers and helped the MagiTact team to gain a common understanding of the strategic directions to pursue.

Application Development

The subsequent generation of prototypes highlighted user-oriented aspects of MagiTact. Their focus was different from that of the initial demos: While demos developed during earlier stages aimed to convince management and other stakeholders of the technology's feasibility, this set of applications was built to appeal to future customers.

As the gaming and entertainment scenarios were selected as prioritized starting points for the initial business model, a number of mobile **entertainment applications** was developed around virtual music instruments to be operated by magnetic interaction. First plans for commercialization aimed at selling these applications or at providing them for free as a means of promotion for the parent company. Offering in-app purchases (e.g. for additional functionalities at a fee, or by limiting the free utilization to a trial-period) could create more opportunities.

By enabling users to try the first MagiTact apps for free, the number of first-time users should be leveraged, facilitating the creation of a buzz around the novel interaction paradigm and creating a widely recognized brand. These factors had the potential to increase users' future readiness to pay for further MagiTact offers. However, the threat of negative backfiring of disappointed users applying unsuitable magnets remained.

Business Model Specification

Increasing recognition and praise from the technical scientific community and external reviewers confirmed to the management team that MagiTact bore much technical potential beyond the provision of mobile applications.

In order to explore the opportunities for building a strategy of opening up a market for magnetic interaction while involving all central stakeholders, an additional business modeling project was initiated together with the User Driven Innovation unit. The goal was to develop a strategic approach for MagiTact's market entry to base a financial business case on. This project was conducted as an iterative process of market research and discussion with the project team within which MagiTact's competitive advantages and potential offerings were elaborated on.

Business analysts and MagiTact business owners agreed that in order to be successfully adopted by a mass market, MagiTact needed to create a new market for magnetic around-device-interaction. To address different relevant stakeholders for a successful market introduction, a multi-sided business model needed to be developed. In the case of MagiTact, the complexity of the mobile ecosystem may be turned into an

advantage in a business model strategy that engages different stakeholders through mutually reinforcing streams of value creation (see Figure 2). Within the business model specification project, two additional revenue streams were identified to complement the provision of mobile entertainment applications.

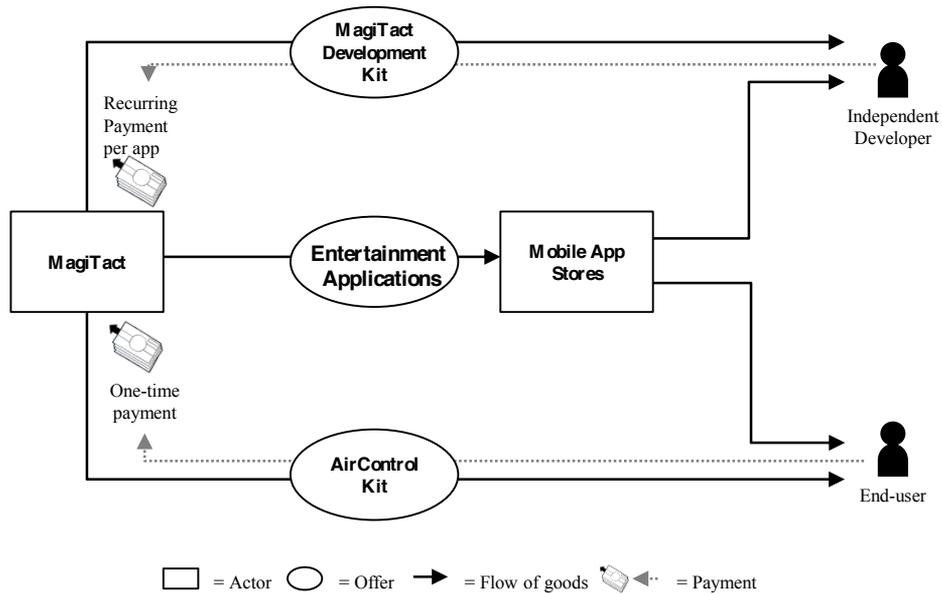


Figure 2 Multi-sided platform strategy

In addition to providing own MagiTact **Entertainment Applications** for free to create awareness for the technology among users, a second revenue stream was built around the provision of a **MagiTact Development Kit** to independent developers, leading to an increased offering of MagiTact applications. Independent developers benefit from being able to offer enhanced functionality of the applications they can provide to users of the different app stores. This offer combines the MagiTact Software Development Kit (SDK) and Application Programming Interface (API), in combination with access to developer support services. Charging a percentage of the revenue made from each app that uses MagiTact's SDK and APIs can generate a recurring income. This approach suggested the potential of allowing MagiTact to leverage the number of available applications in mobile stores and to help building the MagiTact brand. The third offer within this business scenario built on ideas from the Silent Reply scenarios of the application scenario and initial business modeling activity and aimed to solve the challenge of bringing sufficiently strong magnets to the user. The **Air Control Kit** was developed as a product bundle that includes a set of magnets of different shapes and a set of mobile applications that offer basic smartphone interaction with magnets. Such applications could encompass basic phone control, image control and drawing pad functionalities. By focusing on the advantages of basic mobile interaction, this offer could serve to introduce MagiTact to end-consumers, beyond the gaming market.

Building on available parent company assets, Air Control Kits could be offered in already existing shops and promoted through established marketing channels. Thereby, the distribution among end-users could be leveraged.

The three combined revenue streams benefit from reinforcing one another and provide an efficient way to raise user awareness and leverage the amount of MagiTact applications in the market.

Exit Strategy

An in-depth analysis of MagiTact's business potentials conducted by the incubation management unit of Deutsche Telekom suggested that a large device manufacturer is in the best position for a successful, smooth market introduction. As it was expected that MagiTact reaches its maximum usability after a long period of research and development, the unit suggested that this market can be better handled by an already known, influential device provider. A start-up would be challenged with incurring the costs of preparing the market adequately and dealing with the costs of research and development for such a long period of time.

An exit strategy was developed, aimed to sell the MagiTact technology to a hardware producer who may enable MagiTact on his mobile devices exclusively. The business owners envision that MagiTact has the potential of serving as a showcase innovation that a device manufacturer may communicate with the release of a new product. Offering such a novel function allows hardware producers to differentiate themselves from their competitors. The "magnet challenge" could be solved by the device manufacturer by providing a set of suitable magnets delivered along with each mobile phone. Additionally he has the chance to establish the sale of magnetic items as a novel product category of their accessory offers.

Among other dimensions, the expected cost structure for realizing this scenario is very different to any of the previous considerations: While there would be no operating costs and no need to set up new management processes, major cost positions can be expected to result from legal consulting during the negotiation process. Advantages of this approach are the prospect to quickly redeem a share of previous investments while possibly making a profit on top.

5 Business Model Development for Corporate Ventures

Interpretation and Analysis

MagiTact represents a case of adopting a user-centered perspective in the development of business models for research-driven technologies. Feedback from lead users served to enhance the project team's understanding of common user needs, a capability considered core to the creation of good business models (Teece 2010).

Companies introducing highly innovative technologies face the challenge that they not only need to offer their product to the market, but that they need to establish a new market first. It is frequently argued that large companies are not well suited to bring

forward radical innovations due to rigid intra-organizational procedures and substantial investments tied in existing infrastructure (Ghemawat 1991). The MagiTact case supports the argument that by creating spin-off companies, large companies can enhance their ability to pursue highly innovative technologies while benefitting from the opportunity to build on existing capabilities and partnerships of the parent company. The case also exemplifies how multi-sided platforms can serve to bring together a number of distinct but interdependent customer groups to establish a new market. Such platforms may generate value by facilitating interaction among these groups and utilize network effects (Osterwalder & Pigneur 2010).

Finally the case outlines how characteristics of the complex mobile landscape, closed ecosystems for introducing innovations and unique requirements of the technology, created a number of challenges, making the exploration of alternative business model configurations an iterative process and an ongoing learning experience.

Principles for Advancing Corporate Ventures

A topic frequently mentioned in the interviews was the challenge of navigating the MagiTact project through dynamics prevalent in the management team at the corporate level. Drawing from these insights, the following paragraphs present a set of reoccurring trade-offs that corporate venture teams need to stay aware of.

The process of business model development in a corporate venturing context involves a number of stakeholders with different motivations and expectations towards future developments (e.g. business owners, developer team, business analysts and corporate management). This creates an environment that bears potential for numerous conflicts of interest. Potential for such conflict is even higher for innovative technologies without a self-evident strategic path to commercialization. The experiences from the MagiTact project suggest that once business owners develop a comprehensive vision of their business model, the more likely they are to pursue and communicate their strategy, even against internal resistances. Still, it is critical not only to understand the reasons for such resistance, but when to pivot or persevere.

Trade-off 1: An early and thorough exploration of alternative strategy options is required to commit to and maintain a strategic vision against internal resistances. While corporate venture teams are likely to face such resistance, they must learn when to persevere and when to adapt their vision according to stakeholder interests.

Since business models are not static, but evolve over time, we suggest that spin-offs should not only focus on the current strategic course but also keep in mind expected future developments. Business model alternatives developed at earlier stages of the process may become interesting again once the technology has gained foothold in the market. Experiences from MagiTact showed that it can be useful to store business model ideas in order to be able to revisit them if needed (e.g. the Silent Reply use case which was initially discarded, was integrated in the development of the AirControl Kit). Being able to quickly generate strategic alternatives or additional application opportunities may enhance a corporate venture's ability to respond to strategy changes directed by corporate management or in the case that central market assumptions turn out to be invalid.

Trade-off 2: In order to successfully commercialize their product on the market, corporate ventures need to focus on the current context when implementing their business model. However they should also keep in mind business model alternatives to revisit if strategic changes are required from management or central assumptions turn out to be invalid.

Receiving endorsements from corporate managers is crucial for an aspiring spin-off. The MagiTact case displayed a number of examples of how positive feedback from external parties regarding the technology's potential brought the project to the attention of high-ranked managers, who made additional resources available. Such feedback was received through publications in the scientific community, from other companies interested in buying the technology, and from assessments of independent consultants. Therefore we assume that by creating a stir of genuine external interest around a technology, the likelihood of company internal support (e.g. contacts, funding, consulting) may be increased. On the other side of the coin such feedback and support may lead to a delusive dependency if the effort to obtain positive feedback exceeds the internal progress. If for instance corporate management demands quick, tangible or measurable results (such as apps with high download numbers out on a marketplace), which do not fit to the strategy or the timing, resources may be consumed without contributing to new ventures vision and the learning experience of the team.

Trade-off 3: By triggering and presenting positive external feedback to managers at the corporate level, spin-offs may increase the likelihood for receiving additional internal support for their commercialization. Still, instead of externalizing the locus of control, such feedback and support must contribute to team learning.

Building on findings from the MagiTact case, we expect that a high attentiveness towards these trade-offs enhances the teams' capability to advance their project towards commercialization. To confirm these assumptions further research would be required.

6 Conclusions & Future Work

In this paper we have presented the advancement of MagiTact from idea generation towards technical and business model development. We analyzed the data we received from interviews and project documents and derived a set of trade-offs to consider in the process of advancing the corporate venture in the parent company. Results from this case study suggest that during business model development in corporate venturing processes, new venture teams should 1) build a stable vision early, but learn when to persevere and when to adapt it according to stakeholder interests, 2) focus on the current context when implementing their business model, but also keep in mind alternatives to revisit if strategic changes are required 3) gather external feedback and support, but ensure that it contributes to team learning.

The insights deducted from this case will serve as inputs for future corporate venturing teams dealing with similar challenges as MagiTact did. We believe that the iterative technical development and business model investigation is a promising approach for guiding corporate ventures through their early phases while avoiding wasteful resource spending on unprofitable products and services. In the future the presented

approach will be refined and adjusted to encompass a broader view on the requirements of corporate ventures on their path to maturity.

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