How shared pre-start-up moments of transition and cognitions contextualize effectual and causal decisions in entrepreneurial teams

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Abstract

Although it is reported that early venture decisions are influenced by the relationships and common history of entrepreneurial team members, little is known about how the mutual interests and ambitions experienced in the pre-start-up phase provide a shared and relational context for joint decisions. Drawing on a multiple case study approach of nine entrepreneurial teams in new ventures, this study identifies the shared pre-start-up moments of transition during which team members' prior work and life patterns start to change. We show that in these intense moments, shared entrepreneurial cognition evolves among team members – the relationality of which provides a unique social context for decision behaviors. Our findings conclude that effectual behaviors advance a theory of context because in simultaneously working with effectual and causal logics (albeit with varying intensities), team decisions are realized that are consistent with the relational context that emerges in the pre-start-up moment.

Keywords: Effectuation; Entrepreneurial teams; Team decision-making; Shared cognition; Social context.

JEL-Classification: D81, J24, L26, M13

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1 Introduction

In entrepreneurship research, it is increasingly acknowledged that most new ventures are created by entrepreneurial teams (Beckman 2006; Kamm et al. 1990; Lechler 2001) – teams that are jointly responsible for the early venture decisions. Previous studies have shown that the shared backgrounds, perspectives and social ties of team members influence entrepreneurial team decisions. For example, extant research demonstrates that shared prior experiences enable quick team decisions (Eisenhardt and Schoonhoven 1996), that previous work affiliations increase a team's preference for exploitation (Beckman 2006) or that collective cognition affects strategic choices (West 2007). This research is often framed in terms of social antecedents that influence decision-making and are often treated as static entities, which have discrete effects for determining, causing or predicting decision outcomes.

What extant entrepreneurial team research does not do, however, is demonstrate *how* the mutual interests and perceptions of team members experienced in the pre-start-up phase constitute a shared relational context that shapes how they make decisions. Understanding this is important but not merely to frame context as a significant indicator of team decisions. Instead, and more distinctly, directing specific analytical attention to the relational context which was created prior to founding, helps to explain the prevalence of certain decision behaviors – be they effectual or causal. Effectual and causal decision logics are often distinguished to indicate two contrasting types of decision behaviors, an experimental, participative or effectual approach, and a linear, planning-based causal approach. These contrasting decision logics are both present in the early uncertain and unpredictable entrepreneurial stages (Andries et al. 2013). The effectuation concept also acknowledges the backgrounds and skills of entrepreneurs in terms of their available means for steering decision-making (Dew et al. 2009). Effectual behaviors are often predicated, therefore, on a high sensitivity to context in the sense that entrepreneurs 'use' their contexts to negotiate particular actions and contingencies (Sarasvathy 2008).

Despite acknowledging the significance of context for entrepreneurial action, effectuation does not explicitly address, however, how effectual and causal decisions are contextualized in the shared pre-start-up phase. As just mentioned, context is recognized as central for enabling the means that are to hand (Sarasvathy 2008) but we are not usually able to trace decision logics, especially in team situations, to the shared perceptions and interests that emerge in the early start-up phase. Moreover, although we are informed that both effectual and causal behaviors are present in team decision-making, little has been written about the emergence of team cognition and its incorporation in entrepreneurial team decisions (de Mol et al. 2015). This is especially the case when considering the ways in which effectual and causal decision behaviors, rather than being sensitive to context, are instead *contextualized* in shared team ambitions, perspectives and cognition.

In view of these limitations, we draw from the work on team cognition and decision-making (Eisenhardt 2013; Ensley and Pearce 2001; West 2007) and relate this to the analytical interests of effectual and predictive decision logics. This follows calls that effectuation research be extended to founding teams (Read et al. 2016; Smolka et al. 2016). We also build upon calls (Arend et al. 2015; Read et al. 2016*)* to strengthen the theoretical validity of effectuation which we do by explicitly attending to the shared pre-start-up moment of transition during which a particular relational context is formed between team members – a context which goes on to shape particular patterns of effectual/causal decision-making. In addition, we add to the empirical applicability of effectuation (Arend et al. 2015; Read et al. 2016*)* by examining it in the, hitherto underexplored, settings of entrepreneurial teams.

2 Analytical framework

Although Sarasvathy (2001) did not explicitly discuss teams in her initial conceptualization of effectuation, some studies illustrate how effectual behaviors emerge in new venture teams (Alsos et al. 2016; DeTienne et al. 2015; Sarasvathy et al. 2008). Effectuation is relevant for team research because, as commonly expressed in the principles of effectuation (Sarasvathy 2008), entrepreneurs draw upon "who they are, what they know and whom they know" in order to drive the creation of the 'pie' or the 'final artifact' (Sarasvathy and Dew 2005: p. 548). Implicit within this, is an assumption that focusing on available means enables entrepreneurs to relate to their social context to activate required resources. Often, however, the social context is recognized to be 'present' although it is mostly implicit in the entrepreneurs' scope of action and the use of resources.

When addressing the social factors influencing teams and their decision-making, most research focuses on how the unique perspectives, skills, social ties and histories of team members conspire to influence team decisions. Some authors focus on how teams co-create to integrate these capabilities into shared forms of knowledge (e.g., Beckman 2006; Eisenhardt and Schoonhoven 1996; Kamm and Nurick 1993) that enable speed, exploitation or effectiveness of joint decision-making. Other studies emphasize the importance of shared cognition which is an emergent state that describes a similar distribution of knowledge among team members resulting from interactions inside the team in relation to its environment (de Mol et al. 2015). Shared cognition is important for entrepreneurial teams because it facilitates decisions by allowing team members to align interpretations of the environment, take quick action, improve information-processing and to achieve consensus about procedures and strategies (Cannon-Bowers and Salas 2001; Furr et al. 2012). Also, emphasizing the link between sharedness and early team decisions, Eisenhardt (2013) demonstrates that simple cognitive rules for key firm activities increase decision effectiveness; Souitaris and Maestro (2009) highlight how shared multi-tasking preferences improve decision speed and comprehensiveness; and West (2007) posits that collective cognition impacts the direction of strategic decisions.

This short review shows that the type of consensus reached within teams is distinct for shaping joint decisions in specific ways. Despite debate about the context of early planning and experimentation (Brinckmann et al. 2010), the relationship between shared cognition and contextual factors shaping decision behaviors has not yet been investigated (Arend et al. 2015; Chwolka and Raith 2012). This is particularly the case for how effectual and predictive decision behaviors are contextualized in the shared interests, ambitions and cognitions that are developed in the pre-start-up phase. Investigating how the social context induces particular modes of team cognition is important to understand how they anticipate specific entrepreneurial decision heuristics (Grégoire et al. 2011).

To address this gap, we focus on the shared entrepreneurial cognition that arises from the social context of entrepreneurial teams. While prior studies have validated uncertainty and experience as effectual preconditions (Dew et al. 2009) and linked self-efficacy (Engel et al. 2014), career motives (Gabrielsson and Politis 2011) and social identity (Alsos et al. 2016) to effectual behavior, it is rare to see *how* effectual/causal logics are shaped by the social context in which they are located. Also, although Arend et al. (2015) propose directions for specifying the landscape of effectuation, many scholars have pointed to the limitations in entrepreneurship research arising from the lack of attention to context (Fletcher 2011; Welter 2011; Welter and Gartner 2016). Zahra and Wright (2011) for example, identify the need to factor-in contextual dimensions, and Welter (2011: pp. 165-166) argues that contextual factors are useful for highlighting ‘when, where and how particular circumstances and situations’ influence entrepreneurial outcomes.

We build upon these calls for a closer consideration of how context is significant for shaping entrepreneurial outcomes. However, rather than framing context in terms of the social antecedents that unidirectionally determine decision-making, we start from a relational view of context to emphasize "how actors co-create their context, how the context itself evolves and how it impacts on the actors involved" (van Gelderen et al. 2012). In this way, we direct analytical attention to context to demonstrate how a shared relational context is created by team members prior to founding and how this shapes subsequent decision behaviors. Specifically, we focus on the pre-start-up moments in which mutual interests and ambitions are shared among team members. We conceptualize these significant events as shared moments of transition, which are analytically distinctive since they capture the foundational relational dynamic context within which a shared cognition for entrepreneurial joint action is recognized. They also provide a pivotal point for entrepreneurial action in that the relational dynamic generated here creates a particular social context for further decision-making. With these interests in mind, we pose the following research question:

How does the shared pre-start-up context of team members shape early entrepreneurial decisions in young ventures?

3 Methodology

3.1 Research design and case selection

The research setting for this study is independent, profit-oriented young ventures, which are created and managed by entrepreneurial teams in which at least one founding member was still active. We adopted an inductive multiple case study approach (Eisenhardt 1989) and engaged in purposeful sampling to select information-rich cases that met these criteria (Gerring 2007). To find sample ventures, we focused on Luxembourg, which has a nascent but highly promoted entrepreneurship culture and we contacted five incubators as they were likely to host young ventures with founding members still on board (Breugst et al. 2015). From this mapping exercise, 117 ventures were identified. Using data from the Luxembourg company registry and statistical office, we were able to filter out those ventures not conforming to our selection criteria. This left a total of 13 ventures for close examination.

We began by contacting these ventures and interviewing their active, available entrepreneurial team members. Since we aimed to detect common factors that might shape team decision contexts (Reymen et al. 2015), and to enable heterogeneity between cases, we applied maximum variation sampling (Creswell 2012). To this end, we iteratively added cases and looked for differences in shared member history (Beckman 2006), prior relationships (Brannon et al. 2013) and founding motivations (West 2007). When analyzing our interview material and secondary data, we identified a common pattern whereby, despite the diversity of team backgrounds, members of the team recalled a pivotal pre-founding moment in which their mutual appreciation, similar motivation and a collective desire to change were recognized. Moreover, these situations constitute the pre-founding moment, or what we refer to as the pre-start-up *shared moment of transition (SMT)* which became the core construct of the study. It captures the point at which the joint decision for venture creation was triggered by a sudden external or cognitive/relational incident.

When we examined more closely the interests and ambitions underlying the teams' respective SMTs, two dominant but contrasting and mutually exclusive orientations were detected: (i) *changing the world* and (ii) *securing personal interests*. These were identified by looking for differences in the scope of reference of the shared events constituting an SMT. We found that cofounders' interests/ambitions were either clearly oriented towards fostering change/innovation in the market, or towards improving their own lives and continuing cherished activities. These distinct orientations allowed us to refine the SMT construct and to characterize each venture's SMT. After interviewing nine teams, theoretical saturation was reached in that sufficient evidence for our criteria of interest was achieved (Eisenhardt 1989), with five cases showing distinctly one SMT orientation and four cases the other. This number of cases is consistent with recommendations for inductive theorizing (Eisenhardt 1989) and practices used in other case studies (e.g., Knockaert et al. 2011).[2] Table 1 provides an overview of the ventures.

Table 1: Venture characteristics

Venture	**Team**[a]	**Founded**	**Size**[b]	**Industry (NACE 2)**	**Shared history**	**Prior main relationship**	**Founding motivation**	**SMT orientation**
ManuCo	*Mia*, Max, Mike	2009	5	Manufacturing	known for years; Mike managed Mia and Max.	colleagues	work boundaries	securing personal interests

[2] As team decisions might be the result of multiple causes, other potential effects from meaningful factors were explored that were not the focus of our study such as team founding experience and uncertainty (Sarasvathy 2001; Reymen et al. 2015) as well as firm industry, size and age (e.g., Souitaris and Maestro 2009). No distinct patterns emerged considering these factors.

PureCo	*Pete, Phil,* (Paul)	2013	11	Professional, scientific, technical activities	Pete and Phil: known shortly; Pete hired Phil temporarily. Pete and Paul: known for years; no joint work history.	business partners; fellow students	new challenge	changing the world
GameCo	*Guy, Glen*	2012	6	ICT	known for years; joint hobby/studies; no joint work history.	fellow students	personal goals	securing personal interests
CyberCo	*Craig, Chris*	2012	40	ICT	known for years; Craig managed Chris.	colleagues	work boundaries	securing personal interests
SeeCo	*Sean*, (Sara, Sam)	2010	10	ICT	known for years; Sean managed both; Sara married to Sam; Sean and Sara: close friends.	colleagues; friends; couple	new challenge	changing the world
EduCo	*Elvis, Eric**, (Ed)	2013	20	ICT	known for years; Ed managed Eric and hired Elvis temporarily.	colleagues; business partners	transform project	changing the world
TechCo	*Tom, Tess**	2013	10	Wholesale and retail trade	known for years; Tess supported Tom's project.	couple	transform project	changing the world
DataCo	*David, Dana*	2011	17	ICT	known for years; Dana supported David's project.	couple	personal goals	securing personal interests
LifeCo	*Levi, Lane*	2013	1,5	Professional, scientific, technical activities	known for years; joint start-ups; Lane managed Levi.	colleagues	personal goals	securing personal interests

[a] Names in parentheses are members who quit; names that are italicized are interviewed members; and names followed by an asterisk (*) are jointly interviewed members
[b] Number of employees

3.2 Data collection

Case material was primarily collected in 16 semi-structured interviews with active entrepreneurial team members who were highly involved in the venture's development, which suggested the possibility for them to recall past behaviors. Ensured by keeping their responses confidential, interviewees spoke openly and provided rich information. All interviews lasted, on average, 50 minutes and were conducted one-to-one at the incubators, while on some occasions two members jointly participated. Additionally, informal follow-up meetings/calls were undertaken enabling a comprehensive view of the backgrounds and joint history of all team members. In each case, both shared and individual views could be identified and cofounders who were separately interviewed provided overlapping information. Since team members had known each other for a long time and had interacted intensively in the pursuit of shared goals during their venture creation, we interpreted that they were well aware of each other's views. Therefore, we asked our respondents about their own and their cofounders' traits, motivations for founding/team selection, their prior relationships and common backgrounds. Furthermore, they accounted for the development of their business, product/service and market. This helped us to have an appreciation of the relational team contexts. Finally, they were asked to describe their joint early decisions followed by directed questioning using the five effectual/causal principles (Alsos et al. 2014; Sarasvathy 2001). Interviews were recorded and transcribed amounting to 146 pages of data.

To triangulate cofounders' reports, we verified and extended information about their environment, ecosystem and factual aspects of the venture development by questioning five incubator managers, the sector development team of the Luxembourgish innovation clusters and three employees of the business/entrepreneurship section of the statistical office. Facilitated by the high media coverage that some firms had experienced, we also referred to archival data from venture and public institution websites, online business networks, newspapers/magazines, and start-up award nominations to affirm interviewees' responses.

3.3 Data analysis

We used an inductive, iterative approach for analyzing our transcripts and archival sources, and organized our data with the help of a computer-based software (NVivo v.11). Since we were particularly interested in exploring the *significance* of each team's pre-start-up context, we searched for descriptions of cofounders' backgrounds, relations, motivations, and their explicitly-given rationale for firm creation and later actions. We coded pieces of text that reflected both individual- (e.g., own perceptions) and team-level constructs (e.g., shared history). This enabled us to detect a set of first order categories that focused on cofounders' reasons for co-creating their venture and their priorities for its development.

Next, we assessed the extent to which these categories were shared. Adopting a relational view (Bradbury and Lichtenstein 2000), we considered the narrative of each cofounder as a configuration of perspectives and a partial reflection of his/her social context including the intra-team interactions. We detected sharedness if cofounders had similar personal views and situations (e.g., all being unhappy with their jobs), or if they clearly referred to common beliefs and actions (e.g., all having the desire for greater independence) (Discua Cruz et al. 2013). By doing so, and by conducting cross-case comparisons (Eisenhardt 1989), we identified shared patterns between members that allowed us to summarize the first order categories into second order themes (Strauss and Corbin 1998).[3]

In a first stage, it became clear that four of the identified themes (collective urge for action, similar motivation for change, feelings of interdependence and joint transition trigger) are related to collective events that described the origins of each venture foundation. These became our aggregated theoretical construct *SMT*. In a second stage, we reassessed the remaining themes and underlying categories with the aim to fully capture the joint aspirations for developing the venture. By doing so, we realized that four themes reflected two sets of collective ambitions/concerns that determined two contrasting sets of entrepreneurial cognitions shaping the venture priorities. These were aggregated into two theoretical constructs *product focus* and *venture growth focus*[4].

By this point, we had identified the significance of an SMT for each team, however, it was still not clear how it related to shared cognition and later decisions. Therefore, in a third stage, we returned to the SMT categories/themes and undertook a more fine-grained analysis of the underlying coded pieces of text to identify possible differences. In so doing, we detected that the reasons for venture creation considerably differed since one group of teams showed a strong desire to master new challenges and innovate, whereas the other signalled their wish for realizing their own values/interests at work and continuing their cherished activities. To account for this dualism of ambitions/interests, we created six new themes and related categories reflecting the two different SMT orientations and aggregated them into two theoretical constructs *changing the world* and *securing personal interests*. Figure1 illustrates the data structure resulting from the multi-stage analytical process. The key themes and theoretical constructs are supported with exemplary quotes for each case (Miles and Huberman 1984) as illustrated in Appendix Tables 3 and 4.

[3] As to be expected, cofounders also expressed individual views that were not shared by all team members. However, in most of these cases, we found equivalent views of other cofounders that were not identical in their content but similar in their direction, allowing an aggregation on the more abstract level of our themes. In the rare case that we were unable to find an equivalent for a selected view, we verified that it did not affect our findings and decided to neglect it in all cases.

[4] As not all shared cognitions fell neatly into one category, we coded according to the predominant characteristics within each case.

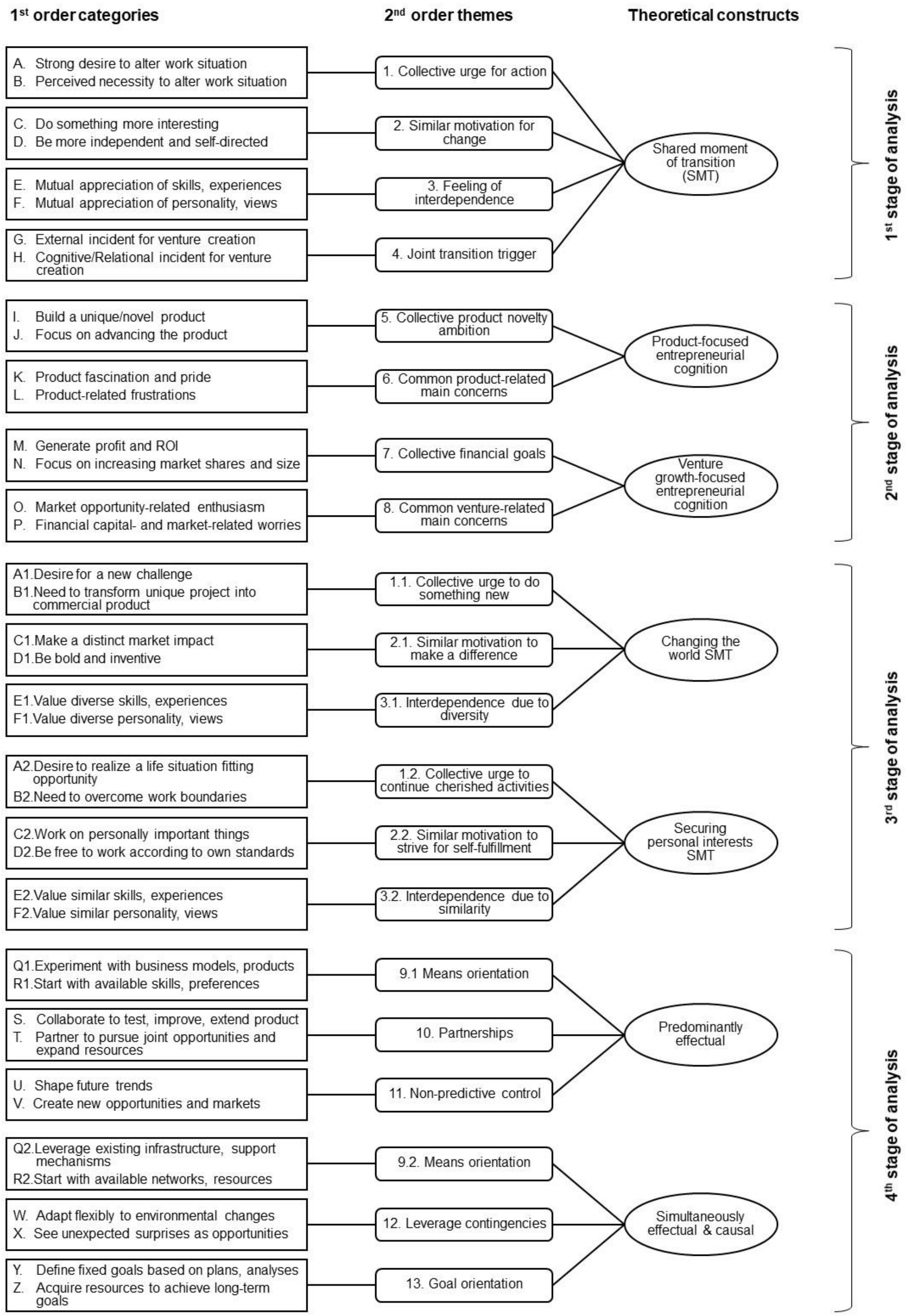

Fig. 1 Data structure and stages of analysis

In a fourth stage, to determine the extent of effectual/causal decisions, we used an abductive coding approach (Dubois and Gadde 2002). We treated effectuation and causation as independent constructs and differentiated these by using 40 identified indicators that we assigned to the five effectual and causal principles as illustrated in Table *5* (Appendix). Similar to Reymen et al. (2015), all statements reflecting actions/decisions taken by the entrepreneurial team related to their venture creation, were coded as decisions. Examples are experimenting with products, investing carefully or starting a close customer dialogue. To test the reliability of the coding framework, three interviews were co-coded by an independent rater signalling high interrater agreement (95.8%). Discrepancies were discussed until consensus was reached.

To classify decisions and facilitate cross-team comparisons, we calculated the percentages of each effectual/causal principle related to all coded decisions per team, as shown in Table *2*. This tabulation enabled us to identify specific patterns in team decision behaviors and to trace their linkage to shared moments and cognition. To determine a dominant cross-team decision pattern, we focused only on the three principles with the highest percentages for each team. For the final analysis stage, archival data about cofounders' early behavior/views were coded and helped to verify, extend and strengthen identified constructs and relationships.

4 Findings

4.1 Shared moments of transition

As shown in Table 1, our case material reveals that all team members were either friends, shared hobbies or worked/studied together. When describing their relationships, they referred to "*really deep trust*" (Mia, ManuCo) or "*a foundation that you can trust*" (Chris, CyberCo). Paralleling earlier findings (Dai et al. 2016), we observe that these trust-based relations stimulated a willingness to change and to engage in collective action. In view of these close ties and open interaction, all teams experienced a specific *shared moment of transition (SMT)*, a life-changing moment, in which both the idea to jointly create a venture was made and the framework for how this venture should be developed was formed.

Such an SMT happened when team members faced the simultaneous occurrence of four events: (1) a *collective urge for action (i.e*. members shared a desire to urgently change their situation); (2) *a similar motivation for change* (i.e. the underlying motivations driving the desire for change were similar)*; (3) a strong feeling of interdependence* (i.e. they mutually thought that only together could they realize their desired changes); and *(4) a transition trigger* (i.e. a brief, intense and sudden incident that became a significant team matter through the initiative of one of the cofounders). These incidents reflected each team's specific relations and situation. For example, in PureCo, their transition started when Pete saw his "*lucky draw"* in the moment when cofounder Phil "*decided to stop his [former] start-up*". SeeCo's transition began when Sara teased Sean that if he was so clever, he should start a firm, to which he countered *"Yes, let's go!"*, and ManuCo's transition started as their former employer refused to fund a customer project, which induced Mia to signal that she was ready to leave.

Although we detected SMTs in each team, the overall orientations of these moments differed. After assessing the scope of relevance of each of the four underlying events of an SMT, we found that they jointly determined the extent to which the teams were either oriented towards *changing the world* or *securing personal interests* (with the exception of the trigger event which had a more activating role). The former orientation reflects a more external focus on changing or transforming existing structures/markets in the sense of 'world-making' (Spinosa et al. 1997) while the latter concentrates on personal fulfillment and self-identity issues related to a wish to improve the team members' individual working lives. See Table 3 for exemplary quotes for all teams for both orientations along the four SMT events.

4.1.1 Changing the world orientation

We found a *changing the world* orientation in the SMT of EduCo, PureCo, SeeCo and TechCo. Their urges for action were strongly linked to their desire to realize a unique, market-impacting project and to master a new challenge. For example, in PureCo, Pete "*felt that [he] needed some new challenges, a new project*" while his colleague, Phil, dreamed of creating something "*totally new*" that "*was kind of adventurous*. Likewise, the shared motivations for change of these four teams reflected their ambitions for being bold, inventive, or involved in significant product or market transformations. For example, in SeeCo, their idea was "*to do innovative projects"* (Sean) and in TechCo, they were motivated by creating an "*incredible project*", "*something they believe in*" which would "*create a big interest*" (Tom). For PureCo, they spoke of being driven by a wish "*to start from scratch and build something [new]*" (Pete).

Further, the strong feeling of interdependence between members of these teams was reflected in the mutual appreciation of the perceived complementarity of their skills and traits, which they spoke of as crucial for realizing their envisioned changes. Amongst the valued diverse characteristics were soft skills, personality traits, viewpoints, age, and expertise, which were expected to provide diversified knowledge and perspectives, enabling them to develop novel ideas and address complex tasks. For example, in PureCo, Phil stated that a CEO and CTO are needed "*like the two legs of the body*" while Pete believed that they "*complemented each other well*" having "*20 years age difference*"; Sean (SeeCo) affirmed that "*Sara listens to feelings*" which is something he is not good at, and concluded that complementary teams "*create value*" and allow the management of "*contradictory problems or ideas in order to find the best idea*"; EduCo counted on Elvis's founding experience to disrupt the market as, in contrast to the rest of the team, "*he knew how young firms work*". This parallels previous studies showing that diversity stimulates team creativity and innovation by increasing problem-solving capabilities and the willingness to change and explore new opportunities (Jin et al. 2017; Bell et al. 2011).

4.1.2 Securing personal interests orientation

In contrast to the above, five teams' SMTs (CyberCo, DataCo, GameCo, LifeCo and ManuCo) focused on achieving individual-level goals. These teams' urges for action indicated their desire to avert an impending life change, which mirrored a wish to continue with their cherished activities. For example, at ManuCo, they were keen to continue doing what they did in their previous company because this activity was no longer a core business for their employer. Members of CyberCo were frustrated with their work arrangements when their employer was acquired, hindering them to serve their customers in the expected quality, and members of LifeCo were not able to advance their research project due to limited funding.

Similarly, the shared motivations for change within these teams indicated a high sensitivity to their personal satisfaction and self-fulfillment. To them, aligning their areas of interests to their jobs or being able to create their ideal jobs was important. For example, at GameCo, they wanted to work in a "*field in which [they] are super passionate*" (Glen); at DataCo, they strove to realize their long-term dream project; and those at ManuCo and CyberCo aimed to work according to their "*own values and ... way of doing things*" (Craig) or "*to create [their] own jobs*" (Mia).

We also discovered that the feeling of interdependence between these team members was attributed to their collective appraisal of their perceived similarities. Common prior experiences, education, fundamental values, soft skills and personality traits were considered important for their effective communication and fast decisions. For example, those at ManuCo and CyberCo appreciated their similar lifestyles, family situations, friends, values and ways of thinking as this allowed them to limit discussion time. Equally, at LifeCo, they valued their similar expertise that helped them to "*know who [they] can work with and collaborate …, and with whom [they] cannot*" (Levi), and those at GameCo cherished their similar backgrounds, hobbies and networks, which made their collaboration "*easy*" (Guy). Consistent with prior research, this finding shows that similarity in teams facilitates cohesion (Hambrick et al. 1996).

We now explore how these team orientations shaped the teams' ability to generate team cognition.

4.2 Entrepreneurial team cognition

Whilst investigating team members' stated reasons for venture creation, their common priorities for the venture's future and the way they explained key venture challenges/achievements, we identified two types of shared entrepreneurial cognition. In further assessing the role of these cognitions in the pre-start-up context, we found that they were closely related to the two SMT orientations. This finding parallels previous work showing that interactions inside the team generates a common knowledge reflecting collective attitudes, beliefs and perceptions (Cannon-Bowers and Salas 2001; de Mol et al. 2015). In this study, however, the shared entrepreneurial cognition we observed reflected the way team members approached, valued and comprehended entrepreneurial action. More specifically, we found the emergence of a shared *product focus* in teams oriented to *changing the world* and a shared *venture growth focus* in teams oriented to *securing personal interests*.

4.2.1 Product focus

Teams with a *product focus* aimed to make a distinct market impact by offering a novel or technically superior product. When asked why they created their venture, members of these teams referred explicitly to their wish to develop such a product. For instance, at EduCo, they confirmed that their most important founding motives were clearly "*product-related/product opportunity driven*" as they "*wanted to take the opportunity to further develop and expand the product*" (Eric). They described their product as being "*disruptive*" and "*world-leading*". Likewise, Tom (TechCo) explained that "*the business was created by the product*" and Phil (PureCo) admitted that being among the first to make "*a consumer product*" in a market dominated by business solutions is what "*drove [him] into this company*".

These teams showed strong emotions when talking about their product in the sense of being fascinated and proud about product benefits or frustrated by product-related issues. For instance, Sean (SeeCo) and Pete (PureCo) proudly praise unique features of their product and Tom (TechCo) demonstrated his product enthusiasm by commenting multiple times how innovatively they deal with the underlying technology.

4.2.2 Venture growth focus

In contrast, teams with a *venture growth focus* were interested in achieving financial benefits to be able to pursue their personal goals. Consequently, they tried either to acquire funding or achieve financial success through organic growth. For example, ManuCo aimed to guarantee its future by making the venture "*bigger and more profitable*" to prepare it for sale. GameCo had pecuniary interests as founders focused on realizing "*a massive opportunity*" (Guy), having "*a scalable product*" (Glen), and benefitting from "*growth in the market*" (Guy). Those at CyberCo intended to "*get benefits from the investments [they had] made*" (Craig). Similarly, at DataCo, they desired to "*grow the company and get a good investor on board*" (Dean), and in LifeCo, they created their venture to be "*economically successful*" and "*to make profits*" (Levi).

These teams provided many details about topics related to the development of their venture rather than to specific product features when describing key challenges/achievements. For example, at LifeCo, they informed in-depth about the difficult funding situation in their industry and explained exit scenarios, and at CyberCo, they showed high frustration when talking extensively about bad experiences with potential investors. Table *4* in the Appendix contains further examples of both types of shared cognition. Next, we analyze the teams' early decision-making behavior.

4.3 Entrepreneurial team decisions

Our data reveal that a team's pre-start-up SMT and associated cognitions strongly impacted their decision behavior. From the team members' descriptions of their joint decisions, we found that all teams showed decision behaviors that were more effectual than causal, as illustrated in Table *2*.

Table 2: Team decisions

	Effectuation						Causation						
Case	**Effectuation total**	Means orientation	Affordable loss	Partnerships	Leverage contingencies	Non-predictive control	**Causation total**	Goal orientation	Expected returns	Competitive analysis	Avoid the unexpected	Plan the future	Coded decisions

CyberCo	**64%**	16%	12%	12%	17%	7%	**36%**	14%	8%	2%	4%	8%	135
DataCo	**53%**	13%	5%	8%	17%	10%	**47%**	15%	15%	10%	4%	3%	102
EduCo	**90%**	38%	6%	18%	8%	20%	**10%**	2%	2%	0%	2%	4%	50
GameCo	**58%**	18%	10%	12%	14%	4%	**42%**	23%	4%	5%	2%	8%	93
LifeCo	**53%**	19%	7%	6%	15%	6%	**47%**	18%	13%	9%	2%	5%	80
ManuCo	**58%**	16%	16%	5%	20%	1%	**42%**	15%	2%	12%	7%	6%	95
PureCo	**92%**	35%	8%	18%	8%	23%	**8%**	2%	3%	0%	3%	0%	71
SeeCo	**94%**	23%	13%	21%	16%	21%	**6%**	0%	3%	0%	3%	0%	70
TechCo	**89%**	29%	13%	19%	11%	17%	**11%**	1%	1%	5%	0%	4%	96

792 total decisions coded

However, depending on their SMT orientation, the overall strength of their effectual behavior varied significantly. In the four teams with a transition oriented to *changing the world* (EduCo, PureCo, SeeCo, TechCo) we observed strong, predominantly effectual behavior across all five principles. Having a common *product focus*, these teams made decisions in an adaptive, participative and experimental way to develop and introduce their innovative, market-impacting offering. In contrast, the five teams that aimed for a transition oriented to *securing personal interests* (CyberCo, DataCo, GameCo, ManuCo, LifeCo) showed almost similarly frequent causal behavior by relying more on planning in at least one principle. Their strong *venture growth focus* steered their decisions to be more linear and predictive in achieving their individual goals. These observations allow us to form a proposition:

Proposition 1*: Shared pre-start-up moments of transition in entrepreneurial teams facilitate the emergence of shared cognition, which together reflect the relational pre-start-up context that shapes team decision behavior*.

In the next section, we describe the decision patterns related to the underlying effectual/causal principles and link these to the teams' relational pre-start-up contexts.

4.3.1 Teams with predominantly effectual decisions

Teams who decided predominantly effectually (see Table 2, effectuation total 89 - 94%) were particularly guided by the principles "non-predictive control", "means orientation" and "partnerships". Prioritising these principles can be traced to their relational pre-start-up context in multiple ways. First, their *changing the world* orientation and shared *product focus* shaped decision preferences that aimed at controlling an unpredictable market. Being challenge- /innovation-driven, these teams acted as "pilots in the plane" (Sarasvathy et al. 2014) and focused on their own development abilities and cooperative strategies to shape future trends and opportunities. For example, PureCo decided to create a product that would change "*the way [people] think about air quality*" (Phil); SeeCo relied on its advanced programming skills to develop an innovative solution that "*has no competitors worldwide"* (Sean), and Elvis (EduCo) stated their intention to "*set future trends" rather than '"just follow[ing] the market*".

Second, to strengthen their market control, these teams relied heavily on the available means that they had mutually considered valuable in their pre-start-up phase. These included their members' diverse skills, backgrounds and characteristics as well as their trust-based relations, shared desire for challenges and *product focus*. Consequently, these teams displayed skill sets that gave them the ability and confidence to innovate and to experiment with disruptive business models. For instance, in PureCo, their different functional skills and experiences inspired them to explore new ways of testing their idea and to apply an iterative hardware development process to identify the ideal business model while consistently sticking to their initial vision. Similarly, in TechCo, the founders' diverse skills enabled them to work on what they were good at and contributed to their openness towards others' ideas, while their product focus helped them to keep focused on the planned direction.

Third, reflecting their diverse networks/approaches and their strong *product focus*, the predominantly effectual teams sought collaborations with various players to test, improve and extend their product, to expand resources and pursue joint goals. For example, SeeCo used their diverse contacts to ensure initial funding and decided to collaborate with a leading player to increase its global reach. Likewise, TechCo partnered with a big U.S.-based company selling their product under their name, which gave them access to key customers and markets. Also, both PureCo and EduCo confirmed that exchanging with competitors was crucial for their subsequent product development. Our findings and above argumentation suggest:

Proposition 2: *A shared 'changing the world' oriented moment of transition and a 'product focus' cognition contextualize an entrepreneurial team's predominantly effectual behavior in the sense of achieving non-predictive control by exploiting means and building partnerships*.

4.3.2 Teams with simultaneously effectual and causal decisions

Teams who displayed decision behaviors that were simultaneously effectual and causal (see Table *2,* causation total 36 - 48%) were mainly guided by the principles of “goal orientation”, “means orientation” and “leverage contingencies”. The emphasis on these decision principles was shaped by their pre-start-up context, albeit in different ways. First, their *securing personal interests* orientation and their *venture growth focus* drove them to start with pre-set goals. Being interested in their personal well-being and in continuing their cherished activities, these teams concentrated on setting clear goals for their venture’s future based on planning, analyses and systematic gathering of required resources. For example, GameCo would never “*leave anything to chance*” but instead “*always set milestones over a period [...]”* indicating their clarity on the venture’s future. Both CyberCo and ManuCo explained that they acquired business planning skills in order to “*get the long-term vision”* (Craig) and to steer their business in the desired direction. Also, LifeCo and DataCo spent considerable time acquiring funding as their business model is focused on fast growth.

Second, these teams exploited their available resources to attain set goals. Their similar profiles, close ties and shared *venture growth focus* allowed them to continue favoured work activities but in the context of their own venture. Shared views about the growth of the business reduced the necessity to continuously negotiate priorities or next steps. Also, knowing their markets and product areas well, they re-used existing networks to identify new opportunities within their industry boundaries and leveraged available support structures to overcome resource gaps. For instance, both founders of GameCo were professional sportsmen and coincidently discovered a niche in the sports market. Having similar experiences, a shared ‘passion’ and a ‘*wide network of international corporations, investment firms and wealthy people*’ (Guy) helped them start their venture. Likewise, the cofounders of LifeCo, ManuCo and CyberCo had a joint work history. So, when starting their venture, they transferred their well-rehearsed roles, familiar collaboration schemes and existing business networks to the new company set-up.

Third, we found that these teams leveraged contingencies to achieve their common goals. Being more interested in venture growth than in product features, they adapted to environmental changes by evolving their venture as opportunities emerged and accepted unexpected events as a possibility to create additional value. For example, when ManuCo realized that the market for their service had changed, they accepted this as an opportunity to adapt their offer and quickly modify their business model. Likewise, CyberCo constantly adapted their offering to respond to customers' needs or to the skills of new members joining their team. This leads us to propose:

Proposition 3: *A shared 'securing personal interests' oriented moment of transition and a 'venture growth focus' cognition contextualize an entrepreneurial team's simultaneous effectual and causal behavior in the sense of achieving pre-set goals by exploiting means and leveraging contingencies*.

Overall findings of this study are visualized in Figure 2.

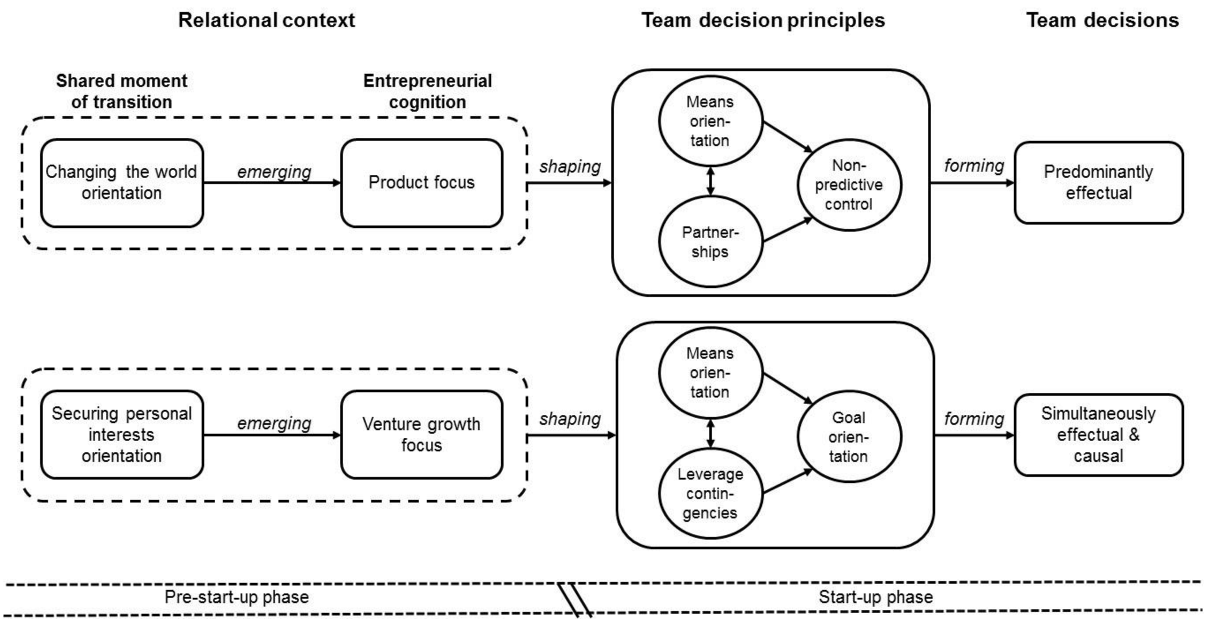

Fig. 2 A model of the relational pre-start-up context and its impact on decision behaviors in entrepreneurial teams

5 Discussion

This study aims to explore how the shared interests and ambitions of entrepreneurial team members experienced in the pre-start-up phase provide a relational context for joint effectual/causal decisions. Specifically, our findings show how effectual and causal decisions are contextualized in so-called pre-start-up *shared moments of transition (SMT)* – intense life-changing moments, which are highly susceptible to stimuli from social context (Mathias et al. 2015) and during which the initiative to co-create a venture, and the framework for how this venture takes shape, are formed. These SMTs happen when teams simultaneously experience four events: (1) a *collective urge for action*; (2) *a similar motivation for change; (3) a strong feeling of interdependence* and *(4) a transition trigger*. They occur in two distinct orientations reflecting cofounders' ambitions for either *changing the world* or *securing personal interests*. Related to these orientations, collective entrepreneurial cognition emerges that is either *product*- or *venture growth-focused*. Together, these cognitions and orientations represent the relational pre-start-up context that shapes team decision behaviors. Specifically, as illustrated in Figure 2, teams with a *changing the world* SMT and a *product focus* displayed mainly effectual behaviors whereas teams with a *securing personal interests* SMT and a *venture growth focus* concurrently displayed causal decision behaviors.

5.1 Theoretical contribution

Our findings have implications for the theoretical and empirical validity of effectuation (Arend et al. 2015; Read et al. 2016*)*. The empirical validity of effectuation is enhanced by focusing on entrepreneurial teams to examine how decision behaviors are related to the shared interests, interdependencies and cognition that emerge in the pre-start-up phase. This focus is distinctive because although there is extant work on team cognition and decision-making (Eisenhardt 2013; Ensley and Pearce 2001; West 2007) and on how collective attitudes, beliefs and team interactions influence team dynamics (Cannon-Bowers and Salas 2001; de Mol et al. 2015), it is rare to see studies directly linking social context, team dynamics and decision behaviors. Our findings provide a new empirical angle to both team research and effectuation by linking these aspects and tracing the intensities of effectual and predictive decision behaviors to the relational context in which they are produced.

The theoretical validity of effectuation is advanced by showing how effectual and predictive logics are contextualized in the situationally-intense (Baron et al. 1999) and pivotal pre-founding, shared transition moments. Rather than emphasizing the contextual sensitivity of decision behaviors (Sarasvathy 2008), we adopt a relational view of context (Fletcher and Selden 2016) which enables us to contextualize entrepreneurial agency in relation to what has happened (past relations, ambitions and cognitions), with what should happen now (decision principles), and what is intended to happen in the future (purpose and priorities for the business) (Fletcher and Selden 2016, referring to Emirbayer and Mische 1998).

By examining how team members align their mutual interests concerning the venture's purpose, our findings illustrate how two distinct SMT orientations emerge. This parallels the work of Fauchart and Gruber (2011) and Grimes (2017) who show how founders privilege the association between their creative ideas and their self-(identity) concepts. In our study, however, we take a team focus rather than adopting an identity lens and create a new theoretical construct (SMT*)* to acknowledge the collective and trust-based interdependencies shared within teams. This construct makes a distinctive contribution to the literature on teams, cognition and decision behaviors in that it captures how shared cognition is co-created from the team's relational context.

5.2 Implications for related literatures

Our findings have implications for related literatures. First, they add to work on social identity (e.g., Fauchart and Gruber 2011) by showing how SMT orientation, which can be related to team social identity, emerges and influences venture decisions. Second, they extend research on the nature and role of contexts for entrepreneurial behaviors by showing how we can account for the 'multiplicity of contexts' and their changing meaning for entrepreneurial cognition or decision behaviors (e.g., Fletcher and Selden 2016: p. 81). Third, it adds to entrepreneurial imprinting (e.g., Mathias et al. 2015) by illustrating how shared relational pre-start-up contexts and cognition imprint decisions.

5.3 Practical implications

Team cognition and how it emerges in entrepreneurial contexts is often an intuitive and intangible process to team members. We suggest that entrepreneurial teams should explicitly acknowledge their relational pre-start-up context including their shared cognition as this will sustainably shape the way their venture develops, (i.e., having implications for their value proposition or their adaptability to unplanned events). This is particularly important in uncertain environments where contingent events can threaten the purpose of the team. Such an awareness can help teams to be alert to the fact although the (political, industry) context of their venture is always in flux, it is possible to maintain a degree of continuity through this unpredictability if their core vision, identity, and intent is clear and explicit. Education institutions could, therefore, integrate material about the context-specific issues that characterize the pre-start-up setting and focus less on generic models that gloss over these specificities. Finally, incubators could embrace more variety in the use of tools for evaluating the performance of hosted firms with less emphasis on the use of forecasts and plans and more on helping ventures to appreciate the value of their micro-foundations – foundations that can aid sustainability.

5.4 Limitations

This study also has some limitations. First, our sample includes only young incubator-hosted ventures, which gives rise to a potential for endogeneity. They differed in terms of their industry, age, size and market uncertainty, and as these factors might influence team decisions, future studies could investigate the propositions with non-incubator or sector-specific ventures. Second, this study focuses only on transition moments and cognitions that are shared. However, those that are not shared might also impact team decisions and would be interesting to explore.

6 Conclusion

To conclude, shared pre-founding moments of transition and entrepreneurial cognition provide the relational context for effectual and causal decisions of entrepreneurial teams in new ventures. We trace how decision behaviors in teams are connected to the relational context. In so doing, we demonstrate the theoretical potential of effectual logic for enabling a theory of context (Bamberger 2008).

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Appendix

See Tables 3, 4 and 5

Table 3: Shared moments of transition (SMT)

Team	SMT component	Exemplary statements
Shared moment of transition: Changing the world orientation		
EduCo	*Collective urge for action*	*Eric*: [The product] has originally been started in 2002 as joint project between [two research institutes]. When the project started to become more and more successful and well-known, [research institute] decided to create a spin-off as it was not its main target to proceed with the commercial activity. I was already working on the project for a long time. *Elvis*: As I was working already with [research institute]… And then they asked me if I wanted to lead [company] and I said yes.
	Common motivation for change	*Eric*: I was already working for the […] project for a long time and decided to join the new company as I wanted to further expand the product. *Elvis*: I was familiar with the [...] project and its key actors… So the initial idea, the key offering, was not mine, it was already there. *(limited due to the involvement of research institute)…*This was really a unique and convincing opportunity for me.
	Transition trigger	*Elvis*: I immediately started searching for a second investor right at the beginning as (research institute] did not want to create the spin-off without this investor. Luckily, I found [company], a leading [player in the field].
	Feeling of interdependence	*Elvis*: I started with coding and pre-sales support working for bigger firms but moved then to business development and management when I was working for start-ups. … Ed and Eric were already working together on the project for several years. And I worked on different consulting projects with them. So we complemented each other very well.
PureCo	*Collective urge for action*	*Pete:* I felt that I needed some new challenges, a new project, and adventurous adventure. So that's how I decided to quit my previous job with my previous partner and think again about something new. *Phil*: I was in a firm, which was working but not what I was dreaming of… When he proposed me to go into [product area], I thought, wow, that's great because that's totally new. I mean there was almost nothing around that field, so it was kind of adventurous.
	Common motivation for change	*Pete:* I feel it is a success to start from scratch and build something. I think it's really what is waking me up at night and making me want to go ahead. *Phil:* It was a field I had some experience in and where I can make a difference.
	Transition trigger	*Pete*: Actually, that was the chance, like the lucky draw I had because it was the end of a cycle for him after two years of developing and trying to stop pushing it on the market. Because he was alone, he couldn't get results. So he decided to stop his start-up, and that's how I invited him to join me.

	Feeling of interdependence	*Pete*: And then, he said: "Ok, I like that, but I can't keep on working [as a service provider]. I want to be your partner." "OK, this is good." And for me, it was then fine and obvious that I anyway would need someone for this part… In 99% of the start-ups, you need CEO and CTO. And in the hardware start-up, it's crucial. If you go without CTO, there is absolutely almost no chance. A CEO alone or a CTO alone is to fail in a hardware start-up because it's really complex and you need these two people like the two legs of the body. *Phil:* Well, so for me, there was an opportunity. So he brought the project, so I mean, I didn't invent, I didn't have this idea of [product]. He brought that idea to me…. One of the points I missed in my other company was someone which was really good at selling. I was much more focused on getting people which were good at engineering or which were getting things done administratively, but I failed miserably at getting someone really good at selling. I feel that Pete is really good at that and at communicating and converting people to a mean.
See	*Collective urge for action*	*Sean*: Sara, who was my colleague and also my best friend said one day to me: "Sean, you want to be smart with your prize-winning ideas… You are managing several projects, you have a secretary but what would be really hard is to create a firm", she said. And "hey", I said to myself, "well, she's right". And I told her the next day: "Well listen, okay, we will create a firm, but you will come with me". She said: "Ok".
	Common motivation	*Sean:* Well, [at my prior company] I did a little bit of everything, I had teams, it worked well, etc. But I wanted more and had more freedom, that's clear. To be free to do a bit what I want… It was an interesting job, but not very flexible, because of the structure of big groups, and had only a limited capacity for innovation. *Sean*: I think she [Sara] was also a bit fed up with working at [prior company] because it was a bit every day the same routine. And she is someone who is not afraid to take risks. So I think it was a little bit unconsciousness and the desire to test something else.
	Transition trigger	*Sean*: Since a few months, we were quarreling a bit without being really angry. And when she said: "You want to be clever – then create your own firm." And I said: "Yes, let's go" the next day, I never thought she would say yes. So I do not know if she really thought or she just said it to kind of "play".
	Feeling of interdependence	*Sean:* We were very complementary as she often saw things that I didn't see and vice versa… Sara was listening to feelings; she was a woman of this kind. She was very lucid. She was not a person who just said: "Yes, that's it."…besides, all alone I would never have created the company. That's for sure that if Sara had not been there, I would not have done it. *Sean:* So I think it's necessary to have complementary teams with people who do not always agree with each other. Because if people always agree, this will not create value. And then, I think, the role of an entrepreneur is just to manage antagonists but to manage contradictory problems or ideas in order to find the best idea in a particular context that may not be applicable tomorrow. I believe a lot in this…
TechCo	*Collective urge for action*	*Tom*: The original project is a personal project… We created a company because the project was visible on the internet and people asked for more. They wanted to use the project for enterprise use.
	Common motivation	*Tom*. So I did this project aside work, and finally, I like it. It's much more difficult, it's much more work, but the outcome is so bigger than - it's not in return for money, and I think everyone really likes it…. And now, you go to work not because you have to get money but because it's your lifestyle. You go to work, and you do it with your team, so the team, and we try to do that, they come to work because they like to do some incredible project… I think the solution is just, you make something in what you believe, and something will happen around you. *Tess:* It's a bit like a life, it's developing, it's strange but it's a bit like that. … I 'm his wife, I am very connected to the project but I think, I like the start-up because it's different: you don't work to work.

	Transition trigger	*Tom:* So, for us, it was risky because when you provide something, you must have a sort of a contract, licensing, even if it's a freeware project. So we created a company to protect ourselves from any issue with the company using what we did aside work.
	Feeling of interdependence	*Tess*: And when he started, it was difficult because he worked a lot, a lot, a lot… And one day he asked me: "Maybe you can help me a bit?" and I said: "Yes, yes, of course." and I don't know, it's something great… He is good at a lot of things: technical, legal, strategy. He knows, I don't know how, but he knows how to keep away a problem… But I am not technical… I like organizing, but I never handled the sales part in another company than here. *Tom:* We have got skills. For example, I know how to deal with a partner. So I do it, and I discovered how to make a good presentation, how to sell something. So I do it, and people just do what they are good at…But in the end, I do the technical things.
Shared moment of transition: Securing personal interests orientation		
ManuCo	*Collective urge for action*	*Mia*: In fact, we wanted to do what we are doing in our previous company, but it was not the core business of the company. So then, we came to a point to say: "What do we do? We keep with the core business of the company where we are comfortable and have a good position, or we do it ourselves?" And we chose to do it ourselves.
	Common motivation	*Mia:* We created the company to create our own jobs and to find solutions for the customers…I mean, we are working even more than before, but as it's our own job and you can manage it still with your personal life, the balance is better, the energy is also there.
	Transition trigger	*Mia:* But on my birthday in 2008, I visited a customer and then I went back with a big order for XX€. But we needed to have new equipment for that. And we asked for the capex in our group, and they refused it because it was not their core business… So I couldn't give the solution to the customer, and on the top of it, I knew it was a profitable deal. And that's when I said: "Ok" when they asked me, "Well, not a bad idea."
	Feeling of interdependence	*Mia:* We will not have done it separately, create our own company alone… We are not friends; we don't see us outside of the business. We don't see us every day. When we can join, we are happy to join, but we don't do it on purpose. But I trust them and they trust me – more than friends… Because we met thanks to the previous company, we found we are very complementary and that we have ideas and that we could do this together… We know the children…We know the wives, we know the husbands… and we share already a lot together, and we share things that we don't want our families to share. …When you create your company when you are 45 - we have all children being students - you take risks, but at the same time you do it being "bon père de famille"…
CyberCo	*Collective urge for action*	*Craig*: I think the initial motivation was first the fact that we had to find a new job. So, because we were thinking about doing something for a long time mainly due to frustration with our existing company… We have been acquired by a big organization, a worldwide organization that changed from one day to another the strategy. And what we were was nothing. *Chris*: Before we were a little company and then we were bought by a big Telco. And we saw when you are in a big structure, nothing is flexible. All the other players weren't happy with this situation, and also the customers were unhappy with the service that was provided to them. There is not the flexibility and Luxembourg is a tiny country, so we cannot have the process provided by a big group because it's too much for the size of the country. That's why we decided to create our own company.
	Common motivation	*Craig*: We used to work, we used to be successful in what we were doing and came to the conclusion: "Ok, perhaps we can try to do that ourselves for ourselves with our values and our way of doing things." And that's how we started. *Chris*: And of course, that [creating our own firm] allows us to have more liberty to do what we like to do. That's the main focus. It's not really the money because we had much more when we were in the big group.
	Transition trigger	*Craig:* Oh. I think the initial motivation was first the fact that we had to find a new job.

	Feeling of interdependence	*Craig*: I knew him, and I don't know what he is thinking, but I knew him on the fact that even if it was difficult to work together, you can trust him…I know how he works and he knows how I work. I know, we can do the same things so that it would be a good combination… So, we know where we are good at, we know where we are bad in and so we play that game together… I think we have got the same fundamental values: for gaining customers, work, long-term and all this kind of things… *Chris*: We have worked together for six years in the same office. So I know how he works and he knows how I work…. We know each other very well. I can decide without him because I know what he [would do]… I think because we have the same age, nearly, we have the same situation. So that is also why it's clear. You know, when we started, his wife was at home, my wife was at home, we have the same number of children, and we have the same age. We have the same view, we have the same friends, so that helps to have the same strategy and the same vision
GameCo	*Collective urge for action*	*Guy*: The whole market is left behind like 15 years. So there is a real potential to grow the game through technologies. And so I thought it was a perfect moment to start very early because I didn't have any responsibilities: no family, no wife. *Glen*: We realized that the market was super fragmented and that there was an opportunity for us to work in that field …. At that time, we were young, and we were like: hey, if we don't do it now, we don't have any responsibilities, and if we don't do it now, it will be harder to do it in ten years.
	Common motivation	*Guy*: Obviously, what made me decide to found the company so early was really my passion for the golf industry and the vision I had for it. *Glen*: Well, we saw a massive opportunity in the field where we are super passionate.
	Transition trigger	*Guy*: And then I started working in Geneva in private banking and what I felt was that actually, I was learning a lot more from my entrepreneurship experience than staying in the bank for six months. And I didn't see myself just doing, I would say, general work for the next 20 years of my life and not growing as a person and as an entrepreneur.
	Feeling of interdependence	*Guy*: So he actually loved the idea and started to help me. And suddenly we became a team very naturally. It was not even that I had founded the company and told him I am going to get you in. It was rather like, ok we were brainstorming this idea. It was somehow very different when I first thought about it, and suddenly it evolved together. And so it made sense to have him on board…So why Glen? Simply because he was a great fit for me and also because he was very similar to me as well… I think trust was great, and also we come pretty much from the same background: We played the same championships internationally, we traveled, we know the same people. So it made a lot of sense, and it was easy to start working together. *Glen*: He shared his idea with me and straight away I was hooked…We discussed that idea and how we could bring all the golf industry together. And it was just natural; it was a natural feeling... We had two similar profiles. So we both have a finance background... So in the beginning, it was pretty hard, I mean, I guess it helped us in making decisions because we had both the same experience… So both of us are quite keen golfers, we are passionate golfers since our tender age
DataCo	*Collective urge for action*	*David*: I decided to start the company because everybody wanted to buy the proof of concept, an investor wanted to invest. *Dana*: So we went to the first sort of network and wanted to see if they would be interested in that technology. And they were super interested, and so we decided at that time that it was the right time to start the company.
	Common motivation	*David:* I always wanted to do that project for like 15 years. And it took me like ten years to do the research and development… We will prove it's possible to be the next Google from Europe! … We are the only one in the world who have this technology right now. This is why all the big guys like Google, like Microsoft, are interested in what we do… *Dana*: We always knew that we wanted to start the company. …I have known about the technology for many years. …and so I loved all of that. And so, I just wanted to do everything possible to make sure the company could work.

	Transition trigger	*David:* We did sales before incorporation. So that's why we started the company… If you don't start a company, you can't invoice the customer.
	Feeling of interdependence	*David:* Dana is my wife. I guess we were together, it's always easier…. She does exactly the same as me. We are basically the glue. *Dana*: I was doing so many hours of work on the side of my job that when we first started, it made sense for me to start it with him… It was all a mutual decision of how and where and when and all the stuff…we do completely different things. So I think, that was really important to us when we started the company. Especially when you are a married couple, I think it's a massive risk, but if you can put it off, it can work really well. *(partially conflicting view)*
LifeCo	*Collective urge for action*	*Levi*: So with the research results that we have achieved so far, we are currently trying to convince investors that it makes sense and that they come on board. *Lane*: In order to realize a Proof of Concept in the area we still need funding. This is precisely the problem that the company has: Finding money/venture capital/business angels/others who are willing to finance this high-risk phase of searching for an active ingredient.
	Common motivation	*Levi*: Particularly in this environment, where founding activities are promoted in Luxembourg, it is important to me that I use my dual expertise to start new businesses…What is important to us is that we find so-called biomedical relevant drug targets, i.e., medically important genes, which could then play an important role in drug discovery. *Lane*: Ultimately, [we aim] to leverage opportunities in Luxembourg's research landscape to found companies here in Luxembourg, to create jobs in Luxembourg… [Our company] is now actively looking for drugs. And we have a research program at [research institute] and hope that perhaps we could accelerate the research through partnerships with such a small company.
	Transition trigger	*Levi:* Of course, we had little money at the beginning, so that we could only progress so far in very small steps. But then at some point, we asked ourselves: "How much money do we need to take the next bigger step?" And this money we are now trying to find as an investment somewhere.
	Feeling of interdependence	*Levi*: He is on one side the main reason why I came here to Luxembourg… Back then we founded a company … We had a good cooperation… and when the opportunity came to work with him on the research level here, I took it. As a mentor, he is really unique… Our interaction is mainly in the academic sphere… and the main discussion points we have are in the academic field of research… We know who we can work with and collaborate with, and with whom we cannot. *Lane*: He works here as principal investigator and has built up [project platform]. But we already knew each other. 12 years ago we have already founded a company together… Levi and I, yes, we have similar mindsets... We have similar competencies for setting up a business in the [...] scene and realizing opportunities in this field by using venture capital.

Table 4: Entrepreneurial cognition

Team	Exemplary statements
Product focus	
PureCo	*Pete*: That's what is killing me in terms of having people postponing or looking around the big thing behind the bush and not daring really to go with the technology and implementing it…The mindset in our team is: people don't want to give up. They want to do it; they want to succeed, really project-driven, success-driven, but in the real, not the subjective personal or financial way, it's really making it successful by delivering it.
	Phil: For me to be involved in making a consumer product drove me into this company… On the idea side, it was really a project, which fit me perfectly… One of the really interesting things of the business of building a product is the R&D part because it's where new ideas emerge and where you test stuff and where you are building the port for the product you are doing.
SeeCo	*Sean:* So we began to develop products because our idea was to have a product orientation and to propose innovative products for the B2B market based on new experiences… Regarding (product 1], clearly, there is no competitor at all. We try to produce what we are developing, that is, we do not try to make tailor-made. We try to capture the customer's need, to synthesize it, in all our customers, to make a product that we try a little bit to impose on our customers to make it easier to maintain.
EduCo	*Elvis*: My motives were mostly product opportunity driven, and other personal reasons were less important… I wanted to realize a unique and very promising opportunity with a great product…We are offering a disruptive product. So we definitely plan to influence others and set future trends and don't want just to follow the market. And we see that this seems to work because others start listening to us and even try to follow our approach… Our focus is on innovation within the standards.
	Eric: My primary motives were product-related. Of course, personal motives like being my own boss or being able to really drive decisions were there as well. But these come afterward.
TechCo	*Tom*: The business was created by the product, by people working on something not getting money first… It's cool because as a technical guy, I know that I like it myself, and if I like it myself and I have got the same skill as millions of other software people, so if I like it, there is a chance that they like it… I think the solution is just, you make something in what you believe, and something will happen around you.
	Tess: I never thought about this kind of company at the beginning… and then I saw that it is something great for him… and I don't know; it's something great… I can't explain because it's a feeling.
Venture growth focus	
ManuCo	*Mia*: We created when we were over 45, and we said: "Ok, we have still 15 years, 20 years, depending on how fit will we be because the motivation interest is still there. And how do we want to make it grow."… Here it's mainly to make it grow because in the first phase it's a bit slower because of the investments and in the end, none of our children will be our successors. So we will have to sell it at a certain point. So let's make it bigger and more profitable… Everything we have made, we reinvest in the company and our people.
GameCo	*Glen*: What we try to do is to build a scalable product, and that can actually scale in any country in the world. It's what we have now. And so the opportunity is really big… So every Euro that we spend is supposed to bring a real return, whether it's monetary, user growth, brand awareness or even credibility we build in the market, you know, or trust.
	Guy: The main reason was that we saw a real opportunity in one area and therefore decided to go for it… Although the market is declining, for us it's a massive opportunity to bring something new in the industry because, in the end, the industry leaders or companies will try to find a way to recap growth in the market and stop the bleeding.
CyberCo	*Craig*: The foundation between him and me is that we invest if we think that there is a potential that tomorrow it will produce added value. The only thing that can change is the delay with the return.….That's why we said we would create that company for two reasons: The first one is because

	we want to create jobs that we enjoy every day. And the second one that perhaps in ten years we can get benefits of the investments we have made. *Chris*: We need to grow. We need to reach the XX million € of turnaround, of figures to resell…..
DataCo	*David*: And the goal is just to grow the company and maybe sell the company to Google for a billion… I think you just need to find an investor at the beginning if you don't have any funds. You just need to convince them; then you go into conquering the world. *Dana*: I think in this game of where we are, you can only grow as a company in our space, our technology space if you have money for growth. And I think the best mean to get money for growth is through investment, especially in the early days.
LifeCo	*Levi*: Of course, the main motivation is to bring the drug to the market in order to help patients and, of course, to be economically successful at the same time. That means that the company can then successfully continue to license these drugs to pharmaceutical companies and that, of course, we hope for a profit for the investors and ourselves. *Lane*: In order to achieve proof of concept in the field at all, funding is missing. That's exactly the problem the company has. To find money, venture capital, business angels, others who are ready to finance this high-risk phase of drug discovery.

Table 5: Effectuation and causation indicators

Empirical indicators	Exemplary statements
E1 - Means orientation	
• defining goals by experimenting with different business models, products within given means	*Pete:* If we really find the right path to success and a business, we should be growing like times three to times four a year, that's the idea. Now the thing is, in the beginning, you don't know when that could start. Once you got the first real increase, you know how you can scale, but until then you have to iterate and pretty create your path and business models.
• having a shared vision based on own imagination, aspirations or experience	*Sean:* The biggest challenge as an entrepreneur is to have a clear and solid vision … as well as a kind of positive paranoia, allowing yourself to call things into question in a positive way.
• leveraging local infrastructure, support mechanisms & start-up ecosystems	*Mia:* For me, the key to success is knowing how to take advantage of the experience and skills of the mentors and coaches, and being able to take advantage of the network of entrepreneurs which allows us to fast-track our development, especially internationally.
• no initial conscious intention to start a business when detecting an opportunity	*Levi:* Oh, we just saw that we had a technology that would have potential beyond the academic lab. In this respect we did not look for a solution, we already had one where we have seen: "Okay, this platform has industrial, commercial potential."
• starting with available knowledge, skills, resources, networks, passions & preferences	Dana: We basically decided that we want to start the company. So we moved from Brussels to Luxembourg. We started to get together with our friends and family to try and raise some money. Once we had an idea of people that could potentially invest their FFFs, then we decided that we could start the company.
E2 - Affordable loss	
• investing carefully and in small steps to ensure profitability	*Sean:* We never lost any money. The firm has always earned money even if it was sometimes almost zero. ... I am very cautious on the contrary. Thus, I will invest what I have, this is for sure, but I will invest the possible minimum for having the maximum of results.
• investing what can be afforded based on own risk perceptions	*Phil*: We would like to have a top PR firm that would get us an article in Wall Street Journal or NY Times but we know, we don't have the 100.000 to do that. So we make our lower bet, lower the investment and try to find the best of what we have.
• making affordable personal sacrifices for the benefit of the firm (time, money)	*Chris:* In fact, Craig and I didn't take any salary in the first two years. We started to have a junior salary now because we have invested everything again. ... In fact, in the beginning, we asked my wife and the wife of Craig to work for the company, but for free.
• seeking for low-risk financial resources that limit dependence on institutional investors	*Elvis*: We did not actively consider to contact venture capital firms as this kind of funding would not fit the company's purpose and also not match with its open source product. We are growing organically, which is often a bit slower but allows us to stay more independent.
E3 - Partnerships	
• collaborating with others to test, improve and extend the product	*Elvis:* We exchange even with competitors. This always helps us very much to develop our product further and identify the necessary adjustments.
• engaging in trust-based partnerships to pursue joint opportunities or goals and expand resources	*Tom*: It's nearly impossible for a start-up to compete because you start with one brick, and two and three bricks. And to match the need of one company, it's not one brick, it's all the integration… We are now signing a partnership with a big company in the US. So, this company will start selling under its brand some of our products in the US.
• evolving the product through an early, continuous customer dialogue	*Tom:* In fact, every day we have got some cool ideas, maybe we, maybe someone else … and sometimes the customer. And we build on the super cool ideas

	we have, so, for example, we have like 10 in the box today to be developed, and there is no analysis at all.
• participating in events, initiatives, contests to present products and enhance stakeholder network	*Tess:* But it's as you said, you have to speak with lots of people. And there is something great in Luxembourg, in a bar, I don't know the name, there are a lot of start-ups over there, and you can discuss.
• sharing and discussing ideas within own networks to get valuable advice and reduce uncertainties	*Phil*: I would always share a lot with every one of my network. … I mean, ideas might not be worth a lot, but if you find a right way to present them, it has a really great impact.
E4 - Leverage contingencies	
• accepting firm issues and learn how to overcome and control them	*Mia:* We didn't have our own shop floor and I had a contract, but they put the price up by 30%. So each time, I was selling, I was losing money. So then we did make the decision very quickly to create the shop floor with the help of the mentor I had, I was in a business mentoring program at that time, so we speed the things up and within nine months we started and were profitable by the end of the year.
• adapting flexibly and fast to environmental changes, market feedback & new requirements	*Elvis*: When we started our business, we assumed that the majority of our revenues would come from professional services and only a minor part from usage fees. But as we saw that this did not work, we completely changed it and are about to transform into a SAS-based firm with an opposite revenue source share than initially thought.
• evolving the firm as opportunities emerge	*Chris*: So each time we take a new employee, the strategy changes. For example, we are doing security, but some consultant we took didn't have any knowledge of security, they have knowledge in storage. And they say I would like to do storage; you can come and do storage if you want. And we can add this competence to our team.
• seeing unexpected surprises as opportunities to create new value or realize unplanned discoveries	*Sean:* In some way, the departure (of my two associates) finally became a huge opportunity and I would not have said that two years ago. I was on my own then, but it was still necessary that the firm evolves as I had already some visibility in the market. I had no choice but to succeed. And so I created (our key product).
E5 - Non-predictive control	
• focusing on own abilities or cooperative strategies to shape future trends	*Sean:* There are no competitors worldwide. We are the only ones who can do (this). …And it's this technology that [global player] wants to buy.
• having the aspiration and imagination to create new opportunities and markets	*Phil:* Well, the whole company is based on changing the future way we think about air quality... It's a really new field.
• proceeding without thoroughly predicting future market developments	*Pete:* It's a nascent market in the sense of a new market where a lot of people, a lot of actors are really getting frantic about it. But it's hard to know; they have a hard time approaching this new technology.
• striving to continuously evolve the firm without making detailed plans	*Tom*: My point of view: if people think they need a business plan to make a successful idea, maybe it's not good because it must be there before. …And certainly (we will have) something like 16 employees until the end of the year. I don't know for next year we don't do a forecast for more than a year.
C1 - Goal orientation	
• acquiring resources that are needed to achieve a long-term goal	*Lane:* We are currently looking for partnerships with the pharmaceutical industry that help us already in the search phase for the active ingredient by providing the necessary funding so that we can do the preclinical research and our partner will get the first right of negotiation.

• defining fixed goals based on business plans and go-to-market strategies	*Guy:* So I wouldn't think that we ever leave anything to chance like opening the fridge and hoping that something can get out. We always kind of set milestones over a period, let's say 3, 6, 9, 12 months and then we know exactly where we want to go and what we want to have.
• having a shared vision involving strategy definition & analyses	*Craig:* I did an executive MBA in order to get that long-term vision, the basis, the toolkit and all these kind of things. And the conclusion is, you need to know the tools in order to avoid to use them badly.
• knowing how the firm should look like at the end (business model, value proposition, market, size)	*Guy*: We know how the company will look like in the next two to four years. Ten years is difficult to say.
C2 - Expected returns	
• actively searching for institutional investors	*David:* So it's like if you have lots of money in your bank account and you can start a company, or you try to find investors. So we didn't have much money on our bank accounts, so we did find investors.
• aiming to maximize financial benefits taking into account higher risks	*Chris:* If we take the risk, we know, the return on investment will be in five years, ok, we will wait five years to have the profitability. But we don't mind because we know, one day we will receive a reward.
• calculating and estimating planned profits, results or firm value	*Mia:* So if we compare with the size we have, and we have done that exercise because we have made an evaluation of the company now, and the share is now valued at 4.5 more than what it was in the beginning.
• investing with larger amounts or in short intervals to quickly evolve	*Levi:* We are looking for an investment of 5 million in the first round, in the second round in 2 years it will then be around the 10 -20 million, mainly to develop drugs. Most of the costs we have are not necessarily internal costs but external, because we then pass on partial tasks to third companies.
C3 - Competitive analysis	
• carrying out systematic market research and analyses	*Glen*: ...we are developing our platform and growing in continental Europe, in the UK, well, that's the first market that we tackle, and then we are going to set up an office in San Francisco to develop the US market from the second semester. But obviously, the golf market is pretty big in the US with 25 million (potential users).
• cooperating and sharing ideas with others is limited (others = competitors)	*David:* We did show it to a few people but I think we knew we were on something, so it was not, we didn't have to show it to the world.
• realizing competitive positioning based on knowledge about competitors' pricing, products, procedures	*Mia:* In our business, the people who machine the material, who produce the material we are machining, are also competitors. But sometimes, they are not entering some markets because they don't have the close relationship we have with some customers.
• seeking formal partner agreements to reach predefined goals not sharing the venture's risk	*Craig*: I used to say: Let's start to work together. If it's successful and if we are bringing money to the table it will be easier, but that's partially only right. So you need to formalize. And you need to formalize, not all in details, but what happened if things will be bad, ok. What will be your part, what will be my part if we separate?
C4 - Avoid the unexpected	
• integrating controls to avoid plan deviations	*Craig:* Our goal is to grow fast and to have a representative in most countries in Europe. That's why we discuss. Even if we say no to six propositions that we received, we continue to discuss with lots of investors.
• making detailed plans for market interactions, product, and firm developments	*Phil*: A hardware product needs about 18 months to reach the market, so there is a really higher need for planning. And some decisions you take them and only eight months after they would really enter into production. So, all the hardware part is much more on the side where you plan, and then the execution comes.

• omitting short-term opportunities in favor of fixed long-term goals	*Mia:* We were able to have big markets in 2010 in China, but we would have closed the company the year after. ... And we will not take a risk to go and show that we can double the turnover and we build 5 million €, and that will cost the company.
C5 - Plan the future	
• acquiring market shares in existing markets through competitive strategies	*Dana:* We are disrupting an already existing market. So the market already exists. There are already lots of big players in that market, and we plan to disrupt that current market with something new.
• acting based on externally validated predictions of own firm developments	*Glen:* But we still look at our business plan to see where we are compared to our forecasts and see for why we happen to be there. But so far, we have not exceeded our forecasts.
• selecting options based on forecasts of external developments	*Glen:* The golf industry stayed pretty far back in terms of technology, so they didn't really embrace the digital turnaround year 2000. And therefore, we see this as a massive opportunity.