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From a Hobby to a Business: Drifting through Paradox While the Business Accelerates

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Abstract

Our longitudinal case study investigates the emergence of an embryonic business from a hobby. As the hobby evolved to become an entrepreneurial venture, the dimensions of play and work engaged in a paradoxical tension that dynamically persisted, spiraling, as the business unfolded. The process of turning a hobby into a business progressively imbricated two opposing disciplines, those of play and work. As a result, inherent tensions between them have to be managed. Turning these tensions into a source of vitality to be nurtured, rather than framing the tension as a dichotomy to be solved, is seen to be vital to the continuation of the venture.

Keywords: paradox, paradox emergence, user entrepreneurship, hobby.

Introduction

We explore the progressive imbrication of play and business in an entrepreneurial new venture. Barley et al. (2017, p. 113) suggest that in the past entrepreneurship research overlooked "the idea that some people are able to turn their hobbies into paying businesses". In this case, after a transition period, in which the business was put to the test via an ad hoc organization created "on the side", formal organization followed. The transition from users/hobbyists to successful small business owners and entrepreneurs generates paradoxical tensions (Demetry, 2017) that are challenging and rich in tension, articulating two opposing emphases of work and play that become progressively enmeshed. Much is known about existing paradoxes but not about their origin and inception; hence, we ask: how do entrepreneurial paradoxes emerge – in this case from the combination of work and play - and how are they navigated over time?

To answer this question, we adopt a phenomenon-driven (Ployhart & Bartunek, 2019) inductive approach via an explanatory case study method, allowing tracking of a real process over time (Yin, 1994). We adopt a courtroom approach to the evidence (Eisenhardt, 1989) that, based upon data, arrives at a phenomenological understanding of the processes involved. While the literature has investigated the role of paradox (Gaim, Clegg, Cunha & Berti, 2022; Smith & Lewis, 2011; Pradies et al., 2023), less attention has been paid to the emergence of paradox. We elaborate the evolution of paradox dynamics over time. Our work focuses on how persistence, a core attribute of paradox (Gaim, Clegg & Cunha, 2022), dynamically persisted over time. In other words we discuss how persistence persists, meaning that the poles in tension are the same but such sameness gains different forms as tensions metamorphose over time.

Empirically, the case discusses the business known as NR3D, an example of a serendipitous business opportunity emerging from a small garage, that legendary locus for entrepreneurship (Audia & Rider, 2005). The garage constitutes a liminal space between work and home, a space in which crafting, tinkering, and playing are the norm. In the garage, a father and son, Vasco (who later founded NR3D) and Rafael (Vasco's son), were slot car aficionados whose hobby turned into accidental entrepreneurship. In the process, not initially for business reasons but for passion, a new venture emerged (Shah & Tripsas, 2016). Such a combination marks also a 'liminal' space of 'entrepreneuring' (e.g., Garcia-Lorenzo et al., 2018) where play and work precariously diverge and coexist at the same time. In our case, passion, end-user innovations and digital technologies provide the conceptual backbone for our discussion. We contribute to entrepreneurship via paradox theory by explaining how the navigating of paradox was used to preserve equilibrium dynamically between two opposing emphases: play and work. Such balancing, however, over time, involves varying challenges and different points of equilibrium, denoting that paradox persistence is a process in constant flux. That in the specific case emerges 'attributionally' as a constant negotiation between the organization and its environment (Koch et al., 2018). In a context of digital transformation, our case brings an element of transparency, highlighting the tensions that permeate digital entrepreneurship, given the explicit combination of work/business and play. Additionally, the paradox literature has represented tension as a source of strain and psychological discomfort which creates defensive responses. Our case reveals something different: the tension was perceived as normal and welcome. The singularity of the case, even though creating constraints to generalization, offers a limpid setting to approach user-innovation from a paradox perspective, as we elaborate next.

Theoretical Background

There is a stream of literature that studies the role of passion in entrepreneurship (Cardon, Wincent, Singh, & Drnovsek, 2009). Passion is defined as a psychological energy that deeply animates and engages people in their activities (Cardon et al., 2009). According to the literature, entrepreneurs have an emotional connection with their projects, activities or products and services (Warnick, Murnieks, McMullen, & Brooks, 2018). In some cases, passion for a hobby extends into a passionate business, retaining a dimension of serious play (Sørensen & Spoelstra, 2012). As such, rather than born of economic rationality, these "creatures" emerge from labors of love. If work can sometimes be serious play, in the case that concerns us, play beco mes serious work. More needs to be known about the interface between work and play, if only because work in start-ups and post-hierarchical organizations often appears to be closer to play (Cable, 2019). Instead of understanding how work becomes similar to play, we will explore how play becomes increasingly similar to work.

End-User entrepreneurship

The importance of liminal spaces for the process of converting hobbies into businesses is clearly important (Garcia-Lorenzo et al., 2018). The garage is the space in which our hobbyists became hobbyists–bricoleurs, where the 'organizational analogue' resides (e.g., Scalfi Eghenter, 2018). Bricolage refers to making do with available resources (Weick, 1993) in order to solve problems. In the case studied here, the problems arose from user necessity. Users are important sources of innovation (Smith & Shah, 2013) and can become entrepreneurs; as a passion is shared with a community of practice, hobbyists can turn into user entrepreneurs. User entrepreneurship is defined as "new venture creation by individuals based on innovations aimed initially toward satisfying their own needs for a new or improved product or service, and subsequently produced and sold to others" (Agarwal & Shah, 2014, pp. 1119–1120). The need in our case was for something unavailable in the market that end users innovated in an under-researched process of end-user entrepreneurship (Agarwal & Shah, 2014). User innovators often test their ideas in small networks of user communities before launching formal ventures (Alvarez, Barney, & Anderson, 2013). User communities provide important benefits, such as feedback regarding improvements, creation of potential markets, and information about opportunities (Agarwal & Shah, 2014).

Digital entrepreneurship

Increasingly, new digital technologies are being used as conduits for the process of digital entrepreneurship (e.g., Ghezzi & Cavallo, 2020; Schoder & Yin, 2000). Digital entrepreneurship was instrumental in the process of a hobby becoming NR3D. In the absence of digital affordances, the process would have been difficult, if not outright impossible. New digital technologies (in this case, 3D printing) played an important role in constructing emerging formulas for user entrepreneurship. Digital technology can extend market reach through the 'back office' roles it provides for micro-enterprises (Luo, Van de Ven, Jing, & Jiang, 2018). Such enterprises would otherwise not be viable because of a lack of scale and capital (Jordan, 2017). NR3D was viable because it could be born digital and benefit from the disintermediation made possible by digital platforms (Teece & Linden, 2017).

Articulating the Streams into a Conceptual and Paradoxical Mosaic

It is only by considering the articulation of the streams discussed above that the case can be fully explained. Hobbyist bricoleurs can eventually make the hobby a business, becoming hobbyist entrepreneurs. Father and son rigorously tested and work-benched innovative improvements to their hobby of slot cars, using shared engineering skills. The hobbyists became innovative users, observed by competitors in the slot car races in which they participated. Based on their innovations, they became entrepreneurs as their success was noted and others sought to access their innovations for their pursuit of the hobby. Slot car fans had long formed clubs to support racers and host competitions; the advent of the Internet formed a global platform for what was once a fairly localized hobby. NR3D was born as a business in an era when the Internet made online shopping for slot cars and parts easier. The advances in digitalization and platforms made the hobby a viable "end-user's new venture".

In the process of the hobby-turned-business metamorphosis, as the NR3D project unfolded, tensions began to emerge, generating contradictions between doing business and being engaged in the hobby. Interdependent contradictions often give rise to paradoxes. A paradox consists of "contradictory yet interrelated elements that exist simultaneously and persist over time" (Smith & Lewis, 2011, p. 382). As the recent stream of research on paradox suggests, paradoxes are constitutive of organizing rather than just being manifestations of dysfunction (Berti et al., 2021). When used wisely, they can be energizing and productive (Cunha, 2022; Lewis, 2018).

Although the paradoxical approach is not new in the entrepreneurship literature (see, for example, Cherrier, Goswami, & Ray, 2018; Kacperczyk & Younkin, 2017), the hobby–business tension in this field is underexplored. As we researched the case, we observed a number of curious oppositions: (1) while the discovery of a business niche was serendipitous, it was preceded by passion and preparation; (2) while the activity was playful, it also implied effort and hard work; (3) while the project became a micro-business, it has global reach. Polarities, generated by tensions such as these, are indicative of the possible presence of paradox. Tensions may not be immediately resolvable; they need to be articulated and equilibrated over time (Li, 2016). There may even be an advantage in balancing rather than trying to solve the paradoxes that arise or make them latent.

Hobbies offer a revealing angle on some dimensions of paradox in the entrepreneurial process. Hobbies are activities pursued for pleasure, out of passion, rarely for profit. Transforming pleasure and passion into profit requires effort and hard work in the face of challenges and failures, the opposite of fun. If passion can be said to permeate entrepreneurship, it is most evident in that liminal space passion turns into a business (Garcia-Lorenzo et al., 2018). Such a space is dangerous, however. Passion can lead to an escalation of commitment and concomitant chaos, whereas business is normally taken to imply a cool head producing rationality, order and discipline, rather than a deeply emotional investment. Passions are usually private affairs, but digital technologies allow passions to flourish online into small operations that can grow rapidly (Huang, Henfridsson, Liu, & Newell, 2017). Microbusinesses can rapidly escalate to achieve massive geographical reach. Digital transformation changes the process of entrepreneurship from a formal, structured, and planned process into one that involves social networks, emergence, and rapid iterations (e.g., Vissa & Bhagavatula, 2012).

As a hobby grows into a business, it is important to introduce discipline; yet, an excess of discipline may destroy the fun, an important motivation in starting the business in the first place and sustaining it over time. An excessive business orientation focused only on the bottom line can reduce personal passion and purpose, alienating the entrepreneur from that which once provided meaning, the emotional center of their being playful and passionate, ultimately depriving the project of its original identity. In studying hobbies-turned-businesses, we thus expand knowledge about the potential paradoxes of entrepreneurship.

Setting

Slot car racing was introduced in 1912 by the Lionel Train Company as an accessory for model train sets. The cars ran on a pair of raised platforms with an electrified train track in a small trench in the middle. The cars were built to a 1:24 scale, each about 20 centimeters long, with conductors on the bottom that fitted into the slot, which had an electric current flowing through it that powered the small motor, while the track guided the cars (Lammle, 2011). In the 1950s, British companies introduced scale model cars that were controllable with a hand-held push-button controller, so that they were capable of achieving variable speeds, thus introducing competition between hobbyists and models.

Slot car competitions vary from informal home get togethers to internationally organized tournaments. Slot car racing offers a cheap and safe alternative to other forms of car racing. It opens up not one but two hybrid spaces or third places (Oldenburg & Brissett, 1982): the racing community and the garage. As Vasco explained, the garage is "our refuge (…) a white zone (…) where you forget all the rest" (email # 21). The idea of the "white zone" refers to an offline space, where isolation protects one from perturbation, a site of focus and flow (email #18). It allows the technically skilled to adapt their cars (see chapter 4 in Schleicher, 2008). Racers can use existing slot cars without any costly or complicated modifications or upgrades and add an app that plugs into the car; it is in this way that the hobby supports an industry.

Slot car racing provides an ecosystem whose business opportunities might appear to be niche but in which a vast range of products (slot clubs, cars, tracks, parts and accessories, as well as controls), supported by new technologies such as 3D printing, make it viable to develop and market products to be sold only in small numbers. Innovative 3D technology, plus the availability of digital platforms, enabled the creation of global ecosystems (Vol Briel et al., 2018) with space for niches, which NR3D, our case business, exploited. NR3D was born as a business in an era when the Internet made online shopping for slot cars and their parts easier. The advances in digitalization and platforms made the hobby a viable "end-user's new venture" (see later, Table 5). Exceptional access led us to explore NR3D as an ideal setting for case study of the ingredients for opportunity (Yin, 1994). Our knowledge of NR3D (described in brief in Table 1) is a result of propinquity: the first author is a longtime friend of the main founder, Vasco. We saw in the case a number of intriguing ingredients, such as the small scale and the global reach, the hobby and the business, the serendipitous and the systematic, the subject s and the network.

NR3D's business success was evident by February 2017, when the top three contenders in the AESlot Club, a slot car association in Lisbon, Portugal, all used chassis from National Racers 3D (NR3D). Eight other contenders in the Club's top 25 also used NR3D chassis. In the national

competition, seven of the top 10 racers used NR3D chassis. As these results suggest, NR3D is the top provider of chassis for the local slot car community. NR3D sells directly (B2C) and regularly to 30 to 50 global customers and does B2B through digital marketplaces and resellers.

Method

Considering that we followed the case from its beginning, we took advantage of the exceptional access to the site that affinity allowed (Eisenhardt & Graebner, 2007), which presented a unique opportunity to understand the process of how a business spawned from a hobby. We approached our single case with sensitivity for process dynamics, shaped by time, something whose processes are best addressed by qualitative methods (Bansal & Corley, 2011). We followed a single case approach because of the singularity of the setting, as well as the impossibility of replicating access. Single cases for which there is unique and unusual access are useful for gaining an in-depth longitudinal understanding of a complex phenomenon. Serendipity, informed by personal interest, is noted as an important source of research ideas (Kilduff, 2006). To preserve the data's richness, we present it in the form of vignettes extracted from raw date, providing "evocative description[s] or … account[s] of … short event[s] or episode[s]" through which "authors reconstruct scenes … [reality] that make readers feel like they are there" (Reay et al., 2019, pp. 207-208).

Table 1
NR3D in brief

Name	**National Racers 3D**
Founded	2015; Lisbon, Portugal
Founders	Vasco C. (1967), a graduate in mechanical engineering and an entrepreneur. He works in the company he founded (Cor Expressa). Rafael C. (2001) is a university student. He worked with his father, Vasco, in NR3D.
Formal status	Independent personal project
Product	Slot car chassis and other accessories
Market	Global, via platform
Websites	www.shapeways.com/shops/nacional-racers-3d https://www.facebook.com/NationalRacers3D/

Source: elaborated by the authors.

Data sources and data collection

In line with methodological recommendations (Yin, 1994), we collected data longitudinally from multiple sources. We did it informally from the beginning and systematically from December 2017 until Spring 2020. Table 2 presents the data sources. Given the advantages of familiarity (Jones & Bartunek, 2021), the process was followed in real time, as it unfolded. Data was collected in a naturalistic, continuous way, mostly via informal conversations and visits to the garage. These informal sources were complemented by 15 formal interviews that served to systematize knowledge and to fill specific gaps, as well as nine informal but directed interactions with friends, family members and members of slot car clubs. We distinguish between *interviews* (formal, recorded), *emails*, and *interactions* (informal, non-recorded). The latter took place in informal contexts in which topics relating to NR3D were elicited but tape recording was not practically possible or socially appropriate. Notes on relevant content from interactions were made within 24 hours. In total, we consulted 16 individuals, in line with methodological recommendations (Zeithaml

et al., 2020). Entrepreneurship research refers to the value of informal contact between researchers and entrepreneurs (Wiklund et al., 2019), and we took advantage of such occasions.

In addition to informal conversations conducted over the years, we interviewed the founders to obtain facts, initially asking "grand tour" questions (Spradley, 1979) such as "Tell me about how it all started". Later, we re-interviewed them to adjust the emerging theoretical model via mini-tour questions to probe for details ("What type of information do you gain from participating in the races?"). We also exchanged emails to verify specific aspects of our evolving understanding and consulted all the limited published material produced by NR3D, as well as its website. We interviewed Vasco's wife, Olga, and friends and slot car members-come-NR3D customers and conducted observations of two slot car club events to gain a direct understanding of the hobby and to interact with members of the community.

We finished collecting data on the basis of two criteria. First, we gathered data until we reached conceptual saturation, a state where new data do not bring additional theoretical insights about the research question (Charmaz, 2001). To verify that we obtained data saturation, we initially shared our emerging model and, subsequently, the paper, in a form of triangulation with Vasco in order to make sure that no relevant dimensions were absent (see more on this below). Second, we followed the process closely as it unfolded up to two key moments: the launch of nShapes (see below), which we see as a potential moment of bifurcation that may qualitatively reorient the project and the Covid-19 pandemic that interrupted the races.

Table 2
Data sources

Source	Description	Goal
Informal interactions	Regular since the beginning of the project.	Gain familiarity with the case in a first phase, clarifications subsequently.
Kick-off open ended interview (90 m)	90 minutes with founders, January 5, 2018.	To obtain a general overview of the project. [interview #1]
Focused interviews (15 to 100 m)	23 interviews (15 to 100 minutes each). [#2 and #3 conducted in 2018; #4 to #17 in 2019; #18 to #24 in 2020]	To corroborate specific facts which required context and explanation. Vasco [founder, interviews #2, 3, 4, 6, 12, 24] Rafael [founder; interviews #5, 7 and 11, 24] Olga [Wife and mother; interview #8] Mário [Friend; interview #9] Vicente [Friend; interaction #10 and interview # 18] Filipe [Friend; interview #13] José [Slot Club; interaction #14] Mário [Father; interaction #15] Fátima [Friend; interaction #16] Ricardo [Brother; interaction #17] Regina [Friend; interview, #18] Céu [Slot Club; interaction, #19] Richard [Friend; interview, #20] José [Slot car aficionado; interaction, #21] Ana Rosa [School educator; interview, #22] Cristina [School manager; interview, #23]
Electronic messages	Regular messages were exchanged with Vasco for clarification and follow-up. Total messages: 74 Interaction interval: December 2017 – April 2020	To clarify specific aspects that required no context.
Document analysis	We consulted all the documents produced by NR3D, including commercial brochures, catalogues as well as online materials.	To gain knowledge about how the project positions itself in front of the public.
Observation	Observation of two racing events (in December 2019 [4 hours] and January 2020 [7 hours]).	To gain firsthand knowledge of the interactions in the community. Informal conversations held with the 10+ and 20 + participants in this specific event, all of them customers of NR3D.

Source: elaborated by the authors

Data analysis

To analyze the case, we examined the data along three major steps. Following the logic of grounded theory, we evolved from the evidence to a more abstract and higher-level analysis (O'Reilly et al., 2012). We did this in three steps. First, we mapped the case, paying special attention to the chronology of events (see Table 3). We organized the data around events, opportunities and difficulties that helped to explain the evolution of the project. In this phase, we tried as much as possible to respect our informants' language and interpreted it in its respective context (Miles & Huberman, 1994). We selected key sequential phases that best described the unfolding of the venture (e.g., pre-NR3D, founding).

In a second step, we analyzed the dynamics of the case according to grand conceptual rather than purely chronological themes. As we examined the case, it became clear that there were three

general themes pervading the evolution of the case: the background conditions that existed prior to the launch of NR3D, as well as the play and work that characterized the venture's evolution. The background elements triggering the venture were the founder's engineering background, business acumen, embeddedness in the slot car community and the opportunities afforded by new digital platforms. These elements were dormant but were assembled together as an actor network in response to an opportunity created by a broken chassis. The "broken chassis" event triggered a process resulting in tension between two additional clusters of themes: (1) the work side, with (1a) new technical solutions, (1b) the need to strategize and (1c), the systematization of the business; (2) the play side, that persisted as (2a) racing, (2b) achieving superior racing results and (3c), leading to competitive supremacy, as NR3D dominated the competition.

Table 3
NR3D chronology

Date	**Fact**
July 2015	Broken slot car chassis
August 2015	First sale through Shapeways digital platform
August-September 2015	Online shop active
December 2017	Trademark registered
December 2017	Participation in the Forslot Madrid (Spain) fair
March 2018	Commercial presence in the Evotec Shop España
April 2018	Slot Fair - Barcelona (Spain): held on the first Sunday of each month, starting from January 7, 2018
July 2018	Collaboration with IBB Auto Racing, a major global distributor, begins
January 2019	Collaboration with Weerg begins
November 2019	Creation of nShapes
May 2020	Chassis certified for participation in the WES 2020 (World Endurance Series) competition (Barcelona), eventually cancelled because of the Covid-19 pandemic

Note: bold indicates phases that correspond to our formal data collection processes. Previous phases were followed informally.

Source: elaborated by the authors

In a third step, we zoomed out to a more abstract level of analysis (Gioia et al., 2013) to conceptualize the two main processes previously identified in the explanation of the unfolding of the case: play and business, as represented in Figure 1. Their spiraling represents a higher-order theorizing, in that it is the entanglement of the two processes that provides the ingredients for the opportunity rather than the two processes (work and play) per se.

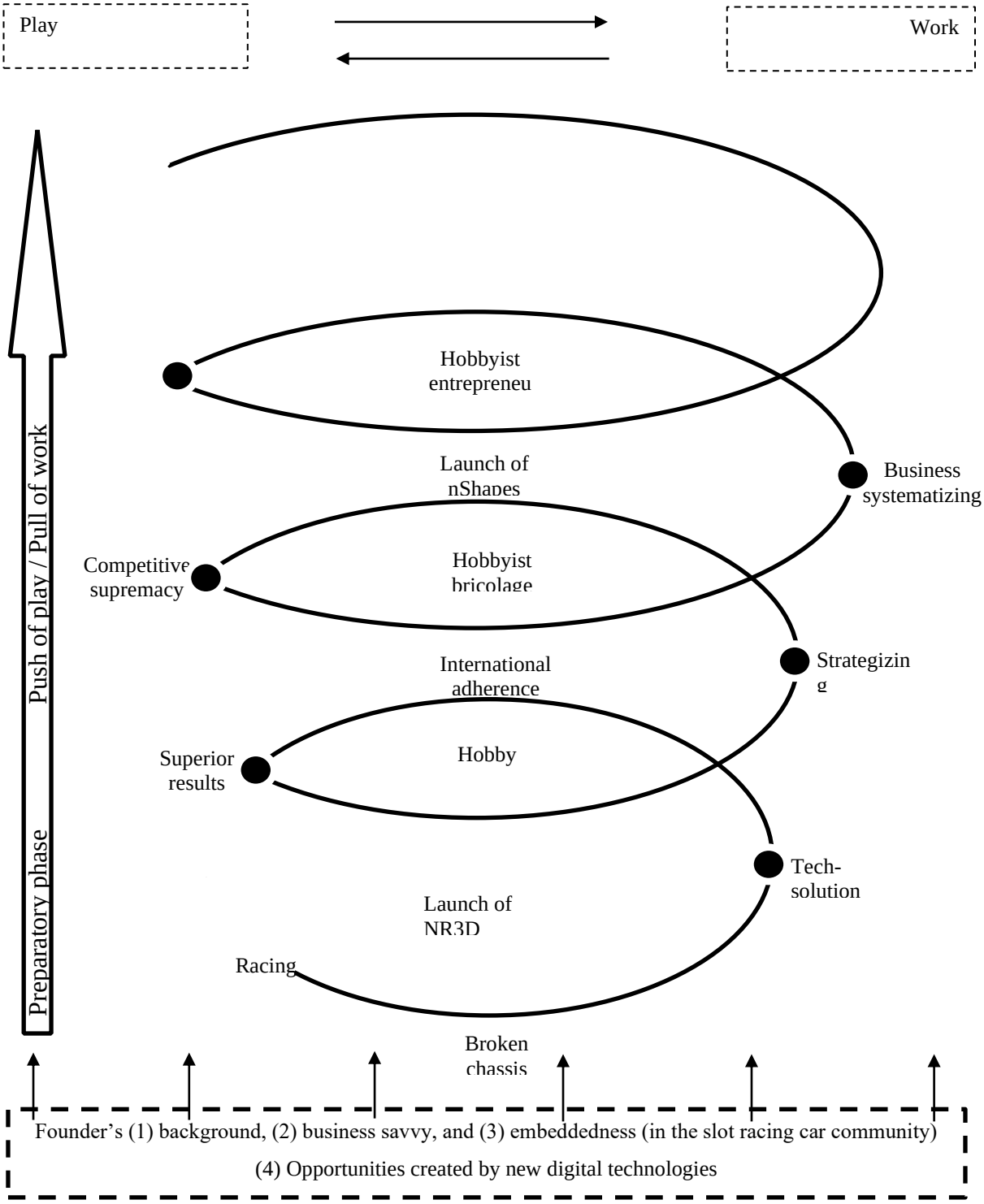


Figure 1. A process model of the paradoxes of turning a hobby into a business
Source: elaborated by the authors

To guarantee that our themes and theorization adhered to the reality of the project, we continually cross-checked our theoretical interpretations with the founder so that he could attest as to the rigor and realism of our theorizing (Pratt & Bonaccio, 2016). In a phone interview held in January 2020, Vasco observed that his experience in reading the paper had been like "reading my biography". To increase the accuracy of the interpretation, we double-checked the veracity of our analysis by checking interpretations with informants (Jarzabkowski & Bednarek, 2018) as well as with a variety of external sources, including family, friends, and customers (see Table 4). We submitted our interpretations to our informants at various points in time, iteratively adjusting the model to the collection of more data.

Findings

The preparatory phase

The NR3D project was initiated by chance, requiring preparation and incubation, processes facilitated by the interplay of four contextual conditions. These conditions were the founder's (1) background, (2) business acumen and (3) network embeddedness, as well as (4) the emergence/availability of new digital technologies. The story as a whole is described by Richard (a longtime friend of the founder, interaction #20, by email):

Taking affordable 3D printing technology, combining it with engineering knowledge and an online world, you have a recipe for a business model that is able to cater to the needs of the slot car hobbyist on an almost individual level as opposed to a mass level.

Background

Vasco's background is in mechanical engineering; this background was critical in assisting the design and understanding of slot car chassis. He was technically prepared for a serendipitous discovery (Jing & Van de Ven, 2018). Vasco's son, Rafael, had parallel interests. Vasco understood that new technologies such as 3D printing and digital platforms afforded opportunities for a viable business case that would previously have been unavailable due to the small scale of supply and market demand, taking advantage of the transformative potential of emerging digital technologies (Rayna et al., 2015). Timing was critically important. From Vasco's perspective, the business could not have been launched four or five years earlier.

Business acumen

Vasco had long been a self-employed entrepreneur and had already started two businesses before NR3D. Unlike people that categorize hobbies as pastimes rather than potential businesses (Frith, 2007), he did not resist the commercialization phase of NR3D because business was central to his professional identity and experience. Dual competence in engineering and business was a source of advantage regarding the design of the chassis. Alongside his technical knowledge of the mechanics, knowledge of business helped to turn an idea into a product with a market. The transformation of the hobby of slot car racing into what became NR3D also involved two important

contextual factors and their respective affordances: the potentialities to perform new functions or improve the performance of existing functions (Autio et al., 2018).

Embeddedness in slot car racing networks. Research shows that social networks support serendipitous innovation (von Hippel & von Krogh, 2016, p. 216), one reason is that they create conditions for serendipity to occur (Arena et al., 2017). Participation in the small but dedicated local slot car community was a critical activity in sustaining the business, necessary to test and receive feedback on innovations. The four clubs in the greater Lisbon area were described by Vasco as "NR3D's lab".

New digital technologies

Affordances were created by digital technologies and infrastructures (Autio et al., 2018). Digitalization enabled the sort of dispersed, shared entrepreneurial exploitation of opportunities that would have been impossible in the absence of such technologies. In the case of NR3D, access to global markets via platforms and the low costs of 3D printing were critical. In summary, the opportunities were such that the hobby could become more than a pastime. The combination of these conditions led the hobby in an unplanned direction.

The push of play

In organizational settings, play refers to engaging with tasks and enjoying their diversion (Mainemelis & Ronson, 2006). As a hobby, slot car racing was an enduring enthusiasm:

We still enjoy assembling the cars to compete, we still attend the races, and the hobby component is still present. Normally, [in the competitions] we forget about all the rest and still have fun (email #16).

The sense of play was both the cause and consequence of embeddedness in slot car racing networks. Three categories can be considered to explain the play component: racing, superior results, and competitive supremacy, listed by order of appearance in the unfolding of the case. At its inception, the project that became NR3D was all about racing. Racing created an opportunity for bricolage. The process started in response to a need to replace the broken chassis of a sold-out model of a Ferrari 312 (see Picture, Moment 1 in Table 5). Vasco and Rafael's engagement in the construction of the chassis resulted from Vasco's long experience of the design of models with CAD. As Vasco explained, replacing the car with a new model involved significant work and testing, something that is feasible only before the beginning of the competitive season:

With the solution it was necessary only to transfer the mechanical components from one car to the other. Possibly that was the most important step. With this simple operation of transference (…) we observed a tremendous performance improvement … that was the magic (email #64).

What would have been impossible for many people became a challenge of engineering artistry. The ability to build the chassis from scratch resulted from professional knowledge of 3D printing. The knowledge translated to the construction of the chassis. As Vasco explained (email #43):

Having background at the business level is also important in that it helps in setting many parameters regarding commercialization, marketing, and financial management; it is also important to make a direct connection to engineering, particularly the product development (thinking, from the very beginning, about costs, how to 'sell' our solution, what type of products will have a higher demand, setting development priorities according to the expected demand, etc.).

Bricoleurs may not have the ideal resources to solve a problem but an important source of creativity derives from their intimate knowledge of materials (Baker & Nelson, 2005). Knowledge of materials to replace a broken chassis for which a replacement was unavailable in the market kick-started user innovation (Shah & Tripsas, 2016; von Hippel, 2007). Vasco created the product to solve his own immediate problem. NR3D produced superior results in racing as a result of serendipity ("an unexpected experience prompted by an individual's valuable interaction with ideas, information, objects, or phenomena"; McCay-Peet et al., 2015, p. 392). Its inception was not a result of intention, planning or search but chance. The transformation of the hobby into a business was triggered by the happy accident of the chassis of a car (the Ferrari 312) breaking and the impossibility of finding a new chassis in the market. The alternative was to build one. In other words, "in the beginning we solved our own needs" (email #1). Vasco described the venture as a case of serendipity "borne out of necessity" (personal communication, 8 January 2017). The episode led not only to replacement of the broken chassis but also to the innovation of a superior technology that produced improved performance in terms of racing results.

Even as the venture evolved to become a start-up, part of the notion of play resulted from the intrinsically competitive focus of the hobby. As Céu, a slot car club member, pointed out, "people take competition very seriously". As the project evolved, the nature of competition changed. At the beginning, it consisted of young Rafael's participation in the races; later it changed to other people participating with NR3D-equipped cars, so that their vehicles gained competitive supremacy. Regardless of format, competing in races was fun, especially when winning.

The pull of work

The pull of work corresponds to the business dimension of NR3D. The process refers to the activities of business development and the exploitation of commercial opportunities. Three moments can be identified in work activities. First, serendipitous discovery of a new technological solution, followed by a process of strategizing around such discovery, which led to the systematization of the project as a business proper. As Vasco (interview #4) stated:

With regard to the hobby directly (developing the parts, assembling, testing, competing, evaluating …) using a quote from the Discovery Channel that says more or less the following … 'find a job you really like to do and you'll never have to work again', I think it perfectly reflects the spirit, there being no tension. However, with regard to the commercial component, that's a different thing as it has nothing to do with a hobby, just work, which is becoming ever more demanding and absorbing. There, yes, we need to have an approach that is totally professional, with the hobby left behind.

Once the chassis was made and proved technologically apt, a question formed in Vasco's mind: what if more people in the slot car community wanted the same model? The discovery of the opportunity was serendipitous but the process of turning the discovery into a business experiment was deliberate. What followed corresponded to the process now typified as a lean start-up (Blank, 2013). Instead of starting with a plan, lean entrepreneurs start with a hypothesis: "what if?" I n this case the model-turned-product was submitted to the market via Shapeways, a printing services, community and market space platform (www.shapeways.com). Platforms make it cheap to go global, as new digital technologies significantly reduce the need to own infrastructure and capital to launch a project (Van Alstyne et al., 2016). Two days after the digital store was created, a first order was posted. Not only was the first order an important moment per se but also, tellingly, the first client was from New Zealand, the antipodes of Portugal.

Realizing this observation was an epiphany (Blank, 2013). It was the fact that someone from the antipodes bought the very first product of the new business project that created the sense of a revelation, "a sudden and transient manifestation of insight" (van Iterson et al., 2017, p. 221). It was a moment that was revelatory about the business opportunity and its potential to reach distant market niches. Subsequent exploration of the commercial relevance of the chassis was initially conducted inside the small network of slot car racing in Lisbon. As Vasco pointed out, "we received orders and advice from people with more knowledge and experience in the activity, who indicated models that were possibly more interesting" (Vasco, interview #1).

In a lean start-up, the process of strategizing is based on guesses and moves rather than carefully crafted plans (Blank, 2013). In the case of NR3D, strategy consisted of testing ideas and collecting feedback from customers as rapidly as possible. Feedback came directly from members of the local slot car racing network, as well as from distant customers via Facebook. (We witnessed, for example, an interaction with a Japanese customer supported by Google Translate.) Feedback helped to improve product dimensions involving design, functionality and performance, as well as "to correct details and plan new developments" (email #14). Feedback collected during the races was important because of its technical specificity. The fact that, during the races, the chassis is seen in action offers immediate, direct information. Feedback obtained via Facebook was less specific but helped to improve the customer relationship process (e.g., by providing video tutorials) and generate innovative ideas for new models to launch. The two forms thus helped to improve the product side (races) and the customer side (Facebook). Both mattered.

After NR3D was launched, Vasco and Rafael decided not to participate directly in competitions as a team but to continue as a provider of chassis for other teams. They registered the company and the brand, and started to attend business events, such as fairs. Fairs are important because they increase visibility, permit direct contact with customers/pilots, as well as information collection and the expansion of opportunities through meeting new potential customers (Garud, 2008). NR3D was present for the first time in a business event in December 2017. As Vasco observed, "customers get to know us in person" (email #15). The hobby was evolving to an order of magnitude that was something different: "I think we now see it more as a business even though the hobby component is still there, but in a different perspective" (email #9). In addition, new commercial initiatives were launched: "We started to support competitions at the Iberian level (Portugal and Spain) which allows us to develop and to test new products" (email #1). The product strategy also evolved: "we now include in the design parts that previously would have to be bought from other

providers and that (…) are already integrated in our products." T his improved functionality and reduced the final costs of assembly for clients. In summary, the push–pulls of hobby and work evolved dynamically over time. The poles remained the same but not in the way they manifested.

By the end of 2019, a number of concerns were already pure business, such as price, speed, quality and customer support (e.g., assemblage tutorials). In early 2020, as the business grew, given the price strategy of the Shapeways platform, it was used mainly to target non-European markets. For Europe, a new strategy was devised, consisting of the development of close ties with physical shops, not only to sell physically but also to leverage digital reach. Preferential markets were defined: Spain, France, Italy and Germany. In summary, the two forces of play and work were deeply intertwined and co-evolved in a natural fashion. What we observed was a case in which this tension was a source of synergy and fun rather than friction and constraint.

Discussion

Our case study reveals the emergence and the progressive imbrication of paradox, marked by passion and play, two elements that typically stand outside the domain of rationality and normativity characteristic of orthodox management and organization approaches (Oldenburg & Brissett, 1982; Tasselli, 2019) during the transformation of a hobby into a paying business. While previous studies focused on the acknowledgement of the existence of paradoxical conditions, we shed light on the emergence of paradox and observed an evolving paradoxical tension between being in business and being at play. The between-pole tensions exist in a dynamic interplay that is cultivated rather than casual, as they contribute to enriching decision-making via supporting both poles through reflexive thinking (Hodgkinson & Sadler-Smith, 2018). Previous research indicates that processes that seem unplanned and a matter of luck, such as serendipity, may also involve intention and deliberation, the discovery of accidental opportunities implying the presence of prior knowledge (Austin et al., 2012). The tension between these characteristics suggests a process marked by persistently co-evolving push–pulls that, as we explore next, qualify as paradox. In charting the ingredients for opportunity, three main contributions emerge: paradoxical tensions as anchored in practices, the fragility of balance between paradoxical poles and the role of events as the sources of oscillation. We start by discussing how emergent entrepreneurial foreknowledge is anchored in practice.

Contribution 1

What started as non-paradoxical (a hobby) became paradoxical as NR3D was formed and evolved, involving trade-off decisions with important consequences for the unfolding of the project (Berti & Cunha, 2022). As predicted by paradox theory, management of the project equated with management of the tensions and conflicts the project posed. Although originally exposed to liminal tensions (e.g., Garcia-Lorenzo et al., 2018), the entrepreneurs were the active makers of such tensions, through practice (Jarzabkowski et al., 2018) rather than passive receivers. The two poles of work and play, although opposite, reinforce one another productively but they do not cease to change. The play side imbued the work project with passion and energy, constantly creating and re-creating the 'organizational analogue' (Scalfi Eghenter, 2018) to be considered for further developments. These two ingredients are important sources of entrepreneurial success (Cardon et

al., 2009), elements that matter because NR3D is a part-time operation that takes place after hours. As Vasco pointed out, the venture is becoming more work than fun (see Table 4), with the balance shifting dynamically (Smith & Lewis, 2011) [1]. To preserve balance requires mindfulness about the potentially dis-equilibrating effects of push–pulls: over-pushing or over-pulling the tension in the direction of one of the poles can produce damaging dynamics. As we discuss next, the balance between paradoxical poles is fragile.

Contribution 2

Our informants mentioned the need to preserve the generative dynamism of the relationship between the forces of play and work, as an emphasis on one side without the other being limiting and damaging. They were thus aware of the presence of push–pulls between poles that could threaten to disrupt the balance but that were lived, until this phase, as normal and spontaneously managed. These push–pulls can lead the project in two unwanted directions, in which one pole is suppressed via either/or types of approach (Smith & Lewis, 2011): work without play or play without work. Transforming NR3D into a pure business operation would be negative, as it would mean the absence of fun. The awareness that the project is no longer simply a hobby was countered with the idea that the sentiment of fun that originated it should be sustained. Doing so was relevant not only to maintain the passion, but also to renew the psychological energy devoted to the project: most of the activities of NR3D took place in moments of leisure, including nights and weekends. The fun component is also important to develop and maintain positive relationships within the network community of racers and thus get important business, commercial and technical knowledge that feeds the business component, a process we observed in the races. In March 2017, NR3D already involved daily work not only on the product but also on the customer side, five or six hours per day. Preserving the sense of play was critical to keep the momentum, as play triggers energy and creativity (Mainemelis & Ronson, 2006).

Table 4
Perceived, self-reported relative percentages of work and leisure[2]

Year	Percentage of work	Description of activities (in Vasco's own words)
2015	10% (Vasco) 0% (Rafael)	NR3D in 2015 can be described as: It all starts with play which works and that continues with new play: the discovery of the world of digital 3D printing. Every time we ge t a new order it is like Christmas Day, for us it is exciting to open the box to see for the first time the outcome of our work. This is something that lasts until today every time we have new prototypes arriving.
2016	25% (Vasco) 20% (Rafael)	NR3D in 2016 can be described as: The play continues but with the increasing demand from our customers we need to dedicate more time to NR3D. In parallel we need to spend more time with online marketing work and customer support.
2017	50% (Vasco) 20 % (Rafael)	NR3D in 2017 can be described as: We continue to develop the play side that got more serious. With the bigger sales volume and the entry in offline shops in Spain, we need more commitment to NR3D, this work remaining aside from the hobby. We do participate in the first events for communicating the brand/product that also gives us a lot of satisfaction that goes beyond the work involved.
2018	60% (Vasco) 40% (Rafael)	NR3D in 2018 can be described as: The Hobby remains but now with the responsibility that the NR3D brand imposes which means more dedication. We start the first races exclusively with our products, launch the new image, more professional, and continue to search for alternatives for the production of our parts. We continue privileging attention to customer and new product launch, with significant amounts of time invested in innovative design solutions. We have launched the All-in-One concept that originated a new line of models with a new form of engine assembling, with no need to use parts from third parties.
2019	75% (Vasco) 40% (Rafael)	NR3D in 2019 can be described as: The Hobby must continue … We are about to start the year with our participation in the first event for classical models – 24 Horas Bela Vista – NationalRacers, the first resistance 24 hours race for classical models with exclusively NR3D All-in-One chassis. We keep on playing with development and model testing to use in this 24-hour race, while at the same time we conclude the process of adaptation of the brand to the new commercial demands. The necessary work in terms of logistics and online marketing increases year by year with the increase of the number of followers and customers of the brand
2020	85-90% (Vasco) 65% (Rafael)	NR3D in 2020 can be described as: ● Having a presence in physical shops in Europe ● More diversified i n terms of product ● The project will become more professionalized but with a creative dimension

Source: elaborated by the authors

Play without work could be equally problematic when the venture started to incorporate a growing business edge. Passion is important, but as Uhl-Bien and Arena (2018, p. 3) have pointed out, "passion alone can create chaos". NR3D benefitted from the business acumen of Vasco. His business experience helped to smooth the hobby–business transition. This expands to business development the relevance of the 'attributional processes', meant as constant negotiation "between an organization and its environment through 'entre-relating activities'" found by Koch et al. (2018) in haute cuisine. In fact, Vasco and his partner Olga had started a business in advertising production management and lessons learned there have been transferred to the new business. Nonetheless, growth was framed as a double-edged sword: positive but also problematic, given its implications for the hobby side. In this, as well as in other ventures, the assumption of growth as

necessary may involve choices that will risk unbalancing "both/and" choices (Smith & Lewis, 2011). Balance is weaved and reweaved in function of events that suggest the need for oscillatory moves. Thus, paradox is induced by immersion in a context and shaped by events rather than an intellectual, abstract operation. People thus approach paradox and navigate it as they experience events that recommend oscillatory moves. Paradox for them is embedded in these events rather than perceived as existing outside the flow of practice.

Contribution 3

We have exposed the sequence of oscillatory moves around the forces of passion to discipline and back again, in a sequence that is both repetitive and dynamic. Importantly, we found that oscillations were triggered by specific events emanating from process continuity that give emphasis to poles: the damaged chassis, the first order from the antipodes, good racing results, sustained demand from international markets. Oscillations, in other words, are a product of circumstance and interpretation, performed in response to events (Hussenot & Missonier, 2016), rather than planned cognitive oscillations between mentally grasped poles.

Events provide interpre tive contexts (Aoki, 2020), playing an important role in making tensions between poles salient, as something to be faced . Event-based discoveries shaped the dynamics of the process, defining the personal relationship with the focal activity, synthesizing passion and work, introducing the need to formalize what was previously informal. In the process, however, the founders navigated the tensions in a way that took advantage of the energy originating from both poles. The goal was not to neutralize either of the poles but to keep the tension healthy. The passion and the sense of play served to fuel the hours dedicated to the activity, whereas the business results (profit, impact, and brand awareness) served to justify the investment, as the activity changed from a pure hobby to a hobby-become-business. The relationship between the poles in tension was thus perceived as mutually beneficial, and there was no point in unbalancing or devitalizing the process (Schad et al., 2016). Managing the push–pulls was thus critical to maintaining the hobby while running the business.

The process of keeping poles in dynamic equilibrium involved falling to one of the extremes, a challenge that was ever present. The viability of the hobby-enterprise equation lay in understanding the generative relationships between poles, a permanent dialectic (Clegg et al., 2002). The paradox literature has emphasized tension as a source of strain and psychological discomfort that gives rise to defensive responses (Vince & Broussine, 1996), which in this case, is an inadequate description. The tension was perceived as part of the fun, an important finding of our study.

Our work offers a grounded analysis of the possibility of navigating paradoxes to preserve equilibrium. Such navigation expresses an entrepreneurial dynamic process which, over time, involves varying challenges and different points of balance. The technology allows the reconversion of classic cars that could no longer compete because of technical weaknesses. What makes sense as a hobby (having fun and winning) is unwise from a business perspective, which is why the founders stepped back from competing and started sponsoring competitions. Instead of winning, now they have fun helping others to win with their products. The level playing field of competition is now

more balanced in the clubs, thanks to NR3D chassis: what now makes the difference is the pilot rather than the car.

Implications for Practice

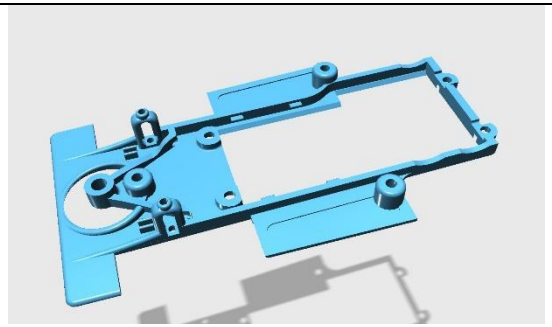
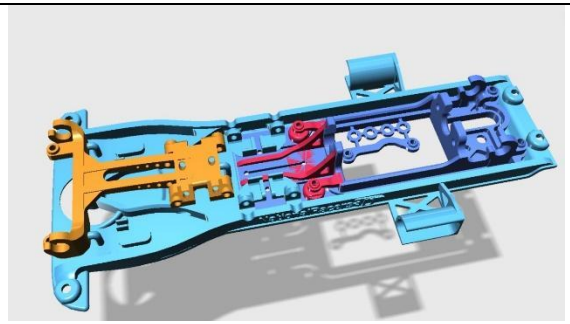
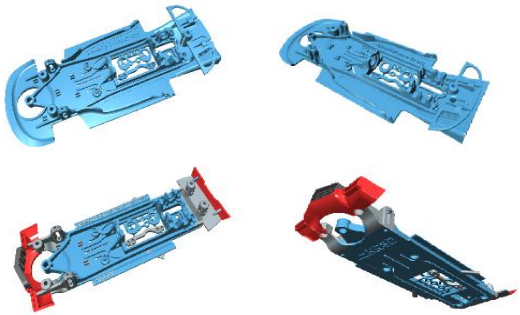
The study has a number of implications for practice. Established organizations may, in a reverse paradoxical operation, reach out to hobby communities in adjacent fields to make sense of potential developments and latent threats occurring there, at peripheries of attention (Day & Schoemaker, 2004), in order to infuse work with a sense of play. These communities may open windows onto possible emerging trends. Niche players may capture parts of markets without the awareness of major players. The implications are especially clear for digital entrepreneurs: they can explore global niches in a flexible way without major capital investments.

Organizations can also gamify their activities by attracting their members towards those associations where the boundaries between fun and business sometimes blur (Cartel et al., 2019). The example of Lego and its user-led innovation is illustrative (Eisenberg, 2011; Hienerth et al., 2014). The capacity to sustain such equilibrium over time, however, needs to be further investigated, as maintenance of dynamic equilibrium is challenged by growth (Greiner, 1972). The capacity to sustain a dimension of play at work can make a difference in terms of nurturing the creative side of enterprise.

Limitations and Opportunities for Further Research

The study contains several limitations. We investigated a single case – more importantly, the case of a micro-venture involving only two people. The fact that these two people are father and son is not irrelevant. The fact that they are exploring new layers of complexity in terms of product (see Table 5: Picture, in Moment 3, representing the latest products, and contrast it with the one of Moment 2, completed in March 2018, and with the simpler model in Moment 1) contributes to Rafael's education as a fresh engineering student. The mission and the psychological safety inherent in the case may be difficult to fully replicate in other contexts, which imposes an important boundary condition to our case.

Table 5
Evolution of the product

	Moment 1	Moment 2	Moment 3
Image			
	Sloter – Ferrari 312 PB	*Fly – Mercedes-Benz Truck*	*Two models of All in One solutions (last generation)*
Product concept	OEM replacement	Pre All in one	All in one
Level of complexity*	Low	Mid-High	High
Benefits	● Direct original replacement. ● Lighter and more resistant than the corresponding OEM. ● Better mechanical / dynamic features. ● Easy assembly and without the need for additional work.	● All phase 1 and ... ● Eliminated the need for additional parts for engine assembly, using for the first time a sketch of what turns out to be the All-in-One concept. ● Introduction of flexible motor support with integrated suspensions. ● Improved print resolution and mechanical strength of materials. ● Dynamic performance far superior to OEM architecture.	● All phase 2 and… ● Total integration of all mounting components in the chassis with new flexi design in one piece, including engine support, suspensions (front and rear) and all mounting accessories. ● Optimization of product costs, offering more options at more competitive prices. ● Flexibility of assembly options that allow simple or advanced assemblies depending on the wishes of each pilot. ● Even easier assembly without the need for any additional work on the chassis.
Dominant stream of literature	"Hobby and passion"	"End user entrepreneurship" fueled by "hobby and passion"	"Digital entrepreneurship" as magnifier of the previous two

*From a development point of view.
Source: elaborated by the authors

It is also possible to claim that, given its dimension, the case is difficult to generalize. While the observation is pertinent, it must be noted that small and medium companies constitute the backbone of the economy and offer important opportunities for theorizing (e.g. Dewald et al, 2007): within the EU-27, for example, they represent 99.8 percent of the total number of enterprises, accounting for about 60 percent of the GDP, with their contribution to value added and share of employment being 58 percent and 67 percent, respectively (Gagliardi et al., 2013). Second, the history of entrepreneurship is full of cases in which an endeavor started in a garage evolved into large-scale firms. Third, inductive work of this sort is not meant to bear statistical power or to be generalized; it rather aims to extract conceptually generalizable lessons that can be used to build theory that can be tested later. The case resonates with a digital version of frugal innovation, an interesting possibility for future exploration.

The study opens many promising lines of research into the paradoxes of entrepreneurship and its roots, specifically for the case of non-traditional forms of entrepreneurship (Wiklund et al., 2019). It suggests that a fruitful tension between the forces of work and play is important. It should be noted, however, that the case refers to the start-up phase: we have captured an embryonic process. The effects of the passage of time are crucial because time may extinguish "the fire of passion" (Cardon et al., 2009, p. 526) with the challenges involved in managing a company as it grows and changes over time, as the former hobby becomes a hobby-job. As shown by Volpone et al. (2013), as they become jobs, hobbies may lose their restorative power, an important possibility to scrutinize with the continuation of this study. As such, it may be necessary to follow the evolution of this type of project over longer periods. It is possible to hypothesize that some ventures might vanish because of the lack of time or interest of the founders. An overemphasis on work may neutralize the fun. In early 2020, the logic was changing with the creation of nShapes, but the creative idea of one dimension of work being a game was still defended as important to sustain motivation, as Roy (1959) explained.

Conclusion

Our analysis of the ingredients that provided the opportunity for a hobby to become a business reveal the emergence of a paradox between play and managing a business, confronting the founders with a sequence of shifting tensions. Ongoing, dynamic oppositions between poles needed to be articulated in order to maintain playfulness while increasing business seriousness in a shapeshifting process of serious play. In other cases, the emphasis on the business may fundamentally change the venture as it becomes professionalized. What was once a hobby may become purely a business operation. The hobby can get lost in the process and become a memory or even a source of nostalgia. Exploring how the paradox of entrepreneurial foreknowledge emerges helps to understand how businesses are born and how they evolve, thus adding an empirical dimension to the conversation initiated by Ramoglou (2021).

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Notes

1. The creation of nShapes, a new brand to explore 3D-printed objects outside the domain of slot cars, is a byproduct of the experience gained with NR3D. The nShapes project was nurtured by the core competencies and knowledge gained at NR3D and was launched as a spinoff
2. Vasco explained that “this is difficult to quantify as the separation is often unclear” (email #44).

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Inclusive language

The authors use inclusive language that acknowledges diversity, conveys respect to all people, is sensitive to differences, and promotes equal opportunities.

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