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Moving a mountain with a teaspoon: Toward a theory of digital entrepreneurship in the regulatory environment

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ABSTRACT

Digital entrepreneurship is an emerging phenomenon in the digital era. While the literature has started to look into this phenomenon, the attention has been paid mainly to digital startups in free markets. In a regulatory environment, however, it is unclear how a new startup might digitally transform business through entrepreneurial actions to overcome the challenges and barriers from regulations. Drawing on the dynamic capabilities and digital innovation literature, I conduct an in-depth longitudinal study at a Dutch digital startup. I trace the underlying mechanisms through which it creates digital solutions to the regulations in the Dutch healthcare sector — demand-driven digital disruption, fast digital adaptation, and continuous digital transplantation. Novel implications for digital entrepreneurship in the regulatory environment are presented.

1. Introduction

Recent literature has documented the digitization of innovation and entrepreneurship allows rapid growth of new startups in free markets (Huang et al., 2017; Nambisan, 2017; Nambisan et al., 2017). One of the reasons is that digital startups grow by drawing on and adding to digital infrastructure (Henfridsson and Bygstad, 2013; Yoo et al., 2010), which allow them to leverage the real options by adapting information technology (IT) platform (Fichman, 2004) and shape agility upon digital options (Sambamurthy et al., 2003). The literature, however, is unclear about in a regulatory environment, how digital startups may take “disruptive” entrepreneurial actions with digital platforms to overcome the regulatory inhibitors and barriers of business. This paper aims to shed some light on this important but relatively ignored area in the research on digital entrepreneurship by an extensive research effort of an in-depth longitudinal study of a Dutch digital startup in the healthcare sector.

I draw on the dynamic capabilities literature (Dong and Wu, 2015; Teece, 2007; Teece et al., 1997) and the digital innovation literature (Henfridsson et al., 2014; Nambisan et al., 2017) as the starting point to guide my thinking through how digital startups sense and seize the entrepreneurial opportunities in the regulatory environment, and constantly innovate by reconfiguring their digital platforms in other markets. In this study, I trace three mechanisms leading to the success of a Dutch digital startup to entrepreneurially cope with the regulatory environment: *demand-driven digital disruption*, *fast digital adaptation*, and *continuous digital transplantation*. I present these mechanisms and their

sequential process, which provide unique insight for research and practice of digital entrepreneurship.

The paper makes several contributions to the research on digital entrepreneurship. First, it contributes a theoretical understanding with regard to how digital startups can create, capture and sustain new entrepreneurial opportunities in the regulatory environment. This is a unique insight departing from the extent literature about digital entrepreneurship in free markets. Second, it identifies three mechanisms underlying the process toward the success of digital startups in the regulatory environment. These mechanisms explain *how* and *why* a digital startup can sense new entrepreneurial opportunities in the regulatory environment, seize the opportunities, and reconfigure digital platforms for other opportunities. This study also contributes to the theory of dynamic capabilities by identifying the micro-foundations of dynamic capabilities in the context of digital entrepreneurship. Finally, I conducted an in-depth case study through collecting and analyzing longitudinal, rich data from 11 qualitative interviews, 96 survey responses, and archival sources from the research site, its business partners and clients over 33 months between 2015 and 2017. Therefore, the findings from this study also enrich the literature on digital entrepreneurship. Next, I briefly discuss the relevant literature and theoretical foundation, followed by reporting the methods. I then present the results and findings. Finally, the contributions and limitations are discussed.

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2. Literature and background

The dynamic capabilities literature has suggested that organizational capabilities to innovate constantly in a fast-changing market is critical for generating sustainable competitive advantage (Eisenhardt and Martin, 2000). Dynamic capabilities refer to the firm's ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments (Teece et al., 1997), the organizational routines that change existing routines (Winter, 2003), the capacity of a firm to purposefully create, extend, or modify its resource base (Helfat et al., 2007), and the organizational activities that sense opportunities, seize opportunities, and maintain competitive advantage through reconfiguration (Teece, 2007). As the micro-foundations of dynamic capabilities, sensing ability describes scanning, creating, learning and interpreting activities to identify new opportunities, and seizing ability addresses the sensed new opportunities through investing in, developing and introducing new products, processes and business models (Teece, 2007). A key to sustain competitive advantage is the ability to reconfigure assets and organizational structures as the firm grows and as the markets or technologies change (Girod and Whittington, 2017). Since digital technologies play an enabler role of dynamic capabilities (Dong and Wu, 2015), I extend the idea of sensing, seizing and reconfiguration as organizations' ability to address the regulatory challenges from industrial environments through entrepreneurial actions with digital technologies.

I view a digital startup as consisting of digital technologies and human agents, who are capable of monitoring continuously the flow of their activities and expect others to do the same for their own in the context of entrepreneurial actions (Giddens, 1984). I draw on the digital innovation literature suggesting that digital technologies lead to *disruption* (Burgelman and Grove, 2007; Pagani, 2013), offer *flexibility* (Sambamurthy et al., 2003; Svahn et al., 2017), and afford *repurposed use* (Nambisan et al., 2017), in order to understand the mechanisms through which a digital startup is likely to sense and seize the opportunities in a regulatory environment.

Specifically, digital technologies enable cross-boundary disruptions that trigger new dynamic cycles of value creation opportunities (Pagani, 2013), which allows creative solutions to overcome the inhibitors and barriers of business in the regulatory environment if combined with the attention to market demand. Furthermore, digital technologies constitute an infrastructure or platform to which new functionalities can be added without a complete overhaul of the existing design (Henfridsson et al., 2014). The digital options can therefore contribute to organizational agility when taking entrepreneurial actions to quickly respond to market demand (Sambamurthy et al., 2003). Finally, digital technologies provide affordances or constraints — a relation between digital technologies with certain features and human agents' intent or purpose to which the technologies are to be used (Nambisan et al., 2017). The use of digital technologies in certain entrepreneurial actions under the regulatory environment could be viewed as sets of affordances and constraints that are likely to be repurposed in another market. In the next case study of a Dutch digital startup, I trace the mechanisms that are in line with disruption, flexibility and repurposed use of its digital platform to understand and explain its digital entrepreneurship in the regulatory environment.

3. Methods

3.1. Research design

A qualitative approach is used for theory development at early stage of academic quest on the research question (Eisenhardt, 1989; Yin, 1991), which is particularly suitable for research on a novel topic related to digital entrepreneurship due to the dynamics, interrelatedness and non-linearity of digital entrepreneurship phenomenon (Berger and Kuckertz, 2016; Nambisan, 2017). I conducted a longitudinal single

case study with multi-methods to triangulate data at a Dutch digital startup called Duobus for developing a theoretical understanding of digital entrepreneurship in the regulatory environment. In the Netherlands, healthcare organizations' recruitment of self-employed personnel is highly regulated with complex, time-consuming paper work due to regulations. Self-employed personnel and contractors need to know and testify their business relationship. Whether there is an employer-employee relationship is important with regard to tax liability. Employers only have to pay payroll taxes for their employees, but not for hired self-employed personnel under certain conditions. Until May 2016, self-employed personnel need to provide a Declaration of Independent Contractor Status (Verklaring Arbeidsrelatie, VAR) as a proof that there was no employment relationship for every contract. The VAR needs to be issued by the tax authorities to clarify the status as an independent entrepreneur for a natural person. Only if a healthcare organization is recruiting a self-employed person with the VAR it safeguards from claims from the tax authorities with regard to payroll taxes for the contracted tasks. Since May 2016, the VAR has been replaced by the model agreements as a result of the Employment Relationships Act (Wet Deregulerend Beoordeling Arbeidsrelaties, DBA). Again, every contract needs to be made based on one of the model agreements.

Duobus is a company established in January 2015, offering a digital platform on its website (duobus.nl) where healthcare organizations (e.g., hospitals and homecare companies) and self-employed personnel (e.g., nurses) to find and work with each other in the Netherlands. On Duobus platform, however, users can have a much simpler contracting and taxing process that is consistent with the VAR and DBA. By the end of this study in September 2017, Duobus has 79 organizational users and 977 self-employed individual users. I collected extensive data from Duobus over a period of 33 months from January 2015 to September 2017. In particular, I used four different methods in data collection, including interviews, participant observation, survey and archival data. Participant observation has started since the beginning of the digital startup journey of Duobus in January 2015. 11 semi-structural interviews with two founders, the chief executive officer (CEO), and two employees responsible for information technology and marketing were conducted. Six clients were also interviewed, including two healthcare organizations and four self-employed personnel. All interviews were recorded with each lasting from 45 min to 90 min, which eventually yielded 304 pages of transcription (about 102,000 words). An online survey with simple Likert-scale questions and open questions about users' perceptions and satisfaction of Duobus platform was also conducted in 2017 with 96 responses from 222 users (response rate = 43%). Table 1 provides an overview of data collection effort.

On Duobus platform, a healthcare organization can describe an assignment (requirements, places, dates and times). The digital platform will automatically select the self-employed personnel who meet the requirements of the assignment. Qualified self-employed personnel can place bids on the assignment, which will be seen by the organization in conjunction with other information such as the profile and quality of the personnel. If a bid is accepted by the organization, a digital contract will be generated in line with the regulations and the personnel will do the assignment and get paid according to the contract.

Table 1
Overview of data collection.

Source	Description
Interviews	11 interviews with mean length of 75 min, generating word count of 102,000 words in 304-page transcription
Participant observation	37 meetings with average length of 85 min
Survey	96 respondents of an online survey in 2017
Archival data	Project descriptions, company documents, presentation materials, financial database, user database, online website, media releases

After the assignment is done, the organization automatically receives an invoice, transferred in a corresponding format through the specific administration systems installed at the organization (e.g., Exact Online, and Nedap Healthcare). Duobus charges 3 Euros service fee only when an assignment is successfully completed or 0.50 Euro per hour. All the data and information needed to be compliant with the regulations are archived and stored on the platform for government censoring.

Each self-employed personnel can build a profile on Duobus platform with certificates of conduct and other official documents allowing them to work for certain healthcare tasks. For the first time the official documents will be checked at home by a specialized contractor from Duobus to guarantee the legitimacy. It is possible for the self-employed personnel to set their preferences for tasks, such as travel distance, income rate, and invoice settings. The self-employed personnel can only find the assignments from healthcare organizations according to their verified qualifications and competencies.

3.2. Data analysis

My data analysis strategy has a four-step grounded process (Glaser and Strauss, 1967; Strauss and Corbin, 1998). First, I mapped the chronological process that Duobus has taken from establishment to the end of this study over 33 months to uncover specific events and milestones for the case narratives (Langley, 1999). I cross-checked my understanding of the process (see Fig. 1) with the two founders and the CEO of Duobus.

Second, I conducted open coding (Glaser and Strauss, 1967; Strauss and Corbin, 1998) by using the three analytical filters from the dynamic capabilities literature — *sensing, seizing* and *reconfiguration* (Teece, 2007), and the digital innovation literature that have been detailed earlier — *disruption of digital technologies* (Burgelman and Grove, 2007; Pagani, 2013), *flexibility of digital technologies* (Sambamurthy et al., 2003; Svahn et al., 2017), and *repurposed use of digital technologies* (Nambisan et al., 2017), in order to furrow and categorize concepts. In the open coding, I focused on identifying the unique events of how Duobus platform has led to disruption to the inhibitors and barriers of business in the regulatory environment through offering a digital platform according to the market needs, changing its flexible digital platform that is agile to market needs, and finally affording repurposed use of the digital platform to another market. The emerging concepts from the open coding were compared with the chronological process derived earlier to construct detailed narratives (see Table 2).

Third, I conducted axial coding (Glaser and Strauss, 1967; Strauss and Corbin, 1998) by iterating the emerging concepts with textual evidence and relevant literature. I clustered and differentiated the emerging concepts to further abstract their characteristics and empirical substance to derive and label three mechanisms of digital entrepreneurship under the regulatory environment — *demand-driven digital disruption, fast digital adaptation, and continuous digital transplantation* (see Table 2).

Finally, I conducted selective coding (Glaser and Strauss, 1967; Strauss and Corbin, 1998) to flesh out how the three different mechanisms derived from the previous step are chronologically related to each other and their key business outcomes such as revenue growth and user satisfaction, and then generated a conceptual model of digital entrepreneurship in the regulatory environment (see Fig. 2).

4. Results and findings

4.1. Demand-driven digital disruption

The data analysis results revealed that the digital startup journey of Duobus started from *demand-driven digital disruption* (see Fig. 2), defined as the disruptive entrepreneurial opportunities of using a digital platform to address regulations to meet market demand. In 2014, the two founders of Duobus were both working in a healthcare organization called Thuiszorg Dichtbij and facing the need of recruiting self-employed personnel for homecare services. According to the VAR, however, healthcare organizations cannot directly hire and contract with self-employed personnel as they individually do not meet taxing requirements as an organization.

The founders found that the traditional way of search for qualified self-employed personnel, checking their qualifications, and contracting with them under the VAR was too time-consuming and costly. The founders have considered to leverage intermediate services offered by other companies, which were however lack of adaptive functionality or charging an immensely high service fee. To find and contract with self-employed personnel, Thuiszorg Dichtbij need to use and contract with an intermediate with self-employed personnel as its registered “employees”, charging 6 Euros or higher for one-hour work in addition to the pay to the personnel. Based on the demand of Thuiszorg Dichtbij, the founders started to realize the potential entrepreneurial opportunities to simplify the intermediates services by using digital technologies, through automate matching between healthcare organizations' tasks and qualified self-employed personnel, pre-examining the qualification of self-employed personnel, standardizing the legal contracting process between healthcare organizations and qualified self-employed personnel, making electronic invoices compatible with the data formats of common enterprise systems used in healthcare organizations, and finally offering a reasonably low price.

One of the founders with programming skills therefore programmed the first version of Duobus platform, and the other founder — a manager of Thuiszorg Dichtbij — allowed a pilot project of running Duobus platform in Thuiszorg Dichtbij for about one year. They quickly realized the value of Duobus platform to their organization. The digital platform worked very well to effectively address the taxing requirements of VAR. By providing a digital solution to address the issues of the VAR, Duobus reduced the transaction costs down to 30 cents per hour (about 5% of other intermediates' prices) or sometimes even 5 cents per hour (about 1% of other intermediates' prices). By noting the great potential that Duobus platform can allow digital disruption of the VAR for other healthcare organizations, the two founders established the company and launched Duobus platform to other users in early 2015. As a founder put it,

First of all, we started to make a software program to have a solution for some problems in the market. There were some issues with the rules and regulations and there were no simple solutions to follow the rules correctly. So, we had to use some digital programs to make some contracts that are suitable for every different type of users.

First, I had only one customer and we made everything for that one customer. At some point, there were some other people said “oh, that is also quite interesting for us.” So, we added some new

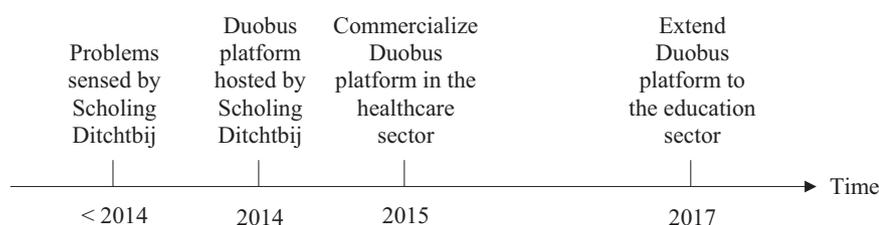


Fig. 1. Chronological process of milestones at Duobus.

Table 2
Description of data coding.

Example	Open coding	Axial coding	Selective coding
First of all, we started to make a software program to have a solution for some problems in the market. There were some issues with the rules and regulations and there were no simple solutions to follow the rules correctly. So, we had to use some digital programs to make some contracts that are suitable for every different type of users.	Issues with regulations; digital program as a solution	Demand-driven digital disruption	Demand-driven digital disruption is followed by fast digital adaptation
First, I had only one customer and we made everything for that one customer. At some point, there were some other people said “oh, that is also quite interesting for us.” So, we added some new features. We've added some functionality and at the end we started with Duobus.	Add new features; start with Duobus		
Our product is superior compared to competitors' products and it's mainly because we add more value because our systems are more customized. So, we make different systems just for example for one healthcare company to be more efficient. So instead of a product that is standardized, our product is more tailor made for each company. I think we have better quality.	Customized systems; tailor for users; superior quality	Fast digital adaptation	Fast digital adaptation leads to revenue growth and user satisfaction
I think we just prioritize. I think that's really important. So, if a key user really wants something we will give that functionality a higher priority. Because you can only focus a certain time on a project, and if you prioritize you get like more clear view and a better aim on the goals you want to achieve. I think it's really important that you say “OK, the key users have an idea. We will prioritize that idea.”	Prioritizing user needs; goal-oriented functionality development		
I think the main reason driving the success of our company is that we are really flexible. So, when people of the companies really want to have something we can offer it in a week or so. Only if it's really necessary. So, if they really need something, first of all we will discuss it, we will talk with them and we will ask “OK, what will this add to your company?” And if it's really necessary we will build it in a week or so, or sometimes two weeks or a month, depending on what it is.	Flexibility; quick problem-solving		
Actually, a self-employed person receives a pop-up that says, for instance, six assignments cannot be shown because you did not follow a certain type of education. We always had in our mind that it would be nice if you subsequently could click on the vocational training and follow it at a partnering organization.	Pop-up with training in need; training from partnering organization	Continuous digital transplantation	Fast digital adaptation is followed by continuous digital transplantation
We do support the help desk for self-employed personnel in care, and we programmed a piece such that it could work on our platform and that they could register an account. We could guide more self-employed personnel to the large user base if they want to.	Programming gateway; sharing user base		
Because there is a lot more functionality which we've added, well it will soon be released, a digital education platform. In association with two, three other partners we will offer a very wide range of digital education. We want to develop thirty-five new courses a year and add these to the platform. Then we can offer these digital courses all over the world, because it is web-based. For the live courses, we have trainers throughout the Netherlands. We do this together with Scholing Dichtbij, which develops the content and courses, and together with Symbiotic, which is a partner that develops the digital education platform.	Digital education platform; digital education with partners; thirty-five new courses; world-wide digital courses; trainers for live courses		
We want to establish market presence with our name and we want to use our name at some point to go to other markets. When our name is well known, it's much easier to get to other markets because people will know that we provide high quality service and it will be easier to find partners to cooperate and to build such a platform together.	Famous brand from on to another market; certain quality service; ecosystem with partners		

features. We've added some functionality and at the end we started with Duobus.

4.2. Fast digital adaptation

The results showed that the second mechanism underlying Duobus' digital startup journey is fast digital adaption (see Fig. 2). I found that demand-driven digital disruption provided entrepreneurial

opportunities to solve the issues of the VAR, followed by fast digital adaptation allowing it to accumulate a large user base. The notion of *fast digital adaption* refers to the ability to quickly change the digital features of a digital platform in response to customer needs. IT platform offers digital options that enable agility (Fichman, 2004; Sambamurthy et al., 2003); new functionalities can be added to a digital infrastructure without a complete overhaul of the existing design (Henfridsson et al., 2014; Huang et al., 2017).

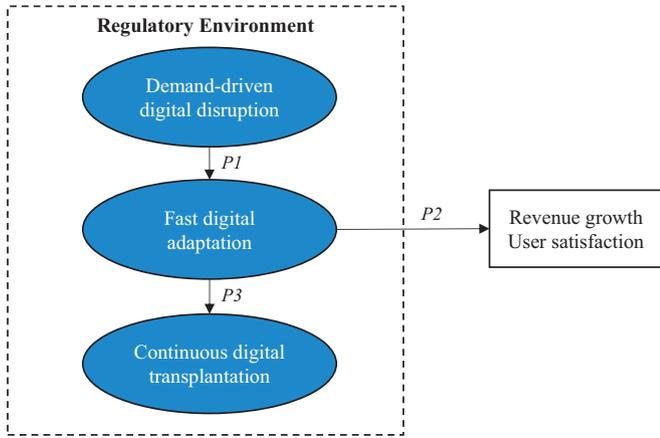


Fig. 2. Digital entrepreneurship in the regulatory environment.

Proposition 1. Demand-driven digital disruption provides entrepreneurial opportunities in the regulatory environment, which need to be captured through fast digital adaptation.

To seize the entrepreneurial opportunities and accumulate user base, Duobus have been constantly adapting the features of its digital platform according to the needs of healthcare organizations and self-employed personnel. For example, the average cycle time of adding or upgrading a feature of Duobus platform is one week. Digitization of the intermediate process not only allowed Duobus to achieve cost-leadership, but also made fast adaptation possible. As a founder explicated,

Our product is superior compared to competitors' products and it's mainly because we add more value because our systems are more customized. So, we make different systems just for example for one healthcare company to be more efficient. So instead of a product

that is standardized, our product is more tailor made for each company. I think we have better quality.

To keep a high innovation speed with the digital platform, the results reveal the concept of problemistic search — a problem-focused, goal-oriented search process toward finding solutions to a focused problem (Dong and Netten, 2017; Greve, 2003) — is critical for pursuing fast digital adaptation. It is important to identify the focus of innovation activity because managerial attention is a scarce resource (Dong, 2016; Ocasio, 1997). Otherwise, it is likely that excessive IT use leads to information overload in managerial decision-making and makes the innovation activity counter-productive (Dong and Netten, 2017; Dong and Wu, 2015). The CEO of Duobus, who is in charge of the daily operation of the company, explained the reason why they were able to quickly adapt the digital platform according to customer preferences,

I think we just prioritize. I think that's really important. So, if a key user really wants something we will give that functionality a higher priority. Because you can only focus a certain time on a project, and if you prioritize you get like more clear view and a better aim on the goals you want to achieve. I think it's really important that you say "OK, the key users have an idea. We will prioritize that idea."

Though a low price is critical for preempting the first wave of customers, revenue growth and making users satisfied in the long term relied on the value added due to fast adaptation of the digital features of Duobus platform. Recent research documented that firms' IT investment can accelerate the speed of new product development or product feature upgrading, which in turn improves productivity (Tambe et al., 2012). The results also suggest that fast digital adaptation plays a key role to achieve revenue growth and making users satisfied. As one of the founders of Duobus stated,

I think the main reason driving the success of our company is that

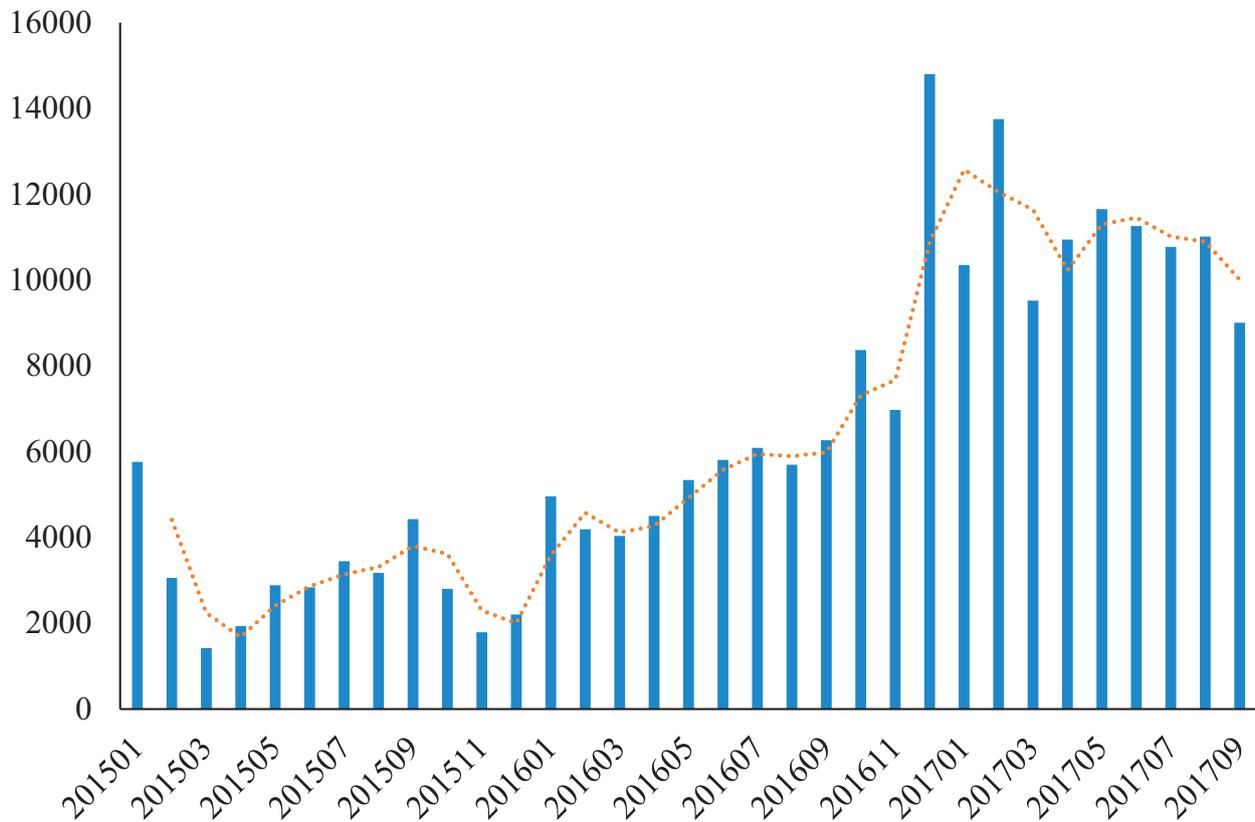


Fig. 3. Monthly revenue of Duobus (Euro).

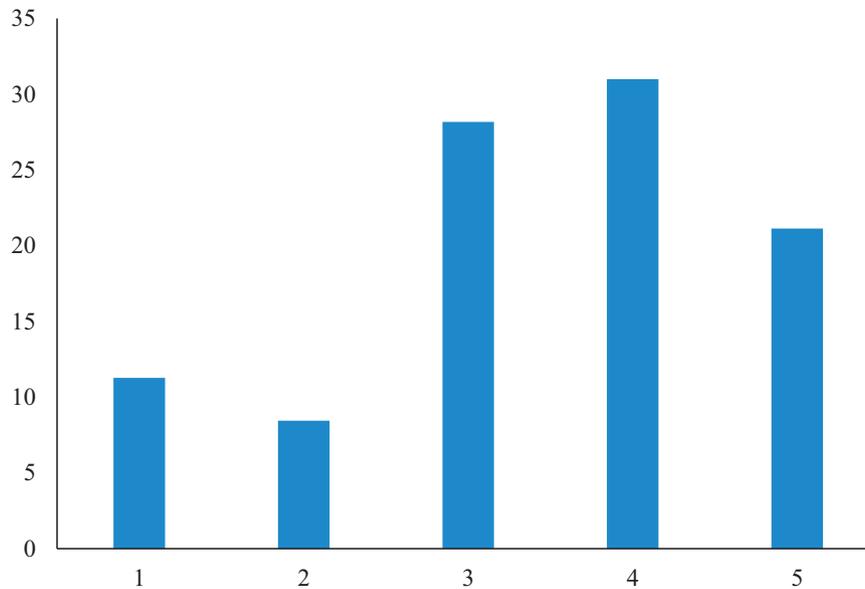


Fig. 4. User satisfaction of Duobus platform (%).

we are really flexible. So, when people of the companies really want to have something we can offer it in a week or so. Only if it's really necessary. So, if they really need something, first of all we will discuss it, we will talk with them and we will ask "OK, what will this add to your company?" And if it's really necessary we will build it in a week or so, or sometimes two weeks or a month, depending on what it is.

Proposition 2a. Fast digital adaptation leads to revenue growth.

Proposition 2b. Fast digital adaptation leads to user satisfaction.

Based on archival data about the monthly revenue, Duobus' revenue has grown up to five times from 2015 to 2017 (see Fig. 3). Duobus has experienced a sustainable growth to about 10,000 Euros per month in 2017 and became profitable in 2016. The survey data showed that the majority of users are satisfied with Duobus platform (see Fig. 4), with more than 80% positive or neutral respondents in a 5-point Likert scale (1 = very unsatisfied, 5 = very satisfied).

4.3. Continuous digital transplantation

The results further showed another mechanism underlying Duobus' digital startup journey — *continuous digital transplantation* (see Fig. 2), namely repurposing or reconfiguring a digital platform for capturing new entrepreneurial opportunities beyond its initial intents. After experiencing a great success in healthcare sector, the new entrepreneurial opportunities of Duobus were identified by reconfiguring and repurposing the digital platform to serve customers in another market — the education sector. Duobus has decided to enter the education sector by offering digital courses and training programs to self-employed personnel. Since different qualifications and certificates are needed to accomplish specific healthcare services, new opportunities emerged when searching the qualified self-employed personnel for specific tasks from healthcare organizations on Duobus platform. As one of the founders of Duobus explained,

Actually, a self-employed person receives a pop-up that says, for instance, six assignments cannot be shown because you did not follow a certain type of education. We always had in our mind that it would be nice if you subsequently could click on the vocational training and follow it at a partnering organization.

We do support the help desk for self-employed personnel in care,

and we programmed a piece such that it could work on our platform and that they could register an account. We could guide more self-employed personnel to the large user base if they want to.

By collaborating with business partners that are specialized in digital education services, Duobus has been able to quickly embed others' digital courses in its own platform for customers. This repurposed use of Duobus platform allows it to quickly enter the education sector in a cost-efficient way. Thanks to the generality of digital infrastructure (Yoo et al., 2010), Duobus was able to generalize its digital platform for education purposes. As a founder indicated,

Because there is a lot more functionality which we've added, well it will soon be released, a digital education platform. In association with two, three other partners we will offer a very wide range of digital education. We want to develop thirty-five new courses a year and add these to the platform. Then we can offer these digital courses all over the world, because it is web-based. For the live courses, we have trainers throughout the Netherlands. We do this together with Scholing Dichtbij, which develops the content and courses, and together with Symbiotic, which is a partner that develops the digital education platform.

As Duobus has gained a good reputation by serving self-employed personnel in the healthcare sector in a satisfactory way (see Fig. 4), it is likely to transfer the brand name and user base when transplanting its digital platform for education purposes. As two founders of Duobus pointed out, respectively,

We want to establish market presence with our name and we want to use our name at some point to go to other markets. When our name is well known, it's much easier to get to other markets because people will know that we provide high quality service and it will be easier to find partners to cooperate and to build such a platform together.

Proposition 3. Fast digital adaptation captures entrepreneurial opportunities in the regulatory environment, which could be repurposed in another environment through continuous digital transplantation.

5. Discussion and implications

5.1. Contributions and implications

This study makes three major contributions to digital entrepreneurship research. First, it contributes a theoretical understanding with regard to how digital startup can create, capture and sustain new entrepreneurial opportunities in the regulatory environment by using a context-specific theorizing approach (Hong et al., 2014). The extent literature has been focused on digital entrepreneurship in free markets and how a digital startup may leverage digital technologies to create disruption to overcome the inhibitors and barriers of business in the regulatory environment is unclear. By generating a context-specific theory about digital entrepreneurship in the regulatory environment (see Fig. 2), researchers and practitioners can learn useful insight from it into how and why digital technologies enable entrepreneurial actions in the important regulated industries, such as healthcare and pharmaceuticals, utilities and energy, alcohol and tobacco, and telecommunications.

Second, it identifies three mechanisms underlying the process toward success of the digital startup in the regulatory environment. Demand-driven disruption describes how a digital startup senses the disruptive entrepreneurial opportunities of using a digital platform to address regulations to meet market demand. Fast digital adaptation theorizes a digital startup's ability to quickly change the digital features of a digital platform in response to customer needs. Continuous digital transplantation denotes repurposing or reconfiguring the digital platform for capturing entrepreneurial opportunities beyond its initial intents. These mechanisms are sequential events in a process model. Demand-driven digital disruption provides entrepreneurial opportunities in the regulatory environment, which need to be captured through fast digital adaptation. Fast digital adaptation captures entrepreneurial opportunities in the regulatory environment, which could be repurposed in another environment through continuous digital transplantation. In particular, fast digital adaptation if found to play a key role in generating revenue growth and user satisfaction. It also contributes to the theory of dynamic capabilities by identifying the micro-foundations of dynamic capabilities (Teece, 2007) in the context of digital entrepreneurship, and offers systematic and detailed guidance for digital startups to take entrepreneurial actions in the regulatory environment.

Finally, given the complex and interrelated nature of digital entrepreneurship phenomenon (Berger and Kuckertz, 2016; Nambisan, 2017), I conduct an in-depth case study with rich data from 11 qualitative interviews, 96 survey responses, and archival sources from the research site, its business partners and clients over 33 months between 2015 and 2017. The narratives and qualitative evidence showed in the case provide a rich story about the entrepreneurial actions of a Dutch digital startup in the healthcare sector. Therefore, the findings from this paper enrich the literature on digital entrepreneurship.

5.2. Limitations and concluding remarks

There are limitations inherent to this study. First, I conduct a longitudinal case study to build an initial theory about digital entrepreneurship in the regulatory environment. However, such a qualitative method does not have strengths in testing theory. Future research may take a quantitative approach such as survey methods to examine my findings. Second, I take the dynamic capabilities and digital innovation literature as the theoretical foundation, which provides us powerful theoretical lens to interpret the results on the one hand and potentially bias my interpretation from a specific angle on the other. Also, I do note that the process model of Duobus and its way to address the inhibitors and barriers of business in the regulatory environment may not be the only way. Future research may consider other alternative theoretical explanations to investigate the drivers of digital

startup success. Last but not least, I only consider a case of digital startup in the Dutch healthcare sector, which limits the generalizability of my findings to other industries and countries. Future research may collect data and examine the findings in other contexts.

Despite above limitations, I believe that this research helps deepening the theoretical understanding of digital entrepreneurship in a unique context — regulatory industries. It advances digital entrepreneurship research by identifying and theorizing the underlying mechanisms through which digital startups can take entrepreneurial actions in the regulatory environment. Digital platforms allow digital startups to take advantage of regulations in an industrial environment and achieve revenue growth and make users satisfied. Hopefully, this research helps break new ground for the context-specific theorizing of entrepreneurship and innovation in an era of digitization.

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