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Can Business Model Innovation help SMEs in the Food and Beverage industry to respond to crises? Findings from a Swiss brewery during COVID-19

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Abstract

Purpose

The purpose of this paper is to show how different Business Model Innovations (BMI) help small and medium-sized enterprises (SMEs) in the food and beverage industry to navigate turbulent and uncertain environments such as the COVID-19 economic crisis.

Design/methodology/approach

The paper adopts an in-depth case-study approach and uses a Dynamic Business Modelling (DBM) approach to analyze how a pioneer craft brewery in Switzerland implemented innovative actions undertaken during the COVID-19 pandemic.

Findings

The paper offers a novel framework describing three processes helping SMEs to implement innovations in their business model to respond in an effective way to crises, such as the COVID-19 pandemic. The first process refers to SMEs' ability to *leverage readily available* resources and allows SMEs to rapidly use their current knowledge to react to the changing environment amid the crisis. The second process points at SMEs' *ability to transform existing resources* into novel products or solutions. Finally, by *mobilizing distant resources* from their network, SMEs can obtain new resources and knowledge that facilitate the implementation of major changes in their business model.

Originality/value

Unlike previous studies, this research adopts a cause-and-effect perspective to make explicit how SMEs' business model changes affect strategic resources, key drivers and processes, thereby impacting performance. The analysis of the multiple reinforcing and balancing feedback loops resulting from the DBM approach can help SME entrepreneurs learn *how* and *what* changes are required in their BM to effectively face turbulent times, such as the COVID-19 crisis. From such an analysis, it emerged that the ability of SMEs to effectively implement innovations amid a crisis depends in large part on their collaborations with business partners and their ability to use and transform internal and external knowledge. In addition, as the future evolution of the COVID-19 crisis is still ongoing and uncertain, this study offers a unique perspective for SMEs in the food and beverage industry as the situation unfolds rather than after the fact.

Keywords

Business Model Innovation; SMEs; Crisis; Entrepreneurship; COVID-19; Food and Beverage

1. Introduction

The COVID-19 pandemic has forced many countries to close their borders, impose social distancing policies, thereby causing significant disruption to both economies and societies (Gibson, 2020). Such unexpected changes led to multiple discontinuous shifts in consumers' preferences and related behaviors. Examples include the diffusion of home-office practices, home-delivery food services, as well as the drastic reduction of dining out in restaurants and bars.

This phenomenon exposed many small and medium-sized enterprises (SMEs) to the risk of failure. This is particularly pertinent in Europe where 87.8 % of all businesses operating in the food and

beverage (hereafter F&B) and accommodation sectors are SMEs (Eurostat, 2020). Compared to larger organizations, SMEs are frequently more exposed to the impact of a crisis (Herbane 2013; Mayr *et al.*, 2017) due to their vulnerability and dependence on several stakeholders.

While this situation can be considered a source of crisis, it also stimulated some SMEs, particularly those characterized by high flexibility and adaptability (Williams *et al.*, 2017; Manfield and Newey, 2018), to introduce new technologies, innovate operations and launched new customer services to cope with such high levels of uncertainty (Liu *et al.*, 2020).

However, it is still unclear how Business Model Innovation (BMI) can help SMEs (Foss and Saebi, 2018; Futterer *et al.*, 2018; Lambert and Davidson 2013; Chesbrough, 2010) to overcome a crisis in a sustainable fashion (Loon and Chik 2019; Micheli *et al.*, 2020). Furthermore, little is known about how SMEs operating in the F&B industry can systematically benefit from changes in their business model (Tang, 2016; Tell *et al.*, 2016; Franceschelli *et al.*, 2018; Presenza and Petruzzelli, 2019) particularly as a response to abnormal events, such as the COVID-19 crisis.

This gap raises two main research questions: *how can SMEs in the F&B industry innovate their business model to overcome severe crises, such as COVID-19? And, what do they need to effectively implement a Business Model Innovation in times of crisis?*

To offer an answer to these questions, this paper follows a mix-method approach including an in-depth case-study and a Dynamic Business Modelling (DBM) approach to explore *how* SMEs operating in F&B can pursue a BMI strategy to respond to severe crises, such as the coronavirus, and *what* they need to effect such change. The case-study focuses on a small craft brewery in Switzerland (Docteur Gab's), which undertook a number of business model (BM) changes during COVID-19 to weather the crisis. The case-study findings were next analyzed using the lens of the DBM (Cosenz and Noto, 2018; Cosenz and Bivona, 2020), which allowed us to identify dynamic relationships between key-business model components and firm performance as well as essential processes for SMEs to effectively implement innovations in their BM to respond to crises.

In alignment with interactive BMs (Sanchez and Ricart, 2010; Wang and Kimble, 2016), our findings suggest that SMEs focusing on strong collaborations with business partners effectively engage in BMIs in times of crisis. The results in this paper show that rapid BM changes can be pursued by *using readily available resources*. However, SMEs that implement more innovative changes in their BM should *transform existing resources* as well as *mobilize distant resources* from their business partners to react to a crisis in a timely fashion. Our findings also suggest that SMEs' ability to absorb external knowledge stemming from these partnerships (Ferraris *et al.*, 2020; Dezi *et al.*, 2019) is essential in implementing BMIs particularly in turbulent times. As such, our study offers a novel framework SMEs can rely on to implement innovations in their business models as a response to a crisis. In addition to this, as the future evolution of the COVID-19 crisis is still ongoing and uncertain, the suggested approach offers a unique perspective just as the situation unfolds rather than after the fact. The paper is structured as follows. The next section reviews the literature on BMI in SMEs as a response to the COVID-19 crisis. It also describes how the DBM approach can support SME entrepreneurs to better understand those processes underlying BMI implementation in times of crises. After the research methodology section, Docteur Gab's case-study and its BM prior and during the COVID-19 is described. This is followed by the investigation of Docteur Gab's BM during the COVID-19 pandemic through the lens of the DBM perspective. As a result of such an analysis, the discussion section outlines a novel framework for understanding BMI for SMEs during a crisis and provides theoretical and managerial implications. Finally, the last section offers some conclusions and identifies aspects that merit further investigation.

2. Theoretical background: from a static to a dynamic perspective of the Business Model Innovation in response to crises within the context of SMEs

2.1. Business Model Innovation in SMEs as a response to the COVID-19 crisis

The COVID-19 crisis has caused an unprecedented exogenous shock to the world (GDA, 2020). Social distancing measures adopted to slow the spread of the coronavirus put large swaths of the global economy under tremendous pressure (Eggers, 2020; OECD, 2020). The pain has been particularly acute among SMEs operating in the F&B industry and related services. Restaurants lost 120 billion U.S. Dollar during the first wave of infections and about half of all restaurants will permanently close according to projections (Bloomberg, 2020).

While the current coronavirus pandemic and the many lockdowns worldwide led to a unique situation which requires immediate corrective actions, particularly by SMEs operating in the F&B industry, the nature and peculiarities of SMEs' responses to crises remain poorly understood in the literature, with highly fragmented (James *et al.*, 2011; Doern, 2016) and often contradicting results (Davidsson and Gordon, 2016; Mayr *et al.*, 2017).

In fact, as remarked by Davidsson and Gordon (2016, p. 916), the literature on SMEs “tends to emphasize either the vulnerability or the resilience of such firms; the former deriving from liabilities of smallness and newness, while the latter is typically attributed to greater flexibility and adaptability”.

For instance, in a study on SME responses to the 2008–2009 economic downturn Smallbone *et al.* (2012) demonstrated that only resilient SMEs (e.g., those characterized by high flexibility and adaptability) can cope with the impact of a global recession. Resilient SMEs tend to adapt to the crises by generating new revenue streams, for instance, investing in human capital, rather than introducing cost-cutting policy (Williams *et al.*, 2017; Manfield and Newey, 2018). In adapting to crises, SMEs also adopt a bricolage approach (Baker and Nelson, 2005; Senyard *et al.*, 2014; Tsilika *et al.*, 2020), thereby combining tangible and intangible resources at hand to new problems/opportunities, reconfiguring innovation processes for new products or services.

Intangible resources, such as knowledge, are widely recognised to contribute to the competitive advantage of a firm (Burns *et al.*, 2011; Tsai, 2018). However, the lack of formal knowledge management procedures, the lack of specialised human resources (Baptista Nunes *et al.*, 2006) and the absence of clear knowledge-oriented leadership (Donate and de Pablo, 2015; Zia, 2020) may prevent SMEs from developing new innovations and increase their competitiveness (Santoro *et al.*, 2018). The use of an interactive BM (Sanchez and Ricart, 2010), by enhancing entrepreneurial knowledge and facilitating knowledge sharing within the actors of the ecosystem (personnel, suppliers, customers and partners), is likely to lead to formal and informal collaborative partnerships that may help SMEs overcome innovation process obstacles (Usai *et al.*, 2018). In addition, Abdulkader *et al.* (2020) suggest paying attention to firm-specific processes to properly govern knowledge inflows (outside-in or inbound innovation) and knowledge outflows (inside-out or outbound innovation), as a source of innovation and value creation (Zhao *et al.*, 2013; Scuotto *et al.*, 2017). While the former aims to acquire expertise from outside the organisation (Chesbrough and Borgers, 2014), the latter focuses on underutilised resources to be shared with external parties.

In a similar vein, Dezi and colleagues (2019) remarked that SMEs that are able to establish relationships with - and to leverage knowledge from - external stakeholders (e.g., local partner) show higher innovation performance. The importance of internal and external resources (such as the relationships with employees, customers and suppliers) as well as the way such resources are combined to pursue BM changes has been also highlighted in post-crisis periods by Cucculelli and Peruzzi (2020). Particularly, Kuckertz *et al.* (2020) in a recent study on how start-ups cope with the COVID-19 crisis suggest that relational (e.g., goodwill of business partners, consultation of the business network) and financial (e.g., capital accumulation) resources help such firms to identify and pursue market opportunities, thereby introducing innovations and alternative products/services.

The above remarks highlight that resilient and more flexible SMEs leveraging external relationships with partners and key-actors of their ecosystem can also rapidly adapt to changing and turbulent environments, thereby strengthening their competitive advantage (Sanchez and Ricart, 2010; Dayan *et al.*, 2017; Abdulkader *et al.*, 2020). Moreover, a knowledge-oriented strategy (Spender and

Grant, 1996) can effectively help SMEs to exploit and recombine internal capabilities and competencies (Wernerfelt, 1984; Barney, 2001).

To shed light on how SMEs can make an effective use of internal and external resources to introduce changes in their products or service during crises, we claim that BMI proves resourceful particularly for SME entrepreneurs facing uncertain and critical times. Different from BM, often defined as formal conceptual representations of how value creation, delivery and capture processes are structured and function (Teece, 2010; Zott *et al.*, 2011), BMI refers to the introduction of innovations in the above processes, thereby generating new value sources or new systems of products or services that are difficult to imitate (Amit and Zott, 2012; Foss and Saebi, 2018; Futterer *et al.*, 2018; Lambert and Davidson 2013; Chesbrough, 2010). BMI can result from a combination of new and old products or services, market position, processes and other types of changes (Björkdahl and Holmén, 2013) as well as the introduction of new business models alongside the existing one (Johnson *et al.*, 2008; Loon and Chik, 2019). Such a level of innovation can be also pursued through investments in digital technologies, thereby supporting SMEs to adapt their BM to respond to volatile and changing environments (Bonfanti *et al.*, 2018; Nambisan, 2017; Ghezzi and Cavallo, 2020). Similarly, BMIs can also result from joint collaborations with business partners where the recombination of resources and knowledge and the ability to absorb such knowledge may lead to better performance in the innovations carried out in the BM (Corbo *et al.*, 2020).

While the benefits of BMI for firms' performance are evident primarily in large organizations (Amit and Zott, 2012; Chesbrough, 2010), understanding the creation of new and innovative business models for SMEs, in particular in times of crises, remains a challenge for researchers and managers alike (Tang, 2016; Presenza and Petruzzelli, 2019). Furthermore, due to SMEs' fragile attributes, such as limited resources (Woschke *et al.*, 2017) and lack of access to debt in time of crisis (Serrasqueiro *et al.*, 2018), a lean and agile approach to BMI implementation is required (Cosenz and Bivona, 2020; Ghezzi and Cavallo, 2020) to prevent firm failure as consequence of the introduction of radical changes in their business model. There are ample opportunities for researchers to delve into these myriad issues as there is still tremendous demand to develop practical tools and approaches to support BMI (Foss and Saebi, 2018; Trimi and Berbegal-Mirabent, 2012) and a dearth of understanding about how BMI can help F&B SMEs overcome turbulent times such as the COVID-19 crisis (for an exception see Cucculelli and Peruzzi, 2020).

2.2. *Applying the Dynamic Business Modelling approach to support SMEs in times of crisis*

In line with the above remarks, it is here further claimed that a dynamic - rather than a static - perspective to BMI can offer a consistent approach to match BMI with SMEs' peculiarities (Davidsson and Gordon, 2016; Manfield and Newey, 2018; Woschke *et al.*, 2017; Serrasqueiro *et al.*, 2018; Bianchi *et al.*, 2018; Cosenz and Bivona, 2020). This dynamic perspective can also support SME entrepreneurs to enact sustainable changes in their BM to cope with high uncertainties, such as the Corona crisis. In fact, in spite of the acknowledgement in the literature of a growing number of frameworks to support SMEs in implementing BMIs (Arbussa *et al.*, 2017), critics have pointed to the need of a shift from a static to a dynamic perspective, particularly, in uncertain, complex and fast-moving environments (Wrigley and Straker, 2016). Such frameworks often provide a comprehensive list of BM core elements portrayed into specific blocks (Chesbrough, 2010), thereby offering a static perspective of how firm processes generate value over time. In addition, they also neglect the causal relationships between such processes, preventing SME entrepreneurs from learning how BM decisions may impact the performance of the firm (Demil and Lecocq, 2010).

To sustain our arguments, this study draws on previous research making use of the Dynamic Business Modelling (DBM) approach within the contexts of start-up ventures (Cosenz and Noto, 2018), corporate sustainability (Cosenz *et al.*, 2019), and innovation growth strategies in SMEs (Cosenz and Bivona, 2020). However, to the best of the authors' knowledge, the DBM has not been applied yet to BMI supporting SMEs in times of crisis.

The DBM combines System Dynamics (SD) (Forrester, 1961; Sterman, 2000) with the BM perspective. To this aim, the business model canvas (BMC) provided by Osterwalder and Pigneur (2010) has been revised to outline cause-and-effect relationships between strategic resources and key drivers and processes affecting firm performance. Such cause-and-effect relies on the theoretical arguments pertaining to the dynamic performance management perspective (Bianchi, 2016).

The use of the SD methodology helps decision makers to identify two types of processes influencing firm performance: reinforcing (R) and balancing (B) loops (Sterman, 2000). Reinforcing loops tend to self-reinforce or amplify what is happening in the system and can be associated with virtuous growth-oriented or vicious-circle processes (e.g., an increase in the number of customers can lead to word-of-mouth, which can ultimately attract more new customers). Balancing loops counteract such changes. Unlike reinforcing feedbacks, balancing loops limit growth processes, thereby providing a new equilibrium state (e.g. an increase in customers can be counteracted by market saturation, given a number of customers). In fact, as the customer base enlarges, fewer new customers are available to join the company, until the market is ultimately saturated.

By combining SD with the BM perspective, the DBM approach offers an agile and flexible schema with which to explicit factors and processes outlining how a company operates to pursue its goals. In particular, it shows how the dynamic and causal relationships between “strategic resources” and “key-partners” affect “value drivers” which, in turn, influence “key-processes” and associated “results”. As such, the analysis of the multiple reinforcing and balancing feedback loops resulting from the use of the DBM approach can help SME entrepreneurs to discern sustainable growth paths from those leading to a failure, particularly, in turbulent and uncertain times.

FIGURE 1 ABOUT HERE
(Figure 1 – A generic DBM diagram)

Figure 1 shows strategic resources and key-processes as stocks variables. Stocks characterise the state of the system and generate the information upon which decisions are based. Examples include a firm’s customer base, the number of employees hired, or the amount of products accumulated in inventory. Stocks change according to their inflows and outflows, as result of the actions taken by decision-makers. If the inflow (new customers) is greater than the outflow (customers loss rate) then the level (customers) gradually rises. While a stock is shown as a rectangle, an in- or out-flow is represented by an arrow with a valve pointing into - or out of - the stock.

By differentiating stock from flow variables, the above diagram can help decision-makers to identify the strategy levers on which they can act on to build the desired level of strategic resources. Examples of strategy levers include product price change, key-partners acquisition and investments in assets. These relationships are outlined in figure 1 (Cosenz and Noto, 2018). Assuming a reduction in product price, this decision is likely to influence the customer base positively thereby leading to an increase in order rate, shipments and revenues. On the contrary, investment decisions, such as the acquisition of raw materials, assets, human resources and external funding produce additional costs. The difference between revenues and expenses generates company income, which in turn can lead to a change in firm net present value and reputation, thereby enhancing the number of key-partners (e.g., suppliers, investors). Partnerships with external businesses may nurture the firm’s strategic resources (e.g., funding from investors, human resources) whose exploitation influences value drivers, such as product quality, productivity, innovativeness. In turn, value drivers produce an effect on the business processes (e.g., service delivery), as well as on the company’s reputation (e.g., customer satisfaction), which is likely to attract new customers , fueling a reinforcing feedback loop. Multiple balancing loops, however, may counteract such a growth path. In fact, particularly in a market saturation

condition, the lack of available financial resources resulting from growth-oriented investments, may limit such an expansion strategy.

In the next sections, the DBM mentioned above will be used to make explicit the cause-and-effect relationships between strategic resources, key drivers and processes underlying the changes implemented in the BM of a small brewery (Docteur Gab's) during the COVID-19 pandemic. To this purpose, section 3 describes the adopted research methodology. First, it clarifies the reasons why an inductive case-study approach fits with the current research and the criteria used to select Docteur Gab's case. Second, it documents the multiple steps suggested in the literature and followed to convert and validate the data gathered to build Docteur Gab's DBM diagram before and during the COVID-19.

3. Research Methodology

To explore the research questions previously introduced, this study follows a multi-fold methodological approach. First, after the literature review, an inductive case-study approach (Eisenhardt, 1989) helped us to understand in detail how SMEs implement BMIs in moments of crisis. Because case studies are useful to understand "how" questions (Gehman *et al.*, 2018), such an approach is particularly suitable to this paper's purpose to better understand how SMEs can implement BMIs to respond to crises. This appears relevant due to the little, although growing, contribution provided in the extant literature pertaining to the BMIs of SMEs.

Therefore, a single case-study perspective is particularly suitable to develop new theories in the field and to demonstrate that existing research does not sufficiently address the investigated research question (Eisenhardt and Graebner, 2007).

Following the approach proposed by Kim and Andersen (2012), the second step in our methodological approach combined information obtained in the in-depth case study with the DBM diagram. This step was useful to identify relevant resources and processes can help SME entrepreneurs to implement BMIs in times of crisis. We follow two criteria to choose Docteur Gab's, a Swiss craft brewery, as the focus of our analysis: (i) the company introduced multiple innovations in its BM to fight the COVID-19 economic crisis (some of which became part of their permanent offer) and (ii) it has expressed interest in taking part in this research.

3.1 Data collection

During the case study analysis, primary and secondary data were combined to address a broader range of historical and behavioral aspects relevant to Docteur Gab's BM. Using a diversity of sources including interviews and secondary data helped us to develop "converging lines of inquiry", exploit the opportunity for "triangulation and corroboration" (Yin, 2009, p. 115-116) and reduce biases by overcoming the limitations of each separate source (Furnari, 2015). This approach also helped us to nurture the analysis on how BMIs take place in SMEs during moments of crisis.

Our first data sources included secondary data dating back since Docteur Gab's foundation in 2001 to understand its business development. These sources included newspaper articles, company reports and internal statements, as well as Docteur Gab's historical blog and webpage (www.docteurgabs.ch). Second, to have a deeper sense of the company and a full description of the initiatives carried out before and during COVID-19, six semi-structured interviews with Docteur Gab's co-founders during March-October 2020 were carried out. All interviews were conducted via video-call or phone and then transcribed. They last ten hours in total.

3.2 Data analysis

Building on the data collected through the case study, we then followed Kim and Andersen (2012) method to build Docteur Gab's DBM before and during the COVID-19 pandemic. Consisting of five steps aimed at linking key findings from secondary (e.g. company documents) and primary data (e.g. interviews with decision-makers), their method for data analysis offers an iterative approach, which has previously been applied to multiple sectors (Scott *et al.*, 2018; Meinherz and Videira, 2018; Rees *et al.*, 2018).

The first step of data analysis begins with the identification of dominant themes with the purpose to define the problem articulation and the system boundary. In our case, this implied analysing Gab's reports and newspaper articles as well as the interviews with their co-founders to extract recurrent key-words and sentences (e.g., resources, networks, response to crisis, etc.). These dominant themes helped us understand Docteur Gab's BM before and during the COVID-19 pandemic. In a next step, causal links are analysed between the recurrent themes identified in the first step. As a highly iterative process, this step allows the researcher to compare the behaviour of variables captured in the causal links with the data found through the case study. To facilitate the validity of these links for future reference, all collected data are transcribed and this step will only end when all causal links are clearly substantiated.

In the third step, the causal relations identified in step 2 are expressed in the form of word-and-arrow diagrams making explicit stocks and associated flow variables. Such a distinction plays an important role in understanding the resources underlining Docteur Gab's BM and company performance.

Next, the above causal relationships are merged in one main causal loop diagram (such as the map reported in figure 1) to create a visual model. Each feedback loop is assessed in terms of its polarity (e.g., distinguishing reinforcing from balancing loops), thus establishing whether the loop facilitates or inhibits Docteur Gab's business growth processes to respond timely to the COVID-19 pandemic. Finally, the causal loop diagram is validated by linking the map to the collected data. This stage aims to verify that the map is not disconnected from its original source of data (Kim and Andersen 2012, p. 323). For example, the map visualising Docteur Gab's BM before the COVID-19 showed causal relationships between human resources, production and delivery capacity on customer satisfaction. We then looked back to the data and interviews to verify that these were correctly reflected in the collected data sources.

4. The case of Docteur Gab's

In order to investigate Docteur Gab's BM before and during the COVID-19 pandemic, through the lens of the DBM as previously illustrated (see figure 1), this section first offers a description of Docteur Gab's and its BM prior to COVID-19, before moving on to discuss the innovations the company implemented to fight the crisis.

4.1 Docteur Gab's case-study and their BM value creation processes before the covid-19

Founded in 2001, Docteur Gab's offers locally produced high quality craft beer and is recognized as a pioneer in Switzerland, particularly in Canton Vaud, where the company is located. Since its inception, the three co-founders share the following motto "*we are in business because we like to solve challenges, and we like to keep our customers happy no matter what the challenge is*". To pursue this inspiring mission, they develop a close relationship with local restaurants, pubs, small grocery stores and supermarkets (who represent 90% of company customers; the remaining is generated by internet direct sales and local events), which helps them to relate to the restaurant industry at large.

In the first fifteen years, the company has recorded slow but constant growth. In such a period the company built a strong and reliable brand identity in the operating region and bolstered financial health. In fact, taking advantage of both the absence of direct competitors in the area and the highly

fragmented market, Docteur Gab's gradually enlarged their customer base and expanded production and delivery capacity. Unlike other breweries, Docteur Gab's distributes 70% of their beer with their own delivery cars. This strategy contributed to build trust and a direct relationship with actors in the F&B industry, which also helped them collect relevant customer feedback and update their beer portfolio according to changes in customers' demand. Furthermore, investing in delivery capacity allowed them to avoid the use of distributors and thereby increase their profit margin.

The continuous search for producing high quality craft beer, renewed production and storage facilities and personalized delivery service, together with a skilled and motivated staff contributed to boost the company's image and financial performance, particularly in the last five years. In this period, Docteur Gab's recorded an annual 30% growth, reaching an installed production capacity of 200,000 hectoliters a year, 35 full-time workers and a turnover of 10 million Swiss francs (about USD 10 million) in 2019.

FIGURE 2 ABOUT HERE

Following the DBM diagram discussed in the previous section, Figure 2 describes Docteur Gab's BM before COVID-19 pandemic.

Based on information collected during the research phase of the case-study, the owners' past decisions focused primarily on investments in production and delivery capacity, and qualified human resources. Docteur Gab's entrepreneurs also paid a great attention to developing virtuous relationships with key-partners (e.g., raw material suppliers), with the intent to improve company value drivers (e.g., beer portfolio attractiveness, delivery delay ratio, customer satisfaction and Docteur Gab's reputation) and, finally, financial performance (e.g., net income).

Using the DBM depicted in figure 2, it is possible to highlight three main reinforcing loops underlying Docteur Gab's growth processes before the COVID-19 pandemic.

The first two loops result from the investments in production capacity and human resources, which led to a positive change in the strategic asset "Beer portfolio". The improvement in "Beer portfolio" gave rise to the value driver "Beer portfolio attractiveness", thereby enhancing both "Customer satisfaction" and "Docteur Gabs reputation". Consequently, the stocks of customers 1 (reinforcing loop R1) and 2 (reinforcing loop R2) enlarged, by means of that orders, sales revenues and net income recorded a continuous growth path over time. Moreover, the improved liquidity, as consequence of the positive financial performance (net income), allowed the company to further sustain such growth processes over the years.

The third reinforcing loop (R3 in figure 2) also contributed to amplify customers and sales revenues. Unlike the previous feedbacks, R3 arises from the investments in delivery capacity, which strengthened company delivery service. In turn, it contributed to further magnify customer satisfaction and expand customers, sales revenues and Docteur Gab's net income.

However, the above described reinforcing feedbacks can be counteracted by balancing loops, which are also highlighted in the DBM structure (see B1 in figure 2). In fact, the continuous boost in customer orders, because of the above reinforcing loops, may saturate the delivery capacity. As such, delivery delays may erode customer satisfaction and reputation. Consequently, company revenues may fall, leading to a decline in company performance.

To counteract such a limit to growth, decision makers can benefit from the use of the DBM . In fact, by making explicit the feedback relationships that describe how the BM operates, the DBM can help decision makers to identify the strategy levers that will strengthen growth-oriented loops and to weaken balancing ones. Specifically, by investing in new delivery capacity, delivery time can be restored to customers' desired level, thereby allowing the company to regain its competitiveness and pursue its desired growth path.

4.2. Docteur Gab's and their BMIs during COVID-19

While most breweries and a large portion of their client restaurants in the region stopped operations until the end of the pandemic, Docteur Gab's co-founders looked for alternative revenue streams. They soon realized they could use their internal assets and facilitate knowledge exchange processes with external actors, enlarging their endowment of strategic resources, to respond to the crisis in innovative ways. Three main changes were implemented in their BM.

4.2.1. From brewery to distillery

During the first wave of the COVID-19 pandemic, the demand for ethanol and alcohol-based products for medical purposes was on the rise, while sales to restaurants plummeted. Docteur Gab's quickly realized this was an opportunity, as they could use their beer to produce alcohol and hand-sanitizer to pharmacies, university hospitals, as well as through their online store.

For this purpose, they created an alliance with a local distillery who transformed Gab's beer into alcohol. This change allowed them to efficiently use their facilities when they would have otherwise been shut down.

4.2.2. Groceries home delivery

The exponential increase in the demand for online orders created a shortage of timely home delivery solutions for a diversity of businesses in the country during the pandemic. Particularly, the over 10-days delivery time revealed that grocery stores were struggling to fulfil orders in the Swiss market during the COVID-19 pandemic. With their available distribution capacity, Docteur Gab's realized they could deliver groceries and basic items to at-risk groups of people and those in self-isolation.

While they were skeptical about customers' reaction at first, they soon realized that customers welcomed Gab's attempts to adjust to the changing market conditions. In fact, by the end of May 2020, their online orders had increased by 225% versus the months prior to the pandemic. This initiative also led to a monthly increase of 35% in new customers visiting their online store and generated a 30% margin on average on each internet sale.

4.2.3. Beer funding platform for restaurants

With the purpose of helping restaurants and gastronomic outlets to prevent bankruptcy due to the COVID-19 crisis, Docteur Gab's undertook another, more radical, change in their BM. They launched a unique beer funding platform. Like a crowdfunding platform, this initiative matches Swiss restaurants with people willing to donate a minimum amount of 100 Swiss francs (about USD 100) to their preferred restaurant. In return, people receive a case of beer, i.e. 24 Docteur Gab's bottles with personalized beer labels showcasing the collaboration between the brewery and the restaurant. Docteur Gab's quickly tasked their available employees to recruit restaurants interested in the beer funding initiative and started promoting the platform in different social networks. Within two weeks, 57 restaurants were listed on the platform and 47 received donations of at least 2,000 Swiss francs, raising in total more than 300,000 Swiss francs. This initiative was profitable for both the brewery and the restaurants. The latter, particularly, made a 35% profit margin for every case of beer funded through the platform. This initiative was also very profitable in financial terms because it contributed to enlarge Docteur Gab's restaurant network and end-customers.

While the platform initially aimed at helping restaurants and gastronomic outlets, Docteur Gab's soon realized that the production of personalized beers in collaboration with a diversity of actors in the F&B industry could become the next generation of new products in their portfolio.

Figures 3a and 3b provide an overview of the impact of these initiatives on Docteur Gab's performance during the lockdown period in Switzerland. Generally, while COVID-19 negatively

impacted Gab's sales in March and April 2020, the positive spillovers of the changes implemented in their BM to respond to the crisis were reflected particularly in May 2020 when their sales increased by 20% with respect to the same period in 2019 –even when all restaurants and bars were still closed in the country (figure 3a). Figure 3b further shows that this positive performance was mainly driven by the beer funding platform. In addition, Docteur Gab's would have had losses of approximately 75% due to the lockdown measures if it hadn't changed its BM (black dotted line). In turn, with the introduction of the beer funding platform the company reduced the losses and also obtained a 20% revenues increase compared with the same period in 2019.

FIGURES 3a and 3b ABOUT HERE

Figure 3a: Docteur Gab's sales volume - Figure 3b: Percentage of change in revenues compared to 2019

5. Applying the DBM to explain SMEs' BM changes in moments of crisis: Docteur Gab's BMs during COVID-19

The use of primary and secondary data repeatedly pointed at Docteur Gab's ability to fully exploit their available resources and expand its professional networks to respond to the crisis, as they introduced changes in their BMs. In addition to this, the DBM diagram proved insightful to better understand Docteur Gab's value creation process when introducing such changes.

Figure 4 describes Docteur Gab's BMI during the COVID-19 pandemic. Unlike figure 2, this new structure highlights as black-colored variables the new elements resulting from the changes introduced in the business model. Figure 4 also outlines three reinforcing feedbacks underlying the main drivers of Docteur Gab's BMI and one balancing loop restraining such a development path.

FIGURE 4 ABOUT HERE

Figure 4 - Docteur Gab's BMI during the COVID-19 pandemic

The first reinforcing loop (R1) in blue depicted in figure 4 describes the ability of the company to promptly use their *modern and ample production facilities* in the distillation process of beer to produce ethanol. This allowed the company to gain new customers, specifically hospitals and pharmacies, and to generate a new stream of revenues. Although this BM change led only to a small contribution in terms of net income and cash flow, such additional financial resources could fuel further this initiative and amplify the positive effects of R1.

The second reinforcing loop (R2) in red highlights the growth process underlying the decision of Docteur Gab's founders to deliver groceries to isolated people during the lockdown. The unexploited *storage and delivery capacity* and the facilitated access to *local suppliers* (due to its excellent *brand identity*), allowed the company to offer a competitive home-delivery service. This initiative also contributed to generate supplementary financial resources to continue the delivery of food products over time, thereby feeding the reinforcing loop R2.

The third reinforcing loop (R3) in green shows the cause-and-effect relationships explaining the beer funding platform initiative and associated results. Specifically, Docteur Gab's qualified human resources in the beer industry as well as strong relationships with restaurants in canton Vaud stimulated customers' willingness to sustain such businesses in time of need. Consequently, sales revenues were boosted leading to a significant increase in both net income and cash flow. As occurred in R1 and R2, the additional financial resources generated by the beer funding platform initiative

could fuel further company growth and intensify the favorable effects of these reinforcing loops. This growth behavior is also confirmed by the positive change in sales revenues portrayed in figure 3b. As previously observed, the DBM can support SMEs' entrepreneurs to identify both reinforcing and balancing loops underlying BMI in turbulent and uncertain times. Figure 4 also shows multiple balancing feedback loops (e.g., the loss of customers due to the longer delivery times, the resistance from certain restaurants in participating in the beer funding initiative, the decreasing financial resources due to growing investments) which may prevent the company from achieving the desired results. Due to its relevance to the investment policies adopted by Docteur Gab's founders, only the balancing loop B1 between investments and bank balance is commented here. This feedback captures a potential limit to growth. In fact, the higher the investments (in strategic assets), the higher the cash out, which in turn depletes bank balance. Therefore, the company could be forced to scale back on additional investments, leading to a moderate growth rate.

6. Discussion

6.1 A framework for understanding BMIs for SMEs during crisis

The analysis carried out through the DBM approach before and during the crisis suggests that Docteur Gab's followed an interactive BM approach (Sanchez and Ricart, 2010; Wang and Kimble, 2016) that helped them to withstand the crisis. Under such an interactive approach, Docteur Gab's involved external parties in their value creation process, while also used in different ways the resources at hand and available only through their partners.

In line with previous research, we develop a framework to help SME entrepreneurs to navigate a crisis by implementing changes in their BMs (see figure 5). This framework describes three processes that supported Docteur Gab's in its efforts to unlock the resources mentioned in section 5.1 and to respond to the crisis. These three processes also differ in the need of managing internal and external knowledge when implementing BMIs (Abdulkader *et al.*, 2020; Pati *et al.*, 2018), namely, the degree of change implemented in the BM during a crisis - and the performance associated with it - is also contingent on the knowledge exchanged with external parties (Ferraris *et al.*, 2020; Dezi *et al.*, 2019).

FIGURE 5 ABOUT HERE

The first process in the framework points at the *ability of SMEs to use readily available resources* to create a new revenue stream. For Docteur Gab's this implied their capacity to use existing assets to quickly offer something new to respond to an immediate change in their business environment due to the crisis. Using readily available resources is thus the first step SMEs may want to explore when searching for quick solutions to navigate a crisis. Because this process relies on existing readily available resources and a prompt generation of revenues with the firm's actual BM (Abdulkader *et al.*, 2020; Sanchez and Ricart, 2010), it involves marginal changes to SMEs' BM. It may include working together with business partners, however, only for the exploitation of SMEs' available resources. Therefore, while some changes are expected to the BM, little efforts in knowledge management processes such as knowledge translation (Corbo *et al.*, 2020; Dayan *et al.*, 2017) from outside the SME are needed. For example, Gab's used readily available resources when using their production capacity and beer for the distillation and production of ethanol to sell to hospitals and pharmacies. For Docteur Gab's, this change meant a collaboration with a local distillery and the enhancement of their customer segments. The blue loop R1 in figure 4 and the first block in figure 5 describe this process.

The second process leading to SMEs' BMIs during crises refers to the *transformation of existing resources* into innovations. Under this process, an SME makes use of and transforms immediate resources for the creation of new products that could address both an urgent market need (e.g., changes in their business environment due to a crisis), but also long-term business opportunities. Because the process requires recombination of existing resources in novel ways, it has larger implications on a firm's BM. It may also involve external business partners and inter-company knowledge exchange. In fact, collaborating with business partners may help SMEs' BMI effective implementation (Dezi *et al.*, 2019; Ferraris *et al.*, 2020). Therefore, knowledge plays an important role in the success of BMIs that rely on the transformation of existing resources. An example of this includes Docteur Gab's groceries delivery offering during COVID-19. During this period, the company relied on existing assets such as their distribution cars as well as storage facilities to conceive a novel use for these assets in joint collaboration with local food suppliers. The second block in figure 5 as well as the red feedback loop R2 in figure 4 describe the process of transforming readily available resources.

Finally, it is possible to observe that SMEs in times of crisis can undertake major BMIs thanks to their efforts to *mobilize distant resources*. In this case, SMEs use and transform resources that are usually out of reach and that can only be unlocked by working jointly with external parties (Ferraris *et al.*, 2020; Sanchez and Ricart, 2010; Wang and Kimble, 2016). Leveraging distant resources and their recombination with readily available ones also implies that SME entrepreneurs simultaneously experiment with different and novel ideas (Abdulkader *et al.*, 2020; Andries *et al.*, 2013) and have the ability to exchange and absorb knowledge from business partners (Corbo *et al.*, 2020; Ferraris *et al.*, 2020). Mobilizing external resources also means that it is necessary to put in place knowledge management processes for an effective BMI implementation (Sanchez & Ricart, 2010, p. 149).

An example of mobilizing distant resources includes Docteur Gab's beer funding platform. For a business that mainly relies on business-to-business sales, reaching out to the end-customer was possible by activating their network of clientele restaurants and having deep knowledge about them and their needs. Their human capital also played an important part in engaging restaurants in this initiative. Because Docteur Gab's distributes 70% of their product directly with their own delivery cars, they possess direct knowledge of their main customers (i.e., restaurants) and develop personalized relationships with restaurant owners. Such strong connections to restaurants and the ability to understand their needs facilitated the process of implementing BMIs as they could easily engage restaurants in the process of creating the beer funding platform. In line with the view on interactive BMs (Sanchez and Ricart, 2010; Wang and Kimble, 2016), these findings provide evidence that involving external parties in the value creation process as well as the ability to leverage their resources (Ferraris *et al.*, 2020) are an important source of knowledge (Abdulkader *et al.* 2020, Dayan *et al.*, 2017). This knowledge can become strategic in facilitating the process of transforming the contingencies of a crisis into a beneficial situation for the SME. This process is described by the green loop R3 in figure 4 and the third block in figure 5.

6.2 Theoretical and managerial implications

Our study contributes primarily to recent conversations in the field of business model innovations within the context of SMEs (Foss and Saebi, 2018; Franceschelli *et al.*, 2018; Zott *et al.*, 2011), particularly in time of crisis. It shows that resilient SMEs (Conz and Magnani, 2020; Dezi *et al.*, 2019; Kuckertz *et al.*, 2020; Manfield and Newey, 2018) can effectively implement innovations in their BM by undertaking an interactive approach (Sanchez and Ricart, 2010; Wang and Kimble, 2016). In other words, innovations can be implemented by collaborating closely with business partners in their network to respond to turbulent and uncertain business environments. Our proposed framework presented in figure 5, resulting from the analysis of Docteur Gab's BMIs implemented during the COVID-19 crisis, shows that by involving business partners in the value creation process, SMEs can enrich their endowment of tangible and intangible resources, which in turn can help them

to innovate their BM and react to unfavorable events. The framework also highlights the rising need for managing internal and external knowledge. Therefore, SME entrepreneurs neglecting the role played by knowledge management would not be able to understand how to identify, integrate and combine internal and external resources from business partners and drive major innovations to change their BM.

Furthermore, unlike previous works applying the DBM in the context of SMEs (Cosenz and Noto, 2018; Cosenz and Bivona, 2020), this study offers a novel contribution by making explicit the relationships between strategic resources, key drivers and processes affecting SME's BMI implementation in turbulent times, such as the COVID-19 crisis. In addition, the DBM approach provides the basis for future scholars oriented to investigate the drivers of BMIs in SMEs in times of crises.

Our study also provides managerial implications. The novel framework offered in figure 5 illustrates insights into other SMEs in the F&B industry facing difficulties during the COVID-19 pandemic or other crises. This is especially relevant as the F&B industry is only expected to recover from the impact of COVID-19 in 2025. In the meantime, alternative paths for innovation such as new dining concepts will be even more common in the years to come. In addition to this, the framework also helps SMEs to implement long-term changes in their BMs during crises such as COVID-19. Like Docteur Gab's, other SMEs must currently be reflecting on the temporality of the BMIs carried out during crises such as COVID-19. While many of these changes may start to generate revenue during the crisis, it might well be that these innovations represent a viable strategy to carry out also post-crisis. Because SMEs' managers and owners often lack a systemic understanding of the factors that create value in their company during crises, the framework suggested in this paper can be of benefit for them both to assess the implications of BM changes carried out during the crisis, such as COVID-19, and to foresee which innovations they should implement permanently.

7. Conclusion

This paper shows that SMEs in the F&B industry engaging in an interactive BM approach use and transform internal resources while also mobilizing external ones to effectively implement BMIs in response to a crisis, such as the COVID-19 pandemic. While SMEs using and transforming internal resources can rapidly respond to a crisis, collaborating and activating knowledge-sharing with business partners are essential for SMEs to deploy innovative and long-term BM changes during a crisis. Building on an in-depth case study analysis of a Swiss brewery and the use of the DBM perspective, this study offers a novel framework depicting three processes helping SMEs during COVID-19. First, the ability of SME's to use readily available resources helps them to react rapidly to the changing environment. Second, SME's ability to transform existing resources and convert existing resources into novel products or solutions. And finally, the ability of SMEs to mobilize distant resources helps them leverage resources from their network to pursue major BMIs. Following this framework, our paper also shows that while the active involvement of business partners leads to major BMIs, SME's ability to translate and absorb knowledge from their business partners is an essential element in ensuring effective BMIs in times of crises.

The paper shows that a dynamic understanding of BMI is essential for SME entrepreneurs to respond to turbulent environments as it helps them to identify critical processes to withstand the crisis. Following this line of thought, further research should focus on providing a deeper understanding of the underlying processes supporting BMI and their implications on firms' performance during and after a crisis. To support these insights, a system dynamics-based simulation model can be built to quantify different growth scenarios based on the underlying processes identified through our research methodology. Such simulation model can also prove useful to test alternative growth paths to respond to crises and generate new theoretical insights. In addition to this, to overcome the limits of a single case analysis and to further enrich the initial findings of this study, this research can be extended to other SMEs in the F&B industry and different BM can be results compared.

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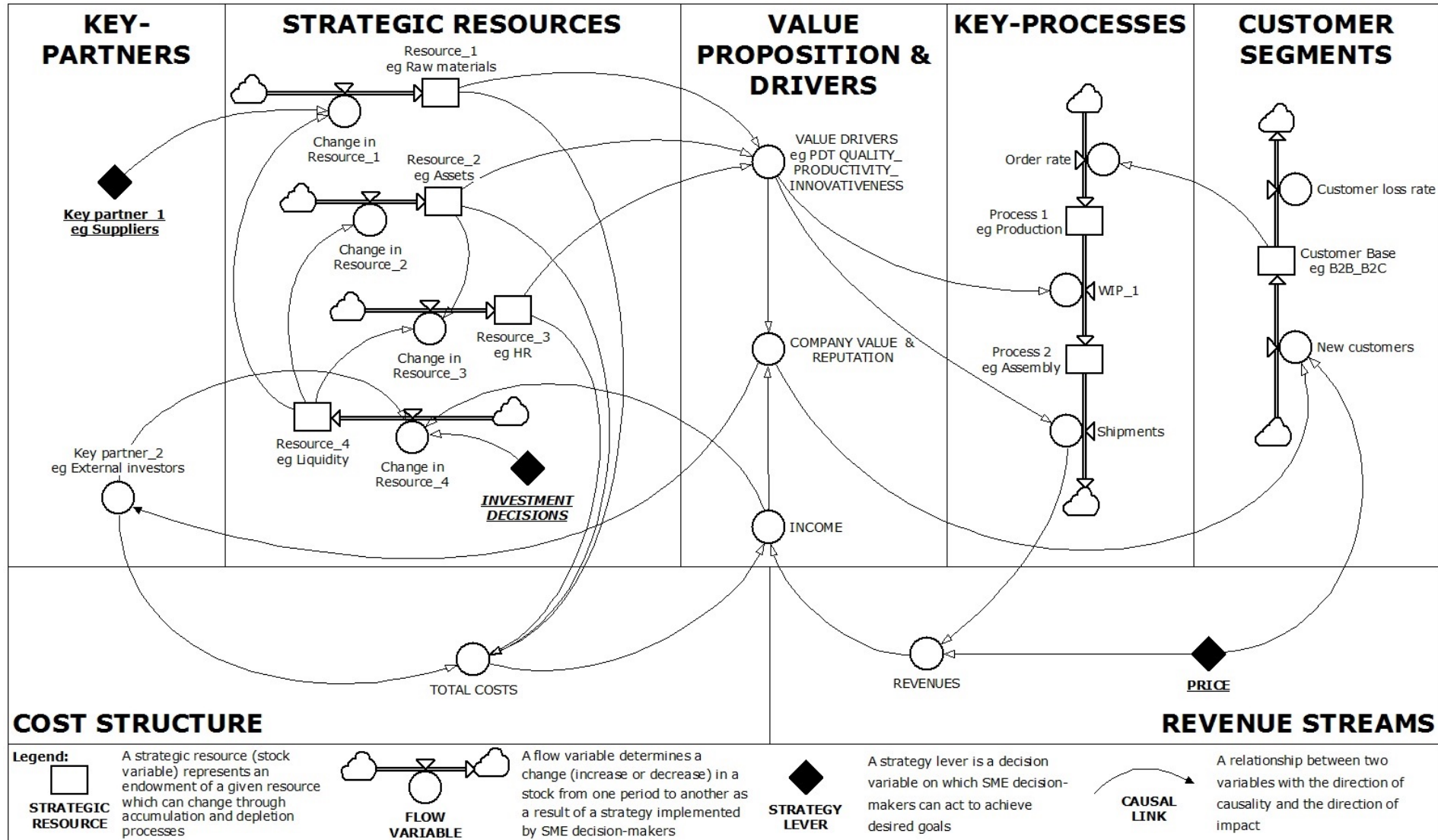
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Figure 1. Dynamic Business Model structure



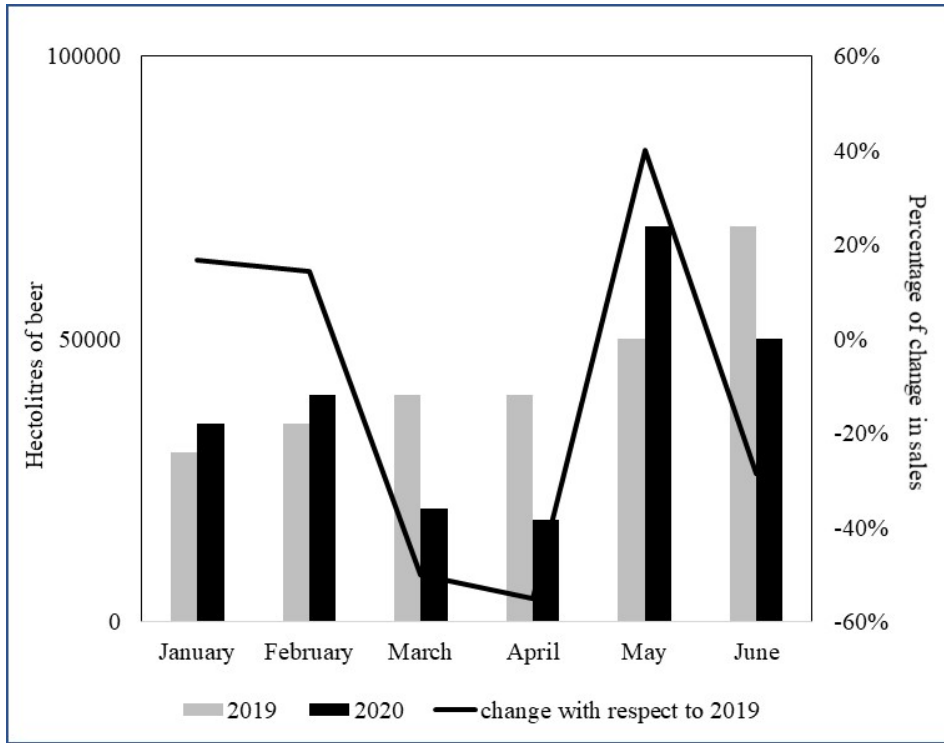


Figure 3a: Docteur Gab's Sales volume

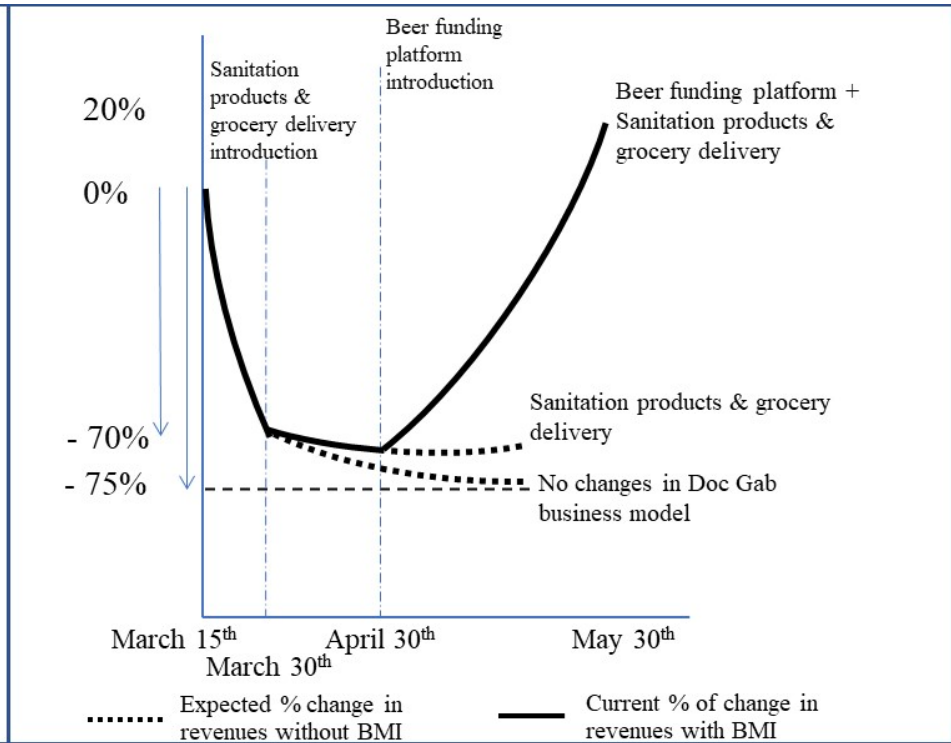
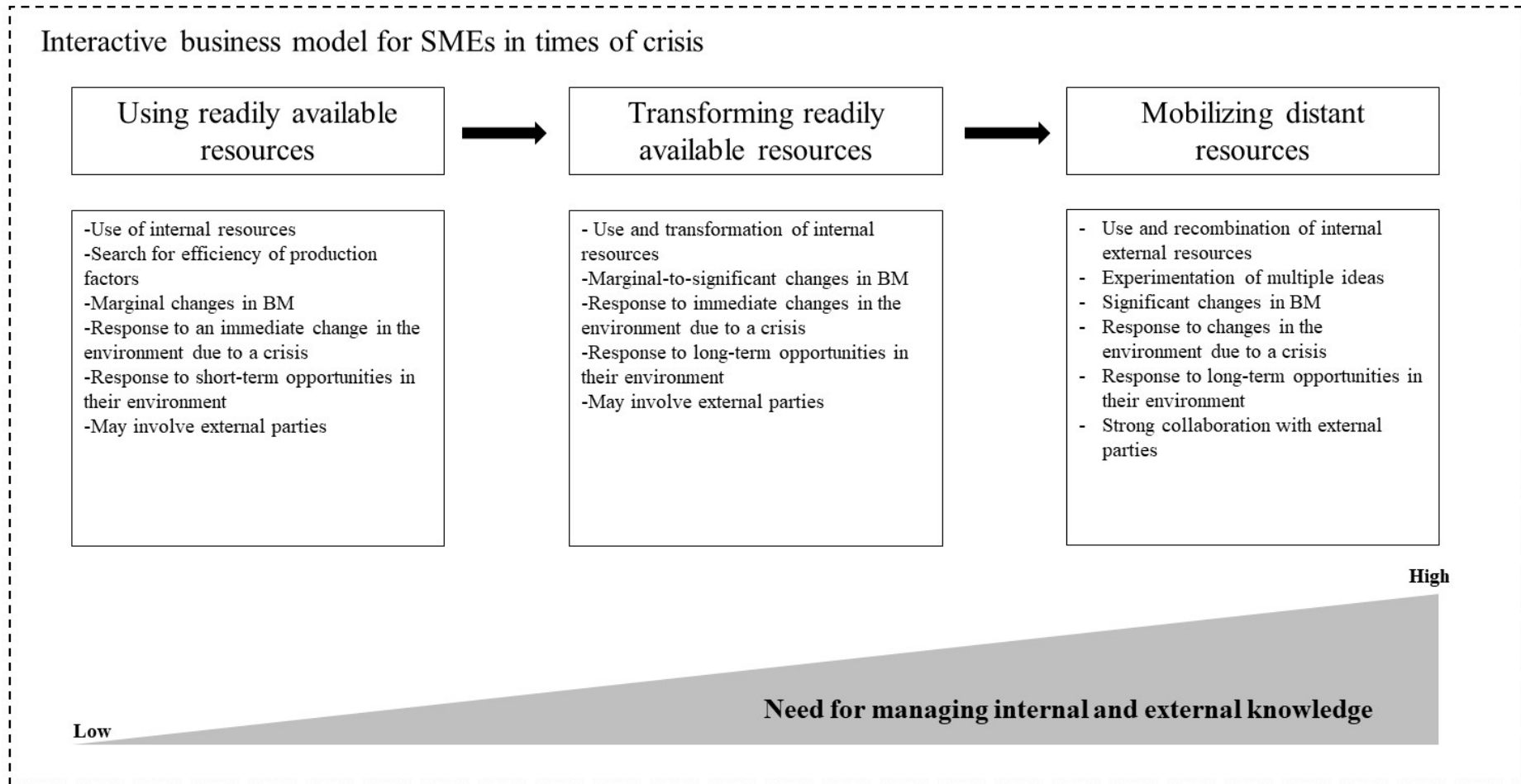


Figure 3b: Percentage of change in revenues compared to 2019

Figure 5. Interactive business model for SMEs in times of crisis



Source: own contribution

