Bifocals: Visualizing Interactions between Business Model Design and Ecosystem Innovation

Deborah Glassey-Previdoli
University of Applied Sciences Western Switzerland (HES-SO)
Riccardo Bonazzi
University of Applied Sciences Western Switzerland (HES-SO)
Patrick Kuonen
University of Applied Sciences Western Switzerland (HES-SO)

Abstract

This article describes an ongoing research project, which is mainly addressed to managers of nursing homes. Recent events have obliged nursing homes to redefine the interactions among stakeholders in their business ecosystem. By combining the existing literature in business ecosystem design and business model design, we propose a method called *Bifocals* to align the two ecosystem and business perspectives. We claim that our method (1) allows representing in details the niche ecosystem where the firm is located, (2) it offers a more structured way to respond to an ever-evolving ecosystem and (3) it underlines a coherent way to build and test new business model features to restructure the firm, in response to its ecosystem. We illustrate how to use Bifocals by describing how we supported the creation of a new service that adapts to recent evolution in the business ecosystem of nursing homes. In the future, we intend to validate our method by working with a group of nursing homes and health department officers.

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Introduction

"I cannot distinguish a letter even of large print: but am happy in the invention of double spectacles, which serving for distant objects as well as near ones, make my eyes as useful to me as ever they were."

Benjamin Franklin in (Franklin & Sparks, 1840, p. 132)

This article is mainly addressed to people in charge of redefining the ecosystem concerning nursing homes, as well as scholars interested in tools for business ecosystem design.

We define a *business ecosystem* as an economic community supported by a foundation of interacting organizations and individuals—the organisms of the business world (Moore, 1993). The economic community produces goods and services of value to customers, who are themselves members of the ecosystem. The member organisms also include suppliers, lead producers, competitors, and other stakeholders. Over time, they coevolve their capabilities and roles and tend to align themselves with the directions set by one or more central companies and reaching so-called *homeostasis* (Kikuchi et al., 2018). Those companies holding leadership roles may change over time, but the function of ecosystem leader is valued by the community because it enables members to move toward shared visions to align their investments and to find mutually supportive roles. Business ecosystems focus on present customer value creation, and Ecosystem actors have several reasons to stay together or actively participate in the orchestration of their ecosystem (Valkokari, 2015).

Since there are multiple definitions across countries about nursing homes, we refer to (Sanford et al., 2015) to define a *nursing home* as a facility that provides 24-hour functional support for people who have identified health needs and require assistance with activities of daily living (ADLs) and instrumental activities of daily living (IADLs). Such a place may or may not be staffed with health care professionals and it provides long-term care and/or rehabilitation as part of hospital avoidance or to facilitate early hospital discharges. Finally, a nursing home does not function as a hospital ward, it is not hospital-based and it may play a role in providing palliative and/or hospice care at the end of life.

It should be underlined that we choose to focus here on well-being rather than healthcare, which is subjective and concerns the overall feelings of the patient, rather than the time spent with healthcare professionals. Hence, our research question is: **how to assess the business ecosystem of a nursing home, to improve patients' well-being?**

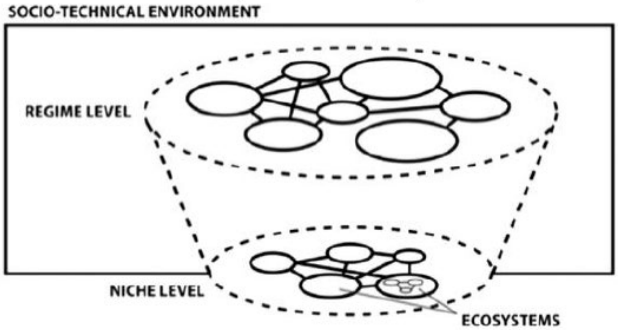
The rest of the paper proceeds as it follows. Section 2 briefly reviews the relevant literature to answer our research question and underlines a research gap. Section 3 describes how we applied design science to develop an artefact that addresses the research gap. Section 4 describes our artefact in the shape of a method to switch from ecosystem design to business model design. Section 5 offers an example (also known as *illustratory instantiation*) of how the process can be used to develop new services to adapt to an evolving business ecosystem. Section 6 briefly discusses the preliminary results and section 7 concludes the paper by highlighting its contributions and limitations.

Literature review

In this section, we briefly review the recent literature concerning (1) how business ecosystems evolve and (2) available tools to perform ecosystem design.

Innovation in business ecosystems. In their systematic literature review of innovation ecosystem thinking, (Yaghmaie & Vanhaverbeke, 2019) identify one multilevel model (Figure 1): Walrave et al. (2018) describe how to innovate in a *niche community* of actors who are interested in influencing the development of the particular domain. Moreover, Konietzko et al. (2020) lists a set of recommended principles on how to successfully innovate in ecosystems by performing three relevant processes: (a) collaboration, (b) experimentation and (c) platformization (in the rest of the paper we shall focus mainly on the first process).

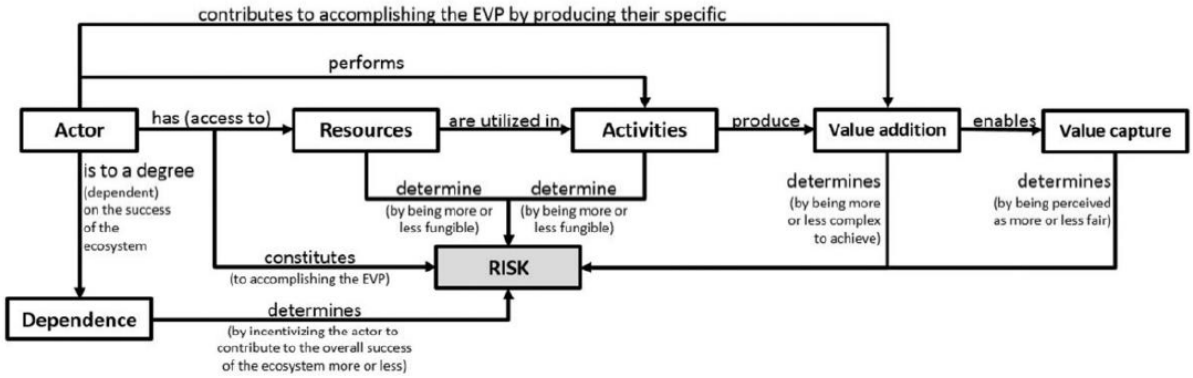
Figure 1
Multilevel Analysis for Ecosystem Development and Path-breaking Innovation



Source: (Walrave et al., 2018)

Tools for experimentation in business ecosystems. In order to create and capture more value from the existing ecosystem, a recent technique called *Ecosystem Pie Model* (Talmar et al., 2020) allows visualizing (a) the strategies for aligning the actors to the value proposition of the ecosystem (Walrave et al., 2018), (b) the interfaces of collaboration between parties (Davis, 2016), (c) the types of complementarity between the different actors (Jacobides et al., 2018). The structure of the model is described in Figure 2.

Figure 2 Nomological Network of the Constructs Used by the Ecosystem PIE



Source: (Talmar et al., 2020)

The gap in the current literature. In their analysis concerning care coordination, Raynor et al. (2014) identify three capacities for firms in a changing ecosystem: (i) the capacity to understand the ecosystem; (ii) the capacity to respond to an ever-evolving ecosystem; and (iii) the capacity to structure itself in response to its ecosystem. On the one hand, it appears possible to assess the environment with the process of Konietzko et al. (2020) and find new collaboration in the ecosystem niche,

then to use the ecosystem PIE to perform experimentation and finally to restructure the firm in order to develop a platform by using existing business model design tools (Amarsy, 2014; Osterwalder et al., 2020). Nonetheless, a single coherent process to do these three steps appears to be missing.

Design science methodology

In this section, we illustrate the chosen methodology to answer our research question. We position our study in the field of design science research (Hevner et al., 2004) and we developed an artefact under the shape of a method, as defined by March and Smith (1995). Accordingly, we have followed the guidelines of Gregor and Hevner (2013) to create a set of design principles as part of a nascent design theory, which is at level 2 of the contribution types. We describe the development of our artefact by following the steps of Peffers et al. (2007).

(1) **Identify the problem and motivate**: As described in section 1, the focus of our analysis is the people in charge of redefining the ecosystem concerning nursing homes. Most of the previous researches have focused on research institutions as the main subject of analysis for innovation in the healthcare ecosystem. Instead, we centred our analysis around the evolution of the concept of nursing homes and we focus on well-being rather than healthcare.

(2) **Define objectives of the solution:** As shown in section 2, seekers often estimate that the main cost of an idea challenge comes from the reward itself; yet, making mistakes in the selection process and picking the wrong idea might result in the seeker wasting time and money. Therefore, we are looking for a method that allows obtaining ideas that fulfil (and hopefully extends) the criteria of the idea seeker at a reasonable cost.

(3) **Design and development**: Section 4 illustrates how we combined tools in ecosystem design and business model design, to obtain a method that allows to (i) the capacity to visualize the evolution of the ecosystem, (ii) support the conception of new solutions respond to an ever-evolving ecosystem; and (iii) suggests the changes to implement to structure itself in response to its ecosystem and the testing strategy to validate the business hypotheses.

(4) **Demonstration**: Section 5 illustrates an example of to design a new service that exploits new trends in the business ecosystem.

(5) **Evaluation:** At the end of Section 5, we illustrate the preliminary feedback received by a startup offering the service conceived by using the Bifocals method.

(6) **Communication**: We have started sharing the preliminary results via academic conferences and we plan to submit our full report once the first phase of data collection will be completed.

Our artefact: Bifocal method to pass from ecosystem design to business model design

In this section, we illustrate how we created our method called *Bifocals*, to underline the fact that it allows passing from the business ecosystem to business model design.

In the first column of Table 1, we follow the steps of the collaboration process of Konietzko et al. (2020) and we represent them by linking together the elements of the Ecosystem PIE (Talmar et al., 2020) in the second column. Since we take the point of view of the nursing home, we will make a distinction between internal and external resources/activities/value addition components. This allows focusing on the niche ecosystem mentioned by Walrave et al. (2018) while visualizing a complete set of information that describes the flow of information, goods and money. That leads to

the first testable proposition **(P1)**: *the ecosystem component of the Bifocals method allows representing in greater details the niche ecosystem where the firm is located.*

By observing the links among components shown in the ecosystem PIE canvas, it is possible to underline features that can be Eliminated, Reduced, Raised or Created (Chan & Mauborgne, 2004). In addition to that, the process of Konietzko et al. (2020) allows addressing the right questions in the right order. That leads to our second testable proposition **(P2)***: the value alignment component of the Bifocals method offers a more structured way to respond to an ever-evolving ecosystem.*

For each step of the process, in the third column, we assign a type of risk derived from the literature on business model design (Amarsy, 2014; Osterwalder et al., 2020): lack of product/service desirability (problem-solution fit), lack of technical feasibility (product-market fit) or lack of economic viability (business model fit). That leads to our third testable proposition **(P3)***: the business model component of the Bifocals method underlines a coherent way to build and test new business model features to restructure the firm, in response to its ecosystem.*

Table 1
How the Bifocals Method Links Business Ecosystem and Business Model Design

Business Ecosystems Design (Konietzko, Bocken and Hultink, 2020)	Elements in the Ecosystem PIE (Talmar *et al.*, 2020)	Types of business model design risk (Amarsy, 2014; Osterwalder *et al.*, 2020)
1) Partner selection process	Internal Resource / Actor	..
2) Involve new actors	Actor	…
3) Establish trust	Ext. Activities –> Int. Act.	Technical feasibility
4) Get commitment/buy-in	Ext. Activities -> Ext. Act.	Product Desirability
5) Align individual and shared interests	Value Addition –> Ext. Activity	Product Desirability
6) Re-define actor roles	Value Addition –> Ext. Activity	Product Desirability
7) Decentralized/ collaborative gov.	Internal activity -> Int. Resource	Technical feasibility
8) Develop joint strategies and goals	Ecosystem Value Proposition (EVP)	Product Desirability
9) Ensure fair value capture among actors	Ext. Activity -> Int Value Capture	Economic viability

Source: Authors' work

Preliminary results: visualization of the business ecosystem

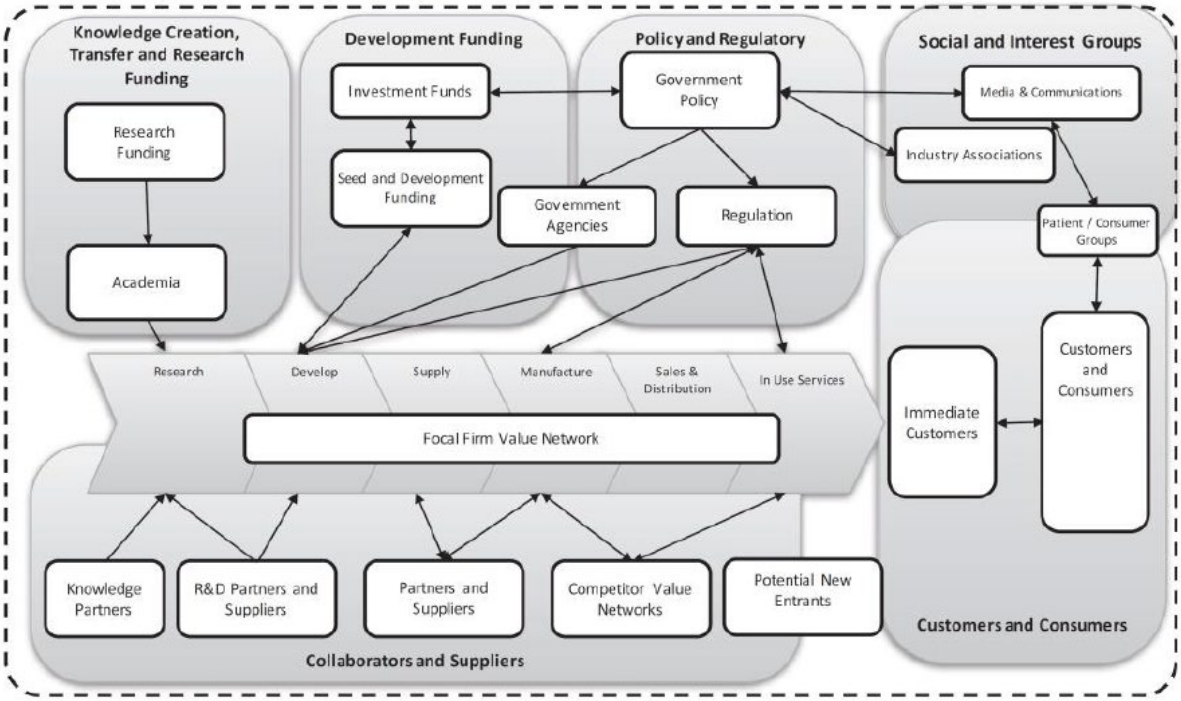
In this section, we present the current situation in Switzerland concerning nursing homes (Figure 2), we briefly describe some of the trends for the future and we move on illustrating the Ecosystem PIE obtained with our method (Figure 3).

General insights concerning nursing homes in Switzerland. In Switzerland, nursing homes (*Etablissement Médico-Social* in French and *Pflegeheim* in German) have hosted 122'000 people in 2017 for long-term stays of 3.5 years on average (Swiss Federal Statistics Office, 2019). According to the Swiss Federal Statistics Office (2005), a Swiss nursing home exchanges data with five stakeholders: (1) The Federal Offices of Public Health and Social Insurance, (2) The Cantonal public health services, as well as social welfare offices and statistical offices, (3) The service and hosting providers concerned with the nursing home, (4) The research institutions and (5) The insurers, for example, SantéSuisse– an umbrella association of health insurers. Previous attempts to visualize the innovation ecosystem in healthcare, such as the one shown in Figure

2 allows adding (6) the collaborators, such as the healthcare providers, which are usually separated from the hosting providers, (7) the suppliers, (8) the social and interest groups, (9) the customers and consumers that surround the immediate customer, that will be named here *informal caregivers*, (10) the immediate customers, which will be named *Elderly people*.

The nursing home of the future. In recent years, European countries have explored new forms of the nursing home, such as day-care services, whereas Northern countries already sponsor retirement communities and flats built close to but not in care homes (The Economist, 2020). Such tendency to improve nursing homes has increased recently since across the rich world nearly half of all deaths from Covid-19 have happened in care and nursing homes, even though less than 1% of people live in them (The Economist, 2020). Such movement towards decentralization of hosting solutions for patients might require new transportation solutions and that changes in the business ecosystem offer new opportunities for innovation.

Figure 3
Example of Visualization of the Healthcare Innovation Ecosystem

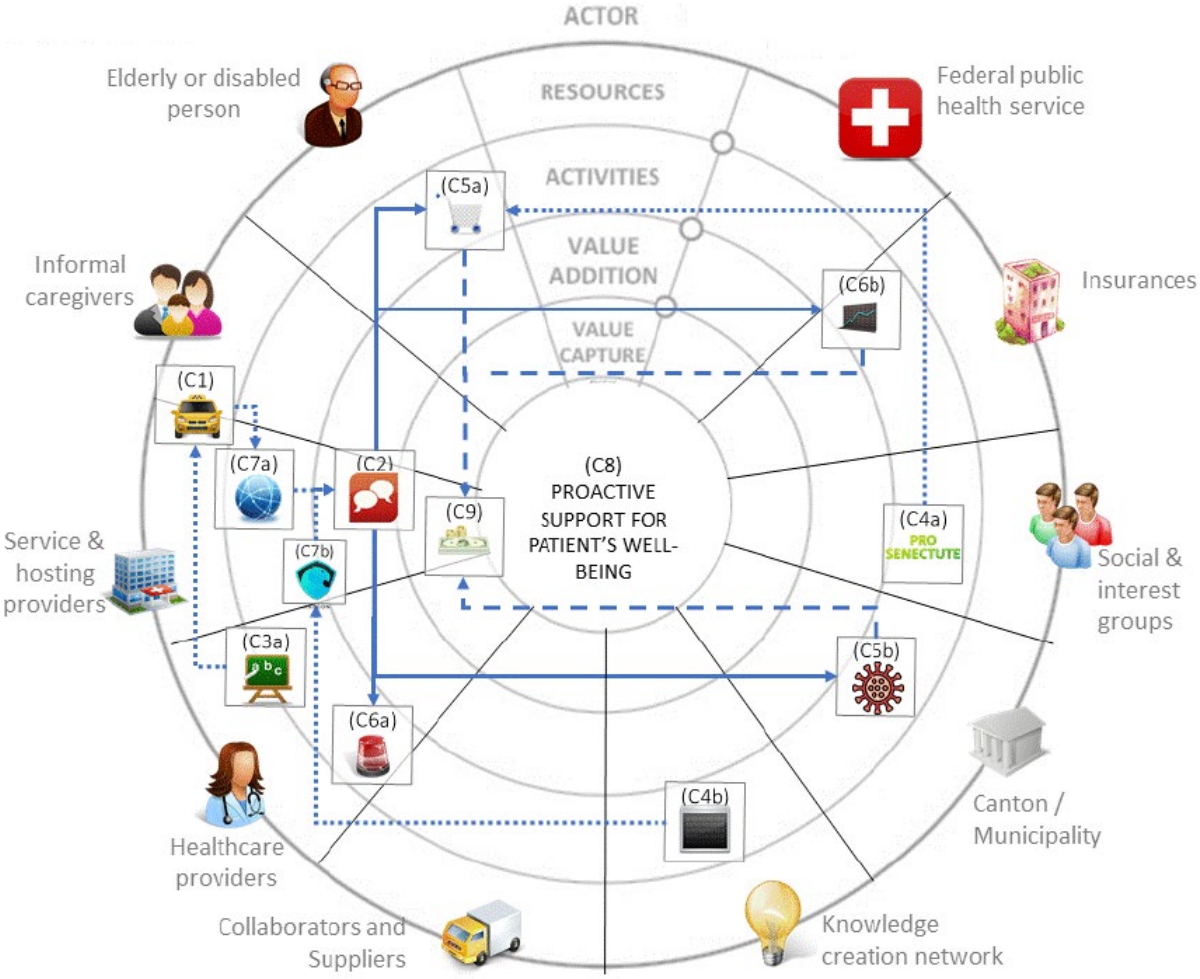


Source: (Phillips & Srai, 2018)

Applying our method to perform ecosystem redesign and business design. The first step of the collaboration process proposed by Konietzko et al. (2020) led us to select a niche of actors, who were in contact with the elderlies while they were not hospitalized. That led to the inclusion of informal caregivers as a resource for transportation (shown in Figure 4 as step C1 and a taxi icon). Inspired by Uber, we thought if we could create a crowdsourced transportation system of elderly people. Indeed, it turned out that it already existed for disabled people[1]; nonetheless, it is offered by professionals instead of professionally trained volunteers. That led to the creation of a new component for value addition of the ecosystem (named C2 in the figure 4): drivers trained by care providers might be able to use the time spent driving to support the elderly people and collect information about their wellbeing. The fact of being trained by healthcare providers (named C3a in Figure 4), will establish trust

among ecosystem actors interacting with the service, whereas Social and interest groups (such as pro-senectute in Switzerland, named C4a) will support the service by promoting its services to elderly people and research institutes (C4b in Figure 4) will offer the technological know-how to manage the platform.

Figure 4
Ecosystem PIE for a New Transportation Service Offered to Elderly People



Source: Author's illustration based on the empty canvas available from ecosystempie.com/guidelines.pdf (icons by iconspedia.com and freepik.com)

The new value addition will allow current activities of other actors, such as doing daily shopping for elderly people (item C5a, which refers to the step) and helping the municipality to improve the nursing homes during the Covid-19 pandemics (item C5b). Moreover, a service that collects data while performing transportation might be relevant for doctors (item C6a) who can receive relevant data about their patients from professionally trained personnel and insurance firms (item C6b), who are willing to reposition themselves by sharing with their clients' data about their health risk (in Switzerland, this is currently possible as long as the health risk data is not used by the insurance to assess the financial risk of each client). Finally, the internal activities management of the network (item C7a) and decentralized autonomous organization (item C7b) will assure the decentralized governance suggested by step 7. Consequently, the joint goal of the niche ecosystem can be summarized as

"proactive support for patient's well-being" (item C8) and the value capture activity to finance the new service would be a yearly subscription fee from the three actors, which getting support for their activities (Item C9).

The arrows in Figure 2 allows to assess the different types of business risk, expressed in the third column of our table: (a) full arrows, like the one connecting the new value addition C2 and the shopping activity C5a, concern product desirability; (b) dashed arrows, like the one connecting the shopping activity C5a and the value capture activity C9, concern willingness to pay and business viability; (c) dotted arrows, like the one connecting the Decentralized autonomous organization C7b and the new value addition C2, concern the technical feasibility.

Seeing the model used in practice: Match'NGo. An example of the business model side of our Bifocals method is the project Match'NGo of the company ErgoSum Srl. During the beginning of the Covid-19 pandemics, the team has established a minimum viable product made of a network of volunteers (C1) to transport elderly people in their daily activities (C5a) and test the technical feasibility of the system. The idea has already won a start-up competition[2], who took place at the end of May 2020. This event was considered as a first product desirability test and it gave Match'NGo visibility across other actors in the ecosystem. The project managers are currently discussing with the Pro-Senectute association (item C4a) and they have received a small grant from the Swiss confederation to work with a research institution (C4b). In the meantime, they are working closely with different municipalities (C5b) to fine-tune their services.

Discussions

In this section, we discuss our preliminary results by following the argumentative model of Toulmin (2003), which is composed of (i) a *background*, that describes the problem and the research question, (ii) a set of *claims* backed by *reasons*, which are supported by *pieces of evidence*. Such claims are associated with a few *qualifiers* (boundary conditions when the claims hold), which deal with possible *reservations* (limitations or ground for rebuttal of the claims).

Background. As shown in section 01, our research question concerns how to assess the business ecosystem of a nursing home, in order to improve patients' well-being. The relevance of this research question is grounded in longstanding socioeconomic trends (the increase of lifespan and the consequent expansion of healthcare expenses), recent shifts linked to new technologies (business model changes of insurance firms linked to recent developments in machine learning algorithms) and unexpected events (new safety guidelines following the worldwide spread of Covid-19).

Our first **claim** is that our method allows us to represent in details the niche ecosystem where the firm is located. The **reason** for our claim is described in section 2: previous scholars have described the innovation ecosystem in healthcare, but they have not used the ecosystem PIE model. In section 5 we offered as **evidence** the description of how we managed to visually assess the interactions among actors, once we include informal caregivers. Compared to previous visualizations, our representation allows us to see more in details the ecosystem niche. Nonetheless, a possible **reservation** regarding our approach concerns the focus on one main actor, who seeks to orchestrate the ecosystem. Therefore, our **boundary conditions** are set around the use of this method for the orchestrator: if multiple actors want to obtain a unified representation of the ecosystem, our method might require additional features to obtain a common ground.

Our second claim is that our method offers a structured way to respond to an ever-evolving ecosystem. As shown in section 2, the ecosystem PIE fits well for experimentation, but we wanted to extend its use. In section 4, we described how to visualize the collaboration strategy and in section 5, we're have shown how such method had led to the identification of one new value proposition and two additional revenue streams across actors in the business ecosystem. Nonetheless, the Bifocals method does not explain how to conceive such ideas and it should be used in combination with existing techniques to enhance group creativity (in section 4 we have mentioned the Eliminate-Reduce-Raise-Create Grid as a simple example).

Our third claim is that our method underlines a coherent way to build and test new business model features to restructure the firm, in response to its ecosystem. As shown in section 2, business model design techniques have recently evolved to include business resilience. In section 4, we described how to pass from ecosystem design insights to business model hypotheses to be tested in the future. In section 5, we have described how we identified the 3 types of business hypotheses to be tested. Nonetheless, the Bifocals method does not explain how to test such ideas and it should be used in combination with design thinking techniques for prototyping and testing. Accordingly, in section 5, we have briefly illustrated how we used two validation techniques called Single-Feature MVP with the potential users and Letter of intent with the potential sponsors (Bland & Osterwalder, 2019).

Conclusions and further directions of investigations

This article describes an ongoing research project, which is mainly addressed to managers of nursing homes. Recent events have obliged nursing homes to redefine the interactions among stakeholders in their business ecosystem.

By combining the existing literature in business ecosystem design and business model design, we propose a method called Bifocals to align the two ecosystem and business perspectives. We claim that our method (1) allows representing in greater details the niche ecosystem where the firm is located, (2) it offers a more structured way to respond to an ever-evolving ecosystem and (3) it underlines a coherent way to build and test new business model features to restructure the firm, in response to its ecosystem. We illustrate how to use Bifocals by describing how we supported the creation of a new service that adapts to recent evolution in the business ecosystem of nursing homes.

In this section, we conclude by using the guidelines of Davis (1971) to underline the contribution of our paper:

1) *What seems to be phenomena, which cannot exist together, are in reality phenomena, which can exist together*. In section 4, we have argued that we could represent in one single image the key elements from business ecosystem design and business model design. Previous works have focused on representing in detail each of these two dimensions, but a tool that allows switching between the big picture and focused action (like a Bifocals) appeared to be missing.
2) *What seems to be unrelated (independent) phenomena are in reality correlated (interdependent) phenomena*. In section 5, we used the Bifocals method to link activities that might appear uncorrelated, if not seen from a business ecosystem perspective. Healthcare professionals are not used to gathering insights during patients' daily activities, since such data (coming from a device such as Fitbit) would be unreliable and time-consuming. Nonetheless, our service allows us to explore a new way to conceive the role

of caregivers, and let the concept of nursing home evolve towards a new shape.

Although the paper shows promising insights, our research project is currently ongoing and it has its limitations, as discussed in section 6. Nonetheless, such limitations allow future directions of investigations.

- The Bifocals method so far has led to the development of a single business idea, and we are planning to use it in the future to structure our discussion with owners of nursing homes and health department officers.
- The Bifocals method is a bridge between existing techniques in business ecosystem design and business design, and it cannot be used as stand-alone. Therefore, future research will continue to work on how to integrate seamlessly such tools into one coherent approach.
- The Match'NGo project has passed the first round of tests concerning product desirability and technical feasibility, but it is still at its initial stage. Future work will develop a more advanced prototype to validate the product-market fit and business model fit.

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About the authors

Deborah Glassey-Previdoli is a PhD student and research assistant at the Institute of entrepreneurship and management of the HES-SO Valais Wallis. She has been researching the field of energy management and she has been studying best practices of digital transformation in the field of secondary education. She can be contacted at **deborah.glassey@hevs.ch**.

Riccardo Bonazzi is a professor at the Institute of entrepreneurship and management of the HES-SO Valais Wallis. His main interests are business model design and organization design. Previously, he has researched governance, risk and compliance management. He can be contacted at **riccardo.bonazzi@hevs.ch**.

Patrick Kuonen is a professor at the Institute of entrepreneurship and management of the HES-SO Valais Wallis. He has worked for a multinational audit firm, and he has been leading projects with small and medium enterprises in the tourism sector. He can be contacted at **patrick.kuonen@hevs.ch.**