

# Assessing shared value in innovation ecosystems: a new perspective of scorecard

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Shared value in  
innovation  
ecosystems

Received 1 March 2023  
Revised 19 July 2023  
Accepted 10 September 2023

## Abstract

**Purpose** – Measuring shared value (SV) created in innovation ecosystems (IEs) is increasingly relevant but complex, given the multidimensional and multiactor nature of both concepts, which challenges traditional performance measurement systems (PMSs). Moving from this gap, the authors propose an integrated approach to extend the balanced scorecard (BSC) for measuring and monitoring SV creation at IE level.

**Design/methodology/approach** – The proposed approach combines the most recent contributions on PMS in IEs and SV to define perspectives and dimensions that are better suited to deal with the nature of both IEs and SV. The approach is also applied to the real case (Alpha) of an Italian IE through a step wise method. Starting from the IE vision, the authors identify in the strategy map the specific objectives related to each perspective/dimension combination and then associate a performance indicator with each objective.

**Findings** – The resulting SV BSC is composed of indicators interconnected along different perspectives and dimensions. The application of the approach to the real case proves its feasibility and highlights characteristics, advantages and disadvantages of the SV BSC when used at IE level. The authors also provide guidelines for its application to other IEs.

**Originality/value** – The study contributes to the research on PMS by introducing and applying to a real case an integrated approach to assess SV in IEs, overcoming the shortcomings of PMS framed for single firms. It can be of interest for both researchers in the field of ecosystems value creation and practitioners managing or promoting such complex structures.

**Keywords** Innovation ecosystems, Shared value, Performance measurement systems, Balanced scorecard, Sustainability, Strategy map

**Paper type** Research paper

## 1. Introduction

Innovation ecosystems (IEs) are structures composed of interdependent and interconnected heterogeneous actors that aim to create value, performing collaborative innovation activities to materialise a joint value proposition (Ritala *et al.*, 2013; Adner, 2017; Jacobides *et al.*, 2018).

There is consensus in the literature on the potential IEs have to create more value than single entities alone (Adner, 2006; Adner and Kapoor, 2010; Russell and Smorodinskaya, 2018), both in terms of intensity and the dimensions of the impacts generated for multiple stakeholders and society as a whole (Guerrero *et al.*, 2016; Radziwon *et al.*, 2017; Del Vecchio *et al.*, 2017; Lopes and Farinha, 2018; Audretsch *et al.*, 2019). This is particularly true when the IE's goals include sustainability purposes in terms of Triple Bottom Line (TBL) objectives and impacts (economic, social, environmental).

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More recently, authors are linking this potential to the so-called shared value (SV) creation (Porter and Kramer, 2011; Arena *et al.*, 2022), defined as the strategic processes and policies in support of pursuing economic returns while solving societal issues, which are not generic, but closely aligned with the core business of an entity.

Although SV as a concept has become enormously popular in management theory and business practice, it still lacks a robust measurement system, capable of capturing its economic, social and environmental dimensions through reliable data and indicators (Menghwar and Daood, 2021). This topic is of great importance for IEs, too, increasingly dealing with pressure from managers, communities and institutions demanding performance metrics (Gomes *et al.*, 2018; Alberti and Belfanti, 2019; Cobben *et al.*, 2022).

Measuring SV created in IEs is particularly complex, due to the multidimensional, multi-actor, multilevel and dynamic nature of IEs (and of SV creation, too) (Gomes *et al.*, 2018). Indeed, these characteristics challenge traditional performance measurement systems (PMS), commonly adopted at company level. Its multidimensional nature deals with the different impacts generated at economic, social, environmental and of course innovation levels (Arena *et al.*, 2022). This requires PMS capable of tackling such dimensions simultaneously, while adopting a reasonable number of indicators to cover all these aspects and supporting the identification and management of potential trade-offs. Second, an IE is, by definition, constituted of interdependent and independent actors that have a proactive role in its construction and development and contribute in different ways to the SV creation process with their resources, capabilities, relations and complementarities (Jacobides *et al.*, 2018; Royo-Vela and Cuevas-Lizama, 2022). As such, these “actors” are not simply “stakeholders”, traditionally seen as entities with stake or interests, in a company’s activities: actors of an IE are recognised as proactive in creating value and thus their needs, aims and resources are considered all fundamental to be tackled. Indeed, here, the level of analysis is shifting from the company (and its stakeholders) to the IE (and its actors), and this complicates the definition and adoption of PMS, as the needs, requirements and critical success factors of all actors are equally relevant and need to be acknowledged.

Third, IEs comprise multiple levels, as framed by Viitanen (2016): these levels go from regional to global reach, from incubation environments to anchors and their activities. Last, IEs are characterised by dynamic boundaries (Gomes *et al.*, 2018) that rarely overlap the relevant administrative or geographical boundaries. This challenges perimeter definition and data collection in the implementation and adoption of PMS.

Given such difficulties, the literature on value creation in IEs is dominated by conceptual works and single-case studies (Leendertse *et al.*, 2020) demanding further understanding of value creation and its measurement at the ecosystem level (Gomes *et al.*, 2018).

This need is perceived by real IEs, too, that are challenged in the measurement of value created. Indeed, some IEs are practically addressing this issue publishing impact reports (such as the Mars Impact Report, available at: <https://www.marsdd.com/impact/>) or individuating specific performance that is to be monitored (as done by Canada’s Global Innovation Clusters, available at: <https://www.digitalsupercluster.ca/annual-report/2021–22/>). However, even these very advanced IEs limit the measurement of SV to a few standard indicators at company level, mainly depicting output or inputs (e.g. the amounts invested, the number of projects launched, the employment rate) rather than broader impact and reporting qualitative success stories. The difficulty in identifying a set of interconnected metrics able to summarise the complexity of the IEs and proper data sources makes monitoring SV creation a challenge.

Within a parallel strand of the literature, some authors have started to adapt traditional PMS, for the definition of a set of multi-level indicators to be adopted in multi-actor collaborative settings (Lopes and Farinha, 2018; Kaplan and McMillan, 2020; Nazari-Ghanbarloo, 2022). The balanced scorecard (BSC) in particular, introduced at company level by Kaplan and Norton (1996), has been applied to multi-stakeholder and multiactor settings

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(Frederico *et al.*, 2021), as it enables merging financial and non-financial measures, long and short-term impacts and connecting KPIs with cause-effect relations (Lopez and Farinha, 2018; Kaplan and McMillan, 2020). Despite these recent developments, the BSC so far has not been used to deal simultaneously with both the multidimensional and the multi-actor nature of IEs and thus is not directly applicable for measuring SV creation, in terms of the incremental socio-economic and environmental impacts, created at IE level.

Moving from these considerations, this paper focuses on the issue of SV measurement from an IE perspective, in line with the framework proposed by Arena *et al.* (2022) that outlines the building blocks of SV creation in IEs and analyses its main characteristics. Specifically, we contribute to the state-of-the-art literature by proposing an approach that could be applied to effectively measure and monitor SV creation at IE level, answering this research question:

*RQ.* How can the BSC be extended and adopted to measure and monitor SV in IEs?

To this end, we propose an integrated approach to designing a “SV BSC for IEs” extending the TBL BSC of Kaplan and McMillan (2020) and leveraging key contributions focused on IEs and value creation (Carayannis and Campbell, 2009; Katz and Wagner, 2014; Lopes and Farinha, 2018; Arena *et al.*, 2022) through a stepwise method. As a result, our proposed BSC addresses four perspectives (Enablers, Processes, Actors, Impacts), disentangled from specific dimensions.

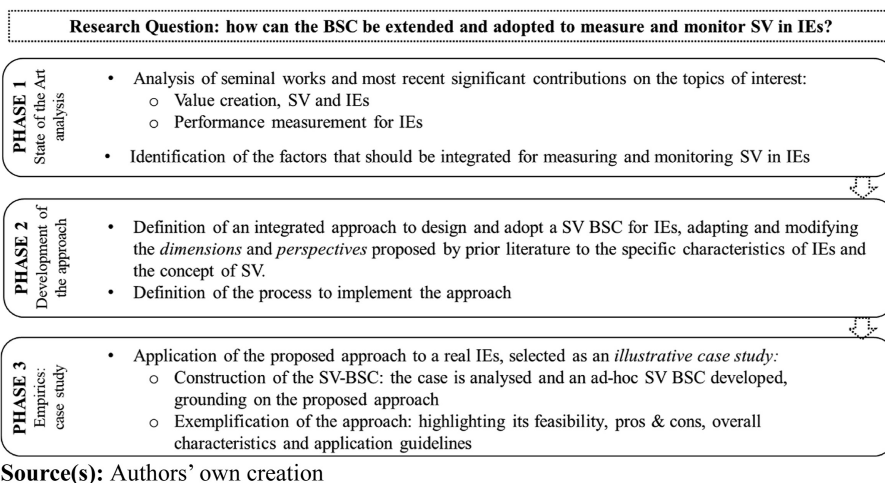
Such an approach is then applied to a real case, deductively studied in line with Yin (2014). The selected case, here anonymised as Alpha, is an emerging IE located in an Italian interior area where a private promoter is involved, together with different private and public entities at national and local levels. This IE explicitly aims at creating SV through innovation projects in different sectors (from agritech to renewables, from sustaining the cultural heritage to applied research and data analysis) and is struggling with impact monitoring at IE level, thus being a proper setting for applying and implementing the introduced approach, analysing its feasibility, too. Data were collected through desk analysis, semi-structured interviews and meetings with project managers. We first developed a strategy map (as an intermediate step useful for identifying strategic objectives per BSC perspective) and then the SV BSC for this specific IE, composed of interconnected indicators populating each perspective. Last, the resulting BSC has been commented upon and validated by informants deeply involved in the development of Alpha.

Through this approach, SV creation is measured and monitored at IE level, capturing its multi-actor and multidimensional nature. Common characteristics among indicators (and data to build them) of the same perspectives are identified (such as scale, time window and data sources), as well as the advantages and disadvantages of applying the BSC at IE level for measuring and monitoring SV.

The rest of the paper comprises 6 sections. In Section 2 we briefly describe the three phases this research builds on, introducing the research design diagram. Section 3 reviews the literature relevant to value creation and performance measurement, highlighting the main limitations of traditional measurement approaches developed at firm level when applied to IEs. Section 4 details the proposed approach and describes the methodology to be adopted by IEs to develop their own BSC to measure and monitor SV. Section 5 presents the application of the method to the real case Alpha, followed by a discussion of the results in Section 6. Finally, the main contributions and limitations of this work are summarised in section 7.

## 2. Research design

As illustrated in Figure 1, a three-stage research design procedure has been adopted. Grounding in the revised literature (phase 1, described in section 3) we define an integrated approach to design an SV BSC for IEs (phase 2, detailed in section 4), then applied to a real case (phase 3, further specified in section 5).



**Figure 1.**  
Research design  
diagram

Specifically, phase 1 entails the analysis of the literature in the fields of interest (value creation and SV in IEs, PMS and BSC), focusing on seminal works and more recent contributions in the fields. Phase 1 enables to better define the literature gaps and framing the research question, as well as identifying from the literature factors that need to be integrated for measuring SV in IEs.

This informs the second phase of our research, namely the development of the integrated approach we propose to design (and apply) the SV BSC for IEs. Specifically, we adapt and modify the dimensions and perspectives proposed by prior literature on PMS for value and SV creation at company level to the specific characteristics of IEs and SV. Also, in this phase we define the process to implement the proposed approach.

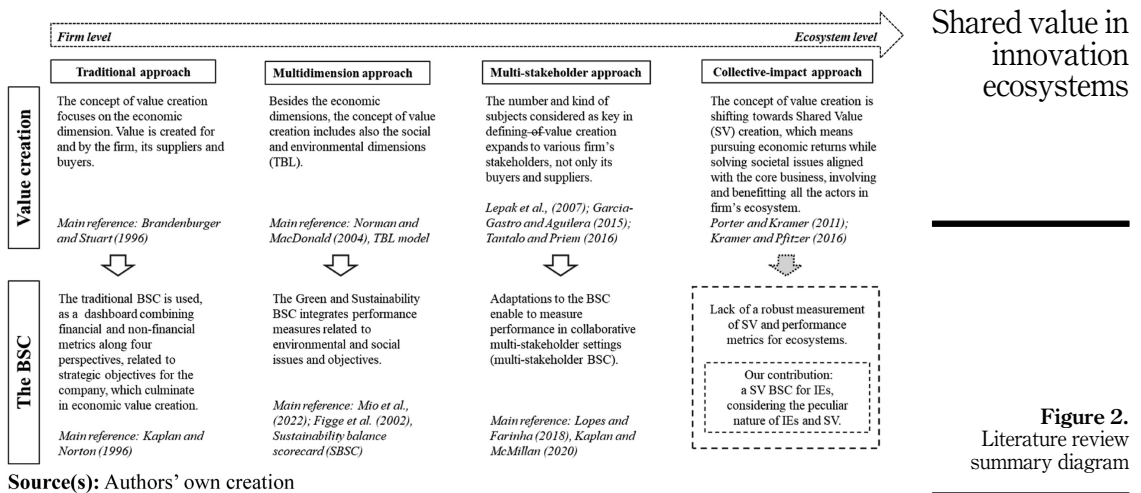
Once the approach is set, we apply it to a real case, selected as particularly illustrative: this is the core of the empirical phase of our study (phase 3). In this phase, we construct the strategy map and the SV BSC for the analysed case, based on the approach developed in phase 2. This application enables to highlight feasibility, advantages and disadvantages of the proposed approach and refines application guidelines.

### 3. Value creation and performance measurement: a review of the literature

This section contains a review of the literature relevant to value creation and performance measurement, highlighting the linkages between SV creation and IEs, as also the main limitations in the application to IEs of the traditional measurement approaches developed at firm level. [Figure 2](#) summarises the literature reviewed in the following sub-sections, in which the seminal contributions and developments of the concept of value creation towards SV and the parallel evolutions of BSC are discussed. The analysis shows that a robust measurement of SV at IE is missing, and this paper aims to fill this gap, by proposing—and implementing—a BSC to monitor SV creation in IEs.

#### 3.1 From value creation to SV

Value creation is at the core of a broad spectrum of the literature relating to business and management, that has increasingly been calling into question the traditional logic according to which value creation mainly tackles the economic dimension and is the result of



interactions occurring strictly between the firm and its suppliers and buyers (Brandenburger and Stuart, 1996).

While on the one hand a multi-stakeholder approach has emerged, extending the kind of subjects involved in value creation (Lepak *et al.*, 2007; Garcia-Gastro and Aguilera, 2015; Tantalo and Priem, 2016), thus including multiple stakeholders other than the core firm, its buyers and sellers, on the other hand different scholars have suggested broadening the dimensions of value, going beyond the economic aspect, to include the social and environmental domains as well (Stubbs and Cocklin, 2008; Volschenk *et al.*, 2016), in line with the UN sustainable development paradigm (UN, 2015). These three dimensions have gained ground in academic research and practices starting from the Triple Bottom Line (TBL) model proposed by Norman and MacDonald (2004) in the accounting field and moving towards the development of Corporate Social Responsibility (CSR) initiatives to bolster societal welfare using corporate resources.

Despite this increasingly relevant relation between economic and social dimensions, companies do not often act nor perceive themselves as real “agents of social change” (Kramer and Pfitzer, 2016, p. 80) In this connection, Porter and Kramer (2011) proposed the SV concept, providing a strategic approach firms can adopt to contribute positively to social and environmental issues related to their core value chain, while pursuing profitability, thus overcoming the traditionally presumed trade-off between profit and societal problems and configuring the firm as a real proactive agent of change. These peculiarities make SV more than the simple integration between multi-stakeholder and multi-dimensional value and, thanks to its peculiar nature, SV has received growing attention from both managers and scholars, fostering a lively debate (Menghwar and Daood, 2021). Kramer and Pfitzer (2016) have developed this concept further, pointing out that companies pursuing SV creation should adopt a collective-impact approach, involving all the actors in their specific ecosystem.

This makes IEs particularly well suited for creating SV, since they are collaborative structures composed of interdependent and interconnected heterogeneous actors that perform innovation activities to materialise a joint value proposition (Ritala *et al.*, 2013; Adner, 2017; Jacobides *et al.*, 2018). The value proposition specifies the social and environmental value that, together with the economic one, the IEs aim to provide to all involved (Oska *et al.*, 2020). Besides private companies, the set of actors involved in an IE

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may include governments, universities and research organisations, non-profits, groups of citizens and interest groups.

Despite the strong linkages between SV creation and IEs, the literature on SV creation at IE level is still limited and dominated by conceptual works and single-case studies (Leenderste *et al.*, 2020; Oskam *et al.*, 2020). Although some scholars have started to analyse the characteristics of the SV creation process at IEs level (Liu *et al.*, 2016; Alberti and Belfanti, 2019; Arena *et al.*, 2022), the main, and twofold, challenge remains its measurement: academic literature lacks both a robust measurement of SV (Menghwar and Daood, 2021) and adequate performance metrics for ecosystems (Cobben *et al.*, 2022).

### *3.2 Performance measurement metrics for IEs: the BSC*

Parallel to the advances in the literature on value creation, the range of instruments that firms can include in their PMS has increased, as different key performance indicators (KPIs) have been added to the traditional financial ones to monitor non-financial aspects also (such as quality, time, flexibility and customer satisfaction; Kaplan, 1984). Moreover, standardised reporting frameworks (like the Global Reporting Initiative related to the Environmental, Social and Governance Framework or the Sustainable Development Goals (SDGs); UN, 2015; Diaz-Sarachaga *et al.*, 2018; García-Sánchez *et al.*, 2022), or synthetic metrics to measure the global company performance (such as the Social Return on Investment–New Economics Foundation, 2007; or the Local Multiplier 3 - Sacks, 2002) began to be adopted.

In particular, the need to give a comprehensive view of company performance by balancing financial and non-financial measures and short- and long-term indicators (Bentes *et al.*, 2012) led to the development of the BSC. The BSC is a multi-dimensional approach to design a dashboard of indicators (both traditional and non-financial metrics) along different well-defined perspectives. In the original BSC framework proposed by Kaplan and Norton (1996), these additional perspectives were Customers, Internal processes and Learning and Growth. Drivers of value creation with cause-and-effect relationships are identified in relation to these perspectives.

The BSC approach requires a first step, in which strategic objectives for each perspective are defined to compose a strategy map, and the second step is to identify the performance measures related to the different objectives, their targets and the initiatives to reach them. The BSC can be used by companies in their PMS to measure and monitor performance, but also to support decision-making or to detect value creation drivers, leveraging cause-effect relationships (Kaplan and Norton, 1996; Bentes *et al.*, 2012). The success of the BSC framework is also attested by its adaptation in other fields (e.g. for the strategic management of sustainable cities; da Silva Neiva *et al.*, 2021). However, its adoption poses some difficulties, as it is not possible to design a final aggregated metric, and it requires dealing with inconsistencies emerging in the assignment of priorities to different parameters of performance (Bentes *et al.*, 2012).

Despite such difficulties, the ability of the BSC to manage multiple objectives by systematically recognising stakeholders and their interests (Sundin *et al.*, 2010) has attracted attention from both researchers and practitioners, especially considering the progressive enlargement of the dimensions of value creation. It has led to different adaptations of the original BSC being proposed, which integrate performance measures related to environmental and social issues – such as the sustainability balance scorecard (SBSC; Mio *et al.*, 2022; Figge *et al.*, 2002) – and more recently a multi-stakeholder view (Lopes and Farinha, 2018; Kaplan and McMillan, 2020) even in dynamic supply chains (Reefke and Trocchi, 2013; Nazari-Ghanbarloo, 2022).

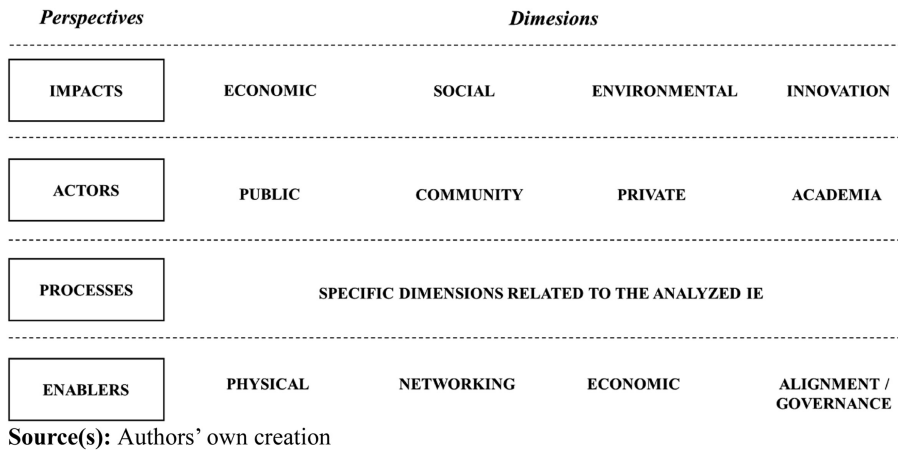
Focusing on innovation and entrepreneurship networks of formal and informal relationships, Lopes and Farinha (2018) proposed a BSC to measure performance in

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collaborative settings – e.g. ecosystems – developing their BSC along four perspectives: Environmental, Social, Economic, Network collaboration. This is a radical departure from the original company centric BSC to a broader one able to measure the impacts of an ecosystem even in terms of improved sustainable competitiveness of territories. This BSC can support the members of the network in setting and respecting ambitious joint strategic objectives. However, it does not identify the elements and characteristics of the network that can be used to reach them (i.e. the drivers and enablers of such impacts). Combining perspectives and dimensions in a double-entry matrix, [Kaplan and McMillan \(2020\)](#) set up a multi-stakeholder BSC for IEs focused on TBL outcomes. They maintained the Processes perspective of the traditional BSC of [Kaplan and Norton \(1996\)](#) and introduced three changes to the other perspectives with regard to the original model: the Financial perspective becomes the Outcomes perspective, in line with the TBL view and encompasses financial, environmental and social dimensions; the Customer perspective is reframed as Stakeholders perspective to reflect the relevance of the interests of the multiple participants in the ecosystem; and the Enablers perspective substitutes the Learning and growth one to highlight the relevance of a broad set of capabilities for the stakeholders' collaboration and alignment. [Kaplan and McMillan \(2020\)](#) presented different applications of their BSC for TBL strategies, without suggesting how to develop the linkages between the different perspectives and dimensions. Moreover, despite the introduction of TBL outcomes and stakeholders, their BSC is mainly used at supply chain rather than at IE level. At a more general level, such evolution of the BSC poses challenges for organisations adopting it, such as balancing different objectives and resources to achieve them or aligning behaviours ([Sundin et al., 2010](#)). Despite the increasing number of indicators and instruments able to measure different performance dimensions ([Da Silva et al., 2022](#)), the adaptability of these approaches to IEs appears limited, due to the peculiar multidimensional and multi-actor nature of IEs. Moreover, this becomes even more complex when an IE is in need of monitoring SV.

#### 4. An SV BSC for IEs: the approach

We present in the following paragraphs the proposed approach (named Phase 2 in [Figure 1](#)) to design an SV BSC for IEs, delineated extending the TBL BSC of [Kaplan and McMillan \(2020\)](#), simultaneously considering both the multidimensional and multi-actor nature of IEs and SV. We redefine the perspectives proposed by [Kaplan and McMillan \(2020\)](#) and specify dimensions, useful to the design and application of the BSC in such a complex setting. Perspectives and dimensions are individuated based on the analysed literature on value creation in IEs ([Carayannis and Campbell, 2009](#); [Katz and Wagner, 2014](#); [Lopes and Farinha, 2018](#); [Arena et al., 2022](#)), to offer consistency between the BSC and the object we want to monitor with it (i.e. the IE). As shown in [Figure 3](#), the BSC we propose is constituted of four perspectives – in line with [Kaplan and McMillan \(2020\)](#) – which represent the IEs' drivers for SV creation. Specifically, we adopted two of their perspectives – Enablers and Processes – but modified the other two. First, the Outcome perspective of [Kaplan and McMillan \(2020\)](#) becomes the Impacts perspective, to further stress the differential effects of IEs in terms of SV creation. As a strategic approach to value creation, SV can be assessed in the medium and long term, moving the focus from actual performance to mid-term achievement. Moving to an Impacts perspective means pursuing permanent and fundamental changes for the entire set of actors in the different dimensions rather than temporary or marginal benefits for specific target groups. The Stakeholders perspective of [Kaplan and McMillan \(2020\)](#) becomes the Actors perspective, to highlight the different role these entities take in the ecosystem with respect to stakeholders of a company. Indeed, as we are applying the BSC at IE and not anymore at company level, the approach needs to change. The focus shifts from the strategic



**Figure 3.** Scheme of the SV BSC for IEs: perspectives (in the boxes) and dimensions (per perspective) are detailed

objectives of a company to those of an IE. While the term “stakeholders” pinpoints mainly passive entities that have interests in a company’s activities, being involved and engaged to express their needs (Sundin *et al.*, 2010), the term “actors” suggests a more proactive role. Actors are key components of an IE (Arena *et al.*, 2022); their independence and complementarities are vital for value creation (Jacobides *et al.*, 2018).

We use these four perspectives and complete the framework identifying key performance dimensions per perspective, encompassing the specific characteristics of IEs. The identification of specific dimensions recalls Kaplan and McMillan’s (2020) suggestion proposing “social, environmental and economic” dimensions for their outcome perspective and “case-specific” dimensions for the others. We include specific dimensions for each perspective but the Processes one, to be generally adopted as guidelines in every IE.

For the Impacts perspective, we have been inspired by Lopes and Farinha (2018), who in their conceptual model focus on the measurement of the impacts of an ecosystem considering four perspectives: Environmental, Social, Economic and Network collaboration. Specifically, in our framework their perspectives become the dimensions of our Impacts perspective; we modify the fourth one naming it as Innovation, to introduce the distinctive characteristic of the IEs (the focus on the development of innovations to materialise their value proposition), in line with the building blocks of IEs’ outcomes, as identified by Arena *et al.* (2022).

Then, the Quadruple Helix model proposed by Carayannis and Campbell (2009) informs the dimensions considered in the Actors perspective. It is an extension of the network of interactions between industry, university and government called Triple Helix model (Etzkowitz and Leydesdorff, 2000), which is recognised as the source of innovation and regional development. The Quadruple Helix adds a fourth element, society at large, its interaction with the others allows to better address societal needs and increase the potential impacts. Therefore, this framework is particularly well suited to represent actors typically involved in an IE, which are not limited to “company – customers – sellers” but are a constellation of private companies, governments, universities and research organisations, non-profits, groups of citizens and interests groups. These different actors define the dimensions along which we disentangle this perspective. We acknowledge that some stakeholders may not always be proactive actors. However, the individuation of proactive actors and their strategic objectives becomes relevant for identifying key drivers of SV creation to be included in the BSC at IE level.



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As in the original BSC framework, the Processes perspective focuses on the elements of the internal processes that are crucial for the efficiency and effectiveness of the activities. In an IE this requires the identification of main projects through which the innovation activities are implemented, as well as the synergies among them.

Finally, the Enablers perspective is also analysed considering the structural elements and relational mechanisms that specifically characterise the IE and support its activity, such as the physical, networking and economic assets available (Katz and Wagner, 2014) and the alignment efforts performed by governance structures or by the core actors of the IE (Arena *et al.*, 2022).

The SV BSC scheme resulting from the combination of these perspectives and dimensions (Figure 3) can be used as a reference framework to define specific IEs' strategic objectives, their performance measures, related data sources and links between the indicators belonging to different perspectives. Based on the specific IE vision, this task starts with the construction of the strategy map, i.e. specifying the strategic objectives related to each perspective/dimension combination. Indicators are then linked to each objective and related one to one with the different perspectives, thus generating the SV BSC for IEs to enable their comprehensive assessment.

## 5. The approach in action

The approach introduced in Section 4 to design an SV BSC for IEs, is here applied to an illustrative real case, albeit anonymised, studied deductively (Yin, 2014).

In Subsection 5.1, the main characteristics of the analysed IE are briefly described and methodological details provided. Subsection 5.2 presents the design of the strategy map and the final SV BSC based on the information set collected through documental analysis and interviews and then validated by informants in follow-up meetings. Special attention is here paid to highlight and explain the linkages between the selected indicators.

### 5.1 Case description and analysis

**5.1.1 Case introduction.** The studied case, named Alpha for confidentiality, is an IE recently promoted in Italy by a private company and it involves different private and public entities at the national and local level, such as the Region, Province and local Municipalities, local schools and university departments in the field of agriculture and technology development and foundations and local public development agencies for agriculture and the environment.

It is selected as particularly illustrative of the issue under analysis: it is an emerging IE promoted by a private firm aiming at being an agent of social change and local economic development, by pursuing simultaneously economic-financial returns for the company and creating benefits for the multiple actors involved in the IE and the local community.

Alpha explicitly aims at creating SV, by becoming a new tech hub through the introduction of new development models focused on innovation and sustainability. In this connection Alpha develops projects in different fields, i.e. from agriculture experimentation (to promote a sustainable and local agriculture), to supporting the development and adoption of digital technologies for the environment (i.e. for monitoring pollution), from launching projects to sustainably use water to others focused on sustainably creating energy (through leveraging on solar energy). This IE is emerging in an area of more than fifty hectares in the country's interior. This region is largely rural, far from the big cities, but is close to an industrial area where Alpha's promoter has been working for years.

Given the number and heterogeneity of actors involved in the IE and its goals, monitoring SV created by this IE is particularly complex.

*5.1.2 Data collection.* Data were collected from various sources (archival documentation, interviews and direct observation), then triangulated to enhance reliability and completeness (Yin, 2014). First, a desk analysis was conducted to retrieve secondary data from both publicly available sources (i.e. the promoter's website and sustainability reports, Alpha's website and news available online) and restricted ones (presentations and reports provided by the informants during interviews and meetings).

Then, semi-structured interviews and meetings with managers active in the main IE projects were conducted: ten informants were interviewed to gather information on the main project areas. The informants interviewed in this first set of semi-structured meetings are selected as representative of the specific projects and of the diverse actors' typologies (Hub's managers, project coordinators of private entities collaborating with Alpha's promoter, CSR managers, specialists and technological managers). As such, managers of the promoter's parent company and other entities active in the specific projects have been interviewed (see Table 1). Informants were given the interview guidelines beforehand (see Appendix); the questions focused on understanding the role of the informant in Alpha's development, as well as for their specific project. Projects' maturity stage, the main actors involved, objectives and the expected impacts for Alpha and the neighborhood communities were then discussed. More specific questions were included, too, on the possible applications and synergies of projects, opportunities, risks, resistance to change, as well as on KPIs useful to monitor each project and the IE's success, linked to drivers of value creation. Interviews were recorded, transcribed verbatim, and a report was then shared with the informants for validation. Follow-up meetings were then conducted with the informants, to further detail some elements and check the emerging results.

Non-structured meetings were also conducted with actors (other than those in Table 1), selected as representing other entities active in projects of the ecosystem pertaining to different actor' categories, as managers of start-ups and SMEs active in the area, incubators, foundations and research entities and also local agricultural and commercial entities.

Finally, follow up meetings were conducted with representatives of the IE's promoter (other than those in Table 1) to structure the analysis, share results and validate the developed work, that is actually being applied to monitor Alpha's performances.

Informant code	Role	Project area	Interview length
Informant A	Project Coordinator	Renewable energies	26 min
Informant B	Responsible of projects for the territory	Agritech	43 min
Informant C	Environmental manager	Development and adoption of digital technologies for the environment	46 min
Informant D	Project manager	Water treatment and renewables	36 min
Informant E	Technological manager	Water treatment and renewables	36 min
Informant F	Corporate Social Responsibility Manager	Civil works and redevelopment	43 min
Informant G	Civil works specialist	Civil works and redevelopment	43 min
Informant H	Program Manager	Civil works and redevelopment	50 min
Informant I	Manager	Agritech	60 min
Informant J	Sustainability Manager	Agritech	60 min

**Table 1.**  
List of informants (semi-structured interviews)

**Note(s):** The table provides details on the anonymised informants and on the conducted interviews. Follow-up meetings were then conducted with the informants as well as non-structured meetings with other IE's actors  
**Source(s):** Authors' own creation

5.1.3 Data analysis. All retrieved data were analysed with a deductive approach. The authors adopted a manual coding process, first individually and then sharing the intermediate results of the analysis. The adopted categories refer to the perspectives and dimensions of the strategy map and the SV BSC introduced in Section 4. Grounding in this data analysis, the approach introduced in Section 4 could be applied to Alpha, thus being exemplified and illustrated “in action”.

5.2 Application to the real case: main findings

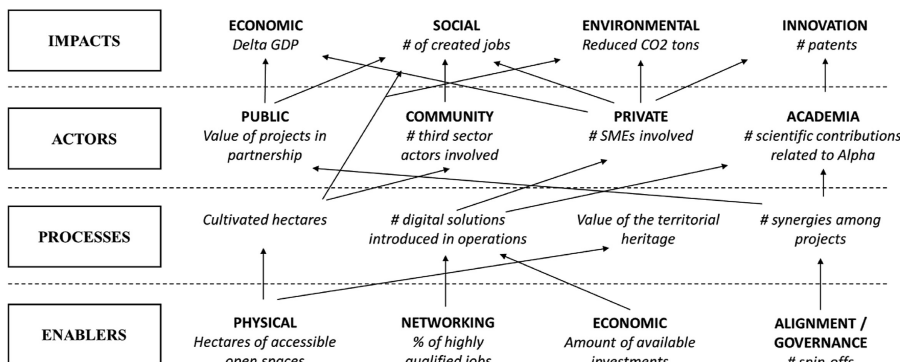
Alpha’s overall strategic vision entails creating SV, thus benefitting the promoter, the involved actors and the entire local community in social, environmental and economic terms, as the aim is to “enhance the territory with different initiatives” (informant D).

The strategy map of Alpha reported in Figure 4 has been populated with this overall vision in mind, considering the dimensions framed in Figure 3 and as described in Subsection 5.2.1. Subsection 5.2.2 presents the SV BSC (Figure 5), which has already been shared with the involved informants who validated it, being satisfied with the results achieved.

<b>IMPACTS</b>	<b>ECONOMIC</b> <i>Enhance the GDP of the territory</i>	<b>SOCIAL</b> <i>Increase employment level</i>	<b>ENVIRONMENTAL</b> <i>Reduce CO2 emissions</i>	<b>INNOVATION</b> <i>Develop an innovation hub</i>
<b>ACTORS</b>	<b>PUBLIC</b> <i>Enhance PPP</i>	<b>COMMUNITY</b> <i>Include the third sector</i>	<b>PRIVATE</b> <i>Enhance relationships with SMEs</i>	<b>ACADEMIA</b> <i>Collaborate with universities</i>
<b>PROCESSES</b>	<i>Improve productivity in the sectors in focus</i>	<i>Digitalize processes in every project</i>	<i>Riqualify the areas where the IE grounds</i>	<i>Improve synergies among projects</i>
<b>ENABLERS</b>	<b>PHYSICAL</b> <i>Make spaces open and shared</i>	<b>NETWORKING</b> <i>Attract talents</i>	<b>ECONOMIC</b> <i>Attract different kinds of investors</i>	<b>ALIGNMENT / GOVERNANCE</b> <i>Strengthen proactive engagement</i>

Source(s): Authors’ own creation

Figure 4. Strategy map of Case Alpha. In the boxes there are the four perspectives; per each perspective, dimensions are in bold, and examples of objectives are in italics



Note(s): Arrows represent the most relevant connections among KPIs

Source(s): Authors’ own creation

Figure 5. Alpha’s SV BSC: indicators are included per each perspective and under each dimension (in bold).

5.2.1 *Alpha's strategy map.* 5.2.1.1 Impacts' perspective. The analysis starts with the first perspective (Impacts) and its first dimension (economic): economic impacts are key, but their achievement is not straightforward, as the main projects and activities conducted are quite different in nature. Indeed, some of them are industrial (focused on photovoltaic, renewables and technological applications . . .) and thus have a more clearly definable and attainable economic return. The others are more sustainability-related, as they are focused on revising the aesthetics and buildings of the territory, or aiming to train and attract talents, or to enhance research on agriculture and sustainability. These projects can generate economic benefits to the territory, but over a long term and in a less direct way. All the projects aim at increasing Gross Domestic Product (GDP) for the broad territory where the main IE activities are located (i.e. the region).

In the words of informant A: *"The fundamental impact will be mainly of economic nature, also because, as a firm, a project needs to clearly forecast a return, an economic sustainability; the second, not less important, will be of environmental nature"*.

The environmental dimension is particularly key in this IE, as revealed by informant C: *"Firms and their business model cannot avoid considering the environmental aspects [. . .] the business model should consider the sustainable development model of the IE and therefore a competitive IE cannot be non-performing also under an environmental perspective"*.

Specifically, under the environmental dimension, the main strategic objective of Alpha entails the reduction of CO<sub>2</sub> emissions. For instance, some IE projects aim at installing a photovoltaic plant, at collecting and analysing environmental data to support a more efficient and sustainable production and consumption, at supporting the adoption of precision farming techniques, at reusing industrial waters and or at renovating green spaces and smart buildings. These are just some examples clarifying how and why reducing CO<sub>2</sub> emissions is a key environmental objective to be included in Alpha's strategy map: *"So, the plant is engineered to maintain the actual and future production levels respecting SDGs, the carbon footprint, the water footprint and thus maintaining an environmental sustainability" (informant E).*

As relevant as these first two impact dimensions is the social one, which relates to *"employment, employment, employment" (informant F), "as the one of employment is for sure the most sensitive topic"*. Employment, in the studied case, can be directly enhanced by the promoter, by actors involved in projects and activities or indirectly along the activated supply chains. For instance, the civil and building works, maintenance and services will be mainly dealt with by local workers; moreover, the hope is that the IE will attract more talents that will then be employed in local entities. To quote informant E: *"the maintenance of the area (. . .) is [and will be increasingly] managed by local experts, as well as all the intellectual aspects related to development and permitting documents"*.

The fourth impact dimension of the strategy map is innovation-related and the main aim in this connection is *developing an innovation hub*: *"The idea is to create a huge technology hub" (informant F)*. Indeed, the ecosystem is an "innovation" one, as it aims at jointly creating value through innovations. Indeed, projects of the ecosystem will test technologies in the different fields in which the ecosystem acts (agritech, renewables and circular economy), developing synergies among projects and activities.

5.2.1.2 Actors' perspective. To reach these complex aims, different actors should be in focus, in line with the homonym perspective of the strategy map: public, community, private and academia dimensions all relate to specific strategic objectives.

First, the enhancement of Public, Private Partnerships (PPPs) emerges as the main strategic objective under the public dimension: *"Working on the relationships with communities, authorities and local institutions is the fundamental point here, because now in Italy this is the key for the success of projects on renewables and sustainability, as authorizations are essential for the success of IE projects and for their rapidity" (informant A).*

The relevance of this strategic objective is clearer if we consider the fact that not having strong PPPs slowed down some of Alpha's projects and even stopped them for a while, as "*Environmental associations were definitely opponents. Also, the local municipality had some technical objections*" (informant E).

While PPPs are key for public actors, a community-related objective entails *inclusion of the third sector*. For instance, two years ago activities in agriculture were performed with "*social cooperatives, with mentally disabled young people [...]*" (informant B), with the objective of increasing the involvement of the third sector in different projects and activities.

Not only is the third sector in focus, but also the private one; here the strategic objective identified is to *enhance the relationships with SMEs*. This relates not only to the need to increase employment, a fundamental social impact, but also of strengthening the entrepreneurial culture and the environment of the local territory. The IE "*is being useful to give a bit of a sparkle of entrepreneurship that (in the territory) is completely absent*" (informant B). It is important to create with "*local entrepreneurial realities, these paths of research and development, transmitting to local entrepreneurs the environmental culture*" (informant C). This aim can be achieved if proper synergies, competences and networks are in place (as we will see, these are indeed key dimensions of the Processes and Enablers perspectives) and if relations with academia are strengthened.

In this connection, the last dimension of the Actors perspective is academia, which relates to the strategic objective of *creating and enhancing activities of research, development and training, in terms of scientific studies in the relevant fields of the IE* (agritech, circular economy, environmental collection and analysis, water treatment . . .). Partnerships and collaborations with universities are in place and under development.

5.2.1.3 Processes' perspective. Partnerships and collaborations as well as the impacts discussed heretofore are supported by the existence of synergies among different IE projects and activities: *Improving synergies among projects* is indeed one of the strategic objectives individuated under the Processes perspective. Synergies are "*interactions, because they will involve us together in projects of development of technologies, ideas, environmental developments . . .*" (informant C). For instance, informant C had this to say on the photovoltaic plant: "*is not to be excluded that it will represent that basic asset on which, later on, different technologies related to the IE might be grounded*". This project area might contribute to providing green energy to other IE activities (such as agricultural ones, mobility), whereas the water treatment activities might provide water for the promoter's industrial activities and to other local realities. Another example might be the activities related to civil works and urbanisation: "*These civil works are activities supporting the results of other projects. Therefore (. . .) the IE has this transversal component which is particularly relevant*" (informant G) and a real enabler for other projects.

These transverse activities also relate to another important objective of the Process dimension: *requalify the areas in which the IE is grounded*. Indeed, the idea is to "*promote the requalification of the territory and the conservation of all the areas of the IE*" (informant H), that, as said, are grounded closely around one of the promoter's industrial areas. As such, the IE activities take place at a few hundred meters' distance from the promoter's industrial activities; the IE can, in this way, affect the image and reputation of the promoter and the territory: "*This consolidates the relationship with the territory, it integrates it*" (informant F).

It is then relevant to state that a huge effort was required to harmonise the infrastructure needed for some IE activities (as such the water treatment or the photovoltaic plant) with the territory, promoting projects of landscape insertion to limit the negative impacts on the territory.

It is not only synergies and requalification that are relevant process dimensions, but also digitalisation and productivity. Indeed, the last two objectives of this third perspective are: *digitalise processes in every project* and *improve productivity in the sectors in focus* such as

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agritech, photovoltaic or water treatment. Digitalisation is achieved by applying technologies enabling collecting and analysis of data (i.e. environmental ones, which is exactly the aim of one of the main IE project areas).

5.2.1.4 Enablers perspective. To enable such objectives, assets are needed to “*enhance the basic infrastructure and the network of relations on the territory*”. In the words of *informant H*, this is what they need to secure to achieve the expected impacts. Specifically, *making spaces open and shared* is the strategic objective related to the physical dimension of the Enablers’ perspective.

The last dimensions relate to economic, networking, alignment/governance enablers. *Attracting various kinds of investors* emerges as the main objective related to economic enablers. This task is easier for industrial projects, although sustainability-related ones also need them. For instance, agritech projects are mainly demonstrative, by now and not self-sustainable, with the objective being to see them “*standing with their own legs*” (*informant B*).

Under the networking dimension, to *attract talent* is the key objective, as “*multiple skills and competences are necessary: we have really a lot of skills and this is a true enabling factor because, when we need it, we have the required resource*” (*informant B*). As mentioned by the informants and by Alpha’s website, the idea is to create a kind of “*applied academia*” that would be able to train and attract experts, as well as to deliver support services. Talents should be attracted thanks to relations with schools and entrepreneurial local activities, which could then create other development paths. Alpha aims at being an “*attractor on the territory*” and, to do so, “*an inclusive and participatory approach is fundamental*” (*informant F*). Thus, the strategic objective pinpointed in relation with alignment and governance is to *strengthen the proactive engagement* of different actors and local communities.

5.2.2 Alpha’s BSC. On the basis of the strategy map reported in [Figure 4](#) and the collected data, an SV BSC for Alpha can be created, by identifying indicators linked to the objectives of the strategy map. Indicators are linked to one another, from the bottom to the top of the scorecard (see [Figure 5](#)), in line with the construction principles of a BSC.

When discussing the Enablers perspective, informants provided some suggested indicators: “*investments, environmental indicators [...] as the soil recovered, cultivations and preserved hectares; [...] a territorial value given more by the services, recovered or new, on a territory that did not have any*” (*informant H*), remembering that “*availability of investments is an enabler*” (*informant B*).

Following this kind of guidelines, indicators are individuated under the Enablers perspective in terms of hectares of accessible open spaces (physical dimension) and quantum of available investments (economic dimension), which mainly affect dimensions in the Processes perspective, such as cultivated hectares, value of territorial heritage and the number of digital solutions introduced, which are three KPIs we can find in the BSC.

Concerning the other two enablers (networking and alignment/governance) the proposed KPIs are: % of highly qualified jobs (with respect to the total number of talents attracted) and number of spin-offs linked to the project.

Other indicators might have been relevant to assess the talent attraction and retention, such as the “*number of hours of training [...] number of students involved and, in general, number of actors involved*” (*informant B*): these will be material in achieving the ones inserted in the BSC. Indeed, the more the training the higher the percentage of highly qualified jobs and the more the involvement the higher the number of spin-offs linked to the projects and as a consequence the possible synergies among Alpha’s projects, which constitutes a KPI under the Processes perspective.

KPIs under the Actors perspective are affected directly by KPIs under the Processes one and indirectly also by the Enablers ones. For instance, the number of synergies among Alpha’s projects affects the value of projects in partnerships or the number of scientific

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contributions related to Alpha, both KPIs under the Actors' perspective which are also affected by the spin-offs linked to the project and the other Enablers.

Then, under the Actors' perspective "*other KPIs will probably be linked to the number of involved units, regarding [...] the construction of the plants, [...] the maintenance. Then we also mention the parameters related to local content*" (*informant A*). In this connection, KPIs related to the number of third sector actors involved and of SMEs involved are key. They are affected by the increased activities (in quantitative and qualitative terms) monitored by process KPIs and enabled by the networking, physical and economic dimensions monitored by the above mentioned indicators.

This perspective directly affects impacts: "*A very important KPI, but difficult to be found, is economic sustainability*" (*informant B*). The economic KPI identified in line with the strategic objective is delta GPD. The return for the territory is represented by the generated gross domestic product and employment (social dimension). In the words of *informant F*: "*The return is gross domestic product and employment for workers*"; thus, a fundamental KPI is the number of employees, which some projects even track weekly (*informant B*).

It is not just economic and social returns that are in focus, but also environmental and innovation-related ones, as the object of analysis is an IE aimed at creating shared and sustainable value. Environmental returns are traced in terms of reduced tons of CO<sub>2</sub> emitted, as KPIs "*of environmental nature, linked to the avoided emissions*" (*informant B*). The latter (innovation) relate to the number of patents developed within the IE: "*Cultural aspects, start-ups, innovation*" and their protection are in focus, as two key elements of the IE – and of the BSC – are "*ownership and sustainability*" (*informant F*).

Such KPIs strongly relate to those of the other three perspectives. For instance, the number of experimental techniques tested and patents is positively driven by the number of SMEs involved, as well as by the scientific contributions; indirectly, it also depends on digital and innovative solutions introduced, investments, highly qualified jobs and spin-offs.

## 6. Discussion

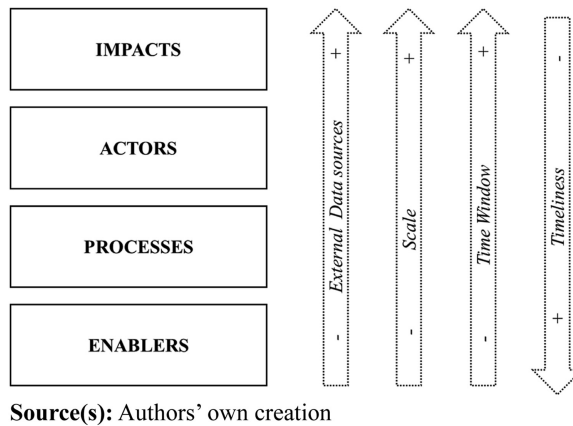
Application of the proposed SV BSC to the real case Alpha not only proves the feasibility of the introduced approach, but also allows to derive some general considerations on the design of a BSC for measuring SV at IE level, thus strengthening the answer to the research question. More specifically, although KPIs are of course case-specific, some common characteristics can be discussed and observed ([Subsection 6.1](#)) as well as the advantages and disadvantages of the proposed BSC approach when used to track SV at IE level (instead of economic value at corporate level; [Subsection 6.2](#)). Moreover, guidelines for the application of the proposed approach to other ecosystems are provided ([Subsection 6.3](#)).

### 6.1 KPIs performances and characteristics

It can be noticed that KPIs belonging to the same perspective share some characteristics: i.e. going from *Enablers* to *Impacts* perspectives, passing through *Processes* and *Actors* ones, indicators change in terms of data source, time window, timeliness and scale (see [Figure 6](#)).

Specifically, from the perspective on the bottom (*Enablers*) to the one on the top (*Impacts*), indicators are calculated relying on more external data sources (vs internal ones) and are characterised by an increasingly bigger geographical scale, larger time windows and tighter timeliness.

First, indicators of the *Enablers* perspective can be calculated mainly with data internal to the promoter firm and its IE: i.e. hectares of open spaces, investments, spin-offs, highly qualified jobs over the attracted talents, to be calculated, can rely on internal data. Going towards the top of the BSC this situation changes: at the *Impacts* level, KPIs need many



**Figure 6.**  
Characteristics of indicators and measurements in the different perspectives when applying the BSC at IE level

external data sources to be calculated, such as GDP, employment, emissions. As such, they become more difficult to be calculated and monitored, as confirmed by Alpha's managers during follow-up meetings.

Moreover, KPIs monitored at Impacts level are of bigger scale relative to those of the previous perspectives and have longer time windows, meaning that usually more time is needed to properly catch the effects at Impacts levels, with respect to Enablers or Processes ones. This can result in the emergence of trade-offs or even communication problems among managers responsible of diverse teams and projects.

Last, indicators related to the Impacts perspective are not likely to be tracked timely (by timeliness we mean the rapidity with which the indicators can be calculated and thus be adopted to promptly monitor the IE). While it is easier to promptly track KPIs at Enablers and Processes levels, it becomes more difficult to do so at Impacts levels. For instance, hectares of accessible open spaces, amounts invested, cultivated hectares and synergies among projects are tracked timely, whereas tracking the number of scientific contributions or delta GDP involves the passage of more time between the specific event and the availability of data to measure and monitor it. The heterogeneity of monitored KPIs also affects the complexity of systems to be implemented to support this PMS.

### 6.2 Advantages and disadvantages of the SV BSC

A second key discussion point entails the advantages and disadvantages of the introduced BSC as emerging from the case, compared with the traditional one adopted at company level (Kaplan and Norton, 1996), the SBSC (Mio *et al.*, 2022) and the multi-stakeholder BSCs (Lopes and Farinha, 2018; Kaplan and McMillan, 2020), which are presented in Table 2. It is worth pointing out that, while advantages and disadvantages of traditional BSC, SBSC and multi-stakeholder BSC are derived from the literature, the ones related to the here proposed SV BSC for IEs are emerging from the empirical application to the Alpha's case and are then corroborated going back to literature contributions.

The SV BSC introduced here has a peculiar and new level of analysis: the IE and its constituent actors. This enables having many entities (with their diverse objectives, resources and activities) in focus simultaneously, which introduces a greater complexity in designing and adopting the BSC at IE level, when compared to its previous formulations. Despite being complete and more capable of including different actors, this SV BSC for IEs throws difficulties in its design. For instance, synthesising the numerous inputs from the diverse actors and projects requires integrating multiple sources and identifying the key indicators



	Traditional BSC	SBSC	Multi-stakeholder BSC	SV BSC for IEs	Shared value in innovation ecosystems
Advantages	Clear and simpler focus	Stakeholders and their needs are included and considered		Multi-actor focus: actors are considered as proactive entities	
	Easy to be prepared and adopted (availability of data)	Long-term impacts are considered and availability of data	Long term (and supply chain) impacts considered	Long term impacts at ecosystem AND at territorial level considered. Both internal and external focus. Annual reports are not needed for computing KPIs	
Disadvantages	Stakeholders (and their needs) are not included in definition of strategic objectives: risk of missing the point of view of stakeholders	Difficulties in balancing and prioritizing objectives: using it for strategic decision making becomes more complex		Complexity in design and adoption (balancing objectives, defining metrics . . . ): it can be used for decision making only if a governance is in place	
	Long term impacts risks remaining unobserved	Internally – focused	Low availability of data (especially on the supply chain) Low timeliness	Low availability of data (external ones) Low timeliness Complex to be read (no traditional financial indicators)	

**Table 2.**  
SV BSC at IE level vs previous formulations of the BSC: advantages and disadvantages

Source(s): Authors' own creation

and their relations. Trade-offs emerge, too, especially when considering the prioritisation of objectives at Actors and Impacts levels: while some informants stress the relevance of the social impact dimension, in line with the interest of public actors in employment, others highlight more the innovation, economic or environmental spheres. Concerning the Actors' perspective, the IE might face trade-offs in terms of which relations to prioritise: investing time and effort in sustaining the relations with the third sector might overshadow doing so with SMEs or with public entities.

Given these characteristics of the SV BSC for IEs and also the fact that IEs often do not have a clear governance structure – as in Alpha case –, adopting this approach for strategic decision making is more complex respect to what happens with traditional BSC at company level. Also, its adoption to monitor/measure value introduces some difficulties – far more than in the traditional BSC – that should be acknowledged, in terms of data sources and of balancing different objectives. Therefore, the main purpose of such a BSC for IEs is the identification of SV drivers, keeping a multi-dimensional perspective. These challenges (balancing objectives and trade-offs in prioritisation) are there also in SBSCs and multi-stakeholder BSCs, but they are enhanced when keeping an IE level of analysis and SV as type of value monitored. Last, our SV BSC also enables tracking long-term impacts at ecosystem and territorial level, enabling keeping both an internal and external focus simultaneously and thus monitoring and managing SV, created by and for the ecosystem's actors and society. Moreover, the KPIs adopted here – given their nature as non-accounting based indicators – can be computed without having an annual report or financial data (difficult to be prepared at IE level). However, this could make the results more difficult for managers to read, as they are used to populate the BSC at company level

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with accounting-based indicators and value drivers. Moreover, as mentioned above, the SV BSC here proposed requires the availability of data from several sources (both internal and external).

### *6.3 Applying the introduced approach in other ecosystems*

The study has identified and applied to a real case an approach to designing and adopting a BSC at IE level, for monitoring and measuring SV creation. Alpha has started adopting the designed SV BSC for monitoring the IE's SV creation considering the diverse perspectives, dimensions and KPIs proposed.

Although we applied the approach to one case only, we aim at supporting its generalised application by providing here synthetic guidelines useful for applying the introduced SV BSC to other, diverse ecosystems.

The first step consists in individuating the value proposition of the ecosystem and its vision, as this will guide the identification of key strategic pillars of the ecosystem. The definition of a few key strategic pillars will then support the identification of relevant dimensions to be considered per perspective and strategic objective.

If the ecosystem under analysis is an IE that aims at creating sustainable and SV, the dimensions suggested in this research can be used as building blocks of the scorecard. Otherwise, some dimensions could be modified, to better fit the ecosystem under study; for instance, a business ecosystem aiming to create SV may not need an "innovation" dimension at Impact level; an entrepreneurial ecosystem may need an "entrepreneurial" dimension at Impact level.

Once dimensions are set, strategic objectives should be identified; knowledge of the ecosystem is key at this point, and it should be refined, if possible, merging information from different informants active in the ecosystem. To build a balanced and useable strategy map, strategic objectives should be no more than 16–20 and be well distributed among all the perspectives: the dimensions provided in the suggested approach help in formulating such a structure. In this way a strategy map can be drafted and shared with informants for validation during dedicated meetings or focus groups.

Grounded in the strategy map, KPIs are then individuated, ideally one per strategic objective. KPIs are selected with informants and representatives of different actor categories who play key roles in projects of the IE. Connections among indicators should be identified (at least, the most relevant ones), so as to support usage of the BSC for individuating drivers. Also at this point, validations with entities active in the IE is needed, to understand whether the BSC properly covers all the most relevant indicators.

## **7. Conclusion**

This paper shows how the BSC can be extended and adopted to measure and monitor SV in IEs. Specifically, we present an integrated approach aimed at designing an SV BSC for IEs, grounded in the most recent literature on performance measurement and SV creation. We also illustrate the application of this approach through a real case study, highlighting its main characteristics, advantages and disadvantages. Finally, we provide guidelines for adopting the proposed approach. As such, this research addresses the recognised literature gap and responds to the need of robust SV measurement (Menghwar and Daood, 2021) in IEs (Cobben *et al.*, 2022; Da Silva *et al.*, 2022; Silva *et al.*, 2022) emphasised by scholars and practitioners. Therefore, this paper offers both academic and practical contributions.

First, the paper contributes to the literature on SV measurement in IEs, by introducing a new approach that combines and extends previous BSC frameworks (Lopes and Farinha, 2018; Kaplan and McMillan, 2020), proposing an original redefinition of perspectives and

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dimensions. In this way this approach, inspired by the most recent literature developments, addresses two levels of complexity related to performance measurement, concerning the subject (i.e. the IE) and the object (i.e. the SV). Specifically, it simultaneously takes into account the distinctive multidimensional and multi-actor nature of IEs and the need of measuring and monitoring SV in a comprehensive manner. Second, the application of the SV BSC for IEs to a real case study allows us to derive some further general considerations on the approach, particularly regarding the definition of KPIs. Transitioning from the Enablers to the Impacts perspectives, the choice of KPIs requires expanding the scope of analysis, considering different timeframes and balancing trade-offs among objectives. This could be of interest for researchers studying not only IEs, but also other ecosystem typologies (i.e. business ecosystems, knowledge ecosystems, innovation systems, clusters . . .), who could adapt the SV BSC to their specific object of analysis. Lastly, we identify and compare the advantages and disadvantages of the proposed approach with those of the traditional BSC, SBSC and multi-stakeholder BSC, contributing to the academic debate on the application of performance measurement tools at different levels. Overall, our approach contributes to management studies, by capturing elements of complexity related to IEs and SV, thus overcoming the limits of common performance measures.

This paper presents relevant practical contributions, too. Through the application of the proposed approach to a real case study, we demonstrate its feasibility, indicating that managers can adopt this approach to develop an ad hoc SV BSC for their IEs. Grounding in the results of this study, managers can address the complex task of measuring and monitoring the value created by their IE using only a few, but interlinked and relevant, KPIs. Moreover, practitioners interested in utilising the proposed BSC can draw inspiration from the results and discussion of the presented real case study. In particular, the discussion points support the design and adoption of this type of BSC in various ways. First, managers should have a clear understanding of the characteristics of KPIs in the different perspectives, facilitating both the *ex ante* definition and ongoing monitoring of KPIs. Furthermore, the advantages and disadvantages discussed in [Section 6.2](#) can inform managers about the pros and cons of the approach before implementation. Lastly, the provided guidelines in [Section 6.3](#) are highly relevant as they offer practical indications for applying the introduced approach to different real cases.

This research may also be valuable to policymakers interested in promoting the adoption of SV measurement systems and approaches at the IE level, given their potential in opening new economic development pathways.

While this research offers valuable insights, there are limitations primarily related to the adopted methodology. Firstly, despite our attempt to propose a replicable approach, the application of the SV BSC to only one case study raises generalisability concerns. Therefore, we recommend further research in diverse scenarios to identify potential patterns or shortcomings. Additionally, as Alpha has recently begun adopting this approach, we cannot present results regarding its effectiveness as a measurement tool. Future research is necessary in this regard, including longitudinal studies to monitor the development of an IE in creating SV. Others could leverage our results and application to quantitatively measure the SV created by an IE, further refining the proposed approach and the emerging discussion points.

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## Appendix

### Interview guidelines

Guidelines used during semi-structured interviews and shared with informants beforehand

- (1) Which is your role in Alpha's IE? And which is the role of the specific project in this IE?
- (2) Could you please briefly describe the specific project you are dealing with and its positioning?
- (3) How much is the project developed? How will it evolve?

- (4) Which are the key objectives of the project?
- (5) Which are the key partners involved?
- (6) Which are the expected impacts from the project for the promoter? And for other actors and the neighbourhood?
- (7) What can be the effects of such impacts on the territory? (i.e. for industrial projects: can the technology be adopted elsewhere in the territory? For innovation-related projects: can the adopted approach incentivise synergies with other entities and projects on the territory?)
- (8) Is there any resistance to change? How relevant?
- (9) Can the project affect the competitiveness of specific sectors?
- (10) Which KPIs would you use to monitor the impacts of the project?
- (11) Which are the main factors enabling impacts on the territory? Which the main barriers and risks?

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