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Fana Rasolofo-Distler

► **To cite this version:**

Fana Rasolofo-Distler. Institutional Pressure and Real Estate Balanced Scorecard Indicators. Sustainability Accounting, Management and Policy Journal, 2022, 13 (4), pp. 826-857. 10.1108/SAMPJ-04-2021-0125 . hal-03637079

HAL Id: hal-03637079

<https://hal.science/hal-03637079v1>

Submitted on 14 Apr 2022

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Journal:	<i>Sustainability Accounting, Management and Policy Journal</i>
Manuscript ID	SAMPJ-04-2021-0125.R4
Manuscript Type:	Research Paper
Keywords:	BSC, performance indicators, ecology, digital innovation, real estate

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Institutional Pressure and Real Estate Balanced Scorecard Indicators

Fana Rasolofo-Distler

Abstract:

Purpose: This article discusses the impact of institutional pressures on the selection of the performance indicators in 83 Balanced Scorecards (BSC) used in French real estate companies. I studied the way in which two factors that are representative of institutional pressures in the real estate sector - namely, “ecology” and “digital innovation” – were incorporated into the BSC causal chains. Design/methodology/approach: My methodology is that of action research. In order to analyze the balance of indicators between short and long term, I classified the companies according to their strategic acuity, i.e., their ability to balance an organizational vision (near vision) and an environmental one (distance vision) when choosing their performance indicators. This resulted in a company classification with three categories: emmetropic, hypermetropic, and slightly myopic. Findings: The research enabled to observe that the selected ecological indicators in BSCs derive mainly from coercive institutional pressure. Hence, in companies with fewer legal requirements in ecological matters, the selected ecological indicators are included in the BSC causal chain in that they are used as a commercial argument with a view to improving financial performance. These results are similar to the reactionary and reputational perspectives of the sustainability business case. With regard to the incorporation of digital innovation indicators into BSCs, I found that the companies that have the most digital innovation indicators are those that mobilize the most ecological indicators. Digital innovation indicators are part of the companies’ internal process perspective and are linked to organizational learning indicators. These results are similar to the responsible and collaborative perspectives of the sustainability business case. I also found that the

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2
3 companies incorporate digital indicators into their BSCs by institutional mimicry insofar as the
4 selected indicators are not always consistent with a strategic rationale but are chosen by copying
5 what is done in other companies. Originality/Value: My reflection is in line with the literature of
6 recent years that reconciles sustainable development and innovation. I study how "ecology" and
7 "digital innovation" are incorporated into the BSC causal chains. To my knowledge, this is the first
8 time this type of study has been conducted in the literature.
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18 **Keywords:** BSC, performance indicators, ecology, digital innovation, real estate
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21 This article aims to provide an analysis of the impact of institutional pressure on the global
22 performance indicators used in the management system of companies in the real estate sector. I
23 studied the Balanced Scorecards (BSCs) of 83 French real estate companies conducting five types
24 of business activity: 23 lease management firms, 21 conducting real estate transactions, 13 in the
25 property management sector, 15 in real estate development and 11 in the low-income housing
26 (LIH) sector. All real estate activities relate to construction. In France, residential and tertiary
27 buildings account for 45% of the final energy consumption, i.e., 27% of greenhouse gas emissions,
28 which makes them the sector with the highest energy consumption. Therefore, the ecology ought
29 to be an essential stake for companies in the real estate sector. Given this fact, there are important
30 institutional pressures on companies in the real estate sector in terms of ecology. It is also a sector
31 where we can find the beginnings of innovation via new digitalization technologies. My reflection
32 is in line with the literature of recent years that reconciles sustainable development and innovation
33 (Mithani, 2017; Bocquet *et al.*, 2017; Guerrero-Villegas *et al.*, 2018; Anser *et al.*, 2018; Demirel
34 and Kesidou, 2019; Poussing, 2019). This literature has focused on the effects of CSR and
35 technological innovation on the financial or economic performance of firms. For my part, I study
36 the way in which two factors that are representative of institutional pressures in the real estate
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3 sector - namely, “ecology” and “digital innovation” - are incorporated into the global performance
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5 measurement system.
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9 Here, the notion of global performance encompasses two approaches. The first consists of
10
11 incorporating the principles of sustainable development into company management through the
12
13 search for multidimensional performance: economic, social, and environmental (Zenisek, 1979;
14
15 Elkington, 1997; Paton, 2003). It is therefore a matter of analyzing the operationalization of
16
17 sustainable development in corporate performance management systems (Carroll, 1970; Griffin
18
19 and Mahon, 1997; Preston and O’Bannon, 1997; Donaldson, 1982; Orlitzky *et al.*, 2003; Surroca
20
21 *et al.*, 2010). The second approach to global performance is the one advocated by the BSC
22
23 philosophy. Indeed, the BSC is generally accepted as incorporating a global approach to
24
25 performance (Kaplan and Norton, 1996a; 1996b; Holmberg, 2000). This strategic management tool
26
27 developed by Kaplan and Norton (1992) is one of the greatest innovations in management
28
29 accounting (Atkinson *et al.*, 1997; Otley, 1999; Ittner and Larcker, 2001; Ax and Bjørnenak, 2005;
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31 Ding and Beaulieu, 2011). It enables a company to pilot its performance through four
32
33 interdependent perspectives (financial, customer, internal process and organizational learning) and
34
35 thus to respond to a number of stakeholders. It makes it possible to align the performance
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37 measurement system with the strategy (Chenhall, 2005; Kaplan and Norton 2007). It uses financial
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39 indicators relating to a business’ profitability. But it also incorporates other qualitative indicators
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41 used in managing performance vectors such as the employees and their skills and the company’s
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43 work methods and *processes* that make it possible to create value and generate quality in order to
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45 meet customer expectations. The BSC is thus built around a causal chain between its four
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47 perspectives: organizational learning which produces knowledge; this knowledge enables internal
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49 process control and ensures higher quality for the customers, and this quality contributes to
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3 customer satisfaction. Process control and customer satisfaction are the factors of long-term
4 financial performance. These causal connections form the strategy map on which the BCS relies.
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9 My two global performance approaches are not very different. The balance between financial and
10 non-financial performance advocated in the BSC approach aims to move away from a short-term
11 vision of financial performance and towards a long-term, sustainable vision of global performance.
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14 Focusing on non-financial factors, namely customer satisfaction, internal process control, and
15 organizational learning, aims to guarantee the company's sustainable performance through long-
16 term innovation. These non-financial factors are considered to be sources of sustainable
17 competitive advantage. This approach also takes into account other stakeholders in addition to the
18 shareholders (Evan and Freeman, 1988). With the growing importance of corporate sustainability
19 concerns, the authors have adapted the BSC to incorporate these concerns into the performance
20 measurement system. These contributions relate to the *Sustainability Balanced Scorecard* (SBSC).
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23 Widely studied in the early 2000s (Figge *et al.*, 2002; Zingales and Hockerts, 2003; Zingales *et al.*,
24 2004; van der Woerd and van den Brink, 2004; Kaplan and Reisen de Pinho, 2007; Sardinha *et al.*,
25 2007), the SBSC has been the object of renewed interest from researchers in recent years (Zhao
26 and Li, 2015; Kang *et al.*, 2015; Hansen and Schaltegger, 2016, 2018; Hahn and Figge, 2018; Bento
27 *et al.* 2019). The SBSC's objective is to bring the company's management in line with a sustainable
28 development strategy to enable the creation of sustainable value in a long-term perspective.
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32 One of the expected results of the BSC is its contribution to the emergence of competitive
33 advantage. Chenhall *et al.* (2011) consider that the management control system can contribute to
34 strengthening corporate innovation and thus help companies develop competitive advantages. The
35 literature has largely dealt with the connection between management control systems and
36 strategies. However, to my knowledge, there have not been any articles that have addressed the
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3 incorporation of digital innovation indicators into the BSC. Digital innovation is defined as the use
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5 of new digital technologies in a company's innovation processes or the result of this innovation
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7 process (Nambisan *et al.*, 2017). The research conducted by Orlikowski (1992, 2000, 2007)
8
9 encourages a dialectic understanding of the interaction between technology and organizations. In
10
11 a highly competitive environment, companies can take advantage of new technologies to develop
12
13 competitive advantages by focusing on how these new technologies impact internal processes and
14
15 on how they can use their human resources more efficiently to incorporate these new technologies
16
17 (Adler, 1992; Adler and Winograd, 1993). Incorporating performance indicators pertaining to
18
19 digital innovation into the BSC's internal process and organizational learning perspectives can
20
21 therefore be one way of developing a company's competitive advantage. I would like to analyze
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23 the indicators used in the BSCs of real estate companies to develop competitive advantages through
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25 digital innovation.
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32 This study may be of interest to researchers and managers who wish to reconcile sustainable
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34 development and digital innovation in global performance management. It analyzes the impact of
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36 institutional pressures on the performance measurement system. It offers insights on how to
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38 integrate ecological indicators and digital innovation indicators into the BSC causal chains. It
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40 identifies the tensions that managers may face. It reports on practices adopted in the field by
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42 managers in action.
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47 **Theoretical Framework and Research Questions**

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51 This article aims to analyze the performance indicators used in the BSCs of real estate companies.
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53 I have relied on neo-institutionalism as a framework for this analysis. This use of neo-
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55 institutionalism (Meyer and Rowan, 1977) as a framework seems appropriate to understand the
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3 company institutionalization and legitimization process. According to Scott (1995), institutions
4 perform three roles: a *regulatory* role, a *normative* role and a *cognitive* role. In the matter of
5 sustainable development, institutions (national, regional and local governments, federations,
6 unions, etc.) have defined the actions to be carried out to protect the environment and enable
7 organizations to develop in a sustainable manner. If we take, as an example, the measures
8 applicable to the real estate sector in France pursuant to the Grenelle debate on the environment,
9 these measures can be classified in three categories: *regulatory* measures (Heating Regulations of
10 2005, 2012, 2020), *awareness-raising* measures (Energy Performance Certificate for Construction,
11 Sale, and Rental), and *incentives* (labels, bonuses, financial assistance). Henceforth, to enhance
12 their legitimacy and ensure their continuing existence and stakeholder support, organizations adopt
13 the current rules, measures, discourse and practices.
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29 Neo-institutionalism also makes it possible to analyze corporate institutionalization processes
30 (DiMaggio and Powell, 1983) and to understand the various isomorphism phenomena (coercive,
31 mimetic, normative). The notion of coercive isomorphism implies a balance of power based on the
32 societal, and in particular governmental, imposition of rules and standards on organizations. To be
33 legitimated, the latter are led to adopt these rules and standards and incorporate them into their
34 operation. This incorporation of standards by companies gives rise to various forms of mimicry in
35 terms of management practices, procedures and methods. This is what neo-institutionalism
36 qualifies as mimetic isomorphism. It means that, in uncertain circumstances, the individual or
37 group actors in the organization tend to model their conduct on that of other actors and
38 organizations by incorporating it into their practice. This process is carried out in particular through
39 executive, management, and employee training, customary managerial methods, decision-making
40 processes that are legitimated by current practices, etc. According to DiMaggio and Powell (1983),
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3 the mimetic process can be unintentional. The authors state that “*Models may be diffused*
4 *unintentionally, indirectly through employee transfer or turnover, or explicitly by organizations*
5 *such as consulting firms or industry trade associations*” (p.151). The implementation of a
6
7 management tool such as the BSC is generally entrusted to consulting firms that benchmark good
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9 practices, leading to the dissemination of standard practices in companies (Wright *et al.*, 2012). In
10
11 the same logic, but more with the objective of knowledge production, academics can also, through
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13 their research work, generate interest in the development of tools such as the BSC. In summary,
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15 the institutionalization process can be influenced by a variety of actors comprising knowledge
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17 communities (Abrahamson and Fairchild, 1999; Perkmann and Spicer, 2008). Lastly, normative
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19 isomorphism is the creation of standards and rules by the professionals in a sector to regulate the
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21 conditions under which the profession can be accessed and carried out. Thus, these rules, which
22
23 are acknowledged as legitimate, tend to spread and become institutionalized in practice. These
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25 isomorphism phenomena lead organizations to adopt practices and structures that meet a need for
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27 legitimization vis-à-vis other stakeholders.
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36 This desire for legitimization does not always result in rationalized behaviors and can sometimes
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38 lead to inconsistencies in the organization’s management system. Indeed, adopting practices for
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40 legitimization purposes does not always mean they will be efficient. Consequently, the search for
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42 symbolic recognition often takes precedence over the efficiency and effectiveness of the actions
43
44 undertaken. Thus, in terms of global performance management, we are witnessing disconnects in
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46 the organizations’ internal management in order to meet the dissimilar expectations of the various
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48 stakeholders (Griffin and Mahon, 1997; Otley, 1999; Weaver *et al.*, 1999; Figge *et al.*, 2002).
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50 Taking stakeholders’ enhanced expectations into account makes things doubly difficult. On one
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52 hand, there is the matter of how to identify stakeholders who are essential to the company’s
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3 sustainable development and how to prioritize their expectations. On the other hand, the company
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5 may be faced with contradictory expectations from different stakeholders. According to Cho *et al.*
6
7 (2015), contradicting societal and institutional pressures force organizations to engage in hypocrisy
8
9 and develop strategic façades. Brunsson's work (1989) on "organized hypocrisy" is in the same
10
11 vein in considering that organizations which are unable to reconcile contradictory expectations will
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13 be unable to survive. In fact, Brunsson (1993) considers that what is decent, rational and modern
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15 is not necessarily efficient. Corporate environments evolve so quickly that it seems unlikely that
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17 the latest recommendations will coincide with what is efficient. According to the author, this leads
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19 to a "necessary hypocrisy" that consists of projecting an external appearance which does not always
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21 reflect the organization's internal reality. I feel that the gap between financial and non-financial
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23 performance is even more apparent in the real estate sector since applying institutional standards
24
25 for sustainable development has a cost and, necessarily, a timeline. For example, the cost generated
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27 when upgrading buildings to standard and constructing new ones is, for real estate operators, a
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29 "heavy" investment that is compensated over time by the various energy savings expected from
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31 the buildings' energy performance.
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39 Therefore, in this article, I will attempt to analyze the impact of institutional pressure on the
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41 performance measurement systems used in real estate companies. Is the short-term/long-term
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43 balance advocated in the BSC principles actually visible in the indicators selected by the
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45 companies? How important do companies consider two factors that are representative of the
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47 institutional pressure in the real estate sector - namely, "ecology" and "digital innovation"? Is the
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49 ecology actually incorporated into the companies' performance measurement systems, or is this
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51 apparent concern merely a façade? How are digital innovation indicators incorporated into the BSC
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53 to generate competitive advantages?
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3 The BSC's financial and non-financial indicators offer a balanced view of the company's strategy
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5 between a short-term and a long-term vision (Chenhall, 2005). By means of the indicators used by
6
7 the companies in my study, I am going to measure their strategic acuity, i.e., their ability to balance
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9 a near (short-term) vision and distance (long-term) one when choosing their performance
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11 indicators. I will be using an ophthalmologic metaphor (Revelon and Delecroix, 1998; Revelon
12
13 1999; Smida and Condor, 2001) to establish a typology of the companies under study according to
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15 their strategic acuity. According to Smida and Condor (2001), this metaphor can be applied to two
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17 perspectives: the organizational perspective and the environmental perspective. The first
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19 perspective measures the ability to visualize a nearby space: the organization; the second
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21 perspective is the ability to visualize a space that is farther away and provides information about
22
23 the emphasis that is placed on strategic external factors: the environment. Thus, the ophthalmologic
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25 metaphor makes it possible to identify four types of company according to strategic acuity:
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27 emmetropic, hypermetropic, slightly myopic and heavily myopic. Emmetropic companies have
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29 both near and distance vision; their vision is equally based on the organization and on the
30
31 environment. Hypermetropic companies have distance vision but no near vision; their vision is
32
33 focused more on the environmental perspective. Inversely, slightly myopic companies have near
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35 vision but no distance vision. Their vision focuses more on the organizational perspective. Lastly,
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37 heavily myopic companies have neither near nor distance vision. Their vision is neither
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39 organizational nor environmental.
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48 I divided the global performance perspectives into two analytical groups: the organizational group
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50 (near vision) comprising the financial, customer, and internal process perspectives; and the
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52 environmental group (distance vision) comprising the learning perspective, to which I added two
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54 other perspectives, i.e., ecological and digitization, in order to analyze how companies incorporate
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3 ecological and technical changes into their environment. The three perspectives of the
4 environmental axis (learning, digitalization, and ecology) are representative of distance vision
5 insofar as the company's performance in these three perspectives guarantees, in my analysis, the
6 emergence of sustainable competitive advantages. My conception of the organizational learning
7 axis of the BSC is in line with that of Kaplan and Norton (1996c, p.63) who define this perspective
8 as *"the infrastructure that the organization must build to create long-term growth and
9 improvement"*. The conception of organizational learning here follows the double-loop learning
10 scheme defined by Argyris and Schön (2002). The notion of loop refers to the idea of feedback.
11 The "double-loop" refers to the two feedback loops that link the observed effects of action strategies
12 and the values served by the strategies. Organizational learning is a circular process and contributes
13 to knowledge for action and forecasting. If implemented properly, BSC can be an entirely new
14 feedback and strategic learning system (Kaplan, 1998; Rasolof-Distler and Distler, 2018).
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31 This results in the classification of the companies under study as shown in Table 1 below:
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- 35 - Emmetropic companies which have both near and distance vision will have balanced
36 indicators in all six performance perspectives.
- 37 - Hypermetropic companies which have distance vision but no near vision will prioritize the
38 three perspectives in the environmental group.
- 39 - Slightly myopic companies which have near vision but no distance vision will prioritize the
40 three perspectives in the organizational group.
- 41 - Heavily myopic companies which have neither near nor distance vision will neglect all six
42 performance perspectives.
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54 Please insert here table 1
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Methodology

To conduct this study, I opted to use the action research method. This method is based on a central idea according to which the production of knowledge is developed in and especially by the action conducted by social groups. Therefore, an action research involves a method of reciprocal interaction between researchers and practitioners (Lewin, 1951). According to Lewin (1947), an action research arises when a desire for change is met with a research intention. It thus has a dual purpose: to produce scientific knowledge that can be used in a change project. To do so, it must be based on work that is jointly carried out by everyone involved and be developed within an ethical framework that has been negotiated and accepted by all parties so that researchers and practitioners work together to obtain knowledge (Lewin, 1975).

This action research method is the one I used to conduct my study. In fact, the 83 Balanced Scorecards analyzed in my study are the result of an action research carried out in real estate companies as part of projects to optimize the performance measurement systems. The literature on action research is rich in useful definitions but there is no precise definition of action research (Altrichter *et al.*, 2002). I mobilize some of these definitions to present the action research I have conducted. My conception of action research is similar to that described by Kaplan (1998) as "*innovation action research*" in that I actively accompany organizations in the implementation of the BSC. The action research carried out follows five stages as shown in the Diagram 1. These stages are inspired by the recommendations of Hatchuel and Molet (1986).

Please insert here Diagram 1

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3 The diagnosis phase of the company allows to define with the company a need for optimization.
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5 The action research conducted follow the logic of “in vivo” experiments (Lewin, 1997). The study
6
7 is carried out in-company and addresses a problem that has been identified with the actors in the
8
9 field. Thus, action research is also distinguished by the researcher’s involvement in the
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11 organization (Esterby-Smith *et al.*, 1991) and by the combination of two elements: research and
12
13 learning. When the diagnosis phase leads to the emergence of a problem relating to the management
14
15 of global performance, the researcher will draw on existing knowledge in the literature by
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17 mobilizing the theoretical frameworks relating to this issue. This action research is similar to Glaser
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19 and Strauss’ “Grounded Theories” (1967): these are theories based on continuous feedback and
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21 dialog at both the theoretical and practical level. According to Reason and Bradbury (2000), the
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23 purpose of an action research is not to develop a theory based on an action or even to construct a
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25 theory about an action, but to promote the emancipation of the actors in the field through improved
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27 knowledge about what they do. This research method aims to address problems encountered by
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29 management in the field while conforming to a rigorously academic framework (Vermeulen, 2005;
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31 Markides, 2007).
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39 Access to the company is through "*part-time management students looking for a way of integrating*
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41 *their studies with their work*"¹. These students follow end-of-cycle university courses. They are
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43 introduced to research methodologies and the scientific criteria of a research approach. As shown
44
45 in the Diagram 2., each student A benefits from a double supervision: in the company by the P1
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47 pilot and in training by the P2 pilot. The P1 pilot is a real estate professional. The P2 pilot is a
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49 scholar. The result of the research, in this case the BSC developed in the framework of the action
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55 ¹ This is one of the applications of the action research mentioned on
56 <https://www.emeraldgrouppublishing.com/how-to/research-methods/carry-out-actionresearch>
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3 research, is presented to a validation committee composed of the pilot P1, the pilot P2 and a second
4 scholar named here "Candid". Within the framework of the validation committee, the pair of
5 researchers and actors will agree and negotiate on the validation of the knowledge produced at both
6 levels (usefulness for the company and contribution to the management sciences). The objective is
7 the integration of theory and practice (Brydon-Miller *et al.*, 2003; Zuber-Skerritt, 2012; Antonsen
8 *et al.*, 2020). The intervention process lasts one year, from the diagnosis phase to the presentation
9 of the BSC to the validation committee. The procedure used is similar to the principles of "engaged
10 scholarship" (Van De Ven and Johnson, 2006): reality-based research statements, a collaborative
11 and long-term learning model, and research assumptions and methods that are adapted to the
12 problems in the field. Baskerville and Wood-Harper (1996) emphasize the wealth and rigor of the
13 documentation in a study conducted in-company. Indeed, the abundance and quality of the
14 information resulting from the close collaboration between the researcher and the practitioners is
15 often mentioned as the main advantage of an action research (Huxham and Vangen, 2003).
16 Communication with the actors in the field is essential and makes it possible to act on actual issues
17 while enabling the researchers to produce useable knowledge.
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39 Please insert here Diagram 2.
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42 When the context of the company allows it, the implementation of a BSC is proposed. A phase of
43 discussions with the company's stakeholders is then held with the aim of modeling the BSC in line
44 with the company's strategic vision and strategy map. For data collection, I triangulated three
45 methods (Jick, 1979). First, I conducted semi-structured interviews with members of the company's
46 strategic committee. Based on these discussions, I was able to select verbatim statements to
47 support my analysis of institutional pressures (Balogun and Johnson, 2004). The questions focused
48 on their strategy and on performance indicators they adopt to control their enterprise. Secondly, I
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3 attended meetings with managers and their teams to examine the use of indicators as part of a
4 performance measurement and decision-making situation. These meetings served as "Focus
5 Groups" (Antonsen, 2014) to confront my theoretical frameworks with the company's expectations.
6
7 This method also helped me identify the whole informal dimension of the control exerted by
8 managers over their teams, and even selfcontrol established within businesses. I took notes of the
9 discussions held between the participants at meetings, including as many direct quotes as possible
10 in addition to some notes on gestures, expressions and other body language signs (Jarzabkowski
11 and Seidle 2008). I asked questions to understand the role and responsibility of each actor. Thirdly,
12 to complete my study, data collected from the observations and interviews were cross-referenced
13 with the study of the corporate internal documents.
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27 It is important to mention that the collective aspect plays a major role in action research. As stated
28 by Kolb (1984), anyone may contribute technical or other specific knowledge based on his or her
29 experience. Knowledge is the cornerstone of research. The researcher has to make sure to consider
30 the difficulties and problems encountered by the actors in the field, examine all possible solutions
31 they propose, and try to develop management tools. These tools are jointly built with the actors in
32 the field in order to create synergy (Hatchuel and Molet, 1986). Through his or her personal
33 involvement, the researcher himself/herself becomes just as much a participant in the study as the
34 other members in the study group and thus must also analyze his or her own actions. For Kemmis
35 (1991), applying new tools and practices alone is not enough; self-critique and active participation
36 in the change process are important elements if one wishes to see the practices really change. For
37 change to be productive, it must come from within. Thus, Elliott (1991) defines an action research
38 as the study of a social situation for the purpose of improving the quality of an action. Practical
39 judgement can be improved by applying it to concrete circumstances. The validity of assumptions
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3 or theories not only depends on scientific testing, but rather on their usefulness in helping people
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5 act with greater skill and intelligence. According to the author, action research theories are not
6
7 separately validated and then applied in practice; they are validated through practice.
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11 Action research follows a cyclical process (Susman and Evered, 1978; Greenwood, 2007; Kemmis
12
13 and McTaggart, 2008) of diagnosis/observation, action plan, action, assessment, and learning. It
14
15 begins by observing what is taking place in the field. The resulting reflection leads to an action
16
17 plan. This plan is implemented and assessed, and then amended if necessary. Moving from the field
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19 observation to the action plan is articulated through numerous reflections, negotiations, and
20
21 identification of possibilities. Depending on the plan that is established, changes are made.
22
23 Afterwards, an analysis is performed on the impacts of these changes. This short-cycle process
24
25 makes speedier changes possible. When a solution has been provided, it is rarely efficient the first
26
27 time, at the first analysis or experiment (Knoerr, 2001). The best solution will need to be found for
28
29 the organization, and this is why the process is constantly reiterated, thus giving rise to the cyclical
30
31 nature of the action research (Dick, 2011). Providing possibilities or solutions does not mean that
32
33 the action research is over. The solution found must be continually modified in order to refine it to
34
35 the extent possible. As far as I am concerned, the validation of the proposed solution is done at the
36
37 time of the presentation in front of a validation committee composed of the pilots P1 (real estate
38
39 professional) and P2 (scholar) and of a third member, a "candid" scholar who brings a new
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41 perspective on the process. I do not conduct a post-intervention analysis of the changes made. My
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43 intervention stops at this stage.
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51 The companies under study in my research conduct their business activities in the real estate sector.
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53 Eighty-three French companies were studied, operating five real estate activities:
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- 23 lease management companies. These firms lease properties belonging to third parties. They operate through prospection-lease processes. They contact prospective property owners to obtain lease management contracts and then lease the contracted properties out.
- 21 real estate transaction companies (sale or rental). They connect buyers and sellers for sales transactions; landlords and tenants for rental transitions.
- 13 property management companies that handle the management of the common areas in condominiums.
- 15 real estate development companies that construct buildings to be put up for sale.
- 11 low-income housing (LIH) companies that provide housing to those with limited income. Their activity follows a construction/acquisition-leasing process that leads them to build or buy property to let.

The 83 BSCs resulting from the action research were analyzed using Nvivo software. This qualitative analytical software is increasingly used in management research relating to sustainable development (Belinski *et al.*, 2020; Elsayed and Ammar, 2020; Robertson and Samy, 2020; Bubicz *et al.*, 2021). Indeed, it offers a transparent and realistic method of data analysis (Dalkin *et al.*, 2021). The indicators for each perspective were encoded in a node named for each perspective. Thus, I obtained four nodes for the four performance perspectives in the BSC. The ecological indicators were encoded in an “Ecology” node and the digital innovation indicators in a “Digitization” node. These two additional nodes enabled me to analyze the indicators for these two perspectives representing the company’s strategic acuity with regard to the ecological and technical changes in their circumstances. I also created nodes for each type of activity (lease management, real estate transactions, real estate development, property management, LIH). A word frequency

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2
3 query performed for each node made it possible to draw up a list of the most frequently-used
4 indicators for each global performance perspective and for each real estate activity. Matrix coding
5 allowed me to record the weight of each performance perspective, for each of the real estate
6 activities under study.
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12 13 **Results** 14 15

16
17 As explained previously, I divided the global performance perspectives into two analytical groups:
18 the organizational group and the environmental group. The organizational group represents near
19 vision with regard to strategic acuity. It comprises three of the global performance perspectives,
20 namely the financial, customer, and internal process perspectives. The environmental group
21 represents distance vision with regard to strategic acuity. It comprises the other three global
22 performance perspectives used in my analysis, namely the learning, ecology, and digitization
23 perspectives
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35 The companies were classified in four categories according to their strategic acuity: emmetropic,
36 hypermetropic, slightly myopic and heavily myopic. Table 2 details the proportion of indicators
37 allotted to each activity in the six global performance perspectives. It must be specified that digital
38 innovation is not a separate perspective in the companies' BSCs. Indeed, these digital indicators
39 are apportioned over all four of the conventional BSC perspectives. I wanted to group them together
40 in this digital innovation perspective in order to analyze where they are found in the BSC causal
41 chain and thus to assess the innovation processes in the companies under study. The results show
42 that the organizational learning perspective is well-represented among the indicators, for all real
43 estate activities. Organizational learning, which is considered a factor in adapting to complex
44 environments, has become a core element in global performance management. Organizations
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3 therefore consider the question of organizational learning to be a non-negligible strategic factor.
4
5 This has led them to make people, individuals and actors key to their strategy again. Aside from
6
7 these overall considerations, I observed particular features in the companies' strategic acuity,
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9
10 depending on their business activity.
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13 Please insert here Table 2
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16 *LIH Companies are Emmetropic* 17 18

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20 My study shows that LIH activities are emmetropic in that their performance vision is balanced
21
22 between the short- and the long-term. They allocate as much importance to organizational
23
24 indicators as to environmental ones. This indicator balance can be explained by the institutional
25
26 environment in which LIH organizations operate. In France, the LIH sector is comprised of
27
28 4,500,000 housing units and houses 10 million people. LIH tenants come from low-income
29
30 households. This is a highly-regulated sector given the various subventions granted by the
31
32 institutions to enable such housing to be built and leased. In fact, this is a sector in which there is
33
34 heavy coercive isomorphism that is due as much to the standards and regulations for building the
35
36 housing complexes as it is to their leasing conditions.
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41
42 A word frequency query performed for each of the indicators used in the LIH companies (Appendix
43
44 1) lists the companies' priorities in terms of:
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46

- 47 - The housing planned and completed in accordance with the institutional standards,
48
- 49 - The tenant's satisfaction with regard to the services provided, which relates to internal
50
51 process control. We also find in particular the number of days of delayed intervention in
52
53 the housing units.
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3 - Employee training
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6 Financial perspective indicators, although present in the BSCs of the LIH companies, are slightly
7 less represented (13%), particularly with regard to the indicators for the internal process perspective
8 (33%). Indeed, the goal of the LIH companies is to achieve a financial balance without absolutely
9 targeting profitability. Moreover, LIH companies cannot make public offerings. They are exempted
10 from corporate income tax. The profits made are reinvested in the construction of rental properties.
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19 The balance between short-term and long-term vision is found in the balanced presence of
20 ecological indicators in LIH companies. Here, too, the importance granted to ecological concerns
21 is indicative of coercive isomorphism in that the institutions have gradually addressed the challenge
22 of sustainable buildings through increasingly more coercive regulations (Grenelle
23 environmental measures in 2009 and 2010, Alur Act in 2014, Elan Act in 2019). These various
24 laws set out the standards that must be followed by developers and landlords to achieve a level of
25 energy performance capable of protecting the ecosystem. The ecological indicators include terms
26 such as “green”, “certification”, “HEQ” for High Environmental Quality”, and “LEH” for “Low-
27 Energy Housing” (Appendix 2).
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39 40 41 *Lease Management, Real Estate Transaction, and Property Management*

42 43 44 *Companies are Slightly Myopic*

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47 Among the activities under study, three require a business license. These are lease management
48 (“G” license), real estate transactions (“T” license) and property management (“S” license). Indeed,
49 these activities are mandated activities. The companies are mandated as agents in property rentals
50 or sales or to manage common areas in condominiums. Monitoring the number of contracts is
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3 therefore one of the most frequently-used indicators. Word frequency queries for these three
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5 activities highlighted words such as “results” or “income” for turnover, which in this case indicates
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7 profit monitoring (Appendices 3, 4 and 5). My study showed that companies conducting these three
8
9 business activities are slightly myopic in that they focus more on the organizational perspective
10
11 than on the environmental one.
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16 In all three activities, ecological indicators are rarely involved compared to the other performance
17
18 perspectives: 13% for lease management, 5% for real estate transaction, and 2% for property
19
20 management. This lack of ecological indicators results from environmental legislation with more
21
22 incentives and fewer constraints, from the standpoint of the property owners, at least before the
23
24 Climate and Resilience Act of August 2021. As for real estate transactions (sale or rental), the
25
26 mandatory and emblematic tool is the Energy Performance Certificate (EPC). Its purpose is to
27
28 reduce CO₂ emissions and contribute to energy savings. It is used to measure energy consumption
29
30 and provide the future tenant or buyer with information about this consumption. Thus, property
31
32 sale or rental offers must display the EPC for the property on offer. On the other hand, with regard
33
34 to property owners, the institutions have instead opted for incentive measures (such as financial
35
36 assistance or tax breaks) and any decisions relative to energy savings upgrades are up to the
37
38 property owners and not to the property management companies.
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45 Consequently, I observed rather normative and mimetic isomorphism in the real estate companies’
46
47 practices. When dealing with environmentally-sensitive customers, the information in the EPC can
48
49 ensure the transaction goes smoothly. When assessing and negotiating over a property, the EPC
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51 can be a strategic tool that makes it possible to provide the data on the energy consumption of the
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53 property and to ask for a representative price for the participation in the efforts required of each
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55 citizen with regard to sustainable development. On the other hand, when customers are less
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3 sensitive to ecological concerns, the information in the EPC is less used and other factors such as
4
5 the location or price of the property will determine the success of the transaction. Therefore, in
6
7 these companies, the ecological aspect is more of a commercial argument than an actual strategy.
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10 11 *Real Estate Development Companies are Hypermetropic* 12

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15 Real estate development companies are the leaders in the ecological and digital innovation
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17 perspectives. With regard to the ecology, this is coercive isomorphism, as in the case of LIH
18
19 companies. Indeed, both activities involve the construction of properties for future lease, in LIH
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21 companies, and for future sale for real estate developers. With regard to digital innovation, as
22
23 previously mentioned, this is not a specific performance perspective as may be the case for the
24
25 other perspectives defined in the BSC. I added digital innovation as a supplementary perspective
26
27 in order to analyze how it is incorporated into the practices in real estate companies.
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32 A word frequency query of the indicators for the digital innovation perspective revealed concerns
33
34 about mobile applications, websites and the Internet, virtual and 3D viewing, information systems
35
36 and Big Data (Appendix 6). Here, I observed mimetic isomorphism. One company director
37
38 indicated that the almost inescapable use of digital tools allowed for de facto benchmarking, i.e.,
39
40 to refer to the practices of competitors who produce added value. In fact, the exploitation and
41
42 interpretation of the information that is almost available on company websites leads to emulating
43
44 successful companies and adopting strategies that "work". In addition, a number of the managers
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46 interviewed mentioned the training they had taken to define the performance indicators they wished
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48 to monitor.
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3 The companies under study have to maintain their position in a highly competitive environment.

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5 The digital revolution in the real estate sector has led to the emergence of “Proptech” (Property
6
7 Technology). This term refers to the technological innovations in the real estate services, from
8
9 development to transactions, building materials to IoT, and virtual reality to Data Mining. The
10
11 development of digital technology in the real estate sector corresponds in part to a change in habits,
12
13 in particular those of “Digital Native” generations who grew up with the development of the
14
15 Internet and digitization. On the other hand, digitization aims to optimize processes and create
16
17 value. The disintermediation arising from the use of digital platforms may pose a real threat of
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19 “uberization” of the real estate business. However, the development of digital technologies offers
20
21 genuine opportunities in terms of performance management. For example, extracting knowledge
22
23 or information from databases is one of the strategic perspectives on which the business networks
24
25 in the real estate sector are relying the most.
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32 Real estate development companies focus on environmental perspective indicators (distance
33
34 vision) because, as real estate contractors, they are participating in the construction of tomorrow’s
35
36 cities. They are therefore attentive to both the energy performance of the buildings and the digital
37
38 innovations required to develop “Smart Cities.” They have to ensure that the buildings are
39
40 environmentally-friendly without compromising the well-being and comfort of their future
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42 inhabitants. They are studying the impact of new technologies on the way buildings are built and
43
44 on the lifestyles of the people who will live in them.
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49 **Discussion**

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53 The purpose of this article is to analyze the impact of institutional pressure on the performance
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55 measurement systems used in real estate companies. How important do companies consider two
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3 factors that are representative of the institutional pressure in the real estate sector - namely,
4
5 “ecology” and “digital innovation”?
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9 *Incorporating Ecological Matters into the Performance Measurement System*

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12 Incorporating sustainable development concerns into a company’s performance measurement
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14 system is a recurring topic in the literature (Hockerts, 2001; Figge *et al.*, 2002; Bieker and
15
16 Waxenberger, 2002; Rabbani *et al.*, 2014; Hansen and Schaltegger, 2016). In addition to a greater
17
18 overall awareness of the environmental stakes, incorporating sustainable development is becoming
19
20 a requirement for organizations as part of their institutional legitimization dynamics. The BSC is
21
22 a tool that makes it possible to manage global performance and incorporate sustainable
23
24 development concerns into the management system, via the SBSC. Thus, the authors considered
25
26 the potential format of the SBSC. Figge *et al.* (2002) refer to three possible ways of incorporating
27
28 ecological aspects into the BSC: include the ecological aspects in the four already-existing
29
30 performance perspectives, add an additional and specific perspective relative to ecological aspects
31
32 or design a separate dashboard for ecological aspects.
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40 In the companies in my study, only 2 out of the 83 chose to include an additional perspective
41
42 specific to ecological matters. The others preferred to incorporate the indicators into the four
43
44 already-existing perspectives in the BSC. Is it possible to confirm that the ecological aspects were
45
46 actually incorporated into the management and performance measurement systems of the
47
48 companies under study? Given the results of my study, I consider that the effective incorporation
49
50 of the ecological concerns into a company’s management system depends on the incorporation of
51
52 these concerns into the BSC causal chains. In this case, the ecological indicators incorporated into
53
54 a company’s strategy map are effectively measured and monitored in the management and
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3 performance measurement system. On the other hand, ecological indicators that are not
4
5 incorporated into the causal chain of the company's strategy map, even when they take legitimate
6
7 concerns into account, are not selected in the BSC. Thus, the question is not really about what form
8
9 the BSC has, but rather what the company's strategic vision is, given the institutional pressure.
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11

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13 I found that legal requirements in terms of ecological matters are covered by performance
14
15 indicators in the management systems of the companies under study. Indeed, the companies that
16
17 most often use ecological indicators in their performance measurement systems are the ones that
18
19 are in a situation of coercive isomorphism due to institutional pressure. I therefore find that the
20
21 companies that were classified in my study as emmetropic and hypermetropic, i.e., those that
22
23 focused on a distance vision (environmental perspective), essentially do so due to legal
24
25 requirements. These companies construct buildings for the purpose of renting or selling them. They
26
27 cannot rent or sell their properties if they do not comply with environmental obligations. These
28
29 companies' use of the SBSC corresponds to what Hansen and Schaltegger (2016) refer to as social
30
31 and political perspective, i.e., the SBSC will help the organization manage these institutional
32
33 pressures and thus ensure its legitimacy.
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40 Companies that are subject to fewer legal requirements use ecological measures for strategic
41
42 purposes. This is what Carroll and Shabana (2010) call a "business case" in that the incorporation
43
44 of ecological concerns into performance management contributes to economic performance.
45
46 Schaltegger and Burritt (2018), drawing on the four different ethical management versions of CSR
47
48 defined by Roberts (2003), discuss four perspectives of the business case: a reactionary perspective,
49
50 a reputational perspective, a responsible perspective, and a collaborative perspective. The business
51
52 case that I have identified lies at the interface between the reputational perspective and the
53
54 reactionary perspective. CSR is used as a commercial argument, with the difference that the
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3 companies concerned here do not incur excessive communication costs in order to gain a
4
5 reputation, but simply use the arguments usually used by other companies, by mimicry. The CSR
6
7 practices of these companies are also close to the reactionary perspective of the business case
8
9 insofar as the managers of these companies may have CSR convictions but only retain the
10
11 indicators that fit into the BSC causality chain. Following the BSC causal chains implies that the
12
13 main purpose leads to the financial perspective of the performance, even if that has to be as
14
15 sustainable as possible. Environmental performance is likely to be subordinated to economic
16
17 performance (Hockerts, 2001). My results correspond to what Hansen and Schaltegger (2016) refer
18
19 to as an “instrumental” perspective of the SBSC, in that the incorporation of ecological indicators
20
21 into the performance measurement system depends on how they contribute to achieving financial
22
23 targets and improving the organization’s performance as shown in Diagram 3. Training and
24
25 encouragement of eco-behavior will allow, on the one hand, to reduce the consumption of supplies
26
27 and energy, and on the other hand, to improve the company's reputation in terms of CSR. The
28
29 financial impacts are the increase of sales and the control of operating costs. These companies are
30
31 the ones classified as “slightly myopic” in my study as their management system has near vision
32
33 focus and their indicators prioritize the organizational perspective to the detriment of the
34
35 environmental one.
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44 Please insert here Diagram 3
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47 *Digital Innovation as a Source of Competitive Advantage* 48 49

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51 Digital innovation refers to the use of digital tools in the innovation process. This digital innovation
52
53 aims to provide the company with a competitive advantage. Contrary to ecological aspects, for
54
55 which I observed highly coercive institutional pressure, the digital innovation observed in the
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3 companies under study derives more from mimetic isomorphism. Indeed, due to the change in their
4 environments, companies imitate behavior that is deemed efficient and incorporate the most easily-
5 identifiable technology in their business sector. In the real estate development business, new digital
6 technologies such as Building Information Modeling make it possible to design better properties,
7 from their construction to their use. Moreover, real estate developers are starting to digitize their
8 offers in order to keep up with market changes. Nowadays in France, 90% of property transactions
9 (purchase, sale, rental) begin on the Internet. Digital platforms such as Airbnb, Leboncoin, and
10 Bienici have led to a disintermediation of the market. Given the risk of uberization of their
11 business, companies owe it to themselves to invest in digital innovation.
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25 From the work of Bocquet *et al.* (2017), we see that companies implementing strategic CSR exhibit
26 a higher probability to innovate in their process. In my results, I find that the companies that have
27 the most digital innovation indicators are those that mobilize the most ecological indicators. These
28 companies go beyond their legal obligations to make ecology a differentiation strategy. The
29 ecological and digitalization indicators are therefore integrated into the causal chains of the BSC
30 leading to financial performance. Graph No. 1 shows that digital innovation indicators are mainly
31 present in the internal process perspective and then are found in a balanced manner in the customer
32 and organizational learning perspectives. In fact, Kaplan and Norton (1996c) recommend that the
33 innovation process be incorporated into the internal process perspective when designing the BSC.
34 This is to identify and innovate critical internal process elements in which the organization must
35 excel. The authors encourage companies to incorporate the performance indicators with the highest
36 impact on customer satisfaction into the internal process perspectives in order to meet the corporate
37 financial targets. Therefore, companies with distance vision (hypermetropic) will invest in
38 innovation processes for developing new products or services in order to meet the changes in their
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3 customers' expectations. Innovation processes require new, specific technology and skills, which
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5 will redefine jobs and roles in the company (Adler, 1986; Gupta and Parsaei, 1994). This
6
7 redefinition of jobs and roles usually comes with increased employee certification (Adler and
8
9 Borys, 1986; Adler and Winograd, 1992). Through the organizational learning perspective,
10
11 companies will define the knowledge and skills required to efficiently use the new technologies,
12
13 identify the required training, and ensure that these new technologies are mastered by the
14
15 employees (Duffy *et al.*, 1995). If we refer to the business case perspectives mentioned by
16
17 Schaltegger & Burritt (2018), the ones found here are more similar to the responsible and
18
19 collaborative perspectives. As shown in the example of Diagram 4, the development of employees'
20
21 innovation capacities will allow for the innovation of internal processes through the use of new
22
23 digital technologies such as BIM (Building Information Modeling), leading to the construction of
24
25 connected and intelligent housing compatible with ecological concerns.
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32 Please insert here Diagram 4.
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35 However, according to Busco and Quattrone (2015), the BSC is essentially a method of ordering
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37 and innovation, i.e., a visualization that provides its users with guidelines for establishing new
38
39 logical pathways among abstract strategic concepts. This visualization can also enable the company
40
41 actors themselves to come up with innovations other than those initially set out in the strategy
42
43 maps. Moreover, even companies with no well-defined digital innovation strategies, i.e., slightly
44
45 myopic companies, nevertheless have digital indicators such as Net Promoter Score (NPS) or
46
47 Social Media Optimization (SMO). Companies are aware of the importance of social networks and
48
49 online ratings from customers. However, they have not yet managed to conceptualize an active
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51 digital strategy. Consequently, through mimicry, they settle on incorporating the digital indicators
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53 commonly used in the competitive environment into their performance measurement system.
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3 Finally, unlike institutional pressures on the ecological dimension, which is done coercively
4 through legal frameworks, digital innovations are instead incentivized by the market without there
5 being a legal obligation for companies. According to the work of Mithani (2017), organizations are
6 increasingly scrutinized on their ability to reconcile ecological performance and innovation.
7 Therefore, they need to find an appropriate balance between investments in innovation and
8 investments in ecology. Indeed, the heavy and compulsory pressures on the ecological level imply
9 important costs for companies, which leads to a limitation of their capacity to invest in innovation.
10 This is one of the reasons for the low presence of digital innovation indicators in the BSCs of the
11 companies studied.
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25 Please insert here Graph 1
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27 **Conclusion**

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31 I have examined the impact of institutional pressure on the selection of the performance indicators
32 in 83 Balanced Scorecards used in French real estate companies. The BSC makes it possible to
33 provide a balanced view of a company's performance through four perspectives: financial,
34 customer, internal process and organizational learning. Action research was carried out in
35 companies conducting five types of business activity: lease management, real estate transactions,
36 property management, real estate development, and construction and rental of low-income housing
37 (LIH). Several research questions are at the origin of this article. First, I questioned the balance
38 between short-term and long-term indicators used by companies. Is the short-term/long-term
39 balance advocated in the BSC principles actually visible in the indicators selected by the
40 companies? To answer this question, I classified the companies according to their strategic acuity,
41 i.e., their ability to balance an organizational vision and an environmental one when choosing their
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3 performance indicators. This resulted in a company classification with three categories:
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5 emmetropic companies, whose indicators are balanced between the organizational perspective and
6
7 the environmental perspective, hypermetropic companies that focus more on environmental
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9 perspective indicators, and slightly myopic companies that prioritize indicators in the
10
11 organizational perspective. No company was classified as highly myopic in that all of the
12
13 performance measurement systems studied actually incorporate either the organizational or the
14
15 environmental perspective. I also wondered about the place given by the companies studied to the
16
17 two factors representative of institutional pressures, namely ecology and digitalization. Is the
18
19 ecology actually incorporated into the companies' performance measurement systems, or is this
20
21 apparent concern merely a façade? How are digital innovation indicators incorporated into the BSC
22
23 to generate competitive advantages? To answer these questions, I studied the way in which these
24
25 two factors were incorporated into the BSC causal chains. I found that ecological indicators are
26
27 selected in the BSC for two clearly-identified reasons. Ecological indicators are selected either
28
29 because they correspond to legal obligations within a logic of coercive isomorphism or because
30
31 they fit into a strategic rationale with a view to financial performance. Thus, in management firms
32
33 with fewer legal requirements, ecological protection is used as a commercial argument for
34
35 customers who are sensitive to ecological concerns. As for digital innovation indicators, these are
36
37 generally part of the BSC's internal process perspective and are linked to organizational learning
38
39 indicators (Kaplan and Norton, 1996c). Indeed, institutional pressure with regard to innovation
40
41 leads companies to invest in new technologies that require specific skills and training (Adler, 1986;
42
43 Gupta and Parsaei, 1994; Duffy *et al.*, 1995). In the companies classified as hypermetropic, the
44
45 digital innovation indicators are in fact incorporated into a strategic rationale outlined by the BSC
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47 strategy map. However, even in companies that are slightly myopic, i.e., those that do not actually
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49 have an environmental vision, I found that their performance indicators include digital innovation
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3 indicators chosen by mimicry, whereas these indicators are not part of a clearly-identified strategic
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5 rationale.
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9 In summary, this article reveals the feasibility of measuring global performance integrating ecology
10
11 and digital innovation. It responds to a preoccupation of recent years in academic research on how
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13 to reconcile CSR and technological innovation. It shows that the companies that have the most
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15 digital innovation indicators are those that mobilize the most ecological indicators (Bocquet *et al.*,
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17 2017). At the same time, it highlights the difficulties encountered by managers in the field when
18
19 faced with institutional pressures (Hansen and Schaltegger, 2016). Nevertheless, companies that
20
21 have implemented the BSC tool to manage their overall performance agree that they use this tool
22
23 to develop a competitive advantage. Indeed, in a context of strong coercive and normative
24
25 institutional pressures, managers spend their time reporting on the application of laws and standards
26
27 to legitimize their actions. However, they have little feedback on the cost-performance ratio of the
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29 actions taken. Through the implementation of the BSC, they hope to generate competitive
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31 advantage through feedback and organizational learning.
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38 My research has three main limitations. First of all, the mobilization of part-time management
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40 students to have access to companies can influence the emergence of mimetic isomorphisms.
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42 Indeed, these students follow the same training and advise the companies that welcome them
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44 according to the training they have followed. Then, my research stops at the development of the
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46 BSC. I do not study the impacts or changes that occurred after the implementation of the tool. This
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48 could be the subject of future research on the appropriation and use of the BSC by the company's
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50 actors and their impact on the optimization of global performance measurement system. Finally,
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52 my research does not include the impacts of the new Climate and Resilience Law (August 2021)
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54 which requires property owners to carry out energy renovations or else they will no longer be able
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3 to rent their property. This new law will accentuate the coercive isomorphism for Lease
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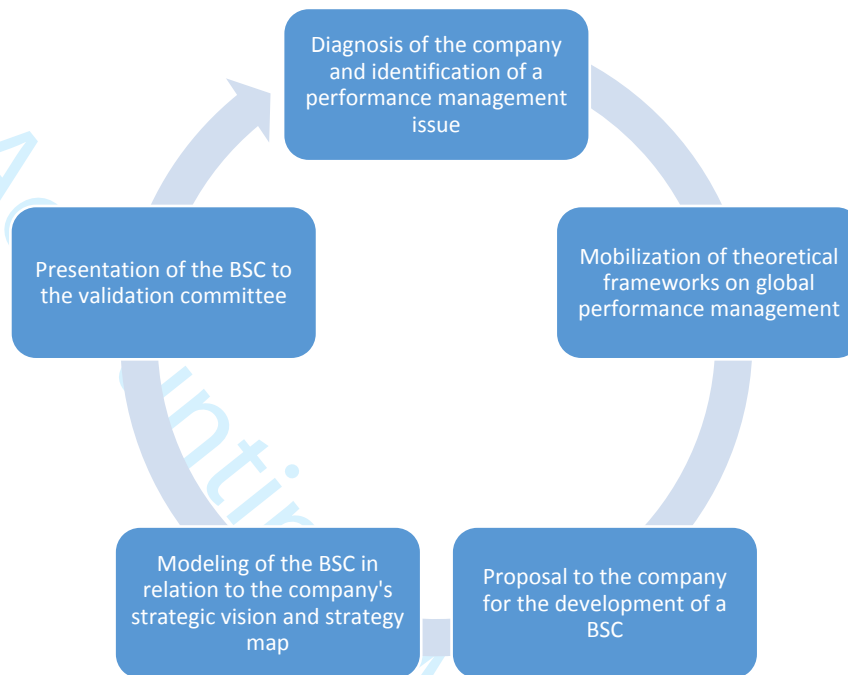
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Diagram 1. The steps of the action research process on the implementation of the BSC



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Diagram 2. The actors of the management of the research-actions carried out

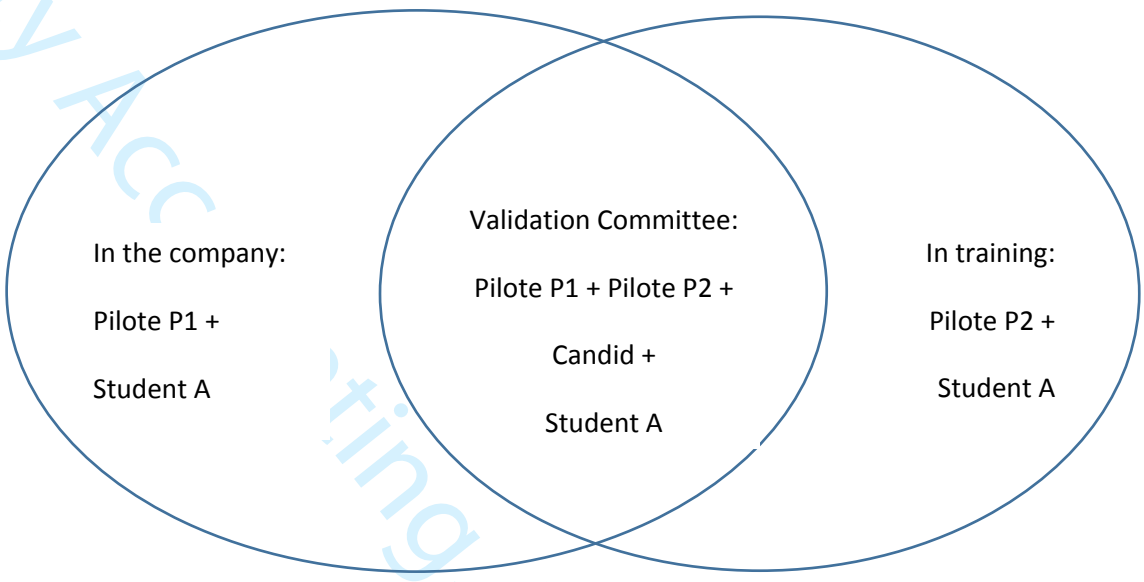


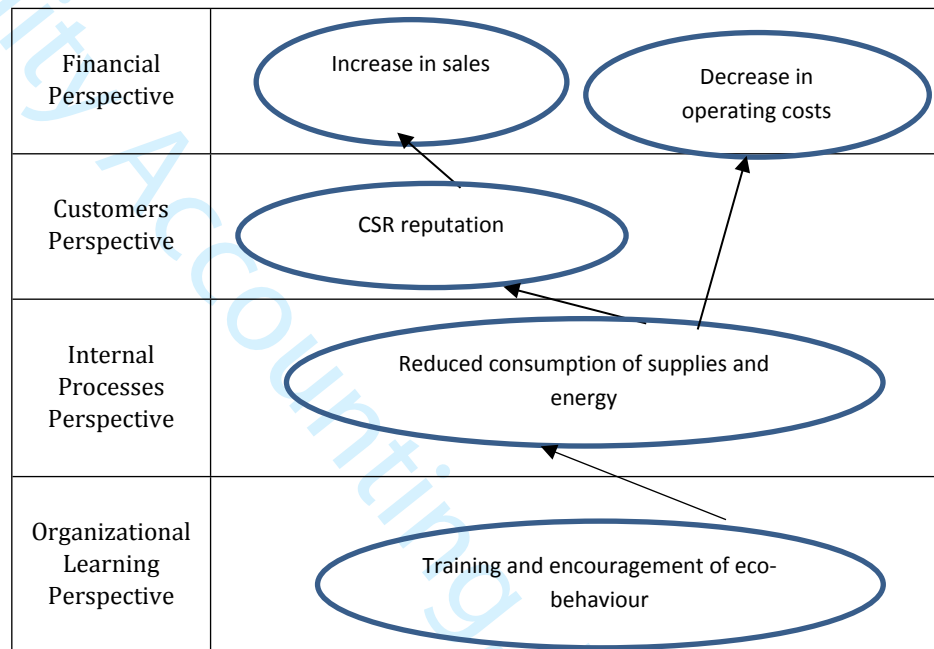
Diagram 3. Example of a strategy map of a Slightly Myopic company

Diagram 4. Example of a strategy map of a Hypermetropic company

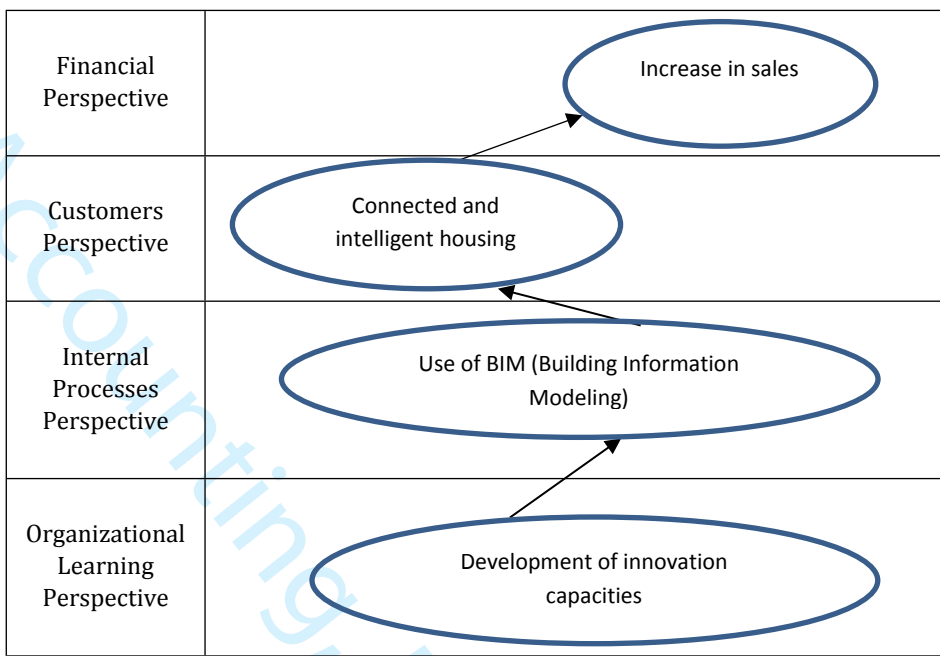


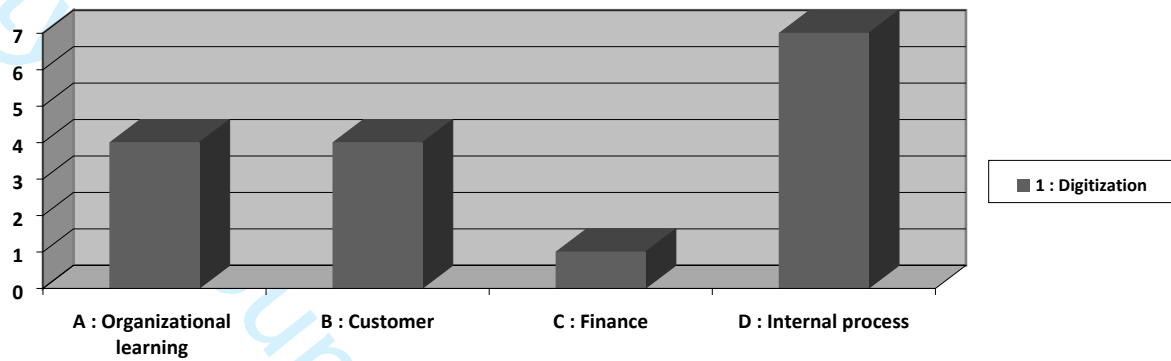
Table 1. Matrix of performance perspectives and strategic acuity

		Emmetropic	Hypermetropic	Slightly myopic	Highly myopic
Organizational group	Financial	Indicator balance		Indicator priority	No indicators
	Customer	Indicator balance		Indicator priority	No indicators
	Process	Indicator balance		Indicator priority	No indicators
Environmental group	Learning	Indicator balance	Indicator priority		No indicators
	Ecology	Indicator balance	Indicator priority		No indicators
	Digitization	Indicator balance	Indicator priority		No indicators

Table 2. Indicator proportions by perspective and by activity

	A: Lease management		B: Real estate transaction		C: Real estate development		D: Property management		E: LIH	
1: Financial	55	16%	58	20%	34	17%	41	22%	24	13%
2: Customer	82	25%	75	26%	35	17%	49	26%	31	17%
3: Process	82	25%	73	26%	48	24%	49	26%	59	33%
4: Learning	70	21%	61	21%	40	20%	39	21%	32	18%
5: Ecology	42	13%	15	5%	41	20%	3	2%	30	17%
6: Digitization	3	1%	4	1%	6	3%	4	2%	4	2%

Graph 1: Digital innovation indicators in the performance perspectives



Appendix 1: Word frequency query for the LIH activity

Word	Length	Number	Weighted percentage (%)
energy	9	72	1.18
objectives	9	68	1.12
housing	8	55	0.90
built	7	53	0.87
days	5	48	0.79
customers	7	48	0.79
government	6	46	0.76
satisfied	9	42	0.69
satisfaction	12	34	0.56
standards	6	29	0.48
tenants	10	28	0.46
training	9	23	0.38
result	8	23	0.38
employees	8	21	0.35
deadline	5	19	0.31
development	11	19	0.31
service	7	18	0.30
internal	8	17	0.28
performance	11	17	0.28
process	9	17	0.28
management	7	16	0.26
measure	7	16	0.26

Appendix 2: Word frequency query for the environmental perspective

Word	Number	Weighted percentage (%)
green	28	6.03
eco-construction	14	3.02
energetic	13	2.80
HEQ	12	2.59
CSR	12	2.59
number	11	2.37
energy	10	2.16
environment	8	1.72
ecological	8	1.72
certification	7	1.51
certified	7	1.51
environmental	7	1.51
waste	7	1.51
rate	7	1.51
recycling	6	1.29
reuse	6	1.29
LEH	5	1.08
paper	5	1.08
renovated	5	1.08
budget	4	0.86

Appendix 3: Word frequency query for the lease management activity

Word	Length	Number	Weighted percentage (%)
objective	8	143	1.38
customers	7	121	1.17
mandates	7	65	0.63
training	9	61	0.59
satisfaction	12	60	0.58
result	8	55	0.53
time	5	55	0.53
achieved	7	47	0.45
employees	8	46	0.44
internal	7	44	0.42
work	7	39	0.38
hours	6	38	0.37
built	7	37	0.36
deadlines	6	37	0.36
new	8	36	0.35
lease	8	33	0.32
tenants	10	30	0.29
income	7	29	0.28
cost	4	28	0.27
lots	4	28	0.27

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3 **Appendix 4: Word frequency query for the real estate transaction activity**
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Word	Length	Number	Weighted percentage (%)
customers	7	259	2.02
sale	5	109	0.85
employees	8	88	0.69
objective	8	79	0.62
training	9	78	0.61
satisfaction	12	73	0.57
employees	14	66	0.51
result	8	56	0.44
time	5	56	0.44
mandates	7	54	0.42
process	9	42	0.33
service	7	42	0.33
income	7	41	0.32
deadline	5	40	0.31
built	7	40	0.31
prospects	9	39	0.30
internal	7	37	0.29
new	8	37	0.29
achieved	7	36	0.28
cost	4	36	0.28

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Appendix 5: Word frequency query for the property management activity

Word	Length	Number	Weighted percentage (%)
customers	7	98	1.54
employees	8	54	0.85
property manager	6	51	0.80
co-ownerships	12	49	0.77
objective	8	46	0.72
income	7	45	0.71
result	8	35	0.55
training	9	32	0.50
manager	12	30	0.47
service	7	29	0.46
time	5	29	0.46
co-owners	15	27	0.43
satisfaction	12	27	0.43
deadline	5	26	0.41
internal	7	26	0.41
mandates	7	25	0.39
new	8	24	0.38
contract	7	23	0.36
built	7	21	0.33
agencies	7	21	0.33

Appendix 6: Word frequency query for the digital innovation perspective

Word	Length	Number	Weighted percentage (%)
customer	6	4	3.17
assets	5	3	2.38
[the app]	13	3	2.38
app	11	2	1.59
creation	8	2	1.59
mobile	6	2	1.59
site	4	2	1.59
system	7	2	1.59
visit	7	2	1.59
alert	6	1	0.79
call	5	1	0.79
big	3	1	0.79
communicate	11	1	0.79
competition	11	1	0.79
connected	10	1	0.79
connection	9	1	0.79
co-owner	14	1	0.79
criteria	8	1	0.79
data	4	1	0.79
digital	7	1	0.79
digitization	14	1	0.79
digital	8	1	0.79
documents	9	1	0.79
data	7	1	0.79
during	6	1	0.79
demarcate	9	1	0.79
dematerialization	17	1	0.79
expenses	8	1	0.79
emailing	8	1	0.79
extranet	8	1	0.79
footfall	13	1	0.79
[habestetvous]	12	1	0.79
information	12	1	0.79
technology			
inform	8	1	0.79
innovation	10	1	0.79
Internet	8	1	0.79

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3	investment	14	1	0.79
4	extranet	10	1	0.79
5	learning	8	1	0.79
6	software	9	1	0.79
7	machine	7	1	0.79
8	control	8	1	0.79
9	media	5	1	0.79
10	newsletter	10	1	0.79
11	new	8	1	0.79
12	NPS	3	1	0.79
13	optimization	12	1	0.79
14	tools	6	1	0.79
15	partners	11	1	0.79
16	platform	10	1	0.79
17	process	9	1	0.79
18	developer	8	1	0.79
19	pre-defined	10	1	0.79
20	loan	4	1	0.79
21	appointment	3	1	0.79
22	recommended	11	1	0.79
23	input	7	1	0.79
24	return	6	1	0.79
25	networks	7	1	0.79
26	employees	8	1	0.79
27	score	5	1	0.79
28	SMO	3	1	0.79
29	social	6	1	0.79
30	socials	7	1	0.79
31	secured	8	1	0.79
32	tasks	6	1	0.79
33	technical	10	1	0.79
34	trends	9	1	0.79
35	visible	8	1	0.79
36	volumetry	10	1	0.79
37	web	3	1	0.79
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