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Integrated Reporting

Implementing a holistic Performance Measurement
System to assist decision makers in the evaluation
of corporate impacts

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Abstract

Purpose – The purpose of this paper is to study the possible influence that Integrated Reporting may have on management control systems and whether the former may serve as a driver of change for the latter in today's knowledge driven and increasingly dynamic economy.

Originality/value – Responding to the need to study the internal implications that integrated reporting may deliver, this paper adds value to the previous research because it serves as a connection between theoretical guidelines, providing a practical instrument for management to apply to their unique business models and have a better awareness of the impacts of their decisions.

Findings – The integration of sustainability and the shift to an integrated way of thinking are dynamic processes that require organisations to shape their culture and structure accordingly. The following research outlines the phases of this dynamic process and provides insightful solutions for management to develop a holistic performance measurement system in order to pursue a sustainable competitive advantage in the long term. Furthermore, additional tools for decision makers will be portrayed and discussed in order to facilitate the alignment of business activities to key objectives and allocate resources efficiently. A guideline will be provided to better interpret and understand the interconnections of a company's productive factors and how to balance the trade-offs between capitals. Therefore, a theoretical model will be built in order to help companies take all the necessary measures to continuously assess corporate impacts on a holistic level, hence embracing change to shape the organisational culture, empower people and integrate sustainability into the corporate strategy effectively.

Research limitations/implications – Low empirical evidence and absence of a longitudinal analysis due to the limited sample of firms that currently implement integrated reporting. Although the theoretical grounds have been verified by previous literature, more research and empirical studies need to be conducted in order to consolidate and verify the findings of the current study

Chapter 1

The contents and evolution of Integrated Reporting

Introducing Integrated Reporting

Following a meeting that brought together international representatives from the private and public sector in 2009 to discuss the necessary actions to promote and realise a sustainable economy worldwide, it was agreed that it was to be an internationally recognised body to take the responsibility to develop a framework for an appropriate reporting system. This mentioned reporting system would help businesses increase their awareness, and their array of stakeholders to better understand the company's long term commitments to achieve its mission in a sustainable way. Integrated reporting was therefore conceived as a means to help do so, bringing together financial and non-financial information, with the objective to increase transparency on the company's performance and guide the reader through the organisation's business model, as well as the impacts that it has on society (Eccles & Krzus, 2010).

At the heart of the reporting system is the recognition of the organisation's role in society, therefore of its ongoing accountability towards all its stakeholders (Krzus, 2011). Throughout the following dissertation, we will be focusing on the benefits that Integrated Reporting (otherwise abbreviated with <IR>) can deliver to the management. In particular, can <IR> function as a driver of change for management control systems? To answer this, we must ask ourselves if it can help the management have a better awareness of the inputs and outputs that are delivering value. Furthermore, can we better assess and measure the impacts that the organisation has on the various forms of capitals that the firm influences or is affected by? Another important question to be asked is how the management can reach the desired alignment of capital allocation and corporate behaviour to its ultimate and intrinsic goals of financial stability and long term sustainable development.

Contents of <IR>

Coherently with the report's function to communicate the firm's value creation narrative, the IIRC has prepared a Consultation Draft for reporters to

understand what should be presented and how. In the Consultation Draft we therefore find the fundamental concepts, guiding principles, content elements and other useful advice for the preparation and presentation phases. Figure 1 below depicts the Guiding Principles and Content Elements that should be contained in the report. The elements that make up the <IR> should be communicated concisely, giving the reader the tools in order to capture the value creating narrative of the firm as well as the strategic initiatives that are in the organisational pipeline that will lead the company to the achievement of its mission. The principles that we find can be applied and adapted to both the private sector and public sector, to for-profit and non-for-profit companies (IIRC, 2013).

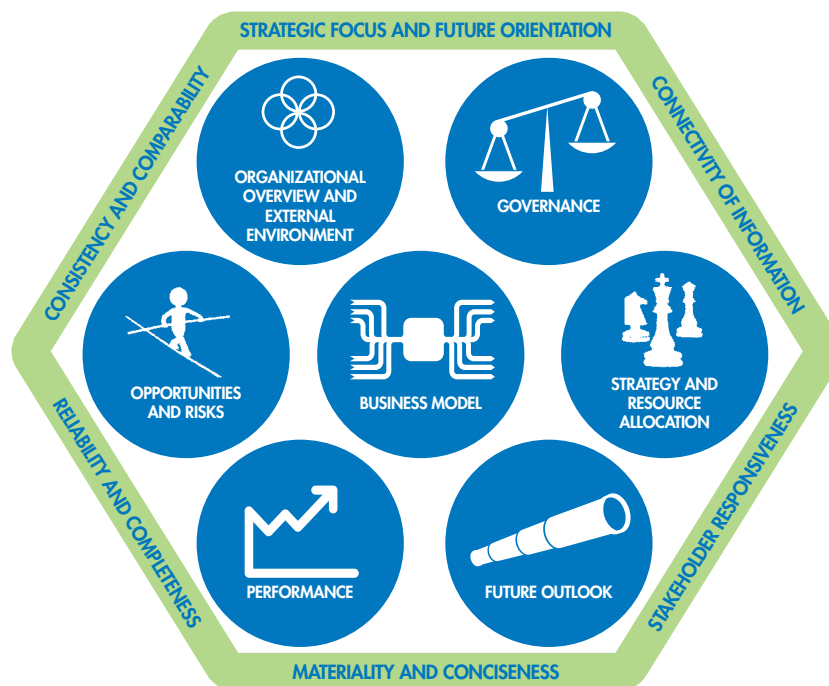


Figure 1: Guiding Principles and Content Elements. Source – Consultation Draft of the International IR Framework, 2013

Objective of <IR>

In deciding how to present the content, we should keep the objectives of the <IR> in mind, hence to communicate the ongoing value creation function

transparently. First of all, the reader should be able to have a better understanding of the value drivers that are materially related to the firm's short, medium and long term objectives. Secondly, we want to direct the attention to the financial capital allocation in order to have a better idea of how the firm is deploying its resources in order to achieve the desired outcomes. Moreover, <IR> should also shed light on who is accountable for the capitals that the firm influences or is affected by, hence the financial, manufactured, intellectual, human, social and relationship, and natural capital (IIRC, 2013). The aim is to help the reader understand the interrelations that exist among the forms of capital and the actors that are held responsible for their transformation from inputs to outcomes. Finally, the report should serve as an instrument to promote and develop integrated thinking in order to boost internal cooperation as well as the connectivity across the organisational decision makers.

When preparing the Integrated Report, the authors must also have a clear idea of who the report is directed to. By all means, <IR> is intended for all the firm's stakeholders, and should direct attention to their diverse interests in the company. It is in the organisation's interest to demonstrate the societal benefits of the outcomes that it has achieved and that it will continue to deliver in the future, therefore speaking to society at large. Nevertheless, the primary readers will inevitably be the providers of financial capital on one hand and the management on the other. The former can better interpret the organisational strategy by relying on qualitative and quantitative data, with the opportunity to build more confidence in the long term viability of the firm's business model. Management instead can retrieve valuable information on factors that are driving value, serving as a connection point between performance evaluation and target setting for the future strategy of the organisation.

As elucidated in the contents of the Consultation Draft, <IR> should also address the concerns over risks and opportunities in order to provide assurance and focus the attention to the actions that should be undertaken in order to prevent, mitigate or accept the risks that have been identified, taking advantage

of the opportunities that the firm is presented with. The aim is to increase awareness over the possible events that the external environment may reserve for the organisation. By assessing risks and opportunities, we are able to take more informed decisions based on objective and quantified data.

Main sections of <IR>	Description
Organisational overview and external environment	An assessment of what the firm delivers in terms of outputs and desired outcomes, as well as the consideration of the external environment by which it is affected
Governance	The way the firm's governing structure is organised in order to ensure the ongoing creation of value, including a revision of risk assessment and management systems. How the firm's value system and cultural style can affect the impacts on the forms of capitals
Opportunities and risks	The identification of opportunities and risks that could affect the way a company creates value. Not only will the organisation have to identify the sources of opportunities and risks, but establish the magnitude of each, the probability and action plans in order to deal with them, coherently with the risk acceptance promoted by management
Strategy and resource allocation	The mission and vision of the firm that portray its ultimate objectives, as well as the description of the most efficient and effective way to do so, coherently with its business model
Business Model	

	Understanding the structural components and unique elements that allow the company to deliver value, differentiating itself from other firms
Performance	An outlay of the organisation's performance measurement systems. In particular, we want to understand the impacts of the firm and the various form of capital it affects
Future Outlook	How the organisation is going to be affected by the external environment in the future and how this can affect its strategic objectives and business model.

Table 1 – Covering the main sections of <IR>

Figure 2 contains a graphical representation of how a firm operates, and summarises the previous elements we have identified. From the various forms of capitals that serve as inputs, the firm transforms these inputs according to its business model and desired outcomes, that will again once more affect the six forms of capitals: financial, manufactured, intellectual, human, social and relationship, natural.

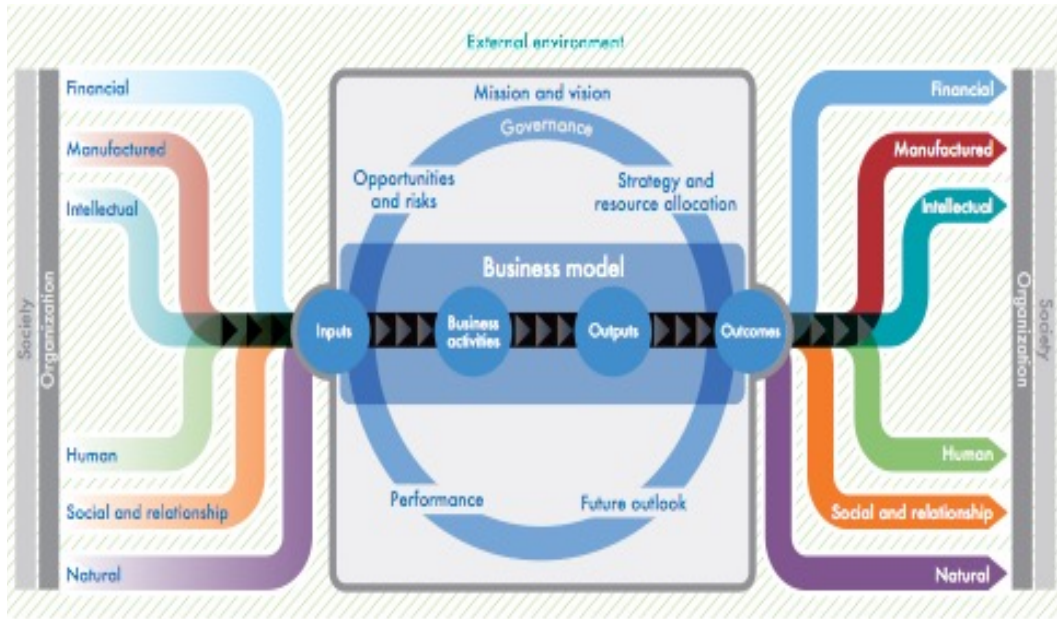


Figure 2 – A visual summary of the organisation's value creation process that should be further analysed in the Integrated Report. Source: Consultation Draft of the International <IR> Framework

As defined in the Consultation Draft of the IIRC, capitals are 'stocks of value or assets that can be added to, or diminished, by the activities of a business'. As depicted in Figure 2, the capitals are six, but every organisation should represent what they believe is materially relevant to them. For each form of capital, organisations should seek to find Key Performance Indicators that are able to reflect the desired outcomes and that are in line with the strategic orientation of the firm. A complete report should comprehend the strategic goals, followed by the tools that the company disposes of in order to reach them, the risks and opportunities it can suffer or take advantage of and, finally, measures that reflect the results achieved. Thus, from the mission and vision of an organisation we should be able to translate them into quantifiable results that we can then assess at the end of each period in order to give valuable feedback to management and eventually correct any undesired deviations from the initial plan.

The true challenge is understanding the interconnections and understanding how to balance the trade-offs that exist among capitals. Best

practices in this field, such as the interactive integrated report put into place by the German software firm SAP, have portrayed the linkages that exist between non-financial and financial performance indicators. This allows us to fully appreciate what levers the company disposes of, the effects of investments in certain areas of the firm as well as what it should prioritise in order to align corporate social responsibility with concrete financial results. For example, it shows how every percentage point gained in a synthetic indicator that they call 'Business Health Culture Index' can influence employee engagement, customer loyalty, increase revenues and, finally, on the company's operating profit that can increase by 65-70 million euros. This example is one of the most innovative in this field and is a result of a deep understanding of the company's business model and value drivers, resulting in a facilitated decision-making process for management.

Potential and reported benefits of Integrated reporting

On top of the benefits that can be extended to relationships with external stakeholders, we will be discussing about the main benefits that can be brought in relation to management control systems. We want to study the impacts that Integrated Reporting may have on the several phases of management control's main phases from planning, to the ongoing control and, finally, in the evaluation of performance. According to the IIRC, the internal benefits that <IR> has brought to the firms that have adopted it so far are listed below:

- Understanding value creation processes
- Increasing the quality of what is measured
- Efficiency of measurement systems in retrieving information
- Increasing the internal connectivity and collaboration among divisions
- Motivating employees to reach the desired objectives

Understanding value creation

When managing different inputs, we want to have a clearer idea of the causal relationships that exist between the factors we manage in time. By understanding the effects of the factors we dispose of, we can formulate our production function more accurately. For this purpose, by integrating the non-financial to financial indicators we can reach a broader understanding of how and where value is generated. Black Sun (2014) reports that an increasing amount of companies rely on non-quantified information, in line with the soft systems approach that we discussed about previously.

Understanding the way value is created leads to adaptations and structural changes regarding the strategy of the firm as well as the way resources are allocated. Since today's competitive context is increasingly complex and dynamic, it is in the firm's interest to take precautionary measures in order to increase its responsiveness to external shocks and take concrete actions. The level of responsiveness will inevitably have an impact on the firm's long term viability (Krzus, 2011).

Increasing the quality of what is measured

The quality of decision making can be increased by focusing on what is materially relevant for decision makers, allowing management to establish KPIs that are directly linked to the creation of value, integrating the financial information with non-financials. This introduces new challenges in the measurement of information that was not previously quantified because considered irrelevant. This might be the case if we embrace an approach that promotes short term value maximisation over a more long term outlook. In fact, for the medium and long term we risk to underestimate the impacts of our actions, not investing and allocating resources efficiently and in line with the organisational strategy.

Especially in the initial phases where the management establishes the contents and structure of <IR>, the firms that have adopted this reporting system

have noticed the inclusion of performance indicators related to intangibles and non-financial capital in management systems (Black Sun, 2014). The impacts on the various forms of capitals that the firm affects can be laid out and management can measure the factors that directly affect the impacts that the firm has on the various forms of capitals. A qualitative measurement system must therefore possess Key Performance Indicators that are characterised by materiality and relevance, as well as the ability to capture long term value and interconnectivity. These features are key to define a holistic and well-balanced performance measurement system that the company can use in order to set its objectives coherently and monitor the outcomes on an ongoing basis. KPIs are not only used to assess performance but also as primary feedback for the owners of certain organisational processes.

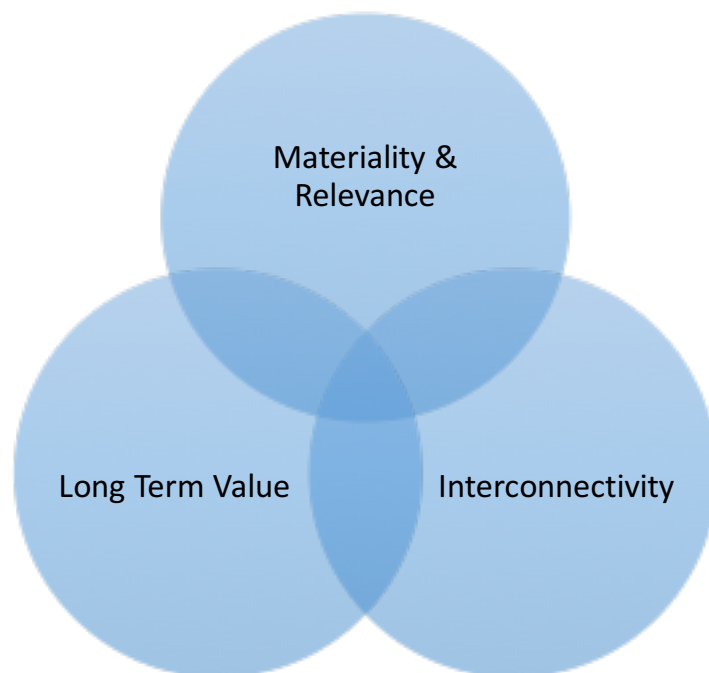


Figure 3 - Main features of comprehensive KPIs in performance measurement systems

The immediate consequence of constructing an Integrated Report may translate in an increase in reporting costs. The investment in new, more comprehensive measurement systems is related to the costs needed to retrieve

the information needed and integrate it. Firms may need to hire experts that can help the current accounting system to keep non-financial information into consideration, tracing and quantifying the outcomes.

However, the desired benefits may be visible in the medium term, when the strategy that has been identified thanks to a more integrated view of the firm's business model and long term competitive advantage is outlined more clearly. Management can therefore have a clearer idea of where the firm is, what risks and opportunities it may face and what to leverage in order to go in the desired direction.

Retrieving Information and making decisions

Not only can we increase the quality of what is measured, but the detection of value drivers as they move to this innovative reporting system is also facilitated. The way organisations measure and manage performance is a consequence of a more comprehensive understanding of value creation processes. According to the report published by Black Sun (2014), 80% of organisations that have published a form of Integrated Reporting expect to have a positive consequence on decision making in the near future.

Internal connectivity and collaboration

More collaboration was noticed between the board and management, giving the opportunity to exchange more qualitative information regularly. On top of that, more collaboration and informal communication between internal functions and divisions was also noted, with the benefit of breaking down the 'silos effect' and therefore better aligning corporate strategy with individual and team efforts. This aspect is crucial if collaboration among employees and departments is preferable compared to internal competition.

To the question of which teams have collaborated the most in the preparation of the Integrated Report, a visual summary of the results can be appreciated in Figure 3. We can notice the most active participation in the

Finance and Sustainability departments, followed by Corporate Communications and Marketing, and Investor Relations to follow. Investors are demanding more qualitative reports in order to appreciate the value of firms not only by judging the financial results of a company, but by embracing a more holistic and long term approach. Consequently, the role of Investor Relators will become increasingly important in the preparation phase of <IR>, as they are the connection point between the firm and primary external stakeholders. Little or no participation has been noted in the Risk Management, Human Resources and Internal Auditing functions. More efforts need to be undergone in order to involve these functions, as they can reveal important information for the elaboration of <IR>.

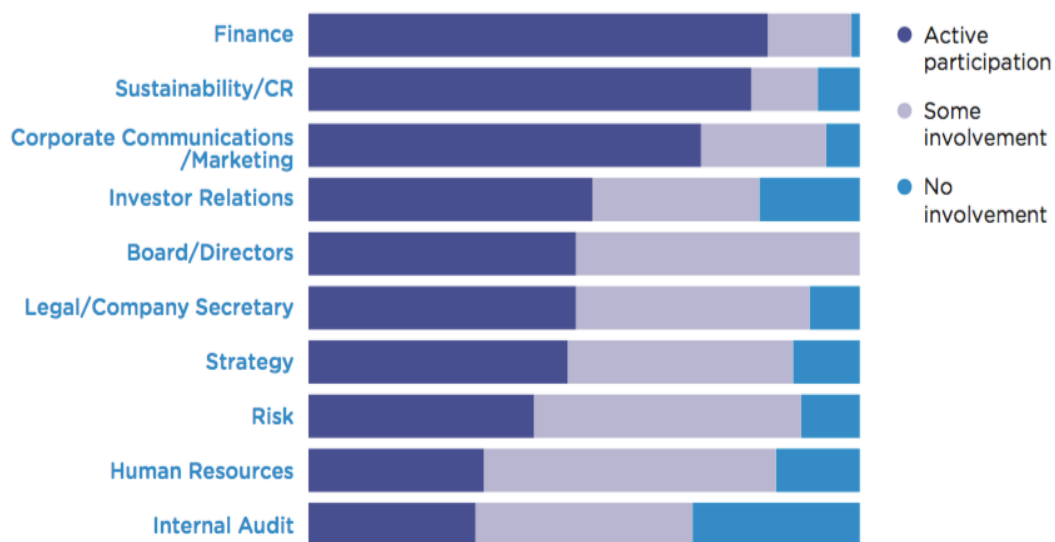


Figure 4 – Source: Black Sun Plc., (2014). *Realizing the benefits: The impact of Integrated Reporting*. p.21

Motivating performance

The challenge that managers face is finding a way to link the desired performance indicators to remuneration systems in order to effectively align the desired performance to outcomes at the divisional and individual level. We can use this powerful instrument to make corporate strategy better understood across all the levels of an organisation. A better understanding of the value

drivers and a direct collaboration in the preparation phase can lead to more motivated and productive employees, that can have a better understanding of where their efforts are directed and how they are delivering value to the firm. Empowering employees is at the heart of Integrated Reporting, that recognises the importance of Human Capital in order to outrun competition and achieve a long term competitive advantage.

Potential Impacts on Management Accounting

In the Consultation Draft of the IIRC, on top of communicating the contents that <IR> should have and what it's intended use is, it also highlights how "[integrated reporting] should enhance accountability and stewardship with respect to the broad base of capitals [...] and promote a deeper understanding of the interdependencies between them". Not only is it in the interest of primary stakeholders, investors and other key stakeholders to understand how value drivers are connected and what their relationships are, but management too can benefit from this valuable information and take more informed and conscious decisions, understanding the causal linkages more clearly.

For management accountants <IR> can provide valuable insights on the strategy and sustainable value creation of the organisation. Integrated Reporting can in fact enrich the quality of managerial decision making by shedding light on the several impacts that the organisation has on the capitals that it affects. Having a more profound knowledge of the business model to start with can enable management to acknowledge what the key value drivers are, and identify the potentials for growth in the medium and long term.

One of the key challenges for management is to embed sustainability into the strategy of the firm and later express the desired outcomes as a quantifiable and measurable result to be communicated at all levels of the firm, serving as objectives in the short, medium and long term. The principles of a complete sustainability disclosure refer to its various dimensions, hence economic, social and environmental impacts of the firm.

Materiality

Undertaking coherent decisions involves having the right set of information at disposal. In line with the objective of <IR> to outline the value drivers of an organisation, management should keep track of and report the key factors that help explain the value creation process, and are therefore materially relevant (IIRC, 2015). Every organisation will have a unique business model, and therefore there is no pre-determined set of indicators to be reported. The weights of organisational outcome will depend on its strategic orientation, reason why most reporters prefer to concentrate on a smaller set of strategically relevant indicators (Stubbs & Higgins, 2014) rather than a broad set of indicators that do not fulfil the purpose and can be misleading. Although this inevitably leads to the decreased comparability of firm's performance level, it does on the other hand provide an instrument better suited in order for its composers to incorporate the specific determinants of a firm's value creation and transmit this information on to its readers in a fluid and concise manner. As opposed to the GRI guidelines concerning the contents of sustainability reporting where a formalised set of rules have to be carried out, the IIRC does not establish a strict set of rules to be followed, rather, broader guidelines in order to deliver a meaningful report.

The definition of materiality states the following: "a matter is material if it is of such relevance and importance that it could substantively influence the assessments of providers of financial capital with regard to the organization's ability to create value over the short, medium and long term". Figure 5 below shows a chart that is normally used in order to assess what is materially relevant to the firm. The aim is to represent what the organisation prioritises on a strategic level. For this purpose, we define materiality as a function of two variables: magnitude of effect and likelihood of occurrence. Establishing what is material involves fixing a threshold for the two variables mentioned, under which the organisation is not in the interest to keep monitored. First because monitoring involves resources to be used, therefore costs for the organisation.

Secondly because too many indicators of performance may cause confusion or misalignment with key strategic goals. Thresholds therefore establish boundaries for reporting and must be decided after an assessment of the stakeholder’s expectations (IIRC, 2015). It’s important to keep in mind that external expectations are dynamic and must therefore be constantly monitored. As a consequence, so must thresholds and reporting boundaries be flexible in time in order to adapt to variations.

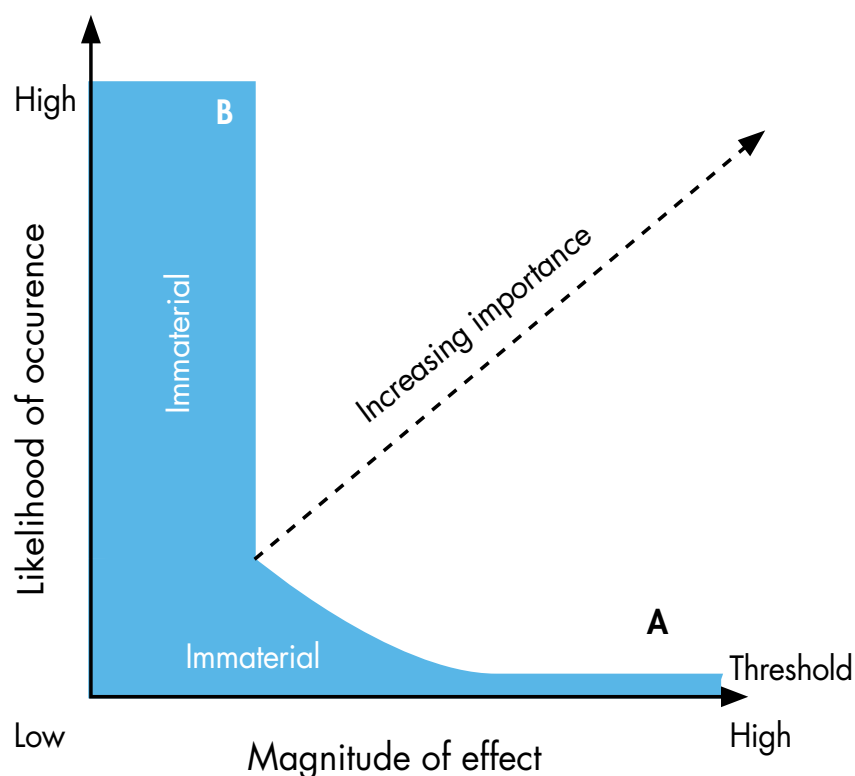


Figure 5 - Assessing what is materially relevant. Source: IIRC Consultation Draft (2013)

It has been proven that a firm’s ability to secure funding at a lower cost of capital is directly and positively connected to its ability to consistently provide qualitative information regarding the composition of its intellectual assets as well as the strategy that it intends to pursue not only in the short term but also in the long one. Consistency and comparability are therefore two crucial aspects that must be taken into consideration in order to give investors the necessary tools to take more informed decisions.

Nonetheless, it is also important to notice that the same information that is useful for external investors should also be addressed as high priority also internally by the management of the company in order to build a solid ground to the pursuit of a sustainable competitive advantage. Allocating and using resources in the most efficient way possible and making sure that the multiple interests of stakeholders are taken into consideration are just two of the reasons why management should report intellectual capital. Management also has the opportunity to highlight the degree to which it is innovating continuously and the set of actions that can attract and retain skilful employees in time. Furthermore, transparent and consistent information can also have an important role in the reduction of operational risks, lowering the level of informational asymmetry that can lead to unrealistic valuations or biases during the decision making process (Dumay, 2016).

In a study conducted by Mio & Fasan (2014), findings show that the industry to which a company belongs to can play an important role in the way materiality is determined and reported. This is mainly due to the fact that the narration of value is in fact different according to the industry to which the company belongs to. On top of these findings, also two other factors were found to negatively affect the materiality disclosure, and that is the board size and diversity. In particular size and diversity have an impact when it comes to establishing the firm-specific criteria of materiality. It is important to notice that the ability to effectively manage the comparability and credibility of the report is done through a proper materiality assessment (Fasan & Mio, 2016), reason why this process is key to delivering the right set of information to its readers.

Throughout the following chapters the aim will therefore be to better comprehend how the development of Integrated Reporting can support management in the challenging operation of integrating economic, social and environmental issues into the organisational business model and strategy.

Chapter 2

The path to integrating sustainability

Value-relevant information

<IR> attempts to outline a true and fair view of the value creation process and outcomes of the organisation, therefore setting the grounds for sustainability accounting to thrive (van Bommel, 2014). However, we cannot define value in a standard, predefined way. There are two factors that play a decisive role in the evaluation process: the reliability and relevancy of the information we take into consideration. In defining what is relevant information for the evaluation of a company we can include all the data considered by investors in order to understand what affects the stock price of the firm, hence the underlying economics of the investment (Wyatt, 2008). In fact, Investors often use statistical analysis such as regressions in order to identify patterns of positive associations between the items used for the evaluation and the market value of equity, stock returns and future earnings.

The problem, however, lies in the dimension of intangibles that make up the firm's assets, introducing the problem of *reliability* due to the uncertainty of the future benefits that they can deliver to the firm. Reliability refers to the capability of extracting information related to the mentioned future benefits that an asset is able to create in time. First, measures of reliability must be able to reflect the value creation process and, secondly, it must be able to reflect the underlying economic substance of the previously mentioned process (Wyatt, 2008). Distortions in the evaluation process may emerge because we erroneously make the conclusion that the information set that we dispose of in order to make the statistical regression is the *only* cause related to value creation. Although investors may utilise a synthetic indicator such as earnings to make their evaluations, we must keep in mind that earnings alone are not useful to obtain a full understanding of what lead to the creation of value, hence the value drivers of the firm.

Dumay (2016) argues that what is value-relevant does not necessarily have to be related to the monetary dimension. Value-relevant information, on top of money-related information, must also include the utility delivered by the

organisation's products/services as well as the social impacts and the set of sustainability values that shape its culture and strategic orientation. The author also highlights how value is not enduring in time, but can vanish quickly if not managed well, which is especially true in today's dynamic and rapidly evolving economy.

Seeking legitimacy among stakeholders

Stakeholder theory is the active consideration of a broader set of stakeholder's interests within corporate strategy and accountability. The need therefore not only to consider the financial pursuits of shareholders but to include a variety of different stakeholder expectations into consideration when taking decisions, with the aim to deliver value to all the categories identified. In this sense, the process of determining what is materially relevant to stakeholders can prove to be a powerful stakeholder engagement tool (Fasan & Mio, 2016). However, it is also utopistic to think of an organisation that can effectively maximise value for all the different categories of stakeholders (capstone of shareholder value theory that puts financial success at the core of corporate missions). Accounting for social impacts requires a deep understanding of the relevant stakeholders and their relative interests in the firm. When talking about social accounting and stakeholder theory we have to distinguish two different perspectives:

- Normative theory: under this perspective we are looking at the ethical and social obligations related to the disclosure of the impacts that the firm has on society. This theory sheds light on the principles that give direction to all the organisational actors and tools to understand the orientation of the firm (Durden, 2008). The normative theory highlights the purpose of organisations to not only pursue financial interests for the benefit of shareholders, but to balance the diverse array of interests.

- Legitimacy theory: we take into consideration the fact that there is an unwritten social contract between the organisation and society, hence the firm will have to consider its impacts on society in order to legitimise its operations and outcomes. It is on this basis that the management of the organisation will have to organise resources and activities in order to conduct business accordingly.

Consequently, management control systems will have to be designed with this in mind in order to align corporate behaviour with stakeholder's expectations (Durden, 2008; Mason & Simmons, 2013). Van Bommel (2014) addresses the attention to the fact that there is in fact no unique definition of what is right or rational, but there are several orders of worth, hence of legitimate actions that organisation can pursue in order to be perceived as just by its stakeholders. These orders of worth can be of four types: industrial, market, civic and green. Industrial worth refers to the efficiency of the organisation, the long term commitment to growth and the degree of expertise. Market worth focuses more on the short term maximisation of value, therefore variables such as prices and economic value that define a competitive market (van Bommel, 2014). It is in the interest of the firm, and of all stakeholders, to balance the industrial and market orders of worth, in order to pursue short term and long term competitive advantages. This translates in the selection of KPIs that connect long term value drivers to tangible financial results. The third dimension refers to the civic order of worth, emphasising the need to prioritise actions that respond to the concept of common good, that keeps all the actors affected by a firm's actions into mind. For this purpose, integrated reporting promotes a more transparent approach to corporate disclosures, with the aim to gain trust and support from the community in which it operates. Finally, the green order of worth reflects the ecological and natural impacts of the firm. Nonetheless, van Bommel (2014) expresses his critiques in relation to the weak concept of 'common interest' and 'shared compromise' that integrated reporting

actually serves, stating his concerns to whether this practice can actually legitimise actions that serve the interests of a limited group of people rather than common good. Further concerns and suggestions for improvements will be further analysed in the oncoming sections.

Sustainability accounting is addressed to both external and internal users. The former expect to retrieve valuable information on the triple bottom line performance of the organisation and whether it is committed to pursue a sustainable development also in the future. Integrated reporting serves this purpose, including both future outlooks and quantified sustainability performance indicators. Reporting sustainability externally is viewed by some organisations as a branding technique, hence a means to improve brand recognition and create positive associations to green development. This proves to be inconsistent if the actions taken differ substantially from what is reported. The challenge is for internal reporters to design the performance measurement system, for it to be holistic and the interconnections between financial and non-financial levers to be fully understood (Lamberton, 2005). Another difficult step is to precisely measure social impacts, and therefore the triple bottom line remains conceptualised rather than a tangible measurement component (Durden, 2008).

Therefore, the first step for management is to assess who its stakeholders are and the magnitude of their importance. In this way it can better consider the weight of external expectations into mind, working backwards in order to develop a consistent and coherent sustainable strategy. Not having clearly defined sustainability goals will negatively impact the identification of the suitable KPIs, thus having an even bigger impact in not directing people's efforts in the right direction, which is a key function of management control systems. Management does not only have formal means of control at its disposal, but must also balance these by setting the grounds for informal systems to thrive in the organisation. Under the legitimacy perspective, an organisation's actions can be defined as such if they attain to socially accepted norms, values, beliefs and

definitions (van Bommel, 2014). Informal mechanisms of control can complement formal ones by shaping the company's value system, orienting people's mindset in the same direction, making them more sensitive to sustainability issues.

Figure 6 below effectively summarises the previously discussed steps in order to incorporate corporate social responsibility into MCSs.

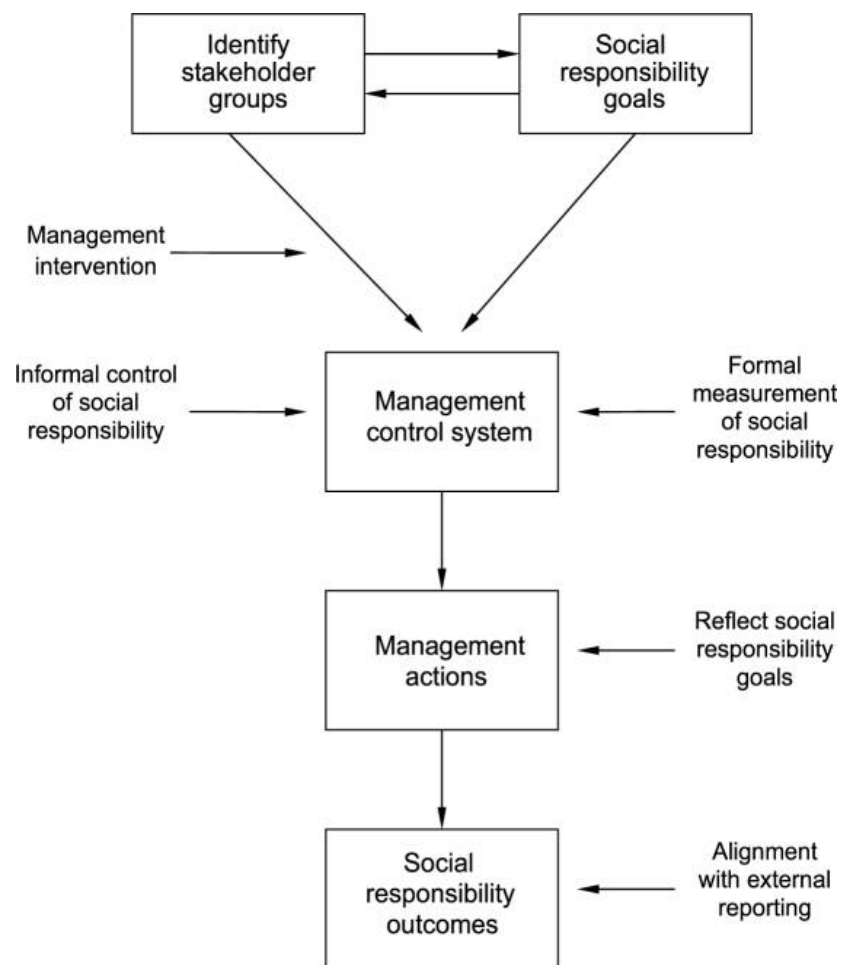


Figure 6. Source: Durden, C. (2008). "Towards a socially responsible management control system". *Accounting, Auditing & Accountability Journal*, 21(5), 671-694

The importance of intellectual capital

We define intangible assets as those that incorporate a certain degree of (uncertain) future benefits, that are neither physical or financial by nature, and

that can be controlled by whoever detains them (Zambon, 2008). We can further differentiate hard forms of intangibles from soft ones. The former can be associated to a corresponding monetary value and can therefore be traded on the market (i.e. patents, brands etc.). The latter, instead, are forms of intangibles that cannot be traded but contribute to deliver future benefits (i.e. group synergies, tacit know-how, organisational processes etc.).

In the past two decades we have seen a noticeable shift with regards to the key factors of production. In a knowledge driven economy labour, land and capital are no longer key assets that allow organisations to achieve a competitive advantage. We can now observe that technology, capital and knowledge have taken the rise, representing the key assets that support the development of organisations' core competencies. This affects the way resources are distributed internally, leading managers to dedicate a substantial amount of time and capital to invest in R&D, therefore innovation, brand management, employee training and other investments that can be useful for employees' engagement and know-how to surge. The aim is to set the ground for know-how to be shared and manageable, passing from tacit to explicit.

This trend has been noticed by academics, managers and policy-makers, who have called for change to occur in company disclosures. Financial information is no longer enough to evaluate performance, since intangible assets represent key value drivers of sustainable competitive advantage over time. An excessive orientation on boosting the company's financials may not be profitable in the long term. Thus, promoting short-term value maximisation may result in organisations losing sight of the drivers of long term success factors. This in turn, may lead to inconsistent decision-making. Although it's not the only function and scope of <IR>, we can however achieve a better understanding of the elements that have contributed to the achievement of the information reported in the financial statements and assess their coherence to the company's strategic orientation.

What is affected by the previously mentioned issues is the way value is determined, since the underlying benefits that intangible assets can deliver are uncertain by nature. This translates into the difficulty to assess both the outcomes and the time frame under which we can expect a return in terms of tangible benefits. Uncertainty also means that intangibles may incorporate liabilities, reason why risk assessment has become increasingly important in order to identify sources, magnitude and plans of action in order to mitigate negative impacts in the long run. Risk management has become for many an important strategic dimension (Frigo & Anderson, 2011), and is also mentioned in the Consultation Draft of the IIRC, informing reporters about the need to set up effective monitoring systems in order to detect external risks and pursue the level of organisational flexibility in order to be responsive to external changes.

As we can see in Figure 7 below, the market value of the firm can be broken down into its causal factors. The main determinants can therefore be grouped into 3 groups: financial, physical and intellectual capital. The latter can be defined as such from the moment that intangibles are durably and effectively internalised or appropriated by an organisation (Zambon, 2008). Alternatively, Dumay (2016) defined intellectual capital as ‘the sum of everything everybody knows that gives [organisations] a competitive edge [...] made up of intellectual material, knowledge, experience, intellectual property and information that can contribute to the creation of value’.

If we continue to break up intellectual capital, we see that it is composed of human capital, relational and structural capital. Human capital is formed by putting together all the skills and know-how that employees are able to contribute to creating value for the organisation, from hard forms of skills to softer ones (Starovic *et al.*, 2003). Relational capital refers to all the assets that are developed as a direct consequence of the company’s external relationships. The third element that contributes to define intellectual capital is the structural component, that keeps into account all those organisational factors such as processes, intellectual property and organisational culture that shape the firm’s

identity (Marr, 2008). The presence of each component will differ from company to company, contributing and interacting with each other in a unique way. On one hand this is a value add to reporting because we are able to see how a company works by investigating how its capitals are related to each other. In fact, if we consider the elements of intellectual capital as isolated from the others, they do not provide useful information. They add value from a reader's perspective from the moment they are connected as a system (Starovic *et al.*, 2003). On the other hand though, it poses some problems related to the comparability of corporate reports.

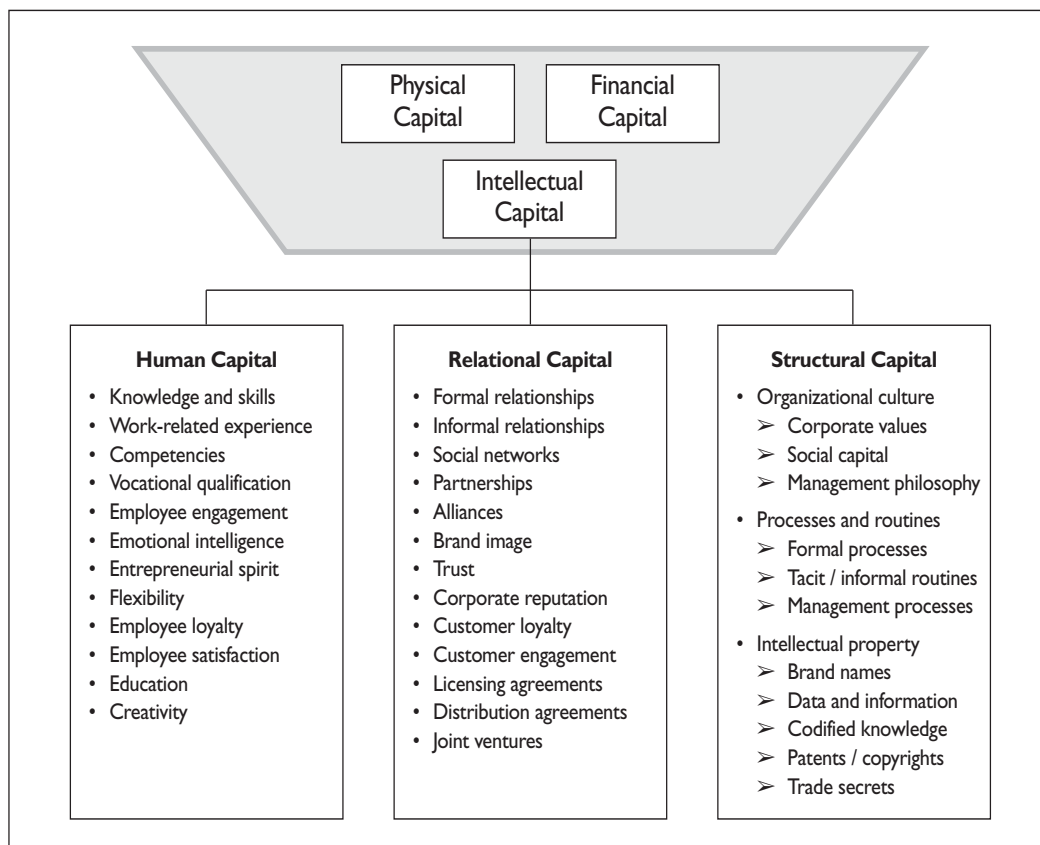


Figure 7 - Components of intellectual capital. Source: Marr, B. (2008). *Impacting Future Value: How to Manage your Intellectual Capital*

From Tacit to Explicit Knowledge

It is management's role to understand how the different forms of capital contribute to the creation and development of knowledge in an organisation. In other words, obtain a deeper understanding into the production function that

explains how inputs are transformed into outputs. The role of management in these terms has changed over time, as the role of knowledge has become increasingly important. Thus, we have witnessed a shift from knowledge detained by individuals, sources of tacit know-how, to articulated networks of explicit knowledge resources (Mouritsen & Larsen, 2005) where individuals represent nodes of the system. This impacts the way management control systems are, or should be, designed in order to exploit key resources that contribute to the formation of key competencies. In line with a resource-based view of the firm, Sánchez *et al.* (2000) also recognise that a fundamental step in managing knowledge requires the capability to transform tacit forms of knowledge into explicit forms in order to develop new, innovative sources of key assets that will be embedded in the processes and eventually in the organisational memory, hence codifiable, storable and re-producible in time (Barros *et al.*, 2015).

From Tacit knowledge to Explicit knowledge
Not teachable → Transferable
Complex → Codifiable knowledge
Not articulated → Network of resources
Not observable → Observable in use
People at centre → Technology as enabler and people as nodes

Table 2 – The evolution of knowledge sources

In particular, management should address the question of how many resources are required in order to foster the development of organisational knowledge (economisation of knowledge). Secondly, decide where to allocate

the amount of resources identified (organisation of knowledge) in order to reach the desired outcomes. Thirdly, how to standardise the process of knowledge management (modularisation), thereby determining how operations should be conducted in order to acquire, preserve and develop sources of knowledge.

Managing intangibles

Deciding how to manage the full set of assets at our disposal requires a thorough and analytical understanding of the key value drivers in order to know what investments to prioritise based on the potential outcomes and impacts on the organisation's performance in the long term. After having identified the potential levers of value, a further step in order to achieve a more complete perspective of how the business is running is to analyse the interdependencies among value drivers. In fact, impacts can often be explained through the interdependencies because most value drivers create value through interactions with each other (Greco *et al.*, 2013). Attempting to evaluate value drivers as isolated from the system would limit our analysis and lead us to formulate erroneous conclusions. Thus, attempting to understand the connections among the sources of value can help us to critically evaluate eventual trade-offs, allowing the management to take more informed decisions on the potential outcomes, reaching acceptable compromises based on the intended strategy of the organisation.

When deciding which assets to invest in, management must make decisions based on which ones support the achievement of a sustainable competitive advantage. An organisation's critical assets that enable and foster the development of core competencies depend on the specific business model and industry in which it competes in. Critical assets, of any kind, should therefore be identified based on what is required in order to maintain and possibly boost competitiveness. This consideration should not only be limited to the present but, most importantly, on our expectations on how the organisation intends to compete in the future (Sánchez *et al.*, 2000). The organisation should therefore

attempt to capture information on the expected demand and trends in the market in order to maximise its responsiveness. Alternatively, the firm may be in the position to shape future trends by leveraging on internal capabilities or scarce resources that other competitors don't have access to. In both cases it is important to identify the sources of competitive advantage in order to organise resources efficiently and effectively to reach our scope. In relation to this, a critical question that should be addressed is how to quantify investments in tangible and intangible assets, since the former can be easily quantifiable but in order to measure the latter we need to often rely on non-monetary estimates. Although this may seem confusing and illogical, even if intangibles are measured by using different measurement units, the aim is to build a scheme that helps manage assets and reach our strategic goals.

Sánchez *et al.* (2000) provide a useful framework that provides a methodology to understand how to identify, measure and monitor the most critical intangible assets aligned to the strategy of an organisation. Measuring intangible assets requires first to categorise them and then break down their components. Once this has been done we can attempt to find reliable indicators that reflect their value¹. Figure 8 below summarises the steps required in order to break down the structural and functional components of key value drivers.

¹ Other methods used in order to evaluate intangible assets involve the calculation of the Return On Assets and comparing it with the Weighted Average Cost of Capital in order to assess the excess earning over a fixed amount of time. Alternatively, the Market-to-Book ratio may also quantify the excess of a company's market capitalisation over its stockholders' equity, difference provoked by the impact of intangibles. However, the mentioned approaches do not provide insights on the real sources of value, hence what makes up intangibles, therefore giving the management little information as to where it should allocate resources

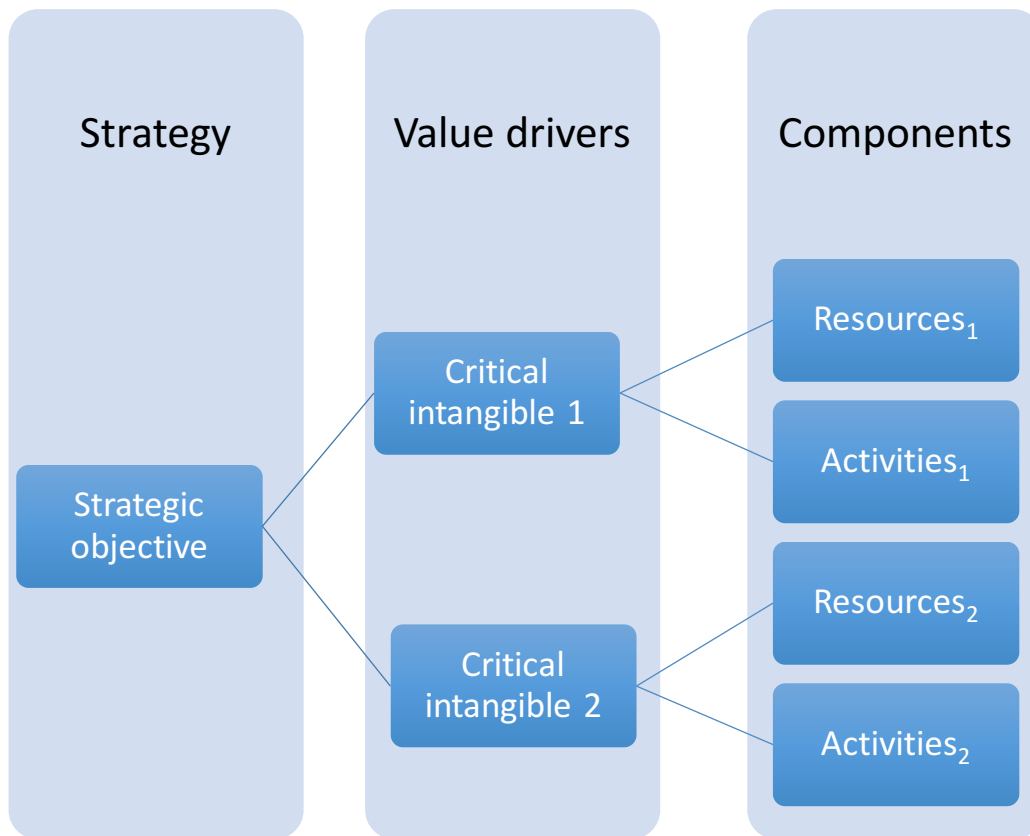


Figure 8 - Building a network of intangibles. Adapted from: "Management of intangibles – An attempt to build a theory", Sánchez et al. (2000)

As we can see, the steps that need to be taken are: (1) elaboration of the strategic objective; (2) identification of the critical value drivers that are related to the achievement of that objective; (3) a break-down of their components into resources required and activities involved in their management. As we do this for the various strategic objectives that an organisation may have, we develop a network of critical intangibles. Building this network can later be useful to assess the connections between value drivers.

After having broken down the specific structure that characterises the organisational priorities and relative components, we need to identify the measures that reflect their entity. Zambon (2008) and Sánchez (2000) both agree on the use of three types of performance measurements for each category of intangibles:

- (a) general
- (b) industry specific (comparable across firms from the same industry)
- (c) firm specific (distinct indicators for the specific firm)

In order to assess the appropriateness of indicators, it is useful to ask whether the measures used are directly related to value creation, whether they are clearly defined and if the organisation has the means to collect the necessary information in order to evaluate what it measures. Furthermore, measures can incorporate a monetary or non-monetary value. For comparative purposes and more informed decisions to be taken it is recommendable to conduct a cost/benefit analysis whenever possible. SAP's integrated report is a good example of this, since it clearly highlights the measures used for every variable, showing the interconnections between the materially relevant performance measures and quantifies their impacts by reconducting them to a financial dimension. In this way we are able to assess the magnitude of the impacts and assess whether investments can be justifiable from a financial point of view. Measuring social and environmental impacts will be further analysed in upcoming sections.

Integrated thinking

In the attempt to understand how to align corporate behaviour and efficient capital allocation with goals such as financial stability and long term sustainable development, we should consider the impacts related to the backbone of integrated reporting: integrated thinking. The objective in this section to analyse how organisations can promote the integration of activities and empower its actors in order to deliver the desired objectives in the short, medium and long term. In particular, the management needs to develop the tools in order to promote a corporate culture that favours the appropriate amount of information sharing and cooperation that can facilitate the achievement of its goals. This attitude is referred to as 'Integrated Thinking' and

should pervade the firm at all levels in order to promote the mentioned culture and connectivity that the practical implementation of Integrated Reporting requires (IIRC, 2013).

Integrated thinking is a corporate attitude that management has to build in order to contain and prevent the possible conflict between the company's efficiency and its broader responsibilities towards society by actively incorporating sustainability into its strategy. The IIRC Consultation draft (2013, p.33) mentions integrated thinking as "the active consideration by an organisation of the relationships between its various operating and functional units and the capitals that the organisation uses or affects". As a consequence, we must not think of the capitals as independent from one another, but acknowledge and understand their interdependencies from their input form to the outcomes that the company generates. Oliver *et al.* (2016) bring attention to the fact that integrated thinking is reinforced when senior management promote a positive sustainable culture and further commit to this by embedding relevant KPIs to their measurement system and putting them into practice through their organisational practices. In the same way, Knauer and Serafeim (2014) also agree with the previous connotation of achieving integrated thinking by promoting and embedding sustainability into the corporate business model, across all hierarchical levels of the firm.

Soft systems thinking

Before defining what we mean by 'soft' system thinking, it is easier to define its complementary first. Thus, in a 'hard' system thinking the prevailing theme is quantification and formal rules. In fact, each responsibility centre is evaluated separately through quantitative measures, attempting to reach an understanding of causes and effects objectively. A soft system thinking embraces qualitative measures and fosters informal mechanisms of control. In order to identify the key performance indicators that measure the linkage between the various forms of capitals and the sustainable outcomes, hence the measurable

impacts of the firm's activities to all its stakeholders, the organisation must embrace a 'soft systems thinking' (Oliver *et al.*, 2016). Senge (2005) suggests that a soft systems thinking would have a positive impact on reducing the 'silo effect' and is most commonly adopted in complex and dynamic environments, where people, units and divisions are highly interconnected with each other and the production function that elucidates the necessary procedures in order to visualise the outputs of a firm are non-linear. Soft systems thinking generates what we call generative reasoning, as opposed to the causal modelling that is a core aspect of the hard systems thinking, and is what brings together different actors of an organisation in order to interpret the linkages between inputs and outputs on a qualitative level.

We tend to underestimate the societal impacts in the long term, since the act of monetising their impacts cannot be appreciated in the short term and considered somewhat unreliable if it is perceived as being too subjective (Pelozo, 2009). Promoting a soft systems thinking and embedding sustainable measures into control systems may help us gain an increasing understanding of the tensions between capitals, hence recognising that some of these qualitative measures are indirectly linked to financial measures (Oliver *et al.*, 2016).

	Hard system thinking	Soft system thinking
Main differences	Causal, linear relationships	Generative reasoning and irrationality
	Strictly quantitative KPIs to measure outcomes	Inclusion of qualitative KPIs
	Siloed information	Integration of information
	Sustainability hierarchically and geographically siloed	Innovation and learning through connectivity and collaboration

Table 3 – A comparison of hard and soft system thinking approaches. Adapted from: 'Conceptualising integrated thinking in practice', Oliver et al. (2016)

Figure 9 below shows how the ongoing interactions that exist between the two apparently opposite systems can in fact be catalysts for the promotion of sustainability. Higher degrees of interaction and inclusion of the two approaches within the organisation correspond to a deeper focus around sustainability issues. Thus, goals only reflect operational efficiency when companies are tied to a highly formalised, hard integrated thinking. The more we incorporate and embrace a soft system thinking, the more we are likely to focus our attention and increase corporate awareness around stakeholder's expectations. Finally, the ultimate level is related to a deeper focus on environmental issues, that is triggered when companies commit to integrating the soft and hard systems into all the phases that go from the strategy making process all the way to the design of the incentives and rewards systems.

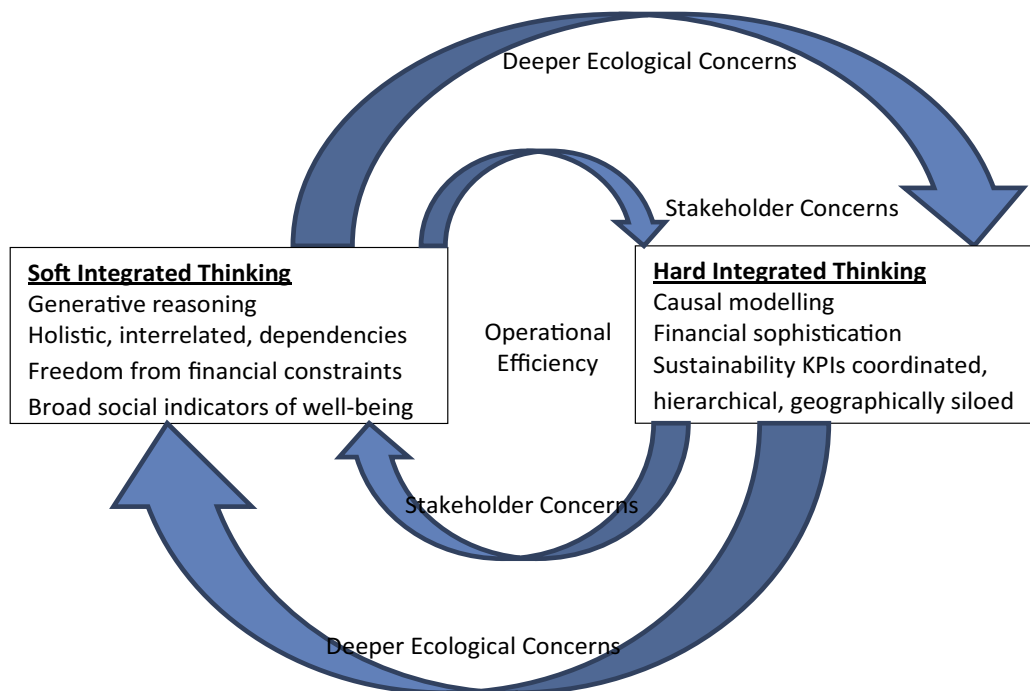


Figure 9 - Explaining the interactions between soft system and hard system thinking. Source: 'Conceptualising integrated thinking in practice', Oliver et al. (2016)

Oliver *et al.* (2016) bring attention to the importance of generative reasoning as a catalyst of integrated thinking, carrying the benefits of enhancing constructive debates and shaping the value system of the firm. More importantly, this debate can break down the formal inhibitions linked to the hierarchical structure of the firm and bring together actors from different organisational areas. It is by this form of debate that interrelations emerge and activities are coherently designed in order to achieve the desired outcomes. Higgins & Coffey (2016) also highlight the importance of dialogic approach because of its ability to enable a variety of discourse based on sustainability, changing the way a company thinks and understands the consequences of its actions. Another benefit that can arise from generative reasoning is the ongoing mutual learning process, driver of innovation. Learning is made possible thanks to:

- Increased information sharing
- Less internal competition
- The reinforcement of relationships
- Result-oriented interactions

Not being limited by formal control systems and engaging in critical debates whereby sustainability is the underlying and guiding principle is useful in order to build flow charts that outline the causal linkages starting from the overall strategy to the activities needed and, finally, to the key performance indicators that summarise both the effectiveness and efficiency of our actions. Flow charts must not be static, but be adapted in time in order to reflect the strategy of the firm and the evolving external environment, that translates into continuously changing expectations. The preciseness of the metrics used will be refined in time, starting from qualitative dimensions and estimates to more concrete, quantifiable and reliable measures.

Integrated thinking is about empowering employees and setting the ground for creativity and innovation to be leading issues under the sustainability umbrella. Senior management is called to promote and reinforce this process by abandoning a top to bottom approach, letting ideas flow from the bottom. It calls for more flexibility in order for internal engagement to prosper in the organisational context. It also calls for more qualitative aspects to emerge and slowly be quantified after a deeper understanding of cause and effect linkages. We can therefore state that integrated thinking is more suitable when incremental change is tightly coupled with the need to continuously evolve in order to stay competitive. Mutual learning is what enables tacit knowledge to become explicit, being then transformed into key competencies that drive competitive advantages in the long run (Mouritsen & Larsen, 2005).

Sustainability reporting

Sustainability reporting has been implemented by many firms over the past decades, addressing important issues such as the external and internal drivers of a sustainable competitive advantage in the long term. With the increasing recognition of the social responsibility of firms, environmentally focused disclosures increased in the 1990s, after its slow diffusion rate in the previous decade. When it comes to sustainability reporting there are two opposite approaches that are adopted by management:

- a) Outside-in approach: concerned with aligning reporting systems to external requirements or standards, in order for the organisation to benefit from a reputational point of view in virtue of a higher level of transparency. This practice may result in the elusive practice of so called 'green-washing', making reporting a function to be viewed as more green, without fully implementing the necessary practices in order to actually achieve a sustainable business model.
- b) Inside-out approach: the reporting system reflects how management has handled the material issues. Corporate performance is therefore measured through a series of KPIs, and reporting becomes an outcome of the organisation's specific strategy. It is therefore the accounting system that is designed around the strategy and not vice versa.

Beck *et al.* (2012) agree by stating that we have witnessed an evolution in time, thus the reporting systems have moved from an outside-in to inside-out form. We are therefore observing that an inside-out approach may lead the way to integrating all the relevant issues related to strategy in a way that can facilitate management's decision making processes by aligning resource allocation and people's behaviour accordingly. It is therefore clear what integrated reporting stands for and how the inside-out approach may serve this purpose more effectively than the outside-in approach.

Our objective here is to analyse why organisations should decide to implement integrated reporting, and how to integrate sustainability measures into the organisational strategy in order to drive organisational change. Non-financial information therefore needs to stand out in a way that members of the organisation can fully understand how the organisation is creating value in the long term and how their individual or collective contribution is delivering value. Finance, as well as strategy departments are therefore more involved in this process of integrating, communicating and further disclosing the desired and actual outcomes generated by the organisation (Stubbs & Higgins, 2014). The aim of the IIRC in fact is to promote a more concise, interconnected and dynamic form of reporting that incorporates the sustainable strategy of the firm over time and outlines a potential future strategy in line with enterprises' objectives.

While sustainability reporting has driven change in companies' culture, representing an important catalyst for change from a strictly profit-maximisation mentality to embrace the recognition of their corporate social responsibility in a modern society, Integrated Reporting can lead the way to another important shift in companies' rationale, hence representing the change towards a more holistic approach to value creation linked to the broad base of capitals that it influences (Stubbs & Higgins, 2014). Therefore, the main difference is that <IR> aims to drive a corporate-wide change related to the internalisation of sustainability, and not only linked to certain functions or committees in charge of composing the sustainability report for external communication purposes. While sustainability reporting focuses on the subjects, hence the corporate stakeholders, <IR> differs because it addresses the attention around the object: the capitals (Mio, 2016). Employees must be empowered and engaged in the process of change in order to actually foster it effectively.

Sustainable Outcomes

Most studies in this field, up to the present moment, have focused primarily on how to implement <IR>, not giving enough attention to the 'why'

and 'what' <IR> should deliver. Furthermore, the benefits of <IR> have mostly been studied under the perspective of providers of financial capitals and other primary external stakeholders. Stubbs & Higgins (2014), instead, analyse <IR> from a different perspective, asking if this practice can induce a 'morphogenetic' change of the company, in order for it to deliver more sustainable outcomes and not simply focus on the maximisation of profits. Accordingly, Integrated Reporting relies on empowering people by putting them at the centre of their business model. Stubbs and Cocklin (2008) highlight how ecological modernisation is based on the previous concept of putting people and the environment the firm has the potential to influence at the centre of business models, with the objective of improving welfare and delivering sustainable impacts.

Driving change

An important aspect of this study is to understand whether or not <IR> can affect the internal structure, processes and culture of an organisation and from that understand the magnitude of change that we are able to observe when integrated reporting is adopted. There are several options that we can undertake in order to induce change and through this section we will be discussing the different drivers of change that are linked to integrated reporting and can play a different role when in the various steps needed in order to deliver an integrated report, hence from the conceptualisation to the implementation phase and the ongoing process of evaluating results and perfecting the outcomes of reporting.

a) Push versus Pull strategies

When it comes to driving change, we can observe two different approaches: the 'pull' versus 'push' strategy (Stubbs & Higgins, 2014). The former is a result of an integrated business and is in line with an inside-out process of reporting, hence <IR> is viewed as an outcome of what is strategically

relevant to the company. Sustainability is viewed as fundamental to the way business is conducted, becoming naturally embedded into the value system of the organisation, that actively shapes the corporate strategy and therefore the way operations are conceived and carried out.

The push strategy instead uses <IR> in order to deliberately induce some form of change in the way a business is organised in order to have a better understanding of the business model and the interconnections that exist among divisions and, especially, among outcomes. Critics of the push strategy observe that sustainability cannot be truly embedded into the business if the means to drive change is a reporting system. Rather, it is seen as forcing change into a system not ready to accept it because not fully integrated. Furthermore, push strategies are considered weaker because they involve few people and divisions in the process. More effort needs to be undergone in order to involve not only people from different departments, but also relevant stakeholders that can be decisive in understanding the direction of change and required actions to deliver it. Higgins & Coffey (2016) support the idea that reporting has the ability to deliver change. In fact, by disclosing how a company contributes to the social and environmental development can bring about change because of its ability to positively affect the way management gives weight to these issues internally. Under this perspective, change is brought as a consequence of increasing awareness and focus on sustainable outcomes. Reporting allows stakeholders to engage and interact with the business, bringing about incremental change

b) Cross-functional teams

When implementing integrated reporting, cross-functional teams can be viewed as decisive in order to deliver the change required and move to a more integrated business model (Stubbs & Higgins, 2014). Cross-functional teams can be effective in breaking down the silos effect and enhance the coordination and collaboration across functional areas. Where resistance to collaboration is high, this approach helps the organisation decrease competitive behaviours that are

detrimental to the long term success of a company, especially when collaboration can be a key factor to increment innovativeness by bringing together people's efforts and knowledge. Thus, instead of isolating the process only to the sustainability or CSR committee, previously in charge of outlining the sustainability report, or even the actual integrated report by collecting hard data from different units, teams made up of different representatives of different functional areas are brought together. Representatives may come from different units according to the necessity and what is considered to be strategically relevant to the company. These include several business units, on top of the sustainability or CSR committee may include members from the following areas: finance, communications and marketing, investor relations, board of directors, legal, strategy, risk management, human resources, accounting and operations. We may also include important external stakeholders in the process in order not to limit our mindset and respond to their expectations. Insightful suggestions may be brought forward because of representatives' deeper understanding of how and what their unit is delivering to the organisation as a whole.

If we are able to understand how functional areas are interconnected, we can make better decisions on the necessary actions in order to achieve measurable results. The effort is and must be corporate wide if we want to achieve an integrated business. From a more collaborative model we can also refine the process of target setting by establishing challenging, yet achievable, targets for different units of the business, hence motivating efforts by aligning behaviours to strategic and materially relevant goals.

By promoting more collaboration and engagement, we set the grounds for integrated thinking to thrive across the company, which is the backbone of integrated reporting. Integrated thinking needs to be incorporated into the corporate culture if we want our business model to achieve the level of integration that allows us to foster generative reasoning, innovation and ongoing learning (Oliver *et al.*, 2016).

c) Ownership

Driving change from isolated sustainability reporting to the new form of integrated reporting may require the revision of who is in charge of the process and either empower owners by increasing their decisional power, or shift the ownership to another department that can be more effective in enabling organisational change (Stubbs & Higgins, 2014). Employees from the sustainability committee may be moved to another department that plays a central role and works with different actors of the company (e.g. finance, strategy or corporate communications divisions). Negative attitudes such as the unwillingness to share information or collaborate in the interest of the organisation may be hindering the integration process. The company may need to look over the authoritative lines of power and architectural design of the organisation in order to consistently put into place a transition towards an integrated business model.

Organisational changes to environmental reporting

Organisations need to embrace and foster change by modularising the design of their systems in order to respond to external shocks such as regulatory changes, consumer orientation and societal pressures. We can measure change from external shocks according to the degree of change that they provoke and what levels of the system are affected. Changes occur at various levels, and can therefore involve three different aspects (Bouten & Hoozée, 2013):

- Organisational subsystems (i.e. the tangible components of an organisation: people, infrastructure and physical assets)
- Design archetypes – defines the structure of the system. Accounting systems are included in the design archetype of an organisation.

- Interpretative schemes – shape the value and belief system of an organisation by providing the necessary tools in order for actors to interpret the design archetype in the same way

As first elucidated by Laughlin (1991), we can distinguish two degrees of organisational change:

- First-order (or morphostatic) change – Whereby external shocks provoke a minor adaptation and involve only one or two of the previously mentioned levels.
- Second-order (or morphogenetic) change – It involves a change in all the levels of the system, that affects and deeply alters its genetic composition. If radical change is a choice of management then we call it an evolutionary change. If forced by external shocks, instead, it is referred to as colonization.

Accounting systems have an important role in establishing the reaction of the organisation to an external shock since it is part of the design archetype. Thus, accounting plays a decisive role in the decision of how to respond to external disturbances (Bouten & Hoozée, 2013). Gond *et al.* (2012), in fact, posit that environmental management accounting must be fully integrated into the traditional management accounting system in order for the organisation to pursue a sustainable strategy.

There is no universally accepted definition for neither management accounting, nor Environmental Management Accounting. However, Savage *et al.* (2001) provide the following definition of EMA: '[EMA] involves the identification, collection, estimation, analysis, internal reporting, and use of physical flow information (i.e., materials, water, and energy flows), environmental cost information, and other monetary information for both conventional and environmental decision-making within an organization'.

Environmental Reporting and, in the same way, Environmental Management Accounting, is not just a means to respond to external changes, but can influence the organisational structure of the firm and the degree to which environmental performance is embedded into the organisation.

Although the simple implementation of EMA is not sufficient to guarantee neither environmental nor financial performance improvements, it does, however, provide valuable information in order to understand the causes and entity of environmental costs through activity-based costing (Bouten & Hoozée, 2013; Durden, 2008), serving as a starting point in order to improve organisational outcomes. Investments that are made to decrease waste rates and environmental costs are contributing to increase the company's operational profits, that can be re-invested and re-allocated to other primary functions in order to increase its market shares in the long term. EMA can also be of great importance in establishing the full costs of production and therefore make more appropriate decisions in terms of product pricing (Savage *et al.*, 2001). Failure to incorporate environmental costs may lead to a miscalculation of overhead costs and as a consequence, miscalculations in the actual cost of products or services. When preparing the budget, EMA is essential in order to set standard environmental costs and any other forms of revenues that may emerge (i.e. recycling, benefits from selling scrap materials etc.). Furthermore, EMA will support management in strategic decision making and in the formulation of incentive systems, designing bonus systems that reward positive outcomes. Further applications linked to the use of environmental costs have been noticed by Adams and Frost (2008) regarding their use in fields such as risk management and assessment.

Measuring social and environmental impacts

The value add that integrated reporting can deliver to an organisation and its stakeholders is the measurement of impacts that it has on capitals. Being measurement-focused requires having awareness not only of the necessary

inputs to produce a series of outputs, but a deeper understanding of the way they have affected the various forms of capitals and how the organisation facilitated the procedures required. Nonetheless, some measures will still remain difficult to predict and quantify precisely. Integrated reporting is also about narrating the value creation process, therefore including qualitative assessments as well. Monitoring data and analysing correlations between inputs and outcomes will be undoubtedly beneficial to the company, but will be refined in time (Vardy *et al.*, 2015).

An important aspect that management has to address is how the organisation incorporates and integrates sustainable KPIs in order to measure performance, communicate the desired outcomes to different actors and evaluate performance in order to make coherent and informed decisions that are materially relevant to all stakeholders. Adams and Frost (2008) highlight the importance of integrating both physical and financial performance indicators into several aspects of management functions in order to craft the corporate strategy by not focusing exclusively on outcomes, but also the inputs needed to achieve the organisational goals. It is therefore crucial to incorporate quantifiable data on the ethical, social and environmental impacts of our organisation in time. This can prove to be crucial in order to evaluate past performance in relation to our objectives and make informed decisions in the present in order to achieve the desired outcomes in the future. Motivating performance and relating the objectives to rewards schemes is important to align behaviours and serve as incentives for actors across all organisational levels. In time, the formalisation process of KPIs and the integration to corporate strategy becomes part of business as usual, once the scope and vision of the firm are clearly established and causal relationships have been understood more thoroughly.

Management Control Systems

Before introducing the benefits and structural changes of integrating sustainability into management control systems, we hereby explore the main

features of management control systems in order to have a better preliminary understanding. From the general definition given by Simons (1995), therefore MCSs intended as the 'formal, information-based routines and procedures managers use to maintain or alter patterns in organisational activities' we can appreciate the implications that management control systems have in an organisation. Thus, the repercussions of MCSs within an organisation affect various organisational activities, from the planning phase to the measurement of results and all the way back to planning again for the next period. Therefore, MCSs are involved in coordinating activities, efficiently and effectively allocating human, physical and financial resources, motivating employees through incentives and rewards systems and, finally, measuring organisational performance in relation to the initial objectives (Battaglia *et al.*, 2016). It is for the previous reasons that MCSs play a crucial role in ensuring that sustainability is deeply rooted into the organisation's strategy, for economic, social and environmental impacts to be managed and assessed by its actors.

Another distinction that we can make is between the diagnostic and interactive use that MCSs can have, as first elucidated by Simons (1995). Therefore, by diagnostic use we mean all the set of formal information systems used for the purpose of controlling, correcting negative variations and rewarding positive behaviour through a specifically designed bonus system that motivates employees and aligns behaviour to intended outcomes. From this definition we can appreciate the impacts that a diagnostic use has on monitoring compliance, facilitating decision making processes, providing feedback and communicating performance to all stakeholders (Battaglia *et al.*, 2016).

The interactive dimension of management control systems, instead, refers to all the set of instruments adopted by management in order to deal with the forecasted threats and opportunities that may emerge along the intended plan of action. In the attempt to adapt to the external changes, environmental uncertainty becomes the focus of attention of MCSs, that must rapidly adapt organisational activities accordingly. This is done by assessing

whether the main goals should remain the same or if they have changed in the meantime and supporting the incorporation of necessary changes into business activities (Battaglia *et al.*, 2016). We can facilitate this process by promoting generative reasoning, constructive discussions through formal and informal means, and continuous mutual learning across all organisational levels (Hoffmann *et al.*, 2015). Interactions as well as frequent and intensive engagement between actors along the hierarchical structure is required in order to support change and effectively reach the alignment between actions and plans.

Eco-control

By effectively accounting for environmental impacts, an organisation can support the management in the efficient allocation of resources and implementation of a coherent and sustainable strategy. Eco-control is concerned with the integration of environmental issues and impacts of a firm into its management control system, and therefore as “the formalised set of procedures and systems that use financial and ecological information to maintain or alter patterns in environmental activity” (Henri & Journeault, 2010). The aim of eco-control is to integrate environmental concerns into the strategy of an organisation in the attempt to align corporate behaviour to desired results. In order to do so, eco-control comprises a performance measurement system that defines environmental KPIs, the budgeting system in order to set goals in terms of environmental impacts and, finally, a structured incentive and rewards system to evaluate performance and align behaviour to desired outcomes.

It should be noted that environmental performance is not strictly limited to the environmental impacts of an organisation. As a consequence, there is no universally accepted definition that incorporates its components. However, in light of its increasing importance and strategic role, if the constituents of environmental performance are clearly defined, holistic and well integrated into the control system, they can also be good indicators for defining other key

aspects that reflect a firm's long term competitive advantage, hence customer satisfaction, productivity, quality and innovation (Henri & Journeault, 2010). A well-defined and holistic environmental performance measurement system should incorporate the following features (that should then be integrated together):

- a) Result-oriented: clearly defines the outcomes and ideally quantifies them in order to achieve more objectivity. The quantification can include a financial assessment of the environmental impacts if considered reliable and functional to the organisation's strategic objectives. A financial assessment includes the computation of both internal and external costs and can be analysed under two perspectives: environmental damage (that has a potentially negative impact also on other aspects such as brand reputation or sanctions related to the production of negative externalities) and costs for prevention (Gunarathne & Lee, 2015).
- b) Means-oriented: the organisation has designed the operations and other requirements needed in order to reach the intended goals. Having a clear view of the facilitators of environmental performance allows the organisation to identify and implement performance gaps and suggest improvements to align processes and products with positive environmental performance
- c) Internal and managerial viewpoint: this aspect stresses the importance of appropriate decision-making and resource allocation in order to concretely manage environmental performance by identifying the appropriate levers of control in order to foster the achievement of results
- d) External stakeholder orientation: in order to keep externalities under control and where possible enhance the well-being of the organisation's stakeholders. a clear view of the degree to which the various stakeholders are

affected by the firm's environmental impact helps identify the different set of expectations, hence prioritise the right actions in order to meet them effectively, and build solid relationships with stakeholders under the environmental and sustainability lens.

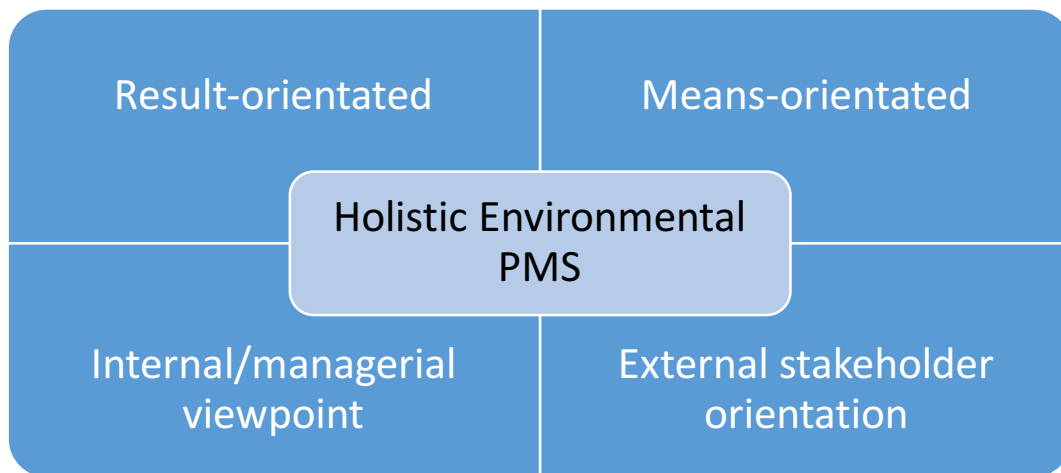


Figure 10 - elements of a holistic environmental performance measurement system

It is important to keep all the previous dimensions into consideration when managing environmental performance. In fact, considering them as isolated will most likely not be sufficient in order to reach the desired outcome. It is by effectively integrating these four dimensions that an organisation can achieve the level of environmental performance that can then allow it to obtain a positive economic performance. Henri & Journeault (2010) propose a schematic framework (Figure 11) in order to summarise the logical cause and effect linkages between eco-control, environmental and economic performance, whereby it is also relevant to take into consideration the external, contextual factors that influence the achievement of the logical and empirically tested connections.

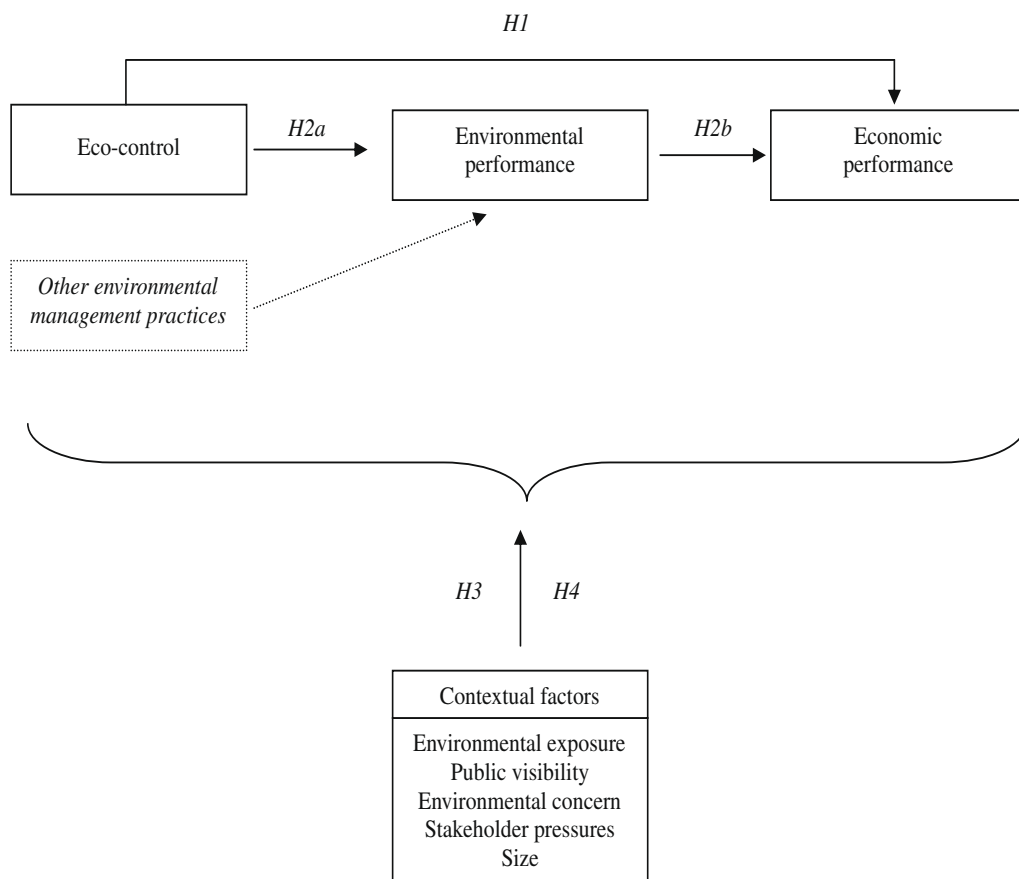


Figure 11 - Source: Henri & Journeault (2010), 'Eco-control: the influence of management control systems on environmental performance and economic performance'. *Accounting, Organizations and Society*, 35(1), 63-80

Environmental performance measurement systems are tightly coupled with decision making and control processes, serving as a connection point between a firm's underlying motivation and its actual performance. The extent to which EPMs are integrated in the control and decision making processes depends on three factors (Lisi, 2015):

1. Top management's commitment to environmental concerns have the potential to shape the corporate culture. Their commitment depends on their belief that the company has a series of social obligations, which motivates them to define goals that are in line with the belief system of the company.

2. Expected competitive advantage: hence the business-oriented motivation for environmental proactivity. This serves as an incentive for managers to direct attention and resources to develop a comprehensive environmental accounting and control system in order to monitor all the costs, benefits and operational outcomes over time
3. Stakeholders' expectations and perceptions over the environmental impacts also serve as a motivation for the implementation of EPMs. The variety of expectations must be weighed in order to align the diverse set of expectations to the strategic decisions taken.

The use of an EPM can positively affect the environmental performance of the firm, that then positively impacts on the economic performance of the company. The first linkage holds true if the firm is able to quantify and map the cause and effect linkages that exist between environmental efforts and corporate goals. This will improve the quality of decision making, that in turn may impact positively on the environmental performance. To this extent integrated reporting has the potential to show and sustain the linkages that can lead to better decision making. Environmental goal congruency can further be supported if EPM is used for performance evaluation and tightly coupled with the reward system of the organisation. The second link that connects environmental performance to economic performance is explained through the pursuit of cost reductions, improved product pricing, attraction of human resources and reputational benefits (Lisi,2015).

[Integrating sustainability into management control systems](#)

The following section is dedicated to the understanding of how management control systems can pursue the integration of sustainability in the corporate strategy, whereby the economic, social and ecological impacts are fully taken into account (Gond *et al.*, 2012). Integrating sustainability into an organisation's strategy involves assuring that the execution of activities

coherently reflects the intended outcomes. When the organisation outlines the intended path in order to achieve a coherent and effective integration, it must think of how to shape the organisational mindset to raise awareness around the impacts that the organisation has not only towards its employees and other primary stakeholders, but on society at large. Integrating is therefore a means to reach important outcomes such as the reduction of use of natural resources, the increase of employee satisfaction (which is tightly coupled with an increase of productivity) and more awareness about the interactions between the organisation and its external environment (Battaglia et al., 2016).

In order to effectively commit to the process of integrating strategic sustainability into corporate activities, senior management must design the monitoring and assessment phases as well as the incentive and rewards systems in order to reflect this orientation (Oliver *et al.*, 2016). First of all, we must understand how management control systems are related to sustainability control systems and then make the attempt to integrate them for better decisions concerning the strategy of the firm to be made. Before we take a deeper look into the integration phase we must understand the individual components that make up the previously mentioned control systems, and their relationship to strategy.

Components of MCSs	Description	Corresponding sustainability control systems
Strategic planning	Planning for the medium-long term according to forecasts made and analysis of the external environment	Planning for sustainability, hence keeping the economic, social and ecological impacts into active consideration
Budgeting	A quantifiable plan of action that translates the	Environmental/sustainability budgeting involves setting

	previously outlined strategy into goals for business units	quantifiable goals for the sustainability plan outlined in the previous step
Performance measurement systems	We portray the specifics on the financial and non-financial measures that are contained in the budget. Thus, even qualitative measures have to be quantifiable in order to set goals. These serve as a basis for the incentive system	Common techniques used: Environmental Management Accounting systems (EMAs) that identify cost flows related to the environmental impacts of the organisation; Sustainable value added approach Sustainable balanced scorecard to outline goals and causal linkages between them
Evaluation	Comparing forecasted performance to actual performance in order to assess the positive or negative variances. Wherever negative outcomes are evident, necessary steps are needed in order to identify the causes and correct them for future purposes	Measuring the efficiency of actual performance in relation to pre-established sustainability goals identified in the previous steps. With quantified goals (i.e. kg of CO ₂ produced, income donated for philanthropic purposes etc.) we can assess numerical variances and attempt to correct negative performance
Rewarding	Rewarding positive outcomes in line with the strategic plan and pre-established bonus system that elucidates the weightings of corporate	Creating a link to the bonus system in order to reward positive economic, social and ecological outcomes in order to motivate sustainable performance and be

	objectives, hence the priority that must be given to certain outcomes	competitive in the long term. Common techniques: multidimensional performance systems
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Table 4 – Components of MCSs and SCSs. Adapted from Gond et al., 2012

Garcia *et al.* (2016) highlight that the lack of integration between sustainability reporting and MCSs must be overcome by embedding sustainability issues into every day decision-making processes and into the accountability system of an organisation if it wishes to pursue a sustainable development. The mentioned authors stress the importance of MCSs to incorporate the necessary information in order to support the accomplishment of the sustainability mission and for impacts to be fully taken into account for measurement and monitoring purposes. Durden (2008) points out that an organisation's CSR objectives are often not aligned to its management control system, therefore losing the possibility to become embedded into the corporate strategy.

In light of the increasing importance that non-financial information plays in the decision making process and strategy development, management control systems must evolve accordingly by embedding the value-relevant information in order to satisfy the needs of its broad array of stakeholders in time. Integrating MCSs and SCSs is in the attempt to ensure a sustainable competitive advantage in the long term, that can be extremely important for firms to identify new business opportunities. Gond *et al.* (2012) make the observation that integration of these two systems is a socio-technical process and its magnitude depends on the overlap of three different dimensions: technical, organisational and cognitive integration.

1. Technical/methodological integration: the configuration of an informational infrastructure that records relevant calculations for both

control systems, making it possible to effectively incorporate the individual components of SCSs into the performance measurement system. When designing and conceptualising this form of integration it is important to think about the linkages that exist between the two systems. In this way management can build a common information system in order to incorporate sustainability indicators, thus supporting the decision making process in order to reach the desired goals (Battaglia *et al.*, 2016). The technical tools that support this dimension of integration are budgets, financial reports and computer-based supply chain models (George *et al.*, 2016).

2. Organisational/systemic integration: this dimension is focused on the way processes are defined as well as a review of the roles and responsibilities in order to empower management accountants by broadening the reach of their accountability (Gond *et al.*, 2012). This aspect carries the benefit of bringing together groups of people that were previously held accountable for different areas, thus facilitating information sharing and connectivity across the firm. In fact, it is by organisational integration that sustainability issues are discussed and prioritised by organisational actors.
3. Cognitive integration: This aspect refers to how organisational members think of sustainability. In order to achieve a cognitive integration, it is in the best interest to promote constructive dialogues and shape the culture of the firm, setting the ground not only for the right interpretations to be made but also for integrated thinking to spread across the organisation. Knowledge must be free to flow and regularly exchanged among actors of the organisation. The maximum level of cognitive integration may be achieved when the traditional MCSs and SCSs are conceived as platforms to support the spread of organisational know-how and culture among its actors (George *et al.*, 2016)

Integration of the two systems is a continuum and its level depends on the development of the three dimensions identified by the authors mentioned. We can, however, based on empirical evidence, identify certain configurations along this continuum and that are summarised in Table 5 below. The configurations rely on another dimension that shapes management control systems, therefore the diagnostic and interactive use of MCSs and SCSs (see previous section).

	<u>Diagnostic MCSs</u>		<u>Interactive MCSs</u>	
Nature of the MCS				
Nature of the SCS	Diagnostic SCSs	Interactive SCSs	Diagnostic SCSs	Interactive SCSs
MCS and SCS Decoupled (run parallel)	Dormant decoupled strategy (A)	Strategy emergence through sustainability (B)	Compliance-driven sustainable strategy (C)	Schizoid sustainable strategy (D)
	MCSs and SCSs are not involved in the definition of strategy and have no points in common	Level of integration low but sustainability is the underlying theme that structures the strategy	Sustainability issues are 'pushed' from external pressures and is managed in parallel to the MCS and diagnostically	Unstable and contradictory co-existence between sustainability and strategy, highlighting unstable technical, organisational and cognitive integration










patterns in time and space				
Tightly Coupled	Dormant integrated strategy (E)	Sustainability-driven organisational strategy (F)	Peripheral sustainability integration (G)	Integrated sustainability strategy (H)
	Sustainability is technically integrated but currently not visible in the strategic orientation of the firm	No formalised MCS but sustainability is what guides the organisational strategy (typically young and under-developed firms)	High technical and organisational integration but low cognitive dimension of integration. Stakeholders' interests are taken into account and integrated in the strategy	Sustainability is perfectly embedded in the strategy and the performance measurement systems. Technical, organisational and cognitive dimensions of integration are high

Table 5 – Ideal configurations of integrated MCSs with SCSs. Source: Gond et al. (2012). *Configuring management control systems: Theorizing the integration of strategy and sustainability*

The left column of the table represents the overall level of integration among the three dimensions that we discussed previously, hence the technical, organisational and cognitive features of the continuum. In light of this, Gond et al. (2012) mark the line between decoupled and tightly coupled systems as a first differentiator and highlight how organisations can move along the continuum by changing several factors such as:

- o Degree of formalised MCSs and strategy-making processes
- o Size of the organisation (consequence of the first variable)
- o Triple bottom line performance: sustainable economic, social and environmental performance
- o Frequency of interaction between MCSs and SCSs
- o Level of integration along supply chain
- o Structures that support innovation and ongoing learning
- o Nature of the firm and sector in which it operates (these two aspects determine what is materially relevant to the firm and the level of stability).

These dimensions will be the main differentiating elements that will empirically determine the key parameters can summarise the different types of ideal configurations: stability, frequency and ability to take into consideration all the dimensions of a sustainable development, hence the triple bottom line. A visual summary in order to appreciate the dimensions discussed for each configuration can be found in Table 6 below where three arbitrary measures (low, medium and high) are used to assess the level of stability, frequency and TBL focus, hence the overall level of integration Gond *et al.*, (2012).

	Stability	Frequency	TBL
Dormant decoupled strategy (A)	Low 	Low 	Low 
Strategy emergence through sustainability (B)	Medium 	Low 	Medium 
Compliance driven sustainability strategy (C)	High 	High 	Medium 
















Schizoid sustainability strategy (D)	Low 	Medium 	High (short term) 
Dormant integrated strategy (E)	Low 	Low 	Low 
Sustainability driven organisational strategy (F)	Low 	Medium 	Medium 
Peripheral sustainability integration (G)	High 	Medium 	Medium 
Integrated sustainability strategy (H)	High 	Low 	High (long term) 

Table 6 – Parameters of ideal configurations. Source: Gond et al. (2012). *Configuring management control systems: Theorizing the integration of strategy and sustainability*

Putting together the information contained in Table 4 and Table 5, it is possible to obtain a comprehensible overview of the different configurations that emerge when management control systems facilitate the integration between the organisational strategy and sustainability issues (Battaglia et al., 2016). No integration whatsoever between MCSs and SCSs portrays a ‘dormant decoupled strategy’. This framework is useful because it gives management the tools to assess if its current configuration of MCSs is in line with its objectives and can seek for legitimacy in light of its stakeholders. By comparing the current configuration with the desired configuration, management should then determine what actions to prioritise in order to reach the desired level of integration, coherently with its strategic priorities and stakeholders’ expectations. The different configurations identified in this framework require and correspond to different ways of managing, monitoring and controlling sustainability (Battaglia et al., 2016). As a consequence, this affects the way

internal decisions are taken and the way external relationships with stakeholders are defined and managed. To this extent, the reporting system can become more transparent and targeted towards the specific needs of stakeholders if management is able to recognise the configuration on the basis of the previously mentioned factors.

Focusing on the ideal configuration, the so called 'integrated sustainability strategy', we can attempt to outline its main characteristics. Hence, the integration lies in the complete overlap between the definition of sustainable strategy and strategy-making, carrying along the necessary control system in order to support its effective implementation. For this to be possible, every economic, social and environmental commitment is translated into measurable and controllable performance targets for operational managers, making sustainability perfectly embedded into the organisation's practices and mindset (Gond *et al.*, 2012). The interactive use of both MCSs and SCSs is intended to enhance mutual learning and be more receptive to changes that can benefit the organisation in the achievement of a competitive advantage. In relation to the configuration (G), the main differentiator is made up of greater cognitive integration between the members of the organisation. Sustainability is therefore the element that shapes and supports the cognitive dimension to thrive in the organisation, giving integrated thinking an important role in order to unify its members.

[A dynamic approach to integration: Mobilisation vs. Demobilisation](#)

Although the analysis of the previous configurations portrays the various settings that define the integration continuum, we hereby undertake a dynamic approach and analyse how an organisation can shift from one configuration to another and why it should do so. In particular, we look at how management control systems either adapt to the changes or, proactively enable change to occur. Figure 12 summarises the various configurations that Gond *et al.* (2012) discovered in their findings. The same authors, along with Battaglia *et al.* (2016)

and George *et al.* (2016) also depict the control levers that facilitate or limit movements along the integration continuum.

Therefore, the term *strategic mobilisation* defines the shift from a diagnostic use of strategy implementation to an interactive one. In the specific case of sustainability integration, it is made possible whenever a SCS's use shifts from being diagnostic to interactive (see Figure 12). Based on the current configuration of an organisation, there are various types and magnitudes of changes in control systems that may occur and that determine the features of the new configuration. In order to determine what changes have been brought (or that are expected to deliver), it is useful to observe how these changes have affected (or will affect) the economic, social and environmental dimensions of the firm's performance, therefore assessing the outcomes of change.

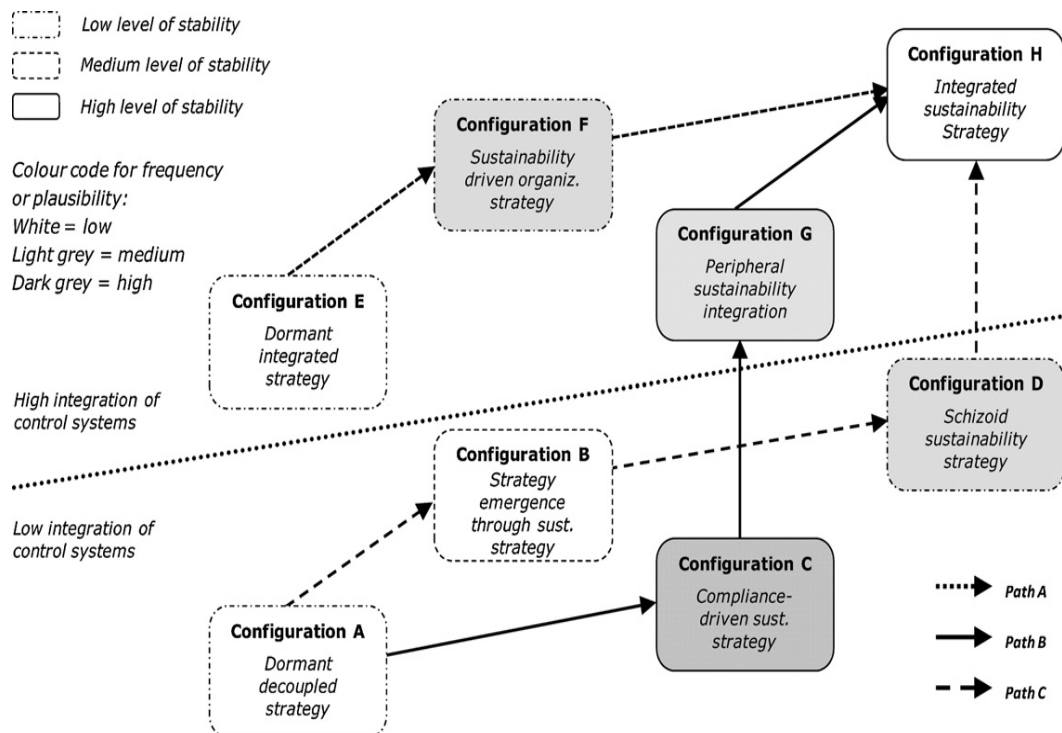


Figure 12 Paths towards a strategic mobilisation. Source: Gond *et al.* (2012) - *Configuring management control systems: Theorizing the integration of strategy and sustainability*

Under the opposite perspective, it is also possible to talk about *demobilisation* (Figure 13). whenever SCSs are managed diagnostically in order

to control and direct efforts towards the achievement of a sustainable competitive advantage, normally when uncertainties around sustainability fall under a controllable range and give way for the triple bottom line performance to be traced and controlled more effectively through a diagnostic control system. A demobilisation may be seen as a way to stabilise the current position of the firm, hence a process of rationalisation of the organisational control systems. A rationalisation is not always a synonym of stability, but it may also have some downsides to it, therefore the excessive bureaucratisation of sustainability management and consequently more rigidity in the system (Gond *et al.*, 2012).

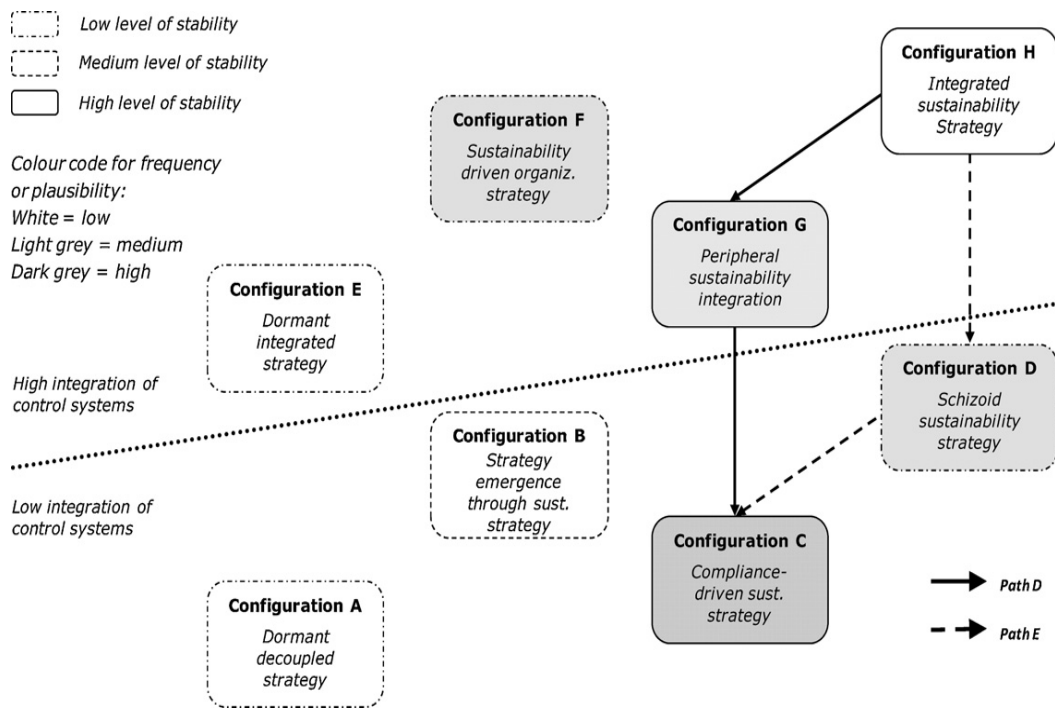


Figure 13. Paths of strategic demobilisation. Source: Gond *et al.* (2012) - *Configuring management control systems: Theorizing the integration of strategy and sustainability*

Another differentiation that is important to acknowledge is concerned with the overall level of integration, function of the three variables reported in Table 5, hence the degree of stability, frequency and triple bottom line performance. Accordingly, changes in the configuration can be assessed by these three determinants and their reciprocal interaction. Achieving integration is not

an immediate process, but requires time and is often a result of adaptation to the external environment, but can also be promoted internally if sustainability is deeply rooted into the corporate mindset and ideology.

Levers of control to implement sustainability

George *et al.* (2016) followed Gond *et al.*'s (2012) call to empirically investigate the theoretical framework they had developed. In fact, the authors mentioned studied the case of OilCom, a company that operates in the controversial oil and gas sector. The authors undertook an analysis of the enablers and barriers that either facilitated or slowed the achievement of the highest level of sustainability integration into the performance measurement system of the organisation. The analysis was conducted by investigating the set of events that either facilitated or slowed the process of integration from three different perspectives, hence the technical, organisational and cognitive dimensions that were identified in the previous literature stream. On top of these three dimensions, it is also important to consider the continuous transformation from diagnostic to interactive use of control systems, which is another important factor that identifies the different configurations.

The mentioned company had shifted from a dormant decoupled strategy (A) to a compliance-driven sustainability strategy (C) due to external pressures from the industry and societal expectations. Therefore, the first phase of transformation was pushed by the need to keep up to the industry standards to keep up with competition that had implemented a sustainability report. As the awareness around sustainability grew among the firm's employees, the technical and organisational dimensions became more mature and the integration of sustainability related issues slowly started to become part of the corporate strategy. As highlighted by the authors, up to that moment the traditional and sustainability control systems were used diagnostically to make sure that the pre-determined strategy was being effectively carried out by the various

corporate units. However, their use was not involved in the process of strategic decision making and the cognitive dimension of integration was still too low.

The following move to a peripheral sustainability integration (G) required MCSs and SCSs to be tightly coupled. It was noted that the shift from a loosely coupled to a tightly coupled integration of MCSs and SCSs required internal processes to support this process. In particular, the internalisation of sustainability was concerned with several aspects of the firm's procedures, systems and policies. Put together, these elements define the strategic orientation of the firm.

Table 7 below reports the potential and empirically tested barriers and enablers of strategic mobilisation. The barriers and enablers are concerned with path B of the integration process, hence the shift from a *dormant decoupled strategy* (A) to a *compliance driven strategy* (C), followed by a vertical shift to a peripheral sustainability strategy (G) and, finally, towards an *integrated sustainability strategy* (H). Following the conceptual framework of Gond *et al.* (2012), the other authors mentioned in this section have empirically tested and reported the obstacles and facilitators that OilCom and Cooperative, therefore the technical, organisational and cognitive factors that an organisation may encounter in the process of integrating sustainability into its strategy:

	From (A) to (C)	From (C) to (G)	From (G) to (H)
Technical barriers	<ul style="list-style-type: none"> - No systematic performance evaluation and target setting - Sustainability issues not included in strategy making process - MCS not developed - Social report not able to interpret the TBL approach 	<ul style="list-style-type: none"> - SPMs limited to certain functions and departments - Monitoring and information systems not mature - Sustainability reporting only to comply to external regulations and industry standards 	<ul style="list-style-type: none"> - The quantification of impacts is not undertaken systematically - Difficulty to assess risks and costs of operations - The KPIs do not appropriately reflect the organisation's strategic orientation - Sustainability reporting viewed as only accountability tool (not strategic)
Technical enablers	<ul style="list-style-type: none"> - Sustainability issues included into budgeting and auditing - Development of policies and revision of procedures from external pressures 	<ul style="list-style-type: none"> - MCS starts to be more developed - Sustainability annual plans begin to be drafted, helping identify the resources, deadlines, responsibilities, impacts, scope and goals - Sustainability issues are transcended and reinforced across the supply chain 	<ul style="list-style-type: none"> - Sustainability KPIs motivate employees by becoming incorporated into incentive and rewards system - Scope of SPM becomes more holistic and the quantification of impacts becomes clearer - Specific investments made to foster sustainability

Organisational barriers	<ul style="list-style-type: none"> - Growth rate of company very rapid - Roles and responsibilities not formalised - Structural defects that do not support sustainability 	<ul style="list-style-type: none"> - Underdeveloped formal structures to support sustainability - Sustainability is still limited to certain functions and isolated from the rest of the organisation - Cross-functional collaboration is low 	<ul style="list-style-type: none"> - Not all stakeholders are involved and taken into account in planning - Silos effect negatively impacts on communication and connectivity across business units - Training for sustainability not extended to every employee
Organisational enablers	<ul style="list-style-type: none"> - Growing structure of health, safety and environmental control system due to coercive pressures - Development of a code of conduct (shapes value system) 	<ul style="list-style-type: none"> - Sustainability unit starts to take a key organisational role - Sustainability focus extended to subsidiaries 	<ul style="list-style-type: none"> - Stakeholder engagement increases and materiality assessment is key to increase participatory plans - Integration across entire supply chain
Cognitive barriers	<ul style="list-style-type: none"> - Low understanding of the positive impacts related to a sustainable strategy - Little experience weighs on the implementation phase 	<ul style="list-style-type: none"> - Profits are still central in organisational strategy (influences mindset and supports short term focus) - Unclear roles and responsibilities to support sustainability 	<ul style="list-style-type: none"> - Innovative orientation and culture is not deeply rooted into the organisational mindset and processes (low receptiveness and adaptation) - Implications of sustainability not fully understood by all organisational actors

Cognitive enablers	<ul style="list-style-type: none"> - The increase of awareness starts from top management - Vision and mission aligned to sustainable development 	<ul style="list-style-type: none"> - Sustainability issues and awareness pervades the organisational hierarchy thanks to top management's dedication and increasing understanding - Openness to dialogue with stakeholders 	<ul style="list-style-type: none"> - Top management drives change - Employees' dedication and fit with organisational priorities is taken into consideration starting from the hiring process
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Table 7 - Barriers and enablers of strategic mobilisation and integration of sustainability. Sources: George et al. (2016), Battaglia et al. (2016), Gond et al. (2012)

The example of strategic mobilisation and integration of sustainability into the performance measurement system of an organisation is worth analysing because of the implications that we can draw in terms of the triple bottom line performance that the company registered as a consequence of this integration. Although this example was just one possible route of integration, it gives us the possibility to appreciate the elements that paved the way to a greater incorporation of sustainability issues into the corporate mindset and therefore into the strategic priorities of the firm. George *et al.* (2016) notice how new organisations may reap the benefits of integrating sustainability into their PMSs if they do so from their early existence. By doing so, a company can align its economic, social and environmental obligations more efficiently and effectively, being ready to assess its impacts, raise awareness among employees and build the grounds for sustainability to thrive in the organisation by being integrated into the corporate strategy by exploiting both formal and informal levers of control in order to reach the goal. Failure to integrate the SCS to the conventional MCS, therefore using it as an isolated tool (either de-coupled or peripheral) will fail to shape the organisational strategy of the firm (Battaglia *et al.*, 2016).

Regarding the factors outlined in the framework, empirical evidence collected by Battaglia *et al.* (2016) has shown that pre-existing organisational and

cognitive enablers of integration are key factors that lead to an interactive use of SCSs, allowing the strategic mobilisation to thrive. The opposite is also true, that therefore an interactive use of SCSs also promotes the reinforcement of organisational and cognitive factors, that in turn boost the integration of sustainability management. Technical factors are developed in time and follow the gradual shift from diagnostic to interactive uses of SCSs.

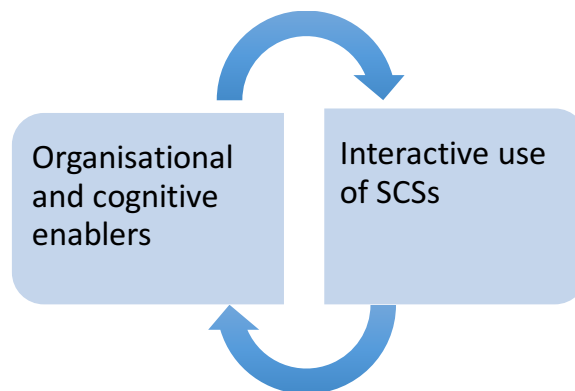


Figure 14. Facilitating strategic mobilisation – The reciprocal and reinforcing relationship between organisational and cognitive factors and interactive SCSs. Source: Battaglia et al. (2016) - 'Managing for integration- a longitudinal analysis of management control for sustainability.'

Furthermore, it is crucial for an organisation to adopt a multidimensional PMS, that balances the different priorities of a firm and develops an appropriate measurement system in order to evaluate and eventually correct the impacts of the organisation. For this reason, the integrated report can function as an effective means through which management can keep track of the different impacts of the firm from the financial, social and environmental standpoints, setting the ground for a sustainable long term development.

Chapter 3

Building a conceptual model to facilitate strategic alignment, decision making and resource allocation

The evolution of knowledge measurement and management

While we have seen the importance of measuring the entity of intangibles and recognising the various forms that can deliver value to the firm, another equally important stream of literature is concerned with the activities involved in actively controlling and managing these knowledge-based resources efficiently and effectively (Kianto *et al.*, 2014). The authors mentioned notice how knowledge should in fact be viewed as capital, therefore a quantifiable asset that can be traded and can deliver value to the organisation. However, it is also important to consider that processes yield value and that knowledge has a mediating function between the intellectual capital stock and organisational performance (Figure 15). For this reason, it is important not only to invest in the creation of knowledge, but shape the organisational activities in order to exploit their potential in order to achieve the desired organisational performance. This perspective changes the way cause and effect are conceived and measured in practice. As shown in the Figure 15 in fact, the unidirectional flow suggests that the cause should be measured first, then the mediating capacity second and finally the effect of the two through the use of a performance measurement system.

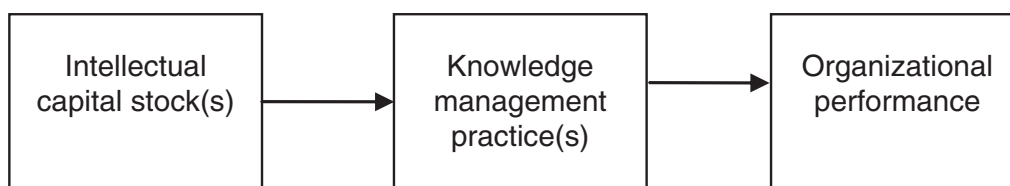


Figure 15 - Knowledge management as a mediator. Source: Kianto et al. (2014). 'The interaction of intellectual capital assets and knowledge management practices in organizational value creation'

The existing frameworks for managing knowledge have contributed to stress the importance of taking non-financial information into consideration when deciding the strategy to undertake in the medium and long term. They have in fact highlighted the importance of balancing leading and lagging

indicators to build the performance measurement system of an organisation. Furthermore, they have been used as important communicational tools for both internal and external stakeholders. Starting from the Balanced Scorecard (Kaplan and Norton, 1992), passing to the Skandia Navigator (Edvinsson and Malone, 1994) up to more recent contributions such as the Knowledge Assets Value Map (Carlucci & Schiuma, 2007), we have witnessed important contributions that still now represent important starting points in order to bridge the gap between the design of the strategy map and the development of strategically relevant KPIs that capture the sources of long term competitive advantages. Generating and refining a model of performance measurement is in fact important to identify the hierarchical components of value, systematically breaking down the structure in order to eventually achieve meaningful and quantifiable indicators of performance and clearer view of knowledge resources (Hu *et al.*, 2015). The Balanced Scorecard for example has allowed management to have a comprehensive overview of how their business is structured and the causal linkages that connect the four perspectives, namely the customer perspective, internal business processes, learning and growth and the financial perspective. However, the causal linkages shown are often the result of a dialogical and subjective process that may sometimes lead to incorporate biased information.

However, limitations linked to the static nature of the previously mentioned performance measurement systems have paved the way for the development of more dynamic knowledge management tools. The recent focus is concentrated on the development of integrated instruments where KPIs are determined by considering the interconnectivity between value drivers. Organisations, especially those that are knowledge driven, normally have a dynamic and interconnected system. Understanding the connections can give way to important breakthroughs in this field and provide management with a more holistic framework. As Hu *et al.* (2015) notice, the balanced scorecard may favour the emergence of information overload and judgement biases, that therefore brings along complexity and erroneous weightings. Hence, the need to

synthesize the information contained in the BSC through the use of analytical tools such as the Analytical Hierarchy Process (AHP) or the Analytical Network Process (ANP) whenever the complexity requires it in order to establish more precise weightings and priorities, giving the management more comprehensive instruments to take informed and coherent decisions.

Understanding and creating the interconnections

Cause and effect linkages can be studied through several approaches, one of which is to create logical connections among components of a system, starting from some assumptions and deducing their possible interrelatedness (Goepel, 2013). This approach may lead to excessive simplifications and erroneous interpretations of the actual interdependencies that shape the system due to personal biases or information asymmetries, where interpretations may sometimes be misleading and lack the objectivity needed for coherent decisions to be made. For this reason, the following section is dedicated to analyse two analytical methods that can help managers have a clearer idea of the components and interconnections among the value drivers of a firm that concur to construct a competitive advantage.

Analytic Hierarchy Process

The first method is the Analytic Hierarchy Process (AHP). AHP is mostly used in multi-criteria decision making, planning, resource allocation and conflict resolution (Saaty & Vargas, 2006). It is a non-linear framework that from subjective inputs or in some cases even thanks to actual measurements, synthetically represents the consolidated result by providing ratio scales (Goepel, 2013), giving decision makers the tools to assess the trade-offs involved in the various alternatives at their disposal.

The aim of AHP is to analytically study the factors that contribute to the realisation of a company's success, giving managers a clearer view of what to prioritise and the relative weightings of the criteria (macro determinants that

define the competitive advantage of a specific organisation) and sub-criteria (KPIs), that should be then related to the different alternatives (decisions to be made that incorporate certain outcomes). Thus, the objective is to obtain a ranking of the alternatives at decision makers' disposal with respect to the criteria and sub-criteria in order for management to be more aware of the consequences of their decisions and how they relate to the corporate objectives in the short, medium and long term. It is important to establish criteria that is materially relevant, giving the opportunity to set the right set of KPIs that express the alignment with the overall goal.

The various steps involved in building a hierarchical structure are:

- (i) Definition of the overall objective (e.g. a long term sustainable competitive advantage)
- (ii) Structuring the criteria, relative sub-criteria for the benefits and costs related to the overall objective (e.g. value drivers and relative KPIs)
- (iii) Establish the various alternatives that we want to rank according to the previous criteria and the best fit with the outlined objective (e.g. different strategic plans of action)
- (iv) Make pair-wise comparisons of the elements in each hierarchical level in relation to the upper level on a scale (e.g. the relative importance of criteria 1 to criteria 2 in relation to the achievement of the overall goal)
- (v) Calculate the weightings by normalising the numerical results obtained in the matrix of the pair-wise comparisons
- (vi) Rank the alternatives

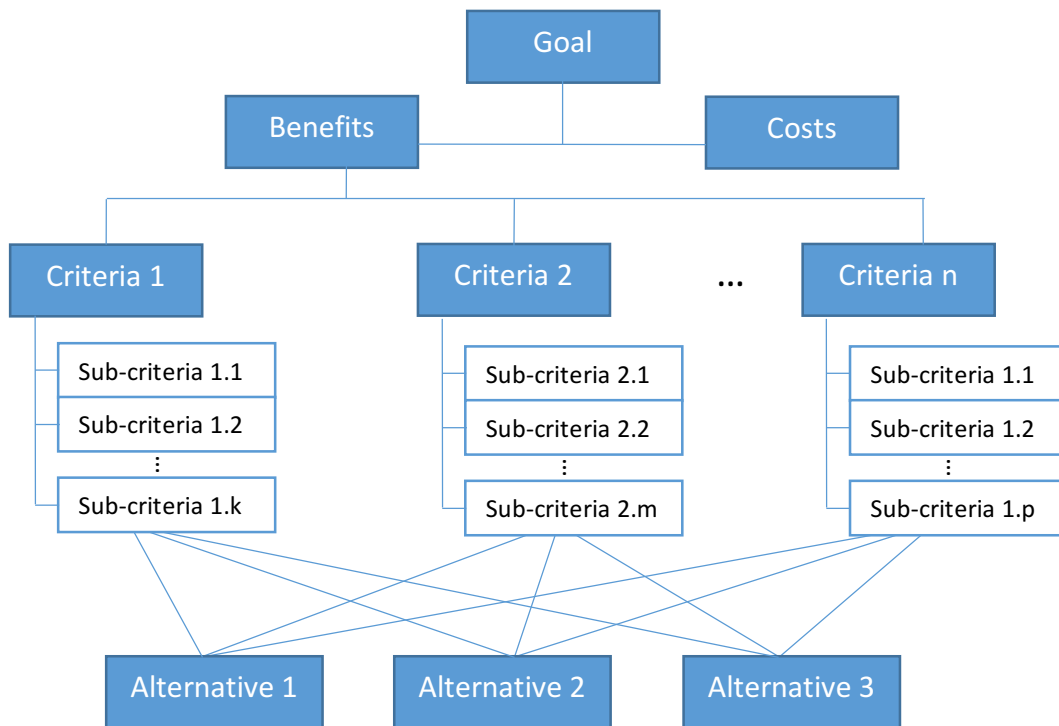


Figure 16 – Deconstructing the hierarchical structure of value drivers

Paired comparisons

The actions required in order to build the AHP model up to step (iii) are a result of deductions or previously conducted sensitivity analysis that has identified the specific value drivers that concur to the achievement of a competitive advantage. In fact, when performing this first assessment, it is common to make a comparison in relation to past performance, therefore relying on sensitivity analysis (Saaty & Vargas, 2006) and statistical regressions in order to recreate observable patterns and linkages that are not clearly visible or that are underestimated. Thus, senior management (either individually or in group) is directly involved because of their comprehensive understanding of the way the firm operates, especially when hard data is missing and there is the need to include estimates. This is a fundamental step because its outcome can affect the entire validity of the model, suggesting that senior management and experts should be involved in the development of: (i) a hierarchy and then (ii) generate

pairwise comparisons (Hu *et al.*, 2015). This can decrease ambiguity, in favour of a more holistic and comprehensive framework.

The next step involved in the creation of the quantitative model involves an assessment of each value driver's relative impact on the organisation's ability to build a competitive advantage compared to the other set of value drivers that have been identified. Therefore, the relative impact on the creation of core competencies that contribute to explaining how the firm can outperform competition in the long term. For the purpose of our focus on how integrated reporting may impact decision making processes, management may incorporate all the criteria that reflect the pursuit of a sustainable competitive advantage with the aid of the six capitals framework.

The way AHP is conceptualised in practice is through the use of a matrix, $n \times n$ (n is the number of criteria we are comparing), which is structured by comparing all the elements of the same level of the hierarchy vertically and horizontally. If we have a matrix Each number placed inside the matrix, x_{ij} , refers to the relative importance that the element i has over element j in the column in relation to the upper level criterion, hence the goal that we wish to study (i.e. competitive advantage, profitability, cost etc.). Saaty & Vargas (2006) propose a scale of absolute numbers in order to guide the actors that are responsible for conducting the comparative analysis, hence the matrix that incorporates the relative weights. The scale uses numbers from 1 to 9, whereby 1 corresponds to an equal impact of the two elements considered and 9 an extremely bigger impact of element i in relation to j (accordingly, when we read the relative importance of j in relation to i , we will find the reciprocal value. The Figure 17 below summarises the generally accepted scale used in order to interpret the meaning of the values that should be used in order to complete the pairwise comparison of the elements that make up the system.

Intensity of Importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to the objective
2	Weak	
3	Moderate importance	Experience and judgment slightly favor one activity over another
4	Moderate plus	
5	Strong importance	Experience and judgment strongly favor one activity over another
6	Strong plus	
7	Very strong or demonstrated importance	An activity is favored very strongly over another; its dominance demonstrated in practice
8	Very, very strong	
9	Extreme importance	The evidence favoring one activity over another is of the highest possible order of affirmation
Reciprocals of above	If activity i has one of the above nonzero numbers assigned to it when compared with activity j, then j has the reciprocal value when compared with i	A reasonable assumption
Rationals	Ratios arising from the scale	If consistency were to be forced by obtaining n numerical values to span the matrix

Figure 17 - Scale to construct pairwise comparisons. Source: Saaty & Vargas (2006); Decision Making with the Analytic Network Process

Criteria comparisons	Financial	Manufactured	Intellectual	Human	Social & Relationship	Natural
Financial	1,00	3,03	3,00	3,00	5,00	4,00
Manufactured	0,33	1,00	0,33	0,20	4,00	1,00
Intellectual	4,00	3,00	1,00	1,00	0,33	4,00
Human	0,33	5,00	1,00	1,00	7,00	1,00
Social & Relationship	0,20	6,00	3,00	0,14	1,00	0,33

Natural	2,00	4,00	0,25	1,00	3,00	1,00
Sum	7,86	22,03	8,58	6,34	20,33	11,33

Table 8 – assigning relative importance to the various criteria

For the sake of our explanation, Table 8 above portrays a series of numerical values that correspond to the importance of the first level criteria of our hypothetical model, hence the various capitals that a firm may affect and the relative importance between them according to the strategic priorities that management perceives. This is what is called the Criteria Comparison Matrix [C] and can be either created by agreeing on the different values to put into one matrix or, on the other hand, by inserting the geometric mean value if different people are asked to fill out their own comparisons. The numbers used are random and respect the principle according to which the element x_{ij} , given any i or j , has the reciprocal value of element x_{ji} (and is therefore perfectly consistent). However, in practice, especially when more than one participant is asked to compare two criteria and their relative importance, there may be issues regarding the consistency of the results. For this reason, a consistency index will have to be computed in order to test the reliability of the comparisons made. At the same time, all the numbers across the diagonal will by definition be equal to 1.

The next step is to normalise the values found and create the Normalised Comparison Matrix, whereby each element $x_{h,k}$ is obtained by dividing x_{ij} by the sum of the values in each column (Table 9 below)

Normalised values	Financial	Manufactured	Intellectual	Human	Social & Relationship	Natural
Financial	0,13	0,14	0,35	0,47	0,25	0,35
Manufactured	0,04	0,05	0,04	0,03	0,20	0,09
Intellectual	0,51	0,14	0,12	0,16	0,02	0,35
Human	0,04	0,23	0,12	0,16	0,34	0,09
Social & Relationship	0,03	0,27	0,35	0,02	0,05	0,03
Natural	0,25	0,18	0,03	0,16	0,15	0,09
Sum	1,00	1,00	1,00	1,00	1,00	1,00

Table 9 – Normalised comparison matrix

The next step is to calculate the average value of each row in order to obtain a ranking of the criteria (Table 10) listed in the matrix and therefore the weightings of importance, also called Criteria Weights, hence the $\{W\}$ vector. This establishes an important step from a first qualitative assessment to a quantitative result that is able to put together people’s perceptions and summarise them into a numerical scale. From our example we can see that Financial capital has the highest relative importance, followed by Intellectual capital. While Manufactured capital has obtained the lowest rank.

	Criteria weights (W _i %)
Financial	28%
Manufactured	7%
Intellectual	21%
Human	16%
Social & Relationship	12%
Natural	14%
Sum	1,00

Table 10 – Finding the criteria weights

As mentioned before, a consistency test is conducted to assess whether rankings are reliable. First of all it is necessary to calculate the sums vector (W_s) as the vector product between the comparison matrix and the criteria vector calculated before: $\{W_s\} = [C]\{W\}$. Then the consistency vector as $\{consistency\} = \{W_s\} \times \left\{\frac{1}{w}\right\}$. From the latter we then calculate the Consistency Index as $CI = \frac{(\lambda - n)}{(n - 1)}$, where λ represents the average of the elements of the consistency vector and n the number of criteria. Finally, the consistency ratio is determined by dividing the Consistency Index by the Random Index (which varies according to the number of criteria we are assessing), hence $CR = \frac{CI}{RI}$. As suggested by Saaty (1999, 2006), the consistency ratio should be lower or equal to 0.1 in order to be in an acceptable range. For $CR > 0.1$ the pairwise comparisons should be reviewed. However, this could turn out to be a weakness of this model because the actors involved are forced to review their initial judgements and may end up putting new weights that don't reflect the actual priorities.

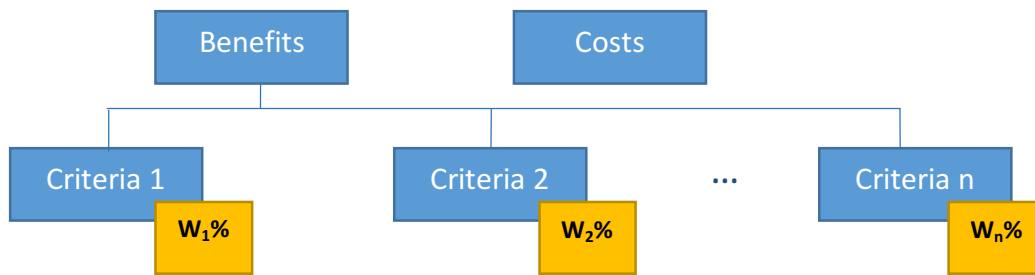


Figure 18 – Assigning weights to the different criteria

The weights of criteria are therefore represented for each criteria i as a percentage in order for decision makers to keep their quantitative relative importance into consideration in the next stages. Weighing the different criteria is important in order also to communicate in what way the organisation intends to compete, therefore serving as a communicational instrument for unit managers and employees of the organisation to understand what priorities to put forward and how to balance their efforts according to the strategy of the firm. If portrayed in the integrated report it can also be communicated to investors and other key stakeholders that can better appreciate what the organisation is prioritising and assess whether the efforts undertaken reflect the strategic orientation or not. For example, if it turns out that human capital is the most important asset of the firm, how are its employees' potential and satisfaction assessed? This is important to assess gaps in performance and relate them to the primary causes of variances whenever they appear.

The same operation is repeated for each level of the hierarchy identified. For the assessment of sub-criteria, that may be represented by the key performance indicators of the criteria identified previously, the process may be divided into two stages. Therefore, a comparison of sub-criteria within the same group is made in order to establish which KPIs are more aligned with the organisational strategy under a specific perspective only. For example, the sub-criteria of financial capital may be represented by all those KPIs that reflect the financial objectives of the firm. The questions to ask in the assessment of sub-

criteria are essentially two: the first will be how many KPIs should be selected for each criteria. This stage may be necessary in order to filter the most relevant KPIs for each criteria i (for $i = 1, \dots, n$) and concentrate the organisational resources in order to achieve the performance level required. Problems may arise in fact if there are too many KPIs for certain criteria because they might be in conflict with each other. Furthermore, monitoring each one involves deploying resources that could be used differently. Secondly, another assessment will deal with the overall balance of the KPIs chosen, understanding whether they are not in conflict with each other. Under the circumstance of the established goal being the long term competitive advantage of the organisation, the KPIs will therefore have to avoid being focused too much on the short term maximisation, as this could be in contrast with the long term mission and negatively affect the sustainable development path.

Table 11 below summarises the set of KPIs and the results obtained from the pair-wise comparison ($W_{i,j}$), that are expressed in percentages in order to reflect their weight. If we then multiply each result for the weight of the upper-level criteria, we obtain the overall weight ($OW_{i,j}$) that the individual KPI has.

Criteria ₁ (W ₁ %)			Criteria ₂ (W ₂ %)			Criteria _n (W ₃ %)		
KPI _{1,1}	W _{1,1} %	OW _{1,1} %	KPI _{2,1}	W _{2,1} %	OW _{2,1} %	KPI _{3,1}	W _{3,1} %	OW _{3,1} %
KPI _{1,2}	W _{1,2} %	OW _{1,2} %	KPI _{2,2}	W _{2,2} %	OW _{2,2} %	KPI _{3,2}	W _{3,2} %	OW _{3,2} %
KPI _{1,3}	W _{1,3} %	OW _{1,3} %	KPI _{2,3}	W _{2,3} %	OW _{2,3} %	KPI _{3,3}	W _{3,3} %	OW _{3,3} %

...
KPI_{1,k}	W_{1,k}%	OW_{1,k}%	KPI_{2,m}	W_{2,m}%	OW_{2,m}%	KPI_{3,p}	W_{3,p}%	OW_{3,p}%

Table 11 – Calculating the local priorities of each KPI

Although many investors still up to date still assess and give more weight to short term financial results, assigning them a higher weight in relation to other criteria, this process of weighing options and fitting the to the corporate strategies has the advantage of giving a holistic overview of the firm’s commitments, justifying how they relate to each other and the connection to long term sustainable development, serving as a driver of change also for investor’s mindset, as they are given the quantitative tools to assess what the firm is prioritising and how it intends to reach those goals.

The next step in the process involves the evaluation of strategic alternatives, that are assessed for their impacts on the previous criteria and sub-criteria. Every alternative will in fact incorporate a series of consequences that can be measured following the six capitals scheme in order to categorise them and weigh them accordingly. Forecasts should therefore be made using this scheme to find the best strategic fit and pursue the path that can more likely guarantee the achievement of the goal. The alternatives might take the aspect of strategic pathways that are being assessed in light of their ability to pursue the best overall benefit to the firm. For example, if a firm has at its disposal a variety of production plants and has to cut down its capacity, deciding which one will be best to invest in will be facilitated by the use of this scheme. The same thing can be said if the organisation has to decide which product it wishes to prioritise, assessing the several impacts that it will have on the various forms of capitals that it influences.

This assessment is made up of the following steps:

- (i) Quantifying impacts under the same parameter, therefore monetary values that facilitates the comparability process.
- (ii) Multiplying the impacts by the overall weight of the KPIs identified previously
- (iii) Adding the weighted impacts together for each alternative in order to obtain a relative ranking of the different alternatives and take a more informed and objective decision
- (iv) Normalising the weighted impacts

Table 12 below summarises the steps discussed under the six capital framework, where all the impacts of the alternatives (A_i with $i = 1, \dots, z$) are evaluated and eventually summed up to assess the overall scoring and rank them. The quantitative measures of the different impacts are noted with QI .

Alternative i (A_i)	
Financial	$\sum_i QI_{1.i} \times OW_{1.i}$
Manufactured	$\sum_i QI_{2.i} \times OW_{2.i}$
Intellectual	$\sum_i QI_{3.i} \times OW_{3.i}$
Human	$\sum_i QI_{4.i} \times OW_{4.i}$
Social & Relationship	$\sum_i QI_{5.i} \times OW_{5.i}$
Natural	$\sum_i QI_{6.i} \times OW_{6.i}$
Total impacts of alternative i	= sum of overall impacts and weighting factors

Table 12 – Calculating the overall impacts of each alternative

Evaluating trade-offs

Performance measurement systems have been criticised for the lack of integration between corporate strategies and relative operations that support the achievement of results. In particular, the inability to evaluate the trade-offs among the different strategic alternatives (Garcia *et al.*, 2016). Although the assessment of sustainability and its ongoing measurement and monitoring may have a negative impact on complexity, particularly when having to take decisions that have a multiple impact on the social, environmental and economic dimensions and having therefore to establish the weights of corporate priorities.

Therefore, even if there may not be an absolute scale under which we can evaluate the different alternatives, we can however assess the trade-offs involved in the exclusion of one alternative to another. We therefore repeat the process discussed above for multiple dimensions under which we want to assess the impacts. In a two-dimensional framework, we may conduct a cost-benefit analysis. This step concludes the AHP. Figure 19 below confronts three likely outcomes of the assessment performed and shows how the choice of one alternative over another is sometimes not so immediate. The two dimensions can be represented on a two-dimensional Cartesian axis, therefore representing each alternative as a different point on the graph after having weighed its benefits and costs. We can in fact compute either:

- 1) Benefit/Cost ratio
- 2) Benefits - Costs.

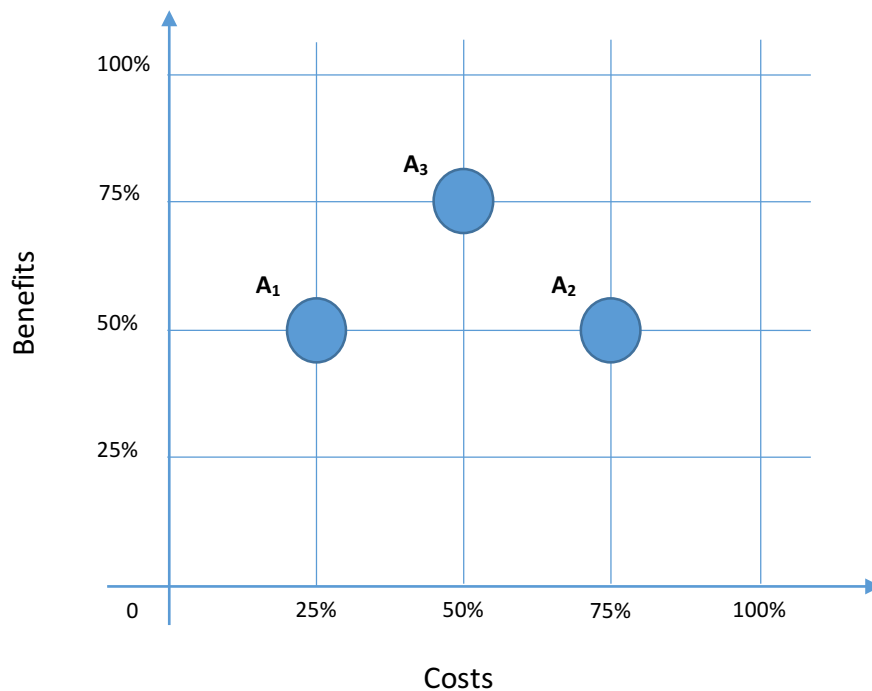


Figure 19 - Evaluating alternatives' benefits and costs to assess trade-offs

In the example reported above, it is straightforward to notice that the alternative 1 (A₁) dominates A₂ because it incorporates the same amount of benefits at a lower relative cost. The same can be said when comparing A₃ to A₂, since the former carries higher benefits at a lower relative cost. However, it is not the so simple when we compare A₁ to A₃, as we have to compute the utility function and establish the trade-offs between the alternatives, hence the amount of costs the organisation is willing to bear in order to pursue a higher amount of benefits.

For a more complete analysis, although more complex because of the increasing difficulty to have all the data at disposal, the overall result would also incorporate other two control parameters on top of benefits and costs, therefore including opportunities and risks. In fact, although more complete, the introduction of other two dimensions carries along more complexity as well, since the assignment of weightings may not reflect the actual priorities of the organisation. By incorporating opportunities and risks into the model the

evaluation process would be similar to the previous, whereby we either compute:

- 1) The ratio $(\text{Benefits} * \text{Opportunities}) / (\text{Costs} * \text{Risks})$
- 2) Additive formula $(\text{Benefits} + \text{Opportunities}) - (\text{Costs} - \text{Risks})$.

Table 13 below summarises the various benefits and downturns associated to the use of AHP in decision making:

	Benefits	Downturns
AHP	Decision problems are synthesised and simplified through a hierarchical structure that allows the decomposition of the objective into its determinants, allowing us to identify the right set of KPIs to track performance	Pairwise comparisons and the computation of the geometric mean may lead to dysfunctional results if the participants have a strong disagreement on the objectives and weightings of its determinants.
	Allows different people to contribute to the consolidated outcome thanks to pairwise comparisons and the calculation of a geometric mean	The inconsistency of results shown by the consistency ratio may be difficult to interpret
	Unites people and promotes constructive dialogue around the competitive factors of an organisation	The AHP may be seen as too mechanical and unfit for dynamic environments where objectives and determinants change rapidly

	Results and calculations are easy to compute, even thanks to the use of spreadsheets such as Excel	The top-down structure does not consider the reciprocal influence that bottom level factors have on the upper level ones, as well as the interconnected factors on the same level of the hierarchy

Table 13 – Summary of the benefits and downturns of AHP

Network Theory

While the hierarchical structure resembles a top-down approach and is conceptually conceived as a unidirectional linear process that allows the goal to be broken down into its critical factors and sub-criteria, and finally for alternatives to be evaluated, a network is multidirectional and considers the loops between different clusters and within the elements of the same cluster. We therefore no longer speak of levels, but of nodes (Figure 20). Of these nodes we can identify different types (Saaty & Vargas, 2006):

- a) Source nodes: exclusively origins of paths of influence
- b) Intermediate nodes: lie in the middle between source nodes and sink nodes, serving as connection points. They connect outer-dependent nodes of the network
- c) Cycle nodes: its elements are interconnected with each other. A loop in fact exists when there is inner-dependence between elements of a node in relation to a certain property
- d) Sink nodes: exclusively a destination of paths of influence

Networks are made up of feedback loops and may sometimes be more appropriate in order to reflect the underlying complexity of the system.

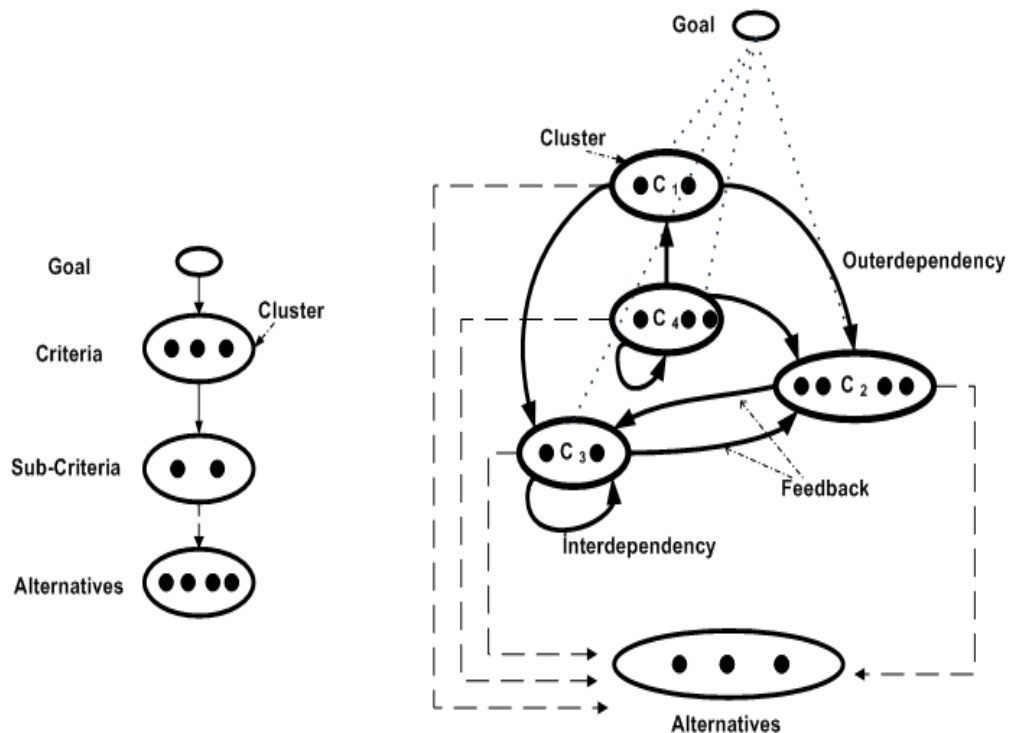


Figure 20 - Differences between AHP and ANP structure. Source: Görener, A. (2012). Comparing AHP and ANP: An Application of Strategic Decisions Making in a Manufacturing Company. *International Journal of Business and Social Science*, 3(11).

Analytical Network Process

The previously mentioned Analytical Hierarchy Process, as the name suggests, is a top-down structure that involves decomposing the overall goal into its criteria and sub-criteria, finally assessing which alternative has a better fit with the overall goal. The top-down structure, although it simplifies the complexity of the organisational structure, it may not fully reflect an organisational setting characterised by a high degree of complexity, where interconnections between the criteria may also play an important role. For this reason, the Analytical Network Process has been proposed.

In ANP, the criteria, sub-criteria and various alternatives are all considered as *nodes* in a network, whereby each node is compared to any other (under the assumption that they are not independent) and considered in relation

to a control criterion. Not only is this method utilised to understand horizontal interconnections, but includes a bottom-up approach that considers the influence that alternatives have on the importance of the criteria, therefore on their weightings. The relationship therefore between nodes of the network becomes bilateral. It is also possible to group different nodes of the same level of the hierarchical structure into *clusters*. Once categories of nodes are put into clusters it is useful to study the priorities to give to the clusters with respect to the goals on top of the local priorities identified in the node-to-node comparison.

Greco *et al.* (2013) and Hu *et al.* (2015), based on the previous work of Saaty (1999; 2006), provide a framework in order to build a managerial tool in order to assess the impact and importance of value drivers on a firm's ability to consolidate its competitive advantage. This approach can be applied to a variety of firms, according to the specific needs and key assets of an organisation. The underlying idea is to follow the approach mentioned before, hence decomposing the determinants of the objective we want to obtain, dividing them into categories in order to classify them and then understanding the various interconnections that exist among them.

The Analytic Network Process is a tool used in order to quantify the 'outcome of dependence and feedback within and between clusters of elements through a super-matrix whose elements are themselves matrices of column priorities' (Saaty, 1999). The ANP is used in order to provide strategic decision support and can incorporate both quantifiable and non-quantifiable data (Hu *et al.*, 2015). The main difference from the AHP (Analytic Hierarchy Process) is that there is no need to establish the levels of hierarchy, rather, we consider the connectivity between elements of the system, similarly to the interconnections that exist in a network. The assumption therefore is that independent criteria does not serve the purpose of reflecting the complexity and level of connectivity of a network. Knowledge resources in fact must not be conceived as isolated from each other, but as a system of interconnected nodes. The main advantage of ANP is that it can help decision makers make more informed and coherent

decisions by predicting possible outcomes and investing on what is believed to deliver the most tangible outcomes. Moreover, it carries along the following benefits (Hu *et al.*, 2015; Saaty, 2006):

- Mitigation of judgement biases
- Incorporation of consistency tests
- Appropriate measurement scales
- Coherency with the utility function of the organisation

Therefore, ANP can be suitable for the purpose of studying the interactions between inputs that define the intricate system of capitals that is described in the integrated report in order to understand what levers of control to prioritise in order to maximise the potential of the organisation's value drivers.

	Benefits	Downturns
ANP	May be more suitable for representing complex organisational settings, having the opportunity to gain deeper insight	Process may be long and difficult to apply due to its complexity and low practicality
	Its objective and generalised application can be adapted to the resolution of a variety of problems	Requires the use of specific softwares to process the results
	It solves the downturns of the top-down approach, adding a	The results are difficult to verify due to the application of

	bottom-up and horizontal approach to achieve a better understanding of the relation between factors	feedback loops and interconnections
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Table 14 – Benefits and downturns of ANP

Building relations between clusters and estimating relative impacts

Through ANP, Greco *et al.* (2013) were able to determine interdependencies between the key inputs of a system, hence the generic value drivers that are most commonly valued in a firm and the properties that define competitive advantages (i.e. Value, rareness, inimitability etc.). The identification phase can be personalised and adapted to specific needs. However, the extent to this depends on the purpose of our analysis. The advantage of personalisation is that it encourages specific organisational needs to emerge and can thus be considered more suitable to foster coherent and consistent internal decision making. On the other hand, if the scope is to make a comparison with other players, therefore assessing relative performance, broader industry level value drivers may be more pertinent. The aim is to infer on the relative weight of key value drivers on pre-established criteria used in order to evaluate the performance of the overall system and the interconnections that exist even among elements of identifiable clusters of the system. The next section is dedicated to explain the necessary procedures to build a universal framework for decision makers.

Identifying the constituents

In order to build the general framework of ANP, adapted to the six capital framework of <IR> there are some standard processes in order to be able to compare the set of alternatives that influence the capitals. In building the generic framework, the underlying assumptions of the model are that the

individual elements of each cluster (KPIs) can be interconnected with each other (interdependence) and with other elements of other clusters as well (outerdependence). Therefore, each value driver can directly influence another one belonging to the same cluster and be affected by other value drivers that belong to other clusters. In this general framework, the connections shown in Appendix 1 are of high complexity because each node of the network is in some degree connected to all the other clusters. All the individual elements have also been connected to each other, making it possible to put all the elements in relation to each other and have a full set of pairwise comparisons. While this is a plausible hypothesis, it is also useful to identify those interconnections that are unlikely and not sufficiently strong to carry on assessing, therefore establishing a certain threshold (expressed in terms of global priority percentage points) under which certain connections are not considered because too weak and uninfluential. Unlikely direct influences are therefore removed in order to keep the scale of calculations lower and concentrate on what is more relevant. Although the calculations are all made by the software Super Decisions (appendix 2 – 9), the amount of pairwise comparisons may decrease significantly and the results may be more reliable. Not only will this simplify the number of overall pairwise comparisons, but the overall decisional process for management as well will be facilitated due to the decrease of decisional variables and assessments to be carried forward.

The first step involves the identification, hence the design of the elements of the firm specific network. The structure of the network that best represents the interconnections of the organisational context may vary in complexity. Therefore, we may in some cases witness few nodes that manage to describe the structural backbone of the organisation's value drivers. Instead, in other more complex realities, the network structure could be better represented by clusters of elements characterised by interdependency and outerdependency. In order to identify the value drivers and properties that are most valuable for an organisation, it is useful to refer to the break-down structure discussed in

chapter 2 in order to start by identifying the strategic objectives up to the individual components. We end up with a tree structure where we can identify the individual components of value, both tangible and intangible, and the corresponding set of KPIs that should be aligned to the long term goal of the company (Lin *et al.*, 2015). However, the tree structure in the ANP is not to be seen from a top to bottom perspective.

The second phase is to identify the local priorities, hence the weight of the nodes in relation to the above level criteria through the use of the Eigenvalues and Eigenvectors resulting from the sub-matrix that considers only 2 levels at a time. In fact, the calculation of the Eigenvector from the comparison matrix gives us the local priorities, whose weights are transferred to the Unweighted Super Matrix (W), that is a partitioned square matrix that describes the influence of the elements in the rows of the and the elements on the columns and is achieved after all the set of comparisons are made.

Only after the normalisation of this matrix do we obtain the Weighted Super Matrix (W_s), obtained by multiplying the Unweighted Super Matrix (W) by the matrix that summarises the weights of the clusters in the network, also called the priority vector (C). After the normalisation, W_s will be made of columns that add up to 1, allowing us to better understand the priorities expressed as relative percentages. The sum of the weights (that make up the priority vector) add up to 1 and are a result of the pair-wise comparisons between clusters made in the previous step.

The following step involves calculating what priority to give to the various strategic alternatives that we want to compare. This is obtained through the process of *squaring* that results in the ranking of alternatives. Squaring involves taking the Weighted Super Matrix and taking it to the power of $2k + 1$, where k is an arbitrary number, large enough to find an approximation of the Limit Super Matrix W^∞ , that expresses the long term mutual influences between elements of the network (Greco *et al.*, 2013).

Chapter 4

Case studies

Case studies

Introduction

In this chapter, I shall illustrate, analyse and compare two case studies of IR implementation. I shall describe how each organisation conceived the nature of PMS and the reality of their context. Moreover, I will illustrate their aims and the methodology used to implement, sustain and measure the impact of their organisational activities.

Case Study 1. SAP: A Holistic View of Performance

SAP is a leading company in the software industry that provides the necessary tools for enterprises to be able to manage and monitor their processes, aligning them to customer trends efficiently. SAP's technologically advanced software is the backbone of today's dynamic and continuously evolving companies that rely on IT to run their business effectively and efficiently. The company's vision and enduring purpose is "to help the world run better and improve people's lives [...] connecting people and technology in real time [...] and helping them reimagine business and life to drive meaningful impact globally" (SAP, 2016).

We can notice from their digitally interactive Integrated Report that SAP interpreted their context as a composite one, requiring interventions of both qualitative and quantitative nature. As their reality is conceived as integrative, IR "is based on the idea that social, environmental, and economic performance are interrelated, with each realm creating tangible impacts on the others". SAP aims to reach a "truly integrated strategy", whereby interconnected activities and structural elements defining the organisation's business model must be understood from personal, qualitative as well as generalised, quantitative perspectives. The reason why it is useful and exemplary to take SAP's integrated report into consideration is because it has achieved a truly dynamic and consistent approach in order to outlay its goals and key factors that allow the goals to be achieved in a sustainable way. The company, differently from the

majority of other companies that publish their integrated report, has developed an interactive form of integrated reporting through its website, therefore allowing its readers to achieve a higher engagement and have a visually enhanced idea of what the company believes in and the intended course of action that it is pursuing in order to reach its goals. SAP in this sense is leading the way to more comprehensive and complete reporting to be developed, serving as inspiration for business worldwide to better acknowledge their scope as well as their impacts. SAP has therefore made a commitment to be transparent with its array of stakeholders, allowing it to capitalise on their support and awareness of how the business is being run. However, the comprehensive nature of integrated reporting should not be aimed at just communicating results and portraying intended strategies, it should also be exploited internally in order to optimise the decision making processes of the company.

The company outlines the strategic commitments and key factors of sustainable growth, highlighting the economic, social and environmental indicators (that comprise tangible and intangible factors) and links them by using a cause-and-effect chain. The company's corporate objectives (namely revenues, profit, employee engagement and customer loyalty) are linked to other key factors of success that allow the goals to be reached. As mentioned previously, the internal use of the integrated report should foster an efficient allocation of resources. Once primary factors are taken into consideration, the decision making process and future resource allocation can be more effective thanks to the re-investment of profits into the company. Knowing in what measure a certain factor can contribute to the achievement of its goals can tell management how much to invest in that specific factor in the future.

Integrated Reporting as driver of corporate objectives

The aim of the company is to link their non-financial to their financial performance. Financial performance is generally reviewed as an all-important

aim. Instead, in their acknowledgement of the consequences on the social and environmental components, SAP's objectives are holistically interpreted as not only in terms of financial results, but also as achievement at social, economic and environmental levels. Coherently with the vision and purpose, SAP has established a list of 17 global goals in order to pursue a sustainable development, ranging from the improvement of the quality of life, to the elimination of any form of inequalities and decent opportunities for everyone up to the active consideration of how climate change is having a big impact on today's and tomorrow's generations.

Methodology

The list of methods used in each phase of the construction of SAP's integrated report is extensive. I shall select and illustrate examples of qualitative and quantitative factors to exemplify their mixed-method strategy, therefore elucidating how the company has managed to interconnect these factors effectively.

Employee Engagement

Employee engagement is conceived as "the level of employee commitment, pride, and loyalty, as well as the feeling of employees of being advocates for their company". Under this category of interventions, SAP includes a range of methods aimed to build employee self-esteem, accountability and empower each employee in order to increase their commitment to the company as well as their satisfaction. These methods consist of discrete interventions aimed to cater for the needs and aspirations of single employees, albeit applied as a generic strategy.

As we can observe in Figure 21 below, employee engagement together with Revenue, Profit and Customer Loyalty are the key corporate objectives of the firm, portraying how diverse in nature they are and how they can have a positive impact on different categories of stakeholders. By highlighting Employee

Engagement it is immediately visible to what extent this single factor can affect and at the same time be affected by several other factors. In fact, as we can observe in the figure below, the BHCI (Business Health Culture Index), Social Investment, Capability Building, Employer Ranking, Revenue, Profit and GHG Footprint are the factors that drive employee engagement.

* Our corporate objectives € Impact on operating profit ■ Economic indicators ■ Social indicators ■ Environmental indicators

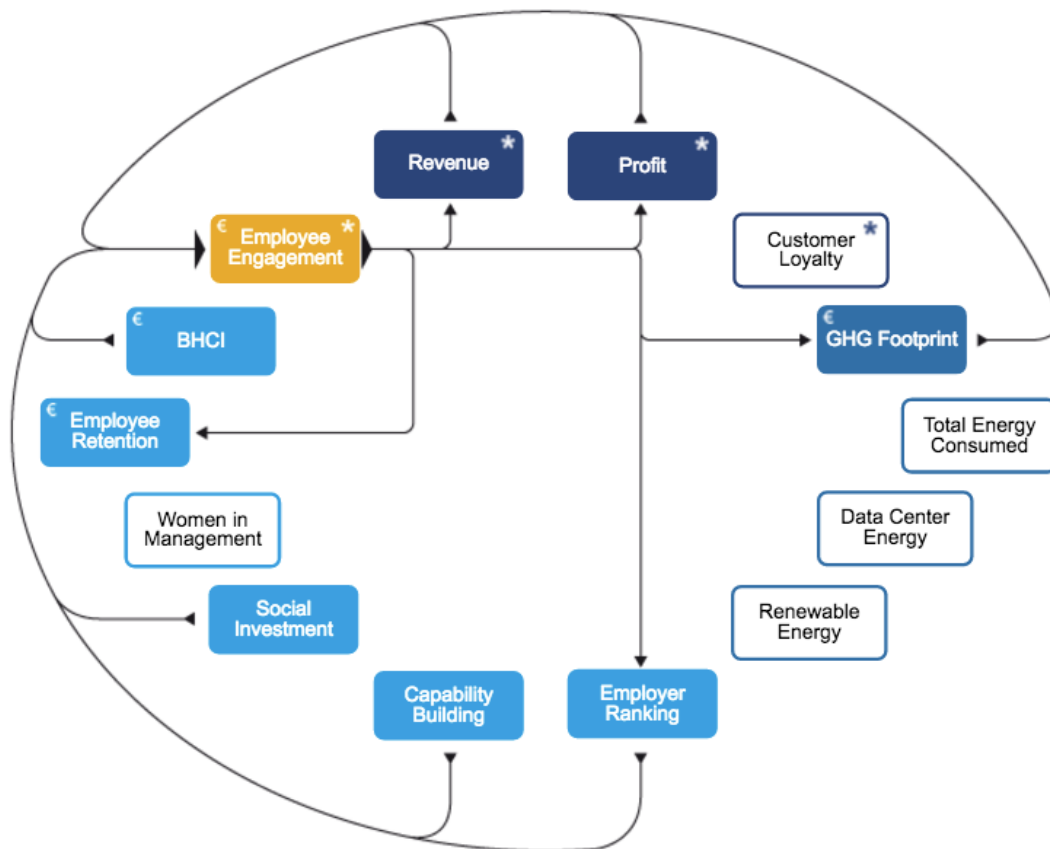


Figure 21 - Employee engagement as a strategic and interconnected factor for SAP. Source: <http://go.sap.com/integrated-reports/2015/en/strategy/integrated-performance-analysis.approach.html>

Out of the mentioned factors there are some that in relation to employee engagement are *source nodes* and therefore not less important than the actual corporate objectives because they are the ones that lead to their accomplishment. This gives an important message to the management of the

company, that will therefore know what to invest in to reach the desired goals². Capability Building (otherwise denoted as career opportunities) has to do with the degree to which a company develops and supports the careers of their employees. In particular, as confirmed also by the corporate policy, internal promotions can have a meaningful impact in terms of commitment and loyalty of the employees. Combining commitment and loyalty will have a positive impact on employee's level of satisfaction and productivity. Social investment (otherwise denoted as corporate social responsibility) is positively related to the commitment of employees to the company. The values and belief systems of employees are therefore important to take into account, as they can be more committed to a company's goals if it perceives it as proactively investing on and accomplishing the sustainable actions that it promises to deliver. The question here would be what are the actual elements of CSR and how to measure their impacts. The second case study will touch these topics more closely and space will be given to understand how to assess not only the quantifiable impacts of our decisions but also the trade-offs that exist among various alternatives. The third source node in relation to employee engagement is identified as BHCI, hence the indicator that measures the degree to which employees are willingly accepting change and other important measures that measure employees' perception of: (i) affiliation and purpose, (ii) leadership styles, (iii) recognition of their work, (iv) empowerment, (v) adequacy of rewards in relation to the value added, (vi) employees' stress level over time and (vii) life balance which measures if employees are managing to reach an equilibrium in terms of their professional and private lives. All the factors mentioned can be assessed by qualitative surveys periodically handed out to employees. Constant monitoring is needed to identify any unintended deviations from the targeted levels or any negative variance from the previous period. By observing the integrated report

² Where the Integrated report is published (<http://go.sap.com/integrated-reports/2015/en/strategy/integrated-performance-analysis.approach.html>) it is possible to deepen each factor in order to understand the individual components that make them up. In this way it is possible to acknowledge what should be invested in and in what measure.

of SAP we notice that the previously mentioned source nodes can be defined as such in relation to Employee Engagement, but if we change perspective and analyse each one individually, we can appreciate how they can be triggered by other factors, therefore equally important to invest on in order to reach the desired goals. For example, the BHCI which is a source node for Employee Engagement is an *intermediate node* in the connection between social investment and profits. The same can be said if we take into consideration the factor 'Women in Management', whereby if the proportion between men and women is balanced, diversity will foster the freedom of expression and employees' propensity to treat one another with respect. By definition, this will positively affect the BHCI index. In turn, as flexible working hours and the ability to work from home are nurtured by the company, the more women can be intrigued and persuaded into pursuing managerial levels. The connection between the BHCI index and Women in Management mustn't be seen as a closed loop, since BHCI has a positive impact not only on Employee Engagement but indirectly also on revenues, profits and customer loyalty. All these elements put together proves the potential of such an innovative and breakthrough integrated report. It has managed to convey the extensive interconnectivity between the company specific value drivers, that guide readers across the complexity of the value creation structure of SAP.

There are also other types of factors, that in the network theory are referred to as either *intermediate nodes*, serving as connections between source and sink nodes. Looking at the integrated report of SAP we can identify different types of clusters, namely the economic, social and environmental indicators that are taken into account. However, there is no information in relation to interdependency among the three clusters of value drivers, therefore on *cycle nodes*. Individual elements of each cluster in fact may be interconnected and mutually reinforcing. Employee engagement can be considered as an intermediate node in relation to the connections between the three macro clusters, but also as a cycle node if we consider the bilateral relation between

Employee Engagement and Employer Ranking, both categorised as social indicators.

The example taken into consideration is useful to acknowledge because it shows how a non-financial corporate objective is intertwined in the company's value creating network. Furthermore, it must also not be conceived as a *final* objective, hence giving it more weight than other value drivers uniquely because it is considered as such. Employee Engagement in fact can not only drive revenues and profits in the long term directly, but indirectly at the same time, hence impacting positively on a broad range of other value drivers that also drive revenues and profits. Employee Engagement is fundamental for the company especially because, as stated on the integrated report, its increase by one percentage point has an impact of around 40-50 million euros on SAP's operating profit.

GHG Footprint

The Greenhouse Gas Footprint is a quantitative expression of the overall "sum of all greenhouse gas emissions that can be measured and reported, including renewable and third party reductions, for example, offsets". Therefore, energy consumption and emissions are placed as one of the key corporate objectives, necessary to achieve a sustainable growth in the long term. Unlike the previous set of interventions, these suggest a quantitative measurement of emissions and energy consumptions, which however are not mentioned or cited. It is therefore difficult to evaluate them individually.

Figure 22 below elucidates how the GHG Footprint can have a large scale impact on other value drivers and other corporate objectives. It can be considered as the connection point between the environmental indicators and the social and economic dimensions, since the other three environmental indicators all have an impact on it.

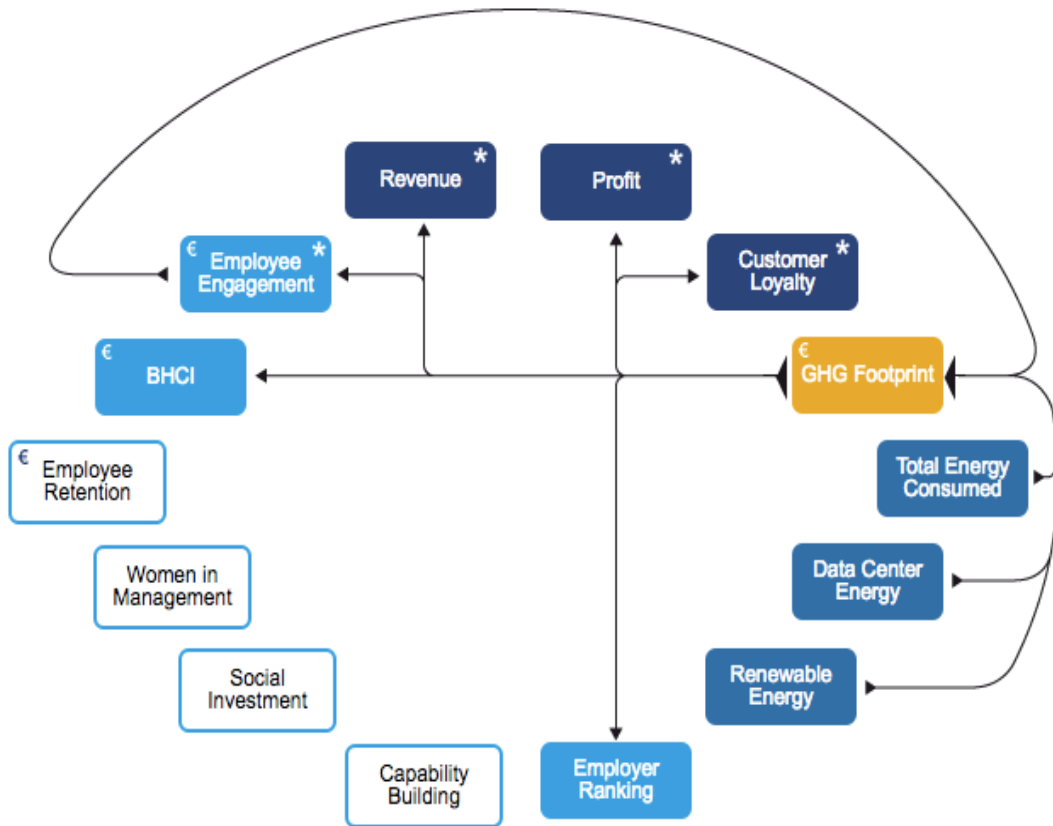


Figure 22 - Showing GHG Footprint can impact and be impacted by other key factors. Source: <http://go.sap.com/integrated-reports/2015/en/strategy/integrated-performance-analysis.approach.html>

From the network visible above we can notice how the GHG Footprint is an intermediate node in relation to a variety of connections between value drivers, both financial and non-financial. In relation to the indicator Employee Engagement it forms a loop of interdependence, whereby investing in lowering the environmental impact of the firm can positively affect employees' loyalty because they feel they are working for a socially responsible firm. However, the firm also recognises that negative effects may arise for the fact that the employees may be asked to travel less in order to reduce the emissions produced, therefore resulting in less engagement in the business' international activities. Viceversa, also the inverse relationship stands, as more engaged

employees are more willing to contribute to lower the company's environmental impacts, recognising that they represent an important part of its strategy.

Both revenues and profits represent sink nodes in relation to the GHG Footprint, confirming that there is a positive correlation between SAP's environmental and financial performance. Moreover, it is also possible to understand the consistency and magnitude of the relationship through the estimation that has been made available for every reader to appreciate, and therefore that for every percentage of Greenhouse Gas Emissions that the company manages to reduce, the operating profit will be positively impacted by four million euros.

How can it inform my gap?

Integrated management systems are key to obtain the integrated report that guides and orients SAP's coherent decision making process. The interconnections and loops that exist between the nodes of the company's network should be analysed by using the Analytic Network Process, means that allows the backbone of the model to be constructed. Together with ANP, sensitivity analysis should also be used in order to investigate whether patterns between the structural elements of an enterprise can be identified through the use of past trends. This last step allows the production function of a company to be quantitatively measured and refined in time. When the external environment can be more easily predicted and the context can be related to past conditions, the sensitivity analysis will be highly informative on how the consequences of corporate actions will take form.

Case Study 2. PwC's TIMM framework

PwC has developed a framework in order to assist companies in having a deeper understanding of the impacts that they have on society and the variety of stakeholders that they are accountable to. At the centre of the framework is the computation of all impacts on a monetary basis in order to standardise and

compare the various impacts on the same basis, reconducting them to what PwC considers as the core of businesses' performance. Whether a company has a for-profit scope or not, reconducting the impacts to a monetary basis can be a useful method to make an ongoing assessment of the amount of resources used and those generated in time. Reporting every activity, product or service on a monetary basis can help show to what extent each one is delivering value to the company in time, allowing comparisons to be made across time, industries, units or between alternative strategic options that the firm should choose from.

To understand how the reporting system can change, a step back is needed in order to understand what can trigger this and how it can be achieved more efficiently. The framework is in fact intended to foster a change in corporate cultures and mindsets. Consequently, businesses can make the leap towards a more modern and integrated way of thinking, hence achieving more awareness around the organisation's impacts on society on a broader basis. Integrated thinking is therefore recognised as a facilitator and catalyst of the shift towards the accomplishment of a holistic Integrated Report (PwC, 2013). PwC calls for the incorporation of integrated thinking into every company's strategic decisions.

As noticeable in Figure 23, the financial performance in this model is at the core of the framework and is structured in a way that highlights the importance of tracking the financial performance of business activities in relation to all the company's stakeholders, namely suppliers, employees, communities, shareholders, governments and customers. This approach enlarges the scope of shareholder value theory, whereby the maximisation regards primarily one category of stakeholders. On the perimeter of the model we find four different categories of impacts, namely the economic, social, environmental and tax. Each of these categories includes several other individual components that make up the KPIs of the framework and that should be assessed in various moments: (i) in the preliminary phase of evaluating the different options that the company can decide to pursue; (ii) during the execution of the selected option in order to

assess the reliability of the initial forecasts and eventually take the necessary measures to put the company back on track; (iii) after certain time intervals to assess periodic performance and detect the sources of eventual variances, therefore limiting future negative impacts, while rewarding positive outcome; (iv) when setting new goals the assessment of KPIs may serve their cause in order to set benchmarks for future performance. It's important that the actors/divisions of the organisation that are responsible for the achievement of the desired impacts (otherwise known as owners of the processes) are identified and have full control over what they are being assessed on.

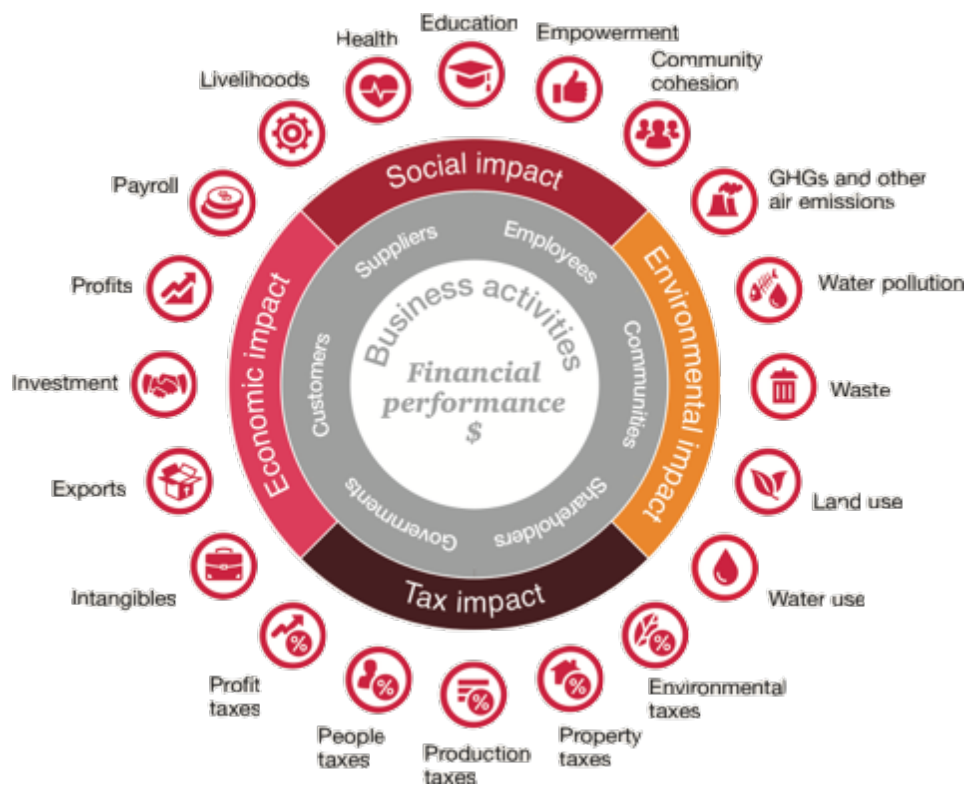


Figure 23 - The dimensions of impacts within the TIMM framework. Source: PwC, "Measuring and managing total impact – strengthening business decisions for business leaders" (2013)

As visible in Figure 24, the framework can be used in order to compare two different and mutually exclusive options that a firm may have to decide upon. The example here illustrates a make versus buy decision, whereby each option is assessed according to the set of different dimensions and respective

KPIs that have been mentioned previously. At a first glance, the main differences between what will be impacted if one option is chosen over the other is immediately visible.

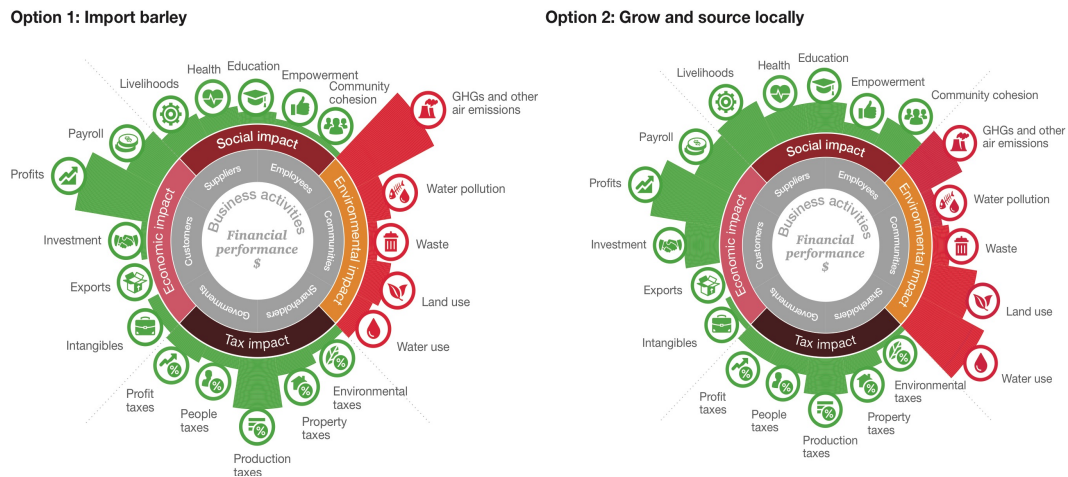


Figure 24 – Comparing impacts in relation to two different strategic and mutually exclusive strategic options. Source: PwC, "Measuring and managing total impact – strengthening business decisions for business leaders" (2013)

As discussed previously, the aim of PwC is to promote the use of its TIMM framework in order for management to have a more comprehensive overview of their performance indicators over time and of the overall impacts on multiple dimensions, providing decision makers the necessary tools to evaluate the trade-offs between one option over another. Nevertheless, with this objective in mind, the model could be improved if the weights of all the measures assessed were also visible. This would highlight the relative importance of each factor, giving the possibility to show how each one played a role in establishing the key factors that contribute to delivering value to the firm and to the array of stakeholders. From this weighting, an overall score could be then assigned to the various options that have been put into comparison. The overall score could assist in the evaluation and should be interpreted as the degree of overall strategic alignment that an option incorporates. In order to calculate the overall score of each option, the AHP approach that has been discussed previously in chapter 3 could

be well suited for the case. Therefore, the weights of the various stakeholders should therefore be decided, giving management a clearer and more comprehensive view to what extent each stakeholder is materially relevant in relation to the company's core values and mission. The same logic should be applied also for the individual components of the four perimetric dimensions of TIMM.

A further improvement on which the model could benefit from (or be personalised according to specific cases) could involve assessing not only the trade-offs between the various options but also the interconnections among individual elements that characterise the system and that define the structural composition of the business model. As discussed in the previous case study, SAP has managed to prepare its integrated report in an interactive way. By following this kind of method, the result would show how each factor is related to one another and to what degree it is related to the achievement of the company's goals. With this in mind, each company should therefore define what its actual goals are and personalise this framework to what it considers as such. Following the ANP approach may therefore be useful in order to assess interconnections between factors and also between the outcomes of the company. As mentioned in the dedicated section, the difference with AHP is that even the degree of mutual relationship between factors on the same level as well as between clusters of the network are assessed.

Chapter 5

Discussion and conclusion

Discussion

Since its origins, one of the primary objectives of the IIRC was to develop a reporting system that would be able to promote and foster sustainability accounting (Flower, 2015). In this regard, there are contrasting opinions among practitioners and academics on whether or not this intention was expressed appropriately and if the current framework can fulfil this expectation. The intention is to provide an incentive for companies to view the reporting of financial and non-financial information as highly interconnected and not as separated information. While profit maximisation is at the heart of corporate objectives, the social and environmental dimensions must not be viewed as peripheral and detached from the financial one, as this could lead to an excessive concentration on short term gain over the long term capacity of delivering value. Integrated Reporting was thus developed in order to respond to the need to develop a holistic reporting system that meets the diverse and dynamic needs of its multiple stakeholders. Furthermore, another underlying objective is to sway managers to push an organisational culture that promotes an innovative way of thinking about business. Therefore, a constructive debate can be promoted about what is materially relevant to the company and how the creation of value can be sustained in the long term. An excessive focus on short term financial gain, along with the negligence of the social and environmental dimensions can make an organisation lose sight of the different dimensions of value on which it is important to invest in. The risks and impacts of not embedding sustainability issues in the corporate structure can have a potentially significant long term financial consequence (Adams, 2015). This has highlighted the importance of embedding strategically relevant, qualitative and non-financial KPIs into the company's performance measurement system. The current research has shown how integrated reporting can manage to facilitate this objective, hence by extending the boundaries of conventional MCSs in order to embed sustainability issues into the corporate strategy. This is achieved by leveraging on the integration of social and environmental KPIs into the performance measurement

system of the company, they can lead to an equal if not greater financial gain in the long term. In order for the benefits to be reaped, a quantitative assessment of each connection to the set of financial KPIs should be shown in the integrated report, making the cause and effect linkages clearly visible.

While it is still too early to assess the actual impacts of this innovative reporting system on a wide scale, mainly due to the fact that in the international context only few organisations have undertaken the challenge to actually implement it, we are witnessing the slow diffusion of a different way to perceive corporate success and the way organisations report it. In fact, for an organisation to reap the benefits of integrated reporting, it must be ready to embrace change under different perspectives. In particular, it must be ready to adapt the accounting systems and management processes accordingly in order to pursue a truly integrated business model. In this way, the integrated report will not just be an accounting outcome, but will reflect the degree of the interconnected organisational context. In fact, accounting for sustainability is not just a means to respond to external changes, as it can positively and directly influence the organisational structure and the degree to which environmental performance is embedded into corporate strategies. As Lai *et al* (2014) point out, publishing an integrated report – for now a voluntary disclosure with the exception of South African companies – may in some cases be used as a legitimisation strategy in order to influence external perceptions of the organisational performance. As the previous authors also notice, distinctive internal capabilities have to be developed in order to fully commit to the practice of integrated reporting.

In light of the call for internal procedures to be further analysed, the aim of this research was to better understand the implications that Integrated Reporting may have on the organisational context from a variety of perspectives. Alongside the benefits that <IR> may deliver to external stakeholders, hence the increased transparency over the organisational performance and business model (Stacchezzini *et al.*, 2016), this study was mainly concerned with the internal implications and design of management control systems in order to foster the

desired level of integration. Research was therefore conducted in order to achieve a better understanding of the correlation and influence that integrated reporting may have on management control systems, on the corporate culture and how the integration process can be intended from a dynamic perspective. In other words, the focus was on the organisational requirements that would foster this reporting system to have a significant impact and drive the change pledged by the promoters of <IR> and align corporate performance in order to meet stakeholders' expectations.

The main results and outcomes of this research revealed that the integration of management control systems and sustainability reporting is a socio-technical process that stems from the overlap of three core factors: the technical, cognitive and organisational dimensions. The technical dimension is concerned with the design of an informational infrastructure necessary to build a common information system to incorporate the adequate set of sustainability indicators that support a coherent and effective decision making process. The second dimension is the organisational integration that is concerned with the roles and responsibilities that can empower employees and enhance the level of connectivity across the firm. The third dimension of the integration process is concerned with shaping the organisational culture, that helps ensure that constructive dialogues and interpretations of sustainability are conceived under a common perspective, hence promoting efforts to be aligned.

Furthermore, it was also possible to identify various key stages of the integration process between MCSs and SCSs, characterised by different degrees of stability, frequency and the extent to which the triple bottom line is developed. By leveraging on these three factors it is possible to move along the continuum, outlining different viable paths for the organisation. Moving along the continuum may be required in order to control and rationalise sustainability management through a diagnostic use of control systems (demobilisation strategy) or, on the other hand, implement control systems interactively to tackle transitional phases of uncertainty or external pressures that require the

organisational members to promote mutual learning and more internal collaboration (mobilisation strategy). The conceptualisation of the continuum of integration has set the basis for other studies to be conducted in order to identify the technical, cognitive and organisational enablers and barriers that allow sustainability to be effectively integrated into the performance measurement system of an organisation and further embedded into strategy.

Another significant finding relates to the understanding of the impact that integrated reporting may have on the cultural dimension of the organisation, that may be promoted through what has been defined as 'integrated thinking'. More specifically, integrated thinking represents the backbone of integrated reporting, that sustains the organisational culture to move in the necessary direction to reap the benefits of integrated reporting. Shaping the culture of an organisation is important in order to make its actors embrace a soft system thinking approach. At the heart of this approach is generative reasoning, that has the potential to introduce more irrationality and enhance the degree of information sharing inside the company. Blending a formal and informal control system can in fact result in the reinforcement of internal relationships and interactions among organisational players, that can boost the level of connectivity and collaboration. This leads to more empowerment and sets the ground for mutual learning to thrive across the organisational boundaries, therefore fostering more innovative ideas. Moreover, the promotion of a soft systems thinking and the foundation of sustainability into the control systems of the organisation can allow decision makers to better understand the tension between various capitals that the firm influences and is affected by.

This research has also added value to the previous literature by meeting the request of further examining the tensions among capitals. At the current moment, <IR> is still far from being a mature practice, and many organisations are facing difficulties in assessing the interconnections that define their specific business model (Mio, 2016). In light of this, a framework was developed in order

for decision makers to acquire the instruments to quantitatively assess the nature and interrelation between the organisational value drivers. Emphasis was therefore given to the design and necessary steps to implement a conceptual framework that can provide managers with a useful tool to consolidate their understanding on the connections between the company's value drivers and the different dimensions of corporate impacts. Evaluating and understanding the variety of corporate impacts can allow the management to dedicate and further allocate the appropriate amount of resources to ensure a long term competitive advantage in a sustainable way. In doing so, trade-offs will have to be assessed among the different operational alternatives that the organisation has identified in order to ensure the highest degree of strategic alignment with corporate goals. According to the level of complexity that describes the business model of the firm and the needs of its users, decision makers may decide to implement either an Analytical Hierarchy Process or Analytical Network Process in order to infer on the structural relationship between the key factors of the organisation's competitive advantage. In some contexts, a hierarchical structure can be suitable to define the relationship among value drivers, but in other contexts defined by a higher degree of complexity, a network structure will be more suitable to assess the interconnections.

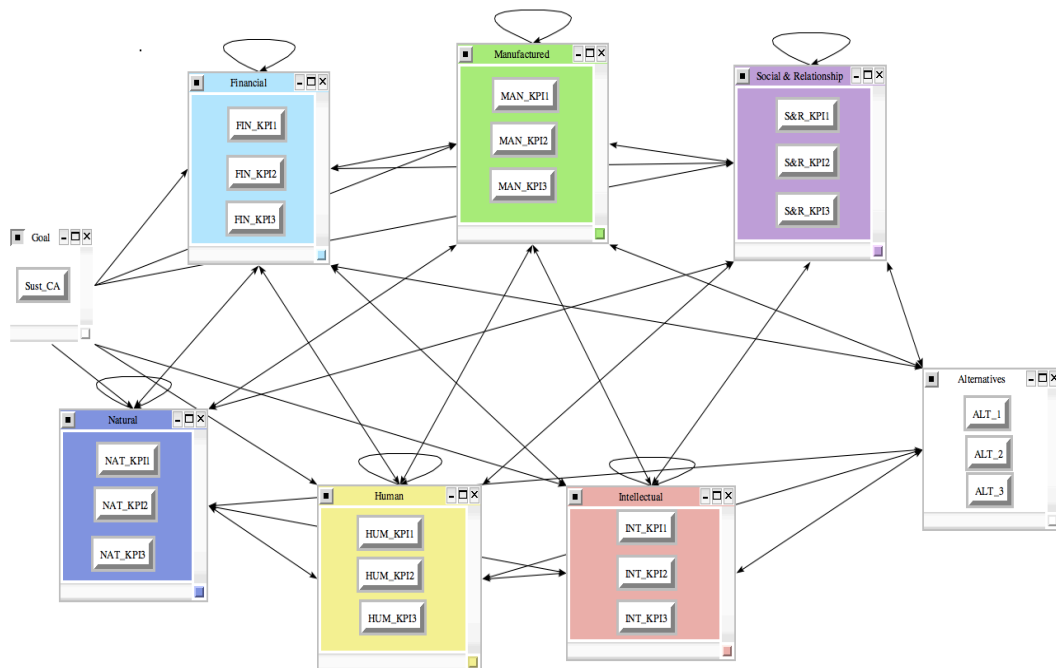
Case studies were provided in order to critically assess the practical applications of Integrated Reporting as well as the assessment of capital impacts. The first practical case in fact refers to the innovative integrated report that SAP has published online, paving the way for the next generation of interactive and transparent reporting that outlines all the set of priorities and efforts undertaken in order to reach its corporate goals, quantitatively measuring the impacts of each initiative and showing the cause and effects of each in order to give the reader the tools to better interpret the flow of value relevant information. The second case study refers to the quantitative tool implemented by PwC in order to assess the trade-offs between financial and non-financial information, with the aim of selecting the appropriate strategic alternative that has the highest fit

with the organisational priorities. This case study has been useful to show how even non-financial information can be measured using a monetary basis, therefore utilising reconducting measurements to a common basis in order to assess the corporate impacts.

Conclusions

Further research could be devoted to further analyse on who the ownership of the necessary internal processes falls on, therefore better explaining the role that organisational members have in assuring compliance and internal motivation in order to reach the desired level of integration. This study may be extended to include the study of qualitative factors such as the influence that the leadership style has on Integrated Reporting. Furthermore, as the users of Integrated Reporting increase over time, more longitudinal analysis are needed in order to reinforce the empirical evidence of the current research's findings, therefore conducting more research around the enablers and barriers of the integration process that have not been empirically validated on a sufficient base of companies. More focus should be addressed to further develop the set of requirements that can guide management accountants to disclose the movements of capitals in a way that can guarantee consistent and more concrete comparisons over time and organisations. As discussed in the materiality section, since the integrated report changes significantly across industries, efforts could be undertaken in order to set specific guidelines in order to align the outcomes of corporate disclosures and increase the degree of comparability.

Appendix



Appendix 1 - general structure of the set of clusters that make up the general network designed using the conceptual framework of the six capitals for its structure. The clusters are identified by: (i) the goal of the company, hence the sustainable competitive advantage, (ii) financial, (iii) manufactured, (iv) human, (v) social & relationship, (vi) natural and (vii) intellectual capitals of the firm, on top of which there is also the (viii) cluster of alternatives, that both affect and are affected by the various clusters of capitals. The goal cluster links to each of the clusters that identify the forms of capitals. This will be important in order to establish in what measure the various forms of capitals can be relevant to achievement of the sustainable competitive advantage of the company.

In each cluster we can find three set of KPIs, hence the three most relevant set of performance indicators that reflect predetermined outcomes that are strategically relevant to the company. The arrows that connect the clusters indicate that at least one element of the cluster from which the arrow starts affects another element of the connected cluster. If the arrow is bidirectional, then there are at least a couple of elements, one in each cluster, that influence

each other. The circular arrow indicates that at least one element in the cluster is connected to another element in the same cluster. The network above shows that the different alternatives do not influence each other and are therefore independent alternatives between each other. For demonstrative purposes only, it is assumed that each alternative affects all the elements of the network, but the degree to which they do so is different, and this will be critical in order to understand the ranking of the alternatives and take a coherent decision.

The screenshot displays a software interface for pairwise comparisons. It is divided into three main sections:

- 1. Choose:** Includes options for 'Node' and 'Cluster', and a 'Choose Cluster' dropdown menu.
- 2. Cluster comparisons with respect to Goal:** Features a 'Matrix' tab and a comparison statement: "Financial is 6 times more important than Human". Below this is a pairwise comparison matrix with values:

	Human	Intellectu~	Manufactur~	Natural	Social & ~
Financial	-	6 (blue arrow left)	5 (red arrow up)	5 (red arrow up)	0 (blue arrow left)
Human	-	-	3 (blue arrow left)	3 (blue arrow left)	1 (blue arrow left)
Intellectu~	-	-	-	3 (blue arrow left)	3 (blue arrow left)
Manufactur~	-	-	-	-	0 (blue arrow left)
Natural	-	-	-	-	4 (red arrow up)
- 3. Results:** Shows a table of results with an inconsistency index of 0.32611.

Cluster	Weight
Financial	0.15758
Human	0.11862
Intellectu~	0.36196
Manufactur~	0.02708
Natural	0.16013
Social & ~	0.17463

Appendix 2 – From a first assessment on pairwise comparisons, in relation to the Goal cluster, the various measures that we find in the matrix reflect the relative importance of each couple of clusters in order to achieve a sustainable competitive advantage. We can notice on the right hand side that a first intermediate result is visible, hence the weight of the various forms of capitals in relation to the company’s goal. Random numbers have been placed so the inconsistency index is above 0.1, identified by Saaty (2006) as the threshold over which it is recommended to repeat or revise the pairwise comparisons. However, in this hypothetical context it would mean that the intellectual capital has a relatively higher weight than the other forms (36%), followed by social and relationship capital (17%). The manufactured capital instead only scores around 2%, which means that it has a low influence over the long term competitive advantage of the firm according to the managers who have conducted the pairwise comparisons and eventually relied on historical data in order to reach that conclusion.

1. Choose 2. Cluster comparisons with respect to Financial + 3. Results

Node Cluster Graphical Verbal Matrix Questionnaire Direct

Choose Cluster
Financial

Natural is 4 times more important than Manufactured

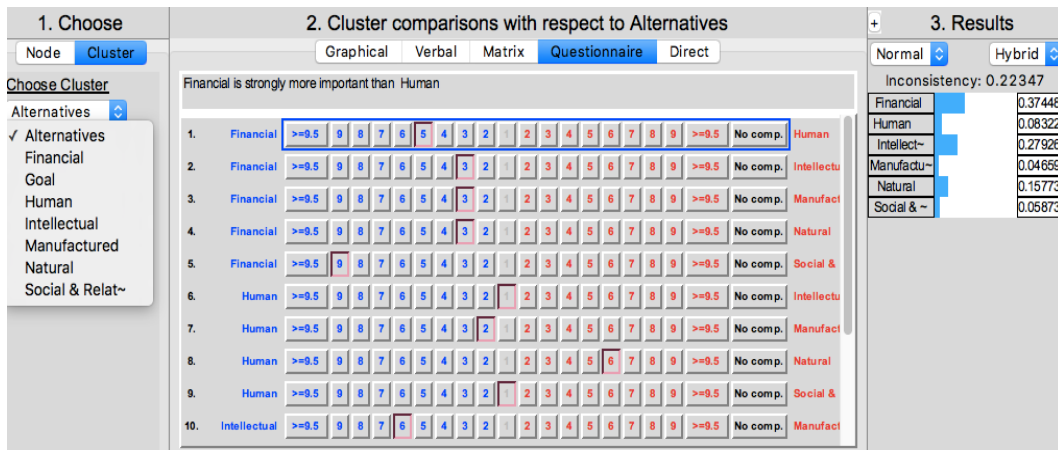
Inconsistency	Financial ~	Human ~	Intellectu~	Manufactur~	Natural ~	Social & ~
Alternativ~	← 0	← 0	← 0	← 0	← 0	← 0
Financial ~		← 2	← 2	↑ 3.000	← 2	↑ 3.000
Human ~			← 6	← 1	← 1	← 3
Intellectu~				← 1	← 0	← 5
Manufactur~					↑ 4	← 1
Natural ~						← 4

Normal Hybrid

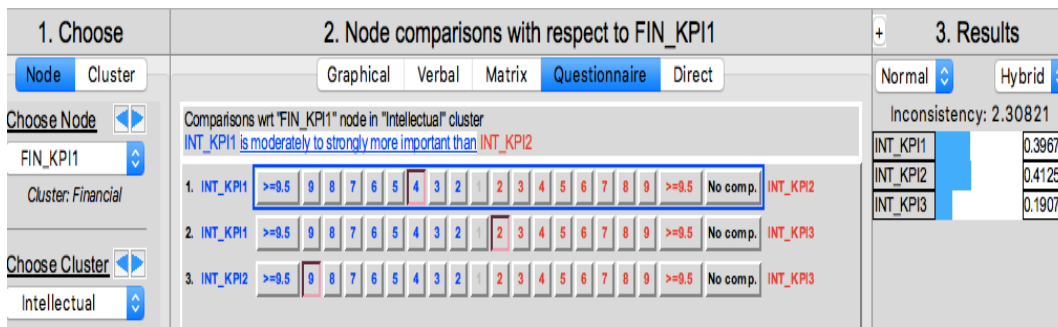
Inconsistency: 0.26989

Alternati~	0.00000
Financial	0.17106
Human	0.22143
Intellect~	0.13443
Manufactu~	0.14417
Natural	0.21591
Social & ~	0.11300

Appendix 3 - The software then provides different ways to input the results of the pairwise comparisons: either graphically, verbal input, through the matrix, directly or through the questionnaire mode. In this particular example the pairwise comparison involves taking into consideration each set of cluster and establishing their relative importance in relation to the Financial cluster on a scale from 1 to 9, with the possibility to also express the non-compatibility of that specific comparison. In the example above we read the highlighted cell as: “natural capital is 4 times more important than manufactured capital in relation to the financial capital”. The intermediate results are displayed in the right hand side and, based on the answers provided, together with the inconsistency index. In this particular case, in relation to the cluster that incorporates the different set of alternatives, the Human dimension is the one with the biggest relative score (22%), followed by the Natural dimension (21%) and the Financial one (17%). This column coincides with the values that will then be transferred into the Unweighted Super Matrix.



Appendix 4 - As we can notice above, the same procedure is repeated for each cluster of the network, therefore obtaining the complete set of pairwise comparisons for the second (cluster) level. Every time one cluster is isolated and the others are compared in terms of relative importance and influence on that specific isolated cluster.



Appendix 5 - The same operation is repeated, but this time in relation to each individual node of the network. The same logic applies, therefore one node is kept isolated and all the other set of nodes are compared in relation to that specific node that has been isolated. In this example, the first financial KPI is isolated and the different alternatives of the intellectual capital cluster are compared to each other in order to establish to what extent each alternative affects that specific financial KPI (e.g. revenues, profits, ROE etc.). As before, the intermediate results are displayed on the right and it is possible to see that in this case the intellectual capital indicator number 2 has a bigger relative impact

on the first financial KPI than the other two alternatives. This procedure is repeated for each element and every cluster.

ALT_1	ALT_2	ALT_3	FIN_KPI1	FIN_KPI2	FIN_KPI3	Sust_CA	HUM_KPI1	HUM_KPI2	HUM_KPI3	INT_KPI1	INT_KPI2	INT_KPI3	MAN_KPI1	MAN_KPI2	MAN_KPI3	NAT_KPI1	NAT_KPI2	NAT_KPI3	S&R_KPI1	S&R_KPI2	S&R_KPI3
0.00000	0.00000	0.00000	0.33333	0.33333	0.33333	0.00000	0.33333	0.33333	0.33333	0.33131	0.70494	0.18296	0.33333	0.33333	0.33333	0.33333	0.33333	0.33333	0.33333	0.33333	0.33333
0.00000	0.00000	0.00000	0.33333	0.33333	0.33333	0.00000	0.33333	0.33333	0.33333	0.37926	0.21092	0.07520	0.33333	0.33333	0.33333	0.33333	0.33333	0.33333	0.33333	0.33333	0.33333
0.00000	0.00000	0.00000	0.33333	0.33333	0.33333	0.00000	0.33333	0.33333	0.33333	0.28943	0.08414	0.74184	0.33333	0.33333	0.33333	0.33333	0.33333	0.33333	0.33333	0.33333	0.33333
0.66667	0.75000	1.00000	0.00000	0.83333	0.80000	0.33333	0.69083	0.43303	0.43278	0.17003	0.49908	0.00000	0.20984	0.50000	0.46362	0.24986	0.42857	0.32748	0.33333	0.33333	0.33131
0.33333	0.00000	0.00000	0.00000	0.50000	0.00000	0.20000	0.33333	0.14884	0.10050	0.27077	0.70736	0.10480	0.00000	0.54995	0.25000	0.28094	0.09534	0.14286	0.41260	0.33333	0.37926
0.00000	0.25000	0.00000	0.50000	0.16667	0.00000	0.33333	0.16033	0.46647	0.29646	0.12261	0.39612	0.00000	0.24021	0.25000	0.25525	0.65481	0.42857	0.25992	0.33333	0.33333	0.28943
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.45174	0.47423	0.31962	0.33333	0.00000	0.50000	0.50000	0.28094	0.42387	0.00000	0.65897	0.32748	0.72727	0.48064	0.50000	0.22381	0.35856	0.29696	0.36950
1.00000	0.00000	1.00000	0.35854	0.37640	0.12196	0.33333	0.50000	0.00000	0.50000	0.46382	0.18264	0.00000	0.06572	0.25992	0.18182	0.11397	0.25000	0.36950	0.51713	0.53961	0.22381
0.00000	1.00000	0.00000	0.18972	0.14937	0.55842	0.33333	0.50000	0.50000	0.00000	0.25525	0.39349	0.00000	0.27530	0.41260	0.09091	0.40539	0.25000	0.40669	0.12431	0.16342	0.40669
0.80000	0.00000	0.20000	0.39670	0.66259	0.44343	0.33333	0.26307	0.49339	0.44427	0.00000	0.20000	0.00000	0.33333	0.32321	0.34874	0.36217	0.18696	0.69590	0.45996	0.09555	0.28083
0.20000	0.50000	0.80000	0.41258	0.23251	0.16920	0.33333	0.54722	0.31081	0.08362	1.00000	0.00000	0.00000	0.33333	0.23814	0.16766	0.37667	0.09774	0.20627	0.22112	0.76038	0.13501
0.00000	0.50000	0.00000	0.19071	0.10490	0.38737	0.33333	0.18971	0.19680	0.47211	0.00000	0.80000	0.00000	0.33333	0.43866	0.48360	0.26117	0.71530	0.09782	0.31892	0.14408	0.58416
0.00000	0.00000	1.00000	0.33333	0.25992	0.28488	0.33333	0.26837	0.32748	0.37640	0.53682	0.26092	0.00000	0.00000	0.85714	0.66667	0.33333	0.33333	0.33333	0.40000	0.40669	0.66667
1.00000	0.00000	0.00000	0.33333	0.41260	0.49772	0.33333	0.11722	0.25992	0.47423	0.09888	0.38976	0.00000	0.20000	0.00000	0.33333	0.33333	0.33333	0.33333	0.20000	0.22381	0.16667
0.00000	1.00000	0.00000	0.33333	0.32748	0.21740	0.33333	0.61441	0.41260	0.14937	0.36429	0.34933	0.00000	0.80000	0.14286	0.00000	0.33333	0.33333	0.33333	0.40000	0.36950	0.16667
1.00000	0.00000	0.50000	0.54546	0.25992	0.59538	0.33333	0.58417	0.19288	0.63371	0.21298	0.28150	0.00000	0.31892	0.38065	0.50000	0.00000	0.80000	0.50000	0.49772	0.45996	0.33333
0.00000	0.50000	0.00000	0.18182	0.32748	0.12827	0.33333	0.18400	0.70097	0.17437	0.64674	0.54357	0.00000	0.45996	0.09150	0.25000	0.33333	0.00000	0.50000	0.21740	0.22112	0.33333
0.00000	1.00000	0.00000	0.27273	0.41260	0.27635	0.33333	0.23183	0.10615	0.19192	0.14028	0.17494	0.00000	0.22112	0.52785	0.25000	0.66667	0.20000	0.00000	0.28488	0.31892	0.33333
0.00000	0.00000	0.00000	0.33333	0.33333	0.33333	0.33333	0.33333	0.33333	0.33333	0.29771	0.47059	1.00000	0.61525	0.58416	0.36429	0.21298	0.09091	0.30116	0.00000	0.50000	0.50000
1.00000	0.50000	0.00000	0.33333	0.33333	0.33333	0.33333	0.33333	0.33333	0.33333	0.15510	0.05682	0.00000	0.29222	0.13501	0.53682	0.14028	0.45454	0.62645	0.50000	0.00000	0.50000
0.00000	0.50000	1.00000	0.33333	0.33333	0.33333	0.33333	0.33333	0.33333	0.33333	0.60719	0.47059	0.00000	0.09253	0.28083	0.09888	0.64674	0.45454	0.07239	0.50000	0.50000	0.00000

Appendix 6 - The (n x n) Unweighted Super Matrix is hereby displayed, where n coincides with the number of individual elements that make up the network, in this case the KPIs for each indicator. The values summarise all the relative scores from the previous pairwise comparisons concerning the nodes of the network.

ALT_1	ALT_2	ALT_3	FIN_KPI1	FIN_KPI2	FIN_KPI3	Sust_CA	HUM_KPI1	HUM_KPI2	HUM_KPI3	INT_KPI1	INT_KPI2	INT_KPI3	MAN_KPI1	MAN_KPI2	MAN_KPI3	NAT_KPI1	NAT_KPI2	NAT_KPI3	S&R_KPI1	S&R_KPI2	S&R_KPI3
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.24865	0.28086	0.37448	0.00000	0.14255	0.13685	0.05253	0.10975	0.06879	0.06875	0.02674	0.07848	0.00000	0.03794	0.09041	0.08387	0.04782	0.08202	0.06267	0.06838	0.06838	0.06796
0.12483	0.00000	0.00000	0.08563	0.00000	0.03421	0.05253	0.02364	0.01597	0.04302	0.11123	0.01648	0.00000	0.09944	0.04521	0.05080	0.01825	0.02734	0.07896	0.06838	0.06838	0.07780
0.00000	0.09362	0.00000	0.08563	0.02851	0.00000	0.05253	0.02647	0.07411	0.04710	0.01928	0.06229	0.00000	0.04344	0.04521	0.04615	0.12531	0.08202	0.04974	0.06838	0.06838	0.05937
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.10003	0.10501	0.07077	0.03954	0.00000	0.08954	0.08954	0.08847	0.10330	0.00000	0.12362	0.06143	0.13643	0.09391	0.09769	0.04373	0.09779	0.08099	0.10078
0.08322	0.00000	0.08322	0.07939	0.08335	0.02701	0.03954	0.08954	0.00000	0.08954	0.11304	0.04451	0.00000	0.01233	0.04876	0.03411	0.02227	0.04884	0.07219	0.14104	0.14717	0.06104
0.00000	0.08322	0.00000	0.04320	0.03308	0.12365	0.03954	0.08954	0.08954	0.00000	0.08221	0.09590	0.00000	0.05164	0.07740	0.01706	0.07920	0.04884	0.07946	0.03390	0.04457	0.11092
0.22341	0.00000	0.05585	0.05333	0.08907	0.05961	0.12066	0.08612	0.16151	0.14543	0.00000	0.02951	0.00000	0.05579	0.05409	0.05837	0.12465	0.06435	0.23951	0.05356	0.01113	0.03270
0.05585	0.13963	0.22341	0.05546	0.03126	0.02275	0.12066	0.17913	0.10175	0.02737	0.14755	0.00000	0.00000	0.05579	0.03986	0.02806	0.12964	0.03364	0.07099	0.02575	0.08854	0.01572
0.00000	0.13963	0.00000	0.02564	0.01410	0.05208	0.12066	0.06210	0.06410	0.15465	0.00000	0.11804	0.00000	0.05579	0.07342	0.08094	0.08989	0.24619	0.03367	0.03714	0.01678	0.06802
0.00000	0.00000	0.04659	0.04806	0.03747	0.04107	0.00902	0.02709	0.03306	0.03800	0.18951	0.09211	0.00000	0.00000	0.05684	0.04343	0.03537	0.03537	0.03537	0.03537	0.01815	0.01845
0.04659	0.00000	0.00000	0.04806	0.05948	0.07176	0.00902	0.01183	0.02624	0.04787	0.03491	0.13759	0.00000	0.01303	0.00000	0.02172	0.03537	0.03537	0.03537	0.00907	0.01015	0.00756
0.00000	0.04659	0.00000	0.04806	0.04721	0.03134	0.00902	0.06202	0.04165	0.01508	0.12860	0.12332	0.00000	0.05212	0.00931	0.00000	0.03537	0.03537	0.03537	0.03537	0.01815	0.01676
0.15773	0.00000	0.07886	0.11777	0.05612	0.12855	0.05338	0.03994	0.01266	0.04224	0.01564	0.02067	0.00000	0.09914	0.11833	0.15543	0.00000	0.06289	0.09390	0.12467	0.11521	0.08350
0.00000	0.15773	0.00000	0.05888	0.08908	0.05967	0.05338	0.01545	0.00708	0.01279	0.01030	0.01285	0.00000	0.06874	0.16409	0.07771	0.05241	0.01572				

ALT_1	ALT_2	ALT_3	FIN_KP1	FIN_KP2	FIN_KP3	Sust_CA	HUM_KP1	HUM_KP2	HUM_KP3	INT_KP1	INT_KP2	INT_KP3	MAN_KP1	MAN_KP2	MAN_KP3	NAT_KP1	NAT_KP2	NAT_KP3	S&R_KP1	S&R_KP2	S&R_KP3
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.06652	0.06652	0.06652	0.06652	0.06652	0.06652	0.06652	0.06652	0.06652	0.06652	0.06652	0.06652	0.06652	0.06652	0.06652	0.06652	0.06652	0.06652	0.06652	0.06652	0.06652	0.06652
0.04735	0.04735	0.04735	0.04735	0.04735	0.04735	0.04735	0.04735	0.04735	0.04735	0.04735	0.04735	0.04735	0.04735	0.04735	0.04735	0.04735	0.04735	0.04735	0.04735	0.04735	0.04735
0.05175	0.05175	0.05175	0.05175	0.05175	0.05175	0.05175	0.05175	0.05175	0.05175	0.05175	0.05175	0.05175	0.05175	0.05175	0.05175	0.05175	0.05175	0.05175	0.05175	0.05175	0.05175
0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
0.07873	0.07873	0.07873	0.07873	0.07873	0.07873	0.07873	0.07873	0.07873	0.07873	0.07873	0.07873	0.07873	0.07873	0.07873	0.07873	0.07873	0.07873	0.07873	0.07873	0.07873	0.07873
0.06447	0.06447	0.06447	0.06447	0.06447	0.06447	0.06447	0.06447	0.06447	0.06447	0.06447	0.06447	0.06447	0.06447	0.06447	0.06447	0.06447	0.06447	0.06447	0.06447	0.06447	0.06447
0.05888	0.05888	0.05888	0.05888	0.05888	0.05888	0.05888	0.05888	0.05888	0.05888	0.05888	0.05888	0.05888	0.05888	0.05888	0.05888	0.05888	0.05888	0.05888	0.05888	0.05888	0.05888
0.07298	0.07298	0.07298	0.07298	0.07298	0.07298	0.07298	0.07298	0.07298	0.07298	0.07298	0.07298	0.07298	0.07298	0.07298	0.07298	0.07298	0.07298	0.07298	0.07298	0.07298	0.07298
0.06319	0.06319	0.06319	0.06319	0.06319	0.06319	0.06319	0.06319	0.06319	0.06319	0.06319	0.06319	0.06319	0.06319	0.06319	0.06319	0.06319	0.06319	0.06319	0.06319	0.06319	0.06319
0.06309	0.06309	0.06309	0.06309	0.06309	0.06309	0.06309	0.06309	0.06309	0.06309	0.06309	0.06309	0.06309	0.06309	0.06309	0.06309	0.06309	0.06309	0.06309	0.06309	0.06309	0.06309
0.04566	0.04566	0.04566	0.04566	0.04566	0.04566	0.04566	0.04566	0.04566	0.04566	0.04566	0.04566	0.04566	0.04566	0.04566	0.04566	0.04566	0.04566	0.04566	0.04566	0.04566	0.04566
0.03467	0.03467	0.03467	0.03467	0.03467	0.03467	0.03467	0.03467	0.03467	0.03467	0.03467	0.03467	0.03467	0.03467	0.03467	0.03467	0.03467	0.03467	0.03467	0.03467	0.03467	0.03467
0.04318	0.04318	0.04318	0.04318	0.04318	0.04318	0.04318	0.04318	0.04318	0.04318	0.04318	0.04318	0.04318	0.04318	0.04318	0.04318	0.04318	0.04318	0.04318	0.04318	0.04318	0.04318
0.06394	0.06394	0.06394	0.06394	0.06394	0.06394	0.06394	0.06394	0.06394	0.06394	0.06394	0.06394	0.06394	0.06394	0.06394	0.06394	0.06394	0.06394	0.06394	0.06394	0.06394	0.06394
0.04201	0.04201	0.04201	0.04201	0.04201	0.04201	0.04201	0.04201	0.04201	0.04201	0.04201	0.04201	0.04201	0.04201	0.04201	0.04201	0.04201	0.04201	0.04201	0.04201	0.04201	0.04201
0.04352	0.04352	0.04352	0.04352	0.04352	0.04352	0.04352	0.04352	0.04352	0.04352	0.04352	0.04352	0.04352	0.04352	0.04352	0.04352	0.04352	0.04352	0.04352	0.04352	0.04352	0.04352
0.09364	0.09364	0.09364	0.09364	0.09364	0.09364	0.09364	0.09364	0.09364	0.09364	0.09364	0.09364	0.09364	0.09364	0.09364	0.09364	0.09364	0.09364	0.09364	0.09364	0.09364	0.09364
0.03314	0.03314	0.03314	0.03314	0.03314	0.03314	0.03314	0.03314	0.03314	0.03314	0.03314	0.03314	0.03314	0.03314	0.03314	0.03314	0.03314	0.03314	0.03314	0.03314	0.03314	0.03314
0.03328	0.03328	0.03328	0.03328	0.03328	0.03328	0.03328	0.03328	0.03328	0.03328	0.03328	0.03328	0.03328	0.03328	0.03328	0.03328	0.03328	0.03328	0.03328	0.03328	0.03328	0.03328

Appendix 8 - The limit matrix is obtained after raising the Weighted Super Matrix to the power of $2k + 1$, indicating the long term mutual influences of elements. As we can notice each column is the same and stand for the overall priorities.

Cluster Node Labels	Alternatives	Financial	Goal	Human	Intellectual	Manufactured	Natural	Social & Relationship
Alternatives	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Financial	0.374475	0.171061	0.157575	0.158869	0.157244	0.180821	0.191375	0.205139
Goal	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Human	0.083222	0.221428	0.118621	0.179070	0.243711	0.187589	0.195375	0.272733
Intellectual	0.279257	0.134431	0.361977	0.327352	0.147546	0.167366	0.344176	0.116443
Manufactured	0.046586	0.144170	0.027063	0.100945	0.353014	0.065147	0.106119	0.045371
Natural	0.157729	0.215910	0.160134	0.066661	0.073431	0.310853	0.078607	0.250489
Social & Relationship	0.058731	0.113000	0.174630	0.167103	0.025054	0.088223	0.084348	0.109825



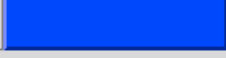
Appendix 9 - The cluster matrix considers the upper level comparisons made previously, thereby considering each set of cluster and comparing them to one in particular. The columns add up to 1 and each value represents the percentage of influence that the cluster in the row has on the cluster in the column.

Here are the priorities.

Name	Normalized by Cluster	Limiting
ALT_1	0.00000	0.000000
ALT_2	0.00000	0.000000
ALT_3	0.00000	0.000000
FIN_KPI1	0.40162	0.066517
FIN_KPI2	0.28592	0.047354
FIN_KPI3	0.31246	0.051750
HUM_KPI1	0.38961	0.078729
HUM_KPI2	0.31903	0.064467
HUM_KPI3	0.29136	0.058876
INT_KPI1	0.36626	0.072981
INT_KPI2	0.31712	0.063190
INT_KPI3	0.31661	0.063088
MAN_KPI1	0.36970	0.045664
MAN_KPI2	0.28068	0.034668
MAN_KPI3	0.34962	0.043184
NAT_KPI1	0.42777	0.063938
NAT_KPI2	0.28109	0.042014
NAT_KPI3	0.29114	0.043516
S&R_KPI1	0.58501	0.093639
S&R_KPI2	0.20705	0.033142
S&R_KPI3	0.20794	0.033284
Sust_CA	0.00000	0.000000

Appendix 10 - For each node, it is possible to observe the priority vectors, the first column indicates the values normalised by cluster and the second column indicates the percentage of importance of each node in relation to the network as a whole, therefore the global priority of each node.

Here are the overall synthesized priorities for the alternatives. You synthesized from the network Super Decisions Main Window: IR.sdmod

ALT_1		0.215993
ALT_2		0.117238
ALT_3		0.666769

Appendix 11 - above we can appreciate the overall synthesis in relation to the 3 alternatives of the model. The normalised values represent the overall synthesised score in relation to each alternative, whereby the biggest relative amount incorporates a higher degree of overall benefit, having considered all the interrelations and weightings not only of the various clusters of value drivers but of each interconnection between their elements. In this particular case, the software has evaluated all the pairwise comparisons and established that in relative terms, the third alternative carries the greatest benefit to the achievement of the sustainable competitive advantage of the firm, and should therefore be prioritised in relation to the other two alternatives.

Although this was a generic model, it's flexibility and adaptability to a variety of different contexts makes it a powerful instrument for decisional purposes, allowing management to have a holistic, yet synthetic overview of the value driver's relative importance in relation to the company's main goal. As mentioned in the AHP section, these procedures could also be repeated if we want to assess not only the benefits but also the costs, opportunities and risks of various alternatives at our disposal.

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References

- Adams, C. (2015). The International Integrated Reporting Council: A call to action. *Critical Perspectives On Accounting*, 27, 23-28.
<http://dx.doi.org/10.1016/j.cpa.2014.07.001>
- Adams, C. & Frost, G. (2008). Integrating sustainability reporting into management practices. *Accounting Forum*, 32(4), 288-302.
<http://dx.doi.org/10.1016/j.accfor.2008.05.002>
- Barros, V., Ramos, I., & Perez, G. (2015). Information systems and organizational memory: a literature review. *JISTEM*, 12(1).
<http://dx.doi.org/10.4301/s1807-17752015000100003>
- Bartolomeo, M., Bennett, M., Bouma, J., Heydkamp, P., James, P., & Wolters, T. (2000). Environmental management accounting in Europe: current practice and future potential. *European Accounting Review*, 9(1), 31-52.
<http://dx.doi.org/10.1080/096381800407932>
- Battaglia, M., Passetti, E., Bianchi, L., & Frey, M. (2016). Managing for integration: a longitudinal analysis of management control for sustainability. *Journal of Cleaner Production*.
<http://dx.doi.org/10.1016/j.jclepro.2016.01.108>
- Beck, C., Dummay, J., & Frost, G. (2012). *Sustainability reporting – inside out or outside in*. Presentation, 11th A-CSEAR Conference 2-4 December, University of Wollongong, Wollongong.
- Black Sun Plc,. (2014). *Realizing the benefits: The impact of Integrated Reporting*. Retrieved from http://integratedreporting.org/wp-content/uploads/2014/09/IIRC.Black_Sun_.Research.IR_.Impact.Single.pages.18.9.14.pdf
- Bouten, L. & Hoozée, S. (2013). On the interplay between environmental reporting and management accounting change. *Management Accounting Research*, 24(4), 333-348. <http://dx.doi.org/10.1016/j.mar.2013.06.005>
- Busco, C., Frigo, M., Riccaboni, A., & Quattrone, P. (2013). *Integrated reporting - Concepts and Cases that Redefine Corporate Accountability*. Springer.

- Carlucci, D. & Schiuma, G. (2007). Knowledge assets value creation map. *Expert Systems With Applications*, 32(3), 814-821.
<http://dx.doi.org/10.1016/j.eswa.2006.01.046>
- de Villiers, C., Rinaldi, L., & Unerman, J. (2014). Integrated Reporting: Insights, gaps and an agenda for future research. *Accounting, Auditing & Accountability Journal*, 27(7), 1042-1067. <http://dx.doi.org/10.1108/aaaj-06-2014-1736>
- Deloitte,. (2015). *Integrated Reporting as a driver for Integrated Thinking?*. Retrieved from <https://www2.deloitte.com/content/dam/Deloitte/nl/Documents/risk/deloitte-nl-risk-integrated-reporting-a-driver-for-integrated-thinking.pdf>
- Dumay, J. (2016). A critical reflection on the future of intellectual capital: from reporting to disclosure. *Jnl Of Intellectual Capital*, 17(1), 168-184.
<http://dx.doi.org/10.1108/jic-08-2015-0072>
- Durden, C. (2008). Towards a socially responsible management control system. *Accounting, Auditing & Accountability Journal*, 21(5), 671-694.
<http://dx.doi.org/10.1108/09513570810872969>
- Eccles, R. & Krzus, M. (2010). *One report*. Hoboken, N.J.: John Wiley & Sons.
- Eccles, R. & Saltzman, D. (2011). Achieving Sustainability Through Integrated Reporting. *Stanford Social Innovation Review*.
- Eccles, R. & Serafeim, G. (2013). A Tale of Two Stories: Sustainability and the Quarterly Earnings Call. *Journal Of Applied Corporate Finance*, 25(3), 8-19.
<http://dx.doi.org/10.1111/jacf.12023>
- Fasan, M. & Mio, C. (2016). Fostering Stakeholder Engagement: The Role of Materiality Disclosure in Integrated Reporting. *Business Strategy And The Environment*. <http://dx.doi.org/10.1002/bse.1917>
- Flower, J. (2015). The International Integrated Reporting Council: A story of failure. *Critical Perspectives On Accounting*, 27, 1-17.
<http://dx.doi.org/10.1016/j.cpa.2014.07.002>
- Frijo, M. & Anderson, R. (2011). Strategic risk management: A foundation for improving enterprise risk management and governance. *J. Corp. Acct. Fin.*, 22(3), 81-88. <http://dx.doi.org/10.1002/jcaf.20677>

- Garcia, S., Cintra, Y., Torres, R., & Lima, F. (2016). Corporate sustainability management: a proposed multi-criteria model to support balanced decision-making. *Journal Of Cleaner Production*.
<http://dx.doi.org/10.1016/j.jclepro.2016.01.110>
- George, R., Siti-Nabiha, A., Jalaludin, D., & Abdalla, Y. (2016). Barriers to and enablers of sustainability integration in the performance management systems of an oil and gas company. *Journal Of Cleaner Production*.
<http://dx.doi.org/10.1016/j.jclepro.2016.01.097>
- Goepel, K. (2013). *Implementing the analytic hierarchy process as a standard method for Multi-criteria decision making in corporate enterprises – a new AHP excel template with multiple inputs*. Retrieved from
http://bpmsg.com/wordpress/wp-content/uploads/2013/06/ISAHP_2013-13.03.13.Goepel.pdf
- Gond, J., Grubnic, S., Herzig, C., & Moon, J. (2012). Configuring management control systems: Theorizing the integration of strategy and sustainability. *Management Accounting Research*, 23(3), 205-223.
<http://dx.doi.org/10.1016/j.mar.2012.06.003>
- Görener, A. (2012). Comparing AHP and ANP: An Application of Strategic Decisions Making in a Manufacturing Company. *International Journal Of Business And Social Science*, 3(11).
- Greco, M., Cricelli, L., & Grimaldi, M. (2013). A strategic management framework of tangible and intangible assets. *European Management Journal*, 31(1), 55-66. <http://dx.doi.org/10.1016/j.emj.2012.10.005>
- Gunarathne, N. & Lee, K. (2015). Environmental Management Accounting (EMA) for environmental management and organizational change. *J Acc & Organizational Change*, 11(3), 362-383. <http://dx.doi.org/10.1108/jaoc-10-2013-0078>
- Hagel, J. (2014). 6 Tips for Integrated Thinking. *Journal Of Accountancy*, 218(6), 20-21.
- Henri, J. & Journeault, M. (2010). Eco-control: The influence of management control systems on environmental and economic performance. *Accounting, Organizations And Society*, 35(1), 63-80.
<http://dx.doi.org/10.1016/j.aos.2009.02.001>

- Higgins, C. & Coffey, B. (2016). Improving how sustainability reports drive change: a critical discourse analysis. *Journal Of Cleaner Production*.
<http://dx.doi.org/10.1016/j.jclepro.2016.01.101>
- Hofmann, S., Wald, A., & Gleich, R. (2012). Determinants and effects of the diagnostic and interactive use of control systems: an empirical analysis on the use of budgets. *Journal Of Management Control*, 23(3), 153-182.
<http://dx.doi.org/10.1007/s00187-012-0156-9>
- Holmen, J. (2005). *Intellectual Capital Reporting* (pp. Vol. 6, No. 4). Management Accounting Quarterly. Retrieved from http://www.imanet.org/docs/default-source/maq/maq_summer2005_holman-pdf.pdf?sfvrsn=0
- Hu, Y., Wen, J., & Yan, Y. (2015). Measuring the performance of knowledge resources using a value perspective: integrating BSC and ANP. *J Of Knowledge Management*, 19(6), 1250-1272. <http://dx.doi.org/10.1108/jkm-10-2014-0431>
- IFAC,. (2015). *Materiality in <IR>*. International Federation of Accountants.
- IIRC,. (2013). *Consultation Draft of the International IR Framework*. Retrieved from [http://www.theiirc.org/wp-content/uploads/Consultation-Draft/Consultation-Draft-of-the-InternationalIRF framework.pdf](http://www.theiirc.org/wp-content/uploads/Consultation-Draft/Consultation-Draft-of-the-InternationalIRF%20framework.pdf)
- Jasch, C. (2003). The use of Environmental Management Accounting (EMA) for identifying environmental costs. *Journal Of Cleaner Production*, 11(6), 667-676. [http://dx.doi.org/10.1016/s0959-6526\(02\)00107-5](http://dx.doi.org/10.1016/s0959-6526(02)00107-5)
- Kianto, A., Ritala, P., Spender, J., & Vanhala, M. (2014). The interaction of intellectual capital assets and knowledge management practices in organizational value creation. *Jnl Of Intellectual Capital*,15(3), 362-375.
<http://dx.doi.org/10.1108/jic-05-2014-0059>
- Knauer, A. & Serafeim, G. (2014). Attracting Long-Term Investors Through Integrated Thinking and Reporting: A Clinical Study of a Biopharmaceutical Company. *Journal Of Applied Corporate Finance*, 26(2), 57-64.
<http://dx.doi.org/10.1111/jacf.12067>
- KPMG International Cooperative,. (2011). *Integrated Reporting Performance insight through Better Business Reporting*. Retrieved from

- <https://www.kpmg.com/Global/en/IssuesAndInsights/ArticlesPublications/Documents/road-to-integrated-reporting.pdf>
- Krzus, M. (2011). Integrated reporting: if not now, when?. *IRZ*.
- Lai, A., Melloni, G., & Stacchezzini, R. (2014). Corporate Sustainable Development: is 'Integrated Reporting' a Legitimation Strategy?. *Business Strategy And The Environment*, 25(3), 165-177.
<http://dx.doi.org/10.1002/bse.1863>
- Lamberton, G. (2005). Sustainability accounting—a brief history and conceptual framework. *Accounting Forum*, 29(1), 7-26.
<http://dx.doi.org/10.1016/j.accfor.2004.11.001>
- Laughlin, R. (1991). Environmental Disturbances and Organizational Transitions and Transformations: Some Alternative Models. *Organization Studies*, 12(2), 209-232. <http://dx.doi.org/10.1177/017084069101200203>
- Lin, C., Madu, C., Kuei, C., Tsai, H., & Wang, K. (2015). Developing an assessment framework for managing sustainability programs: A Analytic Network Process approach. *Expert Systems With Applications*, 42(5), 2488-2501.
<http://dx.doi.org/10.1016/j.eswa.2014.09.025>
- Lisi, I. (2015). Translating environmental motivations into performance: The role of environmental performance measurement systems. *Management Accounting Research*, 29, 27-44.
<http://dx.doi.org/10.1016/j.mar.2015.06.001>
- Mammatt, J. (2009). Integrated Sustainability Reporting and Assurance.
- Marr, B. (2008). *Impacting Future Value: How to Manage your Intellectual Capital*. Retrieved from
http://www.cimaglobal.com/Documents/ImportedDocuments/tech_mag_impacting_future_value_may08.pdf.pdf
- Mason, C. & Simmons, J. (2013). Embedding Corporate Social Responsibility in Corporate Governance: A Stakeholder Systems Approach. *J Bus Ethics*, 119(1), 77-86. <http://dx.doi.org/10.1007/s10551-012-1615-9>
- Mio, C. (2016). *Integrated Reporting - A New Accounting Disclosure*. Palgrave Macmillan UK

- Mio, C. & Fasan, M. (2014). The Determinants of Materiality Disclosure in Integrated Corporate Disclosure. SSRN Electronic Journal.
<http://dx.doi.org/10.2139/ssrn.2443929>
- Mouritsen, J. & Larsen, H. (2005). The 2nd wave of knowledge management: The management control of knowledge resources through intellectual capital information. *Management Accounting Research*, 16(3), 371-394.
<http://dx.doi.org/10.1016/j.mar.2005.06.006>
- Nicolaou, A. (2009). Integrated information systems and transparency in business reporting. *International Journal Of Disclosure And Governance*, 7(3), 216-226.
<http://dx.doi.org/10.1057/jdgd.2009.27>
- Oliver, J., Vesty, G., & Brooks, A. (2016). Conceptualising integrated thinking in practice. *Managerial Auditing Journal*, 31(2), 228-248.
<http://dx.doi.org/10.1108/maj-10-2015-1253>
- Oprisor, T. (2015). Contributions to an improved framework for integrated reporting. *Accounting & Management Information Systems / Contabilitate Si Informatica De Gestiuine*, 14(3), 483-507.
- Pelozo, J. (2009). The Challenge of Measuring Financial Impacts From Investments in Corporate Social Performance. *Journal Of Management*, 35(6), 1518-1541.
<http://dx.doi.org/10.1177/0149206309335188>
- PricewaterhouseCoopers AG,. (2012). *Integrated Reporting – The Future of Corporate Reporting*. Retrieved from
https://www.pwc.de/de/rechnungslegung/assets/integrated_reporting.pdf
- PricewaterhouseCoopers LLP,. (2016). *Implementing Integrated Reporting*. Retrieved from <https://www.pwc.com/gx/en/audit-services/publications/assets/pwc-ir-practical-guide.pdf>
- Saaty, T. (1999). Fundamentals of the Analytic Network Process. *ISAHP, University of Pittsburgh, PA 15260, USA*. Retrieved from
<http://156.17.28.67/download/AnpSaaty.pdf>
- Saaty, T. & Vargas, L. (2006). *Decision making with the analytic network process*. New York: Springer.

- Sánchez, P., Chaminade, C., & Olea, M. (2000). Management of intangibles – An attempt to build a theory. *Jnl Of Intellectual Capital*, 1(4), 312-327.
<http://dx.doi.org/10.1108/14691930010359225>
- SAP Vision & Purpose | About SAP SE*. (2016). SAP. Retrieved 12 July 2016, from <http://go.sap.com/corporate/en/vision-purpose.html>
- Savage, D., Ligon, P., & Lomsek, J. (2001). *Environmental Management Accounting: Policies and Linkages*. New York: United Nations. Retrieved from <https://sustainabledevelopment.un.org/content/documents/policiesandlinkages.pdf>
- Schoenberg, R. (2003). An integrated approach to strategy innovation. *European Business Journal*, 15(3), 95-103.
- Stacchezzini, R., Melloni, G., & Lai, A. (2016). Sustainability management and reporting: the role of integrated reporting for communicating corporate sustainability management. *Journal Of Cleaner Production*.
<http://dx.doi.org/10.1016/j.jclepro.2016.01.109>
- Stacchezzini, R., Melloni, G., & Lai, A. (2016). Sustainability management and reporting: the role of integrated reporting for communicating corporate sustainability management. *Journal Of Cleaner Production*.
<http://dx.doi.org/10.1016/j.jclepro.2016.01.109>
- Starovic, D., Marr, B., & CIMA,. (2003). *Understanding corporate value: managing and reporting intellectual capital*. Chartered Institute of Management Accountants. Retrieved from <http://www.cimaglobal.com/Documents/ImportedDocuments/intellectualcapital.pdf>
- Strategy | Integrated Performance Analysis | SAP Integrated Report 2015*. (2016). SAP. Retrieved 12 July 2016, from <http://go.sap.com/integrated-reports/2015/en/strategy/integrated-performance-analysis.approach.html>
- Stubbs, W. & Cocklin, C. (2008). Conceptualizing a "Sustainability Business Model". *Organization & Environment*, 21(2), 103-127.
<http://dx.doi.org/10.1177/1086026608318042>

- Stubbs, W. & Higgins, C. (2014). Integrated Reporting and internal mechanisms of change. *Accounting, Auditing & Accountability Journal*, 27(7), 1068-1089. <http://dx.doi.org/10.1108/aaaj-03-2013-1279>
- van Bommel, K. (2014). Towards a legitimate compromise?. *Accounting, Auditing & Accountability Journal*, 27(7), 1157-1189. <http://dx.doi.org/10.1108/aaaj-04-2013-1309>
- Wyatt, A. (2008). What financial and non-financial information on intangibles is value-relevant? A review of the evidence. *Accounting And Business Research*, 38(3), 217-256. <http://dx.doi.org/10.1080/00014788.2008.9663336>
- Zambon, S. (2008). *Providing Better Information to Capital Markets to Improve Valuation Decisions: A Technical View on the Reporting of Intellectual Capital*. Presentation, United Nations, New York.
- Zambon, S. & Monciardini, D. (2015). Intellectual capital and innovation. A guideline for future research. *Journal Of Innovation Economics & Management*, n°17(2), 13-26. Retrieved from <http://www.cairn.info/revue-journal-of-innovation-economics-2015-2-page-13.htm>