

# TOWARDS AN INTERPRETIVE MEASUREMENT FRAMEWORK TO ASSESS THE LEVELS OF INTEGRATED AND INTEGRATIVE THINKING WITHIN ORGANISATIONS

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## Abstract

This research study is located within the context of corporate reporting and is relevant for the agenda of sustainability and sustainable development. The specific context for this study is the South African mining industry, within which three units in the form of three companies, were chosen to provide a coherent case for this study. The sample for the analysis is based on the integrated reports of these companies for the years 2012 and 2013. This gives this research a total sample size of six reports. Based on the research findings an initial interpretive measurement framework to assess the levels of capital integration has been theorised which enables the various stakeholders of an organisation to assess the integrated and integrative thinking capabilities. The level of integration is represented as a maturity scale on which integrated thinking is associated with the lower levels, while integrative thinking is attributed to higher levels of maturity. In the elaborated framework, integrated thinking is perceived as being a prerequisite for integrative thinking. The practical implication of this study is that it provides a potential measurement framework for various organisational stakeholders, including investors, to assess the thinking capabilities that are more likely to lead to long term financial stability and sustainability. The value of this research study is that it provides an initial step towards measuring the level of integrated and integrative thinking capabilities within organisations where no such measurement framework currently exists. The limitations and implications of this research study are that the interpretive measurement framework represents merely an initial step and an ongoing working hypothesis which requires further research to develop its maturity and usefulness.

**Keywords:** Corporate Reporting, Sustainable Development, Capital Integration

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## 1. Introduction

### 1.2. Corporate Reporting – The sustainability agenda

Historically the prime focus of accounting has been financial accounting, and this dominant focus in corporate reporting had two major shortcomings. First, it ignored the development of internal control of management accounting; and secondly, it failed to see the wider use of corporate reports by other stakeholders (Crowther, 2012). Over the years the number of groups that are interested in corporate reports has increased. Growing environmental concerns and laws, as well as increased active citizenship from the 1960s, has influenced the social and environmental disclosure policies of organisations (Deegan & Blomquist 2006).

The concept of the “triple bottom-line” started to enter the stage of corporate reporting in the 1990s, thereby suggesting that organisational success should not only be measured and reported by the financial bottom-line (profits), but also by the organisational

performance regarding social (people) and environmental (planet) aspects (Elkington, 1998). In 1997 the Global Reporting Initiative (GRI) was established in order to develop reporting guidelines for sustainability of corporates, and these were first published in 2000 (GRI, 2000), thereby offering a framework for economic, social and environmental reporting.

Saravanamuthu (2004) highlights the importance of accounting standards for enforcing sustainable development as it “forms the basis for corporate accountability to society” (p. 296). The author states that *what is measured, counts*, and that appropriate standards influence decisions of managers, who face “*competing yet interdependent needs of multiple stakeholders*” (Saravanamuthu, 2004, p. 296). These multiple stakeholders add to the complexity of organisational decisions which requires the ability to integrate various standpoints, ideas, expectations and issues, according to Benson and Dresdow (2009).

### 1.3. International Integrated Reporting Council (IIRC)

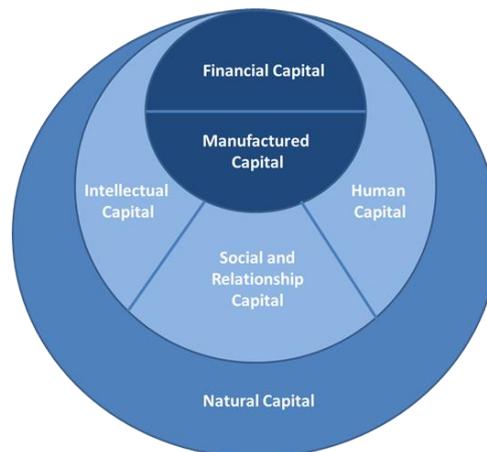
In recognising the agenda of sustainability for the global economy, a key aspect of the International Integrated Reporting Council's (IIRC) aim is to create a global integrated reporting framework that pulls together information about the financial, environmental and social impact and governance activities of an organisation. The IIRC represents a global coalition of various stakeholders, such as regulating bodies, investors, companies and civil society, to mention but a few, all sharing the understanding that corporate reporting should focus on value creation (Sustainability South Africa, 2014). The process of establishing standards for Integrated Reporting is meant to be inclusive and market-led, and requires collaborating across multiple organisations (public and private) and countries, as well as across various major governing bodies. This undertaking, which is referred to as the *IR Pilot Programme*, aims to be driven by the needs of businesses, investors and civil society (IIRC, 2013).

The IIRC's vision is to make integrated thinking part of private and public business practices. The interplay between Integrated Thinking and Integrated Reporting is seen as the enabler for "*efficient and productive capital allocation*", which is said to lead to financial stability and sustainability. The IIRC defines its purpose as not just being about setting standards for, and producing, reports; it is also about instilling integrated thinking in organisations, and in the way that companies create value over time (IIRC, 2013). According to the IIRC:

*"Integrated reporting is a process founded on integrated thinking that results in a periodic integrated report by an organisation about value creation over time and related communications regarding aspects of value creation" (IIRC, 2013).*

The IIRC gives consideration to three focal areas: First, the use of (the six) capitals; second, the creation of value; and third, the definition of the organisation's business model. With regards to the first aspect of *capital*, Figure 1 provides an illustration of the Six Capitals model:

Figure 1. The Six Capitals



Source: adapted from IIRC Background Paper IR - Capitals (2013)

A key assumption in the Six Capitals model is that the standards of reporting and their focal areas determine how an organisation runs its business. In the past, most organisations focused only on the reporting of financial and manufactured capital, and ignored other capitals they used and affected, such as intellectual, social & relationship, human, and natural capital. These past practices made organisations more inclined to make decisions that produced short-term financial gains, with the chance being that these gains were made at the expense of other capitals. The IIRC perceives each of these capitals as stores of value which can be built-up or run down, but with the need to be maintained in order to enable future value creation (IIRC Background Paper - Capitals, 2013)

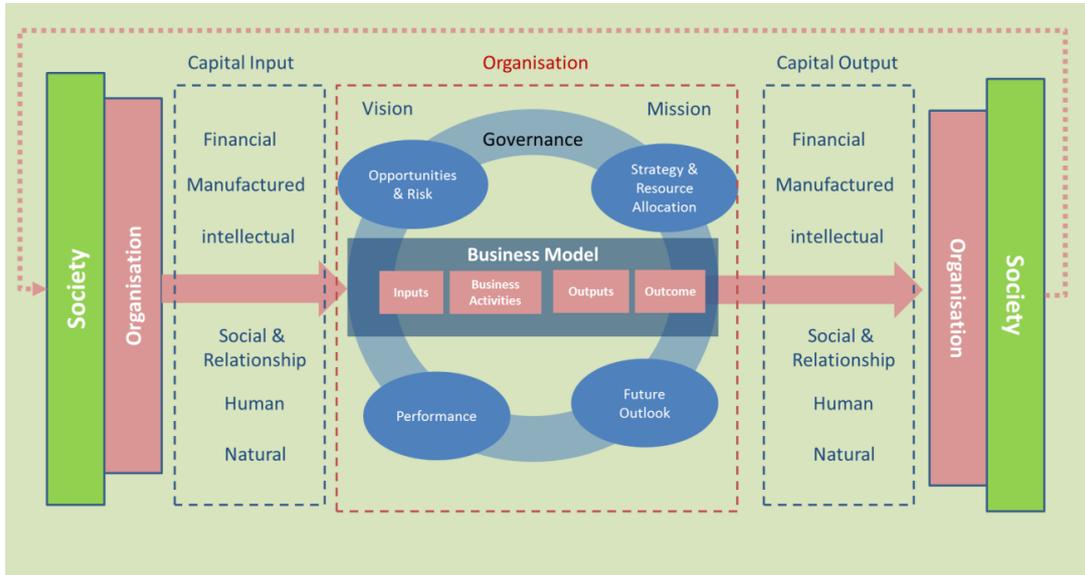
As to the second aspect, the organisational focus on value creation in reporting is driven by a desire to attract long-term capital, as the IIRC believes that

integrated reports are mainly used by providers of capital. Investors have a need to get more holistic insights into the organisation's business models, performance, risk, strategies, operating context and governance, in order to enable them to make informed decisions. The relationship between value creation and the business model is also considered relevant.

The third aspect of the IIRC looks at the portrayal of an organisation's business model, as this model is believed to clarify its value creation. What then becomes relevant is how value is defined by organisations. This requires looking at the interconnection between stakeholder relationships and financial returns. Making these relationships transparent is relevant to long-term investors because it provides insights into possible future financial performance of the organisation. The relationship

between the organisation's six capitals and its overall organisational value creation process. The business model is illustrated in Figure 2 below as the

**Figure 2.** Organisational Value Creation Process



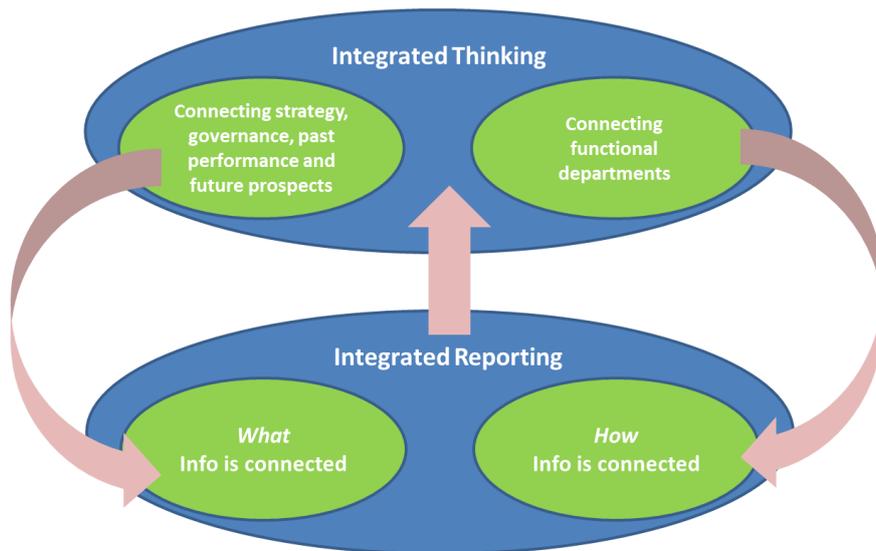
Source: adapted from IIRC

One of the challenges is that the IR framework does not prescribe Key Performance Indicators (KPIs) or other measurement tools and leaves it up to the organisations themselves to judge what is relevant and what is not.

### 1.4 Integrated Thinking

Integrated thinking is the main capability that integrated reporting is supposed to facilitate within organisations. The relationship between Integrated Thinking and Integrated Reporting is illustrated in Figure 3.

**Figure 3.** Relationship between Integrated Thinking and Integrated Reporting



Source: adapted from IIRC (2011)

The IIRC defines integrated thinking as the active consideration by an organisation of the

relationship between the various operating and functional units of a business, and the capitals they

use and affect. The IIRC looks at six different capitals of financial, manufactured, human, intellectual, social & relationship, and natural capital, without any hierarchy implied. Integrated thinking should affect the decision-making and action-taking processes to create short, medium and long-term value (IIRC, 2013). The IIRC further postulates that Integrated Reporting is leading to a new way how organisations define value and thereby explore how their stakeholder relationships correlate with financial returns.

We argue that stakeholders are representatives of the six capitals and the consideration of the organisation's stakeholder relationships requires the consideration of their different capitals in their decision-making processes, with the integrated report being the evidence for the integrated thinking and decision-making process. The main assumption here is that without integrated thinking, it would be difficult to produce an integrated report (Graham, 2014, Watson, 2014).

Integrated thinking is regarded as the ability to connect strategy, governance, past performance and future prospects, as well as the ability to connect functional departments, with all of this resulting in the depiction of the "What" and "How" information, and their connectivity, in an integrated report. The fundamental underpinning aspects (i.e. the "what" and the "how") are based on the six capitals. An important element in the IIRC's description is about "trade-offs" between the capitals, which should (if applicable) be portrayed in an integrated report.

The IIRC has suggested that the requirements based on the IIRC's integrated reporting framework are facilitating integrated thinking within organisations and produce periodically an integrated report as an outcome. This suggests that the integrated report is the product of integrated thinking processes and capabilities within organisations. Even though the IIRC regards integrated thinking as the ability to connect strategy, governance, past performance and future prospects, as well as connecting functional departments, all these aspects are underpinned by and related to the six capitals that represent an organisation's in-and-outputs. Furthermore in its discussion paper, the IIRC states that an integrated report would portray the dependence on resources and relationships, or capitals that an organisation has access to or impacts on, therefore reporting is deemed as critical, besides other reasons, to make "*meaningful assessment of the long-term viability of the organization's business model and strategy*" (IIRC, 2011, p. 2). These capitals are seen to represent stores of value that are the basis of an organisation's value creation (IIRC, 2013). This value creation is based on integrated decision-making which derives from integrated thinking. But what does integrated decision-making mean? In its Capital Background Paper (2013) the IIRC speaks about portraying the relationships,

including trade-offs, between the capitals. Looking at the different capitals and their representation by different stakeholder groups, the IIRC's use of the words "active consideration" (IIRC, 2013, p. 2) in its definition of integrated thinking, entails the consideration of all its capitals, including the interdependencies and trade-offs between these capitals. Formulating it differently, it implies that the organisation should pay cognisance to all its capitals, which might entail paying attention to the often conflicting interests of the various stakeholders. Conflicting interests typically result in trade-offs where one interest dominates another.

### **1.5 Research Goals**

Even though the IR framework was developed (and is still being developed) in collaboration with various global stakeholders, such as businesses, investors, civil society, governments and governing bodies, it is still more of a theoretical framework which has to establish itself in praxis. The overall aim is to establish integrated thinking within companies and this goal is facilitated by integrated reporting. It is assumed that if companies produce integrated reports, then they will also be exercising levels of integrated thinking.

It has been claimed that integrated thinking capabilities of organisations should therefore be explicated by the ability to portray the relationship between the capitals within their respective integrated reports. Yet the question remains so far unanswered as to how this can be measured based on the information provided within the reports, and how this information can be distinguished from "window-dressing" or "green-washing". The main assumption here is that without integrated thinking, it would be difficult to produce an integrated report (Graham, 2014, Watson, 2014).

At the time of undertaking this study no research was available to verify whether this aim is being served from a praxis point of view.

### **1.6 Research Problem**

The nature of the phenomenon under study is based on the six capitals which the IIRC declares to be relevant for integrated reporting. Even though the framework includes others aspects such as governance, and business model and value creation as a whole, the underpinning concept is based on the six capitals which the organisation uses and affects as organisational inputs and outputs. The IIRC's stance is that integrated reports are a primary facilitator of integrated thinking within organisations, with the integrated report being the product thereof.

Taking the above-mentioned into consideration the following propositions were drawn:

1 Integrated thinking and integrated reporting lead to financial stability and sustainability

2 Integrated Thinking is related to the capitals an organisation uses and affects for its value creation

3 Integrated thinking should lead to integrated decision-making

4 Integrated thinking and integrated decision-making can be portrayed in an integrated report based on the relationship and trade-offs between the reported capitals (increase and decrease of the related capitals)

5 There is currently no other way of measuring integrated thinking capabilities of organisations

There are, however, indications that companies that produce excellent integrated reports do not necessarily have financial stability, nor do they serve the agenda of sustainability. The mining company Lonmin, for example, was awarded the status of “excellence” in their integrated reporting by Ernst & Young for the past three years, but was associated with the “*Marikana Tragedy*” in 2012. A dispute between Lonmin’s Rock Drill Operators and the company resulted in 34 deaths and innumerable injuries at one of Lonmin’s mines in the North-West province of South Africa on 16 August 2012 (Tolsi, 2013). It is acknowledged that the situation around Marikana is complex regarding its causes, yet there are legitimate reasons to question the organisation’s continuous engagement with its human, and social & relationship capitals, because the Marikana tragedy is believed to be primarily based on a dispute about remuneration and living conditions of miners (Sorensen, 2012). African Bank Investments Ltd represents another example where the company was awarded the status of “excellence” for their integrated reports in 2012 and 2013, yet the organisation collapsed in 2014 after mounting losses believed to be related to “questionable management practices” and “fraud, reckless lending and lack of disclosure” (IOL, 2014; BDlive, 2014).

The authors acknowledge that these examples have complex causes, yet the standing of “excellence” in integrated reporting awarded to these two companies brings into question the implied proposition that if a company does integrated reporting, then integrated thinking will be enabled and facilitated. At a practical level, in these examples it is valid to ask whether, and how, integrated reports serve the aim of financial stability and sustainability. The consulting firm Ernst & Young evaluates the integrated reports according to the IIRC’s framework. This research paper does not question the quality of their evaluation or that of any other rating company, but focuses instead on the question as to whether high scoring ratings on integrated reports indicate the presence of integrated thinking within these organisations.

Our dissatisfaction with the current propositions relates to the incoherent link of capital trade-offs with integrated decision-making as part of integrated thinking, as well as the conclusion that this leads to financial stability and sustainability. Gibson (2006)

states that “*sustainability is a multi-dimensional integrative concept*” (p. 262) that requires the appreciation of links and integration of relevant consideration that leads to mutually reinforcing gains on all fronts. The author highlights that sustainability is not about balancing or making trade-offs, but about integration and avoidance thereof. By referring to Jenkins et al. (2003), Gibson (2006) emphasises the importance of integration beyond the separate pillars of sustainability, and criticises some sustainability assessment advocates that argue for keeping the three aspects of sustainability separate, and that integration should focus merely on trade-off decisions between the different aspects (Jenkins et al., 2003, as cited in Gibson, 2006).

We believe that sustainability requires taking a step further, beyond a mere depiction of relationships and trade-offs, which is also supported by Gibson (2006). Moldoveanu and Martin (2008) argue that looking along the frontiers of “trade-offs” is associated with the old-school management practice of an optimiser, and contrast this to the required new future high-value decision maker who is able to push these frontiers of trade-offs further out. A high-value decision maker is an integrator who is able to productively resolve tensions between different models. The authors define the integrative capacity as “*the ability to think and act responsibly and responsively in the face of multiple, incommensurable, and possibly conflicting models of oneself, the world, and others*” (Moldoveanu & Martin, 2008, p. 48).

The attributes for the concept of “*integrative thinking*” are neither articulated nor inherent in the IIRC’s definition of “*integrated thinking*”, but the value-add of integrative thinking is based on the innate conflict between the respective capitals and their associated stakeholders, as well as the potential of integrative thinking to contribute to sustainable practices by finding solutions instead of continuing with making trade-offs.

The focus of this study is whether integrated reports show evidence of integrated thinking of these companies. Based on this, the concern for this research study is focussed on assessing the “level of integrated thinking within organisations”; the following research question is posed and answered in this study: “*What influence does integrated reporting standards have on the integrated and integrative thinking capabilities of organisations regarding their use of and effect on the six capitals; and moreover, how can these capabilities be measured?*”

### 1.7 Integrative Thinking

The concept of integrative thinking has been studied in various fields such as medical research, interdisciplinary studies in education, as well as in psychology of adult cognition and development.

Within the context of medical research, Wolf (1998, p. 120) states that “we are gradually learning that to understand is to think interactively and to avoid narrow dogma”. He further states that integrative thinking has to challenge all dogmas, especially the ones which insist on “either-or” solutions to questions (Wolf, 1998).

Within the field of research on the development of adult thinking, Kallio (2011) conceptualizes integrative thinking by drawing and departing from Piaget’s and Perry’s developmental theories of adult cognition. This author states that discussions about post-formal thinking had been referring to integration as a “synthetic form of thinking that integrates several opposing systems into an abstract whole that contains all particulars (Alexander & Langer, 1990 as cited in Kallio, 2011, p. 795). Kallio (2011) further distinguishes between additive and transformational integration, where the former is more of a mechanistic linking of elements, whereas the latter is a synthesis of higher order that creates a new element.

In the field of interdisciplinary studies, Sill (1996) refers to the process of integrative thinking as a creative act to take “disconnected material or ideas and synthesiz[e] them into something new” (p. 133). The boundaries between integrative thinking and creativity are not clear, with a tendency towards overlapping concepts.

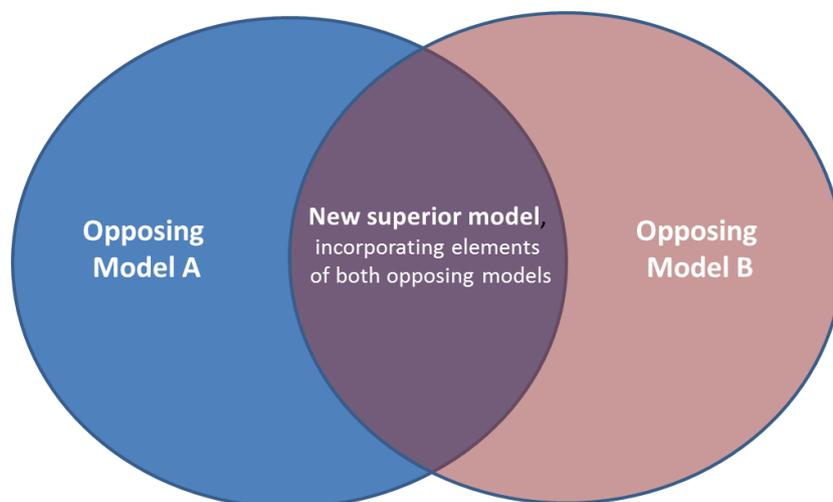
Martin and Austin (1999) refer to integrative thinking as an art and a creative process. Whether creativity is an antecedent or attribute of this concept will depend on the stance adopted as to how integrative thinking is perceived - either as a process, or the integrative thought as the product. Sill (1996, p. 136) refers to Koestler (1964), who provided a model for creativity in which he uses the concept of “bisociation” for integrative thinking as the “amalgamation and integration of “two realms as wholes”. Sill further emphasises that creativity is

inherent in humans and that it can be taught, hereby making the inference that integrative thought is also teachable (De Bono, 1969; Edwards, 1986; Stein, 1974, as cited in Sill 1996). Sill (1996) further refers to the authors Amabile and Tighe (1993), Simonton (1984, 1993), and Stein (1974, 1975), all of whom highlighted environmental factors that can either foster or discourage creativity within individuals and groups. This issue becomes relevant within our study’s research context as the integrated reporting standards could represent the environmental factors that either encourage or discourage creative resolution of the tensions that arise whilst harmonising the productive use and development of capitals employed within organisations.

Roger Martin, who popularized integrative thinking in management and leadership development, argued that business leaders are increasingly faced with choices that inevitably have inherent tensions, that involve trade-offs between different options (Martin & Austin, 1999). He further postulates that these choices are characterized by high ambiguity, uncertainty, complexity, instability, uniqueness, and risk. These choices require leaders to act and attend simultaneously to a variety of interconnected variables that make it necessary to think integratively. He further elaborates that integrative thinking is not an algorithm and compares it instead with art.

The integrative approach requires business leaders to have a personal stance that welcomes *change, openness, flexibility and disequilibrium*, as well as *complexity* and a *focus on learning* (Martin, & Austin, 1999). Martin states that this ability requires that the tension between opposing models is perceived as a creative possibility for developing a new integrated model, containing elements of both, yet still being superior to the preceding models (Figure 4) (Martin, 2007).

**Figure 4.** Integrative Thinking



Source: adapted from Martin (2007)

He defines integrative thinking as: “the ability to face the tension between opposing models and not choose the one over the other” (Martin, 2007, p. 15).

## 2. Research Methodology

Various rating companies award annual performance ratings in integrated reporting to public and state-owned organisations. Ernst & Young (EY) is one of the awarding companies that reviews integrated reports from South Africa’s top 100 companies listed

on the JSE, as well as from 10 state-owned companies.

The case for this study is the mining sector. Three units in the form of three companies were chosen: two companies that did well in the *Ernst & Young Excellence in Integrated Reporting Awards* (E & Y awards), as well as one company that did well in the E & Y awards, but which media reports have shown to have experienced challenges that could be based on interactions between some of its capitals. The case examples are listed in Table 1.

**Table 1.** Companies considered as cases for this research

<b>Mining Industry</b>
Exxaro Resources
Gold Fields Ltd
Lonmin plc

This *qualitative* study, which entailed three research phases utilised the method of *Qualitative Content Analysis*. Since the IIRC postulates that integrated reports are the results of integrated thinking within organisations, it can be argued that a study of the documents in the form of the annual integrated reports of organisations should give access to the intransitive aspects that might indicate the prevalence of integrated and integrative thinking within these companies. This argument is further supported by the assumption, stated in Ernst & Young’s Excellence in Integrated Reporting Award Survey 2014, that “it is difficult to produce a good integrated report without integrated thinking of the board and management” (Graham, 2014, p. 20).

The overall aim of this research study has been to test the conceptual framework that entailed the IIRC’s “six-capital-framework and integrated thinking”, as well as Roger Martin’s “Integrative thinking”, and to develop an overall interpretive framework that could serve as a measurement tool for the level of integrated and, potentially also, of integrative thinking capabilities within organisations.

This study chose to evaluate the annual integrated reports of the three cases (Exxaro Resources, Gold Fields and Lonmin) from the years 2012 and 2013, as well as the media publications between these two reports, as it is believed that these could give indications as to whether, and how, certain topics are more prevalent in the integrated reports than others. This is appropriate as it is suggested in the literature that increased public interest created by media coverage would lead to a response on those topics within these company’s annual reports. The Integrated Reports from the years 2012 and 2013 of these companies thus represent the sample of the analysis. There is therefore a sample size of six annual reports.

The applications of the qualitative content analysis in the first research cycle aimed to

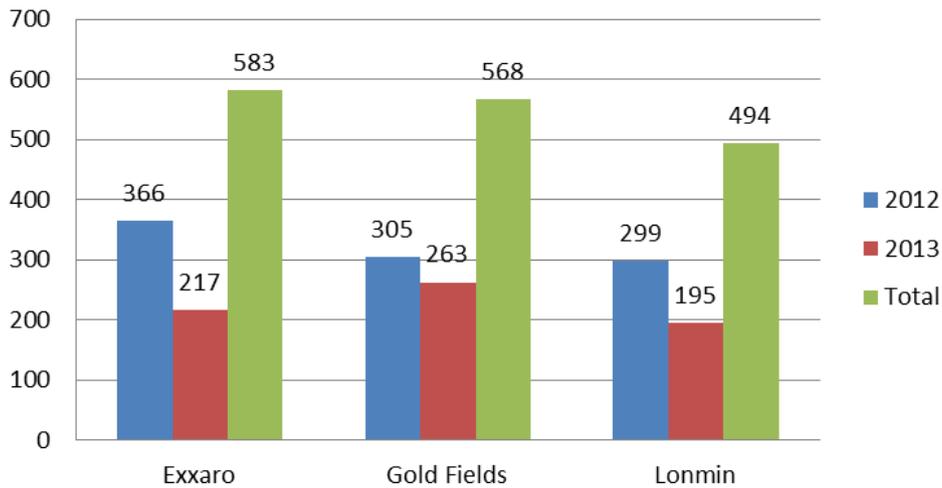
inductively establish preliminary categories and themes for each company based on their Integrated Reports from the years 2012 and 2013. Media publications related to these three companies during 2013 represent the data sources for the qualitative content analysis of the second research cycle. The outcomes after the second research cycle aimed to seek evidence as to the considered capitals for each of the respective companies, based on the categories developed from research cycles 1 and 2, hereby applying a deductive qualitative content analysis, based on the definition of the Six Capital model into which the emerged categories from research cycle 1 and 2 were deducted. The third research cycle aimed to find evidence which indicates that the companies did consider those capitals jointly. A cross-tabularisation of the various capitals explicated whether and how the relationships were portrayed. As part of the third research cycle, the concept of “integrative thinking” has been used in order to see whether there is evidence of new ideas and solutions that were born out of the joint consideration of the companies’ capitals.

## 3. Research Results

Although the applied methodology selected for this research study is qualitative content analysis, *techniques* related to the Grounded Theory process of Glaser and Strauss (1967) were also applied in the data collection process.

In the first research cycle, data was collected from the 2012 and 2013 IR reports of Exxaro, Gold Fields and Lonmin. Each report was read in detail and data was collected in form of direct quotes extracted and treated as meaning units and collected in a proposition log. Altogether, a total of 1645 propositions (meaning units) across the three companies and reports (2012 and 2013), were collected in the proposition log (Figure 5).

**Figure 5.** Distribution of collected propositions (meaning units)

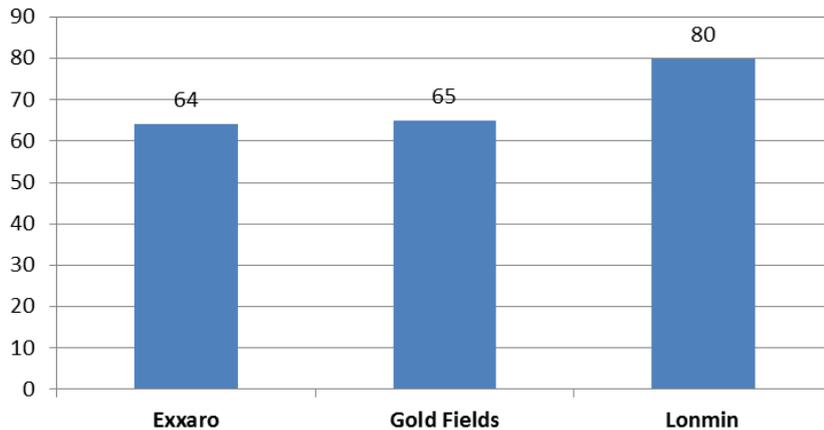


In summarising the process for the first research cycle, it can be noted that the proposition log evaluated the relevance of the selected meaning units, from which the key content was extracted through condensation. This condensed meaning unit was then coded, and allocated to a sub-category. Thereafter all sub-categories were reviewed and abstracted into overall categories based on their common properties. Sub-categorizations and their abstractions into overall categories has been done through a process of constant comparison (as recommended by Glaser & Strauss, 1967) of comparing each text (meaning unit,

condensed meaning unit and code) that was assigned to a (sub-) category with the properties of the texts that were already assigned to that (sub-) category.

The second research cycle focused on contemporary media reports which were published during the course of 2013 and were considered relevant to the established categories from AR cycle 1. The media reports were also approached using the methodology of qualitative content analysis, again using some techniques of Grounded Theory. Figure 6 shows an overview of the number of propositions (meaning units) collected per company.

**Figure 6.** Overview of number of propositions collected from media reports



Altogether 209 meaning units (propositions) were collected from various online publications which were then condensed, coded, sub-categorised and categorised.

The established media categories were then compared to the categories from the integrated reports and, where possible, both sets of categories were then reduced, either subsumed or summarized, under an overall category name.

The aim for the results after research cycles 1 and 2 has been to look at whether these three companies reported on the six capitals. Even though all three companies stated in their reports that they apply the “five-capital-concept” for sustainability reporting, hereby allocating intellectual capital under human capital, only Exxaro structured its report according to these capitals. Therefore the final task after research cycles 1 and 2 was to infer the implied capitals from the emerged categories. The results

indicated that all three companies report on the six capitals, even though to different degrees and detail.

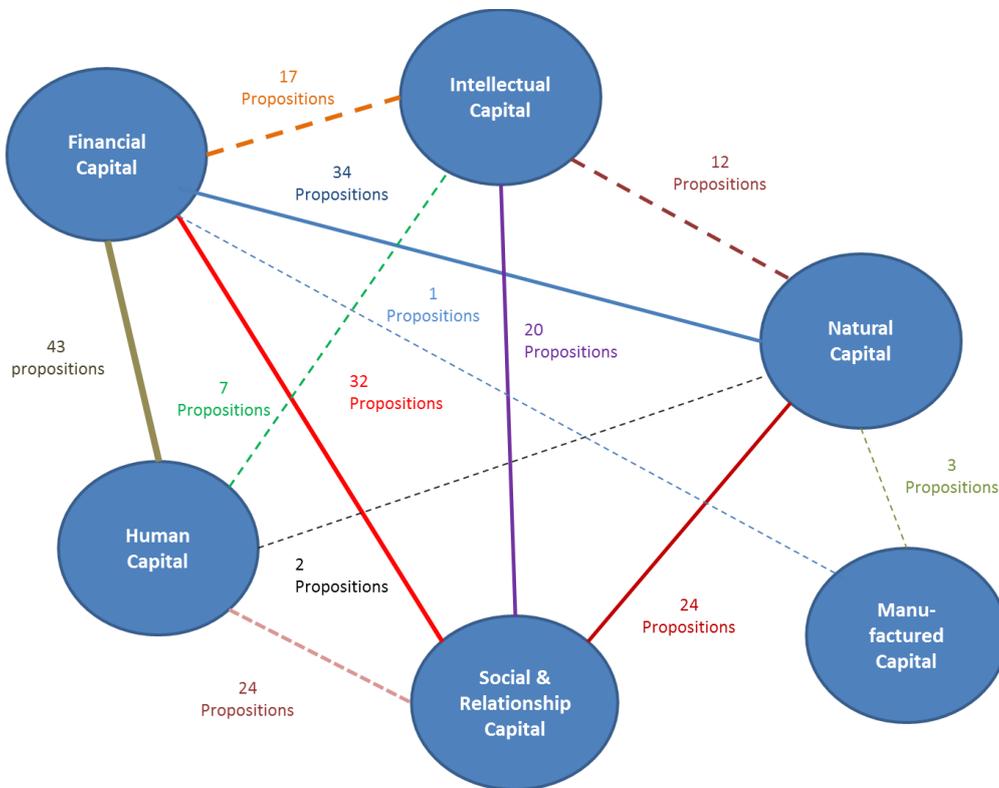
Research cycle 3 focused on the portrayed relationship between the individual capitals, and examined evidence from the reports for joint consideration. All the data processed in research cycle 1 was reviewed and analysed according to the potential evidence for capital combinations. In order to capture all potential combinations of capitals a cross-tabularisation table was used. The table not only served to capture all possible combinations of capitals, but also helped to determine the strength of these combinations by the number of meaning units (propositions) for each combination. The strength of

combinations allowed the portrayal of the relationship and combinations of capitals visually.

**Capital combinations: Exxaro**

Even though Exxaro did not report explicitly on intellectual capital, the definition from the IIRC as well as from the literature review for intellectual capital was used in order to infer the prevalence of this capital. This approach was also applied to all the other capitals, regardless whether the company structured its report according to the capital framework. Based on that approach, Exxaro reported on all six capitals. The relationship and combinations of capitals for Exxaro is visually captured in Figure 7.

**Figure 7. Capital combinations: Exxaro**



Exxaro’s strongest reported relationship between capitals is evident between Financial Capital and other capitals such as Human Capital (43 propositions), Social & Relationship (32 propositions), and Natural Capital (34 propositions). Furthermore, Exxaro also reported strongly on the relationship between Social & Relationship Capital and Natural Capital (24 propositions). It has to be mentioned that many of these capital relationships have been either based on the reporting on financial investments in the respective capitals or on influences of legislation and regulations, such as required reporting on social and labour plans according to South Africa’s Mining Charter.

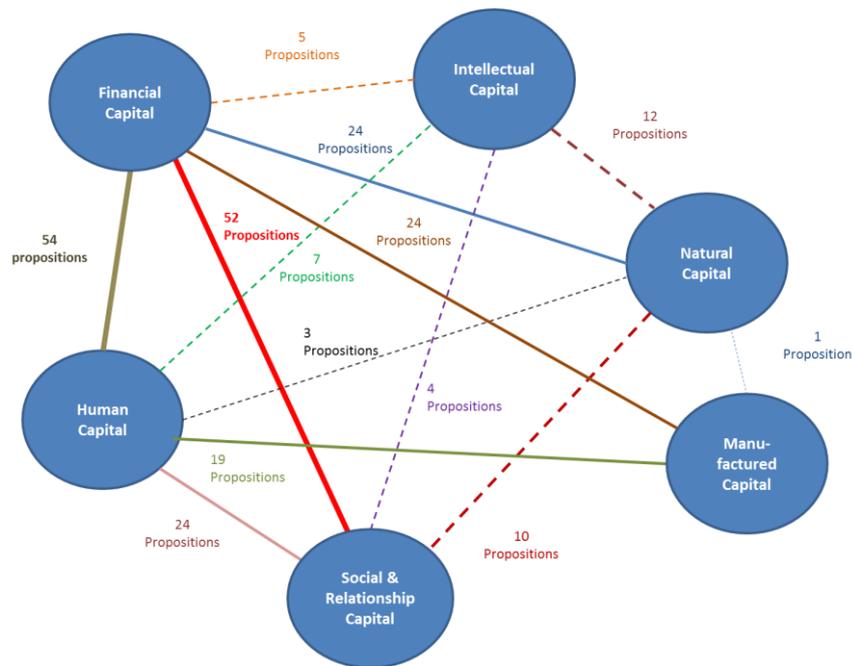
Nevertheless, the reasons why the companies reported certain relationships were secondary for the

purpose of this study but might be interesting for future research that could elaborate on causal models for the prevalence of reported capitals and their combinations. Exxaro’s weakest reported relationships were between Financial and Manufactured Capital, Natural and Human Capital, as well as Natural and Manufactured Capital.

**Capital combinations: Gold Fields**

Gold Fields also reported on all six capitals and portrayed the strongest consideration between Financial Capital and Human Capital (54 propositions) as well as Social & Relationship Capital (52 propositions), as is evident in Figure 8.

**Figure 8. Capital combinations: Gold Fields**

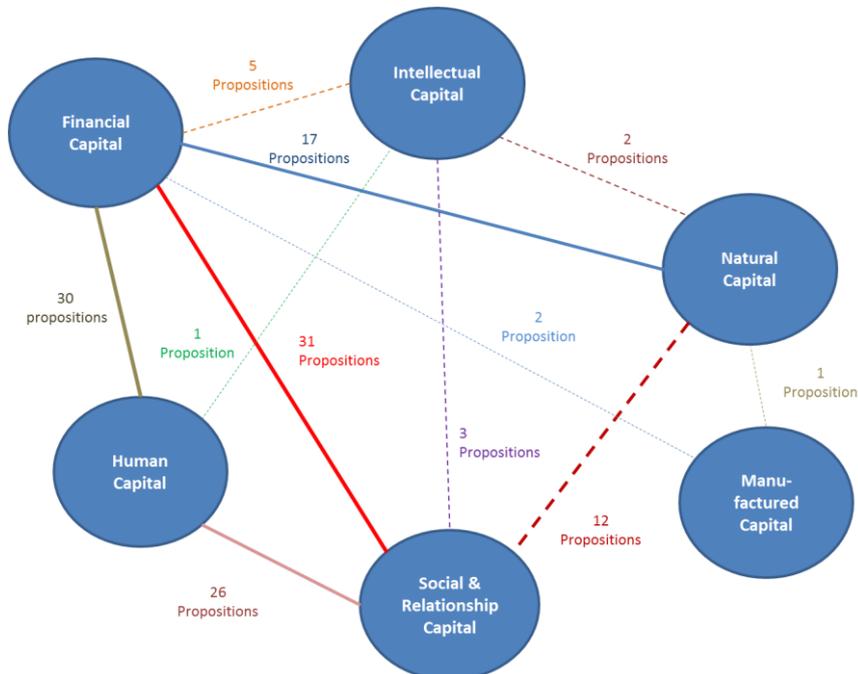


The company also showed the strongest consideration of these capitals when compared with the reports of Exxaro and Lonmin. The weakest combinations were shown between Human and Natural Capital, Natural and Manufactured Capital, Social & Relationship and Intellectual Capital, as well as Financial and Intellectual Capital.

**Capital combinations: Lonmin**

Even though all three companies reported on their six capitals, Lonmin showed the weakest strength in most of its capital combinations, as is evident in Figure 9.

**Figure 9. Capital combinations: Lonmin**



Strongest evidence was found for the relationship between Financial Capital and Human Capital (30 propositions), Social & Relationship Capital (31 propositions) and Natural Capital (17

propositions), as well as between Human and Social & Relationship Capital (26 propositions). All other combinations, even though prevalent, showed little evidence for consideration.

### Innovative models

The last step in the third research cycle has been to look for evidence for new innovative models within the companies when the capitals are considered jointly. In order to find evidence for innovative models the combinations of capitals from the previous step were reviewed again, thereby looking also for evidence for the consideration of multiple capitals.

The evaluation included the distinction between actual and intended new models. Even though various intentions for the creation of new models were expressed across the companies' reports, for the purpose of this research, only actual new models, evident either in their implementation phase or already implemented, were considered as innovations. Furthermore all three companies reported on single linkages between capitals, even though to different degrees.

For the purpose of this research our definition of innovation was based on the idea that a new model has to emerge in the tension and consideration of capitals; therefore single linkages between capitals that just show the relationship between them, but do not produce a new model, have not been considered as innovations. An example for this would be if a company invests in a new plant, thereby relating financial capital (in form of investment) to manufactured capital (purchase of new plant). Even

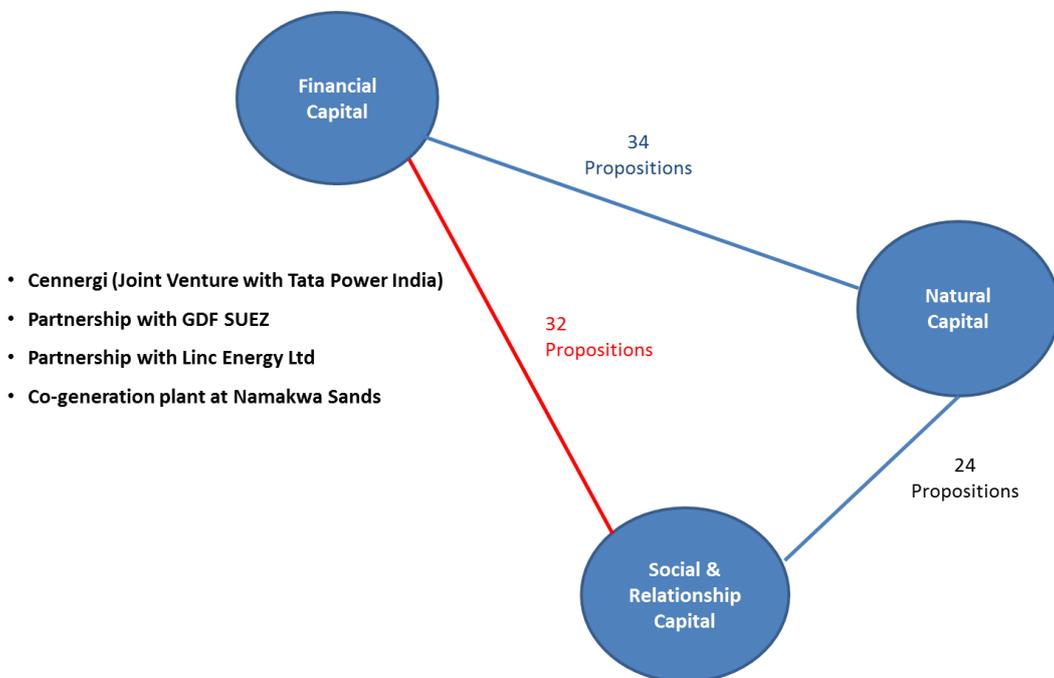
though the relationship has been portrayed, this would not constitute an innovative idea because of a lack of a new model based on the tension between the two capitals.

### Innovative models of Exxaro

Comparing all three companies' joint considerations of capitals, Exxaro portrayed the most solutions that could be regarded as innovative or new ideas that emerged from tension between capitals.

The innovative models shown from Exxaro's consideration of Financial, Social & Relationship, and Natural Capital were directly linked to the challenge of energy supply, as can be seen in Figure 10 below. With its coal production. Exxaro is a major supplier for Eskom's coal generated electricity supply, which is not only relevant for Exxaro's own production activities, but also for South Africa in general. The challenges of Eskom's ability to produce sufficient electricity supply, as well as Exxaro's need to reduce its own carbon footprint, all of this having considerable effects on Exxaro's financial capital, led the organisation to form various partnerships with other companies in the field of green and alternative energy production (such as Cennergi, GDF SUEZ, Linc Energy Ltd and Tronox Ltd), because these alternate energy sources are perceived to have commercial potential for the organisation.

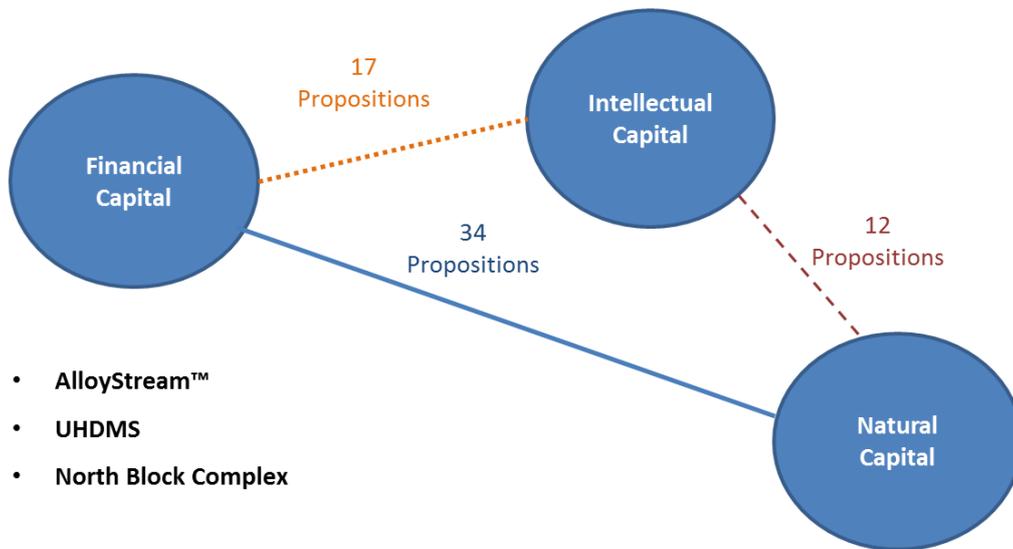
Figure 10. Exxaro's innovative ideas from joint consideration of capitals, I



In the consideration of Financial, Intellectual and Natural Capitals, Exxaro portrays the challenges in its carbon footprint and life-time of its mines for non-renewable natural resources and their financial

effects, and hereby enables the company to develop new processes and business models. The joint consideration of capitals employed is evident in Figure 11.

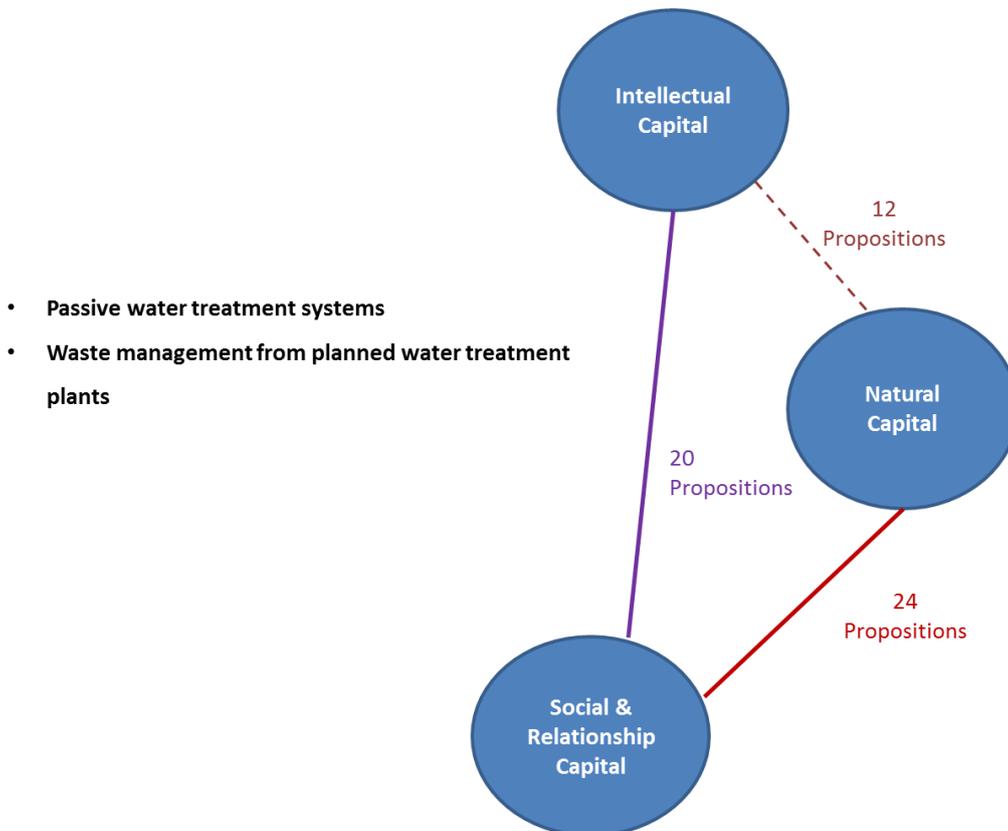
**Figure 71.** Exxaro’s innovative ideas from joint consideration of capitals, II



Exxaro also shows its commitment for collaboration and relationships, especially when it comes to knowledge creation and development of innovative solutions. The consideration of Natural,

Social & Relationship, and Intellectual Capitals gave Exxaro the opportunity to focus on collaborating for innovations for water treatment requirements. This is evident in Figure 12.

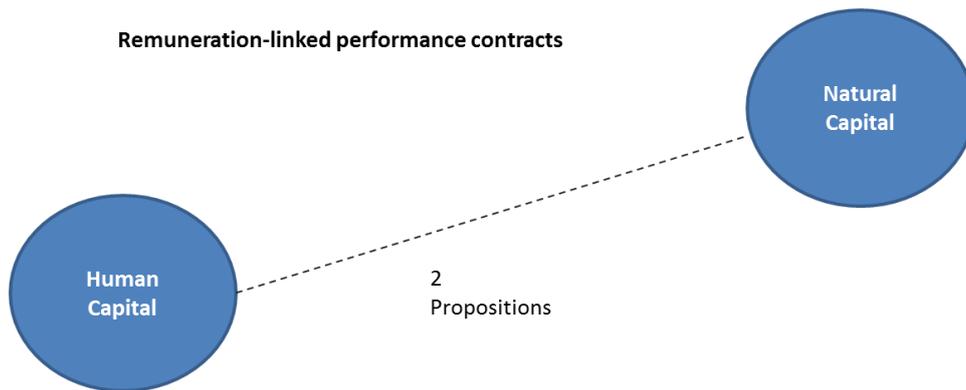
**Figure 82.** Exxaro’s innovative ideas from joint consideration of capitals, III



Single linkages that produce a new model were shown with the consideration of Human and Natural Capital, producing an innovative idea to link the

demands of both capitals that is illustrated in Figure 13.

**Figure 93.** Exxaro’s innovative ideas from joint consideration of capitals, IV

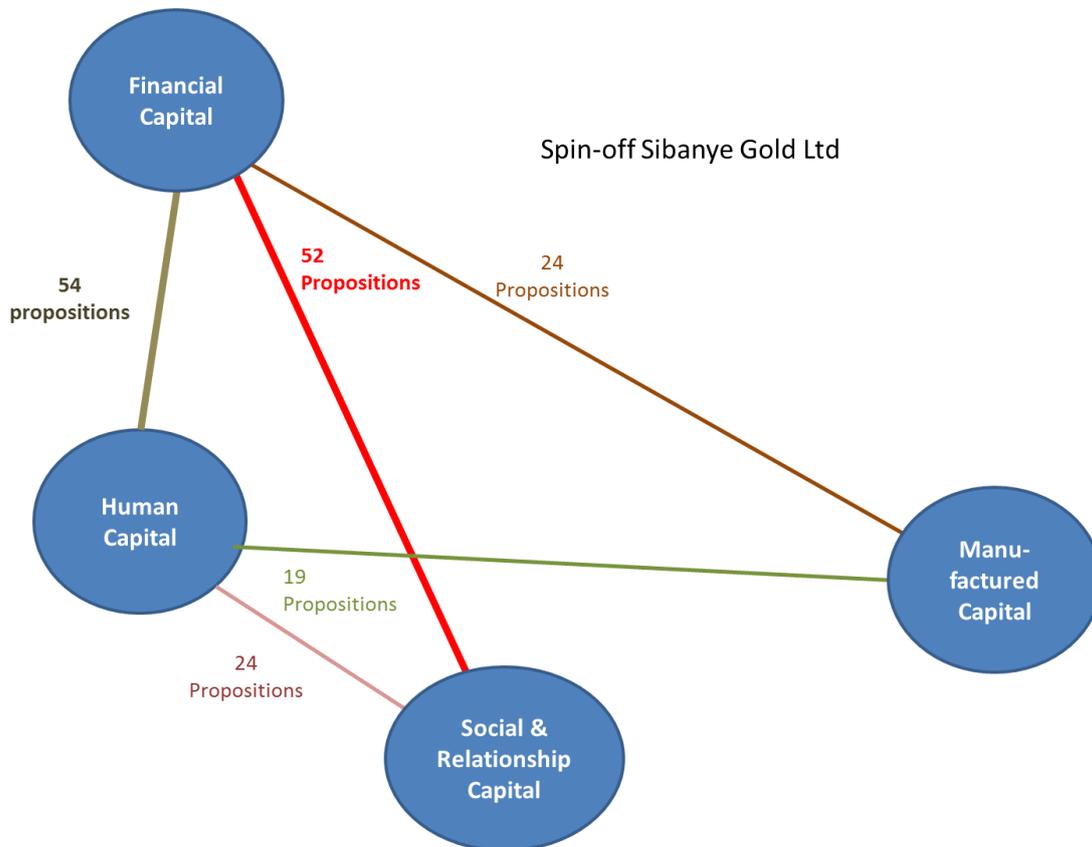


**Innovative models of Gold Fields**

Gold Fields reported on various new models that were based on the consideration and tension between various capitals. One of these is arguably the unbundling of its Beatrix and KDC mines from Gold Fields, and its consolidating them into the new independent company, Sibanye Gold Ltd. The question here remains whether this represents an innovative model. The argument is that the solution

for the tension between the various capitals (Financial, Human, Social & Relationship, and Manufactured) led to a new business model that excludes Sibanye Gold from the wider Gold Fields corporation, as local demands in South Africa and Gold Field’s global strategic aim led to competition for capital allocation. The tension between the various capitals is illustrated in Figure 14.

**Figure 14.** Gold Fields’ innovative ideas from joint consideration of capitals, I



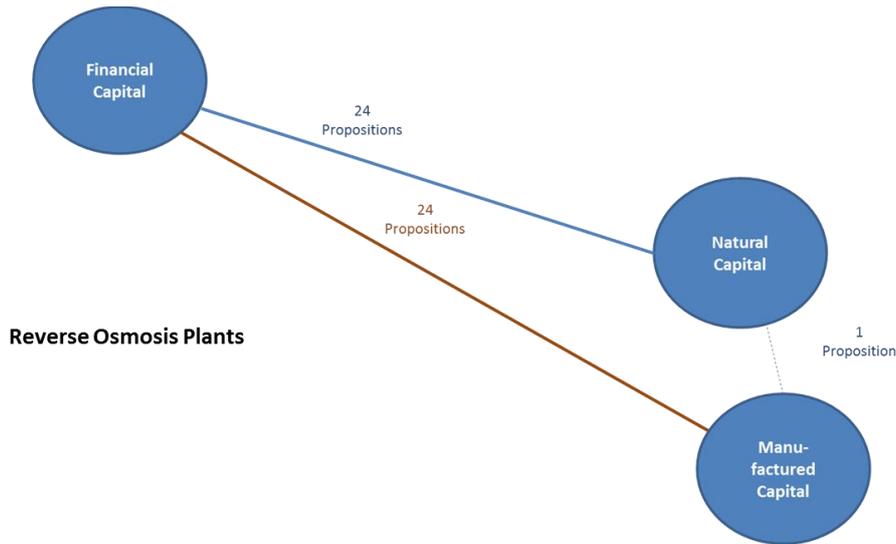
One of the evaluation criteria for Sibanye Gold being a new innovative business model was based on the question as to whether there were any capital

trade-offs. From a financial perspective existing shareholders were given Sibanye Gold shares. Human capital was not majorly affected as the unbundling

did not lead to any major retrenchments. Even though manufactured capital in form of the two operational sites was given up from direct control, the continuation of these sites under Sibanye Gold could be regarded as no trade-off. Social license to operate is also maintained through the new company, even though not under the name of Gold Fields. Therefore we would regard the new business model as innovative based on there being no major trade-offs between the capitals.

A further model was shown in the consideration of Financial, Natural and Manufactured capitals illustrated in Figure 15. Water-intensive mining activities add considerably to an organisation's cost base through water usage. Used water from mining activities also represents a pollution risk for Gold Fields since accidental spillage can contaminate the environment and lead to potential fines.

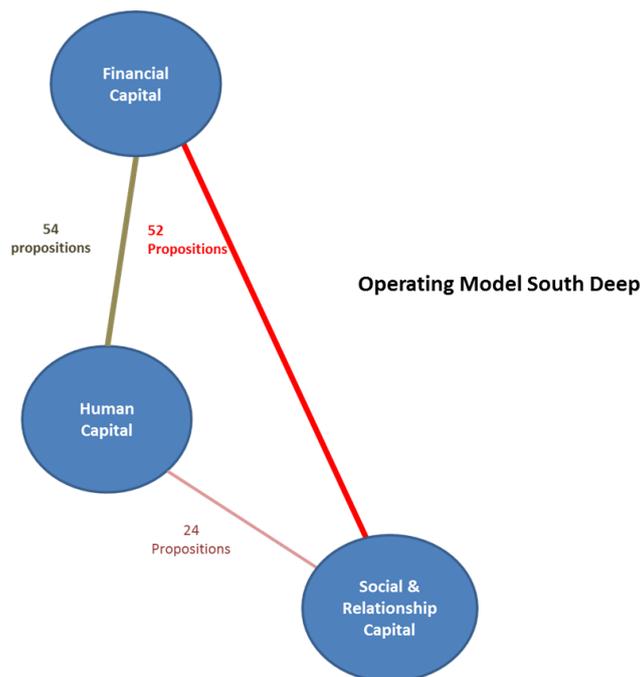
**Figure 105.** Gold Fields' innovative ideas from joint consideration of capitals, II



Another innovative model developed in negotiations with Labour unions regarding a new operating model for Gold Fields' South Deep operation. The tension between the Financial, Human

and Social & Relationship capitals and their consideration resulted in what Gold Fields names "a landmark agreement". The tension is illustrated in Figure 16.

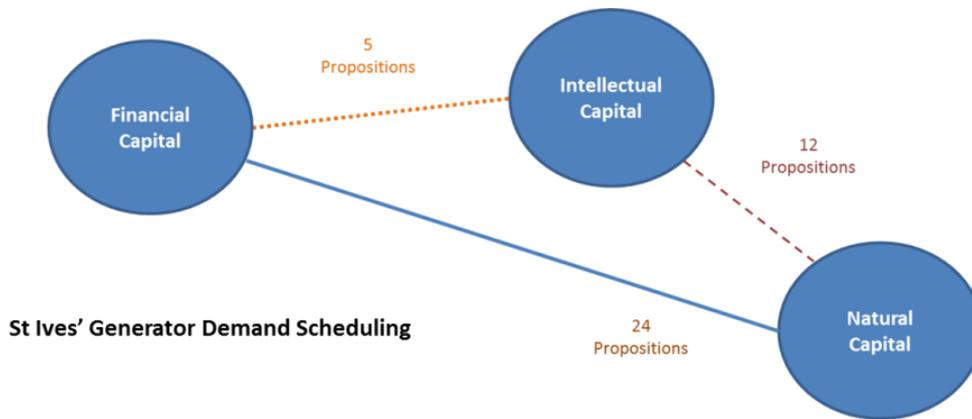
**Figure 116.** Gold Fields' innovative ideas from joint consideration of capitals, III



Lastly an opportunity for an innovative idea was created in the consideration of Financial, Intellectual

and Natural Capitals, as seen in Figure 17.

**Figure 127.** Gold Fields’ innovative ideas from joint consideration of capitals, IV



A new software-based generator demand scheduling process at Gold Fields’ St Ives rock operation reduced its diesel usage, saving the company US\$ 8 million.

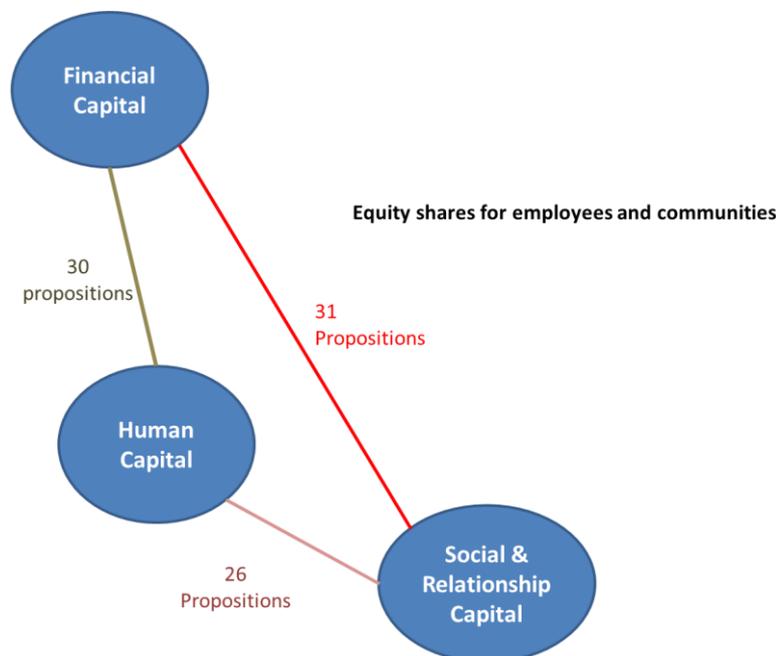
appropriate models for the research aim. Even though some innovations are mentioned, they are missing the relevant details needed in order to consider them for this research.

**Innovative models at Lonmin**

Looking at evidence for Lonmin’s innovative models that have emerged from this research study, it has to be mentioned that it was challenging to find

Nevertheless there has been some evidence for new models based on the consideration of Financial, Human and Social & Relationship Capitals and the tension between these is illustrated in Figure 18 below.

**Figure 138.** Lonmin’s innovative ideas from joint consideration of capitals, I



Even though it is not regarded as a new practice within the industry, the consideration of these capitals led to the organisational decision to provide for equity shareholding for employees and communities. This is evident in the following direct quotes from the Lonmin Annual Reports:

Further evidence for an innovative solution through multiple capital consideration was found between Social & Relationship and Natural Capital, in Lonmin’s considering community challenges regarding its waste management (Figure 19).

**Figure 19.** Lonmin’s innovative ideas from joint consideration of capitals, II



Even though considerable efforts were made through repeated re-reading of Lonmin’s annual reports as well as the trail of the research cycles, there was no other evidence found for innovative models or ideas at Lonmin that were concrete enough to be considered for this research study.

#### 4. Discussion

The application of a combination of inductive and deductive approaches for this qualitative research study gave insights into the varying degrees of integrated thinking capabilities through the strength of relationships portrayed between the capitals of an organisation. This suggests that the IR framework can lead to the depiction of the various capitals as well as their relationship to each other, even though the degree to which this was portrayed varied between the organisations. This would further suggest that integrated thinking is shown according to the IIRC’s definition.

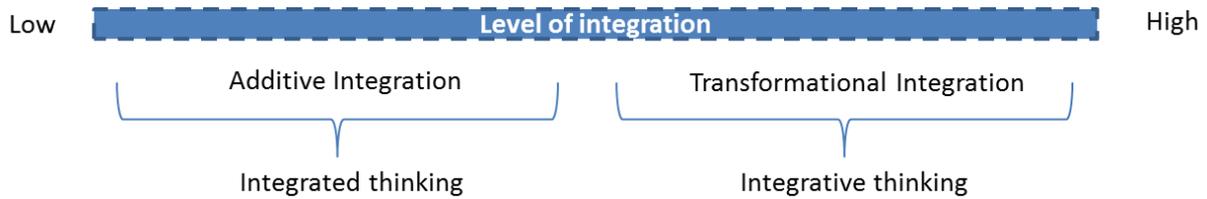
An interesting insight emerged when organisations’ reports were tested for the integrative thinking capabilities according to Martin (????), and evidence was sought for new innovative ideas and models that the organisations developed in the tension and consideration of different capitals (models). The insight was that the results suggest that there are differences between the companies regarding new innovative models and therefore, it can also be argued that the results also suggest that there are differences in the levels of integrative thinking capabilities, which correlate to a certain degree also with the relative strength of the portrayed relationships between capitals that were illustrated. This suggests that the level of integrated thinking has an influence on the level of integrative thinking,

which seems logical in the sense that portraying the capitals and their relationships is required in order to develop a new model within these relationships. In abstracting integrated thinking and integrative thinking into a higher order category, it is concluded that they relate to the same overall concept of “integration”, yet describe different aspects thereof.

Kallio (2011), who theorised about integrative thinking for adult cognition, elaborates on the concept of integration, and differentiates between additive and transformational integration. The author hypothesises that additive integration entails merely a mechanistic combination of elements, whereas transformational integration requires a synthesis where “*lower level objects are formulated in a new way and steps are taken to create something new from them*” (Kallio, 2011, p. 796). This transformational characteristic of integration and synthesis into something new qualifies for the author as “integrative thinking”. Comparing Kallio’s elaborations with integrated and integrative thinking, it can be inferred that integrated thinking is associated with additive integration, whilst integrative thinking is synonymous with transformational integration.

Picturing integration as a continuum, ranging from low to high, as well as taking into consideration that integrated thinking is a prerequisite for integrative thinking, the conclusion would be justified that the portrayal of capitals and their relationships for “integrated thinking” is associated with the lower levels of this continuum, whereas finding creative solutions between conflicting capital relationships for “integrative thinking” is associated with the higher levels. This continuum is illustrated in Figure 20 below.

**Figure 20.** Level of integration as a continuum



Source: Author’s own construction)

Applying this to the capital concept of integrated reporting for financial stability and sustainability, the level of integration can be related to the level of integration of the various capitals’ needs, with the portrayal of capitals and trade-offs being associated with the lower levels, whereas new models that satisfy simultaneous capitals’ needs are to be found on the higher level end of this continuum.

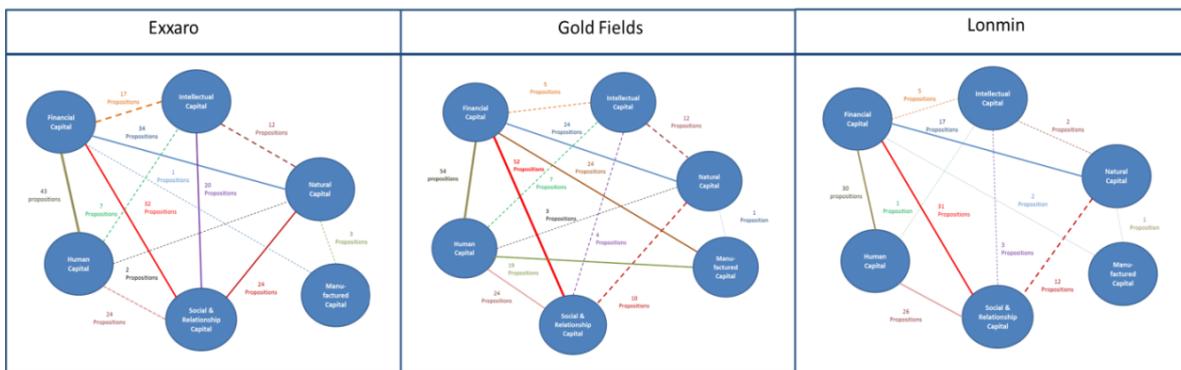
The indications from the literature as well as the theorising process suggest that integrated and integrative thinking are not mutually exclusive. Integrated thinking is a prerequisite for integrative thinking. Even though both concepts show differences in their qualitative characteristics, which are either additive or transformational, both concepts are related to the overall concept of integration.

**Towards a heuristic of an interpretive measurement framework**

The relevance of the above-mentioned theory is that it becomes a departure point for developing an interpretive measurement framework that enables an evaluation of the level of integrated and integrative thinking within organisations according to the capital framework of the IIRC.

The organisations that were used for this research study reported on their capitals, even though more implicitly than explicitly with only one company structuring their reports according to the all six capitals. The relative strength of the portrayed relationships between capitals differs, especially in the case of Lonmin which shows less intensity in its capital relationships (Figure 21). Yet since all of the companies portray their capitals and their relationships, the criteria for integrated thinking (as ‘additive integration’) would be satisfied.

**Figure 21.** Comparison for portrayal of capitals and their relationships between companies studied



Looking at the innovative models that were developed by the companies in the tension and consideration of various capitals, the challenge now becomes about making a value judgement about the models. The quality of the models is inherent in what the organisation and its various stakeholders regard as valuable.

Various possibilities exist to measure the component of integrative thinking. For this study, the evaluation criteria for the initial measurement

framework’s integrative thinking component focused on the number of total capitals considered during the development of and across the various innovative models.

According to this all three organisations show models that emerged from the tension and consideration of capitals. However the difference lies in the number of total capitals considered. Table 2 provides an overview of the capitals considered across occasions and number of innovative models.

**Table 2.** Overview of number of capitals considered across innovative models

No of Capitals	Exxaro	Gold Fields	Lonmin
1	Financial	Financial	Financial
2	Natural	Natural	Natural
3	Social & Relationship	Social & Relationship	Social & Relationship
4	Human	Human	Human
5	Intellectual	Intellectual	
6		Manufactured	

Whilst it is acknowledged that measuring solely according to number of capitals might be judged for its simplicity, this measure provides the possibility for an initial measurement of an organisation’s level of integration capabilities. Utilising our theory as to the existence of a continuum for the level of capital integration, an initial interpretive measurement framework can be put forward for further testing and development. In this framework, the measurement for integrated thinking ranges from no consideration, to consideration of some capitals, consideration of all capitals, and their joint consideration. From a terminology point of view, “consideration” means

that the company portrays its capitals, and “joint consideration” refers to depicting the relationship between the capitals. On the other hand, in this framework, the measurement of Integrative thinking is based on evidence of innovative models that is derived from the tensions and relationships (joint consideration) of the capitals, as measured by the number of total capitals considered across the various innovative models.

The Interpretive Measurement Framework for Capital Integration that has been developed from the research can therefore be illustrated as per Table 3.

**Table 3.** Interpretive Measurement Framework for Capital Integration

Level of capital integration				Maturity level
<b>Integrated thinking</b>	No consideration of capitals			1
	Consideration of some capitals			2
	Consideration of all capitals			3
	Joint consideration of capitals			4
<b>Integrative thinking</b>	Evidence for innovative models based on joint consideration of capitals	<b>Number of total capitals considered across innovative models</b>	2	5
			3	6
			4	7
			5	8
			6	9

Source: Author’s own construction)

In the interpretive measurement framework, the number of total capitals considered ranges from two capitals - the minimum number of capitals to

explicate a relationship - to the maximum number of six capitals, which also represents the maximum

maturity level that can be measured according to this framework.

Applying this framework to the companies that were focused on in this research study, and therefore

measuring their level of maturity for capital integration as an example, allows the following results, as represented in Table 4.

**Table 4.** Application of Interpretive Measurement Framework to companies studied

Level of capital integration		Maturity level	Maturity Level of Companies		
			Exxaro	Gold Fields	Lonmin
Integrated thinking	No consideration of capitals	1			
	Consideration of some capitals	2			
	Consideration of all capitals	3			
	Joint consideration of capitals	4			
Integrative thinking	Evidence for innovative models based on joint consideration of capitals	2			
		3			
		4			7
		5	8		
		6	9		
					9

Since Gold Fields would show the consideration of all six capitals across its various innovative models, it would be associated with the highest maturity level; followed by Exxaro with a total of five capitals considered; and Lonmin with a total of four capitals considered.

In conclusion, even though there is a difference between the companies, all three companies would be deemed to show integrative thinking capabilities according to the above-mentioned Interpretive Measurement Framework that has been developed as a result of the research conducted for this study.

**Heuristic process for the measurement of organisational maturity and testing of theory**

The initial developed theory needs to be tested for its further refinement. The propositions inherent in the developed Interpretive Measurement Framework model are as follows:

1. Integrated and integrative thinking are both required for the financial stability and sustainability of an organisation.
2. Integrated thinking can be explicated by the relationship between an organisation’s capitals, including trade-offs.
3. Integrative thinking capabilities are explicated by the resolution of the inherent conflict between capitals with new superior models that

satisfy the multiple stakeholders’ needs representing these capitals beyond trade-offs.

4. The maturity level of an organisation is dependent on the level of capital integration and the number of stakeholders satisfied in their new models.

5. The higher the number of an organisation’s capitals considered, the higher the organisation’s level of maturity.

In order to serve the criteria of practicality for organisational stakeholders, as well as to allow the developed model to be tested, a heuristic-based approach to the evaluation process has been developed that is suggested as a useful framework to follow. This is outlined in Figure 23, which illustrates that the suggested heuristic-based evaluation process considers three elements – the main process steps, the process decisions, and the process outcome.

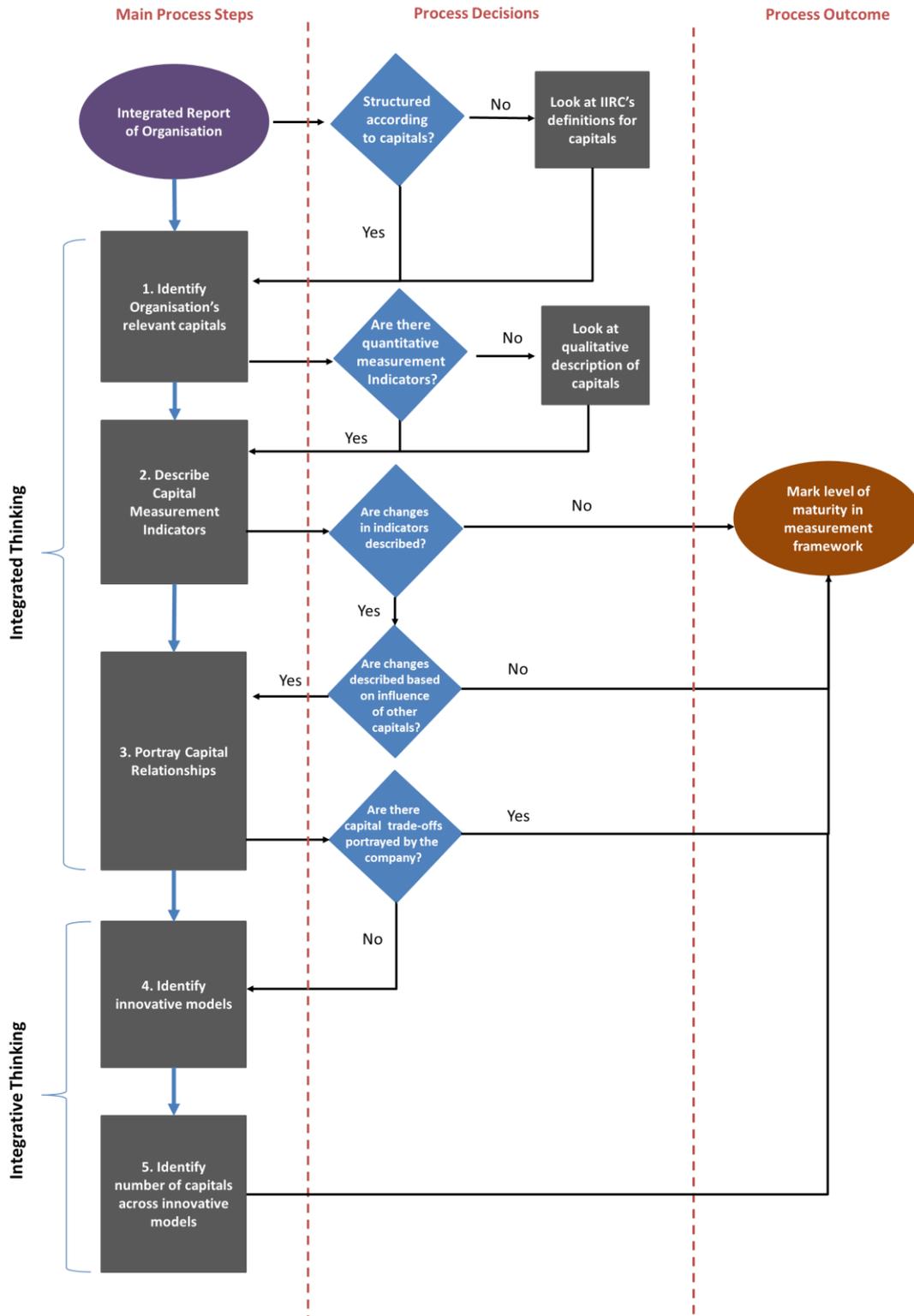
Five main process steps were identified as helpful heuristics to use when applying the Interpretive Measurement Framework, and can be listed as follows:

1. Identify the organisation’s relevant capitals
2. Describe the capital measurement indicators
3. Portray the capital relationships
4. Identify innovative models
5. Identify the number of capitals considered across the innovative models identified

Steps 1 to 3 relate to Integrated Thinking and Steps 4 and 5 to Integrative Thinking.

The process steps flow into process decisions based on questions, as illustrated in Figure 22.

**Figure 22.** Heuristic-based evaluation process



Source: Author's own construction

As is evident from Figure 23, the process decision steps require consideration of the organisation's relevant capitals, its capital measurement indicators, capital relationships,

innovative ideas and models, and the number of capitals considered jointly. Challenges that might potentially be faced in making these decisions will now be discussed.

## Organisation’s relevant capitals

The challenge to the identification of the relevant capitals for the measurement is based on the fact that reports are not necessarily structured according those capitals, which makes the categorisation of information difficult. A contributing factor might be that even the IIRC acknowledges the existence of variations for different organisations’ impact and use of these capitals, and therefore differences in the relevance of them (IIRC Discussion Paper, 2011). However, it has been argued that all six capitals are relevant for the agenda of sustainability and sustainable development, and that companies use or affect those capitals, even though to different degrees. The identification of these capitals can be supported by the definitions of the IIRC’s initial framework.

## Capital Measurement Indicators

Even though the IIRC does not prescribe Key Performance Indicators for these capitals, a study of the Association of Chartered Certified Accountants (ACCA) in 2012 showed that major listed companies at the JSE show increased tendencies towards quantification of non-financial performance indicators. The IIRC’s technical task force stated in their Capital Background Paper (2013) that the IIRC’s “aim is to complement indicators that have been developed by established reporting standard setters and others, such as industry bodies, and does not intend to develop duplicate content” (p. 22).

Besides some of these indicators being enforced and required to be reported on through legislative requirements, companies also show the tendency to

report on the financial impact of social and environmental projects. ACCA states further that portraying KPIs on greenhouse gas emissions is an observed worldwide trend in reporting (ACCA, 2012).

Besides the presentation of KPIs, the qualitative description within these reports gives access to information about the capitals that an organisation deems as relevant. The quality of interpretation of this information will however depend on the interpretive capabilities of the reader. Important in this process step for capital measurement indicators is to identify whether the organisation describes changes in these indicators, and whether these changes are described through the influences of other capitals. Prevalence of these allows portrayal of the relationship between the organisation’s capitals.

## Capital Relationships

In this research study the capital relationships were also not found to have been explicitly portrayed by the organisations in their reports. The capital relationships need to be inferred from the changes in the measurement indicators of these capitals, and whether these changes are based on the influence of other capitals. The reader of these reports will need to strongly rely on individual judgement which needs to be based on the definition of the capitals by the IIRC, as well as the implied capital stakeholders who are involved and affected by this relationship. The following simple example, based on an extract from Exxaro’s IR, aims to demonstrate this in Table 5.

**Table 5.** Example of Portrayal of Capital relationships: Exxaro

Extract (Exxaro IR, 2012)	Involved or affected stakeholders	Measurement Indicators	IIRC definitions (IR Background Paper, 2013)	Inferred Capitals
“Over the past six years, Exxaro has spent almost R1 billion on training and development”.	Shareholders (as equity investors)	<u>Quantitative:</u> Financial expenditure (R1 billion)	The pool of funds that is (...) obtained through financing, such as debt, equity or grants, or generated through operations or investments.	Financial Capital
	Employees	<u>Qualitative:</u> Increased competencies	People’s skills and experience, and their capacity and motivations to innovate	Human Capital

The relevant information is not always clear and precise, or readily available. In such cases the quality of the portrayal of the capital relationships will depend on the quality of interpretive skills of the reader. This is also applicable for the identification of capital trade-offs, which is relevant for the consideration of the company’s integrative thinking capabilities.

## Innovative ideas and models

In the previous sections of this report it has been argued that the tension between the opposing interests and needs of the capitals’ stakeholders also have the innate potential for innovative ideas and models. The ability to identify these innovative ideas and models is an important step in the evaluation process in order to establish the integrative thinking capabilities of an organisation. A further example, provided in Table 6, demonstrates the process for identifying the innovative idea/model in the tension of these capitals, hereby satisfying the multiple needs.

**Table 6.** Example of evaluation process for innovative ideas and models: Gold Fields

Extract (Gold Fields IR, 2013)	Innovative idea/ model	Interests of stakeholders	Inferred Capitals	Benefits to stakeholders/ capitals
<p>“As part of our Liquid Gold project, two new reverse osmosis plants will be commissioned at South Deep in early 2014 to treat process water to a potable standard, (...) which is then used by our own facilities (...), reducing our water costs as well as the risk of overflows from our return water dams and pollution control dams during periods of heavy rainfall”</p>	Reverse Osmosis plants	Shareholders (financial interest of organisation)	Financial Capital	Reduction of water costs
		Company ( in form of needs of its facilities i.e. water consumption)	Manu- factured Capital	Availability of potable water
		EnvironmentalistsNGOs, communities (need for clean water)	Natural Capital	Less risk of overflows and pollution

**Number of capitals considered jointly within and across models**

Even though it is argued by the IIRC that not all capitals are relevant for an organisation, this report has brought counter-arguments for that based on the concept of sustainability. A new model has to consider at least two capitals as it is the minimum requirement for the depiction of a relationship. The maturity level of an organisation is equal to the number of capitals jointly considered for each model and/or across several new models. Therefore the higher the number of capitals considered the higher the levels of maturity for integrative capabilities.

**5. Conclusion**

The study’s research result, presented in the form of an interpretive measurement framework, represents merely an initial step and an ongoing working hypothesis which requires further research to develop the maturity of its usefulness. As mentioned previously, the framework’s component of integrative thinking requires deeper insights into its rating potential. We believe that looking at the consideration of various capitals and the development of innovative models within their tensions is reflective of the integrative thinking capabilities of companies. However the framework requires further refinement in order to enable the comparison of organisations, as well as to increase its applicability into the general and specific contexts of the organisations that are evaluated. This refinement of the framework should also be complemented by investigating its predictability through medium to long-term studies. A potential approach could be to look at the results of companies according to the measurement framework and investor confidence, as well as overall company performance.

Another focus area would be to understand the enablers and stumbling blocks for integrated and integrative thinking within organisations. A systemic investigation into the causal mechanisms of the

various capitals could give interesting insights into the dynamics that are potentially influencing the organisation’s ability for joint consideration of capitals. This, together with the consideration of contextual influences on these capitals, could help to define potential interventions that enhance not only the capital consideration but also the stock of value that is inherent in them according to the IIRC. Another very important aspect for future studies is to investigate integrated and integrative thinking capabilities not only based on the organisations’ external reporting, but to also look at the organisations’ internal activities that may or may not be indicative of the phenomenon. Looking at the many consulting firms that offer their services for integrated reports to companies, this aspect would be justified in order to evaluate whether these capabilities are inherent in organisations.

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