ALIGNMENT OF INTERNAL AND EXTERNAL BUSINESS & INNOVATION DOMAINS

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Declaration

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Synopsis

The concept of strategic alignment, the "golden thread", lies at the heart of this research. The idea that all available resources are simultaneously attracted by the magnetic pull of a company's strategy, like a million small compass needles, is both extremely desirable and incredibly difficult for a company to achieve. This dissertation, however, takes the concept of strategic alignment and pulls it and twists it and eventually shapes it so that it may be applied to the highly uncertain and complex environment of the innovation domain.

It has been well established, that in the world today, adaptability is a key competitive advantage. Innovation has long been seen as a differentiator in company competitiveness. However, researchers and companies continue to struggle with the dichotomy between the open, unstructured and creative nature of innovation and the need to maximise the opportunity for innovation success through structure. The structuring of innovation activities was, for a long time, a controversial issue with the idea that strategy kills innovation being a widely expressed concern. Today, the value of an Innovation Strategy, which governs the innovation activities in a company, is widely accepted. This dissertation aims to contribute to the ongoing quest for a structured approach to innovation without harming the essence of innovation, human ingenuity.

In working towards achieving this aim the Strategic Alignment Model was recognised as a well-established, logical and elegant model to manage the alignment between the overall business domain and a support function domain. Through analysis of the strategic alignment and innovation management literature, the Strategic Alignment Model was adapted to represent the alignment between the business and innovation domains. The adapted model is called the innovation Strategic Alignment Model (iSAM). The iSAM is a unique framework which integrates concepts from the field innovation management such as innovation scope, innovation maturity, innovation governance and innovation models with a well-established strategic alignment approach. No other model in the identified literature provided this link between these two research fields. The structure and content of iSAM was validated with a panel of experts and their feedback is included in various sections of the dissertation.

The implementation of the iSAM in a real company requires a structured implementation framework. Such a framework is presented in this dissertation and both the iSAM and the implementation framework are tested through a multi-year case study. A key consideration is that it was not the aim of the case study to generalise the results for other industries or company types, but rather to

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demonstrate how such a model may be used to understand the alignment between the innovation and business domains and whether or not the model can be practically applied in order to generate alignment recommendations for a real company. Feedback from senior managers in the focus company was that the iSAM made the innovation landscape clearer and that through iSAM a greater understanding of the components of an Innovation Strategy was gained.

This dissertation concludes with the summary of findings from the expert validation exercise and the multi-year case study. There seemed to be a general consensus amongst the experts that the iSAM does provide a valuable framework for Innovation Strategy alignment and that the model comprehensively addresses a critical issue facing companies. The experts also highlighted several areas of improvement and future research. These include: catering for variations in the model based on company size, company type and industry and further empirical evidence for some of the defined relationships in the model. From the case study it was concluded that iSAM provides a simple, clear, common understanding of the components involved in Innovation Strategy and innovation alignment, the implementation framework provides practical guidance and applicable tools to assist in determining innovation alignment and in following a change pathway to achieve alignment and the final recommendations provide clear instructions on what a company needs to do in order to ensure alignment is achieved. The case study also reveals several interesting challenges. These include: ensuring the entire management team engages with the model and the implementation approach and ensuring the applicability of the model for a specific company.

Finally, it is the hope of the author that this dissertation initiates another small twig, which over time and through the work of other researchers in the field, contributes to the growing knowledge in the innovation domain.

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Opsomming

Die konsep van strategiese belyning is die "goue draad" en dus die kern byrae van hierdie navorsing. Die idee dat alle beskikbare hulpbronne gesamentlik aangetrek of belyn word deur die “magnetiese” aantrekkingskrag van 'n maatskappy se strategie (soos 'n miljoen klein kompas naalde), is beslis wenslik, maar terselfdertyd ook ‘n groot uitdaging vir vir die ondernemig. Hierdie verhandeling beskou die konsep van strategiese belyning en wysig en omvorm dit sodat dit toegepas kan word in die onseker en komplekse omgewing van innovasie.

Dit word algemeen aanvaar dat aanpasbaarheid in die onderneming 'n belangrike mededingende voordeel bied. Innovasie word lank reeds beskou as 'n onderskeidende faktor in die mededingendheid van ‘n maatskappy. Navorsers en maatskappye worstel egter steeds met die digotomie tussen die oop, ongestruktureerde en kreatiewe aard van innovasie en die behoefte om die geleentheid vir innovasiesukses te maksimeer deur meer struktuur daaraan te verskaf. Die strukturering van innovasie aktiwiteite is lank reeds 'n omstrede kwessie met die redelik wye persepsie dat strategie innovasie smoor of inperk. Vandag word die waarde van 'n Innovasie Strategie, wat die innovasie aktiwiteite in 'n maatskappy rig, egter veel meer algemeen aanvaar. Hierdie verhandeling dra by tot die voortgesette soeke na 'n gestruktureerde benadering tot innovasie sonder inperking van die kern van innovasie, naamlik menslike vindingrykheid.

Ten einde hierdie doelwit te bereik is die Strategiese Belyningsmodel geïdentifiseer as 'n goed gevestigde, logiese en elegante model om die belyning tussen die totale besigheidsdomein en 'n ondersteuningsfunksie domein te bestuur. Deur analise van die strategiese belyning en innovasiebestuur literatuur, is die Strategiese Belyningsmodel aangepas om die belyning tussen die besigheid en innovasie domeine te vervat. Die aangepaste model staan bekend as die innovasie Strategiese Belyningsmodel (iSBM). Die iSBM is 'n unieke raamwerk wat konsepte uit die veld van innovasiebestuur soos innovasie omvang, innovasie volwassenheid, innovasie bestuur en innovasie modelle, met 'n goed gevestigde strategiese belyning benadering te integreer. Die struktuur en inhoud van iSBM is gevalideer met 'n paneel van kundiges en hul terugvoer is ingesluit in verskillende afdelings van hierdie verhandeling.

Die implementering van die iSBM in 'n werklike maatskappy vereis 'n gestruktureerde implementerings raamwerk. So 'n raamwerk word in hierdie verhandeling aangebied en beide die iSBM en die implementeringsraamwerk word getoets deur 'n multi-jaar gevallestudie. 'n Belangrike oorweging van die gevallestudie was nie om die resultate vir ander nywerhede of tipes maatskappye

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te veralgemeen nie, maar eerder om te demonstreer hoe so 'n model kan gebruik word om die verband tussen die innovasie en besigheidsareas te verstaan en te bepaal of die model prakties toegepas kan word om belyning aanbevelings vir 'n werklike maatskappy te ontwikkel.

Die verhandeling word afgesluit met ‘n opsomming van die bevindinge van die deskundige valideringoefening en die multi-jaar gevallestudie. Daar blyk algemene konsensus te wees onder die innovasie deskundiges wat deelgeneem het aan hierdie studie dat die iSBM ’n waardevolle raamwerk vir Innovasiestrategie belyning verskaf, en dat die model breedvoerig ’n baie belangrike kwessie wat maatskappye in die gesig staar aanspreek. Die kundiges het ook verskeie verbeteringsareas aangedui wat ’n aanduiding is vir verdere toekomstige navorsing. Hierdie areas sluit in : om voorsiening te maak in die model vir variasies gebaseer op maatskappy grootte, tipe, en industrie, sowel as verdere empiriese bewyse vir sekere van die verwantskappe gedefinieer in die model. Die gevallestudie het aangedui dat die iSBM ’n eenvoudige, duidelike en gemeenskaplike verstaan van die komponente van ’n innovasie strategie en innovasie belyning verskaf. Dit dui ook aan dat die implementeringsraamwerk praktiese riglyne en toepaslike gereedskap verskaf om innovasie belyning te bepaal sowel as ’n veranderingsroete te volg om belyning te bewerkstellig. Die finale aanbevelings van die raamwerk verskaf ook duidelike instruksies oor wat ’n maatskappy behoort te doen om te verseker dat belyning bereik is. Die gevallestudie dui ook verskeie interessante uitdagings aan, naamlik die versekering dat die hele bestuurspan deelneem aan die model en die implementerings benadering, sowel as die versekering van die toepaslikheid van die model vir ’n spesifieke maatskappy.

Ten slotte, dit is die hoop van die skrywer dat hierdie verhandeling ‘n nuwe navorsingsarea inisieer, wat met verloop van tyd en deur die werk van ander navorsers in die veld, sal bydra tot die groeiende kennis in die innovasie domein.

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List of Acronyms

BCI	-	Business Concept Innovation
BI&P	-	Business Infrastructure and Process
BS	-	Business Strategy
CEO	-	Chief Executive Officer
CIO	-	Chief Innovation Officer
CRM	-	Customer Relationship Management
CTO	-	Chief Technology Officer
HR	-	Human Resources
HSS	-	Health System Strengthening
II&P	-	Innovation Infrastructure and Process
IMS	-	Innovation Management Systems
IS	-	Innovation Strategy
iSAM	-	innovation Strategic Alignment Model
IT	-	Information Technology
KRNW	-	Knowledge Resource Nomination Worksheet
PWC	-	Price Waterhouse Coopers
R&D	-	Research and Development
SAM	-	Strategic Alignment Model
SBU	-	Strategic Business Unit
TRC	-	Technical Review Committee

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TRL - Technology Readiness Levels

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Glossary

Change Pathway	The steps a company is required to take in order to move from a state of misalignment to one in which its business and innovation domains are aligned.
Discontinuous Innovation	Discontinuous innovations are those that have a dramatic effect on a company or industry. These innovations involve the introduction of a new product, process or technology which leads to a discontinuation of the current product, process or technology.
External Innovation Domain	The external domain, with regards to innovation, defines how a company is positioned in the innovation environment.
Functional Integration	Functional integration deals with the integration between the business and a functional area, such as HR, IT or innovation.
Generic Strategic Perspectives	Grand strategies which are used to define generic strategy typologies.
Incremental Innovation	"Incremental innovations are those that result in a lesser degree of departure from existing practices" [1].
Innovation	"The successful generation, development and implementation of new and novel ideas, which, introduce new products, processes and/or strategies to a company or enhance current products, processes and/or strategies leading to commercial success and possible market leadership and create value for stakeholders, driving economic growth and improving standards of living" [2].
Innovation Capability	Innovation capability is, "the organisational means with which innovative outputs may be facilitated" [8]. It is also described as the potential of an organisation to innovate [3], [4].

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Innovation Governance	Innovation Governance involves the choice of frameworks that defines the mission, focus and implementation of innovation in the company [5].
Innovation Management	Management activities related to all aspects of Innovation in a company including the processes, people, technology and measures.
Innovation Strategy	"An innovation strategy is a functional, predetermined plan governing the allocation of resource to different types of innovations in order to achieve a company's overall
Internal Innovation Domain	The internal innovation domain focuses on a company's internal innovation infrastructure and processes.
Radical Innovation	"Radical innovations are those that produce fundamental changes in the activities of an organization and large departures from existing practices" [1].
Strategic Alignment	Optimal state in which strategy, employees, customers and key processes work in concert to propel growth and profits" [6]. The fit between a company's internal structure and its external environment [7].
Strategic Fit	Strategic fit ensures the infrastructure and processes are aligned to and support the strategy.
Strategy Alignment Perspectives	The alignment perspectives describe the way in which a company adapts to changes in its internal and external environments in order to regain alignment after such a change. The main alignment perspective provides a guide and represents the general approach a company should follow to achieve re-alignment after change.
Sustaining Innovation	Sustaining innovations are those which enhance a current product, process or technology and thereby extend the life of the product, process or technology.

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1 Introduction

At the heart of this dissertation lies the idea that **change** is the new **competitive advantage**, **innovation** is the pinnacle of **change**, **strategy** is required to optimise **innovation** and **alignment** drives the successful implementation of **strategy**.

This introduction provides a high-level perspective on the key concepts presented in this dissertation. The introduction also provides insights into how these key concepts relate to each other and how they contribute to the alignment of the innovation and business domains.

Competitive Advantage: Traditional competitive advantages such as market position, scale, production capabilities and delivery models are essentially static competencies in today's uncertain business environment [8]. These competencies, while still important in gaining competitive advantages, take significant time to develop and may quickly become irrelevant in a fast changing world.

Change: *"Instead of being really good at doing some particular things, companies must be really good at learning how to do new things*" [8]. "New things" essentially require change. Different types of changes can occur in a company. Change can be used to support the achievement of the business strategy, doing things better, or it can be there to change the business strategy, doing things differently [9]. Change in a company ranges on a continuum from small optimisations of current activities to significantly radical and disruptive innovation [10].

Innovation: In recent times the role and importance of Innovation in companies has grown significantly [11], [12]. The amount of time, money and effort focused on Innovation and Innovation Management in both academic and commercial environments have too increased significantly. The concept of an innovation process to formalize Innovation Management in a company has been suggested [13], [12]. Innovation processes are receiving more attention in companies and several attempts to describe these processes have been published. As part of the formalization of innovation as a core business process the role and importance of an Innovation Strategy has come to the fore.

Innovation Strategy: As with all business processes the decisions made and the way in which the process is implemented are all governed by a strategy. The strategy governing innovation in a company is termed an Innovation Strategy [14]. For a strategy to be successful it first needs to be the

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correct strategy, then it needs to be aligned with the business values, structures, capabilities and other strategies and finally it needs to be executed [15].

Alignment: Being good at change is not just about successfully executing the specific change. It is also about how the rest of the company is aligned with the change. Alignment has been shown to be a key competency required, by companies, for the successful implementation of strategy and the achievement of strategic goals and objectives [16], [15]. The more innovative the change, on the continuum of change, the greater the need to focus on alignment. Along with the alignment of operational business units with business strategy, the alignment of certain support functions, such as Human Resource (HR) and Information technology (IT), have been widely researched and documented [16], [17], [18], [19]. In the same way that alignment is required between the business strategy and the HR and IT strategies, this dissertation suggests that alignment between the business strategy and the Innovation Strategy is also important. This is termed Innovation Strategy Alignment.

Innovation Strategy Alignment: This PHD research focuses on the alignment of a company's innovation activities with the overall company strategy and structure and vice versa. One of the major outputs of the PHD is an Innovation Strategic Alignment Model (iSAM), which is designed as a framework to firstly align a range of innovation components including: innovation scope, governance, capability, models, processes and skills and secondly to align these components with the overall business strategy and structure. Along with the iSAM the research suggests an approach for applying the model in a company. The approach defines a set of steps a company is required to follow in order to determine the current alignment of the innovation activities in the company.

In the following section (chapter 2), the research rational, objectives, high-level approach and dissertation structure are presented.

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2 Research Description and Structure

This chapter includes a description of the rationale behind this PHD research, the key research objectives and questions, an overview of the research approach, as well as a description of the structure our outline of this dissertation.

2.1 Research Problem and Rationale

Traditional competitive advantages such as market position, scale, production capabilities and delivery models are essentially static competencies in today's uncertain business environment [8]. These competencies, while still important in gaining competitive advantages, take significant time to develop and may quickly become irrelevant in a fast changing world. *"Instead of being really good at doing some particular things, companies must be really good at learning how to do new things*" [8]. "New things" essentially require change. Different types of changes can occur in a company. It can be used to support the achievement of the business strategy, doing things better, or it can be there to change the business strategy, doing things differently [9]. Change in a company ranges on a continuum from small optimisations of current activities to significantly radical and disruptive innovation [10]. Being good at change is not just about successfully executing the specific change it is also about how the rest of the company is aligned with the change. Alignment has been shown to be a key competency required, by companies, for the successful implementation of strategy and the achievement of strategic goals and objectives [16], [15]. As part of the formalization of innovation as a core business process the role and importance of an Innovation Strategy has come to the fore. As with all other strategies, the alignment of the Innovation Strategy in a company is critical for the success of the strategy and the ability of a company to gain a competitive advantage through innovation. Based on the literature review, presented in Chapter 3, no current framework exists which combines research into strategic alignment with research in the areas of innovation management and innovation strategy in order to provide companies with a methodology and pathway to assess current Innovation Strategy alignment and to develop recommendations to improve this alignment. This research focuses on developing and implementing a framework for Innovation Strategy alignment.

The unique contribution, from this research is three-fold. Firstly, the Innovation Strategy alignment model, which is introduced through this dissertation, combines some of the leading approaches and models from the domain of strategic alignment with the latest thinking in the Innovation Strategy domain. Secondly, while the majority of the research in the current body of knowledge focuses on highly specific sections of the Innovation Strategy landscape the intended contribution of this

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dissertation is to provide an overarching integrated framework for understanding Innovation Strategy and for aligning the Innovation Strategy with the wider business. Finally, very few of the identified research papers provides a comprehensive framework for understanding the relationships between the Innovation and business domains. Innovation Strategy should support a company as an integrated whole and not just a portion thereof. The contribution of this dissertation is to provide a framework which links the Innovation domain with the integrated business domain in order to address alignment questions for a company as a whole.

2.2 Research Objectives

The primary objective of this research is to develop and evaluate an innovation strategic alignment model that provides companies with a methodology or pathway to assess their current state of innovation strategy alignment and to develop a set of recommendations to improve or strengthen their innovation strategy alignment. The sub-objectives of this research are documented in four research questions. These questions are addressed through the literature review, the development of the alignment model and implementation framework, the validation of the model and finally through a multi-year case study. The defined research questions are as follows:

1. What is the role, structure and components of an innovation strategy?
2. How can an alignment model be used to define the alignment needed between the internal and external innovation domains and a company's overall business strategy and structure?
3. How can a practical approach be roadmapped to enable a company to determine its current innovation alignment by using the developed innovation alignment model?
4. How will companies benefit from adopting the model and approach?

2.3 Research Design Strategy and Methodology

When deciding on the research methodology for this dissertation a number of key issues need to be taken into consideration. Blaxter et al [20], describe different research families, research approaches and research techniques. Research families are divided between qualitative versus quantitative research and deskwork versus fieldwork research. Research approaches include: action research, case studies, experiments and surveys while research techniques include: documents, interviews, observations and questionnaires [20]. David Gray categorises research into positivist versus phenomenological paradigms. In the positivist paradigm there is a belief that the world is objective and the researcher is merely an independent observer, while in the phenomenological paradigm the world is seen as being subjective and the observer is a party to what is being observed. Furthermore,

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in the phenomenological paradigm, there is an attempt to try understand what is happening and to construct models using an inductive approach. This is as opposed to formulating and testing hypotheses using a deductive approach [21]. The phenomenological paradigm seems most appropriate for this work as much of the data in the field of company strategy, innovation and alignment is largely subjective and influenced by social constructs. This means an inductive approach for developing the models can be applied. With a phenomenological paradigm multiple research methods can be applied in order to create the full picture. Qualitative methods are also appropriate and small samples can be researched in depth or over time [21].

It is decided that a mainly qualitative approach would be more appropriate for this research with some quantitative analysis used to demonstrate specific points. This decision is made as large-scale data sets are not available and this research involved exploring, in as much detail as possible a small number of examples. The aim of the research is to go into as much depth as possible into the focus concepts related to the research questions and to answer the "how" questions described in section 2.2. The qualitative paradigm is also preferred as it is more discovery orientated, exploratory, descriptive and inductive, all of which are vital in developing and testing a new alignment model.

From a "research approach" perspective case studies and surveys are appropriate approaches for this type of research. The case study approach draws from people's experiences and is strongly linked to reality. Case studies enable researchers to demonstrate the complex nature of reality and because they are developed around actual practices, their derived insights can contribute to real change [20]. For this research, the case study approach will provide the evidence required to address several of the research questions.

The decision to use a case study as the research method over other research methods is based on the decision criteria of the Cosmos Corporation [22], as referenced by Robert Yin [23]. Three factors are taken into consideration when deciding to a apply one of the following research methods: case study, experiment, survey, archival analysis or history. The first factor relates to the form of the research question. The second factor takes the control the researcher has over the behavioural events into consideration. The third factor takes into consideration if the research is focused on a contemporary event or something in the past [22]. The "case study" research method was selected for this research for the following three reasons:

1. The research questions have the form of a "how" question as opposed to a "what/where/who/how many" question.

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2. The researcher did not have control over the behavioural events as the company's management team had to decide their level of involvement and implementation of the case study results.
3. The events were contemporary and the analysis was conducted as and when the strategic objectives of the company were updated or changed.

Based on the decision criteria of the Cosmos Corporation and these three factors the "case study research method is the most appropriate for this research.

Surveys are useful in this research as they can be used to ask specific questions which the researcher wants answered. Although traditional surveys utilise a random sample of people, the complex and specialised nature of the research topic requires the survey respondents to be experts in this field [20]. Overall it is decided that a mainly qualitative approach using case studies and surveys would be most appropriate to study this topic in detail.

The research can be divided into six key steps. Through these six steps the four research questions are addressed.

Step 1: An overview of previous work in the areas of innovation, strategy and strategic alignment.

Step 2: An overview of previous work in the areas of Innovation Strategy and Innovation Strategy alignment. This component culminates in a formal definition of an Innovation Strategy and an overview of the gaps in the current body of knowledge regarding Innovation Strategy alignment. Through this step, research question one is addressed and the foundation for addressing research question two is laid.

Step 3: Identification and structuring of key business and innovation components and domains followed by the development of a framework for the alignment of internal and external innovation and business domains. This component culminates in the introduction of the innovation Strategic Alignment Model (iSAM). In this step the model referred to in research question two is developed.

Step 4: Development of a practical implementation approach for a company to determine its current innovation alignment and make adjustments in order to achieve innovation alignment. This component culminates in a step wise approach for determining current company innovation alignment. In this step the practical implementation approach referred to in research question three is presented.

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Step 5: The execution of a validation exercise, involving surveying a panel of experts, in order to determine the completeness and relevance of the iSAM. In this step, research question two is finalised through the validation exercise.

Step 6: A multi-year case study, where the iSAM and implementation approach are used to determine a company's current innovation alignment. This component culminates with the results of the case study and an assessment of the value of the iSAM for a company's management team. In this step the case study addresses research questions three and four.

2.4 Structure of the Dissertation

The dissertation structure is presented in *Figure 1*.

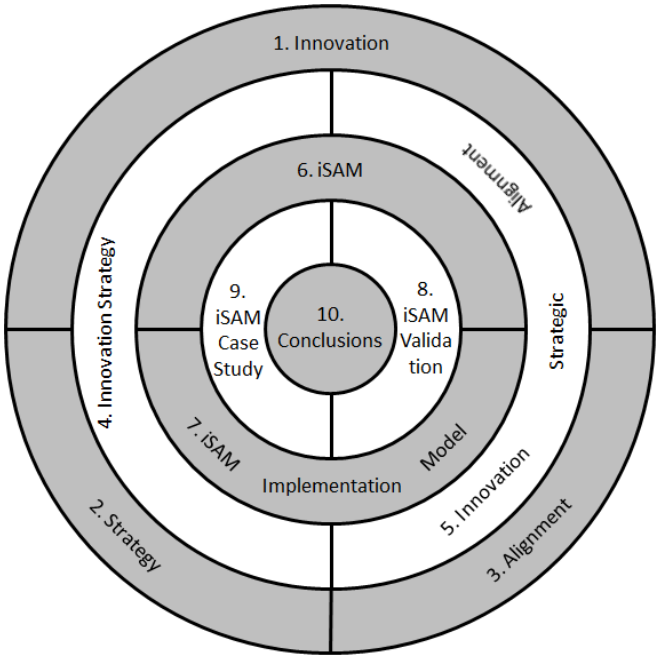

Figure 1: High-Level Dissertation Structure

The dissertation begins with a review of the literature on the topics of Innovation, Strategy, Strategic Alignment, Innovation Strategy and Innovation Strategy Alignment (Sections 1-5 in *Figure 1*). The dissertation then continues with the development of the innovation Strategic Alignment Model (iSAM) (Section 6 in *Figure 1*), which is then followed by the development of the iSAM Implementation Model (Section 7 in *Figure 1*). Finally the iSAM and the implementation model are tested and validated through a validation exercise (Section 8 in *Figure 1*) and a detailed case study (Section 9 in *Figure 1*). The dissertation ends with final conclusions, recommendations and suggestions for future research (Section 10 in *Figure 1*).

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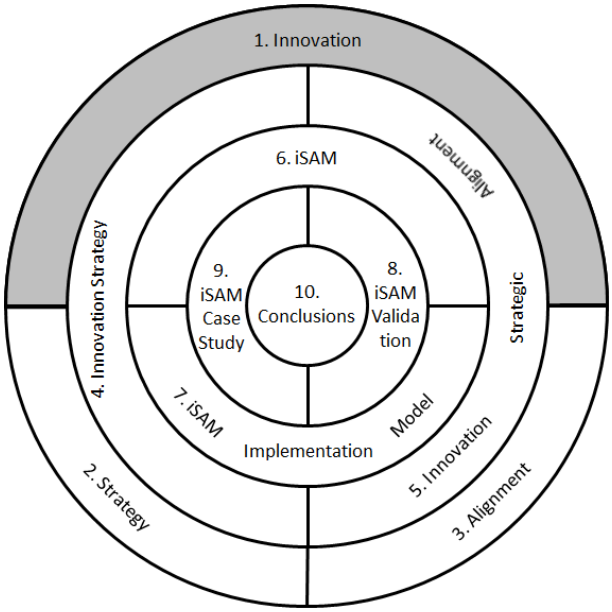
3 Literature Review

This chapter presents a review of the literature related to the topic of the alignment of the internal and external business and innovation domains. The first three sections of the literature review focuses on the broad concepts of Innovation, Strategy and Strategic Alignment with aim of determining a formal definition for these well researched concepts and to understand their overall landscape. A more in-depth literature review of the concepts of Innovation Strategy and Innovation Strategy Alignment is then presented in order to determine and demonstrate the gaps in the body of knowledge and to position this specific research.

The process of developing a literature review, as described by Machi et al follows six key steps [24]. Steps one and two involve deciding on the problem statements and the methods and tools required to address the problem. This is presented in the research description and structure in Chapter 2. Step three involves the collection and compilation of the relevant literature. In this step the most relevant journals and databases are identified and searched for key terms. In step four the literature is surveyed in order to discover the evidence and build an argument. The detailed approach applied for collection, compilation and surveying of the literature is described in Appendix A. The final two steps involve drawing conclusions and communicating those conclusions. The conclusions of the literature review can be viewed towards the end of each of the sub-sections in this chapter [24].

3.1 Innovation



In recent times the role and importance of innovation in companies have grown substantially [11]. The amount of time, money and effort focused on Innovation and Innovation Management in both academic and commercial environments have increased significantly. In this section a review of the literature related to the importance of innovation, a definition for innovation, innovation categories and different innovation models is presented.

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3.1.1 Importance of Innovation

Traditional competitive advantages such as market position, scale, production capabilities and delivery models are essentially static competencies in today's uncertain business environment [8]. These competencies, while still important in gaining competitive advantages, take significant time to develop and may quickly become irrelevant in a fast changing world. In the example of Kodak, their significant market dominance, their scale of operations and their technological and logistical capabilities did not protect them from a disruptive technology which dramatically changed the industry and directly lead to the failure of one of America's leading companies.

"Instead of being really good at doing some particular things, companies must be really good at learning how to do new things" [8]. "New things" essentially require change. Different types of changes can occur in a company. Change can be used to support the achievement of the business strategy, doing things better, or it can be there to change the business strategy, doing things differently [9]. Change in a company ranges on a continuum from small optimisations of current activities to significantly radical and disruptive innovation [10].

The 2013 PriceWaterhouseCoopers (PWC) innovation survey involving 246 CEO's, confirmed the importance business leaders place on innovation. In the survey 97% of the CEO's stated that innovation was either their main focus (10%) or one of their top priorities (51%) or that they value innovation (36%). Only 3% of the CEO's stated that innovation was not a priority for them [25].

In the 2015 Boston Consulting Group's Global Innovation Survey, out of the 1500 respondents, 22% said innovation was their top priority, while a further 57% reported innovation as one of their top three priorities [26].

3.1.2 Defining Innovation

It is important to clarify a definition for innovation, in order to develop a complete definition for Innovation Strategy and Innovation Strategic Alignment. The definition of innovation is highly varied, possibly due to the fact that many different disciplines have focused on innovation from their specific perspective [27]. Also, the concept of innovation has become more complex over time [28]. In this literature review a selection of definitions are presented in order to demonstrate the variety of language and perspectives used when defining innovation. An early definition of innovation, from an economics perspective, was presented by Schumpeter. An innovation, by definition,

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> *"had a substantial economic impact. An innovation was something that changed the market place in a profound way. The innovating organization was, thus, likely to become the new market leader and to gain an immense advantage over its competitors"* [29].

A basic definition of innovation is offered by West and Anderson, "Innovation can be defined as the effective application of processes and products new to the organization and designed to benefit it and its stakeholders." [30]. As would be expected, several other definitions also include the concepts of new and novel. New and Novel are often used synonymously, but as related to innovation, new can be defined as something new to the world, while novel is defined as being a novel use of an already existing entity. For example the first time a technology, which is already being used in one industry, is applied in another industry would be considered a novel application of that technology. Damanpour focuses in innovation at organisational level and suggests that innovation is, "the process that includes the generation, development and implementation of new ideas and behaviours" [1].

An analysis of the meaning of Innovation in a services company was conducted by Oke [31]. It was determined that employees of service companies described innovation as bringing new market leading products and services to customers, the successful commercialisation of new ideas, the application of creativity to further enhance the value-offering to clients, improvement of service processes and a process of research, build, test and learning leading ultimately to the creation of new services. Oke summarises this descriptions by saying:

> *"it would seem that respondents' understanding of innovation is related to the introduction of new 'things' (from conception to commercialisation) and improvement of existing 'things' (from conception to implementation). The 'things' could be products, services or Processes"* [31].

The 21st Century Working Group's definition of innovation includes the concept of the "end result" of the innovation. In the case of their definition, the end result is an improvement in standards of living. Their definition of innovation is as follows:

> *"Innovation transforms insight and technology into novel products, processes and services that create new value for stakeholders drive economic growth and improve standards of living"* [32].

The concept of the "purpose" or "end result" of innovation is important in making the distinction between innovation and invention. This interesting relationship between innovation and invention

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plays a significant role in defining the concept of innovation. Freeman [33] explains that an invention can be seen as a new idea, model or even physical product or service product, whereas an innovation, from an economics perspective, is only achieved when the new idea or product achieves its first commercial success. If invention is a new idea which is made a reality, then the innovation is when the invention is applied and adds value. This idea extends the concept of invention to innovation, as it is no longer only seen as something new or novel, but something that is new, novel and that provides a company with commercial success. This clearly relates to an aspect of the definition (provided earlier) by Schumpeter [29], where an innovation allows a company to become a market leader.

Baregheh et al [27], completed a detailed analysis of the different definitions of innovation across multiple disciplines. They stated that due to the vast difference between disciplines, it could be argued that a discipline specific definition for innovation is appropriate. However, they concluded that as business and academia become more inter and multi-disciplinary a generic and integrative definition of innovation is required. Their definition of innovation is:

> *"Innovation is the multi-stage process whereby organizations transform ideas into new/improved products, service or processes, in order to advance, compete and differentiate themselves successfully in their marketplace"* [27].

Katz et al [14] considered the key concepts of innovation from the literature and the different ways of categorizing innovation in order to develop a comprehensive definition of innovation.

> *"The successful generation, development and implementation of new and novel ideas, which, introduce new products, processes and/or strategies to a company or enhance current products, processes and/or strategies leading to commercial success and possible market leadership and create value for stakeholders, driving economic growth and improving standards of living"* [2].

3.1.3 Categorising Innovation

The categorisation of innovation is not an exact science. There are numerous ways in which innovation has been categorised in the literature. The aim of this section is to present some of these categorisations so that a clear description of innovation categories can be developed for use in the chapters that follow. Baker [28] addresses the categorisation of innovation in three ways: types of innovation, newness of the innovation and impact of the innovation.

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3.1.3.1 Types of Innovation

Doblin [34] suggests four high-level categories of innovation (Finance, Process, Offerings, Delivery) and several different innovation types for each category. These innovation types include business models, networks and alliances, enabling processes, core processes, product performance, product systems, service, channel, brand and customer experience.

Johannessen et al [35] suggest six areas of innovative activity that can be described as different innovation types. These include: new products, new services, new methods of production, opening new markets, new sources of supply and new ways of organizing. Moore [36] defines a "broad universe of innovation types".

Moore explains how different innovation types are appropriate at different stages of market development. These market development stages are: growth markets, mature markets and declining markets. For a growth market the following innovation types are appropriate: disruptive innovation, product innovation, application innovation and platform innovation. For a mature market, the innovation types are divided into customer-focused and operational-focused innovations while for a declining market the following innovation types are appropriate: organic innovation and structural innovation.

Other ways of categorising innovation involve the levels of technological uncertainty [37]. These include: low-tech, medium-tech, high-tech and super-high-tech. Low-tech innovations involve little or no new technology. Medium-tech innovations incorporate some new technology and these technologies are well defined. High-tech innovations require the integration of new, but known technologies into new, first of a kind product, process or service and super high tech innovations require the design and integration of new, key technologies into a new family of product, process or service representing a quantum leap in performance and cost effectiveness for the user [37].

In an investigation into the outcomes of different innovation types Neely et al [3] categorise innovation into; manufacturing technology innovation, information technology innovation, management system innovation and organisational innovation. Innovation has also been categorised into three different degrees of innovation [38]. First-degree innovation brings about changes to the production methods and management philosophy within the boundaries of the current framework. Second-degree innovation brings about changes from the existing situation to a totally new set of production methods and management philosophies. Third-degree innovation brings about changes to the production methods and management philosophies within a new framework.

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By far the most common categorisation for innovation is into two high-level categories, Product and Process innovations. Neely et al [3] explain that product innovations involve the development and commercialisation of new and improved products and services, whereas process innovations involve the introduction of new or the improvement of current manufacturing, distribution and service processes. When looking at types of innovation, Baker [28] states that a company's ability to support product and process innovation is no longer adequate and that a third type of innovation, strategic innovation, needs to be introduced in order to provide further support. This type of innovation specifically emphasises the importance of a longer term view of the contribution of innovation towards competitiveness and success as a company. Strategic innovations are a type of innovation that allow companies to break the traditional rules of their industry, to look at the future without the orthodox industry constraints and to develop strategies that will redefine the market place and change industry borders forever [11]. Hamel [39] refers to strategic innovation as Business Concept Innovation (BCI). He explains that many of the companies that created true wealth in the 1990s did so through more than just process and product innovation, but through BCI. BCI involves innovations to a variety of business design variables including pricing structures, distribution channels and value webs or relationships. One well known example of a true strategic innovation was the, computer company, Dell's introduction of direct selling to consumers. While all its competitors were fighting for shelf space and adding significant costs to their product through retail and wholesale middlemen, Dell was able to disrupt the market by going direct to consumers and significantly reducing the price of its products.

3.1.3.2 Innovation Level: Radical to Incremental

Analysing the level of innovation is another approach for categorising innovations. Baker [28] suggests that the level of innovation is a measure of the newness of the innovation. The scale for an innovation's newness runs from incremental to radical [40]. Research conducted by Johannessen et al [35] indicates that the central theme of innovation is newness and that different innovations can be distinguished by how radical they are. Johannessen et al. [35] go on to explain that the term "radical'' has been associated with revolutionary innovations, whereas "incremental" is associated with innovations within a paradigm". Damanpour [1] describes the difference between radical and incremental innovation as follows:

> *"Radical innovations are those that produce fundamental changes in the activities of an organization and large departures from existing practices, and incremental innovations are those that result in a lesser degree of departure from existing practices"* [1].

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Radical innovation provides the opportunity to turn an industry on its head. It often introduces totally new performance measures [40] or results in a large improvement in known performance measures [41]. Radical innovation often comes about through companies adopting processes or technology from other industries. When Salesforce introduced its new CRM system in 1999 it did so using a new technology platform in the form of cloud computing and a new business model. The software as a service model revolutionised the way software is sold and introduced totally new performance measures into the industry.

Incremental innovation can be described as the enhancement of or extension to current products or processes. Many companies favour this type of innovation as it involves lower risk, more immediate rewards and smaller projects than a radical innovation [42]. Product line extensions is a popular way by which companies improve their product lines. Both Cadburys and Coke Cola have had great success in keeping their products relevant by tapping into emerging trends and introducing new product flavours or varieties.

3.1.3.3 Innovation Impact: Sustaining to Discontinuous

Innovation impact is a description of the size of impact an innovation has on a company and/or industry. The scale for an innovation's impact runs from sustaining to discontinuous [28]. Discontinuous innovations are those that have a dramatic effect on a company or industry. These innovations involve the introduction of a new product, process or technology which leads to a discontinuation of the current product, process or technology. For example, the amateur photographic industry experienced the effects of such a discontinuous innovation through the introduction of the digital camera. This discontinues innovation rapidly caused the demise of the old style photographic film. In this example a new technology totally transformed an industry.

Sustaining innovations are those which enhance a current product, process or technology and thereby extend the life of the product, process or technology. A sustaining innovation would add value to the product, process or technology so that the user continues to experience extended benefits. A significant example of a sustaining innovation has been the catalytic converter in automobiles. This innovation dramatically reduced the harmful emissions from combustion engines and has therefore played a role in the continuous dominance of the combustion engine. Without this innovation more resources may have been invested in clean automobile energy.

Baker [28] explains the difference between the discontinuous and sustaining innovation as follows:

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"Sustaining innovations improve the performance of established products or services. Discontinuous innovations bring to market very different products or services that typically undermine established products and services in the particular market sector" [28].

3.1.4 Innovation Models

The innovation literature describes a number of different innovation model categorisations. These various categorisations are either based on the approach to innovation [43], a progress of innovation maturity [44] or different leadership styles [5]. Rothwell's generations of innovation models are presented in *Table 1*.

Table 1: Generational Model [44]**:**

Generation	Key Features
Third	Interaction between different elements and feedback loops between them, the coupling model
Fourth	The parallel lines model, integration within the firm, upstream with key suppliers and downstream with demanding and active customers, emphasis on linage and alliances
Fifth	Systems integration and extensive networking, flexible and customized response, continuous innovation

IBM has defined four different innovation archetypes [43]. *Table 2* presents the high-level characteristics for each innovation archetype along with examples of companies that have successfully employed each archetype. Each innovation archetype can be represented by a different innovation model placing emphasis on different components of the innovation process.

Table 2: Innovation Archetypes [43]

Innovation Archetypes	Characteristics	Example Companies
Marketplace of Ideas	Well stated goals, employees are free to experiment and discover, many innovations, driven by employees, involve multi-disciplinary teams, requires culture of failure, lower risk	Google, 3M, WL Gore
Visionary Leader	Rallies behind the vision of the leader and executes them flawlessly, few innovations, Process driven by leader, multi-disciplinary teams, higher risk	Jobs (Apple), Branson (Virgin), Akito Morita (Sony)

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Systematic Innovation	Use systematic process and systems to innovate, typical of large organisations with diverse product lines	Samsung, P&G, BMW, GE
External Collaborative Innovation	Networks with partners, alliances and suppliers	Vodafone, Facebook, Alibaba, eBay, Wikipedia, Sara Lee

The innovation model for the market place of ideas archetype is presented in *Figure 2*. The size of the circles indicate the significance of the role played by the specific entity in this specific model. This innovation model places emphasis on the employees and the processes and systems required for collecting and filtering ideas from employees. The innovation platform plays a significant role while the leadership plays a smaller role and only provides encouragement and minimum challenges.

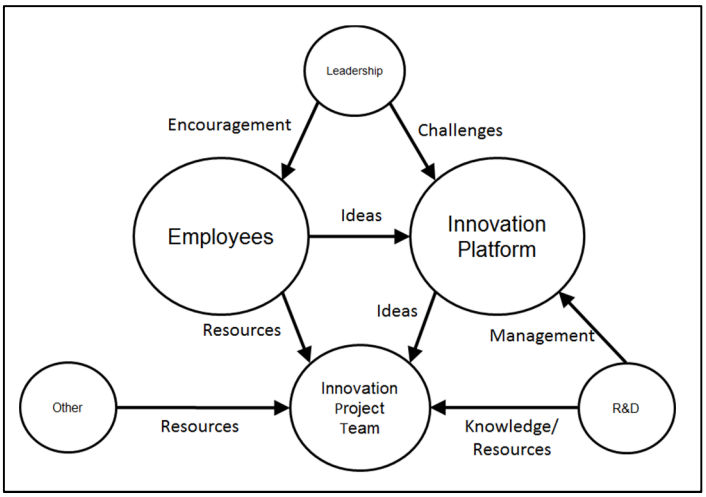

Figure 2: Innovation Model for Market Place of Ideas Archetype

The innovation model for the visionary leader archetype as presented in *Figure 3* emphasises the leadership and the innovation project teams, which are assigned to implement the leader's innovation vision. The role of an innovation platform is reduced and the employees' main function, with regards to innovation, is to find innovative ways to implement the vision of the leaders.

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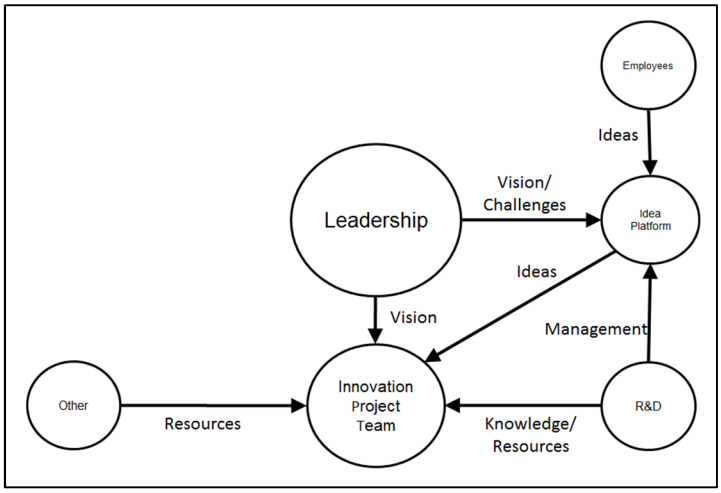

Figure 3: Innovation Model for Visionary Leader Archetype

The innovation leadership models provide a company with a range of options for leading innovation. Nine different innovation leadership models have been suggested [5].

1. The top management team
2. The CEO (or, in multi-business corporations, the group/division president)
3. The high-level, cross-functional innovation steering group or 'board'
4. The CTO
5. The dedicated innovation manager
6. Chief innovation officer
7. A group of innovation champions
8. No one in charge
9. The “duo” or complementary two-person team

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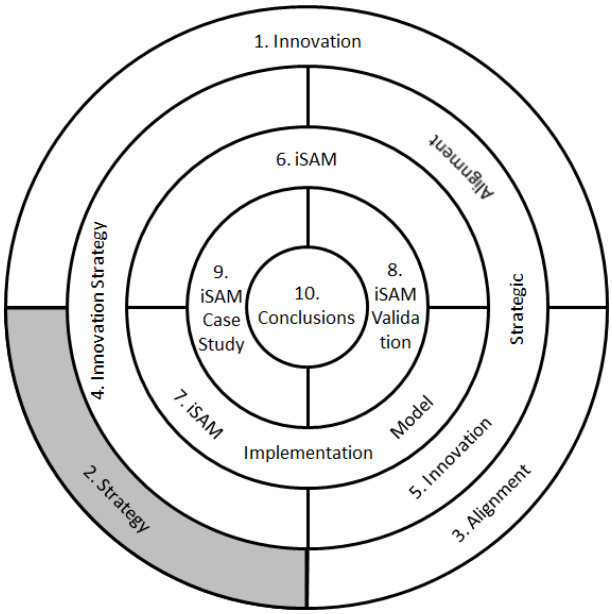
3.2 Strategy



This section includes a brief history of strategy, a review of the different definitions of strategy, and an explanation of generic strategic perspectives.

3.2.1 Brief History of Strategy

The origins of strategy can be traced back through history, initially as a military concept. General Ulysses Grant in the 1860's viewed strategy as, *"the deployment of one's resources in a manner which is most likely to defeat the enemy"* [45].

The application of a structured strategy in a business context can be traced back to the early 1970's [46]. The history of strategy in the context of business started with the framework of Richard D. Irwin in 1971. This framework defined strategy as a match between what a company is capable of doing within the given environmental circumstances. The company's capabilities are considered its strengths and weaknesses, while the environmental circumstances are considered as external opportunities or threats. At the time the required techniques to analyse the internal and external environments were not available, which made the practical use of this framework challenging [47].

In 1980, Michael E. Porter's book, Competitive Strategies: Techniques for Analysing Industries and Competitors, introduced a range of breakthrough approaches for developing company strategies based on the forces which exist within a given industry [47]. These forces are commonly known as the five competitive forces that shape strategy [48]. Porter's approach does take the internal capability of the company into account, however it has a strong focus on the competitive positions at industry level. Larsson et al. describes this "Porterian" approach as a positioning approach which focuses on market structure and the positioning of a company within that market in order to find the ideal product-market position [49].

At a later stage the focus of strategy shifted to a more internal perspective. Emphasis was placed on the internal skills and capability of the company. The strategic quest for a learning organization was deemed essential to achieve a competitive strategic position. The analysis of the industry and external

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environment received little attention [47]. In the mid-nineties a resources based view of strategy development was suggested. This approach includes both the external analysis and internal perspective promised by Irwin's original framework [47]. Larsson et al. refers to the resource based approach as the Penrosian approach after Edith Penrose, who in the 1950's, originally introduced the concept. Penrose believed that companies will develop in the direction of their changing resources and that resources, in the short-term, can both limit and stimulate growth [49].

Today, research focuses on a unified approach to strategy which aims to combine the traditional positioning approach with the resource based approach [50]. This unified approach unites the product perspective with the resource perspective. It therefore combines the strengths, weakness, opportunities and threats approach with a resource matrix approach to introduce a new unified framework [50].

3.2.2 Defining Strategy

There are almost as many different definitions for strategy as there are writers on the topic [51]. Two main reasons for the lack of consensus could be that strategy is a multi-disciplinary concept and that strategy is situational and will consequently tend to vary by industry [51].

As with the definition of innovation there are several different concepts that are suggested in the many different documented definitions of strategy. There are definitions which consider strategy to be management's action plan for running the business [15]. Other definitions include the concept of competition, where the aim of a strategy is to gain a competitive advantage in the market. In several definitions the concept of determining long-term goals and objectives is included. The allocation of resources at a high-level is another concept used in the definition of strategy. The definition by Chandler incorporates the majority of these concepts [52].

> *"Strategy can be defined as the determination of the basic long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for the carrying out of these goals"* [52].

The problem with a single definition for strategy is that it limits the use of strategy and therefore limits the potential benefits companies may gain from a wider application of Strategic Management. Mintzberg addresses this issue by providing five definitions for strategy and discusses the interrelationships between these definitions [53]. *Table 3* summarizes these five definitions.

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Table 3: Five definitions for strategy [53]

Strategy as a …	Description
Plan	Consciously intended course of action, a guideline to deal with a situation.
Ploy	A specific "manoeuvre" intended to outwit an opponent or competitor.
Pattern	Stream of actions revealing a consistency in behaviour.
Position	Locating a company in the greater business environment. A niche.
Perspective	Ingrained way of perceiving and interacting with the world. A company's personality.

3.2.2.1 Strategy Hierarchy

An important part of understanding strategy is to understand the way in which business strategies create various layers of a company's strategy. In the same way that a company's organizational structure is seldom completely flat, a company's strategy also requires hierarchical levels. These levels start with the overall corporate strategy and then filter down into more detailed functional strategies [54]. Three generic hierarchical strategy levels can be defined. These levels are presented in *Table 4*.

Table 4: Hierarchy of strategies [54]

Strategic Level	Primary Focus	Questions Answered
Corporate	Scope of business	What set of businesses should we be in?
Business	Distinctive competencies and competitive advantages	How do we compete in a particular business?
Functional area	Coordination and integration of activities within a single function	How do we maximize resource productivity?

Traditionally the following functional strategies are common in companies:

- Finance and Accounting
- Human Resources
- Information Systems
- Marketing
- Production/Operations

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- Research & Development

3.2.2.2 Rational and Incremental Approaches to Strategy

There has been a well-documented debate among business strategists about the pros and cons of rationalist and incrementalist approaches to strategy.

> *"Rationalist strategy has been heavily influenced by military experience, where strategy consists of the following steps: (1) describe, understand and analyze the environment; (2) determine the course of action in the light of the analysis; (3) carry out the decided course of action"* [55].

Tidd [55] goes on to explain that,

> *"incrementalists argue that the complete understanding of complexity and change is impossible: Our ability both to comprehend the present and to predict the future is therefore inevitably limited."*

Therefore incrementalist strategies evolve over time and are adjusted far more frequently than rationalist strategies. These adjustments are made as uncertainty is reduced through a better understanding of the complexities involved.

3.2.2.3 Comprehensive Definition of Strategy

A single comprehensive definition for strategy is not possible due to the different roles strategy plays, the different hierarchical strategic levels and even the different strategy development processes.

The best one can do is to highlight concepts, which are prominent in the strategy literature and ensure these are represented in the definition of an innovation strategy. Therefore a strategy is a:

- Determination of long-term goals.
- Conscious and pre-determined action plan to achieve goals [53]
- Allocation of resources required by an action plan [52]
- External analysis and an internal perspective [47]
- Ploy, pattern, position or perspective [53]
- Corporate, business or functional level strategy [54]
- Rationalist or incrementalist strategy [55]

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3.2.3 Generic Strategic Perspectives (Grand strategies)

From the literature on strategy a number of ways of classifying a company's strategic perspective have been identified. In the late 1970s and 1980s generic "*strategy typologies*" were proposed. These became the theoretical basis for grouping different company strategies [56]. The aim of the literature study is to identify these different strategic perspectives in order to determine a set of generic classifications.

3.2.3.1 "First to Market" Strategic Perspective

The concept of "first to market" is discussed by a number of sources in the literature. The concept is described by several other phrases including leadership orientation [57], proactive [58], early movers [59], aggressiveness [59] and offensive [60].

A "first to market" strategy is based on:

> *"a strong R&D program, technical leadership and risk taking.* [61]*"*

Leadership orientation is where the firm aims to be the first to market with a new product or service. This requires significant commitment to creativity and risk taking [57].

A proactive strategy generally leads to innovations, which are radical, inventive and early [58]. Therefore a proactive strategy can be described as a "first to market" strategy.

A company with an aggressive strategic perspective is described as being the advancer in the market and as taking a combative posture to exploit market opportunities. It is also described as being the strategy to become the first mover in the market place [59].

An offensive strategic perspective is described as one designed to achieve technical and market leadership by being ahead of the competitors in the introduction of new products [60].

Porter's differentiation strategy, also known as an innovation leadership strategy can also be viewed as a "first to market" strategic perspective [62].

3.2.3.2 Reactive Strategic Perspective

As with the "first to market" strategy the reactive strategy is also described in a number of ways in the literature. These include a follower orientation, late mover, imitator, reactor and rapid copier [59].

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A reactive strategy involves a firm improving on another firm's innovation so that it can deliver a product or service in high volumes and at low cost [58].

A follower orientation is:

> *"where firms aim at being late to market (a second-to-the-market or late-entrant or imitator orientation), based on imitating (learning) from the experience of technological leaders"* [57].

Imitators are described as companies which gear themselves to profit more from an innovation than the company which first introduced the innovation to the market. There are a number of examples of this kind of success including IBM with the personal computer, Matsushita with VHS video recorders and Seiko with quartz watches [63].

3.2.3.3 "Niche Player" Strategic Perspective

Roger defines niche players as:

> *"companies that employ differentiation in their strategic design, but do so for a very targeted segment of the market"* [64].

Defenders can also be defined as a type of niche player. These companies focus on a narrow product-market domain and their management is highly expert in the company's limited area of operations [65].

Niche players are also referred to as specialists. These companies spread their resources across a narrow spectrum of the environment and intensely exploit this narrow segment. The opposite of the specialists are called the generalists [66].

3.2.3.4 "Cost Reducer" Strategic Perspective

Porter defined four generic strategies. Two of these strategies focus on cost leadership. The first is known as overall cost leadership and the second is known as focus segment cost leadership [62]. Companies pursuing an overall cost leadership strategy seek a competitive advantage across a broad industry segment by offering lower price products and services. Companies pursuing a focus segment cost leadership also attempt to gain a competitive advantage by offering lower price products and services, but across a far narrower set of industry segments [67]. The classic cost reducer example comes from the airline industry. North-Western Airlines was the first to implement a low cost business model. This new model opened-up air travel to a totally new and significantly large market segment who had always seen airline travel as too costly. Every aspect of the airline product offering was

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scrutinised and adjusted to suit a low cost model. North-Western created the blueprint for all future low cost airlines.

3.2.3.5 Customer Orientation

Customer orientation can be defined as the:

> *"sufficient understanding of one's target buyers to be able to create superior value for them continuously* [68].

The concept of customer orientation includes a detailed understanding of issues such as the identification of market segments, customer buying habits, price and features preferences and market growth [68].

In a customer-driven strategy, the focus is on uncovering customer needs and wants and then meeting those needs. The marketing, sales and customer services departments play an integral role in a customer orientated strategy as they have the maximum exposure to the client's needs [69].

3.2.3.6 Technology Orientation

A technology orientated strategy is aimed at joining and winning a technology race. As this is a highly competitive type of strategy, companies aim to invent new technologies and establish these technologies as the market standard [68].

Gatignon and Xuereb define a technology orientated company as one which has the:

> *"ability and the will to acquire a substantial technological background and to use it in the development of new products.* [68]*"*

3.2.3.7 Summary of Generic Strategic Perspectives

A summary of the generic strategic perspectives, which were identified in the literature, are presented in *Table 5*. Each author has a different way of describing the strategy. Based on the explanations provided in the literature the strategy terms were grouped and given a group name. "Leaders", "proactive" and "offensive" were all grouped under the "first to market" strategy.

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Table 5: Summary of generic strategic perspectives from the literature

	Generic Strategic Perspectives					
Author	**First to Market**	**Reactive**	**Niche Player**	**Cost Reducer**	**Customer Orientation**	**Technology Orientation**
Ciptono [57]	Leaders	Followers	-	-	-	-
Gilbert [58]	Proactive	Reactive	-	-	-	-
Ansoff [61]	First to market	Follow the leader	-	-	-	-
Freeman [60]	Offensive	Imitative	-	-	-	-
Miles [65]	Prospector	Reactor	Defender	-	-	-
Porter [62]	Product differen-tiation	-	Segment cost leader-ship	Overall cost leader-ship	-	-
Lambkin [66]	-	-	Specialist	-	-	-
Roger [64]	First to market	Rapid follower	Niche player	-	-	-
Lynn [69]	-	-	-	-	Customer orientated	-
Gatignon [68]	-	-	-	-	Customer orientation	Technology orientation

Six generic strategic perspectives have been identified in the literature. These strategies are not mutually exclusive and there may be situations where a company adopts a combination of some of these strategies. However, there are some strategies which are exclusive and cannot be combined. For Example, “first to market” and reactive strategies cannot be combined and a company needs to decide between one and the other. The connections between these generic strategies are described in the development of the innovation strategy alignment framework.

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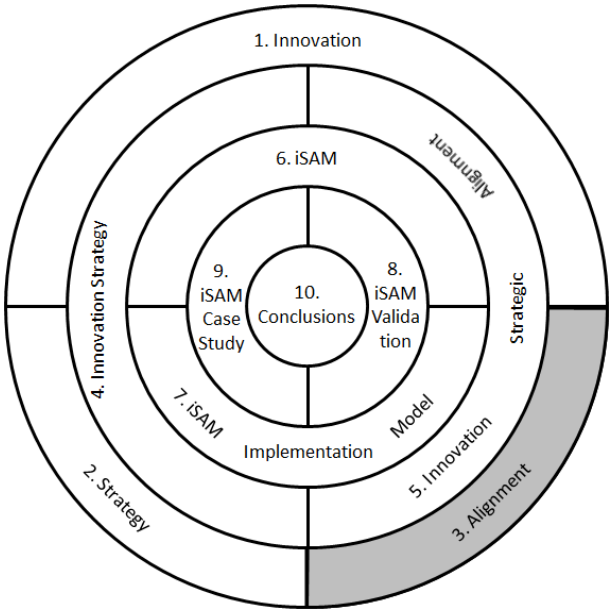
3.3 Strategic Alignment



In this section, literature on the concept of strategic alignment is presented. The literature review first focuses on the definition of strategic alignment and then discusses why strategic alignment is important. The section continues with an overview of different alignment models and closes with a more detailed look at the Strategic Alignment Model.

3.3.1 Definition of Strategic Alignment

Alignment is defined as the "proper or desirable coordination or relation of components" [70]. In the context of strategy, alignment is described as the fit between a company's internal structure and its external environment [7]. Strategic alignment is also described as, "that optimal state in which strategy, employees, customers and key processes work in concert to propel growth and profits" [6]. Kaplan and Norton extend these definitions and include the linking and coordination of various functional departmental strategies and the support these strategies provide to the overall business strategy [71]. At the centre of organisational alignment lies the alignment of a company's strategy and planning process [15].

Strategic alignment can only be achieved by understanding the interactions between different strategies at different levels in a company. The hierarchy of strategies is a way in which these interactions can be understood and managed. The hierarchy of strategies also enables the positioning and alignment of a functional innovation strategy amongst the other business strategies [14]. In *Figure 4* the hierarchy of strategies is represented along with the high-level questions each strategic level should aim to answer [54].

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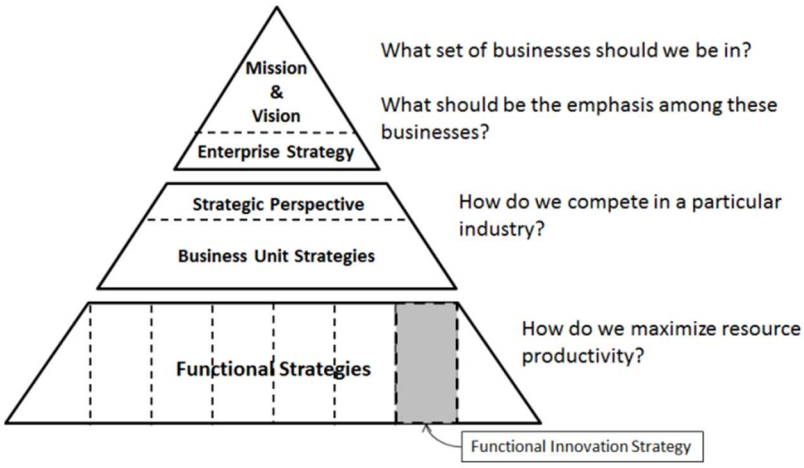

Figure 4: Hierarchy of Strategies

For a functional innovation strategy to be successful it is required to support the business unit strategies and the company's strategic perspective. In turn the company's strategic perspective needs to be aligned with the enterprise strategy and the company's mission and vision. The strategic perspective is the company's "*ingrained way of perceiving and interacting with the world* [72]*"* so that it is able to compete in its selected businesses/industries.

A similar concept to the hierarchy pyramid in *Figure 4* is presented by Kaplan and Norton [16]. The strategic alignment and planning process illustrated in Figure *5* shows strategic alignment between the enterprise and strategic business units and between the corporate level functional strategies and the functional support units (HR, IT, Finance). The functional innovation strategy and the innovation support unit have been added to Figure *5* to illustrate how innovation strategies can align with other business strategies.

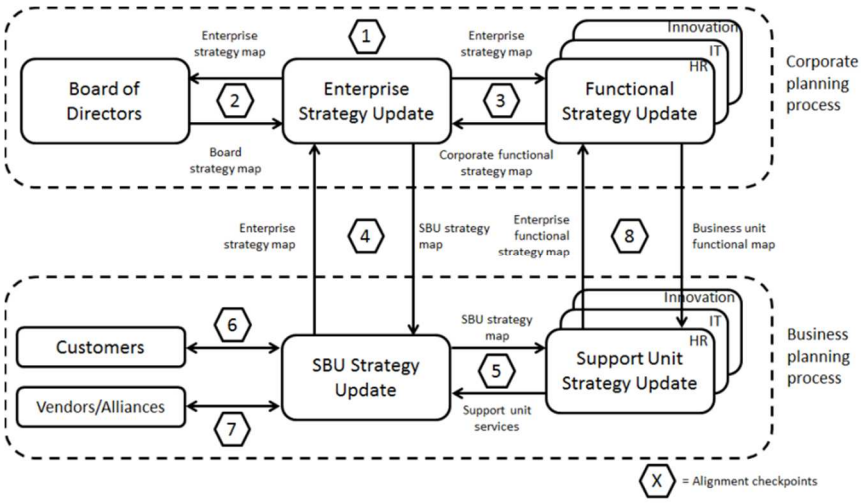

Figure 5: Strategic alignment in the planning process [16]

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Significant research has been conducted into strategic alignment in the Information Technology (IT) functional area. IT strategic alignment has been defined as,

> *"the degree to which information technology mission, objectives and plans support and are supported by the business mission, objectives and plans"* [73]

and also as,

> *"using IT in a way consistent with the firms overall strategy"* [74].

Henderson and Venkatraman define IT strategic alignment as,

> *"the strategic fit (between internal and external business domains) and functional integration of: business strategy, IT strategy, organisational infrastructure and processes and IS infrastructure and processes"* [17].

Based on both the overall business strategy and IT strategy definitions of strategic alignment, two main components of strategic alignment appear to be fit and integration. Strategic fit refers to the alignment between a company's internal structure, including processes, culture, infrastructure and competencies and its external environment. Functional integration refers to the alignment between functional areas and the alignment of these functional areas with the overall business structure and strategy [17].

Avison et al. discuss two other concepts related to IT strategic alignment. The first is a debate concerning the measurement of alignment. They argue that a company's management team with the necessary knowledge of the company and of strategic alignment are able to map out their strategy in a linear manner, however they may then have difficulty applying alignment maps in practice as measuring the relationships in their strategy can be challenging [18]. Secondly, Avison et al. discuss a disagreement between researchers. This disagreement revolves around the question of alignment being seen as an outcome versus alignment being a dynamic process. The former is reported to be the dominant view, but the latter has gained some prominence in more recent research [18].

3.3.2 Why is Strategic Alignment Important?

Traditionally, alignment has supported the implementation of a strategy. Once a new strategy is defined the company has to be re-aligned in order to ensure the company is capable of achieving the new strategic objectives [75]. Alignment has been shown to be a key competency required, by highly successful companies, to successfully implement the strategy and achieve strategic goals and objectives [15], [16]. Strategic alignment is important as it is one of three key requirements for a successful strategy. For a strategy to be successful it:

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- first needs to be the correct strategy
- then it needs to be aligned with the business values, structures, capabilities and other strategies and
- finally it needs to be executed well [15].

Organization alignment practices have been shown to have the biggest gap in the level of excellence between the so called "hall of fame" companies and two other groups of poorer performing companies [16]. Over the last 30 years Harvard Business School research has demonstrated that aligned and integrated companies outperform their nearest competitors in every major financial measure [6]. From an IT perspective, Chan et al. postulate that several findings support the hypothesis that companies that align their IT strategy with their business strategy will outperform those that do not and that alignment leads to better strategic use of IT resources, which in turn leads to improved overall business performance [32].

In today's world, innovation and change can be initiated anywhere in a company, and those changes can have an impact on all parts of the business including the strategic direction. Therefore alignment is also a key competency for the successful implementation of change in a company.

3.3.3 Different Alignment Models

A number of different types of strategy alignment models are documented. The balanced scorecard model for alignment, aligns the operations planning of a company with the support functions planning at an enterprise level down to a strategic business unit level. The balance scorecard also uses the alignment of goals and objectives across different business units and at different levels in a company [16]. A common, widely used, alignment model maps a company's mission, vision and strategy to its people, systems, technology and processes. Culture often falls into the people component of this type of alignment model. A similar model also includes alignment of customers [6]. Strategy alignment maturity models describe a number of levels of alignment maturity by which a company can measure its overall alignment [76]. The Strategic Alignment Model (SAM) focuses on the alignment between the business and its information technology strategy, infrastructure and processes [17]. The SAM provides a comprehensive set of domains and components to align a function within a company to the company's strategy and infrastructure and processes. The SAM is widely regarded as the primary alignment model among the various alignment models available [18]. It was developed by Henderson and Venkatraman and along with the MIT90s model has attracted the most attention from researchers. Its key advantage over the MIT90s model is that it addresses alignment at a strategic

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level and at an operational level through infrastructure and process alignment. The SAM has been the basis for much of the strategic IT research since the early 1990's [18].

3.3.4 The Strategic Alignment Model (SAM)

The Strategic Alignment Model (SAM) (refer to *Figure 6*) of Henderson and Venkatraman make several critical assumptions regarding the relationship between the business and Information Technology (IT) function. The first is that the inability of a company to realise value from its IT investment is due to the lack of alignment between this investment and the business strategy [17]. The second assumption is that economic performance is directly related to a management team's ability to align the administrative structures of a company with the organisation's direction or strategy. This assumption is consistent with the generally accepted view that internal and external decisions need to be consistent with each other. Finally, Henderson and Venkatraman state that due to the dynamic nature of technology and a competitive business environment, which may require an immediate response to a competitor's move, it is not sufficient for a business to be sophisticated in a specific technology. Sustainable competitive advantage also lies with a company's ability to adjust to new technologies and competitor's movements. This requires a company to have the capability to discover or adopt new technologies and master these technologies on a continual basis [17]. These three assumptions change the fundamental role of IT in a company from a supporting, back-office activity to one of strategic importance.

The changing role of IT introduced several important questions which managers need to answer in order to successfully achieve business and IT strategic alignment. These questions include [17]:

- "What are the implications of IT for my business operations today and in the future?
- What are the alternative perspectives for leveraging IT capability for business operations?
- How should the IT function operate and what is the role of IT outsourcing?
- What are the appropriate criteria for assessing IT based benefits?"

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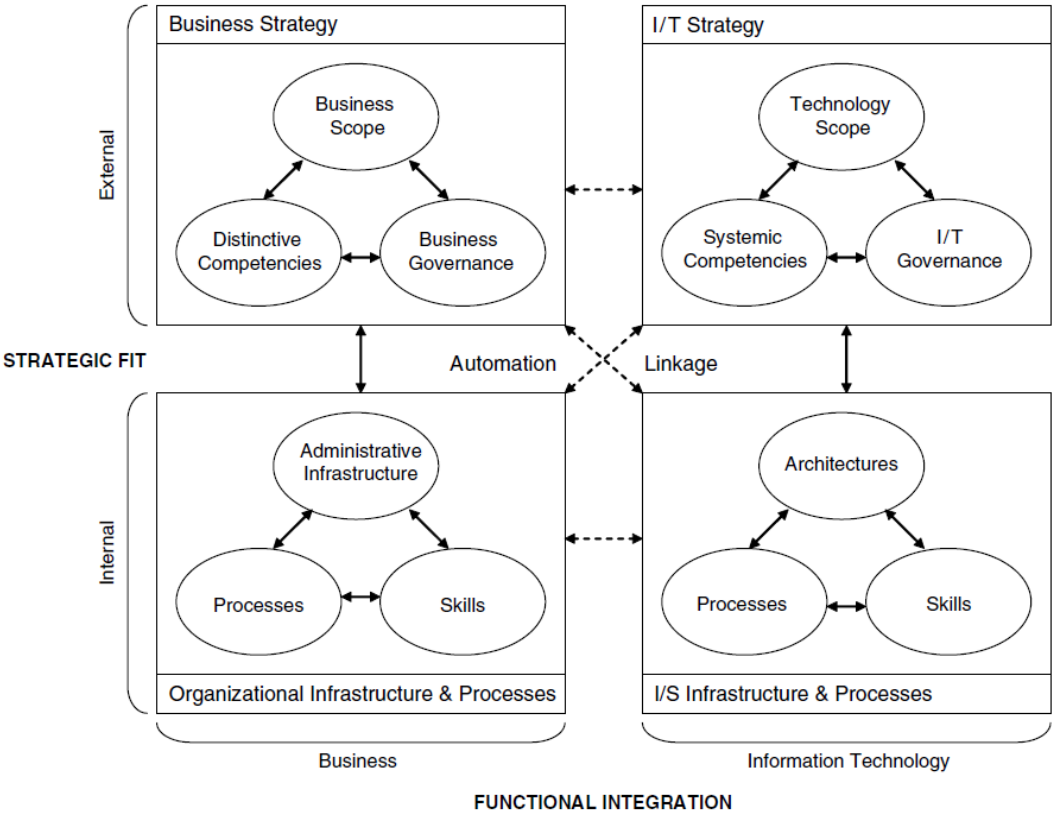

Figure 6: Henderson and Venkatraman's Strategic Alignment Model (SAM) [17]

The aim of the SAM is to present managers with a range of strategic choices to assist them in defining this alignment. The SAM recognizes the need to take both internal and external domains into account when addressing strategic alignment. The logic, which states that the alignment between a company's external positioning and its internal organisation is critical for economic success, has been applied to IT alignment. Both internal and external IT domains are defined and linked to each other and the internal and external business domains (*Figure 6*).

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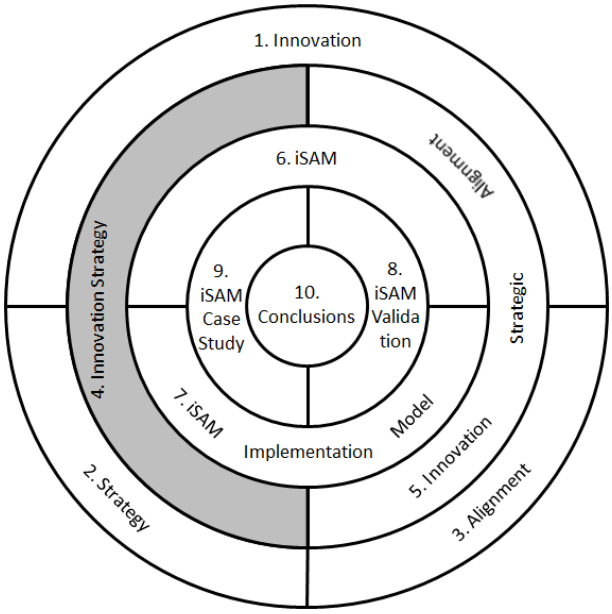
3.4 Innovation Strategy



In this section a literature review of the concept of an Innovation Strategy is presented in order to determine and demonstrate the gaps in the current body of knowledge. The literature review includes the definition of Innovation Strategy, the importance of an Innovation Strategy, the origins and history of Innovation Strategy and a detailed look as to how the Innovation Strategy research has evolved over time. The section ends with a review of the literature related to developing an Innovation Strategy. The approach applied to ensure an adequate review of the literature is presented in Appendix A.

3.4.1 Definition of Innovation Strategy

As with all business processes the decisions made and the way in which the process is implemented are governed by a strategy. The strategy governing innovation activities in a company is termed an Innovation Strategy [14]. The concept of an innovation process to formalize Innovation Management in a company has been suggested [13]. Innovation processes are receiving more attention in companies and several attempts to describe these processes have been published. As part of the formalization of innovation as a core business process the role and importance of an Innovation Strategy has come to the fore [14].

3.4.1.1 Explorative Versus Exploitative Innovation Strategies

In order to develop a comprehensive definition for an Innovation Strategy, the role or purpose of an Innovation Strategy first needs to be described [14]. The roles of an innovation strategy are closely linked to the role of innovation in a company. Innovation plays two major roles in the success of a company. Firstly innovation can play a role in achieving a company's current corporate objectives by enabling a company to launch innovative products, find innovative ways to enter new markets or improve internal efficiencies. Secondly, innovation can play a role in changing the company direction, when required. Rather than innovation being used to achieve current corporate objectives, it is the mechanism for changing corporate direction and objectives [9]. A company which can successfully

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manage its current business optimally, using continuous improvement and innovation to do things better, while at the same time creating the business of the future, doing things differently (*Figure 7*) is known as an ambidextrous company [9].

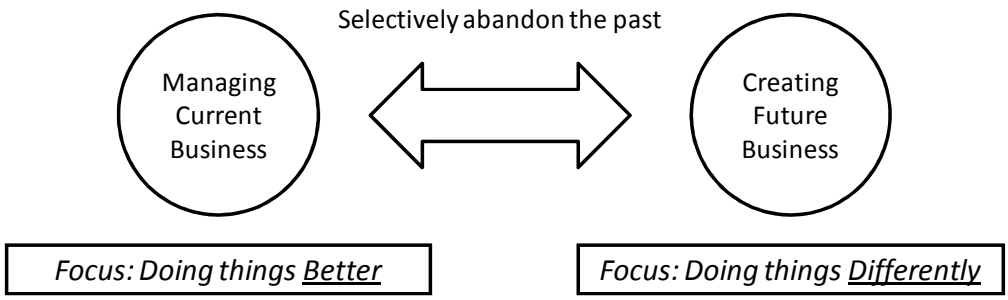

Figure 7: An ambidextrous company *[9]*

Based on these dual roles of innovation, two roles for an Innovation Strategy can be described. The first role is an improvement role. The Innovation Strategy playing this role can be called an Improvement Innovation Strategy. The second role is a future business role. The Innovation Strategy playing this role can be called a Future Business Innovation Strategy [14].

A study by He et al. into the benefits of an ambidextrous organisation defined the difference between explorative and exploitative innovation strategies. Based on a sample of 206 manufacturing firms their study found that "*the interaction between explorative and exploitative innovation strategies is positively related to sales growth rate*" [77].

The goal of an Improvement Innovation Strategy (exploitative) is to ensure the optimal plan and resource allocation in order to achieve the company's corporate objectives. Anthony [78] writes:

> "*by allocating resources more efficiently and accelerating the highest potential innovations, companies can enjoy a winning streak of innovation successes that will throw competitors off balance.*" [78]

The goal of a Future Business Innovation Strategy (explorative) is to help decide when and how to selectively abandon the past in order to focus on the future business. It is about managing the transition between the company's current S-Curve and its future S-Curve (*Figure 8*) [14]. The S-Curve reveals how the growth of yesterday's innovation, which over time has been improved and optimized, eventually starts to decline. Today's innovation is the key to future growth. Deciding which S-Curve to

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follow next and when is the correct time for stepping from the old to the new is the role of a future business innovation strategy.

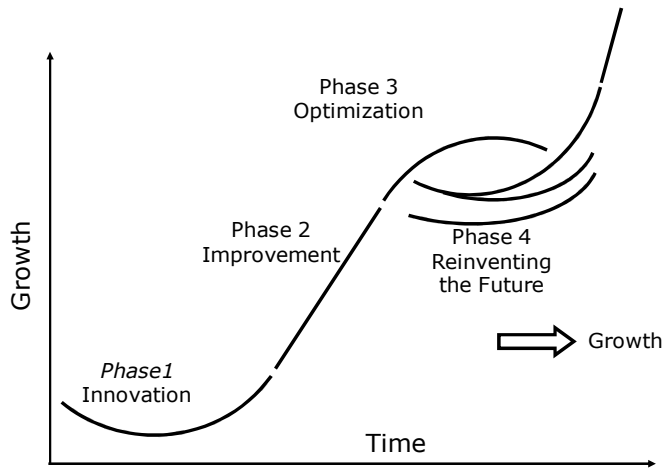

Figure 8: Transition between S-Curves *[14]*

Traditional corporate, business and functional area strategies are required to provide consistency and reduce uncertainty [79]. Therefore these strategies are a stabilizing force in a company allowing the company to concentrate on the detailed operations without having to keep worrying about the long-term direction. This means that once these strategies are set they become a barrier to change and therefore a barrier to innovation. The role of the future business innovation strategy is therefore to counteract this barrier and provide a framework in which these other strategies can be changed if and when required.

3.4.1.2 Innovation Strategy Versus Specific Technology and/or Product Strategies

There is a close two-way link between innovation and technology. On the one side, technology plays a significant role in many innovations. New technologies, which are applied and add value, are often the drivers of innovation. Likewise customer driven innovation can be realised through the combination of diverse technologies. Furthermore, an established technology used in a different way or aimed at a different target market can lead to innovation. On the other side many new technologies have been introduced through a formal innovation process [80]. It is for this reason that the terms “technology” and “innovation” are often used synonymously or combined to form the phrase “technological innovation” [67], [45]. The terms are also combined to define different strategies such as a product innovation and technology strategy [81]. This blurring of the lines between technology and innovation has meant that a company with a well-defined product or technology strategy may not see the need for a separate innovation strategy. While a technology strategy prepares a company to

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focus on a specific technology, for a specific end purpose, an innovation strategy prepares a company to deliver the most appropriate innovations to achieve its business goals, including its technology strategy. The innovation strategy does not specify what those innovations would be, it simply defines the type, level and impact of innovation required and the company structures needed to maximise the possibility of achieving these innovations [80].

3.4.1.3 Technological Innovation Strategy

Some of the early research in the field of technological innovation was conducted by James Utterback. The link between technological innovation and strategy started to be made in 1971 when he suggested that three sets of factors influence a company's ability to implement technological innovation. These factors are, characteristics of the company's external environment, internal characteristics of the company and the flows between the company and its environment. These factors are also very much tied to a company's general strategy. Utterback explains how these factors could either support or hinder technological innovation [82].

In 1978 Utterback and Abernathy added to this original work by investigating how the character of innovation changes as a company matures in an industry and when is it appropriate for a new technology, rather than the market, to be the trigger of change [83]. In this work they touch on the concept of innovation strategic alignment, without referring to it specifically. Their model attempts to connect patterns of innovation with a company's competitiveness strategy, production capabilities and organisational characteristics. Finally they conclude that a company's technological innovation capabilities and methods should be dependent on their level of maturity [83].

Christensen et al discuss technology strategy in the context of the rigid disk drive industry. In this research they show that technological and market strategies play an important role in the survival of new entrants into the market. The research goes further and demonstrates that specific types of technological innovations will tend to be more successful for companies entering the rigid disk drive industry [84]. The strategy, which they suggest, is an example of a technological innovation strategy and can be viewed as a very specific innovation type.

Morgan et al [85] address the concept of a technological innovation strategy by building on the work of Smith and Tushman [86]. This comprehensive model links the concepts of discontinuous, incremental and radical technologies with market orientation and aligns these concepts with either an exploitative or explorative innovation strategy [85]. In another paper Tushman and Anderson describe different innovations as either competency-enhancing or competency-destroying. The

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difference being that a specific innovation could either make use of the current competencies in an industry or it could render these traditional competencies redundant. Electronic transistors is a good example of a competency-destroying innovation as the skill required to manufacture vacuum tubes was no longer required [87].

3.4.1.4 Defining Innovation Strategy

The different definitions of an Innovation Strategy can be categorised based on the distinction between explorative and exploitative Innovation Strategies and between specific strategies such a technology or product strategies and a generic Innovation Strategy. The majority of definitions in the literature only cover a section of this overall picture.

If, in its simplest form, strategy is defined as a plan designed to achieve a particular long-term aim, then an innovation strategy can be defined as a plan which will enable a company to achieve its long-term goals through the use of innovation [14]. Dodgson et al. [45] define an exploitive Innovation Strategy as follows:

> *"An innovation strategy helps firms decide in a, cumulative and sustainable manner, about the type of innovation that best match corporate objectives."* [45]

They continue with their definition of an exploitive Innovation Strategy by defining it as a guide for the allocation of resources in order to achieve the company's objectives.

> *"An innovation strategy guides decisions on how resources are to be used to meet a firm's objectives for innovation and thereby deliver value and build competitive advantage."* [45]

Gilbert [58] presents a similar definition for an exploitative Innovation Strategy.

> *"Innovation strategy determines to what degree and in what way a firm attempts to use innovation to execute its business strategy and improve its performance."* [58]

Lendel's et al. [88] definition is more generic and applicable for both an explorative and exploitative Innovation Strategy.

> *"Innovation strategy is innovative direction of company approach to the choice of objectives, methods and ways to fully utilize and develop the innovative potential of the enterprise. This is the direction given of its boundary, which determines the potential of innovative strategies."* [88]

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Strecker's [89] definition of Innovation Strategy makes a clear distinction between a technology and product strategy where the goals are included, and an Innovation Strategy which includes only the "means".

> *"Innovation strategy is defined as the sum of strategic choices a firm makes regarding its innovation activity. Innovation goals (ends) are not included – only means. Innovation strategy is considered a firm wide, cross-functional meta-strategy."* [89]

In one of the latest definitions in the literature Pisano [90] uses a classic definition of strategy in order to explain an Innovation Strategy.

> *"A strategy is nothing more than a commitment to a set of coherent, mutually reinforcing policies or behaviours aimed at achieving a specific competitive goal."* [90]

Finally, Katz et al [14] present a comprehensive definition of Innovation Strategy that covers both the exploitative and explorative nature of Innovation Strategies.

> *"An innovation strategy is a functional, predetermined plan governing the allocation of resource to different types of innovations in order to achieve a company's overall corporate strategic objectives and a decision framework guiding a company about when and how it should selectively abandon the past and/or change its corporate strategy and objectives in order to focus on the business of the future."* [14]

3.4.2 Importance of Innovation Strategy

Innovation activities are inherently risky due to the uncertain nature of innovation [2]. They demand significant commitment from the most talented personnel and often require the application of a large amount of resources. Furthermore, a decision by a company to pursue one line of innovation at the detriment of others could have a significantly high opportunity cost.

It is for these reasons that selecting the correct blend of innovation types is vital for the long-term sustainability of a company. The correct functional innovation strategy is required in order to optimally use limited resources to achieve the company's overall strategic objectives [14].

Furthermore a company's innovation process, systems and personnel should be conceptualised, designed and developed to achieve the objectives of the functional innovation strategy. If the functional innovation strategy is not aligned with the overall business strategy this process and these

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resources will not be able to contribute successfully to achieving the overall company goals and objectives.

Capgemini's Innovation Leadership Survey reveals that,

> *"the absence of a well-articulated Innovation Strategy is by far the most important constraint for companies to reach their innovation targets."* [12]

The research by Dobni et al. in 2015, reveals that although there is evidence that suggests innovation is an emerging functional area, it is still occurring in a somewhat random and ad-hoc fashion and similar to the survey by Capgemini, a large percentage of companies do not have an explicit Innovation Strategy. Their research concludes by stating that creativity of employees is not a barrier to innovation in companies but the lack of leadership for innovation and organisational design create far larger challenges [91].

3.4.3 Origins and History of Innovation Strategy

The term "Innovation Strategy" first appears in the academic literature in the mid-1960's. The earliest discovered use of the term was in 1966 in a publication by Francis C. Byrnes titled, "*Some missing variables in diffusion research and innovation strategy*" [92]. This initial work dealt with the diffusion of new technologies in the agricultural industry. In 1967 the first identified reference to Innovation Strategy in the context of companies is found in an article by Kenneth Knight. This article is one of the earliest papers to define Innovation and discusses the importance of Innovation and change in companies [93]. In 1968 the term innovation strategy is used in the context of national development when referring to the choice between an imitation strategy and an innovation strategy for companies in a developing Peru [94].

It is only in the early 1970's that research into Innovation Strategy in the context of business, starts to increase in volume. Several of these initial academic journal articles on Innovations Strategy in companies, discuss the development and value of Product Innovation Strategies [95], [96], [97]. The book titled, "*The Economics of Industrial Innovation*" written by Freeman and Soete in 1974 [60], is a seminal piece of work on Innovation in companies and has been cited over 8700 times. The book refers to two types of Innovation Strategies - offensive and defensive Innovation Strategies.

In the 1980's and 1990's the research literature on Innovation Strategy in business continued to increase. The scope of this research became far more varied. Papers were written about national, regional and industry wide Innovation Strategies [98], [99], [100] as well as fairly specific technology

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and product strategies [101]. There was also a proliferation of research which studied the impact of an Innovation Strategy on company performance. For example, Motohashi found that there was some positive associations between productivity and R&D performance [102] and Zahra et al. results supported the importance of Innovation Strategy as a determinant of company financial performance [103]. Two interesting research articles were identified from this period that did touch on the concepts of Innovation Strategy Alignment. Kim et al. conducted a multivariate analysis in order to determine the innovation behaviour that had the most positive impact on company performance based on four different company types [104]. Some of the earliest identified research in the area of Innovation Strategy alignment seems to come from Vasudevan Ramanujam and Gerhard Mensch. As early as 1985 they developed a model to link strategy and innovation by connecting innovation activities to the strategic goals of a company [105].

An analysis of when the term "Innovation Strategy" first appears in a range of key business management academic journals reveals some interesting results. A search was conducted for the term "Innovation Strategy" in the article titles, the article keywords and the article abstracts, across all issues of the journals listed in *Table 6*. The analysis reveals that the term "Innovation Strategy" only appears in a significant way in the Harvard Business Review in 2002 and the International Journal of Innovation Management in 2005.

Table 6: First appearance of "Innovation Strategy" in key academic journals

	Year "Innovation Strategy" First Appears
Technovation*	1985
Journal of Product Innovation Management*	1987
R&D Management*	1987
Journal of Business Venturing*	1993
Research Policy*	1995
Entrepreneurship Theory and Practice*	1996
European Journal of innovation management	2001
Harvard Business Review	2002
International Journal of Innovation Management	2005
International Journal of Technology Management	2005
Academy of Management Journal	2006
International Small Business Journal*	2007
Small Business Economics*	2014

* Appears in top ten publications, based on Google Scholar's visibility and influence metrics for Entrepreneurship and Innovations

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3.4.4 Innovation Strategy Literature Review for the period 1999 to 2016

The review of the academic peer-reviewed literature on Innovation Strategy between 1999 and 2016 was undertaken using the Business Source Premier database of academic journals. The approach followed and the completeness of this source of journals is described in Appendix A. Overall, 177 peer-reviewed academic journal articles were identified which either had the term "Innovation Strategy" in the title or as an author provided keyword/key phrase. The breakdown of the number of articles per three year period is presented in *Table 7*.

Table 7: Relevant articles from Business Source Premier

	Number of Articles	
Years	**Title**	**Keywords**
1999-2001	2	1
2002-2004	7	4
2005-2007	14	15
2008-2010	24	22
2011-2013	24	23
2014-2016	26	15
Totals	**97**	**80**
	177	

The 177 journal articles were analysed and categorised into one of 16 categories based on the context in which the articles present the concept of Innovation Strategy. The results of this analysis are presented in *Table 8*.

Table 8: Categorisation of relevant journal articles from Business Source Premier

	Innovation Strategy Alignment	Impact of Innovation Strategy	Foreign Language	Global/Regional/ National/Industry	Specific Innovation	Specific Innovation Strategy	Innovation Survey	Innovation Creativity	**Totals**
1999-2001	1	0	0	0	0	0	0	0	**1**
2002-2004	0	5	1	1	0	0	0	1	**8**
2005-2007	1	7	1	8	3	0	0	0	**20**
2008-2010	7	6	2	8	2	9	0	0	**34**
2011-2013	0	8	3	12	6	5	0	0	**34**
2014-2016	3	5	3	10	1	0	1	1	**24**
Totals	**12**	**31**	**10**	**39**	**12**	**14**	**1**	**2**	**121**
	Impact on Innovation Strategy	Innovation Strategy Implementation	Innovation Capability	Innovation Benefits	Innovation Process	Business Strategy Innovation	Business Strategy	Technology	**Totals**
1999-2001	0	0	0	1	0	0	1	0	**2**
2002-2004	0	0	2	1	0	0	0	0	**3**
2005-2007	0	0	2	2	3	0	1	1	**9**
2008-2010	3	0	1	1	4	0	3	0	**12**
2011-2013	2	2	4	0	3	1	1	0	**13**
2014-2016	3	1	3	3	6	1	0	0	**17**
Totals	**8**	**3**	**12**	**8**	**16**	**2**	**6**	**1**	**56**
								Grand Total	**177**

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3.4.4.1 Global/Regional/National/Industry Innovation Strategies

The category titled "Global/Regional/National/Industry" has the largest number of assigned articles with 39 of the 177 articles falling into this category. These articles deal with the development and implementation of Innovation Strategies at levels beyond a single company and focus on competitiveness of regions, countries or industries. At a regional level an article discusses the type of Innovation Strategy appropriate for the European Union [106]. At a national level articles include the development of a national Innovation Strategy for Ghana [107], an Innovation Strategy for water conservation in the United States of America (USA) [108] and an article titled, "Our Nation Needs an Innovation Strategy", again focused on the USA [109]. There are several industry level articles which cover Innovation Strategy across a wide variety of industries, including: construction, services and manufacturing [110], biotechnology [111] and tertiary education [112].

3.4.4.2 Specific Innovations and Specific Innovation Strategies

Of the 177 articles 12 discuss a specific innovation. Examples of specific innovations presented in these articles include how Web 2.0 technologies can support SME's [113] and how innovation can promote the quality of hospital service for children with developmental delays [114].

There are 12 articles which present a specific Innovation Strategy. This is in contrast with discussing the general development, implementation or alignment of an Innovation Strategy. The articles on specific Innovation Strategies often focus on either a specific industry or a specific company scenario (eg market entrant). The articles also either address a specific decision companies need to make or describe a specific innovation strategy. In *Table 9* the 12 specific Innovation Strategy articles are presented in more detail.

Table 9: Articles categorised as presenting specific Innovation Strategies

	Article Name	Author/s	Industry OR Company Scenario	Specific Decision	Specific Innovation Strategy
1	R&D Versus Acquisitions: Role of Diversification in the Choice of Innovation Strategy by Information Technology Firms [115]	R. D. Banker, S. Wattal and J. M. Pleh	Information Technology Industry	R&D versus acquisitions of innovative new technologies	N/A

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2	Innovation Strategy and Entry Deterrence [116]	E. Ofek. and O. Turut	Industry Incumbents	Incumbent's decision to pursue radical or incremental innovation when facing a rival entrant	N/A
3	Context-Dependent Preferences and Innovation Strategy [117]	Y. Chen and O. Turut	Implementers of a new innovation	Choose to improve new technology either on the key performance dimension shared with the old technology or on the new performance dimension	N/A
4	A Proposal of Logistic Services Innovation Strategy for a Mining Company [118]	F. Córdova, C. Durán , J. Sepúlveda, A. Fernández and M. Rojas	Mining Industry	N/A	Logistic service Innovation Strategy
5	Market Research and Innovation Strategy in a Duopoly [119]	D. O. Lauga and E. Ofek	Firms in a duopoly	Where to direct innovation efforts	N/A
6	Knowledge management and innovation strategy: The challenge for latecomers in emerging economies [120]	J. Li and R. K. Kozhikode	Resource poor latecomer firms in emerging economies	Latecomers can choose emulation or imitation of multinational incumbents	N/A
7	Implementing an open innovation strategy: lessons from Napoleon [121]	S. Read and D. Robertson	Entertainment Industry	N/A	Open Innovation Strategy

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8	Innovation in the medical device sector: an open business model approach for high-tech small firms [122]	S. M. Davey, M. Brennan, B. J. Meenan and R. McAdam	High-tech small firms in the medical device industry	N/A	Open Innovation Model
9	Convergence and reorientation via open innovation: the emergence of nutraceuticals [123]	F. Siedlok, P. Smart and A. Gupta	Nutraceuticals Industry	N/A	Open approach to innovation and learning
10	Different Modes of Open Innovation: A Theoretical Framework and an Empirical Study [124]	V. Lazzarotti and R. Manzini	General	Decide level of partner variety and innovation funnel openness in the open innovation strategy	N/A
11	Assessing the patenting activity in the Italian universities: the case of the biotechnology research [125]	C. lo Storto	Biotechnology Research Industry	N/A	Different profiles of knowledge search behaviour
12	The battleship strategy: The complementing role of born globals in MNC's new opportunity creation [126]	T. J. Vapola , P. Tossavainen and M. Gabrielsson	Multinational companies in high-tech industries	N/A	Multinational company's "battleship" strategy

While many of these articles provide an interesting perspective on Innovation Strategy all of them have a very specific context and only address a small component of the bigger Innovation Strategy picture in a company.

The concept of Technology readiness levels (TRL) can also be viewed as a specific Innovation Strategy, with a strong focus on technology. TRL's provide a method of estimating technology maturity of a program. Their use allows for uniform discussions of technical maturity across different types of technology [127].

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3.4.4.3 Impact of Innovation Strategy

There are 34 articles, from the peer-reviewed academic journals analysed, which touch on the impact of an Innovation Strategy. Many of these articles investigate a specific impact of a specific Innovation Strategy on a specific industry. For example, Ndubisi et al researched the relationship between levels of autonomy, Innovation Strategy and company performance in International Technology Ventures (ITV). Their results indicated a significant relationship between Innovation Strategy and ITV performance and that Innovation Strategy enhances ITV performance [128]. The work of Ciptono into innovation in the upstream and downstream strategic business units (SBUs) of oil and gas companies revealed an association between a company's innovation strategy and its non-financial performance. The research revealed the importance of Innovation Strategy as a determinant of company non-financial performance [57]. A study of 1000 large corporates in Taiwan found that Innovation Strategy has a positive influence on innovation quality and further influence on innovation performance [129]. In a study on the effect of Innovation Strategy and an innovative working climate on financial performance in the Norwegian wood industry, it was found that Innovation Strategy and an innovative working climate enhanced financial performance in traditional manufacturing firms [130]. A study by Cheng et al. investigated a different perspective on the impact of an Innovation Strategy. They looked at the effect of different Innovation Strategies on job satisfaction levels of R&D staff. The study suggests that companies must focus on product innovation to gain the optimal R&D employee's job satisfaction [131]. The empirical results of a cross-industry study on new product performance in China suggest that compared with an imitation strategy, an Innovation Strategy leads to better new product performance. The study also found that, "the benefits of an Innovation Strategy over an imitation strategy become stronger as market demand is increasingly uncertain, technology changes rapidly, and competition intensifies" [132]. These six studies, into the impact of Innovation Strategies, are typical examples of the type of research that has been performed over the last 17 years to better understand the role of Innovation Strategy in company performance. Each of these studies focus on a very specific aspect of Innovation Strategy.

In an article titled, "You Need an Innovation Strategy", Pisano [90] suggests that without an Innovation Strategy, innovation improvement efforts become highly decentralised and random. The problem with this is that a company's capability and capacity to innovate comes from,

> *"an innovation system: a coherent set of interdependent processes and structures that dictates how the company searches for novel problems and solutions, synthesizes ideas into a business concept and product designs, and selects which projects get funded."* [90]

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Without an Innovation Strategy a company won't be able to make trade-off decisions and choose all the elements of the innovation system [90].

3.4.5 Developing an Innovation Strategy

Several articles present Innovation Strategy Frameworks or approaches for developing an Innovation Strategy. Ciptono et al. suggest a causal sequence among six dimensions of Innovation Strategy. They define the six dimensions as leadership orientation, process innovation, product/service innovation, external innovation source, internal innovation source and investment [57].

In a series of two papers, Larsson et al. build on the well documented Booz Allen Hamilton methodology for innovation strategy formulation [133], [50]. The Booz Allen Hamilton methodology was introduced by Pappas in 1984 [134] and builds on the strategic positioning approach to strategy, introduced by Porter [133]. The methodology aims to ensure that R&D spend on technology is going in the same direction as the overall business strategy. Pappas was able to demonstrate that sustainable competitive advantage can be achieved by defining the right technology strategy and integrating it into the corporate strategic planning process. The Booz Allen Hamilton methodology consists of a four step procedure [134].

1. Technology situation assessment
2. Technology portfolio development
3. Technology and business strategy integration
4. Setting technology investment priorities

It is clear from the language used in Pappas's paper that he viewed Innovation Strategy and technology strategy as synonymous and therefore his definition of an Innovation Strategy would fall into the "specific strategy" category. In Larsson et al's first paper the Booz Allen Hamilton methodology is revisited with a resource approach to strategy [133]. While the methodology is adjusted to incorporate a company's resources, the methodology's primary purpose of Innovation Strategy formulation does not change and the definition of Innovation Strategy as a specific technology strategy remains the same. In Larsson et al's second paper on this topic, they present a unified strategic positioning and resource based approach to innovation strategy formulation. The paper presents different approaches for strategy development and how to apply these to develop a specific technology/innovation strategy based on available resources [50]. Once again the fundamental definition of an Innovation Strategy remains that of a specific strategy with a focus on a specific technology.

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Eiriz et al. investigates the changing Innovation Strategy based on a company's life-cycle. The paper looks at the changing innovation decisions over time as a company evolves. In this way a typology of Innovation Strategy is proposed [135]. The typology consists of a three dimensional space which includes innovation type (product, process), degree of novelty (radical, incremental) and stages of firm growth (start-up, expansion, maturity, diversification and exit). The paper refers to determining the blend of innovation outputs and suggests innovation type and degree of novelty as a rather limiting set of drivers of Innovation Strategies. Finally the paper suggests key questions regarding the relationship between Innovation Strategy and stages of a company's growth. These questions are [135]:

- Do market pioneers persistently develop and implement discoveries or do they tend to relocate their strategic development toward product development or learning by experience?
- Do pioneers and early and late followers develop similar patterns of innovation strategy?
- In what extent is innovation strategy shaped by the firm's growth stage?
- To what extent is the firm's growth influenced by its innovation strategy?

Cooper et al. present a comprehensive approach for developing a product innovation strategy. The approach includes a number of practical tools for defining product goals and objectives, selecting strategic arenas, developing strategic maps and resource allocation and deployment using strategic buckets and strategic roadmaps [81]. The definition used by Cooper et al for Innovation Strategy is that of a specific product Innovation Strategy which will lead to a specific product.

Bowonder et al. have taken a different approach to Innovation Strategy Development. Based on their belief that there are many frameworks in the literature, but that few provide a practical approach to Innovation Strategy implementation, they suggest 12 ways of visualising Innovation Strategies. Based on an assessment of literature, they decided on three dimensions of the competitive space: customer excitement, competitive leadership and portfolio enrichment. For each of these dimensions they suggest a number of strategies for innovation. These include platform-offering, co-creation, cycle time reduction and nine others. For each dimension an innovation framework is suggested which highlights certain questions to be answered and practical structures to be used [136]. This approach provides a framework which, to an extend starts to link an Innovation Strategy to the business strategy.

3.4.6 Innovation Strategy Conclusions

The research literature on Innovation Strategy has substantially grown over the past 10 years. However, due to the potential wide application of innovation in a company or at a national and

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regional level, the Innovation Strategy research is spread across a wide range of topics. This spread starts at the most basic level - the definition of an Innovation Strategy. A significant number of research papers use the term "Innovation Strategy" synonymously with technology or product strategy. Through observation, it seems that this trend has decreased since the author started researching this topic in 2009. Approximately 22% of the identified research papers discuss either industry wide, national, regional or global Innovation Strategies, which is a different context to the Innovation Strategy alignment research presented in this dissertation. A further 15% of the identified research papers focus on a specific Innovation Strategy, while not exactly the same, relates to the issue of a specific technology or product strategy.

Despite the wide range of research on Innovation Strategy several research papers were identified which addressed Innovation Strategy at a company level and whose definition of an Innovation Strategy was not synonymous with a specific technology or product strategy. Of these papers, approximately 23% deal either with the impact of an Innovation Strategy on various specific aspects of a company or with the impact of specific company characteristics on the Innovation Strategy. Several other papers deal either with the implementation of an Innovation Strategy or the relationship between the Innovation Strategy and the Innovation processes or with the role Innovation Strategy plays in Innovation maturity (refer to *Table 8* on page 55).

In conclusion it would seem the current body of research focuses on highly specific, highly focused sections of the Innovation Strategy landscape. The intended contribution of this dissertation is to provide an overarching integrated framework for understanding Innovation Strategy and for aligning the Innovation Strategy with the wider business.

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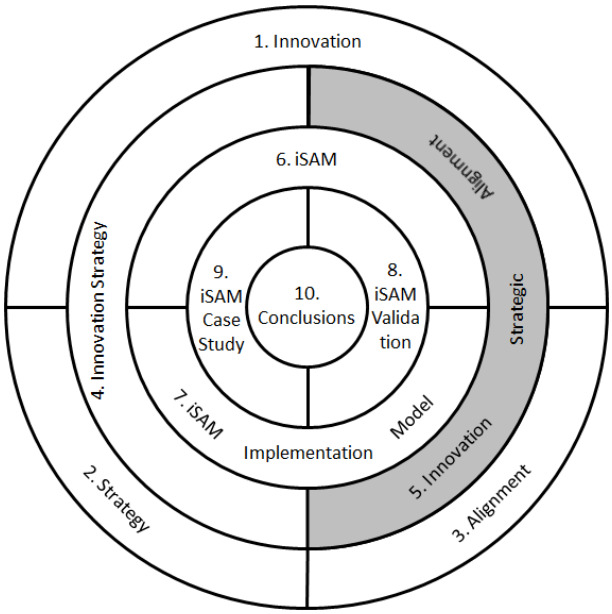
3.5 Innovation Strategy Alignment



The phrase "Innovation Strategy Alignment" is not widely used in the scholarly literature. Based on the detailed analysis of the 177 peer-reviewed articles from Business Source Premier, 12 articles were identified as having a contribution to the topic of Innovation Strategy Alignment. To augment this list, a search was conducted on Google Scholar (in June 2016). This search returned 14 peer-reviewed results for the phrase "Innovation Strategy Alignment". Of these 14 results, one was a paper co-authored by the author of this dissertation [75], five search results were academic papers in which the phrase was split by either a comma or full-stop which changes the meaning of the phrase, one of the papers was returned twice and in another paper the term Innovation Strategy was used synonymously with technology strategy and hence the paper was actually about alignment of technology strategies. This left a total of 18 peer-reviewed papers which contribute to the topic of Innovation Strategy Alignment.

3.5.1 Empirical Studies on Innovation Alignment

A number of empirical studies have revealed interesting relationships between a company's Innovation Strategy and other very specific company characteristics [137], [138], [139], [140]. Ryu et al. state that the lack of consideration of alignment between service innovation strategy and business strategy is a shortcomings of previous research in the service innovation sphere and that through an empirical study they highlight that successful service innovation requires thoughtful alignment between service innovation strategy and business strategy [137]. The empirical analysis of service firms in Spain by Hortelano et al. [138] focuses on the alignment between a company's production strategy and its approach to innovation. This research builds on Venkatraman's [141] strategic alignment theory, which refers to the importance of consistency between two or more of a company's organisational dimensions. The consistency is best achieved through the coordination of strategies. The study reveals that a company pursuing a "customisation" production strategy will perform better when their innovation decisions are based mainly on internal resources. Furthermore, a company pursuing a "standardisation" production strategy will perform better when their innovation decisions

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include high technological intensity and a balance of innovation methods. This paper proposes an alignment approach, but only between the Innovation and production strategies [138].

3.5.2 New Product Development and Innovation Strategy Alignment

Chaochotechuang et al. highlight the fact that several studies have emphasised the need for new methodologies for tackling new product development failure. They focus on the alignment between new product development and Innovation Strategy at various stages of the product development process as a way of improving new product development [142].

3.5.3 Human Resources and Innovation Alignment

The alignment between Human Resources related decisions and Innovation Strategy is covered in several papers. Both Talkea [139] and Eesley [143] examine the relationship between top management teams (TMT) and Innovation Strategy. Talkea et al. hypothesize that diversity in a company's TMT will enhance a company's performance by facilitating an innovation strategy that increases new product portfolio innovativeness. They empirically show that TMT diversity has a strong impact on the strategic choice to focus on innovation [139]. An empirical study by Cunha et al. investigates the relationship between internal resources configuration and a company's capacity for services innovation. The study revealed that a relationship exists between a company's resources and capabilities configuration and its ability to implement service innovations [140]. Tsai et al. take an even more specific look at alignment and investigate whether aligning pay policy with the Innovation Strategy could improve company performance. Their findings reveal that alignment of pay policy and Innovation Strategy is not a panacea for improving company performance [144].

3.5.4 Business Strategy and Innovation Portfolio Alignment

The alignment between a company's business strategy and its innovation portfolio is described by Terwiesch et al. Five innovation portfolio tasks are described. The current and future gaps in the innovation portfolio are determined relative to the overall business strategy and while this research provides practical tools for innovation portfolio alignment with the overall business strategy, it does not cover other components of the Innovation Strategy [145]. Klingebiel et al. continue this line of research. While the innovation portfolio is only part of the Innovation Strategy, this research provides interesting insights into the relationships between innovation and business. It is suggested that early movers should pursue a broader, less selective innovation portfolio, while late movers should target revenue opportunities with a narrower, more selective portfolio. While company performance is unrelated to the company's timing strategy, there is a relation between alignment of the timing

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strategy and the innovation portfolio and company performance [146]. This indicates that a company can be successful with different timing strategies, but that for this success to materialise the company needs to align its innovation portfolio with its timing strategy.

3.5.5 Innovation and Strategic Business Unit Alignment

Another perspective of innovation alignment is presented by Durmusoglu et al. In this research the alignment between headquarters and strategic business units (SBU) is investigated. This is alignment referred to as functional integration. The study found that even with extremely powerful corporate structure SBU's are ignorant of headquarter's changes to Innovation Strategy and that multiple types of metrics are required to ensure alignment. In this work the definition of an Innovation Strategy is synonymous with product strategy [147].

3.5.6 Innovation and Business Strategy Alignment

The most comprehensive work discovered on innovation and business strategy alignment is the thesis by Frances Fortuin. The thesis provides a comprehensive analysis of the relationship between Innovation activities and business strategy and supports the analysis with detailed empirical studies. A section of the thesis does focus on alignment of Innovation Strategy with Business Strategy, but this is dealt with in a relatively theoretical and high-level manner [148].

Fortuin's cross industry and longitudinal studies address key questions in the Innovation Strategy alignment space. With regards to Innovation Strategy alignment, in the cross-industry study she confirmed that, "*the product generation life cycle (PGLC) is a relevant indicator for the explanation of differences in the level of (internal and external) alignment between industries*" and that, "*the level of strategic alignment between innovation and business is higher in short life-cycle industries than in long life-cycle industries, based on the closer market proximity in short life-cycle industries*" [148]. The cross-industry study also provides insights into the role the type of industry plays in determining the Innovation Strategy and subsequent innovation model. The study confirmed that, "*the more exploitation-oriented R&D strategy in short life-cycle industries will lead to R&D competencies being more focused on in-house knowledge*" and "*the more exploration-oriented R&D strategy in long life-cycle industries will lead to R&D competencies being more focused on open innovation*".

With regards to Innovation Strategy alignment, the longitudinal study confirmed that, "*Structured feedback at the level of R&D competencies and capabilities will lead to better strategic alignment of R&D to business in terms of internal and external fit, and will ultimately lead to better business*

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performance". Furthermore, the study found that, "*the methods to improve alignment, such as the introduction of the balanced R&D score card and market technology road mapping, and the change in R&D funding structure will create a better strategic alignment between R&D and business in terms of internal and external fit*" [148].

The dissertation concludes with a description of the implications of the study results for Innovation Management. Fortuin suggests a series of questions which senior management and R&D management can use to assess the internal fit of the Innovation Strategy with a company's R&D competencies and capabilities. She also presents a matrix which recommends certain in-house technological capabilities based on the desired competitive impact (*Table 10*).

Table 10: Competitive Impact Matrix *[148]*

	In-house Technological Capabilities		
Competitive Impact	**Weak**	**Moderate**	**Strong**
Emerging Technology	Scan	scan/collaborate	collaborate
Pacing Technology	Collaborate	share risks	in-house
Key Technology	Optimize	optimize	in-house
Base Technology	Outsource	outsource/exchange	sell/exchange

3.5.7 Innovation Strategy Alignment Conclusions

There is a growing amount of research into the alignment of Innovation Strategy. The vast majority of this research applies a bottom-up approach and focuses on the alignment of an Innovation Strategy with a very specific aspect of a company. These specific aspects range from the composition of the top management team [139], [143] to the new product development process [142]. These papers reveal interesting relationships between the Innovation Strategy and very specific components of a company.

As with the general literature on Innovation Strategy, the definition of an Innovation Strategy varies greatly in the Innovation Strategy alignment literature. The situation exists in several of the studied research papers where the term Innovation strategy is synonymously used for product or technology strategy. This variance in the definition of Innovation Strategy requires a filtering out of the research papers which do not distinguish between an Innovation strategy and a product or technology strategy.

The majority of the identified research papers, which contribute to the topic of Innovation Strategy alignment, are empirical studies on one particular aspect of Innovation Strategy alignment and focused on a narrow industry or sector. In general the empirical studies reveal positive outcomes

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associated with the alignment of the Innovation Strategy with another specific aspect of the company. The work of Fortuin is the one identified exception to this statement. Her empirical study provides comprehensive insights into the alignment of Innovation Strategy in a company. However she too does not provide an overall framework for a company's management team to understand and achieve Innovation Strategy alignment.

While many different researchers are now contributing to the field of Innovation Strategy Alignment there are very few who are linking the well documented concepts of strategy alignment with the relatively new research into Innovation Strategy. A gap in the research exists for an overarching framework, which applies the principles of strategy alignment to the Innovation Strategy research domain. Furthermore, by focusing on the alignment of the Innovation Strategy with separate and very specific aspects of a company, the majority of the current research fails to comprehensively address the full alignment requirements of an Innovation Strategy and its potential impact on the company as a whole.

In the world beyond academic research, there is continued need for practical frameworks to support companies in aligning their Innovation Strategy. A Booz&Co innovation survey revealed that despite the clear and well known benefits of strategic alignment, almost 50% of companies in the survey say their Innovation Strategy is not adequately aligned with their overall company strategy [149].

In conclusion it would seem that the current body of research into Innovation Strategy alignment looks at alignment in a very specific context for a company. Very few of the identified research papers provide a comprehensive framework for understanding the relationships between the Innovation and business domains. Innovation Strategy should support a company as an integrated whole and not just a portion thereof. The contribution of this dissertation is to provide a framework which links the Innovation domain with the integrated business domain in order to address alignment questions for a company as a whole.

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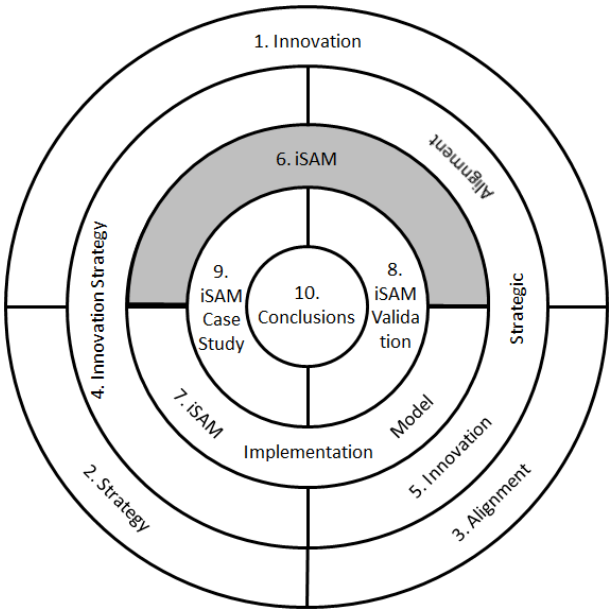
4 The Innovation Strategic Alignment Model (iSAM)



In this chapter the concept of Henderson and Venkatraman's Strategic Alignment Model (SAM) is applied in order to define an innovation Strategic Alignment Model (iSAM). The three assumptions made by Henderson and Venkatraman, in relation to business and IT strategic alignment, are also applicable to business and innovation strategic alignment. Henderson and Venkatraman realised that companies fail to achieve value from their IT investment because of a lack of strategic alignment and because of a management team's inability to align administrative IT structures with the IT strategy. They also state that a company's competitive advantage lies with its ability to continuously leverage technology to differentiate itself from its competition [17].

From an innovation perspective the assumptions are just as applicable:

1. The inability of a company to realise value from its innovation investment is due to the lack of alignment between this investment and the business strategy.
2. Innovation performance is directly related to a management team's ability to align the administrative innovation structures of a company with the organisations innovation direction or strategy.
3. Sustainable competitive advantage lies with a company's ability to innovate on a continual basis and not with one single innovation.

In relation to the first assumption, only as managers increasingly understand the relationship between strategy and innovation and synergies between these two are achieved, will benefits from innovation become more likely [150]. In the 2010 Capgemini Innovation Leadership Study, 46% of the respondents considered the lack of a well-articulated innovation strategy or the inability of the company to communicate this strategy was the most significant reason for missing innovation targets [151]. 80% of respondents in the same Capgemini study, who's company does have an explicit innovation strategy, said that the strategy contained a section on the alignment with the overall

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business strategy [151]. In a Booz&Co global innovation survey of the 1000 public companies that spent the most on research and development, it was revealed that the companies with both highly aligned cultures and strategies outperform poorly aligned companies in both profits and company value [149].

In relation to the second assumption, innovation surveys have continually shown that achieving positive results from innovation requires a long-term focus and the on-going commitment of a range of resources, including: financial, technological, infrastructure and people [150]. How these innovation focused resources are organised depends on the selected innovation model [152]. The concept of an innovation models is discussed earlier in the dissertation in section 3.1.4 on page30. However, it is clear that a company needs to select the correct innovation model to align with its business strategy. This will then ensure the processes, people and technology involved with innovation are also aligned with the business strategy [153].

In relation to the third assumption, Teece et al. [154] discuss the emerging dynamic capabilities paradigm, which places emphasis on the company's ability to adjust internal and external competences to address rapidly changing environments. This approach is likely to show significant value in "regimes of rapid technological change" [154]. Dynamic capability seems to have a strong relationship to innovation capability and that a company's ability to adapt to changing conditions through innovation is a source of competitive advantage [10]. These three assumptions, from an IT perspective, elevated the fundamental role of IT to a one of strategic importance. Similarly companies have been challenged to move innovation from the purely research and development arena to become more pervasive and strategic within the business.

The concept of internal and external alignment is as applicable for innovation activities as it is for IT and overall business alignment. Therefore defining the internal and external innovation domains is critical to achieve alignment. The external domain, with regards to innovation, defines how a company is positioned in the innovation environment. The internal domain focuses on a company's internal innovation infrastructure and processes.

4.1 External Domain Components of iSAM

The external domain, with regards to innovation, defines how a company is positioned in the innovation environment. Within the external domain of both the business strategy and IT strategy in the SAM, three components are described. These three components are strategic scope, required competencies and governance. These components represent three sets of choices managers need to

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address. We postulate that three similar sets of parameters are required by managers in relation to innovation strategy. These are:

- Innovation Scope
- Innovation Governance
- Innovation Capability

4.1.1 Innovation Scope

Innovation scope determines how wide and deep the innovation focus will be within the company. This is analogous to business scope, which defines the choices related to depth and breadth of product-market offerings and IT scope, which defines the specific technologies that support current business strategies. There are many definitions of innovation scope and related metrics. These include:

- the number of innovations adopted in a given time period [155],
- incremental innovation or systemic innovation [156],
- different innovation types (product, process, administrative innovation) [157],
- creating narrow and specialized knowledge by focusing on depth of innovation versus creating broad technological knowledge by emphasizing diversity of innovation [158] and
- a matrix including innovation level (incremental vs radical) on one axis and a range of innovation types on the other [159].

Based on the range of definitions for overall innovation scope and the detailed categorisation and definition of innovation presented by Katz et al. [14], the following definition of innovation scope is applied in the iSAM.

> *Innovation scope is the combination of innovation type (product, process, strategic), innovation level (radical, incremental) and innovation impact (sustaining, disruptive).*

A company's innovation scope can be defined on an innovation cube (*Figure 9*).

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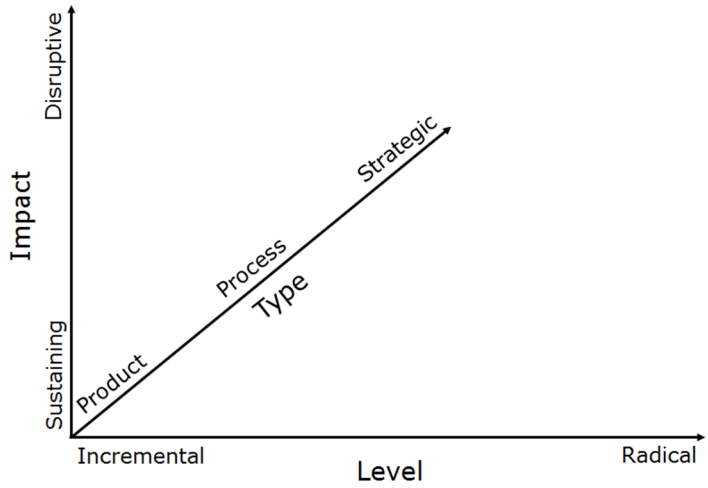

Figure 9: Innovation Scope Cube

4.1.2 Innovation Governance

Innovation Governance involves the choice of frameworks that defines the mission, focus and implementation of innovation in the company [5]. This is analogous to business governance, which is a set of principles, policies and business rules that set the way that the business is run and that are monitored by governance forums such as an advisory board and Innovation Director on the executive committee. An innovation governance framework supports a company in addressing questions on innovation content and innovation process. Six fundamental questions should be addressed by a comprehensive innovation governance system [160]. These are:

1. **Why do you want to innovate?**

   Provides a common understanding as to the real purpose of innovation in the company.

2. **Where do you look for innovation?**

   Describes the areas in the company where innovation is most likely to be generated.

3. **How much innovation do you target?**

   Defines the appropriate balance between ambition and risk the company is willing to accept and influences the level of investment in innovation.

4. **How can you innovate more effectively?**

   Assesses the effectiveness of the company's current innovation activities and mechanisms.

5. **With whom should you innovate?**

   Describes the innovation role-players, both internal and external, to the company and their respective roles and responsibilities.

6. **Who should be responsible for what in innovation?**

   Who are the drivers of innovation within the company?

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In the CapGemini Global Innovation Survey, 52% of the 310 participating companies did not agree that they had a formal innovation governance structure to govern innovation in their organisation [12]. This survey reveals that despite the strategic importance placed on innovation by the surveyed companies and the corresponding investment in innovation, innovation governance structures lagged considerably behind other innovation elements [12].

4.1.3 Innovation Capability

The ability of a company to innovate is based on a defined set of factors, which can be used to determine a company's innovation capability [10]. Companies can choose which factors to develop in order to secure a competitive advantage. This is analogous to distinctive business competencies, which deal with attributes of strategy such as pricing, quality, value-adding services and unique distribution channels. These are competencies a business has, which distinguishes it from its competition. Innovation capability is, "the organisational means with which innovative outputs may be facilitated" [8]. It is also described as the potential of an organisation to innovate [3], [4]. The innovation capability model, as developed by Essmann [10], includes three innovation capability areas: Innovation Process, Knowledge & Competency and Organisational Support as well as 10 detailed innovation capability requirements.

The three fundamental capability areas are [10]:

1. **Innovation Process:** The capability of a company to manage the innovation lifecycle phases of innovation initiatives from conceptualisation through to disposal.
2. **Knowledge & Competency:** The specific and broad-based knowledge and competencies required to develop and manage an innovation process. These may already exist in a company or there may be a need for them to be developed or acquired.
3. **Organisational Support:** The company has the appropriate strategies, structures, climate, culture, leadership techniques and resourcing in order to support the process and knowledge and competency requirements for innovation.

These three fundamental capability areas are further divided into detailed capability requirements as presented in *Table 11*.

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Table 11: Fundamental capability areas further divided into detailed capability requirements [10]

Innovation Process	Knowledge & Competency	Organisational Support
Explore & Converge	Absorb & Consolidate	Innovation Strategy & Leadership
Portfolio Management	Core Competency & Technology	Structure & Infrastructure
Consolidate & Exploit		Environment & Climate
Process Control & Risk Management		Resources & Measurement

4.1.4 Relationship between External Innovation Domain Components

Relationships exist between the three components within the external innovation domain or innovation strategy domain (*Figure 10)*.

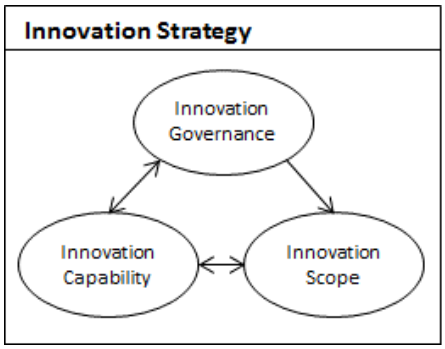

Figure 10: Three Components within the External Innovation Domain

Governance–Scope: The innovation scope is largely determined by the innovation governance framework. The answers to why innovate, where and how much innovation, are determined within the governance framework. These answers inform the decisions on innovation type, level and impact, which form part of the innovation scope.

Governance – Capability: One of the key questions in the innovation governance framework is how a company can innovate more effectively. By linking this question to the innovation capability maturity model and the company's innovation maturity in the various capability requirements, it is possible to identify weaknesses in the company's innovation capability, which can then be improved through a formal innovation capability improvement process. From the other direction, the current innovation capability may dictate how several of the innovation governance questions are answered.

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Scope – Capability: The innovation scope guides a company in determining the appropriate innovation capability maturity level. Where the innovation scope includes significant radical and disruptive innovation, the innovation capability maturity of a company may need to be higher than if the company was focusing on incremental innovation. The scope also assists a company to target its innovation capability improvement efforts by highlighting certain key capabilities required to excel at specific types of innovation with specific desired impacts. The relationship between these two components can also work the other way. The innovation scope can be limited by the company's innovation capability. The scope can change over time as the company's innovation capability matures.

4.2 Internal Domain Components of iSAM

The internal domain focuses on a company's internal innovation infrastructure and processes. Within the internal domain of both the business strategy and IT strategy in the SAM, three components are described, which represent three sets of choices managers need to address. We postulate that three similar sets of choices are required by managers in relation to internal innovation infrastructure and processes. These are:

1. **Innovation Model & Processes:** The choice of which innovation model to apply and the choices that define the detailed innovation work processes. From a model perspective, this is analogous to the internal business administrative structures, which define the roles, responsibilities and authority structures. From a process perspective, this is analogous to the design of the internal business processes required for the company to execute its business strategies.
2. **Innovation Systems:** The innovation systems are the IT systems selected to support the innovation processes. This is analogous with other IT systems in companies which support either the core operations of the company or the support functions such as HR and Finance.
3. **Innovation Skills:** The choices related to the identification, acquisition and development of the necessary skills to drive successful innovation. This is analogous to the skills required within the business domain to successfully implement a specific strategy.

4.2.1 Innovation Models and Processes

The choices for this component involve which innovation model to apply and subsequently which are the most appropriate innovation processes to implement. The innovation literature describes a number of different innovation model categorisations [43], [44], [5]. IBM's innovation archetypes

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provide a description of different overall innovation models [28]. As opposed to other forms of innovation model categorisation, which are very focused on specific attributes such as leadership or maturity, these archetypes provide a general approach to innovation which is determined by the Innovation Strategy and impacts all other aspects of innovation in a company. These archetypes are the marketplace of Ideas, the visionary leader, systematic innovation and external collaborative innovation.

Innovation processes can vary greatly from company to company, even if two companies have similar innovation models. The innovation processes describe the way in which a company has decided to implement a specific innovation model. They include the detailed operations of the innovation lifecycle and should include the following information:

- Detailed activities
- Inputs and outputs
- Roles and responsibilities
- Required documentation
- Application of tools and systems
- Measurement and control functions

Innovation processes can be mapped using any standard process mapping techniques and set of constructs. The process maps may include different levels of detail, depending on the complexity of the processes. The aim of the innovation process maps are the same as any other process maps, they visually represent reality and provide a common view and understanding about the way a company's detailed innovation activities operate. They also provide a platform for improvement activities as they represent the "AS-IS" situation in traditional change processes.

The choice of specific innovation processes in a company is influenced by the preferred innovation model. These innovation processes are then designed to support this preferred innovation model. More rigorous collecting, filtering and decision making processes are required to support the "marketplace of ideas" innovation model compared with the "visionary leadership" model. The processes required to support the "systematic" innovation model should focus far more on translating the customer's needs into research and development activities and then into new offerings. The processes required to support the "external collaboration" model should be designed to identify and manage innovation partners. It should seldom be the case where the innovation processes influence the selection of an innovation model.

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4.2.2 Innovation Systems

The choices of innovation systems are very much dependent on the choice of innovation model and the subsequent innovation processes. However, there are standard categories for IT systems, which support the innovation process. These systems can be categorised into those which support the creativity process, those which support the organisation and running of projects and those which support the innovation operations [161]. The creativity process requires IT to communicate and share challenges and opportunities and to collect and filter innovative ideas. When it comes to the organisation and running of projects, innovation friendly systems are required in order not to stifle the innovation processes. These systems can be used to manage the innovation portfolio and to evaluate the progress and outcomes of innovation projects. When it comes to the operations of innovation, document and knowledge management systems are required along with tools for rapid prototyping and simulation.

4.2.3 Innovation Skills

The choices for this component relate to the identification, acquisition and development of the necessary skills to drive successful innovation. This is analogous to the skills required within the business domain to successfully implement a specific strategy. Innovation skills can be classified into two broad categories: (1) skills required for innovation specific positions and (2) innovation relevant skills required by non-specific innovation positions. For innovation specific positions, like with all positions, job profiles, competency frameworks and performance management components need to be developed. For non-innovation specific positions, innovation components should be built into the job profile. Innovation skills should also form part of a company's skills development and skills acquisition plans.

4.2.4 Relationship between Internal Innovation Domain Components

Relationships exist between the three components within the internal innovation domain or innovation infrastructure and process domain (*Figure 11*).

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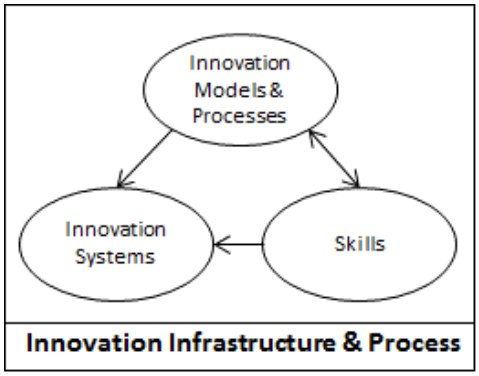

Figure 11: Three Components within the Internal Innovation Domain

Models & Processes - System –: The choice of a specific innovation system in a company is influenced by the preferred innovation model and subsequent processes. The innovation system is designed and implemented to support the preferred innovation model. IT systems to support a bottom-up "marketplace of ideas" model, will be very different to systems designed to support a top-down "visionary leadership" model.

Models & Processes – Skills: The selection of a preferred innovation model influences the innovation skills required in a company. Different innovation models require different skills at all levels in a company. The current skill levels in a company should also be considered when selecting a preferred innovation model. Based on the current skill set, certain innovation models should be avoided until the necessary skills have been developed or acquired.

Systems - Skills: The innovation skills should be taken into consideration when designing/acquiring a specific innovation system. Companies with a low innovation maturity may require either a simpler system or one that automates more of the innovation process.

4.3 Alignment in iSAM

Alignment in iSAM is defined between all four domains: the business internal and external domains and the innovation internal and external domains. Within the field of strategic alignment, three types of alignment are defined. These are strategic fit [17], functional integration [147] and cross-domain alignment [17]. These three types of alignment are represented in iSAM.

4.3.1 Strategic Fit

Strategic fit ensures the infrastructure and processes are aligned to and support the strategy. This type of alignment is critical as there is no benefit in having a well-developed strategy if the infrastructure

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and processes, which are needed to deliver the strategy, are either insufficient or inappropriate. In a review of various research attempts to measure fit, Avison et al. report that there is little consensus between the leading authors regarding the factors involved in measuring fit [18]. In iSAM, strategic fit is the alignment between the external strategy domains and the internal infrastructure and process domains. This is applicable from both an overall business and innovation perspective. The three components of the external innovation domain need to be aligned with and be supported by the three components of the internal innovation domain (*Figure 12*). The same applies for the external and internal business domains.

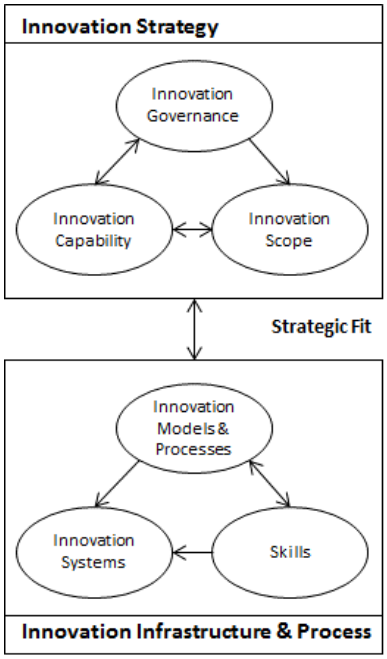

Figure 12: Strategic Fit of Innovation Domains

4.3.2 Functional Integration

Functional integration deals with the integration between the business and a functional area, such as HR, IT or innovation. Functional integration is viewed at two levels: strategic (external) and infrastructure and process (internal). In iSAM the functional strategic integration deals with the strategic alignment between the innovation strategy and the business strategy. The functional infrastructure and process integration is defined by the link between the innovation infrastructure and processes and the business infrastructure and processes. *Figure 13* depicts the functional strategic integration.

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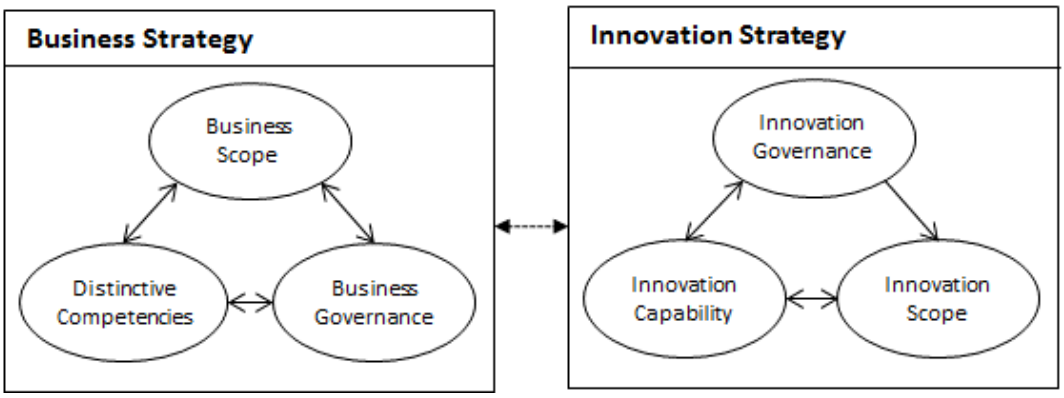

Figure 13: Functional Strategic Integration

The innovation strategy alignment framework developed by Katz et al [14] has been adapted to align Porter's four competitiveness strategies, which can also be called grand strategies, with the detailed scope of an innovation strategy (*Table 12*). The relationship between the competitiveness strategy and the innovation scope is defined as either weak, medium or strong [80]. The other components in the innovation strategy domain in iSAM, innovation governance and innovation capability, either influence the innovation scope or are influenced by the innovation scope. Therefore, if the innovation scope is aligned with the grand strategy, these other two components should also be aligned.

Table 12: Relationships between Innovation Components and Competitive Strategies *[80]*

Components of an Innovation Strategy		Porter's Four Generic Competitive Strategies			
		Overall cost leadership (Cost Reducer)	Overall differentiation (First to market)	Focus-segment cost leadership (Cost Reducer/Niche)	Focus-segment differentiation (Niche)
Innovation Type	Product	Medium	Medium	Strong	Strong
	Strategic	Weak	Strong	Medium	Strong
	Process	Strong	Weak	Medium	Weak
Innovation Level	Radical	Weak	Strong	Medium	Medium
	Incremental	Strong	Medium	Strong	Medium
Innovation Impact	Sustaining	Strong	Weak	Medium	Medium
	Disruptive	Weak	Strong	Medium	Strong

From a functional infrastructure and process integration perspective (*Figure 14*) it is important to determine if the innovation model and processes are able to exist within the business infrastructure and processes and if key innovation competencies are represented in the company's competency framework and in both innovation specific job descriptions and more general job descriptions.

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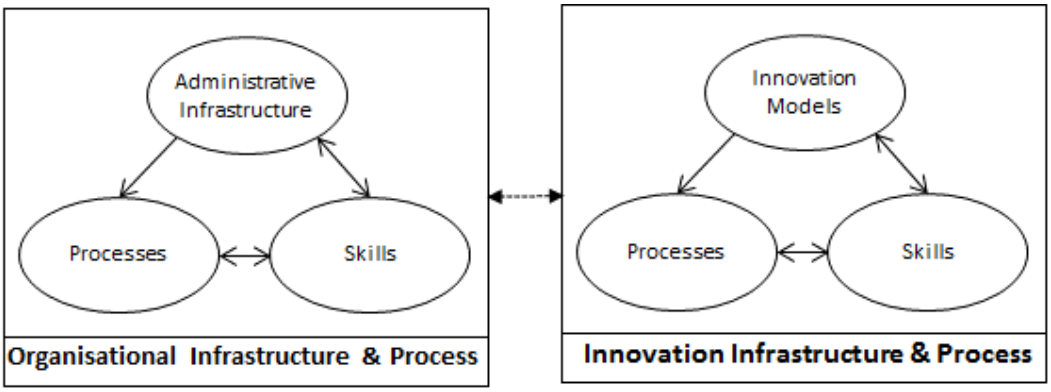

Figure 14: Functional Infrastructure and Process Integration

4.3.3 Cross-Domain Alignment

The SAM uses the concept of alignment perspectives to describe multiple cross-domain alignments. The same approach can be applied in iSAM. Companies with different overall philosophies, strategies and goals and that are appropriately aligned, will adopt a specific alignment perspective, which best fits its specific strategy. The alignment perspectives describe the way in which a company adapts to changes in its internal and external environments in order to regain alignment after such a change. The main alignment perspective provides a guide and represents the general approach a company should follow to achieve re-alignment after change. The other alignment perspectives may also be relevant under certain circumstances, but the main alignment perspective of a company should always be the most dominant. Three alignment perspectives have been defined for iSAM:

1. Business Strategy Perspective
2. Innovation Transformation Perspective
3. Innovation Potential Perspective

Each perspective has one dominant domain, which is the driving force and usually the initiator of change. This domain often has the strongest representation at executive level in the company. It is often referred to as the anchor domain. Coleman et al. consider the anchor domain to be the quadrant that is the strongest area of the business. It directs the change that the business is to undergo [19] [76]. There seems to be some disagreement between Luftman et al. [76] and Henderson and Venkatraman [162] regarding the description of the remaining two domains and their relationships to the anchor domain as far as IT alignment is concerned. In the context of innovation alignment, the impacted domain is the domain, which is directly impacted by changes in the anchor domain. It is the

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domain, which follows straight after the anchor domain in the alignment perspective - either horizontally or vertically. The implication domain is implicated in the change to the anchor domain by the subsequent change to the impacted domain.

4.3.3.1 Business Strategy Perspective

The business strategy perspective is presented in *Figure 15*. In this perspective the business strategy is the main driver or anchor domain. The innovation infrastructure and processes is the implicated domain and needs to fit with the current organisational infrastructure and processes, which is the impacted domain, designed to support the business strategy. The innovation infrastructure and processes are constrained by the organisational design. There is likely no explicit innovation strategy to guide the design or operations of the innovation infrastructure and processes.

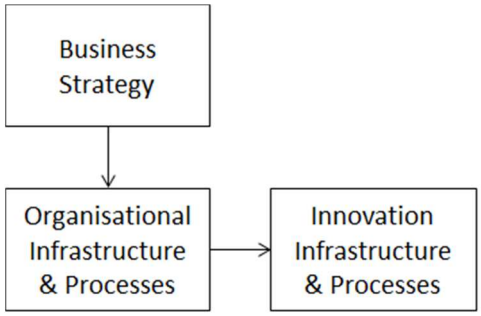

Figure 15: Business Strategy Perspective

In this perspective there are unlikely to be people or other resources dedicated directly to innovation. Therefore, from an external innovation domain perspective, the scope of innovation would be limited (focusing on incremental improvements), the innovation governance activities would be minor and the innovation capability level of the company would be low, without much on-going effort to improve it. From an internal innovation domain perspective the innovation model would not rely heavily on an innovation team. The innovation leadership would come from already established management teams or individuals.

The type of company that would best fit the Business Strategy Perspective is that with a strong operational focus that has to perform the same activities over and over again. These companies gain a competitive advantage through operational efficiencies and have significant capital invested in operational infrastructure.

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4.3.3.2 Innovation Transformation Perspective

The innovation transformation perspective places the innovation strategy (impacted domain) and innovation infrastructure and processes (implicated domain) at the centre of implementing the chosen business strategy, which is the anchor domain (*Figure 16*).

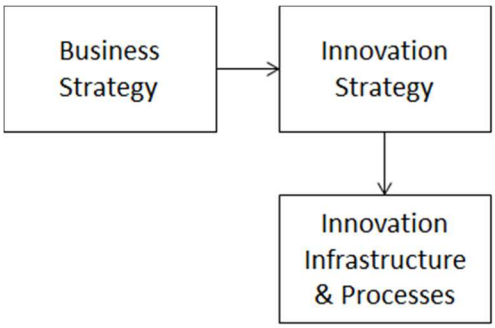

Figure 16: Innovation Transformation Perspective

In this perspective, a company has made a decision that the innovation activities should not be constrained by the current business infrastructure and processes. Instead, the innovation strategy, made up of the scope, governance and innovation capability, should be aligned with the overall business strategy. The correct innovation infrastructure, including: model, processes and skills, should then be designed and implemented in order to support the implementation of the innovation strategy. As an example, a company with a first-to-market generic strategic perspective (business strategy) should have an innovation strategy, which focusses on radical and disruptive innovation (scope), which in turn would require a mature innovation capability and governance structures. To successfully implement this innovation strategy, it would need to select an innovation model geared for this level of innovation and will need to support this model through appropriate innovation processes, systems and skills. The type of company that would best fit the Innovation Transformation Perspective is that which gain a competitive advantage through its ability to adapt and change to shifts in the external environment. Innovation is not at the core of these companies, but they have the capability to innovate in order to implement successful change and significantly improve their core business.

4.3.3.3 Innovation Potential Perspective

In the innovation potential perspective, a company designs a new business strategy (impacted domain) on the potential competitive advantage its innovation strategy (anchor domain) could provide. The business infrastructure and processes (implicated domain) are then designed to implement the new business strategy (*Figure 17*).

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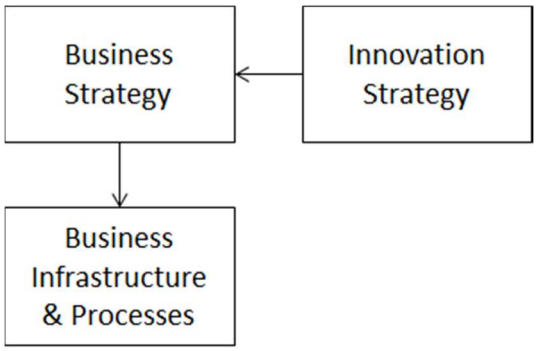

Figure 17: Innovation Potential Perspective

In this perspective a company realises that the broad scope of innovations it is able to deliver together with its significant innovation capability and innovation governance structures, places it in a position to make changes to its business strategy so that it can better exploit its innovation capability. If this new business strategy is supported by a changed and aligned business infrastructure and processes then a significant competitive advantage may be gained. This approach requires strong innovation leadership and will more than likely be driven by the CEO or senior management team and employ a "visionary leader" innovation model. The type of company that would best fit the Innovation Potential Perspective is that whose business is innovation. These companies are found in fast changing industries with high levels of uncertainty about the future and where innovation has the capability to disrupt the entire structure and pecking order. Innovation is not being applied in order to improve other core competencies such as low cost or improved quality, innovation is the core competency and these companies gain a competitive advantage from being able to innovate better and faster than their competitors.

4.4 The Comprehensive iSAM Model

The comprehensive iSAM comprises the two business domains (internal & external) and the two innovation domains (internal & external). Each of the four domains contain three components. The strategic fit between the external and internal domains and the functional integration both at a

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strategic level and at an infrastructure and process level are depicted in iSAM. The full iSAM is presented in *Figure 18*.

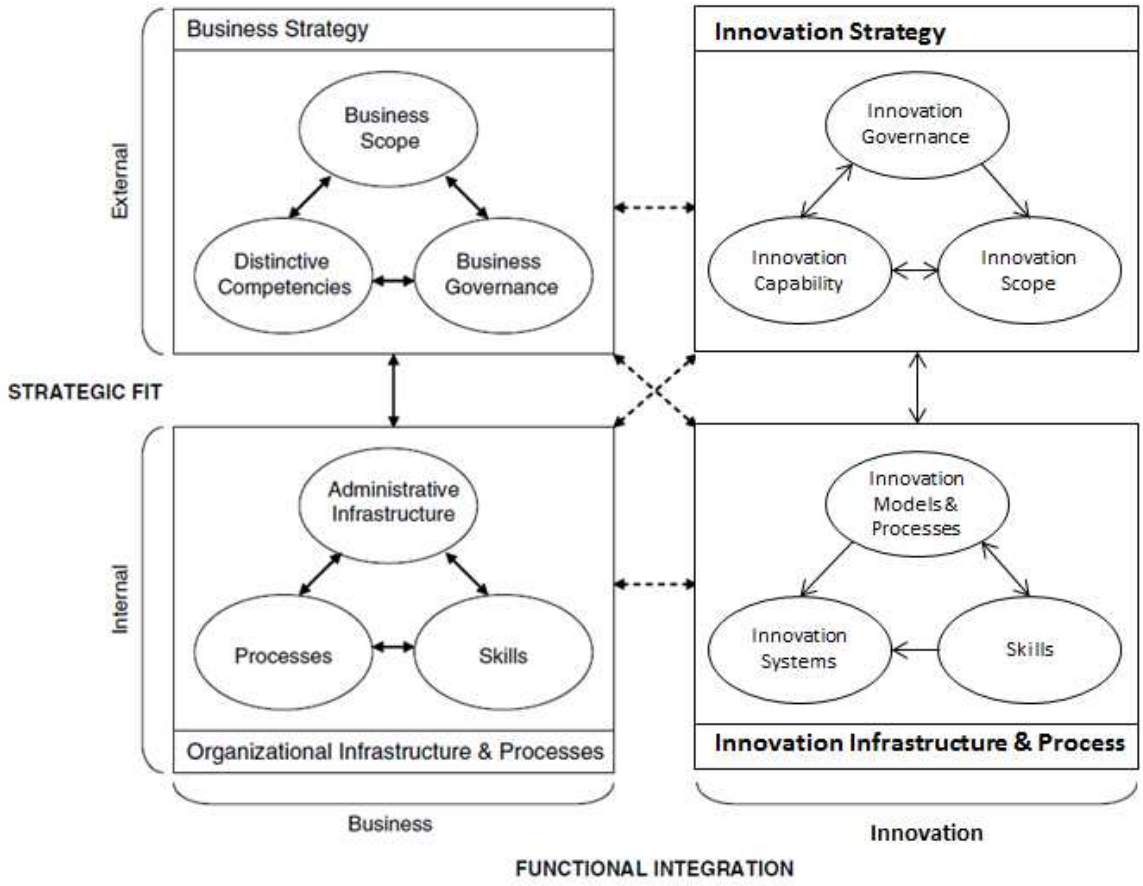

Figure 18: iSAM with All Components and Relationships

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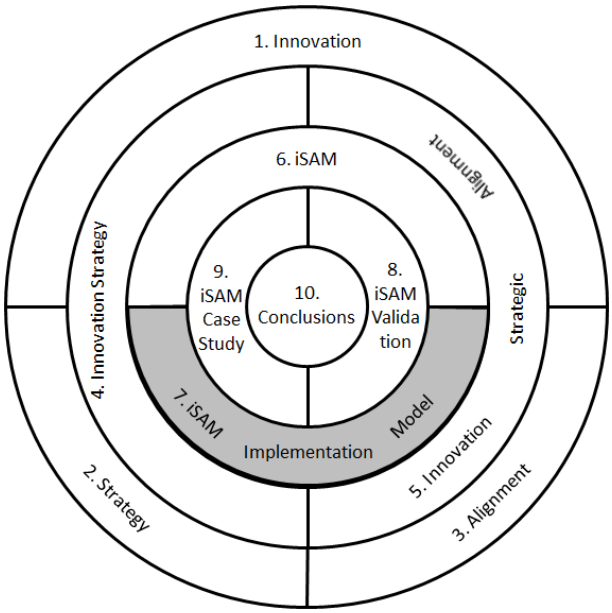
5 iSAM Implementation Framework



In this section an innovation strategy alignment approach, called the iSAM Implementation Framework, is presented. The implementation framework is first presented at a high-level and then the detailed steps of the framework are explained in more detail.

5.1 Introduction to iSAM Implementation Framework

The implementation framework is aimed at assisting a company to assess the current state of alignment between a company's internal and external business and innovation domains and then to take specific actions to improve that alignment. The implementation framework utilises the concepts of strategic fit, functional alignment and alignment perspectives (cross-domain alignment) to work methodically through the alignment between a company's business and innovation domains.

Strategy, like innovation, is very much about change. A company decides on a strategy and then spends time and effort to implement that strategy. In the process internal skills, processes and infrastructure may need to change in order to align with the new strategy. This is just as applicable to the innovation strategy as it is for the overall business strategy. In executing the strategy the company may develop new products, enter new markets, develop new innovation capabilities, implement a new innovation model or do other things to achieve their strategic objectives. Furthermore, in companies today, projects are the vehicle by which change occurs both internally or externally. Projects only exist if a change is required.

The first step in the innovation strategy alignment approach is to document the company's internal and external overall business and innovation domains. Next the functional integration between the business domains and innovation domains are assessed. Then the company's current strategic fit, which is alignment between the strategies and the internal structures, is assessed. The outcomes of

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these assessments could either be poor or good strategic fit or poor or good functional integration. If the outcome is both good strategic fit and good functional integration, then an analysis of the company's current projects will assist in determining if the alignment will be maintained (4b in *Figure 19*). Should there be misalignment with either the strategic fit or with the functional integration, then the company's dominant strategic alignment perspective needs to be determined. The dominant strategic alignment perspective will provide a guiding change pathway for a company to achieve realignment. The appropriate alignment perspective should be followed to determine if the current and planned projects will achieve alignment or if some projects should be stopped and others initiated (5 a, b, c in *Figure 19*). The ultimate goal is to move a company into alignment, which is achieved through continual reassessment and adjustments [19]. The suggested innovation strategy alignment approach is presented in *Figure 19*.

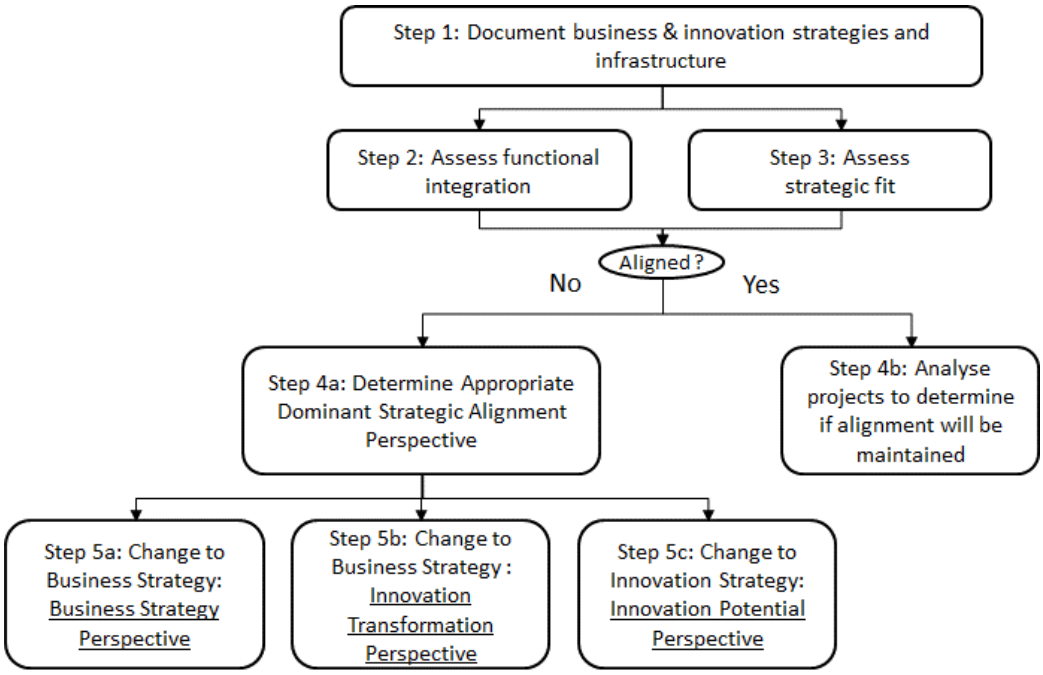

Figure 19: Innovation Strategy Alignment Approach

The output of this innovation strategy alignment approach could be one of the following: either there is both strategic fit and functional integration and the company is well aligned or there are deficiencies in the company's alignment. In the case where there are deficiencies in the company's alignment, it can be determined if the current and planned projects are likely to address these deficiencies following the appropriate strategic alignment perspective or if the projects will not achieve alignment. The analysis of the projects, to determine if they will achieve alignment or not, takes place in either step 5a, 5b or 5c, depending on the appropriate dominant strategic alignment perspective, deduced in step

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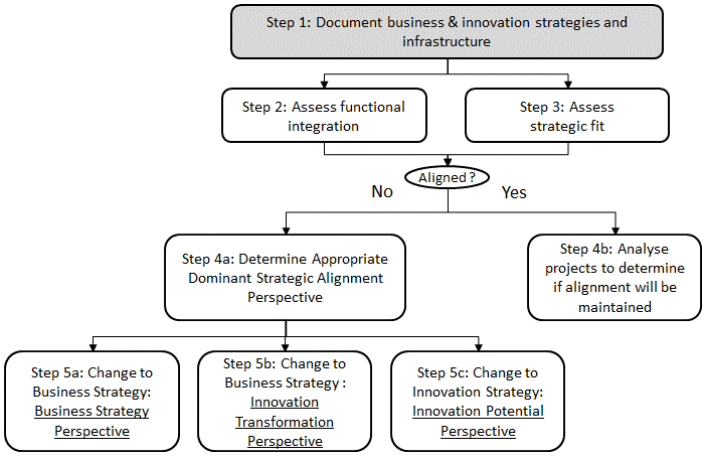
4a. The exact order and approach for assessing the projects, through a set of change pathways, is described in detail in section 5.2.5 on page 94. If the projects will not achieve alignment the approach can reveal, which type of projects are missing in order for alignment to be achieved and which current and planned projects are not contributing to alignment.

In the following section, each of the steps in the innovation strategy alignment approach are presented in more detail.

5.2 Detailed Steps in iSAM Implementation Framework

There are five steps in the iSAM Implementation Framework. Each of these steps has at least one tool or template to assist a company to complete the step.

5.2.1 Step 1: Document Business and Innovation Strategy and Infrastructure



The aim of step 1 is to understand and document the company's business strategy, innovation strategy (implicit or explicit), business infrastructure and innovation infrastructure in the context of the 12 components of the iSAM. In documenting the business and innovation strategies and infrastructure, each of the three components in each of the four domains in iSAM is described at a high-level. A set of questions is used to guide the gathering of this important information. The following questions per component per domain are applicable (see Appendix I for an example of the questions and answers from a real company). These questions can be used either as a questionnaire or preferably to guide an initial workshop at the start of the iSAM innovation strategy alignment approach. Information to address these questions are also harvested from company strategic and operational documents (see Appendix H for an example of a list of documents from a real company).

1. **Business Strategy Domain**

   1.1 Business Scope

   Q1: What is the company's target market/s?

   Q2: Which markets do the company serve with which products/services?

   1.2 Business Governance

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Q3: What are the key business principles by which the company is run?

Q4: What forums or oversight functions exist to ensure these principles are adhered to?

1.3 Distinctive Competencies

Q5: What are the company's distinctive competencies?

Q6: Why do these competencies give the company a competitive advantage?

Q7: Which strategy best describes the company's generic strategy? (First-to-market, cost reducer, niche, niche/cost reducer)

2. Innovation Strategy Domain

2.1 Innovation Scope

Q8: What is the desired blend between:

- product, process and strategic innovation within innovation type
- incremental and radical innovation within innovation level
- sustaining and disruptive innovation within innovation impact

2.2 Innovation Governance

Q9: Are there formal innovation governance forums or structures?

Q10: Answer the following innovation governance questions:

a) What is the purpose of innovation in the company?

b) Where does the company look for innovation?

c) How much innovation does the company target (company's appetite for risk)?

d) How can the company innovate more effectively?

e) Who are the main internal and external innovation role-players, what is their role?

f) Who is responsible for innovation?

2.3 Innovation Capabilities

Q11: What innovation capability maturity level best describes the company:

- unaware of innovation
- innovation is defined
- innovation is controlled
- innovation is integrated
- total innovation synergies

Q12: Which are the two strongest and the two weakest innovation capability requirements (as defined in *Table 11*) and why?

3. Organisational Infrastructure and Processes Domain

3.1 Administrative Infrastructure

Q13: What is the high-level structure of the company? (Flat, deep, matrix)

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Q14: What are the different levels and entities in the company? (Management levels, departments, teams etc.)

Q15: How do the support functions connect to the operational functions? (Centralised, decentralised etc.)

3.2 Business Processes

Q16: Are the business processes well defined and are they integrated across different company departments?

3.3 Business Skills

Q17: Does the company have a detailed competency framework?

Q18: Are there development plans in place at an individual employee level?

Q19: Are there key business skills which are deemed to be missing internally in the company?

4. Innovation Infrastructure and Processes Domain

4.1 Innovation Model

Q20: Based on the innovation archetypes (as described in *Table 2*), which archetype best describes the company's innovation model?

- Marketplace of ideas
- Visionary leadership
- Systematic innovation
- External collaborative innovation

Q21: Briefly describe the innovation model used in the company.

4.2 Innovation Processes

Q22: Which innovation processes formally exist in the company?

- Explore and converge
- Portfolio management
- Consolidate and exploit
- Process control and risk management

4.3 Innovation Skills

Q23: Are specific innovation competencies defined in non-innovation specific roles, do they exist in the overall competency framework?

Q24: What are the competencies defined for innovation specific roles, do they exist in the overall competency framework?

Q25: Are there specific innovation competency improvement activities, which the company has undertaken?

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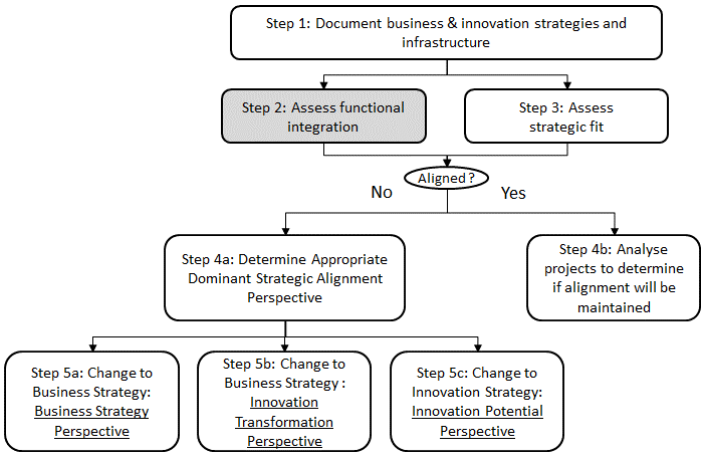
Once these questions are answered the current situation with the business and innovation domains can be documented and step 1 in the iSAM implementation framework is then complete.

5.2.2 Step 2: Assess Functional Integration



Functional integration is the alignment between the business strategy and the strategy of one of a company's supporting functions. In the case of iSAM the supporting function is innovation. The aim of step 2 is therefore to assess the functional integration (alignment) between the business strategy and the innovation strategy and between the business infrastructure and processes and the innovation infrastructure and processes. This is represented in *Figure 20* by the two strategic domains from iSAM.

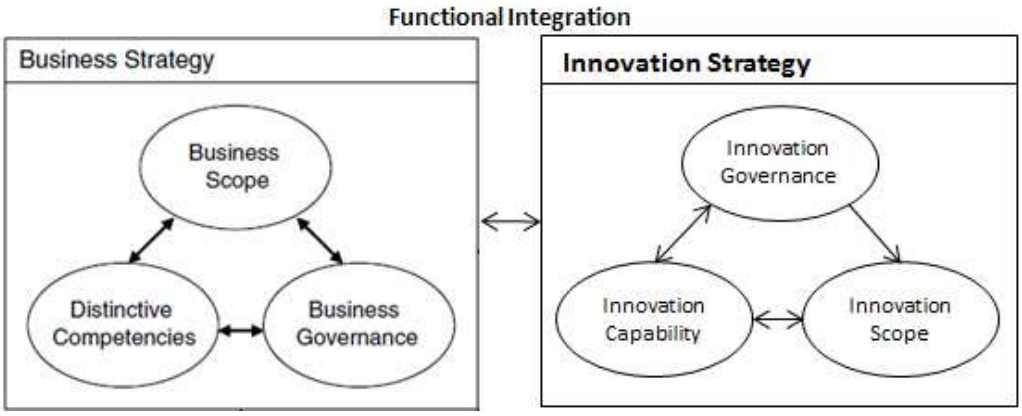


Figure 20: Innovation Functional Integration from iSAM

The innovation strategy alignment framework developed by Katz et al [75] is presented in *Table 13*. The relationship between the competitiveness strategy and the innovation scope is defined as either weak, medium or strong [80]. The other components in the innovation strategy domain in iSAM, innovation governance and innovation capability, either influence the innovation scope or are influenced by the innovation scope. Therefore, if the innovation scope is aligned with the grand strategy, these other two components should also be aligned.

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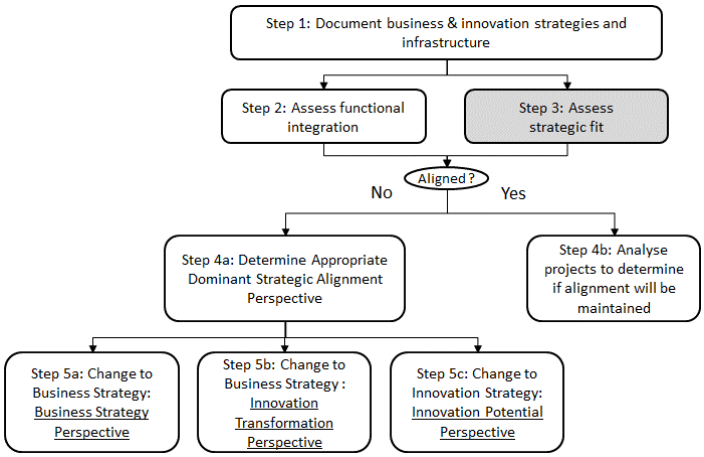
Table 13: Relationships between Innovation Components and Competitive Strategies *[75]*

Components of an Innovation Strategy		Porter's Four Generic Competitive Strategies			
		Overall cost leadership (Cost Reducer)	Overall differentiation (First to market)	Focus-segment cost leadership (Cost Reducer/Niche)	Focus-segment differentiation (Niche)
Innovation Type	Product	Medium	Medium	Strong	Strong
	Strategic	Weak	Strong	Medium	Strong
	Process	Strong	Weak	Medium	Weak
Innovation Level	Radical	Weak	Strong	Medium	Medium
	Incremental	Strong	Medium	Strong	Medium
Innovation Impact	Sustaining	Strong	Weak	Medium	Medium
	Disruptive	Weak	Strong	Medium	Strong

Based on the information collected in step 1 and on the relationships defined in *Table 13* it is possible to determine if a company has good or poor functional integration between the business and innovation domains. In step 1 a questionnaire and/or a workshop along with strategic and operational documents (see Appendix H for example) are used to determine a company's generic competitiveness strategy and its preferred innovation scope. This information is now used in step 2 to determine the strength of the functional integration. For example, if it is determined in step1 that a company has a cost reducer generic competitiveness strategy, but that its innovation scope focuses mainly on strategic innovations then there may be poor functional integration between the business strategy and the Innovation Strategy.

5.2.3 Step3: Assess Strategic Fit



Strategic fit is the alignment between the overall business strategy domain and the organizational infrastructure and process domain and between a functional strategy and the functional infrastructure and processes. In the case of iSAM the function is innovation and therefore the strategic fit is the alignment between the innovation strategy domain and the innovation infrastructure and process domain. Therefore the aim of step 3

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is to assess the strategic fit between the business strategy and organisational infrastructure and processes and between the innovation strategy and innovation infrastructure and processes.

In the case of innovation strategic fit, the company's innovation model, processes, systems and skills are required to be aligned with the innovation scope, governance and maturity capability defined in the Innovation Strategy (*Figure 21*).

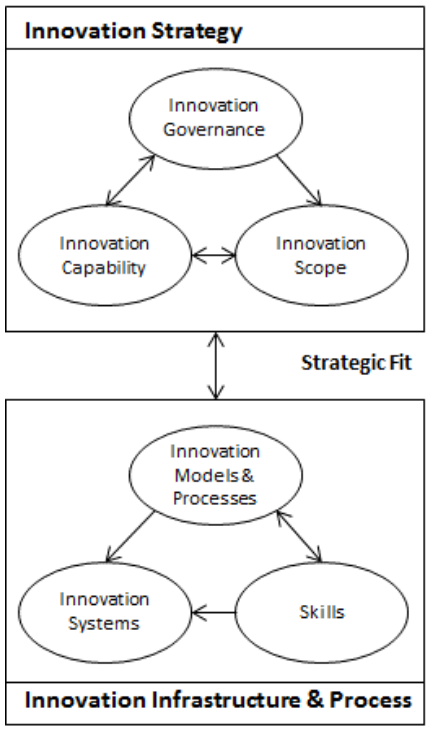

Figure 21: Innovation Strategic Fit from iSAM

Strategic fit for innovation starts by aligning the innovation model. In the literature review, in section 3.1.4 on page 30, four different innovation models are described. The appropriate innovation model should be determined based on the answers to the innovation governance questions. Specifically the questions regarding: where to look for innovation, with whom should you innovate and who should be responsible for innovation. Once the appropriate innovation model is selected, the innovation systems and skills need to align with the chosen model.

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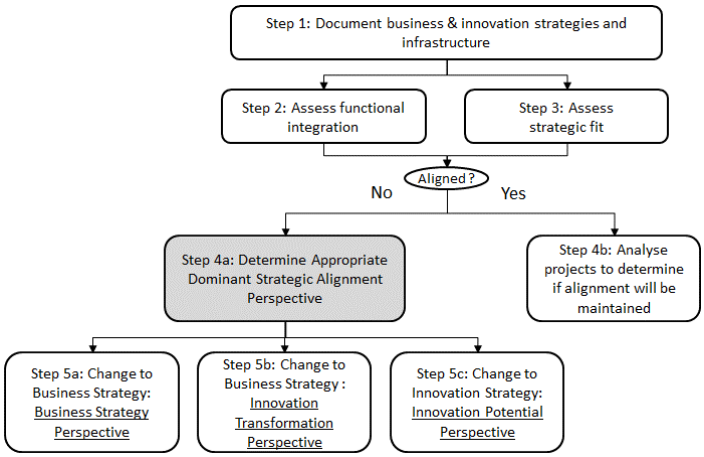
5.2.4 Step 4a: Determine Dominant Strategic Alignment Perspective



If it is determined in steps 2 or 3 that there is misalignment with the functional integration and/or the strategic fit then step 4a is completed next. The aim of step 4a is to determine which strategic alignment perspective is most appropriate for the company. The most appropriate strategic alignment perspective is called the dominant strategic alignment perspective and is determined based on the company's grand strategy and innovation strategy. Three strategic alignment perspectives for innovation have been defined. These are the Business Strategy Perspective, the Innovation Transformation Perspective and the Innovation Potential Perspective.

There are three main factors, which need to be taken into consideration when deciding on the appropriate alignment perspective for a specific company. There are other factors which play a role, such as the innovation model and the balance of influence within the executive committee. However, these factors are all influenced by the three main factors being the company's grand strategy, the company's innovation strategy and the industry in which the company operates. A company with a first to market grand strategy is more likely to adopt an innovation transforming or innovation potential alignment perspective, while a company looking to gain a competitive advantage through cost reduction may opt for the business strategy alignment perspective. A company with a strong focus on radical and disruptive strategic or product innovation in their innovation strategy, as well as a company with a high level of innovation maturity, is best suited for either an innovation transforming or innovation potential alignment perspective, while a company with a focus on more incremental innovation may be best suited for the business strategy alignment perspective.

From an industry perspective, companies in fast changing industries with high levels of uncertainty about the future may opt for either the Innovation transformation Perspective or even the Innovation Potential Perspective. A company in an industry with large barriers to entry and high capital investments may opt for the Business Strategy Perspective. These industries are less likely to be disrupted by a single innovation.

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Depending on which strategic alignment perspective is deemed to be the dominant perspective in the company either step 5a, 5b or 5c is completed next.

5.2.5 Step 5: Following the Change Pathways to Alignment

The specific change pathway selected to achieve alignment between a company's business and innovation domains is dependent on the dominant strategic alignment perspective. The change pathways for each of the three defined strategic alignment perspectives are described later in this section. As projects are the main vehicles by which modern companies undergo change, the change pathways combine the current situation in each of the iSAM domains with the projects that are currently underway to change these domains. It has already been established that misalignment, either with the strategic fit or the functional integration, exists. Through the change pathways, it is possible to determine if the current and planned projects will achieve alignment in the company or if the project portfolio needs to be adjusted in order to achieve alignment.

In order to include the projects in the change pathways, different types of projects needed to be categorised in context with the four domains in iSAM. These projects are there to either implement an external strategy or change the internal infrastructure and processes.

Six different project types have been defined based on the domains in the iSAM:

- **Project type 1 (P1):** External non-innovation projects drive the achievement of the external business strategy.
- **Project type 2 (P2):** Internal non-innovation projects drive changes to the internal business infrastructure and processes.
- **Project type 3 (P3):** External innovation projects are innovation projects which drive the achievement of the business strategy and need to be aligned with the innovation strategy.
- **Project type 4 (P4):** Internal innovation projects are innovation projects which change the business infrastructure and processes and need to be aligned with the innovation strategy.
- **Project type 5 (P5):** Internal innovation process projects drive changes to the internal innovation infrastructure and processes.
- **Project type 6 (P6):** External innovation projects not aligned to business strategy are projects which do not assist in achieving the current business strategy but may lead to a new business strategy in the future.

Based on this project categorisation and the strategic alignment perspectives, the three change pathways are developed. Throughout each of the change pathways the projects are analysed to

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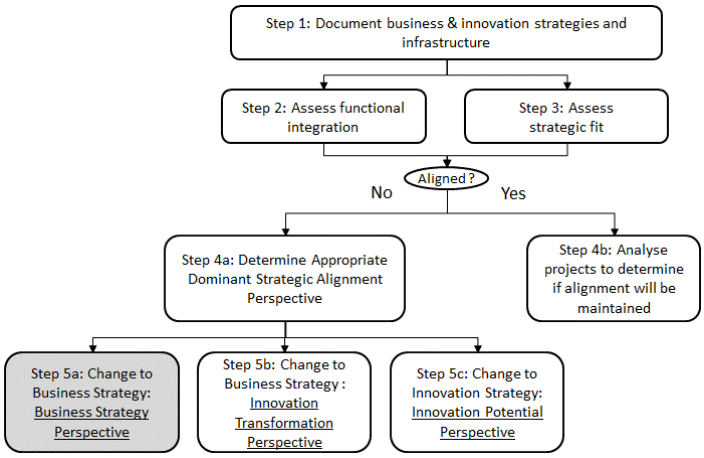
determine if they are aligned or misaligned with a specific iSAM domain. This alignment analysis is performed by answering a series of questions for each of the current or planned projects in the company's project portfolio. These questions are presented in Appendix G.

Step 5a: Business Strategic Alignment Perspective Change Pathway



In the business strategic alignment perspective, the business strategy is the anchor or dominant domain. The business infrastructure and process domain is the impacted domain and the innovation infrastructure and process domain is the implicated domain. Based on this defined flow of change from business strategy to business infrastructure and process to innovation infrastructure and processes, the following 11 steps are defined for this change pathway.

1. Business strategy either stays the same and the other domains in iSAM change to achieve alignment or business strategy changes due to extremal or internal forces and the other domains in iSAM change to achieve alignment.
2. Check that "external non-innovation projects" (P1) are aligned with Business Strategy and review P1 type projects if not aligned.
3. Check strategic fit between business strategy domain and business infrastructure and process domain and define new business infrastructure and process domain if required.
4. Check that "internal non-innovation projects" (P2) which change business infrastructure and processes are aligned to business strategy and review P2 type projects if not aligned.
5. Check strategic functional integration between business strategy domain and Innovation Strategy domain and define new Innovation Strategy if strategic functional integration does not exist with business strategy.
6. Check that "external innovation projects aligned with business strategy" (P3) are aligned with Business Strategy and Innovation Strategy and review P3 type projects if not aligned.
7. Check that "internal innovation projects" (P4) are aligned with Innovation Strategy and changing business infrastructure and processes aligned to business strategy and review P4 type projects if not aligned.

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8. Check that "external innovation projects not aligned to business strategy" (P6) are aligned with new Innovation Strategy and review P6 type projects if not aligned.
9. Check operational functional integration between business infrastructure and process domain and innovation infrastructure and process domain and define new innovation infrastructure and processes but keeping alignment with new Innovation Strategy.
10. Check strategic fit between Innovation Strategy domain and innovation infrastructure and process domain and adjust new innovation infrastructure and processes but still aligned with business infrastructure and processes.
11. Check "internal innovation processes projects" (P5) aligned with innovation infrastructure and processes and review P5 type projects if not aligned.

The eleven steps of the business strategic alignment perspective change pathway are presented in *Figure 22*.

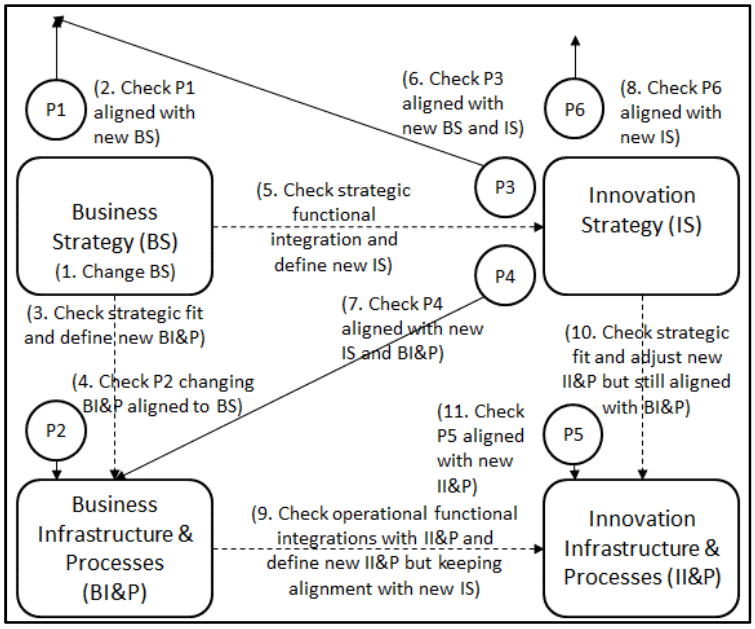

Figure 22: Eleven Steps of the Business Strategic Alignment Perspective Change Pathway

The arrows with solid lines in *Figure 22* indicate the impact of a change project. If the solid line arrow is pointed at a domain then these project types have an impact on that domain. For example, the solid line arrow from project type P4 is pointing at the business infrastructure and process domain, P4 type projects will impact this domain. If a solid line arrow is pointed away from a domain then these project types have an external impact. For example, the solid line arrow from project type P3 indicate innovation projects which drive the achievement of the business strategy.

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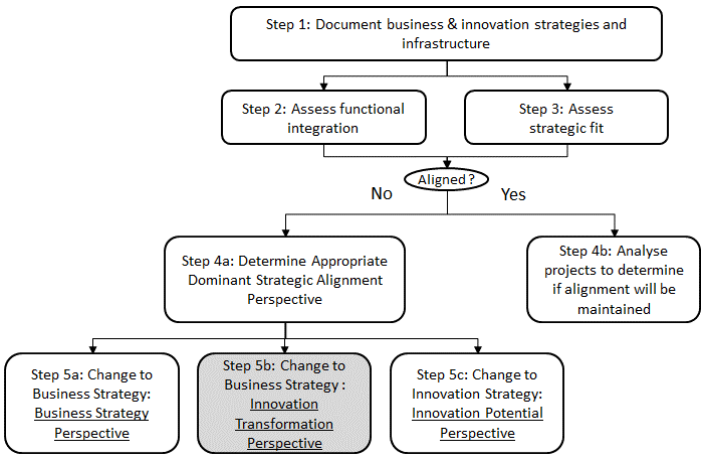
The arrows with the dotted line indicate a relationship between two domains. For example, the direction of the dotted line arrow between the Innovation Strategy domain and the innovation infrastructure and process domain indicate that the innovation infrastructure and process domain will be adjusted based on any changes to the Innovation Strategy domain. The arrows have the same meaning in *Figure 23* and *Figure 24* in the following two sections.

Step 5b: Innovation Transformation Alignment Perspective Change Path



In the innovation transformation alignment perspective, the business strategy is the anchor or dominant domain. The Innovation Strategy is the impacted domain and the innovation infrastructure and process domain is the implicated domain. Based on this defined flow of change from business strategy to Innovation Strategy to innovation infrastructure and processes, the following 11 steps are defined for this change pathway.

1. Business strategy either stays the same and the other domains in iSAM change to achieve alignment or business strategy changes due to external or internal forces and the other domains in iSAM change to achieve alignment.
2. Check that “external non-innovation projects” (P1) are aligned with Business Strategy and review P1 type projects if not aligned.
3. Check strategic functional integration between business strategy domain and Innovation Strategy domain and define new Innovation Strategy if strategic functional integration does not exist with business strategy.
4. Check that “external innovation projects aligned with business strategy” (P3) are aligned with Business Strategy and Innovation Strategy and review P3 type projects if not aligned.
5. Check that “external innovation projects not aligned to business strategy” (P6) are aligned with new Innovation Strategy and review P6 type projects if not aligned.
6. Check strategic fit between business strategy domain and business infrastructure and process domain and define new business infrastructure and process domain if required.
7. Check that “internal non-innovation projects” (P2) which change business infrastructure and processes are aligned to business strategy and review P2 type projects if not aligned.

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8. Check that "internal innovation projects" (P4) are aligned with Innovation Strategy and changing business infrastructure and processes aligned to business strategy and review P4 type projects if not aligned.
9. Check strategic fit between Innovation Strategy domain and innovation infrastructure and process domain and define new innovation infrastructure and processes.
10. Check operational functional integrations between business infrastructure and process domain and innovation infrastructure and process domain and adjust business infrastructure and processes but keeping alignment with BS.
11. Check "internal innovation processes projects" (P5) aligned with innovation infrastructure and processes and review P5 type projects if not aligned.

The eleven steps of the innovation transformation alignment perspective change pathway are presented in *Figure 23*.

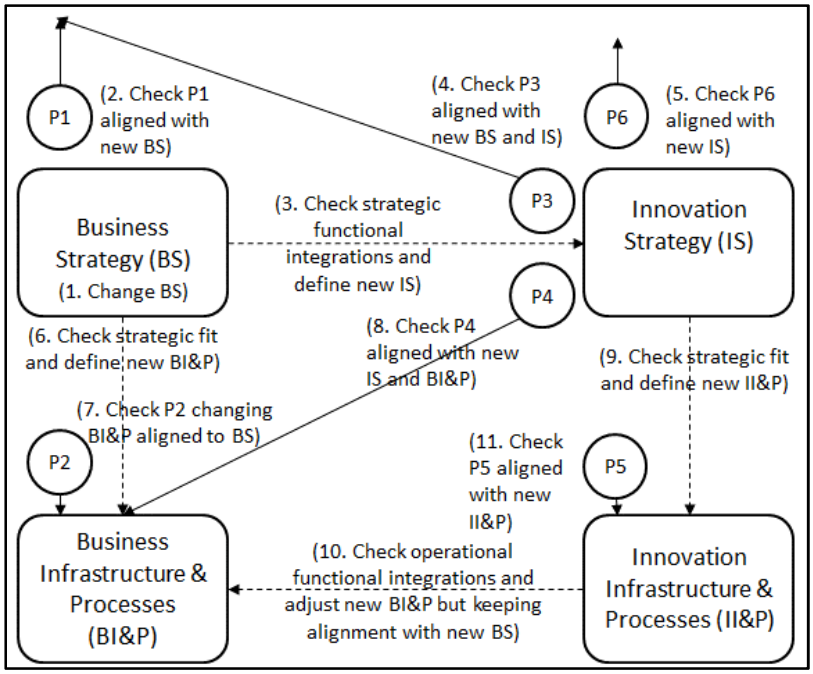

Figure 23: Eleven Steps of the Innovation Transformation Alignment Perspective Change Pathway

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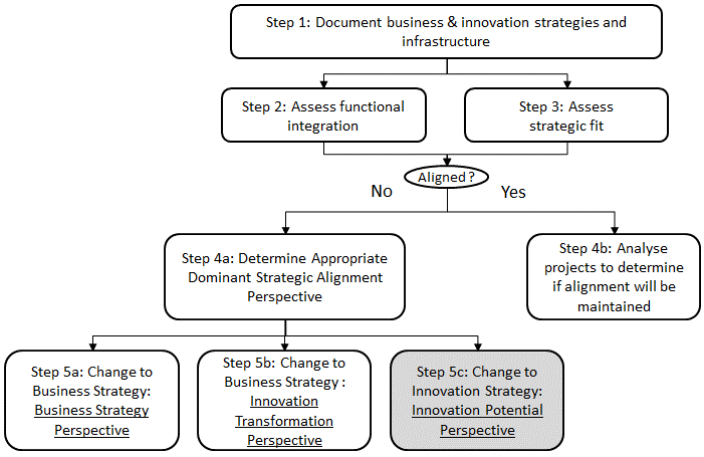
Step 5c: Innovation Potential Alignment Perspective Change Path



In the innovation potential alignment perspective, the Innovation Strategy is the anchor or dominant domain. The innovation infrastructure and process domain is the impacted domain and the business infrastructure and process domain is the implicated domain. Based on this defined flow of change from innovation strategy to innovation infrastructure and process to business infrastructure and processes, the following 11 steps are defined for this change pathway.

1. Change Innovation Strategy due to changes in internal innovation capability or external competitiveness forces.
2. Check that "external innovation projects not aligned to business strategy" (P6) are aligned with new Innovation Strategy and review P6 type projects if not aligned.
3. Check strategic functional integration between Innovation Strategy domain and business strategy domain and define new business strategy if strategic functional integration does not exist with new Innovation Strategy.
4. Check that "external non-innovation projects" (P1) are aligned with Business Strategy and review P1 type projects if not aligned.
5. Check that "external innovation projects aligned with business strategy" (P3) are aligned with Business Strategy and Innovation Strategy and review P3 type projects if not aligned.
6. Check strategic fit between Innovation Strategy domain and innovation infrastructure and process domain and define new innovation infrastructure and process domain if required.
7. Check "internal innovation processes projects" (P5) aligned with innovation infrastructure and processes and review P5 type projects if not aligned.
8. Check strategic fit between business strategy domain and business infrastructure and process domain and adjust business infrastructure and process domain.
9. Check operational functional integration and adjust business infrastructure and processes but keeping alignment with Business Strategy.
10. Check that "internal non-innovation projects" (P2) are aligned with new business infrastructure and processes and review P2 type projects if not aligned.

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11. Check that "internal innovation projects" (P4) are aligned with new Innovation Strategy and business infrastructure and processes and review P4 type projects if not aligned.

The eleven steps of the innovation transformation alignment perspective change pathway are presented in *Figure 24*.

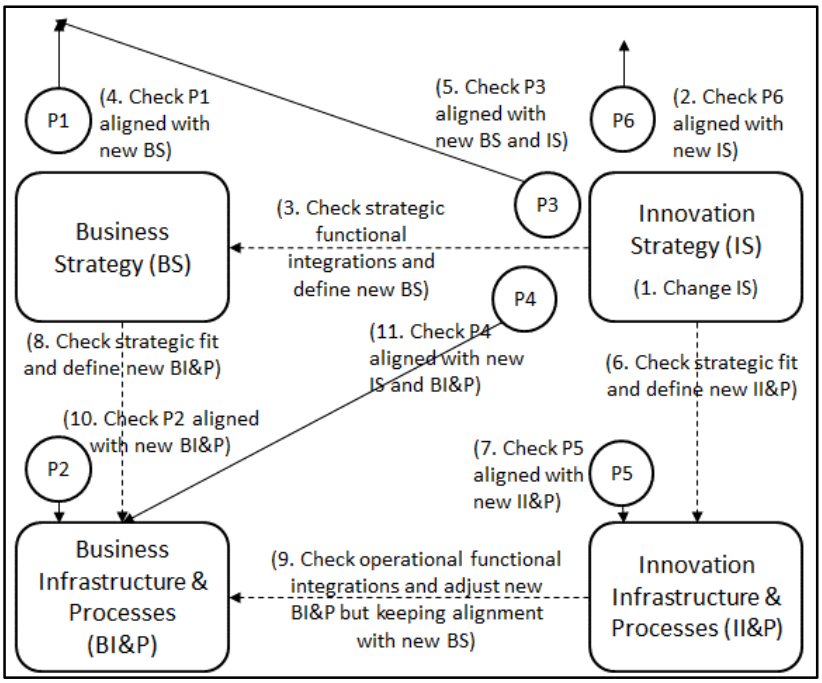

Figure 24: Eleven Steps of the Innovation Potential Alignment Perspective Change Pathway

5.3 Practical Implementation Guide for iSAM

In order for a company to successfully apply iSAM in its environment, a practical implementation guide is presented. The aim of this guide is to simplify the application of iSAM and to provide the practical steps necessary for the implementation. These steps are aligned with but different to the five steps described in the iSAM implementation framework. The practical guide provides more information about how iSAM is introduced to a company, who should be involved in each of the implementation framework steps and the practical forums, workshops or meetings that are required to bed down iSAM in a company. The following 12 steps are described in more detail in Appendix K.

1. Introduce the concept of Innovation Strategic Alignment and iSAM to the company's executive committee.
2. Identify project team to drive initial application of iSAM in the company.

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3. Hold kick-off meeting with project team.
4. Project team members conduct initial assessment of business and innovation strategy and infrastructure (step 1 of iSAM implementation framework).
5. Project team members assess company's current strategic fit and functional integration alignment (steps 2 and 3 of iSAM implementation framework).
6. Internal champion presents results of alignment assessment to company's executive committee and agree on way forward (either step 4a or step 4b of iSAM implementation framework).
7. If step 4b is selected, the project team members analyse current projects to determine if alignment will be maintained and then jump to step 10 of this practical guide (step 4b of iSAM implementation framework).
8. If step 4a is selected, the project team members determine the appropriate dominant strategic alignment perspective (step 4a of iSAM implementation framework).
9. Based on the selected dominant strategic alignment perspective one of three change pathways are selected and followed (either step 5a, step 5b or step 5c of iSAM implementation framework).
10. Internal champion presents results to executive management team with the aim of securing approval for implementation of recommendations and to move forward with operationalising iSAM into the company's operational model.
11. Internal champion and project team implement recommendations along with appropriate teams in the business.
12. Project team monitors implementation and take actions to operationalise iSAM.

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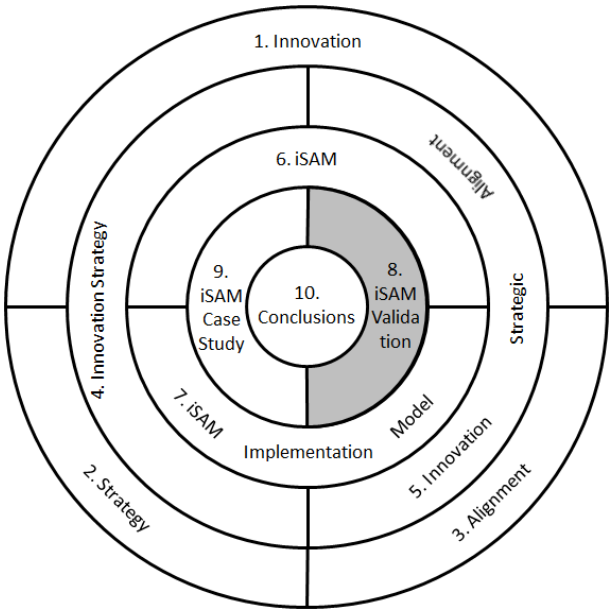
6 Validation of iSAM



In this section critical inputs from Innovation Management experts regarding iSAM are presented in order to attempt to validate iSAM as a comprehensive, sufficient and relevant model. The aim of the validation of iSAM is to determine what factors should be considered for assessing the alignment of innovation activities with the overall business strategy and infrastructure and if these factors are or are not incorporated in iSAM. The validation exercise should also provide insights into addressing the second research question:

"How can an alignment model be used to understand the current state of alignment between the internal and external innovation domains and a company's overall business strategy and structure?"

The validation focuses on the five key aspects of iSAM:

1. Comprehensiveness of the four domains in the model.
2. Comprehensiveness and validity of the detailed components of the innovation domains in the model.
3. Validity of the defined relationships between the detailed components in the innovation domains.
4. The applicability of the concepts of functional integration and strategic fit to the subject of Innovation Strategy alignment.
5. The value of iSAM to the field of Innovation Management.

6.1 Validation Approach

A questionnaire approach was utilised to validate the iSAM. A panel of Innovation Management experts were selected and asked to complete a questionnaire about the model.

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The approach of gaining inputs from a panel of experts through one or multiple questionnaires has several benefits [163]:

- This approach is highly applicable to address complex questions with high level of uncertainty. These types of questions require a panel of experts as opposed to members of the general population.
- Smaller sample size of people being questioned is required compared with a general survey approach.
- This approach allows for further in-detail validation of the results by the panel of experts, if required because they are experts and they are in communication with the researcher conducting the research.
- Non-responses are typically low when applying this approach as there is direct communication with the experts participating in the survey.

This approach is ideal in this instance as the validation of the components of the iSAM is a complex question which requires a detailed level of understanding of Innovation Management and strategy. Furthermore, a clear understanding of the model and of the feedback regarding the model is required in order for the model to either be validated or for gaps in the model to be identified. Finally, from a practical perspective, the low numbers of participants required and the generally high response rates, associated with this approach, simplifies the survey process.

6.2 Steps in the Validation Exercise

The following five steps were followed for the validation exercise:

- Step 1: A questionnaire was developed based on the purpose and focus of the validation exercise.
- Step 2: A panel of experts was identified and their involvement in the validation exercise secured.
- Step 3: The results of the questionnaire were captured and analysed.
- Step 4: Based on the responses from the panel of experts, conclusions were drawn and feedback sent to the panel.

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6.2.1 Validation Exercise Step 1: Questionnaire Development

The questionnaire was developed to focus on five key aspects of iSAM, as described in the introduction to this section. Each of the nine questions in the questionnaire was crafted to address part or all of one of the key aspects. The aim was to develop a questionnaire which extracts the most information from the panel of experts, but is not too lengthy and cumbersome to impact on the response rate. It was decided to use a "yes", "no", "maybe" response approach, which asked the experts to provide more information if they responded no or maybe to a question. Due to the fact that iSAM has several different components and layers, the questions were designed to first provide the experts with some information about the specific aspect of the model and then ask their opinion on that aspect. The questionnaire is presented in Appendix B.

6.2.2 Validation Exercise Step 2: Identifying and Securing Involvement of Experts

The identification of appropriate experts was based on the approach suggested by Okoli and Pawlowski [163]. Their systematic approach provides guidelines on selecting experts. The aim of this process is to ensure a valid study [163].

The following process was followed to select the panel of experts:

1. Prepare a Knowledge Resource Nomination Worksheet (KRNW).
2. Populate KRNW with expert names.
3. Make first contact with experts to determine level of interest.
4. Rank and select experts.
5. Formal invitation to experts to participate in validation exercise.

6.2.2.1 Preparing a Knowledge Resource Nomination Worksheet (KRNW)

The knowledge resource nomination worksheet approach is applied to select experts to participate in the survey [164]. The aim of the KRNW is to ensure the panel of experts consists of individuals who have the knowledge and experience required to validate the iSAM. This approach assists in categorising the experts before identifying them, so that an important group of experts may not be overlooked. In *Table 14*, the applicable disciplines and skills, the applicable organisations and the applicable related literature are documented in the KRNW.

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Table 14: Knowledge Resource Nomination Worksheet (KRNW)

Disciplines and Skills	Organisations	Related Literature
• Innovation Management • Strategy Management • Innovation Strategy • Strategic Alignment • Enterprise Engineering	• Local Universities • International Universities • Innovation consulting companies	• Papers in relevant peer-reviewed journals • Contribution to innovation management books • Involved in PHD Dissertation's on innovation

6.2.2.2 Populating the KRNW

Selecting experts is a key step in a successful validation survey. A rigorous process is required in order to ensure the correct number and quality of experts are selected. Furthermore, it is important to cover all disciplines and skills related to the survey [164]. Populating the KRNW is an iterative process. The first step is to populate the KRNW with personal contacts relevant to the disciplines and skills, organisations or related literature. Next, a review of the common experts in the identified literature and organisations are included in the KRNW. Finally, all identified experts are asked to nominate other relevant experts to be included in the KRNW. The aim is to populate the KRNW with as many experts as possible within each of the identified categories. Each expert may be represented in one or several categories in the KRNW. The populated KRNW is presented in Appendix C. The expert's identity has not been revealed as agreed with the experts when first contact was made.

6.2.2.3 First Contact with Experts

First contact was made through a short email introduction to the researcher, the PHD topic and the validation exercise. Several experts did not respond straight away to this initial email, which was then followed up with either a second email or a phone call. In the end, 9 out of 11 experts agreed to participate.

6.2.2.4 Ranking and Selecting Experts

With only nine experts agreeing to participate, it was decided that all nine be included in the validation exercise. An overview of the nine experts' experience is presented in Appendix D.

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6.2.2.5 Inviting Experts to Participate

The final step in identifying and securing the involvement of experts in the validation exercise, is the formal invitation. This was sent via email with a detailed explanation of the purpose and process of the validation exercise. The email also included a link to a 10 minute YouTube clip explaining the iSAM and a 15 page journal article, on iSAM, which was published in the South African Journal of Industrial Engineering [75]. The email also included the validation questionnaire, which is presented in Appendix B. All nine experts responded to the formal invitation and agreed to participate. However, in the end only seven of the nine experts returned their completed questionnaire.

6.2.3 Validation Exercise Step 4: Data Capturing and Analysis

Two types of data was captured from the returned questionnaires. The first was the "yes", "no", "maybe" responses to the questions. This was captured per expert per question and is presented in Appendix E. The second type was the qualitative data from the questions where "no" or "maybe"" had been the response and from question 9, where a qualitative response was requested no matter what the "yes", "no", or "maybe" answer was. Some experts did provide qualitative feedback even if they had responded yes for questions 1 to 8. The qualitative feedback is presented per question in Appendix F.

6.2.4 Validation Exercise Step 5: Results and Conclusions

The results and conclusion section of the iSAM validation exercise is divided into three parts:

1. Feedback on validation process
2. Results discussion
3. Final conclusions

6.2.4.1 Feedback on Validation Process

The general feedback, which was more informal than formally gathered, was that the process was smooth and straightforward. The experts found the instructions clear and were able to gain enough understanding of iSAM, from either the YouTube video and/or the peer-reviewed journal, to complete the questionnaire. There were no responses from any of the experts stating that they did not have enough understanding of the model to answer a question.

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6.2.4.2 Results Discussion

The results discussion is divided into the five key aspects of iSAM, which were the focus of the validation exercise. The detailed qualitative results are presented in Appendix F.

Comprehensiveness of the Four Domains in the iSAM

This key aspect of iSAM was addressed in question 1 of the questionnaire. Four of the seven experts agreed that the domains in iSAM are relevant and sufficient. However one of the "yes" respondents did state that he would have preferred it if infrastructure and processes would have been separated. Two of the experts responded with a "maybe" and the final expert responded with a "no".

Input from Expert: One of the "maybe" respondents asked where the human dimension was situated. To him the human dimension included, *"creativity, motivation, networking, diversity, working time officially granted for being innovative and Open-Mindedness"*. He tied all this together under the heading innovation culture.

Response to Expert's Input: The issue of a culture to support innovation is addressed within the innovation capability component of the Innovation Strategy domain in iSAM. The innovation capability model, developed by Essmann [10], includes a fundamental capability area called Organisational Support and within this area a detailed capability requirement called environment and climate is defined (see *Table 11)*. This section of the capability model includes innovation conducive climate and innovation conducive culture. It is therefore within this component of the iSAM model that a culture of innovation is addressed.

Input from Expert: The other "maybe" respondent highlighted the fact that while the four domains seem "*sufficient*" and that they are "*certainly relevant*", they cannot be completely isolated from the context of the company size, company type and industry and that in a specific context, "*relations between the entities in the model might be exploited more efficiently*". Another expert raises a similar point in their response to question 9.

Response to Expert's Input: The author agrees with this observation. Future work on iSAM may include defining specific relationships between the domains and components for a specific company size/company type/industry mix.

Input from Expert: The only "no" respondent suggested that the interaction between technology and product development should be taken into consideration within iSAM.

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Response to Expert's Input: The specific relationship between technology and product development may be described when answering the innovation governance questions. This relationship will depend on the specific company and industry. There is also a connection in iSAM between the company's product strategy, which is part of the business strategy domain and the required technology, which forms part of the business infrastructure and process domain.

Comprehensiveness of the Detailed Components of the Innovation Domains in the Model

This key aspect of iSAM was addressed in question 2 and question 7 of the questionnaire. For question 2, three of the seven experts agreed that the three components of the Innovation Strategy domain are sufficient and relevant to describe a company's innovation strategy. Three of the experts responded with a "maybe" and the final expert responded with a "no". For question 7, five of the seven experts agreed that the three components of the Innovation Infrastructure and Process domain are sufficient and relevant. Two of the experts responded with a "maybe" and none of the experts responded with a "no".

Input from Expert: One of the "maybe" respondents, for question 2, was very close to answering yes, but had a question about the objectives of innovation in the company. The expert did go on to state that this is most likely covered in the governance component of the Innovation Strategy domain.

Response to Expert's Input: The expert's second statement is correct in that the governance question regarding why the company should innovate would address the objectives of innovation in the company.

Input from Expert: Another of the "maybe" respondents, for question 2, asked if "*capacity required/available*" was part of the capability component.

Response to Expert's Input: The expert's statement is correct in that available capacity for innovation is included in the fundamental capability area called Organisational Support within the innovation capability model developed by Essmann [10]. The detailed capability requirements fall under organic organisational structure and resource alignment and slack. These innovation capabilities allow a company to adjust its resources for innovation as and when required.

Input from Expert: The final "maybe" respondent, for question 2, was mainly concerned with the naming of the components. He agreed with, "*your overall concept and the underlying themes*" but thought the naming of the components could be improved.

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Input from Expert: The only "no" respondent, for question 2, stated that, "*strategy also implies direction, a vision defining the required end state as well as the mission*".

Response to Expert's Input: The author's response to this point of view is that by answering the innovation governance questions and by defining a desired innovation scope and innovation capability level in the Innovation Strategy, a company is creating a vision and required end state for innovation. The Innovation Strategy describes a desired end goal, which the company needs to attain through implementation of the correct innovation models, processes, skills and systems.

Input from Experts: The first of the two "maybe" respondents, for question 7, asked if innovation facilitators were represented in the iSAM. The same expert also asked about the inclusion of innovation incentives. The second "maybe" respondents, for question 7, asked about innovation culture and how this was represented in the iSAM. On a positive note, one of the "yes" respondents answered, "*Yes, this is the model we use with large clients*".

Response to Expert's Inputs: The inclusion of innovation culture in the iSAM is described in the responses to comments regarding the first key aspect, earlier in this section (Comprehensiveness of the four domains in the iSAM). On the issue of innovation facilitators, it is addressed in both the innovation skills component and in the innovation capability component of the Innovation Strategy domain. As far as incentives are concerned, this too is included in the innovation capability component under the capability requirement, "*Organisational and Individual Measures, Incentives and Job satisfaction*" [10]. Once it is decided a company should enhance its capability in this area, this should filter down to the innovation infrastructure and process domain and an incentive programme, including the detailed process, should be implemented.

Validity of the Relationships between the Detailed Components in the Innovation Domains

This key aspect of iSAM was addressed in question 4 of the questionnaire. Five of the seven experts agreed that there are strong relationships that exist between the components in the innovation strategy domain. Two of the experts responded with a maybe and none of the experts responded with a no.

Input from Expert: The first of the two "maybe" respondents, for question 7, makes a very interesting point about the relationship between innovation capability and innovation success. He suggests that if innovation capability includes innovation maturity, which it does in Essmann's innovation maturity model [10], then innovation capability is not always a requirement for innovation success. The expert

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goes on to explain that a successful start-up may have low-levels of innovation maturity but can still disrupt the market.

Response to Expert's Input: The previous observation by the expert is the exact reason why the relationships are defined between three components of Innovation Strategy in iSAM. Start-ups do not need the same level of innovation capability or maturity as larger more established companies, but this does not mean they are not going to be successful innovators. The answers to the governance questions in the Innovation Strategy domain will assist a company to determine the correct innovation capability or maturity level.

Input from Expert: The second of the two "maybe" respondents, for question 7, suggests that innovation capacity should be included next to innovation capability.

Response to Expert's Input: The author agrees with the suggestion of the expert. In the case of iSAM the innovation capability component is fairly broad and innovation capacity is built into the innovation capability maturity model [10], which is a key component of the innovation capability component in iSAM.

Applicability of the Concepts of Functional Integration and Strategic Fit

This key aspect of iSAM was addressed in question 5, question 6 and question 8 of the questionnaire. For both question 5 and question 6, four of the seven experts agreed that the concept of functional integration was applicable for an innovation alignment model. Three of the experts responded with a maybe and none of the experts responded with a no. For question 8, all seven of the experts agreed that a company's innovation models, processes, systems and skills should be aligned with the company's innovation scope, governance and capabilities (Innovation Strategy).

Input from Expert: One the three experts who responded "maybe" to both question 5 and question 6, indicated that he believed that a company with a "first to market" grand business strategy should have a stronger focus on radical and disruptive product and/or strategic innovations but that he answered "maybe" because, "*we do not have the data to support this*". The same expert made the same comment for question 6, where he stated that he believed a company with a "cost reducer" grand business strategy should have a stronger focus on process innovation and this innovation can range from incremental to radical and disruptive to sustaining.

Response to Expert's Input: While the author agrees with the expert's view that more empirical research is required to truly understand some of these relationships, there are some recent empirical

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studies, which touch on these concepts. As described earlier in the dissertation (page 63), Klingebiel et al. demonstrate, for the mobile phone industry, that there is a relationship between the alignment of a company's timing strategy (early movers vs late movers) with the make-up of its innovation portfolio and company performance [146].

Input from Expert: Another of the three experts who responded "maybe" to question 5, suggests that you can also be first to market with adjacent innovation, which is not disruptive, but still enough to stay one step ahead of the competition.

Response to Expert's Input: A continuum exists within two of the dimensions which make up the innovation scope component in the Innovation Strategy domain in the iSAM. Innovation level has a continuum ranging from radical to incremental innovation and innovation impact has a continuum ranging from sustaining to disruptive. While the model suggests a preferred innovation level for a specific generic strategy (see *Table 12*) this is a suggestion regarding the stronger focus of the company [80]. However, the author agrees that adjacent innovation, which is slightly lower down on the innovation level continuum, could be a desired level for a first to market company.

Input from Expert: Finally, one of the three experts who responded "maybe" to question 6, suggests that cost reducers could also focus on business model innovation and not just process innovation to reduce costs.

Response to Expert's Input: In the innovation scope component of the Innovation Strategy domain, business model innovation falls under strategic innovation. While *Table 12* suggests that cost reducers should have a stronger focus on process innovation and less of a focus on strategic innovation, the author agrees that business model innovation could lead to reduce costs and that maybe this relationship needs to be reviewed.

The value of iSAM to the field of Innovation Management

The final question in the iSAM validation questionnaire asked the experts if they thought the iSAM added value to the field of innovation management. The experts were also asked to elaborate on their "yes", "no", "maybe" answers. Six of the seven experts agreed that iSAM does add value to the field of innovation management. One of the experts responded with a maybe and none of the experts responded with a no.

Input from Expert: The only expert to respond "maybe" to question 9 stated that, "*Similar approaches to structure innovation and innovation management exist. They all help to give a structure to this wide*

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and complex topic, and therefore serve as management support tools". He did go on to say, "*The ISAM is consistent and quite complete*". He finally made the observation that, "*as with all similar models, they are only as good and useful as the reliability and consistency of the values assigned to each proposed dimension. Who decides them? How to assure the appropriate level of objectivity/subjectivity?*"

Response to Expert's Input: The author agrees with the expert's observation regarding assigning values to the proposed dimensions in the model. The aim of the iSAM implementation framework (*chapter 5*) is to guide a company through the assignment of values and the application of the iSAM in a company. In response to the experts comments regarding other similar models, there are many models which focus on structuring the innovation process for improved innovation management. However, very few models address the issue of Innovation Strategy Alignment and fewer still provide a comprehensive framework for Innovation Strategy Alignment which builds on the well-researched area of strategic alignment.

Input from Expert: An interesting suggestion from one of the experts who responded "yes" to question 9 was to check iSAM against the new ISO/TC 279 Innovation management standards. It was suggested that the uptake of iSAM would be significant if iSAM assists companies to comply with the new standards.

Response to Expert's Input: ISO/TC 279 for Innovation Management was created in 2013 with more than 23 countries involved in its development. The goal of the ISO/TC 279 is to standardize tools and methods dedicated to the field of innovation [165]. Unfortunately, even an overview of the ISO Innovation Management standards are not readily available unless the full standard is purchased. Therefore an analysis of the alignment between these standards and iSAM is difficult at this stage. However, the developers of the European Innovation Management Standard, CEN/TS 16555, were also involved in the development of the international ISO standards and the ISO standards followed a similar structure to that of the European Union standard.

The CEN/TS 16555 incorporates many of the elements which are believed to constitute current best practice in Innovation Management. The Standard consists of seven documents which address the following seven key themes [166]:

1. Innovation management system
2. Strategic intelligence management
3. Innovation thinking

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4. Intellectual property management
5. Collaboration management
6. Creativity management
7. Innovation management assessment

The topic of innovation strategy alignment should be dealt with in the first theme, "Innovation management systems" (IMS). According to the first CEN/TS 16555 document, an innovation management system is defined as a, "Set of interrelated or interacting elements of an organisation to establish innovation policies and objectives, and processes to achieve those objectives." [166]

The "IMS" document takes both a company's internal and external environment into account. On the external side it requires a company to understand the impact of the external environment on the IMS, what are the external issues, what are the boundaries of the IMS and who are the external stakeholders? On the internal side the document addresses leadership for innovation and innovation strategy, innovation management, innovation assessment and improvement and innovation planning. There is also a large focus on the innovation processes from idea to outcome. The concepts are in one way or another represented with in the internal and external innovation domains in ISAM. Furthermore, the fact that the external environment is taken into consideration does to some extend include concepts in the external business domain in ISAM. While, a company implementing the iSAM will be addressing several of the key standards, the standards do not specifically address the issue of innovation strategic alignment or the type of innovation strategy, model and processes which would support alignment in a company.

Here is a summary of the feedback from the other experts who answered yes (please see Appendix F for all the feedback):

- *"I believe that the structure AND the mechanic offered to resolve alignment gaps is a great contribution. Alignment issues are generally spoken of often (in businesses at least) - and especially in aligning an ambition to innovate with the business as usual. This work then, I believe, offers a novel contribution to solving this*".
- *"It provides a structured way to assess and align business strategy with innovation strategy. Innovation should not be an ad hoc process, but should be designed to achieve the business's strategic objectives".*
- *"Yes, because the iSAM (finally) brings structure to the field of innovation management"*

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- *"For me the most added value is in this targeted structuring, giving different roles/departments/functions in a company the opportunity to understand what relations are belaboured and which changes can be assumed to be interconnected".*
- "*The iSAM model provides a robust framework that enables the company to think separately about what it is and wishes to be, on the one hand, and what innovation is and how it should be executed, on the other hand*".
- *"Completely agree. This is a major contribution to the field of innovation management. I have spent a major portion of my consulting career in the field of innovation management. You have uncovered many missing pieces of the puzzle to make innovation predictable, scalable and sustainable. Congratulations on the success of a very difficult undertaking!!"*

6.2.4.3 Final Conclusions from Validation Exercise

The iSAM validation exercise was useful in providing both critical feedback for potential improvements to the model and to validate the comprehensiveness and relevance of the iSAM. Some of the key areas where the model can be adjusted and improved include:

1. Catering for variations in the model based on company size, company type and industry.
2. Further empirical evidence is required to prove some of the defined relationships in the model.
3. In the innovation scope component of the Innovation Strategy domain, a more detailed innovation level continuum may be required to describe the target innovation level. This will allow a concept like adjacent innovation to be included in the model.
4. The relationship between business model innovation and a cost reducer strategy should be reviewed.
5. Further analysis of the fit between iSAM and the new ISO/TC 279 Innovation management standard should be undertaken.

There seemed to be general consensus amongst the experts that the iSAM does provide a valuable framework for Innovation Strategy alignment and that the model comprehensively addresses a critical issue facing companies.

It was decided, after receiving and analysing the responses from the experts, that a follow up questionnaire would not be required. This decision was based on a number of factors. Firstly, the experts' inputs were being used to validate the model and not to build the model from scratch. It was determined that there was sufficient alignment between the experts views to validate the model. Even

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when a number of experts responded “maybe” to a question, their maybe’s were based either on a question regarding the detailed content of one of the components of the model or on a minor terminology issue. The vast majority of these issues were explained by the author in the response to the experts’ opinions. Secondly, all the responses from the experts were clear and concise and did not leave much room for misunderstanding. It was therefore not necessary to revert back to the experts in order to clarify any of their comments. Finally, while a multi-round expert survey, would potentially have allowed a general consensus on the value of the model to be achieve, the single round approach is a valid survey method when attempting to validate certain types of information.

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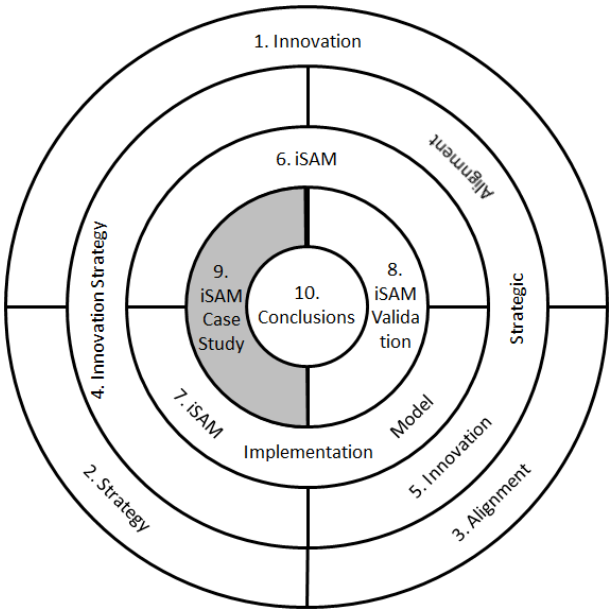
7 iSAM Point in Time and Longitudinal Case Study



The case study utilises the iSAM and the iSAM implementation framework, to assess the current state of alignment between the internal and external business and innovation domains of a real company. The purpose of the case study is to demonstrate how an innovation alignment model can be used to understand the current state of alignment and to show how the iSAM implementation framework can be practically applied in a company. Finally, the case study reveals if the recommendations, generated by the innovation strategy alignment approach, add value to the management team of the specific target company.

The target company for this case study is a consulting and analytics company, which focuses on the development sector. Today the company provides health system strengthening technical assistance to government health departments in developing countries and analytics consulting and information technology platforms to governments, NGO's and donor organisations. The aim of the company is to support, through technical assistance and analytics platforms, all stakeholders in the development industry in order to improve the lives of millions of people in the developing world.

7.1 Purpose of Case Study

The purpose of the case study is to provide answers to three of the four research questions posed by this dissertation.

Research Question 2: How can an alignment model be used to understand the current state of alignment between the internal and external innovation domains and a company's overall business strategy and structure?

- In the case study, if the participants from the focus company are able to use the model to understand and agree on the current state of alignment between the internal and external

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innovation domains and a company's overall business strategy and structure, then it will demonstrate how the iSAM can be used to understand the alignment.

Research Question 3: How can a practical approach be roadmapped to enable a company to determine its course of action to achieve better alignment by using the developed innovation alignment model?

- In the case study, if the participants from the focus company are able to follow the practical, roadmapped approach and determine the actions required to achieve better alignment, then it will demonstrate how the approach may be used to develop a set of recommendations to achieve alignment.

Research Question 4: How will companies benefit from adopting the model and approach?

- In the case study, if the participants from the focus company agree with the recommendations, which are produced and some of the recommendations are implemented, then this will demonstrate to some extent some of the benefits of adopting the iSAM model and implementation approach.

7.2 Case Study Approach

Once the "case study" research method was selected, the type of case study design also needed to be decided. Yin [23] describes four major types of case studies and presents these in a 2X2 matrix. The first way of categorising a case study is a single-case design versus a multiple-case design. Yin provides fives reasons why a single-case design would be selected over a multiple-case design. For this research a single-case design was selected based on two of the reasons provided by Yin [23]. Firstly the researcher had a relatively unique opportunity to access the details of a company's strategy and inner workings and secondly the fact that four sets of strategic objectives over a number of years were available, meant that a unique longitudinal analysis could be undertaken.

The second way of categorising a case study is a holistic study versus an embedded study [23]. Both of these types of case studies could be designed as either a single-case or a multiple-case and hence the 2X2 matrix of case study types. For this research a holistic study was selected. Even though sub-units in the company may have been identified, which may have allowed for an embedded study, it was thought the end result of the research was a holistic set of recommendations for the company as a whole and not for its individual sub-units.

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The case study analyses the target company's innovation strategy alignment over a period of three-years. Over this period four separate sets of company strategic objectives were developed by the management team and these were translated into four sets of projects. The availability of this multi-year data means that an individual analysis can be conducted at each of the four points in time. Furthermore, it means a longitudinal analysis over the three years can also be performed. The first step was to analyse the different periods separately. This "point in time" analysis generates recommendations for that specific period. Unfortunately, while much of the analysis was done in real time, when the company goals and objectives were set, there was not an opportunity, at that time, to present the recommendations from the first three analyses to the management team. Therefore, if any of the recommendations were implemented, it was not due to this analysis, but rather the management team arriving at the same conclusions as the analysis and implementing solutions to what they saw as alignment gaps. Nevertheless, the analysis and the recommendations derived from past strategic objectives have now been tested with today's management team and the recommendations from the analysis of the latest set of strategic objectives have been validated by Senior Managers and may have played a role in some of the latest decisions regarding innovation management at the company.

The multi-year data allows for a longitudinal analysis, which can reveal how alignment has shifted over the years and if some of the recommendations were implemented, their impact on alignment.

The analysis is based on data at four points in time. These points in time are:

- December 2013
- October 2014
- February 2015
- February 2016

At each of these points in time, the company defined a new set of strategic objectives based on the company strategy at that time. These goals and objectives were then translated into a series of projects, which were designed to achieve the defined goals and objectives.

The case study is based on the innovation strategy alignment approach as presented in Figure 25. These five steps were followed for each of the analysed points in time

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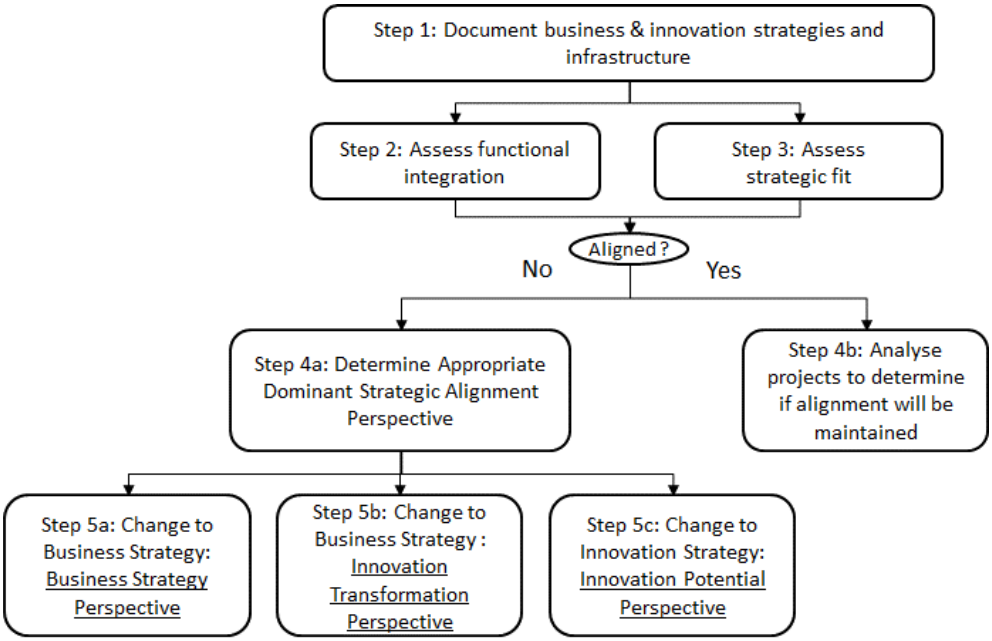

Figure 25: Innovation Strategy Alignment Approach

7.3 Point in Time Analysis

The point in time analysis was conducted at four specific points in time over a three-year period. The details of these analyses are presented in this section.

7.3.1 Analysis 1: December 2013

The company set new strategic objectives in December 2013. The following analysis was conducted on the company at that point in time.

7.3.1.1 Step 1: Document the Current (December 2013) Business and Innovation Domains

In step one, each of the three components in each of the four domains in iSAM are described for the company. This is achieved through analysis of strategic and operational documents and discussions with the company's management (see Appendix H for list of strategic and operational documents analysed). The following list presents the key outputs for this step of the approach.

1. **Main target market:** Donor funded health system strengthening (HSS) projects for departments of health in developing countries & Life Sciences companies looking for growth in their business in developing countries.
2. **Main products:** Consulting services and technical assistance.

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3. **Key business principles:** Social entrepreneurship, data driven, scalable and sustainable solutions, blend private and public sector approaches.
4. **Distinctive competencies:** Global network and reach along with local understanding of how government services are delivered on the ground, able to operate in both the public and private sectors.
5. **Primary generic strategy:** First to market generic strategy, attempting to be seen as leaders in their field by being the first to introduce a solution or to follow a novel approach.
6. **Innovation scope:** Type - Strong product, medium strategic, weak process. Level - Medium radical, medium incremental. Impact - Medium sustaining, medium disruptive.
7. **Innovation governance structures:** Technical review committee (TRC) decides on relevance and appropriateness of new products/solutions.
8. **Innovation capability maturity level:** Unaware of innovation. Although innovation is communicated as an important part of the competitive advantage and culture of the company, there is no formalisation of innovation to a point where the understanding of the term innovation is not always clear.
9. **High-level structure:** Standard hierarchical structure, which is three to four layers deep.
10. **Competency framework:** A competency framework consisting of five dimensions and 40 relevant competencies is used in the company.
11. **Innovation model:** Innovation model different in two parts of company. One section is more a marketplace of ideas, the other is visionary leadership, but neither is especially well established.
12. **Innovation processes:** No formal innovation processes exist in the company.
13. **Innovation competencies:** There are several innovation related competencies in the overall company competency framework.
14. **Innovation roles:** There are no innovation specific roles in the company.
15. **Innovation competency improvement activities:** There are no innovation specific innovation competency improvement activities.

A more detailed set of answers for analysis 1 are presented in Appendix D.

7.3.1.2 Step 2: Assess Functional Integration

This strategic alignment framework [167] presented in *Table 13* is used to assess the functional strategic integration of the company. The first step is to understand the company's preferred generic competitiveness strategy or grand strategy. Based on the analysis in step one, the company strives to

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achieve a first to market strategy. Based on the strategic alignment framework [167], as presented in *Table 13*, this strategy would suggest the preferred innovation type, level and impact should be strategic, radical and disruptive innovation with less focus on incremental, product innovation and a low focus on sustaining, process innovation. Based on an analysis of the company's current and planned projects (applying the questions presented in Appendix B), the company seems to have a stronger focus on product innovation (81.8% of innovation projects) and less so on strategic innovations (0% of innovation projects) as well as a roughly equal focus on radical (54.5% of innovation projects) and incremental (45.5% of innovation projects) innovation and on sustaining (45.5% of innovation projects) and disruptive (54.5% of innovation projects) innovation. The results of the project analysis is presented in *Table 15*. As the company does not have an explicit and formal innovation strategy the past innovation focus or pattern of innovation assists in defining an implicit strategy [53]. While the implicit innovation strategy is not too far off the ideal situation for a "first to market" company, it still reveals a misalignment between the company's grand strategy and its innovation strategy because of the low focus on strategic innovation projects and the equal focus on disruptive and sustaining and radical and incremental projects. From a functional infrastructure and process integration perspective, there are few formal innovation infrastructure and processes in the company, and therefore no alignment exists.

Table 15: Results of Analysis of Project Innovation Scope (analysis 1)

		Analysis 1 (December 2013)
Total Number of Projects		37
Number of Innovation Projects		11
% Innovation Projects		29.7%
Innovation Type	Product	81.8%
	Process	18.2%
	Strategic	0.0%
Innovation Level	Radical	54.5%
	Incremental	45.5%
Innovation Impact	Disruptive	54.5%
	Sustaining	45.5%

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7.3.1.3 Step 3: Assess Strategic Fit

Strategic fit is the alignment between a strategy and the infrastructure and processes, which are required to implement that strategy. Without such alignment it is difficult to fulfil the requirements of the innovation strategy. In this case study, there is no strategic fit from an innovation perspective in the company. The company does not have a formal innovation strategy, but even if the implicit innovation strategy is taken into consideration there is no formal innovation infrastructure or process.

From a business perspective it is not possible in the context of this dissertation to analyse and assess the business strategic fit. The scope of the business strategic fit is significant and includes all of the company's operational processes, equipment, personnel and skills.

7.3.1.4 Step 4a: Determine Appropriate Dominant Strategic Alignment Perspective

Based on the analysis of the functional integration and strategic fit, there does seem to be a level of misalignment in the company. Therefore, based on *Figure 25*, 4a is the next step in the analysis. Taking the two main factors of the grand strategy and the innovation strategy into account, the fact that the company pursues a "first to market" grand strategy and has some radical, disruptive innovation in its implicit innovation strategy points to either the innovation transformation or the innovation potential alignment perspectives being most appropriate perspective for this company. The company's "first to market" grand strategy clearly reveals that they aim to gain a competitive advantage through innovation. The company's current, implicit innovation strategy is slightly less radical and disruptive then is required from a "first to market" company but that is the reason for the identified misalignment in the functional strategic integration. The lack of a formal innovation strategy and any formal innovation infrastructure or processes would indicate that while innovation is important to the company, the business strategy is still the main driver of change and therefore the innovation transformation perspective would appear to be the most appropriate dominant perspective. The dominant alignment perspective will guide the steps through the alignment pathway in step five of the approach.

7.3.1.5 Step 5b: Innovation Transformation Alignment Perspective

The pathway to alignment, based on the innovation transformation alignment perspective, is presented in *Figure 26*. This alignment pathway involves 11 steps, in which the required changes to the four iSAM domains are identified and the current and planned projects are analysed to check their alignment with the four domains. For the company in the case study, 37 current and planned projects

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were identified and analysed in December 2013. The analysis of the projects was conducted by a Senior Manager at the company and included the following:

- Assigning each project to a specific project category (*Table 16*)
- Based on the project category, answering questions regarding the project's alignment to the four iSAM domains (see Appendix B for the alignment questions)

In the innovation transformation alignment perspective the change is initiated in the business strategy, which is step one in *Figure 26*. Once the business strategy has changed, it is important to check the external projects (P1) to ensure they are still aligned with the new business strategy (see Appendix B for the alignment questions). Next, strategic functional integration between the business strategy and the innovation strategy is checked and the innovation strategy is adjusted in order to realign with the new business strategy. Once the new innovation strategy is defined, the external innovation projects (P3 & P6) are checked to ensure they are still aligned (see Appendix B for the alignment questions). The strategic fit between the new business strategy and business infrastructure and processes is checked and the projects impacting the infrastructure and processes (P2 & P4) are adjusted to ensure alignment (see Appendix B for the alignment questions). Finally the strategic fit between the adjusted innovation strategy and innovation infrastructure and processes is checked and the projects (P5) impacting the innovation infrastructure and processes are adjusted to ensure re-alignment (see Appendix B for the alignment questions).

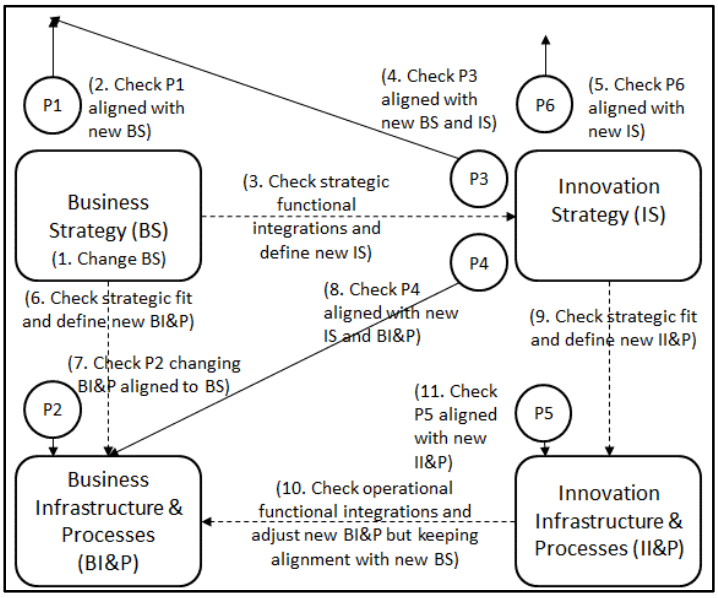

Figure 26: Path to Alignment Based on the Innovation Potential Alignment Perspective

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The breakdown of the 37 projects by project category is presented in *Table 16*.

Table 16: Breakdown of 37 projects by project category

Project Type		Number of Projects
P1	External non-innovation project	13
P2	Internal non-innovation project	13
P3	External innovation project aligned with business strategy	10
P4	Internal innovation project	0
P5	Internal innovation processes project	0
P6	External innovation project not aligned to business strategy	1

7.3.1.6 Results of Analysis 1 (December 2013)

The results of the analysis of the company in question revealed both areas of good alignment and areas of poor alignment. The business strategy is well defined and based on the answers to the project alignment questions the majority of projects are aimed at achieving either the business strategy or the business infrastructure and processes required to achieve the business strategy (see Appendix B for the alignment questions). The few truly innovative projects that exist, 29.7% of projects are categorised as innovation projects *(Table 16*), also seem to align well with the business strategy (see Appendix B for the alignment questions). No formal innovation strategy exists. However, the implicit innovation strategy is slightly misaligned to the business strategy and should have a stronger focus on strategic, radical innovation in order to truly align with the company's "first to market" grand strategy (*Table 13*). An analysis of the current and planned projects reveals a roughly equal focus on radical and incremental innovation and a roughly equal focus on sustaining and disruptive innovation. Furthermore, product innovation is stronger than strategic innovation (*Table 15*).

The area of poorest alignment in the company is in the innovation infrastructure and processes domain. No formal innovation infrastructure and processes exist and there are no current or planned projects aimed at rectifying the situation. The implication of this shortcoming is that innovations will be successful through a combination of chance and significant efforts of specific individuals. This in turn limits the company's ability to truly achieve a "first to market" grand strategy in a consistent way. The results of the innovation transformation perspective analysis along with recommendations are presented in *Table 17*.

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Table 17: Summary of Analysis 1 (December 2013) Results with Recommendations

	Analysis Step	Analysis	Recommendations
1	Change BS (if required)	The BS is well defined	There are no internal or external reasons for BS to change at the moment
2	Check "external non-innovation projects" (P1) are aligned with BS	P1 type projects, all aligned with BS (based on alignment questions in Appendix B)	No need to stop or adjust any P1 type projects
3	Check strategic functional integration and define new IS	Explicit IS does not exist & the implicit IS has too high a focus on incremental, product innovation to be aligned with BS (based on results of project analysis in Table 2)	Answer the innovation governance questions and document explicit IS with greater focus on radical, product & strategic innovations
4	Check "external innovation project aligned with business strategy" (P3) projects aligned with BS and IS	P3 type projects all aligned with BS (based on alignment questions in Appendix B) but not fully aligned with updated IS from analysis step 3 (based on results of project analysis in Table 2 and Strategic Alignment Framework in Table 1)	P3 type projects should have a stronger focus on strategic, radical and disruptive innovation
5	Check "external innovation projects not aligned to business strategy" (P6) are aligned with new IS	P6 type projects aligned with updated IS	No need to stop or adjust P6 type project although with a stronger focus on radical and disruptive innovation, more P6 type projects may be required
6	Check strategic fit and define new BI&P	No analysis was conducted on the strategic fit between the business domains as this is not directly related to the innovation domains	None
7	Check "internal non-innovation projects" (P2) changing BI&P aligned to BS	P2 type projects all changing BI&P aligned to BS (based on alignment questions in Appendix B)	No need to stop or adjust any P2 type projects
8	Check "internal innovation projects" (P4) aligned with IS and changing BI&P aligned to BS	There are no P4 type projects currently being executed or planned	Company should investigate how the innovation processes could play a significant role in any internal improvement or change
9	Check strategic fit and define new II&P	No formal innovation infrastructure or processes exist.	Formal innovation infrastructure and processes should be implemented inline with new IS
10	Check operational functional integrations and adjust BI&P but keeping alignment with BS	No formal innovation infrastructure or processes exist, therefore operational functional integration between BI&P and II&P cannot be checked	Implement formal innovation infrastructure and processes and adjust BI&P accordingly, keeping alignment with BS
11	Check "internal innovation processes projects" (P5) aligned with II&P	There are no P5 type projects and no formal innovation infrastructure or processes exist.	Once formal innovation infrastructure or processes are defined a number of P5 type projects should be developed in order to implemented the II&P

7.3.2 Analysis 2: October 2014

The company set new strategic objectives in October 2014. The following analysis was conducted on the company at that point in time.

7.3.2.1 Step 1: Document the Current (October 2014) Business and Innovation Domains

In step one, each of the three components in each of the four domains in iSAM is described for the company. This is achieved through analysis of strategic and operational documents and discussions with the company's management (see Appendix H for list of strategic and operational documents analysed). Between analysis 1 and analysis 2, there was no change to the company's business strategy and no formalisation of the company's innovation strategy and innovation infrastructure and processes. None of the recommendations, 8 to 11, in *Table 17* were implemented. As discussed earlier, these recommendations were not presented to the company's management at the time and therefore

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would only have been implemented if the management team identified these alignment gaps unilaterally. The following list presents the key outputs for this step of the approach. There was no change to the four domains between the analysis in December 2013 and the analysis in October 2014.

1. **Main target market:** Donor funded health system strengthening (HSS) projects for departments of health in developing countries & Life Sciences companies looking for growth in their business in developing countries.
2. **Main products:** Consulting services and technical assistance.
3. **Key business principles:** Social entrepreneurship, data driven, scalable and sustainable solutions, blend private and public sector approaches.
4. **Distinctive competencies:** Global network and reach along with local understanding of how government services are delivered on the ground, able to operate in both the public and private sectors.
5. **Primary generic strategy:** First to market generic strategy, attempting to be seen as leaders in their field by being the first to introduce a solution or to follow a novel approach.
6. **Innovation scope:** Type - Strong product, medium strategic, weak process. Level - Medium radical, medium incremental. Impact - Medium sustaining, medium disruptive.
7. **Innovation governance structures:** Technical review committee (TRC) decides on relevance and appropriateness of new products/solutions.
8. **Innovation capability maturity level:** Unaware of innovation. Although innovation is communicated as an important part of the competitive advantage and culture of the company, there is no formalisation of innovation to a point where the understanding of the term innovation is not always clear.
9. **High-level structure:** Standard hierarchical structure, which is three to four layers deep.
10. **Competency framework:** A competency framework consisting of five dimensions and 40 relevant competencies is used in the company.
11. **Innovation model:** Innovation model different in two parts of company. One section is more a marketplace of ideas, the other is visionary leadership, but neither is especially well established.
12. **Innovation processes:** No formal innovation processes exist in the company
13. **Innovation competencies:** There are several innovation related competencies in the overall company competency framework
14. **Innovation roles:** There are no innovation specific roles in the company

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15. **Innovation competency improvement activities:** There are no innovation specific innovation competency improvement activities

7.3.2.2 Step 2: Assess Functional Integration

The assessment of the functional integration in analysis 2 (October 2014) is based on the alignment of the competitiveness strategy and the innovation scope. The strategic alignment framework [167], presented in *Table 13,* is once again used to assess the functional strategic integration of the company. The company's preferred generic competitiveness strategy or grand strategy remains the "first to market" strategy. Based on an analysis of the company's current and planned projects (*Table 18*), the company continues to have a stronger focus on product innovation (100% of innovation projects) and less so on strategic innovations (0% of innovation projects). Compared with analysis 1 (December 2013), there has been a shift towards radical (100% of innovation projects) and disruptive (100% of innovation projects). However, the number and percentage of projects that are categorised as innovation projects has significantly reduced in analysis 2 (October 2014). Only 4 (9.5%) of 42 projects are categorised as innovation projects.

As the company still does not have an explicit and formal innovation strategy, the past innovation focus or pattern of innovations assists in defining an implicit strategy [53]. While the implicit innovation strategy is not too far off the ideal situation for a "first to market" company it still reveals a misalignment between the company's grand strategy and its innovation strategy because of the low focus on strategic innovation projects as determined by the innovation project analysis (*Table 18*).

From a functional infrastructure and process integration perspective, there continues to be few formal innovation infrastructure and processes in the company, and therefore once again it is difficult to determine the level of alignment.

Table 18: Results of analysis of project innovation scope (analysis 2)

		Analysis 2 (October 2014)
Total Number of Projects		42
Number of Innovation Projects		4
% Innovation Projects		9.5%
Innovation Type	Product	100.0%
	Process	0.0%
	Strategic	0.0%

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Innovation Level	Radical	100.0%
	Incremental	0.0%
Innovation Impact	Disruptive	100.0%
	Sustaining	0.0%

7.3.2.3 Step 3: Assess Strategic Fit

As in analysis 1 (December 2013), there is no strategic fit from an innovation perspective in the company. The company still does not have a formal innovation strategy, but even if the implicit innovation strategy is taken into consideration, as in analysis 1, there is no formal innovation infrastructure or processes.

From a business perspective it is not possible in the context of this dissertation to analyse and assess the business strategic fit. The scope of the business strategic fit is significant and includes all of the company's operational processes, equipment, personnel and skills.

7.3.2.4 Step 4a: Determine Appropriate Dominant Strategic Alignment Perspective

Based on the consistency of the business strategy between analysis 1 (December 2013) and analysis 2 (October 2014) and the lack of progress in formalising an innovation strategy and innovation infrastructure and processes, there continues to be a level of misalignment in the company. Therefore as in analysis 1 (December 2013), 4a in *Figure 25* is the next step in the analysis. For the exact same reasons given in analysis 1, the innovation transformation perspective would appear to be the most appropriate dominant perspective for the company in analysis 2. The dominant alignment perspective will guide the steps through the alignment pathway in step five of the approach.

7.3.2.5 Step 5b: Innovation Transformation Alignment Perspective

The pathway to alignment, based on the innovation transformation alignment perspective, is presented in *Figure 26* and is the same as in analysis 1 (December 2013). This alignment pathway involves 11 steps, in which the required changes to the four iSAM domains are identified and the current and planned projects are analysed to check their alignment with the four domains. For the company in the case study, 42 current and planned projects were identified and analysed in October 2014. The alignment of the projects was analysed using the alignment questions, presented in Appendix B. The breakdown of the 42 projects by project category is presented in *Table 19*.

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Table 19: Breakdown of 42 projects by project category

	Project Type	Number of Projects
P1	External non-innovation project	17
P2	Internal non-innovation project	21
P3	External innovation project aligned with business strategy	3
P4	Internal innovation project	0
P5	Internal innovation processes project	0
P6	External innovation project not aligned to business strategy	1

7.3.2.6 Results of Analysis 2

As in analysis 1 (December 2013), the results of analysis 2 (October 2014) of the company in question revealed both areas of good alignment and areas of poor alignment. The business strategy has not changed and based on the answers to the project alignment questions the majority of projects are aimed at achieving either the business strategy or the business infrastructure and processes required to achieve the business strategy (see Appendix B for the alignment questions). There are still a few truly innovative projects either currently underway or being planned and these seem to still align well with the business strategy (see Appendix B for the alignment questions). However, only four projects (9.5% of all projects) are categorised as innovation projects. No formal, explicit innovation strategy has been developed since analysis 1 (December 2013). The implicit innovation strategy is still slightly misaligned to the business strategy and should have a stronger focus on strategic innovation in order to truly align with the company's "first to market" grand strategy. 100% of the innovation projects are product innovation projects, which means 0% are strategic innovation projects (*Table 18*).

The area of poorest alignment in the company remains the innovation infrastructure and processes domain. No formal innovation infrastructure and processes exist and there are no current or planned projects aimed at rectifying the situation. The implication of this shortcoming are the same as in analysis 1 (December 2013) and will continue to limit the company's ability to truly achieve a "first to market" grand strategy in a consistent way. The results of the innovation transformation perspective analysis along with recommendations are presented in *Table 20*. As none of the recommendations from analysis 1 (December 2013) were implemented and the business strategy has remained the same, the recommendations from analysis 2 (October 2014) are similar to analysis 1 (December 2013).

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Table 20: Summary of analysis 2 (October 2014) results with recommendations

	Analysis Step	Analysis	Recommendations
1	Change BS (if required)	The BS is well defined	There are no internal or external reasons for BS to change at the moment
2	Check "external non-innovation projects" (P1) are aligned with BS	P1 type projects, all aligned with BS (based on alignment questions in Appendix B)	No need to stop or adjust any P1 type projects
3	Check strategic functional integration and define new IS	Explicit IS does not exist & the implicit IS has too high a focus on product innovation to be aligned with BS (based on results of project analysis in Table 5)	Answer the innovation governance questions and document explicit IS with greater focus on radical, product & strategic innovations
4	Check "external innovation project aligned with business strategy" (P3) projects aligned with BS and IS	P3 type projects all aligned with BS (based on alignment questions in Appendix B) but not fully aligned with updated IS from analysis step 3 (based on results of project analysis in Table 5 and Strategic Alignment Framework in Table 1)	P3 type projects should have a stronger focus on strategic innovation and there should be more P3 type projects
5	Check "external innovation projects not aligned to business strategy" (P6) are aligned with new IS	P6 type projects aligned with updated IS	No need to stop or adjust P6 type project although with a stronger focus on strategic innovation, more P6 type projects may be required
6	Check strategic fit and define new BI&P	No analysis was conducted on the strategic fit between the business domains as this is not directly related to the innovation domains	None
7	Check "internal non-innovation projects" (P2) changing BI&P aligned to BS	P2 type projects all changing BI&P aligned to BS (based on alignment questions in Appendix B)	No need to stop or adjust any P2 type projects
8	Check "internal innovation projects" (P4) aligned with IS and changing BI&P aligned to BS	There are no P4 type projects currently being executed or planned	Company should investigate how the innovation processes could play a significant role in any internal improvement or change
9	Check strategic fit and define new II&P	No formal innovation infrastructure or processes exist.	Formal innovation infrastructure and processes should be implemented inline with new IS
10	Check operational functional integrations and adjust BI&P but keeping alignment with BS	No formal innovation infrastructure or processes exist, therefore operational functional integration between BI&P and II&P cannot be checked	Implement formal innovation infrastructure and processes and adjust BI&P accordingly, keeping alignment with BS
11	Check "internal innovation processes projects" (P5) aligned with II&P	There are no P5 type projects and no formal innovation infrastructure or processes exist.	Once formal innovation infrastructure or processes are defined a number of P5 type projects should be developed in order to implemented the II&P

7.3.3 Analysis 3: February 2015

The company set new strategic objectives in February 2015. These strategic objectives were set only four months after the previous strategic objectives because the company changed its business strategy in that time. Due to the change in the business strategy, all previous alignment analysis and recommendations need to be reassessed in the context of the new business strategy. The following analysis was conducted on the company shortly after February 2015.

7.3.3.1 Step 1: Document the Current (February 2015) Business and Innovation Domains

In step one, each of the three components in each of the four domains in iSAM are described for the company. This is achieved through analysis of strategic and operational documents and discussions

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with the company's management (see Appendix H for list of strategic and operational documents analysed). Between analysis 2 (October 2014) and analysis 3 (February 2015), there was significant change to the company's business strategy. The following list presents the key outputs for this step of the approach. A high level description of the change from analysis 2 (October 2014) to analysis 3 (February 2015) is also provided.

1. **Main target market:** Donor funded HSS projects for departments of health in developing countries & Analytics projects for Life Sciences companies, executive government structures and donors.
    - **Change:** Starting to target executive governments, donors and life science companies with analytics offering.
2. **Main products:** HSS technical assistance, analytics TA and analytics products (IT system)
    - **Change:** Moved away from consulting services to life sciences companies and started to focus on analytics technical assistance and IT platforms.
3. **Key business principles:** Social entrepreneurship, data driven, scalable and sustainable solutions, blend private and public sector approaches.
4. **Distinctive competencies:** Global network and reach along with local understanding of how government services are delivered on the ground, able to operate in both the public and private sectors, analytics and software development capability.
    - **Change:** Increased analytics and software development capabilities.
5. **Primary generic strategy:** First to market generic strategy, attempting to be seen as leaders in their field by being the first to introduce a solution or to follow a novel approach.
6. **Innovation scope:** Type - Strong product, medium strategic, weak process. Level - Strong radical, medium incremental. Impact - Medium sustaining, strong disruptive.
    - **Change:** Far stronger focus on disruptive, radical product innovation.
7. **Innovation governance structures:** No formal innovation governance forums or structures exist in the company.
    - **Change:** Technical review committee (TRC) no longer in operation, prioritisation and innovation decision making happens in a dispersed and ad-hoc manner.
8. **Innovation capability maturity level:** Unaware of innovation. Although innovation is communicated as an important part of the competitive advantage and culture of the company, there is no formalisation of innovation to a point where the understanding of the term innovation is not always clear.
9. **High-level structure:** Standard hierarchical structure, which is three to four layers deep.

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10. **Competency framework:** A competency framework consisting of five dimensions and 40 relevant competencies is used in the company.
11. **Innovation model:** Visionary leadership is implicit dominant innovation model.
    - **Change:** Visionary leaders playing stronger role in all aspects of the company.
12. **Innovation processes:** No formal innovation processes exist in the company.
13. **Innovation competencies:** There are several innovation related competencies in the overall company competency framework.
14. **Innovation roles:** There are no innovation specific roles in the company.
15. **Innovation competency improvement activities:** There are no innovation specific innovation competency improvement activities.

7.3.3.2 Step 2: Assess Functional Integration

As in analysis 1 (December 2013) and analysis 2 (October 2014), the assessment of the functional integration in analysis 3 (February 2015) is based on the alignment of the competitiveness strategy and the innovation scope. The strategic alignment framework [167], presented in *Table 13,* is once again used to assess the functional strategic integration of the company. The company's preferred generic competitiveness strategy or grand strategy remains the "first to market" strategy. For true alignment, the innovation scope should have a stronger focus on strategic, radical and disruptive innovation. As the company still does not have an explicit and formal innovation strategy, the past innovation focus or pattern of innovations assists in defining an implicit strategy [53]. Based on an analysis of the company's current and planned projects, the company has a far stronger focus on product innovation (100% of innovation projects), which means 0% of current and planned projects are categorised as strategic innovations. This is misaligned with the "first to market" generic strategy. However, all the innovation projects were categorised as radical, disruptive innovation projects which is aligned with the "first to market" generic strategy. The number and percentage of innovation projects has increased since the previous analysis. In analysis 3 (February 2015) 22 (45.8%) of 48 projects are categorised as innovation projects. The results of the project analysis is presented in *Table 21*. From a functional infrastructure and process integration perspective, there continues to be few formal innovation infrastructure and processes in the company, and therefore once again it is difficult to determine the level of alignment.

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Table 21: Results of analysis of project innovation scope (analysis 3)

		Analysis 3 (February 2015)
Total Number of Projects		48
Number of Innovation Projects		22
% Innovation Projects		45.8%
Innovation Type	Product	100.0%
	Process	0.0%
	Strategic	0.0%
Innovation Level	Radical	86.4%
	Incremental	13.6%
Innovation Impact	Disruptive	86.4%
	Sustaining	13.6%

7.3.3.3 Step 3: Assess Strategic Fit

As in analysis 1 (December 2013) and analysis 2 (October 2014), there is no strategic fit from an innovation perspective in the company. The company still does not have a formal innovation strategy, but even if the implicit innovation strategy is taken into consideration, there is no formal innovation infrastructure or process.

From a business perspective it is not possible in the context of this dissertation to analyse and assess the business strategic fit. The scope of the business strategic fit is significant and includes all of the company's operational processes, equipment, personnel and skills.

7.3.3.4 Step 4a: Determine Appropriate Dominant Strategic Alignment Perspective

The business strategy has clearly changed between analysis 2 (October 2014) and analysis 3 (February 2015). This adjustment to the business strategy has focused the scope of the implicit innovation strategy so that there is far better functional strategic integration. However, due to the lack of progress in formalising an innovation strategy and innovation infrastructure and processes, there continues to be a level of misalignment in the company. Therefore as in analysis 1 (December 2013) and analysis 2 (October 2014), 4a in *Figure 25* is the next step in analysis 3 (February 2015). For very much the same reasons given in analysis 1 (December 2013), the innovation transformation perspective would appear to be the most appropriate dominant perspective for the company in

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analysis 3 (February 2015). This decision is further supported by the recent change to the business strategy, which has kicked-off a series of other changes to the business as the management team try to align the operations and support functions with the new strategy. The dominant alignment perspective will guide the steps through the alignment pathway in step five of the approach.

7.3.3.5 Step 5b: Innovation Transformation Alignment Perspective

The pathway to alignment, based on the innovation transformation alignment perspective, is presented in *Figure 26* and is the same as in analysis 1 (December 2013) and analysis 2 (October 2014). This alignment pathway involves 11 steps, in which the required changes to the four iSAM domains are identified and the current and planned projects are analysed to check their alignment with the four domains. For the company in the case study, 48 current and planned projects were identified and analysed shortly after February 2015. The alignment of the projects was analysed using the alignment questions, presented in Appendix B. The breakdown of the 48 projects by project category is presented in *Table 22*.

Table 22: Breakdown of 48 projects by project category

	Project Type	Number of Projects
P1	External non-innovation project	10
P2	Internal non-innovation project	16
P3	External innovation project aligned with business strategy	21
P4	Internal innovation project	1
P5	Internal innovation processes project	0
P6	External innovation project not aligned to business strategy	0

7.3.3.6 Results of Analysis 3

The company's strategic objectives and the derived projects, analysed during analysis 3 (February 2015), are based on a changed business strategy. A key focus of the management team is now to determine how to align the company with this new business strategy. This should include aligning the innovation strategy and the innovation infrastructure and processes. The analysis of the 48 current and planned projects in analysis 3 (February 2015) reveals that there are a higher percentage of innovation projects in the project pipeline. In analysis 1 (December 2013) 29.7% of the projects were determined to be innovative, while in analysis 2 (October 2014) the percentage of innovative projects dropped to 9.5%. In analysis 3 (February 2015) this percentage increased to 45.8% (*Table 21*). The

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level and impact of these innovation projects are also closer aligned to the “first to market” generic business strategy, with 86.4% of the innovation projects being both radical and disruptive. However, all the innovation projects are categorised as product innovation, which still reveals some misalignment between the generic business strategy and the innovation scope. The “first to market” generic business strategy has not changed since the first analysis. The innovation projects have a stronger focus on radical, disruptive product innovation, which is key to a “first to market” generic business strategy. These projects are a direct response to the new business strategy of the company. So, although the company still does not have an explicit innovation strategy, the alignment between the new business strategy and the implicit innovation strategy has improved in analysis 3 (February 2015) compared with analyses 1 and analyses 2.

The area of poorest alignment in the company remains the innovation infrastructure and processes domain. No formal innovation infrastructure and processes exist and there are no current or planned projects aimed at rectifying the situation. The implication of this shortcoming are the same as in the analysis 1 (December 2013) and analysis 2 (October 2014) and will continue to limit the company’s ability to truly achieve a “first to market” grand strategy in a consistent way. The results of the innovation transformation perspective analysis along with recommendations are presented in *Table 23*.

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Table 23: Summary of analysis 3 (February 2015) results with recommendations

	Analysis Step	Analysis	Recommendations
1	Change BS (if required)	The BS is well defined	There are no internal or external reasons for BS to change at the moment
2	Check "external non-innovation projects" (P1) are aligned with BS	P1 type projects, all aligned with BS (based on alignment questions in Appendix B)	No need to stop or adjust any P1 type projects
3	Check strategic functional integration and define new IS	Explicit IS does not exist & the implicit IS has too high a focus on product innovation to be aligned with BS (based on results of project analysis in Table 8)	Answer the innovation governance questions and document explicit IS with greater focus on radical, product & strategic innovations
4	Check "external innovation project aligned with business strategy" (P3) projects aligned with BS and IS	P3 type projects all aligned with BS (based on alignment questions in Appendix B) but not fully aligned with updated IS from analysis step 3 (based on results of project analysis in Table 8 and Strategic Alignment Framework in Table 1)	P3 type projects should have a stronger focus on strategic innovation
5	Check "external innovation projects not aligned to business strategy" (P6) are aligned with new IS	There are no P6 type projects currently being executed or planned	The company should identify possible P6 type projects as these will drive strategy development in the future
6	Check strategic fit and define new BI&P	No analysis was conducted on the strategic fit between the business domains as this is not directly related to the innovation domains	None
7	Check "internal non-innovation projects" (P2) changing BI&P aligned to BS	P2 type projects all changing BI&P aligned to BS (based on alignment questions in Appendix B)	No need to stop or adjust any P2 type projects
8	Check "internal innovation projects" (P4) aligned with IS and changing BI&P aligned to BS	There is only one P4 type projects currently being executed or planned	Company should investigate how the innovation processes could play a more significant role in any internal improvement or change
9	Check strategic fit and define new II&P	No formal innovation infrastructure or processes exist.	Formal innovation infrastructure and processes should be implemented inline with new IS
10	Check operational functional integrations and adjust BI&P but keeping alignment with BS	No formal innovation infrastructure or processes exist, therefore operational functional integration between BI&P and II&P cannot be checked	Implement formal innovation infrastructure and processes and adjust BI&P accordingly, keeping alignment with BS
11	Check "internal innovation processes projects" (P5) aligned with II&P	There are no P5 type projects and no formal innovation infrastructure or processes exist.	Once formal innovation infrastructure or processes are defined a number of P5 type projects should be developed in order to implemented the II&P

7.3.4 Analysis 4: February 2016

The company set new strategic objectives in February 2016. These strategic objectives and the derived projects were based on the new business strategy, which was introduced in late 2014. The following analysis was conducted on the company shortly after February 2016.

7.3.4.1 Step 1: Document the Current (February 2016) Business and Innovation Domains

In step one, each of the three components in each of the four domains in iSAM are described for the company. This is achieved through analysis of strategic and operational documents and discussions with the company's management (see Appendix H for list of strategic and operational documents analysed). Between analysis 3 (February 2015) and analysis 4 (February 2016), there was no significant change to the company's business strategy, however, there were some minor changes to two of the components in the four iSAM domains . The following list presents the key outputs for this step of the

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approach. A high level description of the minor changes from analysis 3 (February 2015) to analysis 4 (February 2016) is also provided.

1. **Main target market:** Donor funded HSS projects for departments of health in developing countries & Analytics projects for Life Sciences companies, executive government structures and donors
2. **Main products:** HSS technical assistance through packaged solutions, analytics TA and analytics products (IT system), data as a product.
    - **Change:** Products expanded to include HSS technical assistance through packaged solutions and data as a product.
3. **Key business principles:** Social entrepreneurship, data driven, scalable and sustainable solutions, blend private and public sector approaches.
4. **Distinctive competencies:** Global network and reach along with local understanding of how government services are delivered on the ground, able to operate in both the public and private sectors, analytics and software development capability.
    - **Change:** Significant improvement in analytics and software development capabilities.
5. **Primary generic strategy:** First to market generic strategy, attempting to be seen as leaders in their field by being the first to introduce a solution or to follow a novel approach.
6. **Innovation scope:** Type - Strong product, medium strategic, weak process. Level - Strong radical, medium incremental. Impact - Medium sustaining, strong disruptive.
7. **Innovation governance structures:** No formal innovation governance forums or structures exist in the company.
8. **Innovation capability maturity level:** Unaware of innovation. Although innovation is communicated as an important part of the competitive advantage and culture of the company, there is no formalisation of innovation to a point where the understanding of the term innovation is not always clear.
9. **High-level structure:** Standard hierarchical structure, which is three to four layers deep
10. **Competency framework:** A competency framework consisting of five dimensions and 40 relevant competencies is used in the company.
11. **Innovation model:** Visionary leadership is implicit dominant innovation model.
12. **Innovation processes:** No formal innovation processes exist in the company.
13. **Innovation competencies:** There are several innovation related competencies in the overall company competency framework.
14. **Innovation roles:** There are no innovation specific roles in the company.

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15. **Innovation competency improvement activities:** There are no innovation specific innovation competency improvement activities.

7.3.4.2 Step 2: Assess Functional Integration

The improvement in functional integration, identified in analysis 3 (February 2015), between the company's preferred generic grand strategy and the innovation scope is also revealed through analysis 4 (February 2016). Based on an analysis of the company's current and planned projects, the company has a far stronger focus on product innovation (92.6% of innovation projects). There has been an increase in strategic innovation projects but still only 7.4% of innovation projects fall into this category. Although this is an improvement in alignment with the "first to market" generic strategy, it remains misaligned due to the low percentage of strategic innovation projects. The company continues to have a far stronger focus on disruptive and radical innovation, which is very much aligned with its "first to market" generic strategy. 81.5% of innovation projects are categorised as radical innovations and 92.6 % of innovation projects are categorised as disruptive innovations. The number and percentage of innovation projects have once again increased since the previous analysis. In analysis 4 (February 2016) 27 (51.9%) of 52 projects are categorised as innovation projects. The results of the project analysis is presented in *Table 24*. From a functional infrastructure and process integration perspective, there continues to be few formal innovation infrastructure and processes in the company, and therefore once again, as with the previous three analyses no level of alignment exists.

Table 24: Results of analysis of project innovation scope (analysis 4)

		Analysis 4 (February 2016)
Total Number of Projects		52
Number of Innovation Projects		27
% Innovation Projects		51.9%
Innovation Type	Product	92.6%
	Process	0.0%
	Strategic	7.4%
Innovation Level	Radical	81.5%
	Incremental	11.1%
Innovation Impact	Disruptive	92.6%
	Sustaining	7.4%

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7.3.4.3 Step 3: Assess Strategic Fit

As in analysis 1 (December 2013), analysis 2 (October 2014) and analysis 3 (February 2015), there is no strategic fit from an innovation perspective in the company. The company still does not have a formal innovation strategy, but even if the implicit innovation strategy is taken into consideration, there is no formal innovation infrastructure or process.

From a business perspective it is not possible in the context of this dissertation to analyse and assess the business strategic fit. The scope of the business strategic fit is significant and includes all of the company's operational processes, equipment, personnel and skills.

7.3.4.4 Step 4a: Determine Appropriate Dominant Strategic Alignment Perspective

After the change to the business strategy in late 2014 the company has focused the scope of the implicit innovation strategy so that there is far better functional strategic integration. However, due to the ongoing lack of progress in formalising an innovation strategy, the continued low percentage of strategic innovation projects and the lack of innovation infrastructure and processes, there continues to be misalignment in the company. Therefore as in analysis 1 (December 2013), analysis 2 (October 2014) and analysis 3 (February 2015), 4a in *Figure 25* is the next step in analysis 4 (February 2016). For very much the same reasons given in analysis 1 (December 2013), the innovation transformation perspective would still appear to be the most appropriate dominant perspective for the company in analysis 4 (February 2016). This decision, as in analysis 3 (February 2015), is further supported by the recent change to the business strategy. The dominant alignment perspective will guide the steps through the alignment pathway in step five of the approach.

7.3.4.5 Step 5c: Innovation Transformation Alignment Perspective

The pathway to alignment, based on the innovation transformation alignment perspective, is presented in *Figure 26* and is the same as in analysis 1 (December 2013), analysis 2 (October 2014) and analysis 3 (February 2015). This alignment pathway involves 11 steps, in which the required changes to the four iSAM domains are identified and the current and planned projects are analysed to check their alignment with the four domains. For the company in the case study, 52 current and planned projects were identified and analysed shortly after February 2016. The alignment of the projects was analysed using the alignment questions, presented in Appendix B. The breakdown of the 52 projects by project category is presented in *Table 25*.

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Table 25: Breakdown of 52 projects by project category

	Project Type	Number of Projects
P1	External non-innovation project	6
P2	Internal non-innovation project	19
P3	External innovation project aligned with business strategy	21
P4	Internal innovation project	3
P5	Internal innovation processes project	0
P6	External innovation project not aligned to business strategy	3

7.3.4.6 Results of Analysis 4

The analysis of the 52 current and planned projects in analysis 4 (February 2016) reveals that there is the highest percentage of innovation projects in the project pipeline out of all four analyses. In analysis 1 (December 2013) 29.7% of the projects were determined to be innovative, while in analysis 2 (October 2014) the percentage of innovative projects dropped to 9.5%. In analysis 3 (February 2015) this percentage increased to 45.8% and in analysis 4 (February 2016) that has increased further to 51.9%. The level and impact of these innovation projects continues to be closely aligned to the "first to market" generic business strategy, with a high percentage of innovation projects being both radical and disruptive (81.5% and 92.6% respectively). However, the type of innovation projects remains a concern for alignment, as a high percentage (92.6%) of innovation projects fall into the product innovation category. As in analysis 3 (February 2015), the company still does not have an explicit innovation strategy. However, the new business strategy and the implicit innovation strategy remain aligned as in analysis 3 (February 2015).

The area of poorest alignment in the company remains the innovation infrastructure and processes domain. No formal innovation infrastructure and processes exist and there are no current or planned projects aimed at rectifying the situation. The implication of this shortcoming are the same as in all three previous analyses. The company will continue to have limited ability to truly achieve a "first to market" grand strategy in a consistent way. The results of the innovation transformation perspective analysis along with recommendations are presented in Table 13.

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Table 26: Summary of Analysis 4 (February 2016) Results with Recommendations

	Analysis Step	Analysis	Recommendations
1	Change BS (if required)	The BS is well defined	There are no internal or external reasons for BS to change at the moment
2	Check "external non-innovation projects" (P1) are aligned with BS	P1 type projects, all aligned with BS (based on alignment questions in Appendix B)	No need to stop or adjust any P1 type projects
3	Check strategic functional integration and define new IS	Explicit IS does not exist & the implicit IS has too high a focus on product innovation to be aligned with BS (based on results of project analysis in Table 8)	Answer the innovation governance questions and document explicit IS with greater focus on radical, product & strategic innovations
4	Check "external innovation project aligned with business strategy" (P3) projects aligned with BS and IS	P3 type projects all aligned with BS (based on alignment questions in Appendix B) but not fully aligned with updated IS from analysis step 3 (based on results of project analysis in Table 11 and Strategic Alignment Framework in Table 1)	P3 type projects should have a stronger focus on strategic innovation
5	Check "external innovation projects not aligned to business strategy" (P6) are aligned with new IS	P6 type projects aligned with updated IS	No need to stop or adjust P6 type project although with a stronger focus on strategic innovation
6	Check strategic fit and define new BI&P	No analysis was conducted on the strategic fit between the business domains as this is not directly related to the innovation domains	None
7	Check "internal non-innovation projects" (P2) changing BI&P aligned to BS	P2 type projects all changing BI&P aligned to BS (based on alignment questions in Appendix B)	No need to stop or adjust any P2 type projects
8	Check "internal innovation projects" (P4) aligned with IS and changing BI&P aligned to BS	There are three P4 type projects currently being executed or planned	Company should investigate how the innovation processes could play a more significant role in any internal improvement or change
9	Check strategic fit and define new II&P	No formal innovation infrastructure or processes exist.	Formal innovation infrastructure and processes should be implemented inline with new IS
10	Check operational functional integrations and adjust BI&P but keeping alignment with BS	No formal innovation infrastructure or processes exist, therefore operational functional integration between BI&P and II&P cannot be checked	Implement formal innovation infrastructure and processes and adjust BI&P accordingly, keeping alignment with BS
11	Check "internal innovation processes projects" (P5) aligned with II&P	There are no P5 type projects and no formal innovation infrastructure or processes exist.	Once formal innovation infrastructure or processes are defined a number of P5 type projects should be developed in order to implemented the II&P

7.4 Longitudinal Analysis (December 2013 – December 2016)

The analysis of the company's business and innovation domains at four different points in time between December 2013 and February 2016 has revealed specific improvements to the company's innovation alignment over this period and areas of continued misalignment. The result of each analysis is a set of recommendations aimed at assisting the company to achieve better alignment. In this longitudinal analysis a comparison of the results from each analysis are presented over time. This includes:

- Changes to the business and innovation domains over time.
- Changes to the functional integration over time.
- Changes to strategic fit over time.
- Changes to project types over time.

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7.4.1 Changes to the Business and Innovation Domains Over Time

Each of the four analyses started with a description of the company's business and innovation domains, at that time, based on the four domains of the iSAM. This is achieved through analysis of strategic and operational documents and discussions with the company's management (see Appendix H for list of strategic and operational documents analysed). Decisions made by the company's management team influenced the four domains at different times during the three-year period. In these analyses each domain was described by a number of detailed elements. These elements are closely aligned with the detailed components in the iSAM. The domains and the corresponding elements are presented in *Table 27*.

Table 27: Domains and Elements Used in Analyses

Business Strategy Domain	Innovation Strategy Domain	Business Infrastructure and Processes Domain	Innovation Infrastructure and Processes Domain
Main target market	Innovation scope	High-level structure	Innovation model
Main products	Innovation governance structures	Competency framework	Innovation processes
Key business principles	Innovation capability maturity level		Innovation competencies
Distinctive competencies			Innovation roles
Primary generic strategy			Innovation competency improvement activities

An assessment of the level of change of each element between each analysis was conducted based on the description of each element in each domain (

Table **28**). The level of change is rated on a four tier scale:

- 0 = no change
- 1 = minor change with no real impact on the company
- 2 = moderate change with some impact on the company
- 3 = major change with significant impact on the company

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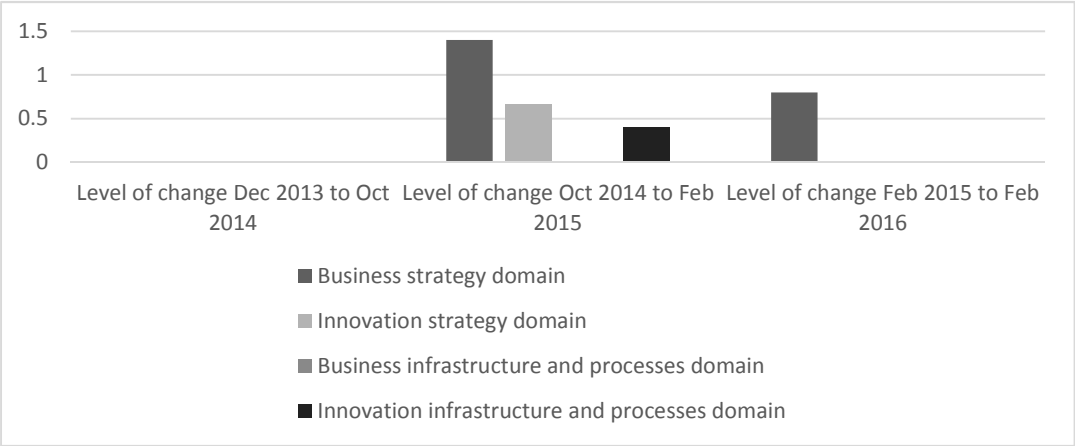
Table 28: Level of Change of Elements

Elements	Level of change Dec 2013 to Oct 2014	Level of change Oct 2014 to Feb 2015	Level of change Feb 2015 to Feb 2016
Main target market	0	3	0
Main products	0	3	2
Key business principles	0	0	0
Distinctive competencies	0	1	2
Primary generic strategy	0	0	0
Innovation scope	0	1	0
Innovation governance structures	0	1	0
Innovation capability maturity level	0	0	0
High-level structure	0	0	0
Competency framework	0	0	0
Innovation model	0	2	0
Innovation processes	0	0	0
Innovation competencies	0	0	0
Innovation roles	0	0	0
Innovation competency improvement activities	0	0	0

Graph *1* provides an overall view of the level of change per domain. The average level of change for a domain is calculated and plotted on Graph *1*.

Graph 1: Average Level of Change per Domain



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The analysis of the change in domains over the three year period reveals that there was no change between analysis 1 (December 2013) and analysis 2 (October 2014). The largest change occurred between analysis 2 (October 2014) and analysis 3 (February 2015). This change coincided with the change to the company's business strategy in late 2014. There are minor changes between analysis 3 (February 2015) and analysis 4 (February 2016). These changes are all in the business strategy domain and are due to small adjustments to the new business strategy based on the experiences in the first year of implementation.

7.4.2 Changes to Functional Integration and Strategic Fit Over time

In each of the four analyses over the three-year period, the company's functional integration was assessed. This was performed based on the descriptions of the business and innovation domains and on an analysis of the company's current and planned projects. The projects were categorised based on their innovation type, level and impact. The results from all four analyses is presented in Table *29*.

Table 29: Results of Innovation Scope Analyses

		Analysis 1 (Dec 2013)	Analysis 2 (Oct 2014)	Analysis 3 (Feb 2015)	Analysis 4 (Feb 2016)
Total Number of Projects		37	42	48	52
Number of Innovation Projects		11	4	22	27
% Innovation Projects		29.7%	9.5%	45.8%	51.9%
Innovation Type	Product	81.8%	100.0%	100.0%	92.6%
	Process	18.2%	0.0%	0.0%	0.0%
	Strategic	0.0%	0.0%	0.0%	7.4%
Innovation Level	Radical	54.5%	100.0%	86.4%	81.5%
	Incremental	45.5%	0.0%	13.6%	11.1%
Innovation Impact	Disruptive	54.5%	100.0%	86.4%	92.6%
	Sustaining	45.5%	0.0%	13.6%	7.4%

The functional strategic integration was assessed by reviewing the Business Strategy in context with the Innovation Strategy. In each analysis, an explicit Innovation Strategy did not exist, so an implicit innovation strategy, based on the current and planned projects, was used to assess functional integration. Functional integration would be achieved if the innovation scope (innovation type, level and impact) is aligned with the company's generic strategy. The generic strategy was determined,

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through analysis of strategic documents and discussions with the company's management team, to be a "first to market" generic strategy. Based on the strategic alignment framework [167] presented in *Table 13*, the best alignment for the "first to market" generic strategy would be strong strategic, radical and disruptive innovation with medium product innovation. Although both product and strategic innovation are important for a first to market company, a significant competitive advantage can be gained, by a first to market company, by creating barriers to entry for other companies. These barriers to entry could take the shape of key strategic partnerships, market positioning through innovative marketing strategies, geographical supremacy by locking in key routes and other such strategic poisoning. Products, even with patents, can be copied. Therefore strategic innovation is seen as a more effective creator of barriers for rapid follower competitors. *Table 29* reveals that, throughout the four analyses, the product innovation was far stronger than the strategic innovation and therefore full functional integration was never achieved throughout the three years. However, there was an improvement in the alignment of the level and impact of innovation. After analysis 1 (December 2013) there was an increase in the percentage of radical and disruptive innovation, which brought the company into better alignment with its "first to market" generic strategy.

7.4.3 Changes to Strategic Fit Over time

The analysis of strategic fit revealed far larger misalignment issues than the functional integration analysis. The lack of formal innovation infrastructure and processes meant that there was total misalignment between the company's implicit innovation strategy and the innovation infrastructure and processes. This issue was never addressed during the three years of the analyses and remained misaligned in each of the four analyses.

7.4.4 Change in Project Type Over Time

The analysis of the company's projects at the four points in time illustrate how the company's project type has changed over the three-year period. Six project types are defined and each of the projects over the three-year period are categorised according to a specific project type. The project types for each analysis is presented in *Graph 2*.

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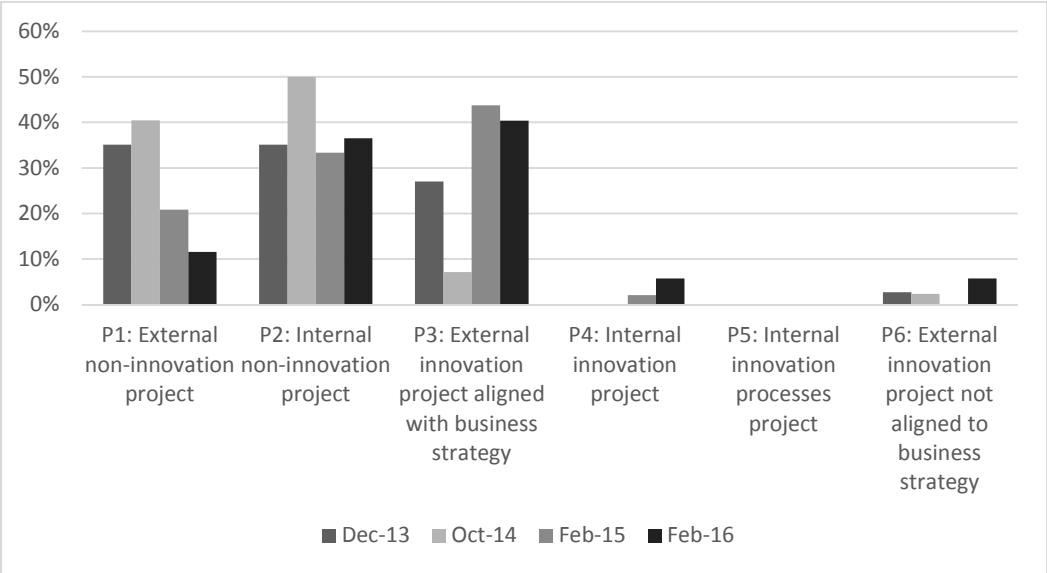
Graph 2: Change in Project Types Over Time



In total the company planned to execute 179 projects over a four-year period. The analysis of project types reveals that before the company changed its business strategy in late 2014, the predominant external projects were non-innovation projects (P1). After the change to the Business Strategy there was a significant increase in innovation type external projects (P3). This reveals that the company's management team adjusted the types of projects in the project pipeline and by doing so improved the alignment between the new Business Strategy and the implicit Innovation Strategy.

There was no real increase in internal innovation projects and throughout the four analyses the vast majority of internal projects were not considered to be innovative. Across all four analyses there was only a small increase in P6 type projects. A significant point in the project type analysis is that, over the three-year period, not a single project was planned with the aim of improving the company's internal innovation infrastructure and processes. This is significant as in every analysis over the three years the major misalignment was between the company's business and innovation strategies and the innovation infrastructure and processes. In short, the company hopes innovation will happen but has no formal infrastructure and processes to increase the probability of successful innovation.

7.4.5 Difference in Recommendations Over time

The results of each of the analysis is a set of recommendations aimed at improving the company's alignment at that point in time. In this section the difference in the recommendations are presented and explained.

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7.4.5.1 Difference in Recommendations between Analysis in December 2013 and October 2014

There are two differences between the recommendations in analysis 1 (December 2013) and analysis 2 (October 2014). Both these differences relate to the same issue. In analysis 1, there is an almost equal split between innovation projects that were categorised as radical (54.5% of innovation projects) and innovation projects that were categorised as incremental (45.5% of innovation projects). The same percentage split is applicable for innovation projects that were categorised as disruptive (54.5% of innovation projects) and innovation projects that were categorised as sustaining (45.5% of innovation projects). In analysis 2, 100% of innovation projects are both radical and disruptive. Because of this change in the innovation scope, the recommendations changed as follows:

- P3 type projects (external innovation project aligned with business strategy) in analysis 1 needed to have more of a focus on strategic, radical and disruptive innovation while in analysis 2 there was just a need for more focus on strategic innovation.
- The exact same change in recommendations, in point one, is applicable for P6 type projects (external innovation projects not aligned to business strategy).

7.4.5.2 Difference in Recommendations between Analysis in October 2014 and February 2015

Due to the change in the company's business strategy in late 2014, there was a fairly significant change to the project pipeline between analysis 2 (October 2014) and analysis 3 (February 2014). The most significant change was the increase to the number of innovation projects. The number of innovation projects increased from 4 of 42 (9.5% of all projects) in analysis 2 to 22 of 48 (45.8% of all projects) in analysis 3. This increase in innovation projects was driven by an increase in P3 type projects (external innovation project aligned with business strategy). The number of P3 type projects increased from 3 (7% of all projects) to 21 (44% of all projects).

Because of this change to the project pipeline, the recommendations changed as follows:

- In analysis 3 (February 2014) there was no longer a need to recommend more P3 type projects (external innovation project aligned with business strategy).

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7.4.5.3 Difference in Recommendations between February 2015 and February 2016

The only small change to the recommendations between analysis 3 (February 2015) and analysis 4 (February 2016) was based on the slight increase in P6 type projects (external innovation projects not aligned to business strategy) over that period. P6 type projects increased from 0 at the time of analysis 3 to 3 (6% of all projects) at the time of analysis 4.

Because of this small change to the project pipeline, the recommendations changed as follows:

- In analysis 4 a stronger focus on strategic innovation P6 type projects was recommended, while in analysis 3, it was only recommended that the company introduce P6 type projects.

Overall the differences in the recommendations over time are small and the major themes persist throughout. The reason for similar recommendations at all four "points in time" analyses is that the recommendations are yet to be adopted by the management team and therefore the same misalignment issues continue from one year to another.

7.5 Case Study Outcomes

The purpose of the case study was three-fold:

1. To demonstrate how an innovation alignment model can be used to understand the current state of alignment.
2. To show how the iSAM implementation framework can be practically applied in a company.
3. To determine how the recommendations generated by the innovation strategy alignment approach, can add value towards innovation re-alignment in the specific target company.

One of the largest challenges in executing the case study was securing the participation of Senior Managers at the focus company. Over the three-year period several Senior Managers left the company and others arrived. This was mainly due to the pivot in the company's strategy as described in the case study. In total two Senior Managers were involved in the validation of the case study. The two managers involved were: the Analytics Client Delivery Manager and one of the two founders of the company. The founder of the company was mainly involved in validating the current state of alignment and providing an opinion on the iSAM model and its applicability for the focus company. The Analytics Client Delivery Manager provided his opinion regarding the value of the final recommendations.

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7.5.1 Understanding Current State of Innovation Alignment

A number of interesting observations can be made, based on the case study, with regards to understanding the current state of innovation alignment in the focus company:

1. The iSAM provided the Senior Managers of the focus company with a simple and clear framework to understand the fairly complex environment of innovation alignment. The company Founder indicated that the iSAM made the innovation landscape clearer.
2. Through iSAM a greater understanding of the components of an Innovation Strategy was gained. This was indicated by both the Founder and the Analytics Client Delivery Manager.
3. The concepts of strategic fit and functional integration were also understood clearly through the iSAM diagram.
4. Armed with this clearer understanding of Innovation Strategy and innovation alignment, Senior Managers were able to answer the key questions (Appendix I) to describe the 12 components of the four iSAM domains. The questions regarding the business strategy, implicit Innovation Strategy and the suggested innovation model were validated by the company Founder.
5. With regards to understanding functional strategic integration, *Table 13* on page 90 provided a simple and clear way of linking the company's grand strategy with the required innovation scope. The Analytics Client Delivery Manager agreed with this approach and the results. However, *Table 13* does require certain updates, based on the feedback from the panel of experts in the validation exercise.
6. Functional infrastructure and process integration (which is alignment between the business infrastructure and process domain and the innovation infrastructure and process domain) and the strategic fit (which is alignment between the Innovation Strategy and the innovation infrastructure and process domain) was difficult to define due to the constant lack of innovation infrastructure and processes over the three year period. The Analytics Client Delivery Manager agreed that the company lacked formal innovation infrastructure and process at the time of the final analysis in February 2016.
7. Overall the iSAM provided a simple framework to understand the components and the relationships within and between the business and innovation domains.

7.5.2 Practical Application of iSAM

A number of successes and challenges were identified in the application of iSAM using the defined implementation approach. These included:

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1. The five steps described in *Figure 19* on page 86 provided a clear path to apply the iSAM.
2. The application of the steps in a real world scenario demonstrated the logic and flow of the implementation approach.
3. The tools provided in each step were practical and useful in capturing the required information and guiding the completion of the step. These tools included the company question template for capturing business and innovation domain information (Appendix I), the list of required documents needed to answer these questions (Appendix H), the table showing the relationships between the generic competitiveness strategies and the components of an Innovation Strategy (*Table 13* on page 91) and the list of questions required to categorise the projects for the analysis (Appendix G).
4. The guidance provided by the change pathways was clear and simple (*Figure 23* on page 98). The 11 defined steps in the change pathways provided a logical framework on which to hang the recommendations.
5. Even though there is a set of questions which were used to guide the categorisation of the projects for the analysis (Appendix G), this process is still fairly subjective and requires a good understanding of all the projects and of the different defined project types.

7.5.3 Value Add of Recommendations

When describing the case study approach (section 7.2 on page 117) the challenges of presenting the recommendations to the entire company management team is discussed. Because of this challenge, none of the recommendations were ever formally presented to the entire management team. Therefore, over the three-year period of the analysis, if any of the recommendations were implemented, it was not due to this analysis, but rather the management team arriving at the same conclusions as the analysis and implementing solutions to what they saw as alignment gaps. However, the final analysis results were presented to one of the founders of the company in May 2015 and this may have influenced some of the changes in the company since that time. The recommendations of the February 2016 analysis was presented to the Analytics Client Delivery Manager who gave his opinion on the validity and value of the recommendations. The following points highlight the value of the recommendations, but also some of the associated challenges:

1. One of the key recommendations, which was constant throughout the three-year analysis period, was to explicitly document the company's Innovation Strategy. The Analytics Client Delivery Manager agreed with this recommendation and stated that an explicit Innovation Strategy would support planning in the company. While there is still some way to go before

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the governance questions and innovation scope are formally defined and agreed to by the Senior Management team, certain aspects of an Innovation Strategy have been incorporated into the company's new project prioritisation alignment template (*Appendix J*). This means that staff presenting prospective new projects need to consider alignment issues and the company management can better manage their portfolio of projects to drive improved alignment. This is a significant step forward in driving alignment through project portfolio management.

2. Throughout the four analyses over the three year period the innovation infrastructure and process domain was the weakest of all four domains in the focus company. In each analysis it was recommended that a decision regarding a formal innovation model, followed by processes, systems and skills need to be made. When this recommendation was discussed with the Analytics Client Delivery Manager he agreed this was indeed a gap in the company operations. He explained that implementation of this recommendation would improve innovation delivery and would improve employee's understanding of the innovation processes and their role in innovation. The Analytics Client Delivery Manager also indicated that there would be benefits in implementing some kind of innovation awards programme which needs to be aligned with the Innovation Strategy and driven by formal processes and systems. Since the final analysis and set of recommendations, some progress has been made in this area. Firstly, it was agreed with the founder of the company that a visionary leadership innovation model was most appropriate. Secondly, a product design team has been formed, which has a major focus on new product conceptualisation and design. Finally, a concept priority alignment forum has been established with the mandate to prioritise new product development concepts and to manage the project portfolio in line with the proposed generic "first to market" strategy and the related innovation scope. As can be seen in Appendix J, the company has adopted a concept template, in which information regarding a specific new concept is captured and then presented to the priority alignment forum. Certain aspects of the iSAM model are represented in this template and assist staff and managers to align new innovation concepts with the company's business strategy and Innovation Strategy. This practical example demonstrates that not all components of iSAM may be required by all companies all the time and that new specific tools should be developed, which incorporate aspects of the iSAM but are configured for the company's specific needs.
3. There has been a significant change in both the project types and the innovativeness of the project portfolio over the three year analysis period. In the first two analyses it was recommended to increase the number of innovation projects, with special focus on P3 type

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projects (external innovation project aligned with business strategy). The number of innovation projects increased from 4 of 42 (9.5% of all projects) in analysis 2 to 22 of 48 (45.8% of all projects) in analysis 3. This increase in innovation projects, was driven by an increase in P3 type projects. The number of P3 type projects increased from 3 (7% of all projects) to 21 (44% of all projects).

4. In each of the four analysis over the three year period, it was recommended that more emphasis was required on innovation driving internal improvements, especially within the support function departments. The Analytics Client Delivery Manager was very much in agreement with this recommendation and indicated that the same focus on innovation of the product should be directed at internal innovation, especially since the company was going through a major growth phase. Since the last analysis the HR, Finance and Business Development departments have all implemented new IT systems to support newly designed processes. While the CRM, procurement and staff management systems are not specifically innovative to companies in general, they are fairly rare within this industry and can definitely provide the company with a competitive advantage, especially when competing for new funding.

7.5.4 Case Study Wrap-up

Overall the case study demonstrated several positive aspects of the iSAM and the implementation approach. The case study also highlighted some challenges which need to be taken into consideration when applying the iSAM in a company.

7.5.4.1 Positive Aspects:

- Provides a simple, clear, common understanding of the components involved in Innovation Strategy and innovation alignment.
- The implementation framework provides practical guidance and applicable tools to assist in determining innovation alignment and in following a change pathway to achieve alignment.
- The final recommendations provide clear instructions on what a company needs to do in order to ensure alignment is achieved and were deemed valid and value adding by senior managers.

7.5.4.2 Challenges:

- Ensuring the entire management team engages with the model and the implementation approach.

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- Ensuring the applicability of the model for a specific company and the risk of the iSAM model being perceived as too theoretical and academic.
- Certain sections of the implementation approach are still fairly subjective and require more detailed tools to ensure objectivity. This would include the assessment of the strategic fit and the selection of the dominant strategic alignment perspective.

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8 Conclusions

This research started out with the aim of contributing to the ever growing knowledge base regarding the formalisation of innovation activities in a company. Much work has been done over the last 20 to 30 years, in the areas of defining innovation, understanding the critical value of innovation in modern companies, innovation models, processes and systems and more recently Innovation Strategy. This dissertation builds on this previous work and sheds new light on the concept of innovation strategic alignment. Along the way the author discovered the well-established research area of strategic alignment and more specifically functional area strategic alignment. The unique contribution of this dissertation therefore evolved into an overarching integrated framework for understanding innovation strategic alignment, based on the leading approaches and models from the domain of functional area strategic alignment and the latest thinking in the Innovation Strategy space.

In this final chapter the findings of the research is summarised in line with the four research questions presented in the research proposal (page 18), final conclusions are drawn, the research contribution is summarised and suggestions for further research are suggested.

8.1 Summary of Findings

The findings from this research are summarised in line with the four research questions.

8.1.1 Research Question 1

What is the role, structure and components of an innovation strategy?

The key concepts required to address Research Question 1 are generally available in the innovation management literature. However, it is clear from the literature that the definition and role of an Innovation Strategy is varied and broad. A significant number of research papers use the term "Innovation Strategy" synonymously with technology or product strategy (page 49). Others discuss Innovation Strategy in the context of an industry, a country or a region (page 56). Much of the literature also focuses on specific Innovation Strategies (page 56). It seems the current body of research focuses on highly specific, highly focused sections of the Innovation Strategy landscape. Despite the variations in the definition of an Innovation Strategy, there is a large group of researchers who agree that the role of an Innovation Strategy could either be to drive exploitation or exploration (doing things better vs. doings things differently) (page 47).

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With regards to the structure and components of an Innovation Strategy there are a number of proposed structures which fall into the "developing an Innovation Strategy" literature. Once again, each of these proposed approaches takes a very specific view point on innovation and therefore the suggested structure of an Innovation Strategy are likewise very specific (page 60). One of the key findings to address the issue of the structure of an Innovation Strategy came in the form of the Strategic Alignment Model (SAM) of Henderson and Venkatraman [162]. This model is aimed at aligning a company's technology strategy with its busines strategy and provides a clear and simple structure for both the business strategy and the technology strategy (page 45). After unpacking the assumptions on which the SAM was designed and demonstrating how these assumptions are just as applicable for an Innovation Strategy, three components of an Innovation Strategy were defined. These are Innovation Governance, Innovation Scope and Innovation Capability (page 69). These components were validated with the panel of experts in Question 2 of the validation questionaire (Appendix B). For Question 2, three of the seven experts agreed that the three components of the Innovation Strategy domain are sufficient and relevant to describe a company's Innovation Strategy. Three of the experts responded with a maybe and the final expert responded with a no. The only "no" respondent stated that, "*strategy also implies direction, a vision defining the required end state as well as the mission*" and that this was not represented in the suggested Innovation Strategy components. The author's response to this point of view is that by answering the innovation governance questions and by defining a desired innovation scope and innovation capability level in the Innovation Strategy, a company is creating a vision and required end state for innovation. The Innovation Strategy describes a desired end goal, which the company needs to attain through implementation of the correct innovation models, processes, skills and systems (page 108). All three of the experts who responded "maybe" did so because of some uncertainty they had regarding the detailed content of iSAM. Once this is explained (page 108) it should address their concerns.

In summary, this dissertation provides a comprehensive description of the definition of an Innovation Strategy, the role of an Innovation Strategy and the structure and components of an Innovation Strategy. The structure has been validated by a team of experts and then applied as part of the iSAM to answer Research Questions 2, 3 and 4.

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8.1.2 Research Question 2

How can an alignment model be used to define the alignment needed between the internal and external innovation domains and a company's overall business strategy and structure?

Four approaches were combined to address this research question. First through the literature, then through the development of the iSAM, next through the expert validation exercise and finally through the case study.

In order to address this research question, the strategic alignment literature was searched for relevant approaches to align the business domains with the domains of a functional area. The author discovered that a significant amount of research has been conducted over a number of years in the area of technology strategy alignment and that the SAM is the best known and most cited technology strategy alignment model (page 45). A key finding is that the assumptions made in the development of the SAM are as applicable today for innovation management as they were 20 years ago for technology management (page 68).

Armed with this link between the strategic alignment literature and innovation management and based on the many different areas of research into innovation management, including: innovation scope, innovation governance, innovation capability and maturity, innovation models and processes, innovation skills and innovation systems, the iSAM was developed and proposed (page 68). The iSAM model lies at the heart of demonstrating how an alignment model can be used to define the alignment needed between the internal and external innovation domains and a company's overall business strategy and structure. The model not only defines the internal and external business and innovation domains, but also describes the components within each of the domains and very importantly demonstrates how the different types of alignment relate to the topic of innovation strategy alignment (page 77).

An important component to address Research Question 2, is the feedback from the expert panel. In the validation exercise (page 102), questions 1, 2, 3, 4 and 7 address the components and structure of the iSAM (Appendix B). Overall there is good consensus amongst the experts that these components were sufficient and relevant to understand innovation strategy alignment (page 107). Questions 5, 6 and 8 address the issue of different types of alignment and once again there is general agreement amongst the expert panel regarding the correctness and value of these defined types of alignment (page 107).

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Finally, the case study demonstrated how the iSAM can be used to communicate and get buy-in for the complex concept of innovation strategy alignment. It was found that the iSAM provides a simple, clear, common understanding of the components involved in Innovation Strategy and innovation strategy alignment (page 148). This clarity then allows a company to discuss their alignment or misalignment issues with in a common framework and using a common language. The company Founder indicated that the iSAM made the innovation landscape clearer and both the Founder and the Analytics Client Delivery Manager indicated that through iSAM a greater understanding of the components of an Innovation Strategy was gained.

8.1.3 Research Question 3

How can a practical approach be roadmapped to enable a company to determine its current innovation alignment by using the developed innovation alignment model?

Research Question 3 is mainly addressed in two sections of this dissertation. Firstly, through the development of the iSAM implementation framework (page 85) and secondly through the application of the iSAM and the implementation framework in a real life case study (page 116).

The iSAM implementation framework applies the concept of cross-domain alignment to the implementation of the iSAM (page 80). By applying this well-documented approach of cross-domain alignment to the field of innovation strategy alignment, a series of change pathways for different types of companies is presented (page 94). The aim of these change pathways is to provide a practical step by step guide for a company to assess their current state of innovation strategy alignment and to develop a set of recommendations to improve or strengthen their innovation strategy alignment.

In the case study, the iSAM implementation framework, including the applicable change pathway, is implemented in a company. The five steps of the implementation framework are applied and four sets of recommendations were developed (page 119). The findings from the case study are that the iSAM implementation framework provided a clear path to apply the iSAM and that the real world scenario demonstrated the logic and flow of the implementation approach. It was also found that the tools provided in each step were practical and useful in capturing the required information and guiding the completion of the step. However, work on some of the tools is still required as the process is still fairly subjective and requires a good understanding of all the projects and of the different defined project types (page 149). In summary, the case study demonstrated that the implementation framework provides practical guidance and applicable tools to assist in determining innovation alignment and in following a change pathway to achieve alignment (page 152).

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8.1.4 Research Question 4

How will companies benefit from adopting the model and approach?

Research Question 4 is initially addressed through the literature on Innovation Strategy (page 47) and strategic alignment (page 41) and then through the case study.

It is clear from the literature that strategic alignment is a critical component for a company to successfully implement its strategy. Alignment has been shown to be a key competency required, by highly successful companies, to successfully implement the strategy and achieve strategic goals and objectives [15], [16]. When it comes to innovation strategy alignment, in recent times the role and importance of Innovation in companies has grown significantly [11], [12]. As part of the formalization of innovation as a core business process, the role and importance of an Innovation Strategy has come to the fore. As with all strategies, for the Innovation Strategy to be successful, it first needs to be the correct strategy, then it needs to be aligned with the business values, structures, capabilities and other strategies and finally it needs to be executed [15]. iSAM and the implementation framework benefit companies by providing structure and guidance to their innovation strategy alignment.

Through the case study the focus company benefited in a number of ways. Firstly, the iSAM provided a simple and clear framework to understand the fairly complex environment of innovation alignment. This then allowed for a deeper understanding of the components of an Innovation Strategy and the concepts of strategic fit and functional integration (page 149). Secondly, the recommendations of the four analyses conducted as part of the case study over the three years, provides key insights into how the company can achieve improved innovation strategy alignment (page 150). These recommendations include documenting an explicit Innovation Strategy, improving the company's innovation infrastructure and processes in alignment with its business and innovation strategies and increasing the number of external innovation projects aligned with the business strategy.

The Analytics Client Delivery Manager was very much in agreement with the recommendations and stated that an explicit Innovation Strategy would support planning in the company. He also stated that the lack of formal innovation infrastructure and processes was a gap in the company and that the implementation of such infrastructure and processes would improve innovation delivery. Finally he agreed that a greater focus on internal innovation was required.

In practical terms, these recommendations have played some role in the development of the company's new project prioritisation alignment template (Appendix J). This template ensures that

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staff, who are presenting prospective new projects, consider innovation alignment issues and the company management can better manage their portfolio of projects to drive improved alignment. This is a significant step forward in driving innovation alignment through project portfolio management. The recommendations have also played some role in the establishment of a concept priority alignment forum. This forum has the mandate to prioritise new product development concepts and to manage the project portfolio in line with the proposed generic first to market strategy and the related innovation scope.

8.2 Final Conclusions

Based on the findings described in section 8.1, the following final conclusions have been drawn:

1. **Innovation Strategy needs to be aligned with the business strategy:** The importance of innovation in a company and the move to formalise innovation activities have led to the rise in the importance of Innovation Strategy (page 52). As with all strategies, alignment is one of the key critical success factors for the successful implementation of an Innovation Strategy (page 43).
2. **There is currently no application of strategic alignment models in the Innovation Strategy domain:** Although there is a growing body of knowledge in the field of Innovation Strategy and in recent years a growing focus on innovation strategy alignment, the research is highly focused and specific without significant practical guidance and support (page 61). Furthermore, no literature was found which applies the well-established work in the field of strategic alignment to the relatively new research into Innovation Strategy (page 66).
3. **The SAM can be applied to the Innovation Strategy domain:** The well-established SAM for technology strategy alignment can be adapted for application in Innovation Strategy alignment (page 68).
4. **iSAM is a comprehensive, sufficient and relevant model for Innovation Strategy alignment:** There seems to be general consensus amongst the experts that the iSAM does provide a valuable framework for Innovation Strategy alignment and that the model comprehensively addresses a critical issue facing companies today (page 114). However, there are some areas for improvement in iSAM. These include: catering for variations in the model based on company size; company type and industry; further empirical evidence to prove some of the defined relationships in the model; the relationship between business model innovation and a cost reducer strategy should be reviewed and a suggestion to check alignment between iSAM and the new ISO/TC 279 Innovation management standard (page 114).

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5. **The iSAM implementation framework does provide a practical approach for utilising iSAM:** The case study demonstrated that the iSAM implementation framework provides practical guidance and applicable tools to assist in determining innovation alignment and in following a change pathway to achieve alignment (page 152). However, work on some of the tools is still required to remove some of the subjectivity and improve the simplicity of completing some of the tools (page 149).
6. **A company can benefit from applying iSAM in its environment:** Companies can benefit from applying iSAM as it creates a simple, common framework around which issues of Innovation Strategy and alignment can be discussed. The recommendations generated by the iSAM implementation framework provide companies with a practical set of steps required to achieve innovation strategy alignment (page 150).

8.3 Summary of Contributions

The unique contribution of this dissertation is three-fold:

1. The iSAM is a unique model as it comprehensively brings together research from the fields of strategic alignment and innovation management. No other model in the identified literature provided this link between these two research fields.
2. The iSAM provide an overarching integrated framework for understanding Innovation Strategy and for aligning the Innovation Strategy with the wider business. This is different from a significant number of other theses, articles and books in this domain, which tend to be highly focused on specific sections of the Innovation Strategy landscape.
3. The iSAM implementation framework provides a practical and logical approach for determining and improving innovation strategy alignment.

8.4 Future Research

A number of gaps in the iSAM and in the iSAM implementation framework were identified through the expert validation exercise and through the real life case study. These gaps provide an opportunity for future research to enhance these models. Future research could focus on:

1. Developing ways to adjust both iSAM and the implementation framework to cater for different company sizes, company types and industries. This was raised by one of the experts through the validation exercise, who suggested that the iSAM cannot be viewed

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independently from the environment and should be adjustable based on the industry type and company size (section 6.2.4.2 on page 107).

2. Empirical evidence to prove some of the defined relationships in the model. This should include evidence of the suggested interaction between innovation scope and a company's generic competitiveness strategy (*Table 12* on page 79).
3. Empirical evidence to prove the benefits of the iSAM for companies. This should include proof that functional integration and/or strategic fit in the context of innovation and business domain alignment is or is not important to the success of a company and the extent of this influence.
4. Improving some of the tools in the iSAM implementation framework in order to reduce the required subjectivity and complexity in some of the tools. This would include tools for the assessment of strategic fit (section 5.2.3 on page 91) and a tool for the selection of the dominant strategic alignment perspective (section 5.2.4 on page 93).

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10 Appendices

10.1 Appendix A: Innovation Strategy Literature Review Approach

The approach applied to ensure an adequate review of the Innovation Strategy literature is presented in this appendix. Three main sources where utilised to gather literature on this topic:

- Business Source Premier: An online database containing articles from 2871 academic journals going back to 1911
- Google Scholar: Googles online search engine, searching thousands of academic journals and books
- Mendeley: A reference manager and PDF organizer for publicly or privately sharing reading lists, references or full-text articles.

The following approach was followed in gathering and analysing the Innovation Strategy literature:

1. The full list of academic journals in the Business Source Premier online database was downloaded. (list of 2871 academic journals)
2. Google Scholar was then used to identify the top ten publications (in terms of visibility and influence of recent articles) in the Google Scholar sub-categories of Strategic Management (*Table 30*) and Entrepreneurship & Innovation (*Table 31*).
3. It was determined that 9 of the top 10 publications for Entrepreneurship & Innovation (*Table 31*) in Google Scholar were in Business Source Premier online database and 10 of the top 10 publications for Strategic Management (*Table 30*) were in Business Source Premier online database. This gave an indication that within the 2871 academic journals in Business Source Premier Database 95% of the most influential publications were available.

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Table 30: Top ten Google Scholar Strategic Management publications

Sub-Category: Strategic Management		In Business Source Premier
1	Academy of Management Journal	Yes
2	Journal of Management	Yes
3	Strategic Management Journal	Yes
4	Organization Science	Yes
5	Management Science	Yes
6	Journal of Management Studies	Yes
7	Journal of Business Research	Yes
8	Journal of Business Venturing	Yes
9	Academy of Management Review	Yes
10	Journal of Marketing	Yes

Table 31: Top ten Google Scholar Entrepreneurship & Innovation publications

Sub-Category: Entrepreneurship and Innovation		In Business Source Premier
1	Research Policy	Yes
2	Journal of Business Venturing	Yes
3	Entrepreneurship Theory and Practice	No
4	Technovation	Yes
5	Small Business Economics	Yes
6	Journal of Product Innovation Management	Yes
7	International Small Business Journal	Yes
8	Journal of Small Business Management	Yes
9	Entrepreneurship & Regional Development	Yes
10	R&D Management	Yes

4. Even though the Google Scholar list of top publications, gives a good indication of the most visible and influential recent articles, there were several well-known publications missing from the top ten list (*Table 32*).

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Table 32: Well-known Innovation publications missing from the Google top ten lists

Well-known Innovation publications missing from the Google top ten lists		In Business Source Premier
1	Economics of Innovation & New Technology	Yes
2	Enterprise & Innovation Management Studies	Yes
3	European Journal of Innovation Management	No
4	Harvard Business Review	No
5	Industry & Innovation	Yes
6	Innovation Journal International	Yes
7	International Journal of Innovation & Technology Management	Yes
8	International Journal of Innovation Management	Yes
9	International Journal of Management & Innovation	Yes
10	International Journal of Organizational Innovation	Yes
11	International Journal of Technology Management	Yes
12	Journal of Entrepreneurship & Innovation Management	Yes
13	Journal of Product Innovation Management	Yes
14	Journal of Technology Management & Innovation	Yes
15	Review of Management Innovation & Creativity	Yes

All of these journals accept the European Journal of Innovation Management and the Harvard Business Review are in the Business Source Premier database. These two journals were searched separately and the relevant articles included in the literature review.

5. Based on the inclusion of significant innovation and strategic management related academic journals in the Business Source Premier database and the alignment between the top ten publications list, in Google Scholar, and the publications in the Business Source Premier database, it was decided that an analysis of the journals in the Business Source Premier database and of the two major publications, not in the database, would provide an adequate review of the Innovation Strategy literature.
6. The Mendeley resource was investigated to determine if the database could contribute other references to the literature review. When searching across the entire database for the concept of Innovation Strategy 1954 results were returned. However, when the search is limited to peer reviewed articles and the time period 1980 to 2016 than 311 articles are returned. Furthermore on closer inspection of the list of articles many articles are returned several times in the search under slightly different names, with some articles appearing eight times in the search results. Due to these short comings and the significant overlap between articles in the Business Source Premier database and Mendeley, it was decided to not use the Mendeley database as part of the literature review.

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7. The literature review was divided into three time periods:
    a. 1900 – 1969: The first time period covered the work on the concept of Innovation Strategy between 1900 and 1969. Google Scholar was used to identify any reference to Innovation Strategy in academic journals and books over this time period. In total, 26 references were identified. However on closer inspection of each reference, it was determined that only six references genuinely either fell into this time period or had content related to Innovation Strategy. The other 20 references were falsely returned by Google Scholar or were duplicates.
    b. 1970 – 1998: Google Scholar was used to identify peer-reviewed research papers or published books from the period, which contained the term "Innovation Strategy" in the title. Of the 43 references returned approximately 35% focused on regional, national or industry wide Innovation Strategy, which is outside of the context of this dissertation. A further 20% did not actually have the term "Innovation Strategy" in their title and were therefore incorrectly returned by the search engine. A further 30% of the references discussed specific product, technology or marketing strategies and therefore were not addressing the concept of an Innovation Strategy as defined in this dissertation. 10% of the references presented empirical studies on the impact of Innovation Strategies on various company indicators. Two journal papers did touch on the concept of Innovation Strategy alignment, but dealt with a very specific alignment issue.
    c. 1999 – 2016: The final time period covered the work on the concept of Innovation Strategy between 1999 and 2016. The literature in the Business Source Premier database was reviewed for this time period (based on the reasons discussed in points 1-5). Two types of academic journal articles were included in the review. First articles that contained the term "Innovations Strategy" in the title and second articles which contained the term "Innovation Strategy" in the author supplied keywords. In total 177 relevant articles were identified (*Table 33*).

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Table 33: Relevant articles from Business Source Premier

	Number of Articles	
Years	**Title**	**Keywords**
1999-2001	2	1
2002-2004	7	4
2005-2007	14	15
2008-2010	24	22
2011-2013	24	23
2014-2016	26	15
Totals	**97**	**80**
	177	

8. The 177 journal articles identified for the period 1999 to 2016 were analysed and categorised into one of 16 categories based on the context in which the articles present the concept of Innovation Strategy. The results of this analysis are presented in *Table 34*.

Table 34 Categorisation of relevant journal articles from Business Source Premier

	Innovation Strategy Alignment	Impact of Innovation Strategy	Foreign Language	Global/Regional/ National/Industry	Specific Innovation	Specific Innovation Strategy	Innovation Survey	Innovation Creativity	**Totals**
1999-2001	1	0	0	0	0	0	0	0	**1**
2002-2004	0	5	1	1	0	0	0	1	**8**
2005-2007	1	7	1	8	3	0	0	0	**20**
2008-2010	7	6	2	8	2	9	0	0	**34**
2011-2013	0	8	3	12	6	5	0	0	**34**
2014-2016	3	5	3	10	1	0	1	1	**24**
Totals	**12**	**31**	**10**	**39**	**12**	**14**	**1**	**2**	**121**
	Impact on Innovation Strategy	Innovation Strategy Implementation	Innovation Capability	Innovation Benefits	Innovation Process	Business Strategy Innovation	Business Strategy	Technology	**Totals**
1999-2001	0	0	0	1	0	0	1	0	**2**
2002-2004	0	0	2	1	0	0	0	0	**3**
2005-2007	0	0	2	2	3	0	1	1	**9**
2008-2010	3	0	1	1	4	0	3	0	**12**
2011-2013	2	2	4	0	3	1	1	0	**13**
2014-2016	3	1	3	3	6	1	0	0	**17**
Totals	**8**	**3**	**12**	**8**	**16**	**2**	**6**	**1**	**56**
								Grand Total	**177**

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10.2 Appendix B: Questionnaire Sent to Panel of Experts

Validation Questionnaire	
Question 1: High-level structure: There are the four domains in iSAM: • Business Strategy • Business Infrastructure and Processes • Innovation Strategy • Innovation Infrastructure and Processes **Are these domains relevant and sufficient for the high-level structure of an innovation alignment model?**	Answer (Yes, Maybe, No):
Q1: If your answer is maybe or no please provide details:	
Question 2: Innovation Strategy Domain: There are three components of the innovation strategy domain: • Innovation scope • Innovation governance • Innovation capability **Are these three components sufficient and relevant to describe a company's innovation strategy?**	Answer (Yes, Maybe, No):
Q2: If your answer is maybe or no please provide details:	
Question 3: Innovation Scope: A description of a company's innovation scope has three categories: • Innovation type: Product, Process, Strategic • Innovation level: Radical, Incremental • Innovation impact: Disruptive, sustaining **Are these three categories sufficient and relevant to describe a company's innovation scope?**	Answer (Yes, Maybe, No):
Q3: If your answer is maybe or no please provide details:	

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Question 4: Relationships in Innovation Strategy: iSAM suggests that there are strong relationships that exists between the components in the innovation strategy domain. For example, if the answers to the **innovation governance** questions reveal the company wants to disrupt an industry and is supportive of high risk innovation then a higher level of **innovation capability** is required and the **innovation scope** will have a stronger focus on radical and disruptive innovation. **Is this a valid suggestion?**	Answer (Yes, Maybe, No):
Q4: If your answer is maybe or no please provide details:	
Question 5: Functional Integration: iSAM suggests that: • A company with a "first to market" grand business strategy should have a stronger focus on radical and disruptive product and/or strategic innovations, while **Is this a valid suggestions?**	Answer (Yes, Maybe, No):
Q5: If your answer is maybe or no please provide details:	
Question 6: Functional Integration: iSAM suggests that: • A company with a "cost reducer" grand business strategy should have a stronger focus (note: not total focus, but stronger focus) on process innovation and this innovation can range from incremental to radical and disruptive to sustaining **Is this a valid suggestions?**	Answer (Yes, Maybe, No):
Q6: If your answer is maybe or no please provide details:	
Question 7: Innovation Infrastructure & Process Domain: There are three components of the innovation infrastructure and process domain: • Innovation models and processes • Innovation systems • Innovation skills	Answer (Yes, Maybe, No):

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Are these three components sufficient and relevant to describe a company's innovation infrastructure and processes?	
Q7: If your answer is maybe or no please provide details:	
Question 8: Strategic Fit: iSAM suggests that a company's innovation models, processes, systems and skills should be aligned with the company's innovation scope, governance and capabilities (innovation strategy). **Is this a valid suggestion?**	Answer (Yes, Maybe, No):
Q8: If your answer is maybe or no please provide details:	
Question 9: Value of model: Does the innovation strategic alignment model (iSAM) add value to the field of innovation management? If you answer "yes" please also elaborate below.	Answer (Yes, Maybe, No):
Q9: If your answer is yes, maybe or no please provide details:	

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10.3 Appendix C: Populated KRNW

Disciplines and Skills	Organisations	Related Literature
• **Innovation Management** - Expert panellist 1 - Expert panellist 2 - Expert panellist 3 - Expert panellist 4 - Expert panellist 6 - Expert panellist 9 - Expert panellist 11 • **Strategy Management** - Expert panellist 4 - Expert panellist 7 - Expert panellist 10 • **Innovation Strategy** - Expert panellist 2 - Expert panellist 3 - Expert panellist 4 - Expert panellist 6 - Expert panellist 11 • **Strategic Alignment** - Expert panellist 3 - Expert panellist 10 • **Enterprise Engineering** - Expert panellist 1 - Expert panellist 7 - Expert panellist 8 - Expert panellist 10	• **Local Universities** - Expert panellist 1 - Expert panellist 4 - Expert panellist 6 - Expert panellist 7 - Expert panellist 8 - Expert panellist 9 - Expert panellist 10 • **International Universities** - Expert panellist 2 - Expert panellist 3 - Expert panellist 11 • **Innovation consulting companies** - Expert panellist 1 - Expert panellist 3 - Expert panellist 6 - Expert panellist 9	• **Papers in relevant peer-reviewed journals** - Expert panellist 1 - Expert panellist 2 - Expert panellist 3 - Expert panellist 4 - Expert panellist 6 - Expert panellist 7 - Expert panellist 8 - Expert panellist 9 - Expert panellist 10 - Expert panellist 11 • **Contribution to innovation management books** - Expert panellist 1 - Expert panellist 2 - Expert panellist 3 - Expert panellist 4 • **Involved in PHD Dissertation's on innovation** - Expert panellist 1 - Expert panellist 2 - Expert panellist 3 - Expert panellist 4 - Expert panellist 6 - Expert panellist 8 - Expert panellist 9 - Expert panellist 10 - Expert panellist 11

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10.4 Appendix D: Knowledge & Experience of Selected Experts

Expert Panellist 1: Currently a Commercial and Marketing strategist. Previously Business Engineering Services Manager in Innovation Consulting company and Consulting Manager in leading research company. Earlier was researcher at research institute for Innovation Management and Enterprise Design. His PhD dissertation topic was innovation maturity models and capability. Contributing editor to Innovation Management.se

Expert Panellist 2: Currently Associate Professor in Management of Product Development. Specialities include Packaging Design & Management, Knowledge & Information Management and Virtual Reality. Published peer-reviewed papers on knowledge management and leveraging unstructured information to support innovation processes. Has played a prominent role in the development of virtual reality design labs for innovation. Over 23-years' of research experience in the fields of product design and innovation.

Expert Panellist 3: Currently Chief Innovation Officer (CIO) at a management-consulting company which focuses on strategy, innovation, operational excellence and change leadership. Has more than a decades experience in helping clients in-source creativity and increase organic growth potential. Previously held positions as a Chief Operations Officer, Master Black belt and Chief Engineer. Has published several books peer-reived articles on Innovation Management, Innovation Strategy for engineering design and Lean Six Sigma.

Expert panellist 4: Currently Professor and Head of the Department at leading South African tertiary institution. Previously was Vice Rector for Research.

Expert Panellist 5: Agreed to participate but did not complete and return the questionnaire due to lack of available time.

Expert Panellist 6: Currently is a Business Improvement Specialist. Is a Lean Six Sigma black belt and has extensive experience in process optimisation, project management, customer experience design and innovation management. Previously was Business Improvement Manager and Senior Manager for Process Innovation at leading management consulting companies. Holds a Master's degree in Technology Management and is currently studying towards a PhD with a focus on Open Innovation.

Expert panellist 7: Agreed to participate but did not complete and return the questionnaire. Reason unknown.

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Expert Panellist 8: Did not agree to participate due to limited availability.

Expert Panellist 9: Did not agree to participate due to limited availability.

Expert panellist 10: Currently the Automotive Advisor for a major defence and space company. Previously played the role of Vice President responsible for New Product Development in the same industry and prior to that was a Director of Engineering, QA and IT. Has played a significant role in the design, development and technology strategy of several high-tech vehicles and is currently completing a PhD in Industrial Engineering.

Expert panellist 11: Currently is the Innovation Manager and Senior Consultant at a leading international management consulting company. He is an ECQA Certified Innovation Manager and Trainer with a PhD in Mechatronics. Previously was the Program Manager Innovation on a multi-national research project and prior to that was the Innovation Manager for a leading automotive manufacturer.

10.5 Appendix E: Results of Validation Exercise

	Expert 1	Expert 2	Expert 3	Expert 4	Expert 6	Expert 10	Expert 11	Yes	Maybe	No
Question 1: High-level structure: There are the four domains in iSAM: • Business Strategy • Business Infrastructure and Processes • Innovation Strategy • Innovation Infrastructure and Processes **Are these domains relevant and sufficient for the high-level structure of an innovation alignment model?**	Yes	maybe	Yes	yes	yes	No	Maybe	4	1	2
Question 2: Innovation Strategy Domain: There are three components of the innovation strategy domain: • Innovation scope • Innovation governance • Innovation capability **Are these three components sufficient and relevant to describe a company's innovation strategy?**	Maybe	maybe	maybe	yes	yes	No	Yes	3	3	1
Question 3: Innovation Scope: A description of a company's innovation scope has three categories: • Innovation type: Product, Process, Strategic • Innovation level: Radical, Incremental • Innovation impact: Disruptive, sustaining **Are these three categories sufficient and relevant to describe a company's innovation scope?**	Yes	No	maybe	yes	yes	Maybe	Maybe	3	3	1
Question 4: Relationships in Innovation Strategy: iSAM suggests that there are strong relationships that exists between the components in the innovation strategy domain. For example, if the answers to the **innovation governance** questions reveal the company wants to disrupt an industry and is supportive of high risk innovation then a higher level of **innovation capability** is required and the **innovation scope** will have a stronger focus on radical and disruptive innovation. **Is this a valid suggestion?**	Yes	maybe	Yes	yes	maybe	yes	Yes	5	2	0
Question 5: Functional Integration: iSAM suggests that: • A company with a "first to market" grand business strategy should have a stronger focus on radical and disruptive product and/or strategic innovations, while **Is this a valid suggestions?**	Maybe	yes	yes	yes	maybe	Maybe	Yes	4	3	0
Question 6: Functional Integration: iSAM suggests that: • A company with a "cost reducer" grand business strategy should have a stronger focus (note: not total focus, but stronger focus) on process innovation and this innovation can range from incremental to radical and disruptive to sustaining **Is this a valid suggestions?**	Maybe	maybe	yes	yes	yes	yes	Maybe	4	3	0
Question 7: Innovation Infrastructure & Process Domain: There are three components of the innovation infrastructure and process domain: • Innovation models and processes • Innovation systems • Innovation skills **Are these three components sufficient and relevant to describe a company's innovation infrastructure and processes?**	yes	yes	yes	yes	maybe	yes	Maybe	5	2	0
Question 8: Strategic Fit: iSAM suggests that a company's innovation models, processes, systems and skills should be aligned with the company's innovation scope, governance and capabilities (innovation strategy). **Is this a valid suggestion?**	Yes	yes	yes	yes	yes	yes	Yes	7	0	0
Question 9: Value of model: Does the innovation strategic alignment model (iSAM) add value to the field of innovation management? If you answer	yes	yes	yes	yes	yes	yes	Maybe	6	1	0
Yes	6	4	7	9	6	5	4			
No	0	1	0	0	0	2	0			
Maybe	3	4	2	0	3	2	5			

10.6 Appendix F: Qualitative Feedback from Panel of Experts

Question 1: High-level structure: There are the four domains in iSAM: · Business Strategy · Business Infrastructure and Processes · Innovation Strategy · Innovation Infrastructure and Processes **Are these domains relevant and sufficient for the high-level structure of an innovation alignment model?**	These four pillars cover pretty well the process and business dimension of innovation. They are quite complete in this respect. However, where is the human dimension situated? – Creativity, Motivation, Networking, Diversity, working time officially granted for being innovative (outside the context of customer projects), Open-Mindedness, etc. From my experience, this is a decisive dimension for establishing a true INNOVATION CULTURE, an ecosystem where Innovation can prosper, with the own employees as the main drivers and creative resources. Where would you situate the time dimension in this model? – Innovative organizations not only learn continuously overt time, but they also learn to UNLEARN (Ex-novation). The best processes are ineffective without the right culture. I always compare with nature: the idea is the seed. The processes are the way to procure the seed and to grow it. The culture, however, is the soil in which the plant shall grow from the seed…	At the highest level, the four domains will be sufficient; they are certainly relevant. However, even at the high-level structure, I can imagine that an iSAM cannot completely be isolated from its environment (branches, type of product [service, capital good, fmcg], number of customers, position in the typical supply chain). Taken into account (or mentioning it explicitly) the context of the iSAM, some of the relations between the entities in the model might be exploited more efficiently. In other words: the four domains seem sufficient, yet embedding in its context might be beneficial.	The consideration of technology and product (knowledge) development interaction with ISAM can also be considered	Although I answered Yes, I would have preferred Infrastructure and Processes separated out	Interesting enough - Prof Wim Vanhaverbeke who is well known for Open Innovation in SMEs is focusing a lot on the importance of business strategy and innovation strategy alignment these days, so very topical.
Question 2: Innovation Strategy Domain: There are three components of the innovation strategy domain: · Innovation scope · Innovation governance · Innovation capability **Are these three components sufficient and relevant to describe a company's innovation strategy?**	My response is much closer to 'Yes' than 'Maybe', but 'Yes' is unfortunately an absolute in this scale. What initially caught my eye (rather didn't catch it) was the term objective. I.e. what is the objective for innovation. This might be because I actually read the questions before proceeding to the video. With watching the video + reading the paper I did conclude that this is sufficiently covered in Innovation Governance - specifically the 'why' of innovation.	Obviously, these three are the most relevant components; at the same time, however, I'm not sure if you see capacity required/available as part of capability. This does not directly address the number of individuals involved, but rather the 'inertia' related to different scopes/capabilities. Some strategies require other magnitudes of efforts than others, which might be	Strategy also implies direction, a vision defining the required end state as well as the mission (how to get there)	Innovation maturity is also important for me, but you include that in your innovation capability, so it is covered.	I am not sure of you got the category names correct. I agree with your overall concept and the underlying themes.

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		directly related to e.g. the business scope.			
<u>Question 3: Innovation Scope:</u> A description of a company's innovation scope has three categories: · Innovation type: Product, Process, Strategic · Innovation level: Radical, Incremental · Innovation impact: Disruptive, sustaining **Are these three categories sufficient and relevant to describe a company's innovation scope?**	Innovation type : 1) Service is missing. Service Innovation is a strongly growing field that has been outperforming product innovation for a few years already. Companies need innovation strategies aiming at providing added-value solutions rather than individual products and non-value adding services such as maintenance, spare parts, etc. Example: sell number of copies per month rather than a photocopier (Xerox), km rather than tires (Michelin fleet solutions), connectivity instead of smartphones, mobility instead of cars, etc. 2) Business Model is missing. Business Model Innovation is considered to have an extremely high potential in the years to come, as most existing business models are based on only about 50 basis business model patterns (Gassmann).	I think you just need to be careful that it doesn't come across as an either or scenario for these. A company can have a continuum of innovation level for instance or an innovation portfolio which may include various types of innovation and levels of innovation (think about a company like Google for instance - they continually improve Google search and Gmail, yet also develop driverless cars at the same time).	Consider tactical (positioning).	In 'Innovation type' I would also include Product Portfolio as a meta-level of product. Reason: a portfolio has a different strategic content than a product or ('accidental') group of products.	Innovation Type: Product and Process makes sense to me. What does strategic innovation type mean? I think what is more relevant may be "Business Model". Business model innovation captures everything else beyond product and process. It includes brand innovation, revenue model innovation, channel innovation, partnership innovation and many more. Is this what you meant by strategic innovation.
<u>Question 4: Relationships in Innovation Strategy:</u> iSAM suggests that there are strong relationships that exists between the components in the innovation strategy domain. For example, if the answers to the **innovation governance** questions reveal the company wants to disrupt an industry and is supportive of high risk innovation then a higher level of **innovation capability** is required and the **innovation scope** will have a stronger focus on radical and disruptive innovation. **Is this a valid suggestion?**	Some companies want to disrupt an industry (and succeeds) but I don't think they always have a high level of innovation capability (if capability also includes maturity). If it is a start-up company for instance, then they may be able to disrupt, but not necessarily repeat that ability, unless they then put in place higher innovation capability. There is definitely an interplay, but sometimes innovation success can be considered by a company not to be an innovation focus vs business focus, but just 'the way how they do things'. There is no conscious differentiation between 'now we innovate' and 'now we do business'. They see it as the same thing - especially high-tech companies these days.	This is a typical situation where I would also include innovative Capacity next to capability.			

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Question 5: Functional Integration: iSAM suggests that: · A company with a "first to market" grand business strategy should have a stronger focus on radical and disruptive product and/or strategic innovations, while **Is this a valid suggestions?**	I believe that this is a fair statement and perfectly acceptable to make if it were correct 80% of the time, which it likely is. But, we do not have the data to support this of course - thus the 'Maybe'. Its also a little of the previously mentioned scale problem of 'Yes' representing an absolute. In Likert scale terms it would be 'Agree' or 4/5.	You can also be first to market with adjacent innovation, which is not disruptive blue ocean, but still enough to be new for consumers. So it is a case of being just one step ahead of the competition (Virgin often does this).	It HAS TO have that!, as the amount of innovators and early adopters on the market is only about 16% (Roger's curve).	Other grand strategies like growth will have similar focus on radical and disruptive innovations.	
Question 6: Functional Integration: iSAM suggests that: · A company with a "cost reducer" grand business strategy should have a stronger focus (note: not total focus, but stronger focus) on process innovation and this innovation can range from incremental to radical and disruptive to sustaining **Is this a valid suggestions?**	Here, I tend to think that 'cost reducer' and 'high risk avoidance' are not mutually independent. This might imply that 'disruptive' and 'radical' are less likely to be connected to 'cost reducer' than 'incremental' and 'sustaining'. So, this suggestion is valid, but for me not encompassing.	Cost reducer would normally be process innovation focused (improve how we do things).	There could also be a potential in business model innovation.	Yes, absolutely (unless business strategy needs a complete makeover)	
Question 7: Innovation Infrastructure & Process Domain: There are three components of the innovation infrastructure and process domain: · Innovation models and processes · Innovation systems · Innovation skills **Are these three components sufficient and relevant to describe a company's innovation infrastructure and processes?**	Where would you situate is the innovation environment/facilitators ? (for creativity, prototyping, intrapreneurship, etc.) What about Innovation incentives (competitions, rewards, etc.)	Just a quick note: Innovation Systems I found a little thinly defined in the paper.	Where would you put something like innovation culture? If covered in one of the categories, then yes	Yes, this is the model we use with large clients. Life cycle processes Infrastructure and processes Human talent	
Question 8: Strategic Fit: iSAM suggests that a company's innovation models, processes, systems and skills should be aligned with the company's innovation scope, governance and capabilities (innovation strategy). **Is this a valid suggestion?**	For sure				

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<u>Question 9: Value of model:</u> Does the innovation strategic alignment model (iSAM) add value to the field of innovation management? If you answer "yes" please also elaborate below.	Similar approached to structure innovation and innovation management exist. They all help to give a structure to this wide and complex topic, and therefore serve as management support tools. The ISAM is consistent and quite complete. As with all similar models however, they are only as good and useful as the reliability and consistency of the values assigned to each proposed dimension. Who decides them? How to assure the appropriate level of objectivity/subjectivity? Whom to involve and how to consolidate the results, etc. You may have an interest to cross-check with the rather new ISO/TC 279 Innovation management standard. If you want to use ISAM on the market, customers might be interested how far ISAM is aligned with this new standard. This analysis might also be relevant for your thesis.	My comment preceding the questionnaire section also refers. But again, with greater context gleaned from the paper, I believe that the structure (as shown in this first round of questions) AND the mechanic offered to resolve alignment gaps (process + project types) is a great contribution. Alignment issues are generally spoken of often (in businesses at least) - and especially in aligning an ambition to innovate with the business as usual. This work then, I believe, offers a novel contribution to solving this.	It provides a structured way to assess and align business strategy with innovation strategy. Innovation should not be an ad hoc process, but should be designed to achieve the business's strategic objectives. I am not sure if this is addressed in your thesis, but what would the effect be of company size when using the model, especially for small and macro organisations? Will it still be applicable and easy to use?	The iSAM will add to the insights of integrating innovation into a business.	Yes, because the iSAM (finally) brings (a) structure to the field of innovation management that seems to be able to function as a foundation for adequately addressing processes/tools/techniques connected to the different domains/entities in the field. For me the most added value is in this targeted structuring, giving different roles/departments/functions in a company the opportunity to understand what relations are belaboured and which changes can be assumed to be interconnected.

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	The model does indeed add value, especially since the concept of innovation has become somewhat of a fashion term ("modewoord") for many companies and company executives and spokespersons - it is a capability you are supposed to have, and therefore you profess to having it even if you do not have it. For many, it seems to be an element of positioning, rather than execution. The iSAM model provides a robust framework that enables the company to think separately about what it is and wishes to be, on the one hand, and what innovation is and how it should be executed, on the other hand. The model does require people in the company to have a good understanding of what both the business structures and processes, and innovation, involve, and then to follow the logic of fit ... and the required adaptations.	Completely agree. This is a major contribution to the field of innovation management. I have spent a major portion of my consulting career in the field of innovation management. You have uncovered many missing pieces of the puzzle to make innovation predictable, scalable and sustainable. Congratulations on the success of a very difficult undertaking!!			

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10.7 Appendix G: Questions for Project Categorisation

The following questions were asked for each project, based on the projects assigned category (P1 to P6).

Projects 1: Check P1 aligned with BS

- Is project aligned with Product-Market Offering?
- Has project been approved at correct governance level?
- Is Project aligned with distinctive business competency?

Projects 2: Check P2 aligned with BI&P

- Is the project changing the support functions activities aligned to BS (if support function project)?
- Is the project upskilling/acquiring the appropriate competencies/knowledge (if competency development project)?
- Is the project changing business processes aligned to BS (if process project)?

Projects 3: Check P3 aligned with BS and IS

- Is project aligned with Product-Market Offering?
- Has project been approved at correct governance level?
- Is Project aligned with distinctive business competency?
- Is project aligned with innovation type, level & impact?
- Has the project been approved by the correct innovation governance structures?
- Is the project aligned with key innovation governance decisions?
- Does the company have the appropriate innovation maturity level to execute the project?

Projects 4: Check P4 aligned with new and BI&P

- Is project aligned with innovation type, level & impact?
- Has the project been approved by the correct innovation governance structures?
- Is the project aligned with key innovation governance decisions?
- Does the company have the appropriate innovation maturity level to execute the project?
- Is the project changing the support functions activities aligned to BS (if support function project)?
- Is the project upskilling on the appropriate competencies (if competency development project)?
- Is the project changing business processes aligned to BS (if process project)?

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Projects 5: Check P5 aligned with II&P

- Is project implementing the appropriate innovation model and processes (if process project)?
- Is the project implementing the appropriate innovation system (if systems project)? Is the project upskilling on the appropriate innovation skills (if skills development project)?

Projects 6: Check P6 aligned with IS

- Is project aligned with innovation type, level & impact?
- Has the project been approved by the correct innovation governance structures?
- Is the project aligned with key innovation governance decisions?

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10.8 Appendix H: Documents Used for Understanding Business and Innovation Domains (step1)

The following documents were used for step 1 in each "point in time" analysis:

1. Company mission, vision and values presentation
2. Annual goals and objectives spreadsheet
3. Product catalogue
4. Product training material
5. Product description presentations
6. Various marketing documents and presentations
7. Funding and commercial project proposals
8. Company new employee induction material
9. Detailed company organogram
10. Detailed company competency framework
11. Monthly Senior Management team progress reports

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10.9 Appendix I: Example Questions and Answers: Case Study Analysis One

Table 35: High-level Description of the iSAM Domains for the Case Study Target Company

1. Business Strategy	
1.1 Business Scope	
What is the company's target market?	Government departments in developing countries, international funding organisations, companies looking to do business with governments in developing countries.
Which markets does the company serve with which products/services?	Consulting services and technical assistance to government departments and funders in order to strengthen strategic and operational systems. Consulting services on market identification, relationship management and regulatory affairs to companies looking to do business with governments in developing countries.
1.2 Business Governance	
What are the key business principles by which the company is run?	• Social entrepreneurship • Data driven approach • Scalable and sustainable solutions • Partner with governments and funders in order to ensure capacity building • Blend private and public sector approaches, skills, knowledge and finances in order to bring the two sectors closer and significantly improve public sector service delivery
What forums or oversight functions exist to ensure these principles are adhered to?	Advisory board provides oversight of strategic positioning and long-term direction. Technical review committee (TRC) ensures new projects and products adhere to key business principles. Management committee and Operations committee ensures the smooth operations and strategic and tactical decision making.
1.3 Distinctive Competencies	
What are the company's distinctive competencies?	Global network and reach along with local understanding of how government services are delivered on the ground. Able to operate in both the public and private sectors.
Why do these competencies give the company a competitive advantage?	Able to deliver services to the public sector through, the various funding channels, using private sector approaches and skills. Able to add value to private sector through the knowledge and relationships developed in the public sector. Able to identify opportunities for public/private partnerships and bring prospective partners together.
Which strategy best describes the company's generic strategy? (first to market, cost reducer, niche, niche/cost reducer)	To date the company has strived to follow a first to market generic strategy, attempting to be seen as leaders in their field by being the first to introduce a solution or to follow a novel approach.

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2. Innovation Strategy	
2.1 Innovation Scope	
What is the desired blend between: • product, process and strategic innovation with in innovation type • incremental and radical innovation with in innovation level • sustaining and disruptive innovation with in innovation impact	Based on previous innovations the company has typically had a blend of the following: • Type: Strong product, medium strategic, weak process • Level: Medium radical, medium incremental • Impact: Medium sustaining, medium disruptive
2.2 Innovation Governance	
Are there formal innovation governance forums or structures?	No formal innovation governance forums or structures exist in the company. There are no formal decision making criteria by which to prioritise and select innovations.
Answer the following innovation governance questions: 1. What is the purpose of innovation in the company? 2. Where does the company look for innovation? 3. How much innovation does the company target (company's appetite for risk)? 4. How can the company innovate more effectively? 5. Who are the main internal and external innovation role-players, what is their role? 6. Who is responsible for innovation?	1. To develop solutions for complex and long standing government system issues and to provide the company with a competitive edge in both the commercial and funding environments 2. Top down innovation mainly comes from the founders of the business. Bottom up innovation is limited to a few teams mainly in the Research & Development department 3. In the past the company has taken on significant innovations and does seem to have an appetite for risk 4. A formalisation of the innovation activities will allow structures, systems and resources to be established, which could support the selected innovation model. Currently the innovation activities are ad-hoc and uncoordinated. 5. The founders play a leading role in initiating innovations in the company. Several individuals are most commonly pulled into these innovations, but this often puts pressure on the current operations. There are no specific external innovation role-players. 6. Although the founders are the main drivers of innovation, there is no specific, formalised responsibility for innovation in the company.
2.3 Innovation Capabilities	
What innovation capability maturity level best describes the company: • unaware of innovation • innovation is defined • innovation is controlled • innovation is integrated • total innovation synergies	Unaware of innovation. Although innovation is communicated as an important part of the competitive advantage and culture of the company, there is no formalisation of innovation to a point where the understanding of the term innovation is not always clear.
Which are the two strongest and the two weakest innovation capability	• Strengths: Environment & climate, leadership • Weaknesses: Portfolio management, process control and risk management

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requirements as defined in table 1 and why?	
3. Organisational Infrastructure and Processes	
3.1 Administrative Infrastructure	
What is the high-level structure of the company? (flat, deep, matrix)	Standard hierarchical structure, which is three to four (in some departments) layers deep, with most managers overseeing five to ten staff members.
What are the different levels and entities in the company? (Management levels, departments, teams etc.)	Departments are divided into teams. Teams are generally managed by a team manager and are divided into sub-teams, which are managed by team leads.
How do the support functions connect to the operational functions? (centralised, decentralised)	HR, finance and legal support functions are centralised and support all departments.
3.2 Business Processes	
Are the business processes well defined and are they integrated across different company departments?	There is a well-defined, high-level operating model, which includes the high-level business processes, report structures, forum and committee structures and approval processes. Roles and responsibilities of each team and each role in a team are well defined, however there is a lack of detail when it comes to describing the integration of the different teams' efforts.
3.3 Business Skills	
Does the company have a detailed competency framework?	Yes, a competency framework consisting of five dimensions and 40 relevant competencies is used in the company.
Are there development plans in place at an individual employee level?	The structures are in place, which guide the how and when individual development plans should be developed. However, these are not developed for most teams mainly due to a lack of prioritisation of individual development in the company.
Are there key business skills which are deemed to be missing internally in the company?	The company struggles in a number of areas due to insufficient skills. These skills may be prevalent in some teams but missing in others. They include, but are not limited to, results focused, communication, business acumen, developing people and analytical thinking.
4. Innovation Infrastructure and Processes	
4.1 Innovation Model	
Based on the innovation archetypes as described in table 3, which	Visionary leadership

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archetype best describes the company's innovation model? • Marketplace of ideas • Visionary leadership • Systematic innovation • External collaborative innovation	
Briefly describe the model used in the company.	Generally large innovations are triggered and driven by the founders of the business. More incremental innovations do happen at a team level, but there is no formal bottom up innovation management process.
4.2 Innovation Processes	
Which innovation processes formally exist in the company? • Explore and converge • Portfolio management • Consolidate and exploit • Process control and risk management	No formal innovations processes exist in the company.
4.3 Innovation Skills	
Are specific innovation competencies defined in non-innovation specific roles, do they exist in eth overall competency framework?	There are several innovation related competencies in the overall company competency framework. These include: adaptability, dealing with ambiguity, innovative thinking, problem solving and initiating innovation. However, managers select around ten of the competencies for as specific role and the innovation related competencies are not often selected for the more operational type roles.
What are the competencies defined for innovation specific roles, do they exist in the overall competency framework?	There are no innovation specific roles in the company.
Are there specific innovation competency improvement activities, which the company has undertaken?	No

10.10 Appendix J: New Concept Alignment Template for Case Study Company

	Concept Information	
1	**Concept name**	
2	**Concept description (max 100 words)**	
3	**Who are the end users?**	
4	**How does this concept create a raving fan culture? (max 100 words)**	
5	**Name five organisations who would find this concept valuable**	
a		
b		
c		
d		
e		
6	**Plot Level of Effort vs Potential ROI (place X in the appropriate cell)**	

		Rate Level of Effort										
	Rate Potential ROI						**Very High**					
							4					
							3					
							2					
							1					
		> 5pm	**>4.5pm**	**>4pm**	**>3.5pm**	**>3pm**	**-**	**>2pm**	**>1.5pm**	**>1pm**	**>0.5pm**	**>0pm**
							-1					
							-2					
							-3					
							-4					
							Very Low					

7	**Proposed delivery time (Year and Quarter)**	
8	**Will this concept align with the following strategic perspectives?**	Yes/no
	First to market: (Does this concept improve our chances of being the first to release something new into the market?)	
	Rapid follower: (Does this concept assist us to quickly replicate what someone else has already	
	Cost reducer: (Will this concept reduce the internal cost of doing business?)	
	Niche player: (Does this concept give us a competitive advantage in a highly specialised branch of	
9	**Will this concept benefit the following ponds?**	Yes/no
	NGO	
	Government	
	Donor	
	Innovation (private health sector)	
	Other	
	Not a whole pond only one specific company	
10	**Will this concept benefit the following product/service offerings?**	Yes/no
	Analytics platform	
	Workflow Management Tools	
	Professional services	
	Data labs	
11	**What level of Innovation is required for this concept?**	Yes/no
	Will this concept introduce a small incremental change to our product offering?	
	Will this concept introduce a large radical change to our product offering?	

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10.11 Appendix K: Practical Implementation Guide for iSAM

1. Introduce the concept of Innovation Strategic Alignment and iSAM to the company's executive committee.
    - **Person/s Responsible:** Company's Innovation Champion maybe supported by an Innovation Consultant.
    - **Appropriate Forum/s:** Regular executive meetings or ad-hoc executive meeting on innovation.
    - **Description of Activity:** Prior to the meeting of the executive team the Company's Innovation Champion should try determine the potential level of support or resistance s/he may experience. S/he should try secure buy-in by engaging with individual members of the executive team. At the executive session the Innovation Champion would introduce the executive team to the concepts of Innovation Strategy, innovation strategic alignment and the iSAM and the potential benefits for the Company.
    - **Tools/Material Required:** A well-crafted presentation explaining these concepts and the benefits to the company.
2. Identify project team to drive initial application of iSAM in the company.
    - **Person/s Responsible:** Company's Innovation Champion.
    - **Appropriate Forum/s:** N/A.
    - **Description of Activity:** The Company's Innovation Champion should identify specific individuals to assist her/him with the initial application of iSAM in the Company. These individuals should be selected based on their knowledge of the company, their influence in the company and their passion and/or understanding of innovation. Once these individuals have been identified, the Champion needs to secure a portion of their time to work on the application of iSAM. This may require reprioritising some of their work and will therefore most likely need high-level support.
    - **Tools/Material Required:** N/A
3. Hold kick-off meeting with project team.
    - **Person/s Responsible:** Innovation Champion.
    - **Appropriate Forum/s:** Project kick-off meeting.
    - **Description of Activity:** The aim of the project kick-off meeting is two-fold. First the selected project team needs to be brought up to speed with iSAM and the implementation framework. Second, the initial application of iSAM in the company

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needs to be planned. This planning will include defining activities, timelines and roles and responsibilities. In the kick-off meeting future project meetings are agreed to and scheduled.

- **Tools/Material Required:** Presentation and other material explain the iSAM and the implementation framework. A project management tool or Excel can be used to capture the detailed project plan.

4. Project team members conduct initial assessment of business and innovation strategy and infrastructure (step 1 of iSAM implementation framework).
    - **Person/s Responsible:** Responsible person in project team will drive this activity.
    - **Appropriate Forum/s:** N/A.
    - **Description of Activity:** The project team conducts an assessment of the Company's business and innovation strategies and infrastructure and processes. This is assessment is conducted through analysis of key company documents and if required interviews with the appropriate company staff. The aim of this activity is to complete the questions presented in Appendix I.
    - **Tools/Material Required:** The list of appropriate company documents are presented in Appendix H and the list of questions that need to be answered for the assessment are presented in Appendix I.
5. Project team members assess company's current strategic fit and functional integration alignment (steps 2 and 3 of iSAM implementation framework).
    - **Person/s Responsible:** Responsible person in project team will drive this activity
    - **Appropriate Forum/s:** Project team alignment workshop.
    - **Description of Activity:** Using the information gathered in the assessment above, the project team have to come to a conclusion regarding the levels of alignment from both a strategic fit and functional integration perspective. This is best achieved through a series of workshops, where the project team unpack the information from the assessment.
    - **Tools/Material Required:** These tools do yet exists, but are required to reduce the subjectivity of this step.
6. Internal champion presents results of alignment assessment to company's executive committee and agree on way forward (either step 4a or step 4b of iSAM implementation framework).
    - **Person/s Responsible:** Innovation Champion.

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- **Appropriate Forum/s:** Regular executive team meeting.
- **Description of Activity:** The Innovation Champion presents the results of the alignment assessment, conducted by the project team and based on the iSAM implementation framework presents recommendations and attempts to achieve agreement on the next steps for the company.
- **Tools/Material Required:** Presentation of results of the assessment along with recommendations for next steps.

7. If step 4b is selected, the project team members analyse current projects to determine if alignment will be maintained and then jump to step 10 of this practical guide (step 4b of iSAM implementation framework).
    - **Person/s Responsible:** Responsible person in project team drives this activity.
    - **Appropriate Forum/s:** Either project team meetings or workshops where the projects are analysed
    - **Description of Activity:** The portfolio of current and planned projects is analysed to ensure they will maintain the alignment which was determined through the earlier assessment. The projects are analysed and categorised using a series of questions, which the project team members have to answer in order to assess a project.
    - **Tools/Material Required:** Project questions in Appendix G.
8. If step 4a is selected, the project team members determine the appropriate dominant strategic alignment perspective (step 4a of iSAM implementation framework).
    - **Person/s Responsible:** Responsible person in project team drives this activity.
    - **Appropriate Forum/s:** Project team meeting.
    - **Description of Activity:** The project team needs to decide which strategic alignment perspective is most appropriate for the company. They should be guided the analysis of the company's strategic documents and the explanation in section 5.2.4 on page 93.
    - **Tools/Material Required:** N/A.
9. Based on the selected dominant strategic alignment perspective one of three change pathways are selected and followed (either step 5a, step 5b or step 5c of iSAM implementation framework).
    - **Person/s Responsible:** Responsible person in project team drives this activity.
    - **Appropriate Forum/s:** N/A.

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- **Description of Activity:** Three change pathways have been described, each for a different strategic alignment perspective. Once the appropriate strategic alignment perspective is decided the project team needs to follow a set of well-defined steps, which are described in section 5.2.5. The end result of this analysis is a set of recommendations for how the company can move from its current state of alignment to a future more aligned state.
- **Tools/Material Required:** The three change pathways described in Figure 22, Figure 23 and Figure 24 on pages 96, 98 and 100 respectively.

10. Internal champion presents results to executive management team with the aim of securing approval for implementation of recommendations and to move forward with operationalising iSAM into the company's operational model.
    - **Person/s Responsible:** Innovation Champion.
    - **Appropriate Forum/s:** Regular executive team meetings.
    - **Description of Activity:** The internal champion presents the recommendation, which were determined by the project team through the change pathways, to the executive committee. These recommendations may include stopping some current or planned projects, adjusting or changing the business or innovation strategy and/or adjusting or changing business or innovation infrastructure and processes.
    - **Tools/Material Required:** Presentation of the recommendations and the reasoning behind each recommendation based on the recommendations presented in section 7.3.1.6 on page 124.
11. Internal champion and project team implement recommendations along with appropriate teams in the business.
    - **Person/s Responsible:** Project team and appropriate teams in the business
    - **Appropriate Forum/s:** Project team meetings and standard business team meetings
    - **Description of Activity:** Depending on which recommendations are approved by the executive team, the Innovation Champion would need to assemble an implementation team whose responsibility it is to implement the recommendations. This team should include members of the original project team and members of the business areas affected by the recommendations. The initial task would be to develop a project plan including sub-projects, activities, timelines, budgets, communication plans, risk plans etc.
    - **Tools/Material Required:** Very much dependent on recommendations.

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12. Project team monitors implementation and take actions to operationalise iSAM.
    - **Person/s Responsible:** Implementation project team.
    - **Appropriate Forum/s:** Project team meetings.
    - **Description of Activity:** Follow standard project management processes to ensure project is executed as planned. Adjust project plans as required and maintain appropriate communication with all key stakeholders, including the executive team. From an operationalisation perspective, the Innovation Champion should establish an annual calendar of activities which should ensure the ongoing innovation alignment of the company.
    - **Tools/Material Required:** N/A.