

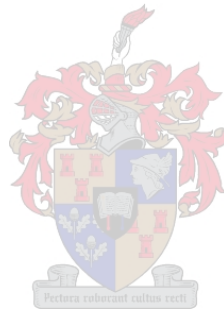
# Fighting change with change:

A methodology for re-engineering an enterprise

by

Jonathan du Preez

Thesis presented in partial fulfilment of the requirements for the degree of  
MSc.Eng (Engineering Management) at Stellenbosch University



Corne Schutte

March 2012

By submitting this thesis, I declare that the entirety of the work contained therein is my own, original work, that I am the authorship owner thereof (unless to the extent explicitly otherwise stated) and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

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## Abstract

The environment within which most organisations operate is ever-changing. In such a dynamic environment the only way an organisation is able to not just survive but thrive is by continuously, effectively and efficiently transforming/re-engineering itself (Hammer & Champy, 2001). Luckily, many organisations have realised and accepted this fact. The problem, however, is that the majority of transformation initiatives, launched by organisations, are unsuccessful. In fact, according to (Blanchard K. , 2010), 70% of change initiatives fail. There can only be two possible reasons for the existence of this very serious problem. Organisations either implement the wrong kinds of change initiatives or they ineffectively manage and execute the transformation efforts that they initiate. To solve this problem, an organisation needs to make use of a structured and integrated enterprise engineering methodology that enables it to effectively manage and execute the right kind of change initiatives (Martin, 1995).

In the literature that was reviewed, very few structured and integrated enterprise engineering methodologies were found to exist. The objective of this study was to bridge this research gap. In other words, the objective of this study was to develop a structured and integrated enterprise engineering methodology.

Developing the enterprise engineering methodology was done by following a basic system engineering process consisting of the following four steps: requirements analysis, system design, system development and system validation. During the requirements analysis step the functional characteristics that the enterprise engineering methodology needed to possess were identified. The purpose of the system design step was to firstly identify the set of methods that the enterprise engineering methodology should consist of and secondly to determine how these methods fit together to form an integrated methodology. The purpose of the system development step was to describe each of the methods that the enterprise engineering methodology needed to consist of in terms of how it is utilised as well as who should be involved during its utilisation. Lastly, during the system validation step the enterprise engineering methodology was evaluated based on how well it satisfies its functional requirements. Expert interviews as well as a case study were used to do this.

## Opsomming

Die meerderheid organisasies, huidiglik in bestaan, wroeg met die konstante veranderinge wat plaasvind in die omgewing rondom hulle. In so 'n dinamiese omgewing is 'n organisasie se toekomstige winsgewendheid en groei hewiglik afhanklik van sy bevoegdheid om aaneenlopend en effektief veranderinge aan te bring (Hammer & Champy, 2001). Die probleem is dat 70% van transformasie-inisiatiewe wat geloots word nie die voordele wat van hulle verwag word suksesvol lewer nie (Blanchard K. , 2010). Hoekom gebeur dit? Hoekom is net 30% van transformasie-inisiatiewe wat geloots word suksesvol? Daar is net twee moontlike redes vir die bestaan van hierdie probleem. Organisasies loots óf die verkeerde tipe transformasie-inisiatiewe óf hulle bestuur hulle transformasie-inisiatiewe op 'n oneffektiewe manier. Om te verseker dat 'n organisasie nie in hierdie strik trap nie, moet dit gebruik maak van 'n gestruktureerde en geïntegreerde besigheidstransformasie-metodologie wat die proses van verandering vergemaklik (Martin, 1995).

In die literatuur wat tot dusver nagevors is, kon daar maar 'n handjievol besigheidstransformasie-metodologieë opgespoor word. Die doel van hierdie studie was om hierdie gaping in die literatuur te vul. Met ander woorde, die doel van hierdie studie was om 'n gestruktureerde en geïntegreerde besigheidstransformasie-metodologie te ontwikkel.

'n Stelselontwikkelingsproses is gevolg om hierdie metodologie te ontwikkel. Die vier stappe wat deel gevorm het van hierdie stelselontwikkelingsproses is die volgende: vereistebeskrywing, stelselontwerp, stelselontwikkeling en stelselvalidasie. Tydens die vereistebeskrywingstap van die proses is die funksionele eienskappe wat die besigheidstransformasie-metodologie moet besit geïdentifiseer. Die doel van die stelselontwerpstap was eerstens om die metodes waaruit die metodologie moet bestaan te identifiseer en tweedens om die wisselwerking tussen die metodes te bepaal. Die doel van die stelselontwikkelingstap was om elkeen van die metodes waaruit die metodologie moet bestaan te beskryf in terme van hoe dit toegepas word, asook wie betrokke behoort te wees tydens die gebruik daarvan. Tydens die stelselvalidasiestap is die metodologie geëvalueer in terme van hoe effektief dit die geïdentifiseerde funksionele behoeftes bevredig. Onderhoude met deskundiges asook 'n gevallestudie is gebruik om dit te doen.

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## Glossary

<b>Business architecture:</b>	Business processes, organisation structure and performance measurement system of an organisation
<b>Business model:</b>	The “approach” an organisation follows to creating value
<b>Enterprise engineering:</b>	The radical transformation of the way in which an organisation operates in order to secure future profitability and/or revenue growth
<b>External environment:</b>	The environment within which an organisation operates and has very little or no control over
<b>Internal environment:</b>	The internal operations of an organisation which consists of its business model and business architecture
<b>Methodology:</b>	An integrated set of methods
<b>Opportunity:</b>	An event within an organisation’s external environment that, if capitalised on, will have a positive future impact on its profit margin and/or revenue
<b>Profit margin:</b>	$(\text{Net income}/\text{Revenue}) \times 100$
<b>Strategic objective:</b>	An action that allows an organisation to capitalise on an opportunity, counter a threat, exploit a strength and/or improve a weakness
<b>Strategic position:</b>	The unique position an organisation has within an industry that differentiates it and provides it with a sustainable competitive advantage
<b>Strength:</b>	A business model attribute of an organisation that provides it with an advantage over its competitors
<b>System:</b>	A combination of elements that together form a unitary whole
<b>Systems engineering:</b>	The design and development of a system
<b>Threat:</b>	An event within an organisation’s external environment that, if not countered, will have a negative future impact on its profit margin and/or revenue
<b>Transformation method:</b>	A tool that helps an organisation bring about change
<b>Value stream:</b>	Logical grouping of business processes that together aim to achieve a common goal
<b>Weakness:</b>	A business model attribute of an organisation that puts it at a disadvantage to its competitors
<b>PAMSA:</b>	Paper Manufacturers Organisation of South Africa
<b>NGO:</b>	Non-governmental organisation

# *Chapter 1: Research design*



Chapter 1 describes the research problem, research questions, the objective of this study, as well as the research approach that was followed in order to achieve the objective

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## Research design

### Introduction

The purpose of this chapter is to describe the research problem that was identified, the research questions that originated from the identified research problem, the objective of this study as well as the research approach that was followed in order to achieve the objective. This chapter also provides a description of the structure and layout of this document.

### Research problem

The majority of organisations currently in existence operate in an environment that is ever-changing. New legislation and regulations for example, are continuously being implemented, societal tastes and values change, competition is increasing, etc. In such a dynamic environment an organisation's future profitability and revenue growth relies heavily on its ability to continuously, effectively and efficiently transform/re-engineer itself (Hammer & Champy, 2001). The problem, however, is that 70% of change initiatives launched by organisations, fail to deliver the benefits they were intended to provide (Blanchard K. , 2010). Why is this happening? Why are only 30% of change initiatives launched by organisations successful? There are only two possible reasons for the existence of this problem. Organisations either launch the wrong kinds of change initiatives or they ineffectively manage and execute their change initiatives. In order to prevent this from happening, an organisation needs to make use of a structured and integrated enterprise engineering methodology that simplifies the process of identifying, managing and executing a change initiative (Martin, 1995).

## Research questions and research objective

When an organisation decides to launch a re-engineering initiative it will inevitably be faced with the following three questions (Goldratt, 1990):

1. What it needs to change?
2. What it needs to change to?
3. How to cause/implement the change?

The enterprise engineering methodology that an organisation decides to use when re-engineering itself, therefore needs to enable it to successfully answer the three questions listed above. In the literature that was reviewed, very few structured and integrated enterprise engineering methodologies were found to exist, and the ones that were found to exist do not possess all of the functional characteristics needed to enable organisations to answer ALL three of these questions. The following research question is therefore posed:

**Can an enterprise engineering methodology be developed that will enable a commercial organisation, needing to re-engineer itself, to successfully do so, by enabling it to answer ALL three questions of Goldratt?**

The objective of this study is to answer this question. In other words, the objective of this study is to develop an enterprise engineering methodology that will enable any commercial organisation, wanting to re-engineer itself, to effectively and efficiently do so by enabling it to find the answers to the three questions listed above. By achieving this objective this study will help solve, not only a very serious and common real-world problem, but also help bridge the research gap that exists surrounding the field of enterprise engineering methodologies.



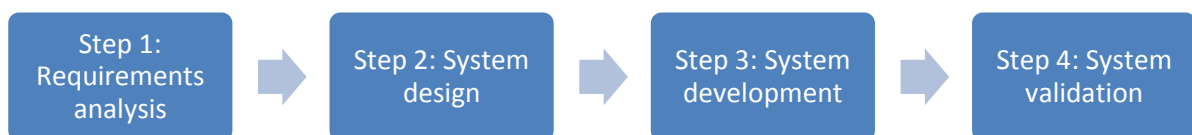
## Research approach

An assemblage of elements such as a coordinated body of methods (i.e. a methodology) forming a complex unitary whole is defined as a system. When developing a new system, such as a methodology, the most effective way to do so is by following a systems engineering process (Blanchard & Fabrycky, 2006). The reason being that, by following a systems engineering process, the following benefits are achieved (Blanchard & Fabrycky, 2006):

- Greater design maturity.
- Improved system integration ease.
- Improved system development ease.
- Improved system validation ease.

A systems engineering process was therefore followed in order to develop the enterprise engineering methodology that this study aims to deliver. The four steps that formed part of this process are illustrated in Figure 1-1 and discussed below. These four process steps are based on the well-known “Vee” systems engineering process steps described by (Blanchard & Fabrycky, 2006). They have, however, been adapted and simplified since the system (methodology) that this study aims to develop is much simpler than the kind of systems that the “Vee” systems engineering process is typically used to develop.

**Figure 1-1: Systems engineering process steps adapted from (Blanchard & Fabrycky, 2006)**



During the requirements analysis step of the systems engineering process the functional requirements of the enterprise engineering methodology were identified. In other words, the functional characteristics that the enterprise engineering methodology needed to possess were identified. This was done by analysing existing enterprise engineering methodologies and reviewing literature in the various fields related to enterprise engineering. These fields included: business strategy, business environment analysis, scenario planning, enterprise architecture, project management, business models, change management and general enterprise engineering/transformation.

During the system design step of the systems engineering process the methods that the enterprise engineering methodology needed to consist of were identified and it was determined how these methods fit together to form an integrated methodology. Identifying the set of methods that the enterprise engineering methodology needed to consist of was done by researching the various business transformation methods that currently exist, identifying the ones that best support the functionality required from the methodology and then allocating a specific method to one or more of the functional requirements. Determining how the selected methods fit together to form an integrated methodology was done by researching each of the methods in more detail and identifying the dependencies that exist between them. In other words, the interfaces between the different methods were identified.

During the system development step of the systems engineering process each of the methods that the enterprise engineering methodology needed to consist of were described in more detail. In order to do this, however, the different variations that exist for each of the methods first needed to be thoroughly researched and analysed. Once this was done, the knowledge that was gained was used to describe each of the methods in terms of how it is utilised as well as who should be involved during its utilisation.

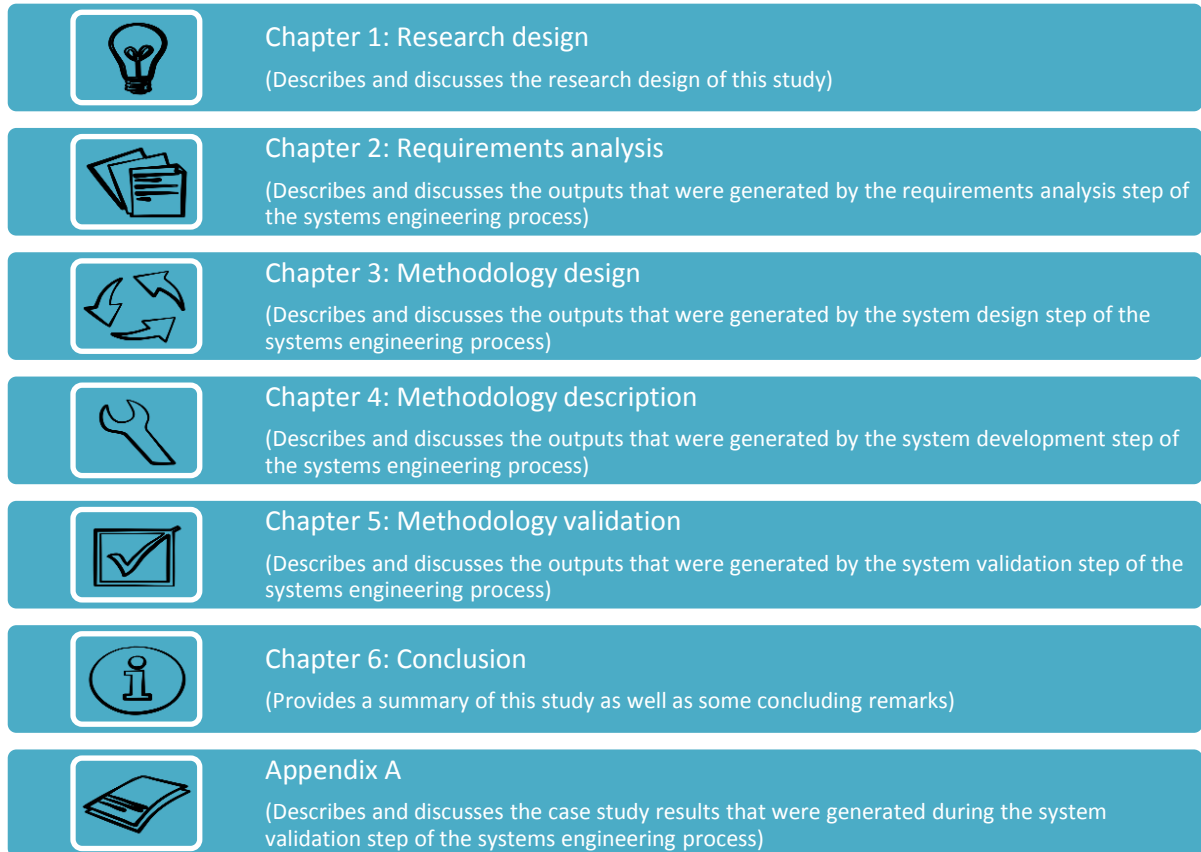
During the system validation step of the systems engineering process the enterprise engineering methodology was evaluated based on how well it satisfies its functional requirements. Stated differently, during the system validation step the enterprise engineering methodology was quality assured. Expert interviews with five enterprise engineering experts as well as a case study were used to do this.

### **Document structure and layout**

This document is broken up into six chapters and one appendix. Chapter 1 provides a description of the research problem, research questions, research objective and research approach of this study. Chapter 2 describes the functional requirements of the enterprise engineering methodology that were identified after investigating representative literature and existing enterprise engineering methodologies. Chapter 3 identifies the methods that the enterprise engineering methodology should consist of as well as the dependencies that exist between them. Chapter 4 describes each of the methods that the enterprise engineering methodology consists of in terms of how it is utilised as well as who should be involved during its utilisation. Chapter 5 illustrates how the enterprise engineering methodology was validated using expert interviews as well as a case study. Chapter 6 provides a summary of this study as well as some concluding remarks. Appendix A describes and

discusses the case study results that were generated during the system validation process step. Figure 1-2 below provides a graphical representation of the structure and layout of this document.

**Figure 1-2: Document structure and layout**



### Chapter summary

Any study that is undertaken needs to have a well-defined objective that, if achieved, will solve a relevant and existing problem and answer one or more research questions. A scientific and formal approach also needs to be followed in order to achieve the objective of a study. This chapter described the research problem that has been identified, the research questions that originated from the identified problem, the objective of this study and the approach that was followed in order to achieve the objective. This chapter also provided a description of the structure and layout of this document.

# *Chapter 2: Requirements analysis*



Chapter 2 describes the functional requirements of the enterprise engineering methodology that were identified after investigating representative literature

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## Requirements analysis

### Introduction

As mentioned in Chapter 1, the enterprise engineering methodology that this study aims to deliver needs to enable an organisation to determine:

- what it needs to change,
- what it needs to change to, and
- how it needs to cause/implement the change.

However, in order for the enterprise engineering methodology to do this it needs to possess a specific set of functional characteristics. The purpose of this chapter is to describe and discuss this set of functional characteristics. Identifying the functional requirements/characteristics of the enterprise engineering methodology was done by analysing existing enterprise engineering methodologies, by researching relevant literature and through personal experience.

### Functional characteristics/requirements

The purpose of any re-engineering initiative undertaken by an organisation is to secure future profitability and/or revenue growth. This goal cannot be achieved if an organisation does not adapt to the external environment within which it operates (Fahey, King, & Narayanan, 1981). When re-engineering itself it is extremely important that an organisation capitalises on and counters the opportunities and threats that exist within its external environment (Ilbury & Sunter, 2005), (Luecke, 2005), (Thompson & Martin, 2005), (Ehlers & Lazenby, 2004). This ensures that an organisation aligns itself with the various forces that exist within its external environment (Brownlie, 1994). Examples of these forces include politics, the economy, society, technology etc. (Narchal, Kittappa, & Bhattacharya, 1987). In order for an organisation to be able to capitalise on and counter the opportunities and threats that it is faced with it of course first needs to identify what they are (Albright, 2004). The first functional characteristic that the enterprise engineering methodology needs to possess is therefore the capability to identify the opportunities and threats that exist within an organisation's external environment.

#### Functional requirement 1:

The capability to identify the opportunities and threats that exist within an organisation's external environment

The opportunities and threats that an organisation is faced with are not the only factors influencing the way in which it needs to re-engineer itself. It is also very important that an organisation re-engineers itself in such a way that it exploits the strengths and improves the weaknesses that it possesses (Osterwalder & Pigneur, 2010), (Luecke, 2005), (Ilbury & Sunter, 2005), (Thompson & Martin, 2005). By doing so, an organisation is able to improve its competitiveness, thereby securing future profitability and/or revenue growth (Ehlers & Lazenby, 2004). This of course means that when re-engineering itself an organisation needs to identify what its strengths and weaknesses are (Osterwalder & Pigneur, 2010). The second functional characteristic that the enterprise engineering methodology needs to possess is therefore the capability to identify the strengths and weaknesses that an organisation possesses.

#### Functional requirement 2:

The capability to identify the strengths and weaknesses that an organisation possesses

As mentioned above, when re-engineering itself, an organisation needs to do so in way that will allow it to exploit, improve, capitalise on and counter its strengths, weaknesses, opportunities and threats. However, launching a re-engineering initiative that enables an organisation to exploit, improve, capitalise on and counter ALL of its strengths, weaknesses, opportunities and threats is, in most cases, not practical (Thompson & Martin, 2005). The reason being, that most organisations experience resource constraints in some form or another (Ehlers & Lazenby, 2004). This means that, when re-engineering itself an organisation needs to prioritise the strengths, weaknesses, opportunities and threats that it is faced with (Thompson & Martin, 2005). By doing so, an organisation is able to focus its re-engineering initiative on its most significant strengths, weaknesses, opportunities and threats. The third functional characteristic that the enterprise engineering methodology needs to possess is therefore the capability to prioritise the strengths, weaknesses, opportunities and threats that an organisation is faced with.

#### Functional requirement 3:

The capability to prioritise the strengths, weaknesses, opportunities and threats that an organisation is faced with

Merely identifying and prioritising the strengths, weaknesses, opportunities and threats that an organisation is faced with adds very little value unless an organisation responds to them accordingly (Birnik & Moat, 2008). However, before this can be done an organisation first needs to identify and carefully plan the actions that it needs to take in response to its most significant strengths, weaknesses, opportunities and threats (Kaplan & Norton, 2008). Doing so ensures that an organisation has a clear picture of what it needs to achieve and that every employee works towards the same set of goals (Gadiesh & Gilbert, 2001). The fourth functional characteristic that the enterprise engineering methodology needs to possess is therefore the capability to identify and plan the actions that an organisation needs to undertake in response to its most significant strengths, weaknesses, opportunities and threats.

#### Functional requirement 4:

The capability to identify and plan the actions that an organisation needs to undertake in response to its most significant strengths, weaknesses, opportunities and threats

When an organisation re-engineers itself it, as mentioned previously, not only needs to identify and plan, but also execute the actions needed to exploit, improve, capitalise on and counter its most significant strengths, weaknesses, opportunities and threats. Executing these actions means an organisation transforms its internal environment in some way or another (Torres, 2008), (Martin, 1995). In other words, executing these actions means an organisation transforms the way it operates (Ross, Weill, & Robertson, 2006). However, before doing this it is very important that an organisation determines and defines what its internal environment needs to change to (Whittle & Myrick, 2005). An organisation does this by describing the end-state of its internal environment. Without a clear understanding of its internal environment end-state an organisation will find it very difficult to successfully execute the actions needed to exploit, improve, capitalise on and counter its most significant strengths, weaknesses, opportunities and threats (Casadesus-Masanell & Ricart, 2010). The fifth functional characteristic that the enterprise engineering methodology needs to possess is therefore the capability to describe an organisation's internal environment end-state.

#### Functional requirement 5:

The capability to describe an organisation's internal environment end-state

Having a clear picture of what its internal environment needs to change to, the only thing an organisation still needs to do is physically implement the internal environment end-state by executing the identified and planned actions. This is the part of any re-engineering effort that is by far the most difficult, resource intensive, time consuming and likely to fail (Ehlers & Lazenby, 2004). An organisation should therefore not attempt to implement all of the required operational changes at once (Torres, 2008). An organisation should rather systematically implement the required changes through a series of transformation projects so that the implementation is more manageable (Partington, 1996). When this approach is followed, however, it is extremely important that the transformation projects are effectively managed (Torres, 2008). If the transformation projects are not effectively managed, then the entire re-engineering initiative is likely to fail (Torres, 2008). The sixth and final functional characteristic that the enterprise engineering methodology needs to possess is therefore the capability to manage the transformation projects needed to implement an organisation's internal environment end-state.

#### Functional requirement 6:

The capability to manage the transformation projects needed to implement an organisation's internal environment end-state

### **The current state of enterprise engineering methodologies**

In the literature that was reviewed, very few structured and integrated enterprise engineering methodologies were found to currently exist. Also, after analysing the ones that were found to exist it was concluded that none of them possess all six of the functional characteristics identified and described above. This means that none of the existing enterprise engineering methodologies that were found to exist enable an organisation to answer ALL three of the following questions it inevitably faces when initiating radical change/transformation:

1. what it needs to change,
2. what it needs to change to, and
3. how it needs to cause/implement the change.

Table 2-1 illustrates which of the six functional characteristics, described above, each of the four existing enterprise engineering methodologies possesses. A brief description of each of the four existing enterprise engineering methodologies is given below in order to support the findings in Table 2-1.



**Table 2-1: Existing enterprise engineering methodologies versus the identified functional requirements**

Functional requirements	Existing enterprise engineering methodologies			
	PERA methodology	Methodology developed by (Martin, 1995)	Methodology developed by (Hammer & Champy, 2001)	Methodology developed by (Torres, 2008)
Functional requirement 1: The capability to identify the opportunities and threats that exist within an organisation’s external environment	No	No	No	No
Functional requirement 2: The capability to identify the strengths and weaknesses that an organisation possesses	No	No	No	No
Functional requirement 3: The capability to prioritise the strengths, weaknesses, opportunities and threats that an organisation is faced with	No	No	No	No
Functional requirement 4: The capability to identify and plan the actions that an organisation needs to undertake in response to its most significant strengths, weaknesses, opportunities and threats	Yes	Yes	Yes	No
Functional requirement 5: The capability to describe an organisation’s internal environment end-state	Yes	Yes	Yes	Yes
Functional requirement 6: The capability to manage the transformation projects needed to implement an organisation’s internal environment end-state	Yes	No	No	Yes

### *The PERA enterprise engineering methodology*

In 1986 the PERA (Purdue Enterprise Reference Architecture) enterprise engineering methodology was developed by the Purdue University Laboratory for Applied Industrial Control. This methodology is based on the principle that an organisation consists of three architectural elements: its manufacturing equipment architecture, its human and organisational architecture and its information systems architecture.

When using the Purdue enterprise engineering methodology to re-engineer itself an organisation needs to go through the following eight phases:

- Phase 1: Identification of the enterprise business entity.
- Phase 2: Concept of the project.
- Phase 3: Definition of the project.
- Phase 4: Specification or preliminary design of the project.
- Phase 5: Detailed design of human and organisational-, information and control-, and customer product and service components of the enterprise.
- Phase 6: Implementation or construction, test and commissioning.
- Phase 7: Operations.
- Phase 8: Decommissioning.

Table 2-1 below provides a short description of each of these phases.

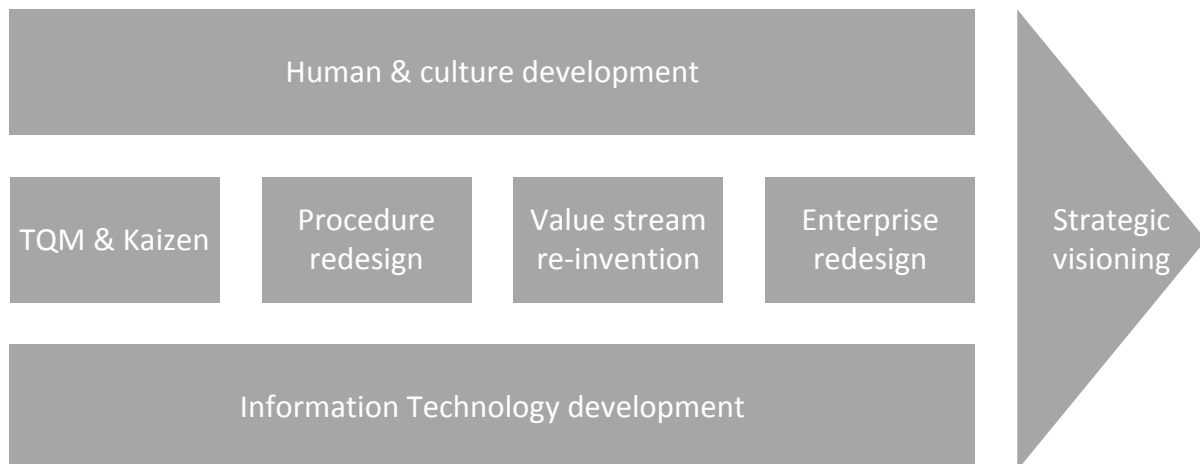
**Table 2-2: Description of the Purdue enterprise engineering methodology**

Phase	Phase description
Phase 1: Identification of the enterprise business entity	During phase 1 an organisation establishes its identity and boundaries
Phase 2: Concept of the project	During phase 2 an organisation defines its mission, vision, values and operational policies
Phase 3: Definition of the project	During phase 3 an organisation defines its identity requirements and tasks and develops flow diagram or other models
Phase 4: Specification or preliminary design of the project	During phase 4 an organisation makes initial choices regarding the specification of its manufacturing equipment architecture, human and organisational architecture and information systems architecture
Phase 5: Detailed design of human and organisational-, information and control-, and customer product and service components of the enterprise	During phase 5 an organisation completes all of the designs needed for the construction phase in more detail
Phase 6: Implementation or construction, test and commissioning	During phase 6 an organisation converts its detailed design into actual plant elements through testing, operational trials and commissioning
Phase 7: Operations	During phase 7 an organisation carries out its mission as prescribed by management
Phase 8: Decommissioning	During phase 8 an organisation is renovated or dismantled

*The enterprise engineering methodology developed by (Martin, 1995)*

In 1995 James Martin published a book entitled “The great transition: Using the seven disciplines of enterprise engineering to align people, technology and strategy”. In this book he describes an enterprise engineering methodology that consists of the seven change processes illustrated in Figure 2-1 below. A brief description of each of these change processes is given in Table 2-2.

**Figure 2-1: Model of the enterprise engineering methodology developed by (Martin, 1995)**



**Table 2-3: Description of the enterprise engineering methodology developed by (Martin, 1995)**

Change process	Change process description
TQM & Kaizen	Continuous improvement of processes and quality management
Procedure redesign	Re-engineering the procedures within existing management structures (in a manner more cross-functional than kaizen, but less dramatic than value stream re-invention)
Value stream re-invention	Fundamental and dramatic re-invention of end-to-end business processes
Enterprise redesign	Re-architecting the enterprise in a way that will enable it to implement its strategic vision as effectively as possible
Strategic visioning	Establishing, altering and validating the vision which drives the entire enterprise and its change efforts
Human & culture development	Processes that build and maintain the structure and culture needed to support the other change processes
Information Technology development	Processes that build and maintain the knowledge infrastructure needed to support the other change processes

*The enterprise engineering methodology developed by (Hammer & Champy, 2001)*

In 2001 Michael Hammer and James Champy developed an enterprise engineering methodology that was published in their book which is entitled “Reengineering the corporation: A manifesto for business revolution”. This methodology, however, is very conceptual and is mainly based around business process engineering. The fundamental principle upon which this methodology was built is provided in the following definition: *Enterprise engineering is the FUNDAMENTAL rethinking and RADICAL redesign of BUSINESS PROCESSES to achieve DRAMATIC improvements in critical, contemporary measures of performance such as cost, quality, service and speed.* (Hammer & Champy, 2001)

*The enterprise engineering methodology developed by (Torres, 2008)*

In 2008 Jerry W. Torres published an enterprise engineering methodology in a book entitled: “Enterprise engineering: Transformation right the first time”. This methodology is based heavily on the concept that a re-engineering initiative should be managed like a project and consists of the following steps:

- Step 1: Develop strategic plan.
- Step 2: Develop project scope.
- Step 3: Solicit and evaluate proposals.
- Step 4: Develop the business blueprint.
- Step 5: Develop and integrate solutions.
- Step 6: Transition to redefined business environment.
- Step 7: Continuously improve business environment.

A brief description of each of these steps is given in Table 2-3 below.

**Table 2-4: Description of the enterprise engineering methodology developed by (Torres, 2008)**

Step	Step description
Step 1: Develop strategic plan	During step 1 an organisation defines its vision, goals and objectives
Step 2: Develop project scope	During step 2 an organisation defines what the projects needed to deliver the strategic plan set out to deliver
Step 3: Solicit and evaluate proposals	During step 3 an organisation solicits the services of consulting firms and evaluates their proposed solutions
Step 4: Develop the business blueprint	During step 4 an organisation defines its future state
Step 5: Develop and integrate solutions	During step 5 an organisation institutionalises the required changes
Step 6: Transition to redefined business environment	During step 6 an organisation acclimatises to its new environment (through for example: training, education, practice and problem management)
Step 7: Continuously improve business environment	During step 7 an organisation makes post-implementation improvements

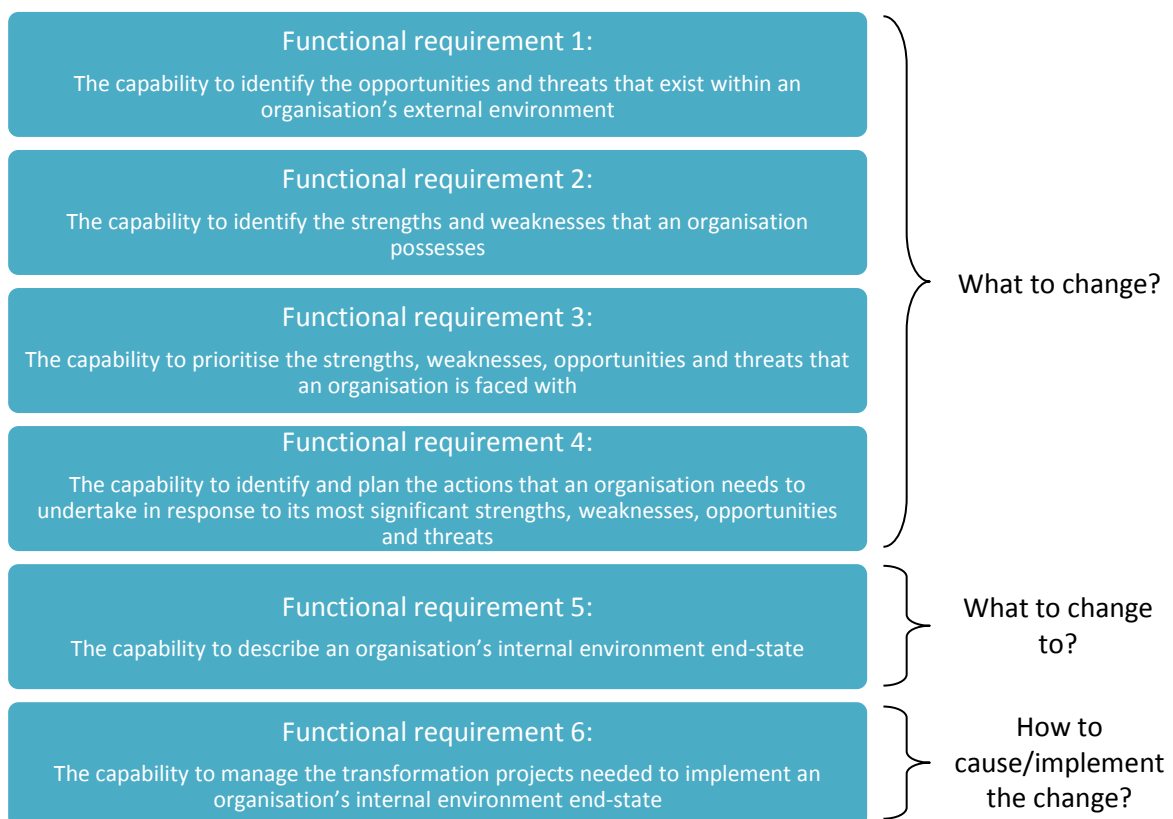
## Chapter summary

The enterprise engineering methodology that this study aims to deliver needs to possess a specific set of functional characteristics in order for it to enable an organisation to determine:

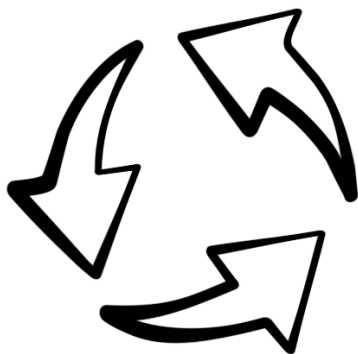
- what it needs to change,
- what it needs to change to, and
- how it needs to cause/implement the change.

This chapter described the six functional characteristics that this set consists of. This chapter also provided evidence that none of the four existing enterprise engineering methodologies that were found to exist possess all of these functional characteristics. The development of a new enterprise engineering methodology that does in fact possess all of these characteristics would therefore add a significant amount of value. Figure 2-2 below illustrates the six functional characteristics as well as how each of them contributes to enabling an organisation to answer the three questions listed above. These functional characteristics/requirements serve as the design specification that was used to design the enterprise engineering methodology. Chapter 3 describes and discusses this design in more detail.

**Figure 2-2: Summary of functional requirements**



# *Chapter 3: Methodology design*



Chapter 3 identifies the methods that the enterprise engineering methodology should consist of as well as the dependencies that exist between them

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## Methodology design

### Introduction

The purpose of this chapter is to identify the components (methods) that the enterprise engineering methodology should consist of as well as how they fit together to form an integrated methodology. The purpose of this chapter is not to describe each of these methods in detail. This is done in Chapter 4.

Identifying the set of methods that the enterprise engineering methodology should consist of was done by:

- researching the various business transformation methods that currently exist,
- identifying the ones that best support the functional requirements described in Chapter 2, and
- allocating a specific method to one or more of the functional requirements (function allocation).

Determining how the methods fit together to form a methodology was done by identifying the dependencies that exist between the various methods.

### Function allocation

As mentioned previously the first functional requirement of the enterprise engineering methodology is that it needs to possess the capability to identify the opportunities and threats that exist within an organisation's external environment. One method that can be used to do this is simply conducting workshops during which relevant individuals within an organisation debate and discuss their various opinions regarding the opportunities and threats that an organisation's external environment presents it. The results that are obtained from these workshops are, however, very subjective. The second and more objective method that can be used to identify the opportunities and threats that an organisation's external environment presents it is called an external environment analysis. According to (Thompson & Martin, 2005), (Narchal, Kittappa, & Bhattacharya, 1987), (Osterwalder & Pigneur, 2010), (Luecke, 2005) and (Illbury & Sunter, 2005) this is the most effective method to identify an organisation's opportunities and threats. When conducting an external environment analysis, information regarding the various forces present within an organisation's external environment is gathered and then carefully analysed. During this research and analysis activity, factors that influence an organisation positively and/or negatively are identified. These factors become the sources of an organisation's opportunities and threats. The third method that can be

used to identify an organisation's opportunities and threats is called a SWOT analysis. In terms of identifying an organisation's opportunities and threats, this method is exactly the same as an external environment analysis. When using a SWOT analysis to identify an organisation's opportunities and threats information regarding its external environment forces is also gathered and then analysed (Armstrong, 1982), (Hill & Westbrook, 1997), (Menon, Bharadwaj, Adidam, & Edison, 1999). Due to the fact that an external environment analysis is an objective and scientific method for identifying an organisation's opportunities and threats, that most experts believe it is the most effective way to do so and that an external environment analysis and a SWOT analysis are one and the same thing, it was decided that an external environment analysis should be allocated to functional requirement 1 of the enterprise engineering methodology (see Table 3-1 below).

**Table 3-1: Functional requirements 1 and its allocated method**

Functional requirement	Allocated business transformation method
Functional requirement 1: It needs to possess the capability to identify the opportunities and threats that exist within an organisation's external environment	<div data-bbox="1043 927 1230 1032" style="background-color: #ADD8E6; padding: 10px; display: inline-block;">           External environment analysis         </div>

The second functional requirement of the enterprise engineering methodology is that it needs to possess the capability to identify the strengths and weaknesses that an organisation possesses. In the literature that was reviewed five different methods for identifying an organisation's strengths and weaknesses were identified. Probably the most common method that is used to do this is a SWOT analysis. However, when it comes to identifying an organisation's strengths and weaknesses a SWOT analysis is not a very scientific method and its results are therefore very subjective. When using this method stakeholders are simply asked to state what they believe the strengths and weaknesses of the organisation are (Armstrong, 1982), (Hill & Westbrook, 1997), (Menon, Bharadwaj, Adidam, & Edison, 1999). The second method that is often used to identify an organisation's strengths and weaknesses is called a resource analysis. As its name suggests, when conducting a resource analysis, an organisation analyses for example its human resources, financial resources etc. in order to identify the strengths and weaknesses that it possesses (Thompson & Martin, 2005). Another method is value chain analysis. When conducting a value chain analysis an organisation identifies the strengths and weaknesses that it possesses surrounding its core/primary value chain activities (inbound logistics, operations, output logistics, marketing etc.) and its supporting value chain activities (procurement, IT, HR, finance etc.) by analysing them (Ehlers & Lazenby, 2004). Yet another method that can be used to identify the strengths and weaknesses that

an organisation possesses is functional analysis. When using this method an organisation identifies the strengths and weaknesses surrounding for example its marketing, manufacturing, research and development, and human resources functions (Ehlers & Lazenby, 2004). There is, however, one method that is much more comprehensive than any of the ones mentioned above. This method incorporates the principles of all of the methods mentioned previously as well as a few other principles. This method is called business model analysis and is very easy to use as well as facilitate. When conducting a business model analysis an organisation identifies the strengths and weaknesses that it possesses by analysing the following nine business model building blocks (Osterwalder & Pigneur, 2010):

- The key partners & suppliers it utilises.
- The key competencies that it possesses (value chain activities & functions).
- The key resources that it uses.
- The offerings and value propositions that it provides its customers.
- The channels it utilises to make its offerings and value propositions available to its customers.
- The relationships it cultivates with its customers.
- The customer and market segments it targets.
- The revenue streams it generates.
- The cost structure of its operations.

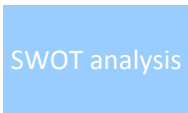
Using this method allows an organisation to not only identify its resources based-, value chain based- and function based strengths and weaknesses, but also an additional seven other categories of strengths and weaknesses. Due to the fact that the business model analysis method is more objective than a SWOT analysis and that it encompasses the other three methods that were identified, it was allocated to functional requirement 2 of the enterprise engineering methodology (see Table 3-2 below).

**Table 3-2: Functional requirements 2 and its allocated method**

Functional requirement	Allocated business transformation method
Functional requirement 2: It needs to possess the capability to identify the strengths and weaknesses that an organisation possesses	<div style="background-color: #ADD8E6; padding: 10px; display: inline-block;">Business model analysis</div>

The third functional requirement of the enterprise engineering methodology is that it needs to possess the capability to prioritise the strengths, weaknesses, opportunities and threats that an organisation is faced with. According to (Armstrong, 1982), (Hill & Westbrook, 1997), (Menon, Bharadwaj, Adidam, & Edison, 1999), (Luecke, 2005) and (Ehlers & Lazenby, 2004) the most effective way to do so is by using a SWOT analysis. A SWOT analysis is not only used to identify an organisation's strengths, weaknesses, opportunities and threats. It can also be used to prioritise an organisation's strengths, weaknesses, opportunities and threats. When using a SWOT analysis to prioritise an organisation's strengths, weaknesses, opportunities and threats they are plotted on a set of axes in order to determine their priority. There are varying opinions regarding what these axes are/represent, but this will be discussed in more detail in Chapter 4. Due to the fact that many experts believe that a SWOT analysis should be used to prioritise an organisation's strengths, weaknesses, opportunities and threats and that no alternative methods could be identified it was decided that a SWOT analysis should be allocated to functional requirement 3 of the enterprise engineering methodology (see Table 3-3 below).


**Table 3-3: Functional requirements 3 and its allocated method**

Functional requirement	Allocated business transformation method
Functional requirement 3: It needs to possess the capability to prioritise the strengths, weaknesses, opportunities and threats that an organisation is faced with	

The fourth functional requirement of the enterprise engineering methodology is that it needs to possess the capability to identify and plan the actions that an organisation needs to undertake in response to its most significant strengths, weaknesses, opportunities and threats. According to (Kay, 1993) the method that should be used to do this is strategy formulation because the result that is obtained from strategy formulation is a description of how an organisation plans to match its internal environment to its external environment. In other words, strategy formulation delivers a plan of how an organisation is going to exploit its strengths, improve its weaknesses, capitalise on its opportunities and counter its threats. (Kaplan & Norton, 2008) agree that the method that should be used is strategy formulation since the result of strategy formulation describes the course of action an organisation needs to take based on the state of its internal- and external environment. (Birnik & Moat, 2008) also feel that strategy formulation is the most effective method since the purpose of strategy formulation is to identify, based on an organisation's internal- and external environment situation, initiatives that are imperative to its success. (Luecke, 2005) not only believes

that strategy formulation is the most effective method, he even defines strategy as being the actions an organisation needs to take in order to exploit, improve, capitalise on and counter the strengths, weaknesses, opportunities and threats that it is faced with. Based on the fact that the experts mentioned above believe that strategy formulation is the most appropriate method for identifying and planning the actions that an organisation needs to undertake in response to its most significant strengths, weaknesses, opportunities and threats and that no alternative methods could be found, it was decided that strategy formulation should be allocated to functional requirement 4 of the enterprise engineering methodology (see Table 3-4 below).

**Table 3-4: Functional requirements 4 and its allocated method**

Functional requirement	Allocated business transformation method
Functional requirement 4: It needs to possess the capability to identify and plan the actions that an organisation needs to undertake in response to its most significant strengths, weaknesses, opportunities and threats	

The fifth functional requirement of the enterprise engineering methodology is that it needs to possess the capability to describe an organisation's internal environment end-state. There are, however, varying opinions regarding exactly what an organisation's internal environment is and what it consists of. One school of thought is that an organisation's internal environment is defined by its business model (Osterwalder & Pigneur, 2010), (Doz & Kosonen, 2010), (Shafer, Smith, & Linder, 2005), (Smith, Binns, & Tushman, 2010), (Itami & Nishino, 2010), (Dahan, Doh, Oetzel, & Yaziji, 2010), (Yunus, Moingeon, & Lehmann-Ortega, 2010), (Johnson, Christensen, & Kagermann, 2008). Another school of thought is that an organisation's internal environment is defined by its business architecture (Whittle & Myrick, 2005), (Giachetti, 2009), (Martin, 1995), (Ross, Weill, & Robertson, 2006), (Scheckerman, 2004). It is the opinion of the author, however, that an organisation's internal environment consists of both its business model and its business architecture. An organisation's business model is the "approach" that it follows to deliver value to its customers (Casadesus-Masanell & Ricart, 2010) and its business architecture is the structure behind its operations (Wolfenden & Welch, 2000). This of course means that when describing an organisation's internal environment end-state it basically means describing the end-state of its business model as well as its business architecture. It is fairly safe to say that the most effective methods for describing an organisation's business model end-state and business architecture end-state are business model design and business architecture design (Casadesus-Masanell & Ricart, 2010), (Whittle & Myrick, 2005). Within the fields of product development and construction for

example prototypes and blueprints which are both “end-state designs” have been used successfully for decades. Designing an organisation’s internal environment end-state should not be any different. The two methods that are therefore allocated to functional requirement 5 of the enterprise engineering methodology are business model design and business architecture design (see Table 3-5 below).

**Table 3-5: Functional requirements 5 and its allocated method**

Functional requirement	Allocated business transformation method
Functional requirement 5: It needs to possess the capability to describe an organisation’s internal environment end-state	Business model design
	Business architecture design

The sixth and final functional requirement of the enterprise engineering methodology is that it needs to possess the capability to manage the transformation projects needed to implement an organisation’s internal environment end-state. Managing these transformation projects needs to be done on an individual basis (Grundy, 1998) as well as, as a portfolio (Meskendahl, 2010). In other words, each transformation project needs to be managed individually and the entire set of transformation projects needs to be managed as a portfolio (Torres, 2008). This will ensure that both the business model and business architecture end-state designs are successfully implemented. The only method that could be found that can be used to manage an individual transformation project is project management and the only method that could be found for managing a portfolio of transformation projects is project portfolio management. Within academic circles as well as within the business environment both these methods are widely used and they have proved to be very effective. The two methods that are therefore allocated to functional requirement 6 of the enterprise engineering methodology are project portfolio management and project management (see Table 3-6 below).

**Table 3-6: Functional requirements 6 and its allocated method**

Functional requirement	Allocated business transformation method
Functional requirement 6: It needs to possess the capability to manage the transformation projects needed to implement an organisation's internal environment end-state	Project portfolio management
	Project management

A list of the eight methods that the enterprise engineering methodology should consist of, and the functional requirements that they have been allocated to, is illustrated in Table 3-7 below.

**Table 3-7: Functional requirements and method allocation**

Functional requirement	Allocated business transformation method
Functional requirement 1: It needs to possess the capability to identify the opportunities and threats that exist within an organisation's external environment	External environment analysis
Functional requirement 2: It needs to possess the capability to identify the strengths and weaknesses that an organisation possesses	Business model analysis
Functional requirement 3: It needs to possess the capability to prioritise the strengths, weaknesses, opportunities and threats that an organisation is faced with	SWOT analysis
Functional requirement 4: It needs to possess the capability to identify and plan the actions that an organisation needs to undertake in response to its most significant strengths, weaknesses, opportunities and threats	Strategy formulation
Functional requirement 5: It needs to possess the capability to describe an organisation's internal environment end-state	Business model design
	Business architecture design
Functional requirement 6: It needs to possess the capability to manage the transformation projects needed to implement an organisation's internal environment end-state	Project portfolio management
	Project management

**Method integration**

Certain dependencies exist between the eight methods that the enterprise engineering methodology consists of. This is due to the fact that the output(s) of a certain method serve as the input(s) to one or more of the other methods.

The outputs generated by conducting an external environment analysis are the opportunities and threats that exist within an organisation's unique external environment. On the other hand, the outputs generated by conducting a business model analysis are the strengths and weaknesses that an organisation possesses surrounding its business model. These four different outputs are the inputs required in order to be able to conduct a SWOT analysis. Dependencies therefore exist between the SWOT analysis method and the external environment analysis and business model analysis methods.

The output that is generated by conducting a SWOT analysis is a prioritised list of the strengths, weaknesses, opportunities and threats that an organisation is faced with. This list serves as the input required to be able to formulate an organisation's strategy. A dependency therefore also exists between the strategy formulation method and the SWOT analysis method.

The output that is generated by the strategy formulation method is a business strategy. This output is the input required by the business model design method as well as the business architecture design method. Dependencies therefore exist between the business model design method and the strategy formulation method as well as between the business architecture design method and the strategy formulation method.

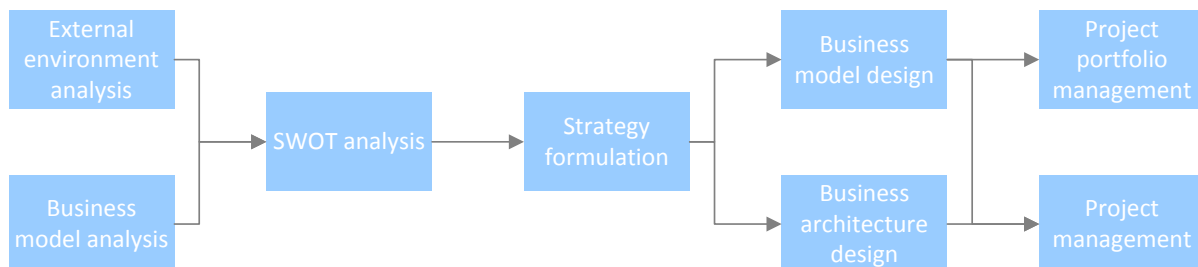
The outputs that are generated by the business model design method and the business architecture design method are a business model end-state design and a business architecture end-state design. These two outputs serve as the inputs for the project portfolio management method as well as the project management method. Dependencies therefore exist between the business model design method and the project portfolio management and project management methods. Dependencies also exist between the business architecture design method and the project portfolio management and project management methods.



Figure 3-1 below provides a summary of the various dependencies that exist between the eight methods that together form the enterprise engineering methodology. These dependencies illustrate that when using the enterprise engineering methodology to re-engineer an organisation the methods it consists of are typically used in a specific sequence. Based on Figure 3-1, the starting point of a re-engineering effort is conducting an external environment analysis and a business model analysis. Once this has been completed a SWOT analysis needs to be conducted. After conducting a SWOT analysis, a strategy needs to be formulated based on the prioritised set of strengths, weaknesses, opportunities and threats. Next, the business model end-state and business architecture end-state of the organisation need to be designed. And finally, the portfolio of transformation projects needed to implement the business model and business architecture designs need to be managed individually as well as, as a portfolio.

Although the eight methods illustrated in Figure 3-1 are typically used in the sequence described above, it is extremely important to note that feedback loops do exist between the various methods. As new information becomes available and new insights are gained during a re-engineering initiative an organisation will very often need to take a step or two back before it is able to continue.

**Figure 3-1: Summary of the enterprise engineering methodology**



### Chapter summary

Designing the enterprise engineering methodology that this study aims to deliver was done by firstly allocating carefully selected methods to one or more of the functional requirements described in Chapter 2. Once this was done, the eight methods that the enterprise engineering methodology consists of were integrated by identifying the dependencies that exist between them. This chapter described the results that were obtained from performing these two activities.

# *Chapter 4: Methodology*

## *description*



Chapter 4 describes each of the methods that the enterprise engineering methodology consists of in terms of how it is utilised as well as who should be involved during its utilisation

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## Methodology description

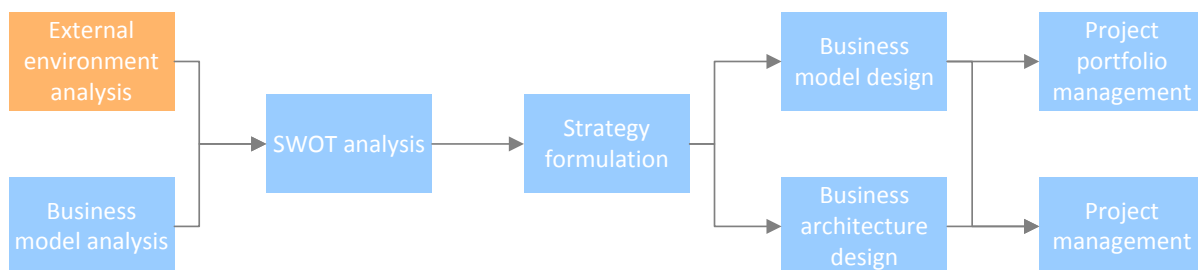
### Introduction

The purpose of Chapter 4 is to provide a detailed description of each of the eight methods that the enterprise engineering methodology consists of in terms of how it is utilised and who should be involved during its utilisation. Essentially, Chapter 4 serves as a user manual for re-engineering an organisation.

### External environment analysis

As stated in Chapter 3, when using the enterprise engineering methodology delivered by this study to re-engineer itself, the first thing an organisation needs to do is conduct an external environment analysis (refer to Figure 4-1 below). The purpose of conducting an external environment analysis is to identify the opportunities and threats that exist within an organisation's unique external environment.

**Figure 4-1: External environment analysis within the context of the methodology**



### *How to conduct an external environment analysis*

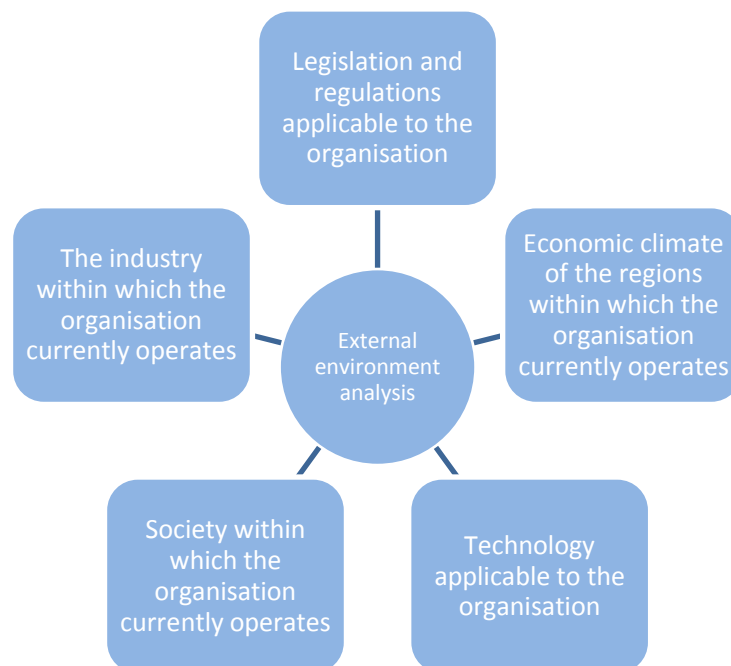
The first thing an organisation needs to do when conducting an external environment analysis is gather as much information as possible regarding the various forces present within its external environment (Narchal, Kittappa, & Bhattacharya, 1987), (Thompson & Martin, 2005). Various opinions, however, exist regarding what these forces are. According to (Albright, 2004) the forces within an organisation's external environment are legislation and regulations, politics, society, economy, technology and the industry. (Ilbury & Sunter, 2005) on the other hand believe that the forces present within an organisation's external environment are politics, society, technology, economy, legislation and the natural environment. Another opinion regarding this matter is that an organisation's external environment simply consists of a political, economic, social and technological force (Thompson & Martin, 2005).

It is the opinion of the author, however, that an organisation's external environment consists of the five forces listed below and illustrated in Figure 4-2.

- Legislation and regulations applicable to the organisation.
- Economic climate of the regions within which the organisation currently operates.
- Technology applicable to the organisation.
- Social and cultural traits of the regions within which the organisation currently operates.
- The industry within which the organisation currently operates. (excluding competitors since this is addressed during the business model analysis)

This list of forces is very similar to the ones given by (Albright, 2004), (Ilbury & Sunter, 2005), and (Thompson & Martin, 2005). The only two differences are that it does not include the political force or the natural environment force. The reason for this is that the political force and the legislation and regulations force are similar in nature and therefore can be combined into one. In most cases, the way in which the political force influences an organisation is through the implementation of legislation and/or regulations. A similar argument is applicable to the natural environment force. The various ways in which the natural environment force could potentially influence an organisation can easily be grouped under the other five forces. In other words, the natural environment force is rather a sub-category within the legislation and regulations, economy, technology, society and industry forces than a separate force.

**Figure 4-2: External environment forces**



The information sources that an organisation should use when researching the five forces listed above include the following:

- Relevant individuals within an organisation (specifically the Business Intelligence team).
- Experts in the field.
- Environmental scanning consultants.
- Print media sources like newspapers and magazines.
- Broadcast media sources like television and radio.
- Electronic media sources like online databases, podcasts and websites.

Examples of the types of information that an organisation should be looking for when researching each of the external environment forces are listed in Table 4-1 below.

**Table 4-1: Examples of external environment information that needs to be gathered**

<p>Legislation and regulations applicable to the organisation</p>	<ul style="list-style-type: none"> <li>• Newly implemented legislation and industry regulations that are applicable to it.</li> <li>• Changes to current legislation and industry regulations that are applicable to it.</li> <li>• Current legislative and regulatory gaps that are applicable to it.</li> </ul>
<p>Economic climate of the regions within which the organisation currently operates</p>	<ul style="list-style-type: none"> <li>• Economic indicators of the regions within which it operates (eg. inflation-, exchange-, interest- and economic growth rates).</li> <li>• Economic trends of the regions within which it operates (eg. globalisation).</li> <li>• State of public infrastructure and services of the regions within which it operates.</li> </ul>
<p>Technology applicable to the organisation</p>	<ul style="list-style-type: none"> <li>• Existing disruptive or beneficial technologies that are applicable to it.</li> <li>• New/emerging disruptive or beneficial technologies that are applicable to it.</li> </ul>
<p>Society within which the organisation currently operates</p>	<ul style="list-style-type: none"> <li>• Health issues of the regions within which it operates.</li> <li>• Population skill and education levels of the regions within which it operates.</li> <li>• Demographics of the regions within which it operates (eg. population, wealth and age spread).</li> <li>• Changes regarding societal tastes, values and standards of living of the regions within which it operates.</li> <li>• Cultural, labour and lifestyle trends of the regions within which it operates.</li> <li>• Consumer spending patterns of the regions within which it operates.</li> </ul>
<p>The industry within which the organisation currently operates</p>	<ul style="list-style-type: none"> <li>• Trends within the industry that it forms part of.</li> <li>• Demand vs. supply within the industry that it forms part of.</li> </ul>

Once an organisation has researched each of the external environment forces it needs to carefully analyse the information that has been gathered. The purpose of this analysis is firstly for an organisation to identify any factors surrounding the forces within its external environment that have a positive and/or negative impact on it. Secondly, the purpose of this analysis is to determine exactly what these positive and/or negative impacts are. In other words, the purpose of this analysis is to identify the opportunities and threats that an organisation's external environment presents it. Very often these factors and their impacts are fairly obvious and easy to identify. However, it is very important that an organisation also looks for those factors and implications that are not so obvious and easy to find within the gathered information since, in many cases, these are the most significant.

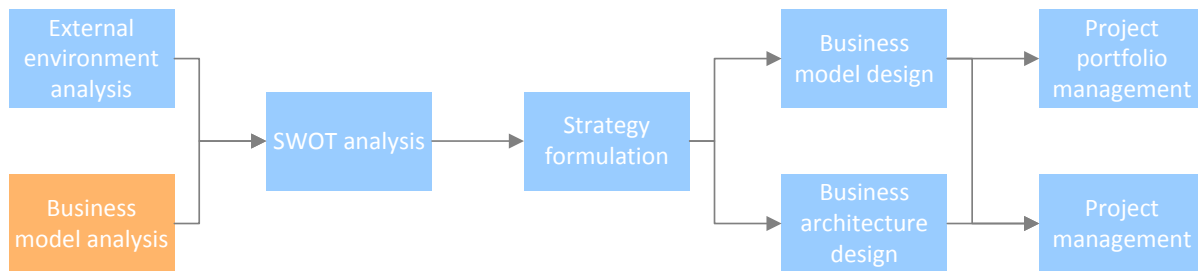
#### *Persons involved in conducting an external environment analysis*

The members of an organisation's management team are typically much more outward focused than most of its other employees. They are also more adept at determining how the external environment influences the organisation. The responsibility of conducting an external environment analysis therefore lies with an organisation's management team. The tasks involved in conducting an external environment analysis are performed much more effectively and efficiently when they are facilitated by an experienced facilitator. An organisation should therefore have someone facilitate the external environment analysis. The facilitator could be a member of an organisation's management team or an enterprise engineering consultant. However, it is very important that either the management team member or the enterprise engineering consultant that fulfils the role of facilitator assumes this responsibility throughout the re-engineering initiative. In other words, the same person assuming the role of facilitator during the external environment analysis should assume the responsibility of facilitator during the utilisation of the other five methods, within the methodology, that require a facilitator. This ensures continuity throughout the enterprise engineering effort.

## Business model analysis

As stated in Chapter 3, the second task an organisation needs to complete, when re-engineering itself using the methodology delivered by this study, is conducting a business model analysis (refer to Figure 4-3 below). The purpose of conducting a business model analysis is to identify the strengths and weaknesses that an organisation possesses.

**Figure 4-3: Business model analysis within the context of the methodology**



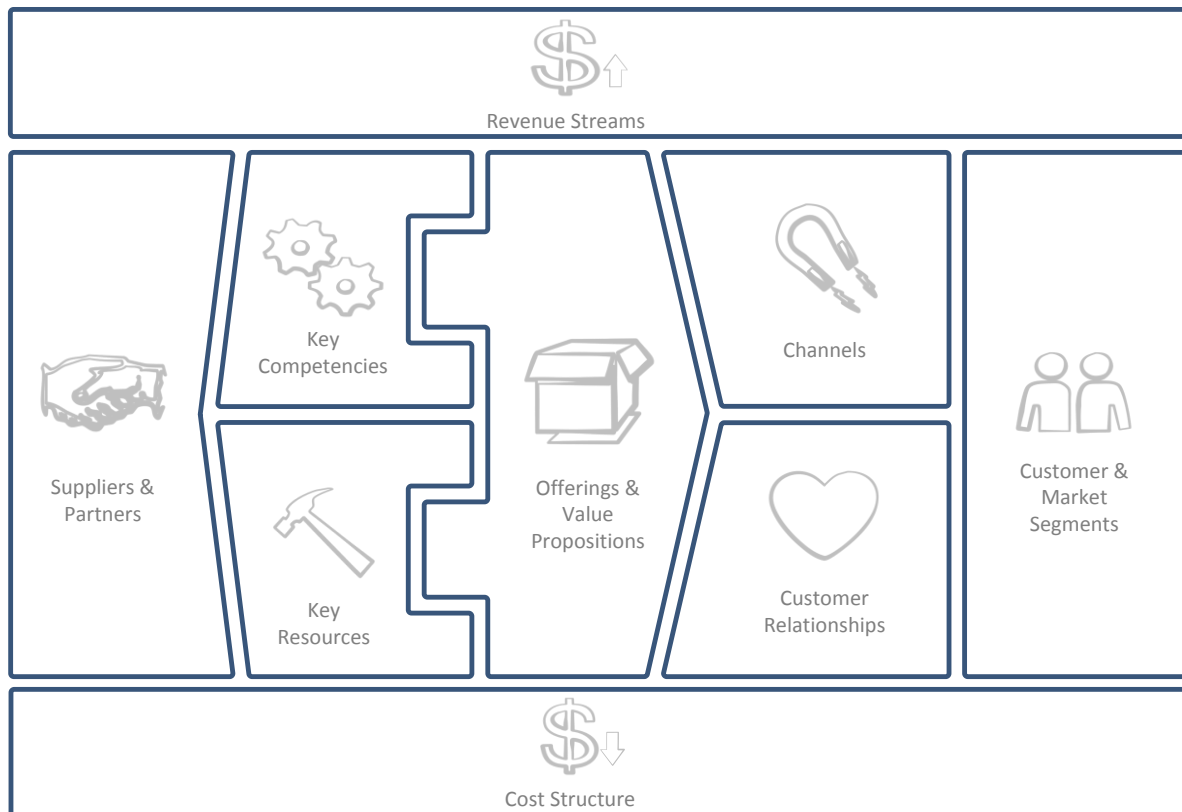
### *How to conduct a business model analysis*

In order for an organisation to identify the strengths and weaknesses that it possesses surrounding its business model, it first needs to understand what its current business model is. Although one would expect an organisation to know exactly what its business model is, this is often not the case. Also, not many people agree as to what exactly a business model is and what it consists of. To answer this question, 400 business model experts from all over the world worked together to develop a standard description of what a business model is as well as what it consists of. The result of this effort was documented by (Osterwalder & Pigneur, 2010). According to these experts an organisation's business model consists of the building blocks listed below and illustrated in Figure 4-4:

- The key partners and suppliers it utilises.
- The key competencies that it possesses.
- The key resources that it uses.
- The offerings and value propositions that it provides to its customers.
- The channels it utilises to make its offerings and value propositions available to its customers.
- The relationships it cultivates with its customers.
- The customer and market segments it targets.
- The revenue streams it generates.
- The cost structure of its operations.

An organisation needs to describe each of these building blocks in order to develop an understanding of its current business model. The business model template illustrated in Figure 4-5 below can be used to facilitate this activity.

**Figure 4-4: Business model template (Osterwalder & Pigneur, 2010)**



Once an organisation has described its current business model, it is ready to identify the strengths and weaknesses that it possesses. In the case of an organisation, a strength is a business model attribute that provides it with an advantage over its competitors and a weakness is a business model attribute that puts it at a disadvantage to its competitors. This means that in order to identify the strengths and weaknesses that it possesses an organisation needs to compare its business model to those of its competitors. An organisation does this by asking itself a series of questions regarding each of its business model building blocks and then finding the answers. These questions are loosely based on the questions developed by (Osterwalder & Pigneur, 2010) and are illustrated in Figures 4-5 to 4-13 below.

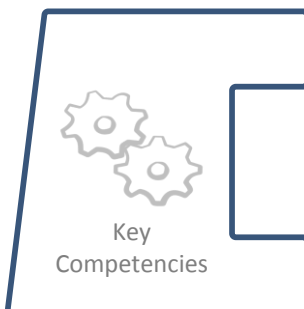


**Figure 4-5: Questions related to partners and suppliers**



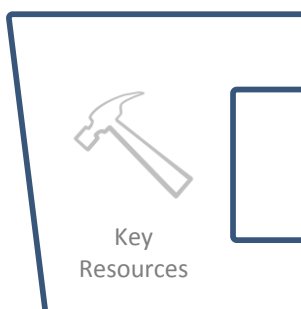
- What benefits does the organisation enjoy as a result of the partners and suppliers that it currently utilises which its competitors don't?
- What problems does the organisation experience as a result of the partners and suppliers that it currently utilises which its competitors don't?
- What benefits is the organisation missing out on by not currently procuring from some or other potential supplier?
- What benefits is the organisation missing out on by not currently having a partnership with some or other potential partner?

**Figure 4-6: Questions related to key competencies**



- What beneficial characteristics does the organisation possess surrounding its key competencies which its competitors don't?
- What negative characteristics does the organisation possess surrounding its key competencies which its competitors don't?
- What key competencies does the organisation currently possess which its competitors don't?
- What beneficial key competencies should the organisation possess which it currently does not?

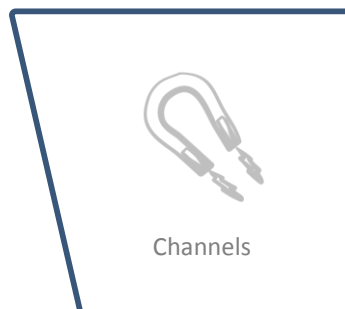
**Figure 4-7: Questions related to key resources**



- What benefits does the organisation obtain from the key resources that it currently utilises which its competitors don't?
- What difficulties does the organisation experience from the key resources that it currently utilises which its competitors don't?
- What key resources does the organisation currently possess which its competitors don't?
- What key resources should the organisation possess which it currently does not?

**Figure 4-8: Questions related to offerings and value propositions**

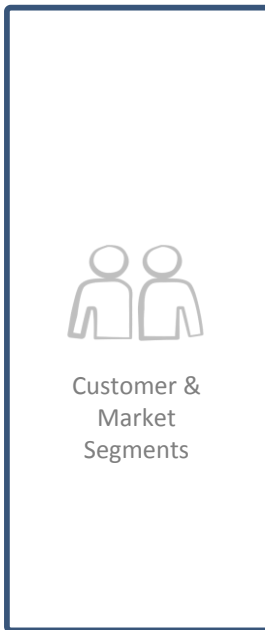
- What characteristics make the organisation's offerings and value propositions better than those of its competitors?
- What characteristics make the organisation's offerings and value propositions worse than those of its competitors?
- What value propositions does the organisation currently provide its customers which its competitors don't?
- What value propositions should the organisation provide its customers which it currently does not?

**Figure 4-9: Questions related to channels**

- What advantages does the organisation obtain from the channels that it currently utilises which its competitors don't?
- What disadvantages does the organisation experience from the channels that it currently utilises which its competitors don't?
- What channels does the organisation currently utilise which its competitors don't?
- What channels should the organisation utilise which it currently does not?

**Figure 4-10: Questions related to customer relationships**

- In what ways are the organisation's current customer relationships better than those of its competitors?
- In what ways are the organisation's current customer relationships poorer than those of its competitors?
- What new types of relationships should the organisation have with its customers, which it currently does not?

**Figure 4-11: Questions related to customer and market segments**

- What advantages does the organisation gain from the customer and market segments that it currently targets which its competitors don't?
- What disadvantages does the organisation experience from the customer and market segments that it currently targets which its competitors don't?
- Which customer and market segments does the organisation target which its competitors don't?
- What customer and market segments should the organisation target which it currently does not?

**Figure 4-12: Questions related to cost structure**

- In what ways does the organisation have a lower cost structure than its competitors?
- In what ways does the organisation have a higher cost structure than its competitors?
- What should the organisation be doing to lower its cost structure which it currently is not?

**Figure 4-13: Questions related to revenue streams**

- Which of the organisation's revenue streams are more lucrative than those of its competitors?
- Which of the organisation's revenue streams are less lucrative than those of its competitors?
- What revenue streams should the organisation generate which it currently does not?

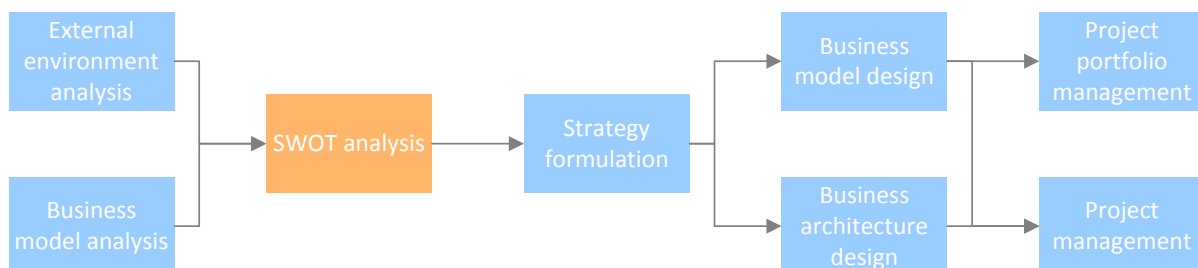
### *Persons involved in conducting a business model analysis*

The best source of information regarding the strengths and weaknesses that an organisation possesses surrounding each of its business model building blocks is the employees within the organisation itself. Conducting a business model analysis should therefore be a collaborative effort that involves as many employees as possible from each of the functional areas within an organisation. However, it is very important that an organisation involves employees within its line functions (supply chain, operations, marketing, sales and product development teams) when conducting a business model analysis. These teams have the most insight regarding the business models of the organisation's competitors and will therefore most likely provide the most valuable input. The tasks involved in conducting a business model analysis are performed much more effectively and efficiently when they are facilitated by an experienced facilitator. An organisation should therefore have someone facilitate the business model analysis. The facilitator could be a member of an organisation's management team or an enterprise engineering consultant. However, as mentioned previously, it is very important that the same person, assuming the role of facilitator during the business model analysis, assume the responsibility of facilitator during the utilisation of the other five methods, within the methodology, that require a facilitator.

### **SWOT analysis**

Once an organisation has conducted an external environment analysis and business model analysis, the next step in the methodology is conducting a SWOT analysis (refer to Figure 4-14 below). The purpose of conducting a SWOT analysis is to prioritise the strengths, weaknesses, opportunities and threats that an organisation has identified.

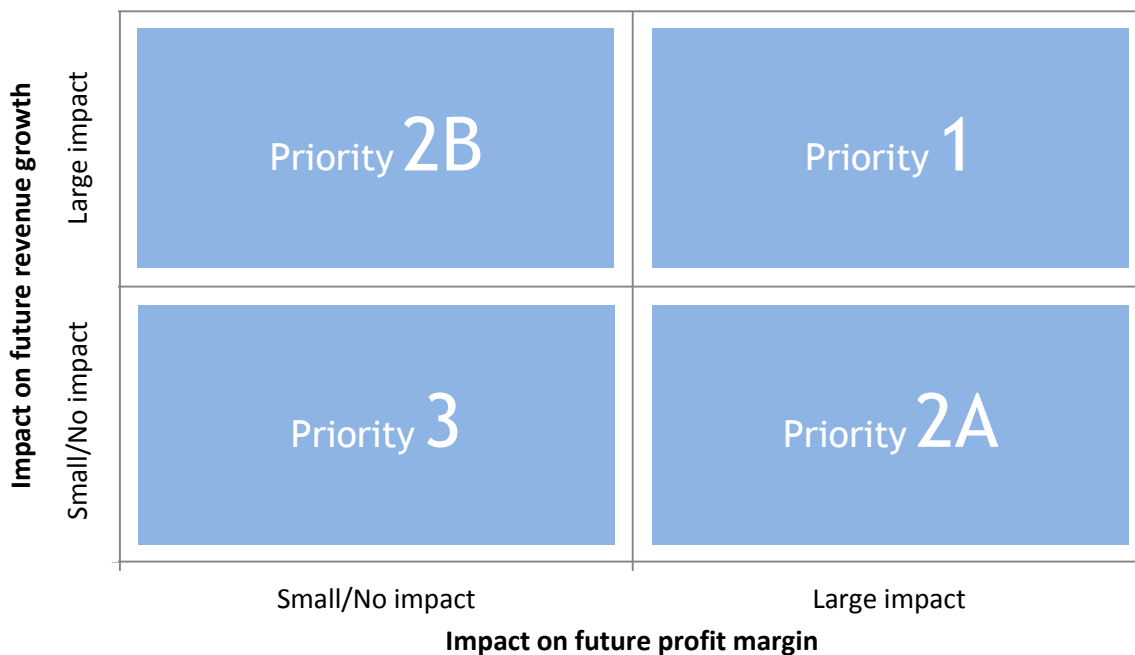
**Figure 4-14: SWOT analysis within the context of the methodology**



### *How to conduct a SWOT analysis*

As mentioned previously an organisation needs to prioritise the strengths, weaknesses, opportunities and threats that it is faced with. The reason being that, due to resource constraints, an organisation will not be able to capitalise on its opportunities, counter its threats, exploit its strengths and improve its weaknesses, all at once.

Prioritising an organisation's strengths, weaknesses, opportunities and threats can be done in a variety of different ways. One way is to prioritise them based on the ease with which an organisation is able to respond to them. Another way is by prioritising them based on the time it will take an organisation to respond to them. However, the goal of any commercial organisation is to maximise its future revenue and profit margin. When an organisation re-engineers itself it should do so with this same goal in mind. It therefore stands to reason that an organisation needs to prioritise its strengths, weaknesses, opportunities and threats based on the magnitude of their future positive or negative impact on profit margin as well as revenue. A graph like the one illustrated in Figure 4-15 below can be used to do this. The strengths, weaknesses, opportunities and threats that fall within the top right quadrant of such a graph are classified as "priority 1" since they have a significant impact on both the future profit margin and future revenue of an organisation. Those that fall within the bottom right quadrant are classified as "priority 2A" since they have a significant impact on the future profit margin of an organisation and only modestly impact its future revenue if at all. Those that fall within the top left quadrant are classified as "priority 2B" since they have a significant impact on the future revenue of an organisation and only modestly impact its future profit margin if at all. Lastly, those that fall within the bottom left quadrant are classified as "priority 3" since they have a modest or no impact on both the future profit margin and future revenue of an organisation.

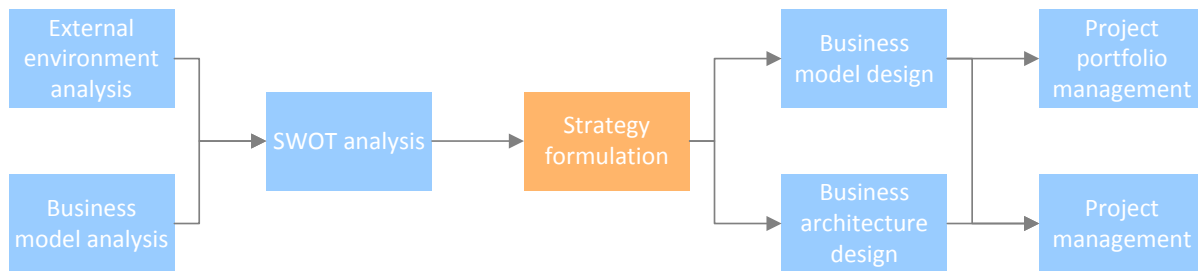
**Figure 4-15: Strength, weakness, opportunity and threat prioritisation***Persons involved in conducting a SWOT analysis*

Conducting a SWOT analysis should be a collaborative effort between an organisation's management team and as many employees from various different functional areas, layers and demographic profiles as possible. However, it is very important that an organisation's line functions (supply chain, operations, marketing, sales and product development teams) are involved since they will most likely have the required information for prioritising the strengths, weaknesses, opportunities and threats. By having as many of an organisation's employees as possible contribute to a SWOT analysis it ensures that the majority of individuals within an organisation are on the same page regarding the kind of situation that it is in. It also eliminates the need for change management later in the enterprise engineering effort. As with conducting an external environment and a business model analysis, the tasks involved in a SWOT analysis are performed much more effectively and efficiently when they are facilitated by an experienced facilitator. An organisation should therefore also have a facilitator facilitate the SWOT analysis. The facilitator could be a member of an organisation's management team or an enterprise engineering consultant. However, as mentioned previously, it is very important that the same person, assuming the role of facilitator during the SWOT analysis, assume the responsibility of facilitator during the utilisation of the other five methods, within the methodology, that require a facilitator.

## Strategy formulation

As mentioned in Chapter 3, once an organisation has conducted a SWOT analysis the next thing it needs to do is formulate a strategy (refer to Figure 4-16 below). The purpose of formulating a strategy is for an organisation to determine how it is going to respond to its prioritised set of strengths, weaknesses, opportunities and threats.

**Figure 4-16: Strategy formulation within the context of the methodology**



### *How to formulate a strategy*

The first task an organisation needs to complete when formulating its strategy is selecting the kind of strategy that it believes it needs to follow. Stated differently, an organisation needs to formulate a strategic positioning statement (Gadiesh & Gilbert, 2001). In order for an organisation to be able to do this, however, it first needs to identify, from the prioritised set of strengths, weaknesses, opportunities and threats, the ones it believes it should respond to (Luecke, 2005). This set should of course consist of as many “priority 1” strengths, weaknesses, opportunities and threats as is practically and economically feasible. Once this has been done an organisation formulates its strategic positioning statement by describing, based on the set of strengths, weaknesses, opportunities and threats that it believes it should respond to, how it needs to differentiate itself in order to secure a sustainable competitive advantage. In most cases the strategic position that an organisation selects and describes will be based on one or maximum two of the three generic strategic positions illustrated below (Luecke, 2005):

**Figure 4-17: Generic strategic positions**



A strategic position that is based purely on price leadership means an organisation minimises the cost of providing its value propositions to its customers to a level that is substantially below those of competitors. To make a price leadership strategic position work, an organisation needs to find ways of decreasing its operating expenses in ways that are difficult to replicate. An organisation does this by, for example, continuously improving its operating efficiency, exploiting the experience curve, creating an effective and efficient supply chain and redesigning its value propositions.

A strategic position that is based purely on value proposition innovation means an organisation provides very distinctive offerings that competitors are not able to easily imitate or replicate. Examples of value proposition innovations include quality, additional features, ease of use, branding, etc. To make a strategic position around value proposition innovation work, an organisation's offerings need to not only be distinctive, but also deliver the type of value that will positively influence the purchasing behaviour of its targeted customers in terms of:

- their product preferences, and/or
- their willingness to pay a premium for the offerings offered by the organisation.

A strategic position that is based purely on customer intimacy means an organisation builds intimate relationships with its targeted customers and fulfils their unique needs. An organisation does this by, for example, offering personalised service and customised solutions, by interacting with targeted customers through personal contact and by continuously making a conscious effort to better understand them.

Once an organisation has formulated its strategic positioning statement the next step is setting itself strategic objectives. An organisation does this by describing the actions that it needs to take in order to exploit, improve, capitalise on and counter the strengths, weaknesses, opportunities and threats within the set that it believes it needs to respond to (Birnik & Moat, 2008). When an organisation does this it is very important that the strategic objectives it sets itself:

- are achievable,
- are measurable (yardstick),
- have an allocated timeframe, and
- are aligned with its desired strategic position.

If the strategic objectives do not possess these characteristics, then an organisation stands a very slim chance of successfully achieving them.



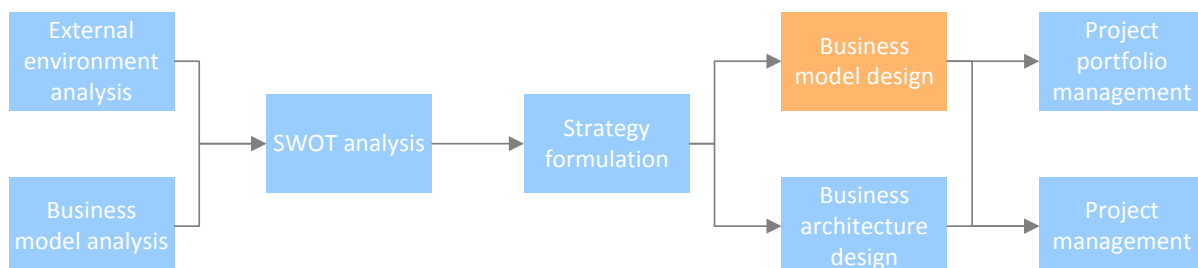
### *Persons involved in strategy formulation*

Strategy formulation is ultimately the responsibility of an organisation's management team, but it is important that an organisation's management team involves as many employees from various different functional areas, layers and demographic profiles as possible. It is especially important that the line function teams (supply chain, operations, marketing, sales and product development teams) be involved since these teams will most likely be responsible for executing the strategy once it has been formulated. By having as many of an organisation's employees as possible contribute to formulating its strategy it ensures that a large number of creative and innovative ideas are gathered. By having the individuals responsible for executing the strategy involved in its formulation eliminates the need for change management and ensures that the strategy has a greater chance of being successfully executed. The tasks involved in formulating a strategy are performed much more effectively and efficiently when they are facilitated by an experienced facilitator. An organisation should therefore also have a facilitator facilitate the formulation of its strategy. The facilitator could be a member of an organisation's management team or an enterprise engineering consultant. However, as mentioned previously, it is very important that the same person, assuming the role of facilitator during strategy formulation, assume the responsibility of facilitator during the utilisation of the other five methods, within the methodology, that require a facilitator.

### **Business model design**

As mentioned in Chapter 3, after formulating its strategy an organisation needs to design the business model that it needs to implement in order to successfully execute its strategy (refer to Figure 4-18 below). In other words, an organisation needs to describe its business model end-state.

**Figure 4-18: Business model design within the context of the methodology**



### *How to conduct a business model design*

When an organisation designs its business model it simply means that it describes the business model that it needs to implement in order for it to attain its desired strategic position and achieve its strategic objectives. In other words, an organisation describes its business model end-state. In order for an organisation to do this it firstly needs to analyse its strategy. The purpose of this analysis is to determine exactly how each of its current business model building blocks, described in Figure 4-4, should change in order for it to attain its desired strategic position and achieve its strategic objectives. Once an organisation understands in what ways its current business model building blocks need to change it uses this information to populate the business model template illustrated in Figure 4-4 with the following information:

- The suppliers and partners building block is populated by listing the most important suppliers and partners that need to be utilised by the organisation in future.
- The key competencies block is populated by listing the most important actions that need to be performed by the organisation in future.
- The key resources block is populated by listing the most important tangible and/or intangible assets that will be required by the organisation in future.
- The offerings and value propositions block is populated by listing the products and/or services that the organisation needs to offer its customers in future.
- The channels block is populated by listing the future means by which the organisation needs to reach its customers.
- The customer relationships block is populated by describing the types of relationships that the organisation needs to have with its customers in future.
- The customer & market segments block is populated by listing the groups of people and/or organisations that the organisation needs to deliver its value propositions to in future.
- The revenue streams block is populated by listing the types of future revenues that the organisation needs to generate from delivering its value propositions to its customers.
- The cost structure block is populated by listing the most important costs that will be incurred as part of the organisation's operations in future.

The sequence in which the nine business model building blocks are populated is not extremely important, but the most logical places to start are the suppliers and partner block, the offerings and value proposition block or the customer and market segment block.

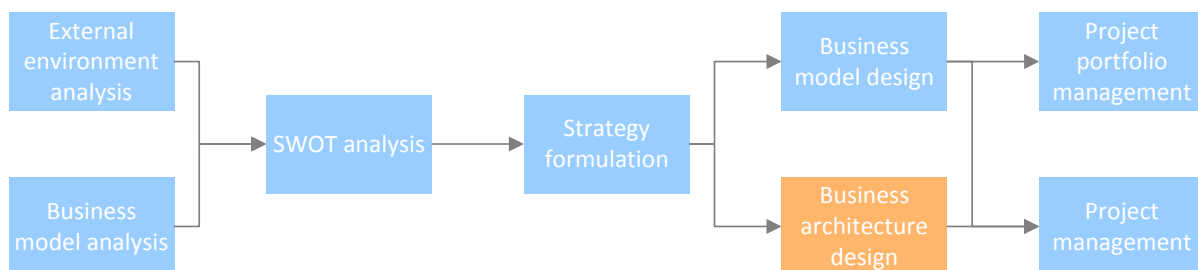
### *Persons involved in business model design*

An organisation's management team has the necessary management experience to determine what kind of business model it needs to implement in order to successfully execute its strategy. Business model design is therefore the responsibility of an organisation's management team. The tasks involved in redesigning an organisation's business model are performed much more effectively and efficiently when they are facilitated by an experienced facilitator. It is therefore valuable to have a facilitator involved in this step. The facilitator could be a member of an organisation's management team or an enterprise engineering consultant. However, as mentioned previously, it is very important that the same person, assuming the role of facilitator during business model design, assume the responsibility of facilitator during the utilisation of the other five methods, within the methodology, that require a facilitator.

### **Business architecture design**

Once an organisation has formulated its strategy it not only needs to design the business model that it needs to implement in order to successfully execute its strategy, but also the business architecture that needs to be implemented (refer to Figure 4-19 below). Stated differently, an organisation needs to not only describe its business model end-state, but also its business architecture end-state.

**Figure 4-19: Business architecture design within the context of the methodology**



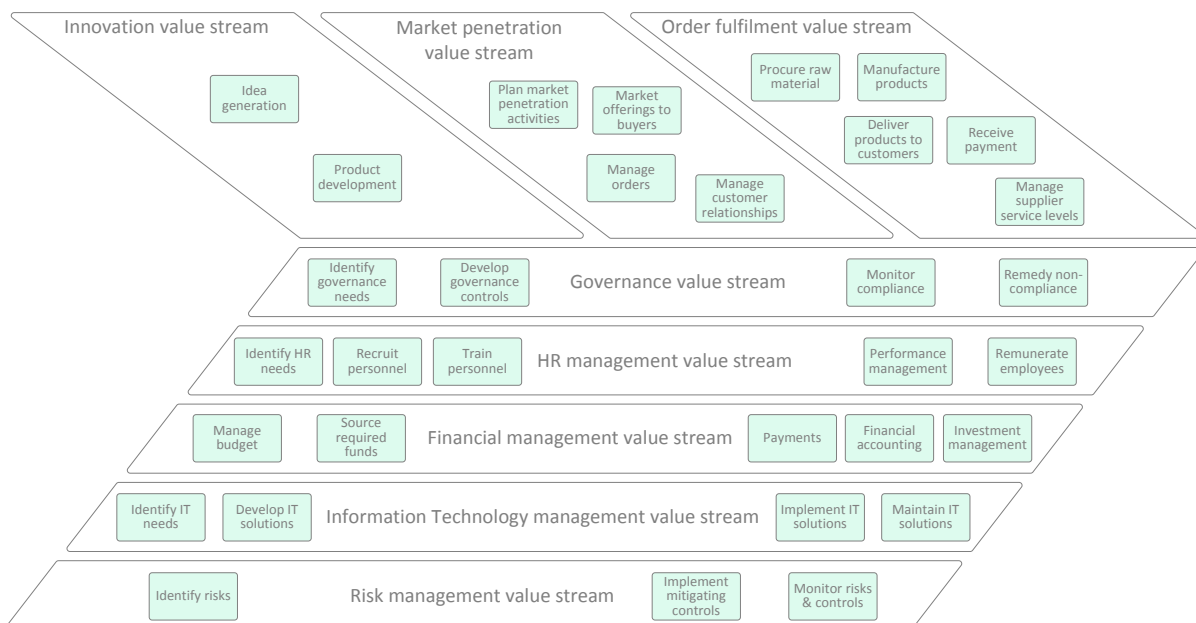
### *How to conduct a business architecture design*

The architecture of any organisation can be divided into the following three components: its business processes, its organisation structure and its management information needs (Giachetti, 2010). When an organisation designs its business architecture it therefore means that it describes the to-be state of its business processes, its organisation structure and its management information needs.

The first business architecture element that an organisation needs to design is its business processes. An organisation does this by first identifying, based on its formulated strategy and redesigned business model, all of the business processes it needs to perform in future as well as how they need to be grouped into value streams. A value stream is a logical grouping of business processes that together aim to achieve a common value stream goal. A value stream is not, however, necessarily the same as a business unit/functional unit/department. In fact, various different business units/functional units/departments are typically involved in executing the processes within a specific value stream. Most organisations do not group their business processes around value streams. Instead, they design and group their business processes around functional units/departments like marketing, sales, human resources, IT, etc. The problem with designing and grouping business processes around functional units/departments is that it creates functional silos within an organisation. These functional silos end up operating extremely effectively and efficiently, but the organisation as a whole ends up operating extremely ineffectively and inefficiently (Martin, 1995). By rather designing and grouping its business processes around value streams, an organisation creates a collaborative working environment that spans across functional units/departments.

An example of how a manufacturing organisation could group its business processes around value streams is illustrated in Figure 4-20 below.

**Figure 4-20: Example of value streams and business processes of a manufacturing organisation**



Once an organisation has identified the business processes that it needs to perform in future as well as how they should be grouped into value streams, it needs to determine the following:

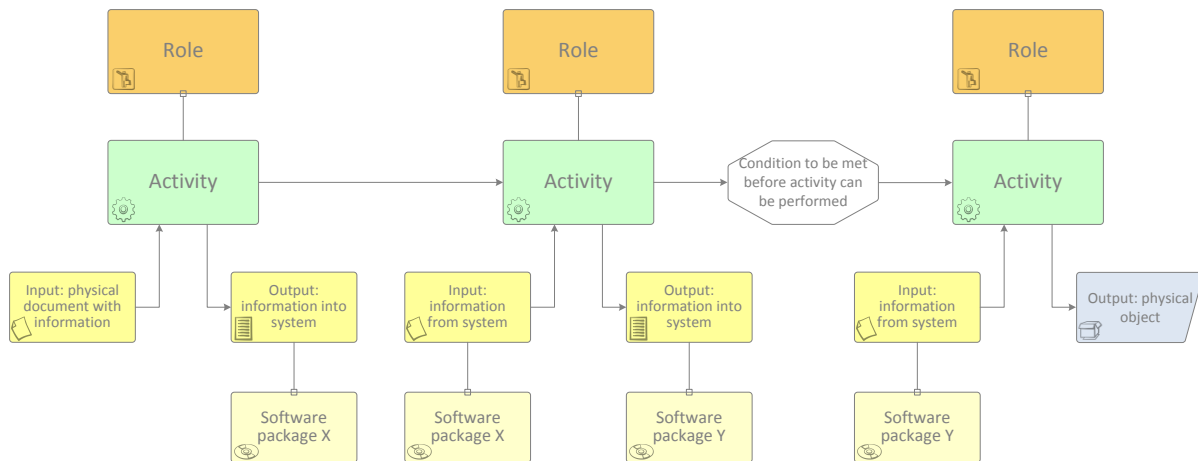
- which of these business processes it is not currently performing,
- which of these business processes it is currently performing,
- which of the business processes that it is currently performing are ineffective and/or misaligned with its strategy, and
- which of the business processes that it is currently performing are effective and aligned with its strategy.

The business processes that an organisation identified as being ineffective and/or misaligned with its strategy then need to be redesigned and the ones that it is currently not performing need to be designed from scratch. Designing or redesigning these business processes means describing the way in which they should be performed in future. An organisation does this by developing a business process model for each of these processes that describes its end-state. When developing these models, however, it is very important that they depict the following information:

- the activities that will be performed within a process,
- the sequence within which these activities need to be performed,
- the roles that will be responsible for performing each of the activities,
- the physical and/or information inputs to each activity,
- the physical and/or information outputs of each activity,
- the software package out of which each activity's information inputs will be extracted, and
- the software package into which each activity's information outputs will be put

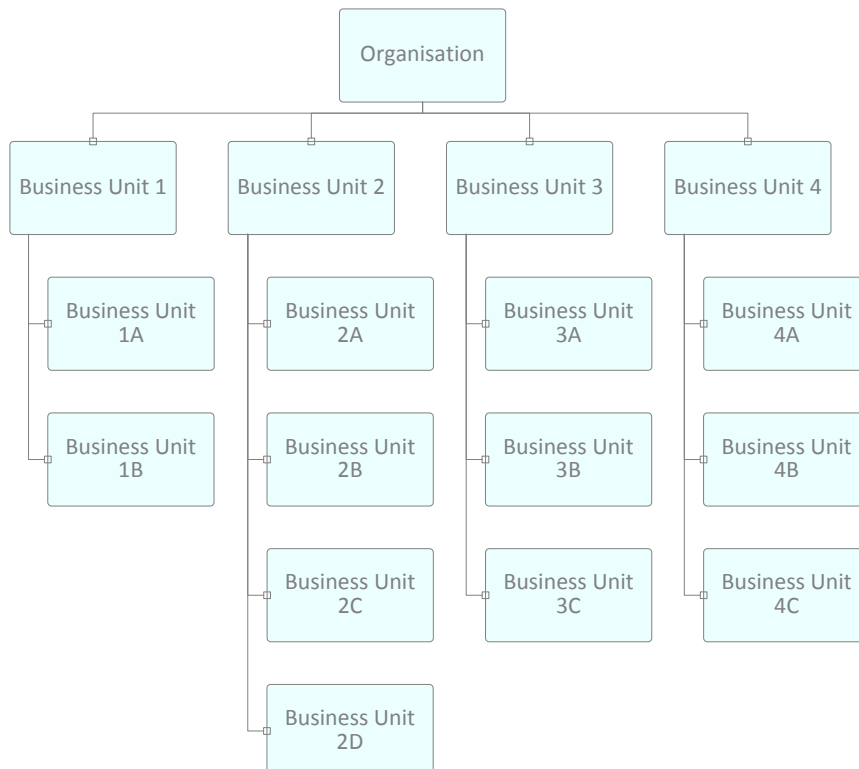
An example of a typical business process model is illustrated in Figure 4-21 below.

**Figure 4-21: Example of a business process model**



Once an organisation has designed and redesigned the necessary business processes, its next task is redesigning its organisation structure. As mentioned previously, organisation redesign means describing the organisation structure that an organisation needs to implement in order for it to successfully execute its strategy. When an organisation redesigns its organisation structure the first thing it needs to do is simply describe the hierarchy of functional/business units that it should consist of. This is done by developing a high level organisation structure model like the one illustrated in Figure 4-22 below.

**Figure 4-22: Example of high level organisation structure model**

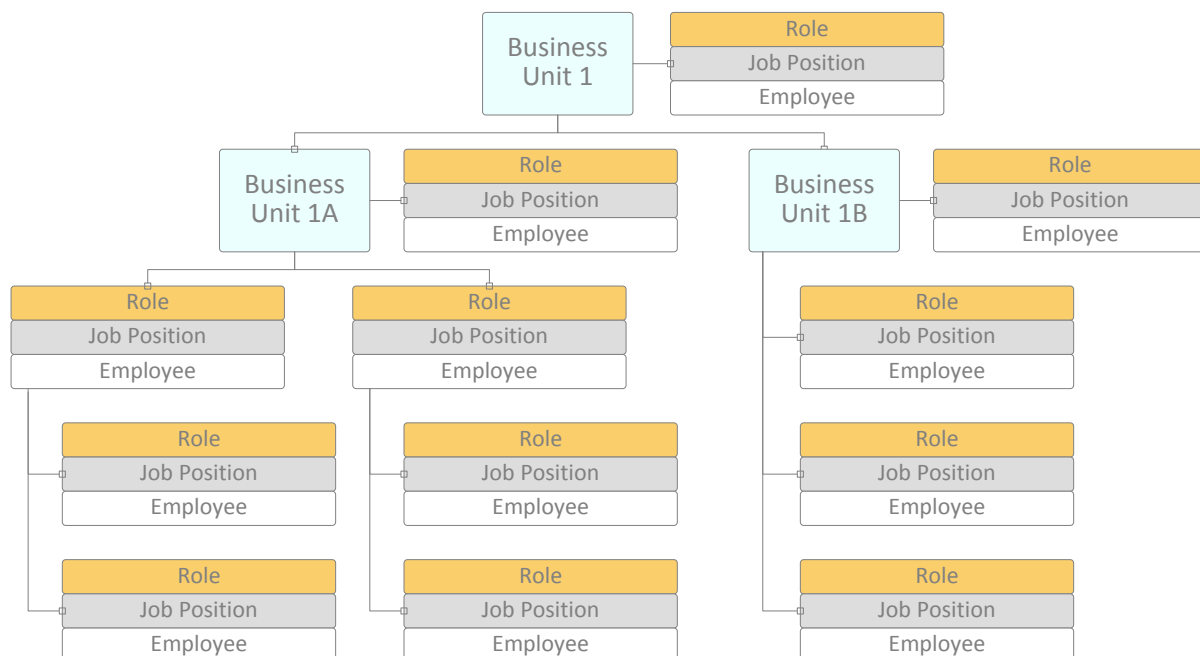


Once an organisation has developed the high level organisation structure model, the next thing it needs to do is determine what the detailed organisation structure of each of its business units needs to be. Essentially this means determining the following for each of the business units:

- what the roles are that need to be performed within it,
- what the job position(s) are that should perform the various roles,
- which employee should fill each of the job positions, and
- what the reporting lines should be between the various job positions.

Very often the detailed organisation structure that an organisation needs for a specific business unit is exactly the same as its current structure. However, in some cases an organisation might need a completely new detailed organisation structure for one or more of its business units, either because they currently do not exist or because their existing structures are ineffective. The third task that an organisation needs to complete when redesigning its organisation structure is redesigning the detailed organisation structures of the relevant business units. This is done by developing a detailed organisation structure model like the one illustrated in Figure 4-23 below for each of these business units.

**Figure 4-23: Example of a detailed organisation structure model**



When an organisation develops both its high level and detailed organisation structure models, it is extremely important that it takes certain organisation structure design influences into consideration. The most important of these design influences is of course an organisation's value streams and business processes. Other organisation structure design influences include, for example, an organisation's business model, key people, locality (geographic), customers, business infrastructure and legislation.

In order for an organisation to successfully execute a new/different strategy it most likely needs to gain access to a different set of management information (Figo, 2002). In order for an organisation to do this it needs to redesign its performance measurement system (Eccles, 1991). This is done by completing the following three tasks (Eccles, 1991):

1. Performance metric identification.
2. Establishing the information architecture.
3. Aligning incentive schemes.

An organisation performs task one by first of all determining what kind of behaviour its employees and other stakeholders (suppliers, partners etc.) need to exhibit in future, based on its strategy. Once this has been done an organisation identifies its new set of performance metrics by describing the metrics that will enable it to determine whether or not its employees and other stakeholders are exhibiting the desired behaviour. When doing this, however, it is very important that the total number performance metrics are kept to a minimum and that they are easy to measure. A performance metric is of no use if it can't be easily measured and a large number of metrics requires too large an effort. Having identified the new set of performance metrics it requires, an organisation is now ready to establish the required information architecture. This is done by implementing the technology and methods that are needed to generate the data for each metric and by developing the rules that govern/regulate this data. The third and final step in redesigning a performance measurement system is aligning an organisation's incentive scheme with its performance metrics. An organisation does this by describing how its employees and other stakeholders will be rewarded, financially or by other means, for exhibiting the kind of behaviour that is required from them. Without defining this final component of the performance measurement system, an organisation will find it very difficult to motivate its employees and other stakeholders to exhibit the kind of behaviour that is required from them. An example of a performance measurement system design is illustrated in Table 4-2 below.



**Table 4-2: Example of a performance measurement system**

Role	Required behaviour	Performance metric	Incentive
Marketing executive	<ul style="list-style-type: none"> <li>- Identify new potential markets</li> <li>- Develop and commercialise innovative products and services for new markets</li> <li>- Market new and existing products and services to potential customers</li> </ul>	<ul style="list-style-type: none"> <li>- Additional profit generated from new product and service sales to new customers for a period</li> <li>- Additional profit generated from existing product and service sales to new customers for a period</li> </ul>	Commission on additional profit generated from sales to new customers for a period
Sales representative	<ul style="list-style-type: none"> <li>- Identify new product and service needs of current customers</li> <li>- Develop and commercialise innovative products and services that fulfil the specific needs of current customers</li> <li>- Market new and existing products and services to current customers</li> <li>- Create intimate relationships with current customers</li> </ul>	<ul style="list-style-type: none"> <li>- Additional profit generated from new product and service sales to current customers</li> <li>- Profit generated from existing product and service sales to current customers</li> </ul>	<ul style="list-style-type: none"> <li>- Commission on additional profit generated from new product and service sales to current customers</li> <li>- Commission on profit generated from existing product and service sales to current customers</li> </ul>

### *Persons involved in business architecture design*

Various different groups of people within an organisation are involved in designing its business architecture. Its management team is responsible for identifying the business processes that it needs to perform in future as well as how they need to be grouped into value streams. The reason is that an organisation's management team have the necessary knowledge to make these decisions.

Designing the business processes currently not performed and redesigning the ineffective and strategically misaligned business processes on the other hand, is the responsibility of the employees currently involved in these business processes and the employees that will be involved in them in future. By making these employees responsible for doing this, a sense of ownership is created amongst the employees performing the business processes and the need for change management is eliminated.

Designing its organisation structure is the responsibility of an organisation's management team. An organisation's management team has the necessary knowledge and management experience to know what kind of organisation structure will enable the successful execution of its business processes. It is, however, extremely important that an organisation's management team involves the Human Resources team as well as the individuals that will be affected by the new structure as much as possible.

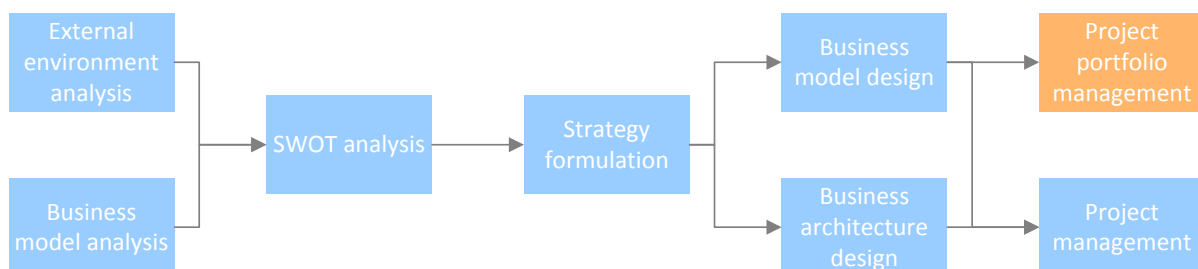
Designing an organisation's performance measurement system is mainly the responsibility of its management team. However, it is very important that an organisation obtains input from its employees and other stakeholders. This way an organisation's management team will ensure that realistic performance expectations are set.

The tasks involved in redesigning an organisation's business architecture are performed much more effectively and efficiently when they are facilitated by an experienced facilitator (especially the business process design task). It is therefore valuable to have a facilitator involved in this step. The facilitator could be a member of an organisation's management team or an enterprise engineering consultant. However, as mentioned previously, it is very important that the same person, assuming the role of facilitator during business architecture design, assume the responsibility of facilitator during the utilisation of the other five methods, within the methodology, that require a facilitator.

### Project portfolio management

After designing the business model and business architecture that it needs to implement, the only thing that an organisation still needs to do is physically implement the designs through a portfolio of transformation projects. However, in order to ensure that the transformation projects are successfully executed, the overall portfolio needs to be effectively managed (refer to Figure 4-24 below).

**Figure 4-24: Project portfolio management within the context of the methodology**



### *How to manage a portfolio of projects*

Project portfolio management, in the context of the enterprise engineering methodology, means managing the portfolio of transformation initiatives needed to implement an organisation's business model and business architecture designs. In order to do this an organisation first needs to identify the portfolio of transformation projects that need to be executed in order to implement its business model and business architecture designs. An organisation does this by performing a kind of gap analysis. During this analysis an organisation compares its current business model and business architecture with its redesigned business model and business architecture. By doing this an organisation is able to identify the "gaps" between its current business model and business architecture and its redesigned business model and business architecture. Identifying these "gaps" enables an organisation to determine what transformation projects need to be executed in order to bridge them.

Once an organisation has identified the portfolio of transformation projects needed to implement its business model and business architecture designs, it can start to actually manage the portfolio. Essentially this means:

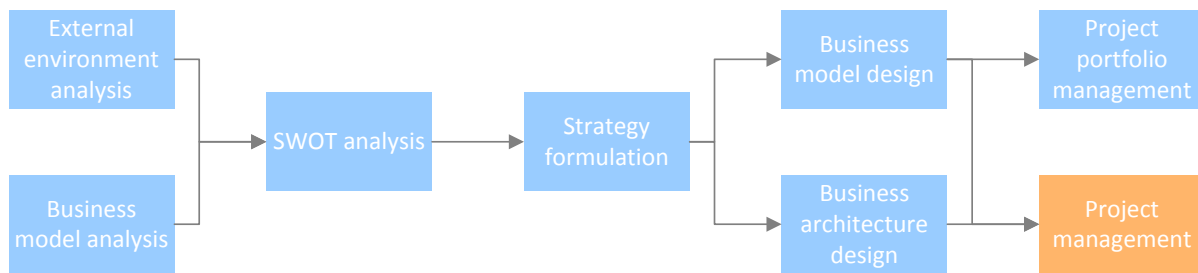
- planning the overall portfolio of projects by identifying dependencies between the various projects and planning their start and end dates (i.e. developing a Gantt chart for the portfolio of projects),
- halting or cancelling projects within the portfolio if required,
- changing the scope of the projects within the portfolio if required, and
- monitoring the overall performance of the projects within the portfolio.

### *Persons involved in project portfolio management*

An organisation's management team is ultimately responsible for any re-engineering effort and it also has the necessary authority to make the decisions related to project portfolio management. Project portfolio management is therefore the responsibility of an organisation's management team.

### **Project management**

When re-engineering itself, an organisation not only needs to effectively manage the overall portfolio of transformation projects needed to implement its business model and business architecture designs. It is also very important that an organisation effectively manages each transformation project within the portfolio on an individual basis (refer to Figure 4-25 below).

**Figure 4-25: Project management within the context of the methodology**

### *How to manage a project*

The two most common methods for managing projects are probably the PMBOK (Project Management Body of Knowledge) method and the Prince II method. Unfortunately, both of these methods are not very useful when it comes to managing transformation projects since they were designed and developed for managing projects of a much larger scale that are significantly more complex. The basic/core elements of these two project management methods, however, can and should be used when managing transformation projects. These basic/core elements have therefore been incorporated into the project management method described below.

Project management, in the context of the enterprise engineering methodology, means **PLANNING** and **CONTROLLING** the execution of each of the transformation projects needed to implement an organisation's end-state. When an organisation plans a transformation project the first thing it needs to do is define the scope of the project. An organisation does this by developing a scope definition report which describes the following:

- the aim of the project,
- the benefits to be obtained from successfully executing the project,
- the deliverables to be generated by the project as well as each deliverable's resource requirements, estimated cost, planned start and end dates and acceptance criteria, and
- the stakeholders involved in the project, their roles in the project and their contact details.

A scope definition report template is illustrated in Figure 4-26 below.

**Figure 4-26: Scope definition report template**

**Scope definition report**

**Project aim**  
Description of the purpose of the project...

**Project benefits**

- List of benefits of the project...

**Project deliverables**

Deliverable	Resource requirements	Estimated cost	Start date	End date	Acceptance criteria
Project deliverable 1	Resources required to deliver deliverable 1	Estimated cost of delivering deliverable 1	Date when work will start to deliver deliverable 1	Date when deliverable 1 will be delivered	Criteria that deliverable 1 needs to meet
Project deliverable 2	Resources required to deliver deliverable 2	Estimated cost of delivering deliverable 2	Date when work will start to deliver deliverable 2	Date when deliverable 2 will be delivered	Criteria that deliverable 2 needs to meet
Project deliverable n	Resources required to deliver deliverable n	Estimated cost of delivering deliverable n	Date when work will start to deliver deliverable n	Date when deliverable n will be delivered	Criteria that deliverable n needs to meet

**Project stakeholders**

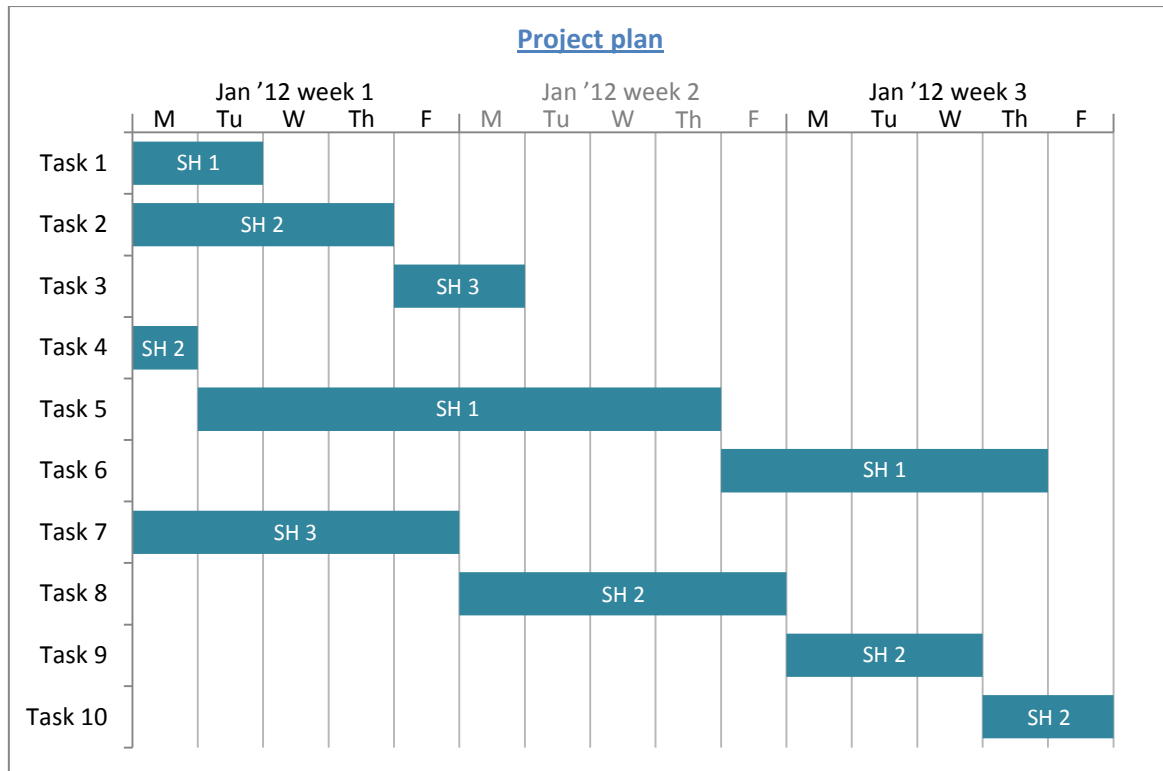
Stakeholder role	Stakeholder name	Stakeholder contact details
Project manager		
Project sponsor		
Affected party		
Etc.		

The second thing an organisation needs to do when planning a transformation project is develop the actual project plan. The project plan should describe the tasks that need to be performed in order to successfully execute the project, the expected start and end dates of each of these tasks, the dependencies between the tasks and the resources responsible for the execution of each of the tasks. A textual and graphical project plan template is illustrated in Figure 4-27 and Figure 4-28 below.

**Figure 4-27: Project plan template in textual format**

<u>Project plan</u>					
Task description	Duration	Start date	Completion date	Task dependency	Responsible project stakeholder
Task 1	2 days	02/01/2012	03/01/2012	None	SH 1
Task 2	4 days	02/01/2012	05/01/2012	None	SH 2
Task 3	2 days	06/01/2012	06/01/2012	Task 2	SH 3
Task 4	1 day	02/01/2012	02/01/2012	None	SH 2
Task 5	8 days	03/01/2012	12/01/2012	Task 4	SH 1
Task 6	5 days	13/01/2012	19/01/2012	Task 5	SH 1
Task 7	5 days	02/01/2012	06/01/2012	None	SH 3
Task 8	5 days	09/01/2012	13/01/2012	Task 7	SH 2
Task 9	3 days	16/01/2012	18/01/2012	Task 8	SH 2
Task 10	2 days	19/01/2012	20/01/2012	Task 9	SH 2

**Figure 4-28: Project plan template in graphical format**



Once an organisation has properly planned a transformation project it can start executing it according to the project plan. However, to ensure that this is done successfully an organisation needs to control the execution of the transformation project. Controlling a transformation means ensuring that it delivers exactly what it is supposed to within the planned cost and schedule parameters. An organisation does this through effective project risk management, problem management and project administration. Managing project risks is done by performing the following activities:

- Anticipating events that will have a negative impact on the success of a project.
- Identifying the potential impact(s) that each of the events could have on a project.
- Determining the magnitude of the potential impact(s).
- Determining how likely each of these events is to occur.
- Determining what mitigating controls need to be implemented for each of these events.
- Determining which project stakeholder is responsible for implementing each of the mitigating controls.
- Documenting all of this information using a risk register, like the one illustrated in Figure 4-29 below.
- Ensuring that the relevant project stakeholders physically implement the mitigating controls.

**Figure 4-29: Project risk register template**

<b>Project risk register</b>						
<b>Project risk</b>	<b>Potential impact</b>	<b>Magnitude of potential impact</b>	<b>Likelihood of occurrence</b>	<b>Mitigating control</b>	<b>Status</b>	<b>Responsible stakeholder</b>
Risk 1	Impact if Risk 1 occurs	Catastrophic / Major / Severe / Moderate / Minor	Certain / Likely / Possible / Unlikely / Remote	Mitigating control to be implemented for Risk 1	Mitigated / Active	Stakeholder responsible for mitigating Risk 1
Risk 2	Impact if Risk 2 occurs	Catastrophic / Major / Severe / Moderate / Minor	Certain / Likely / Possible / Unlikely / Remote	Mitigating control to be implemented for Risk 2	Mitigated / Active	Stakeholder responsible for mitigating Risk 2
Risk n	Impact if Risk n occurs	Catastrophic / Major / Severe / Moderate / Minor	Certain / Likely / Possible / Unlikely / Remote	Mitigating control to be implemented for Risk n	Mitigated / Active	Stakeholder responsible for mitigating Risk n

As mentioned above, the second element to controlling a transformation is problem management. An organisation does this by performing the following activities:

- Continuously measuring and documenting the performance of a project using a project performance report like the one illustrated in Figure 4-30 below.
- Regularly communicating with project stakeholders.
- Using the information gathered from the project performance report and the various project stakeholders to identify issues that have a negative effect on the success of a project.
- Determining what corrective measures need to be implemented in order to resolve each of these issues.
- Determining which project stakeholder is responsible for implementing each of the corrective measures.
- Documenting the identified issues, the required corrective measures and the responsible stakeholders using an issue log like the one illustrated in Figure 4-31 below.
- Ensuring that the relevant project stakeholders physically implement the corrective measures.

**Figure 4-30: Project performance report template**

<u>Project performance report</u>			
Deliverable	Cost performance	Schedule performance	Quality performance
Project deliverable 1	Deliverable under budget / on budget / over budget	Deliverable ahead of schedule / on schedule / behind schedule	Deliverable exceeding acceptance criteria / meeting acceptance criteria / not meeting acceptance criteria
Project deliverable 2	Deliverable under budget / on budget / over budget	Deliverable ahead of schedule / on schedule / behind schedule	Deliverable exceeding acceptance criteria / meeting acceptance criteria / not meeting acceptance criteria
Project deliverable n	Deliverable under budget / on budget / over budget	Deliverable ahead of schedule / on schedule / behind schedule	Deliverable exceeding acceptance criteria / meeting acceptance criteria / not meeting acceptance criteria



**Figure 4-31: Project issue log template**

<u>Project issue log</u>				
Issue	Impact on project	Corrective measure	Status	Responsible stakeholder
Issue 1	Description of the impact of Issue 1	Description of the corrective measure to be implemented for Issue 1	Resolved / Active	Stakeholder responsible for resolving Issue 1
Issue 2	Description of the impact of Issue 2	Description of the corrective measure to be implemented for Issue 2	Resolved / Active	Stakeholder responsible for resolving Issue 2
Issue n	Description of the impact of Issue n	Description of the corrective measure to be implemented for Issue n	Resolved / Active	Stakeholder responsible for resolving Issue n

The third and final element to controlling a transformation project is project administration. Project administration essentially means managing the logistics component of a project and includes, but is not limited to, performing the following activities:

- Scheduling and arranging project meetings and workshops.
- Recording the minutes of project meetings.
- Arranging payments to project suppliers.
- Arranging parking, internet access, building access, etc. for project stakeholders.
- Arranging travel itineraries.
- Preparing and distributing project documentation and reports.

#### *Persons involved in project management*

Managing an individual transformation project requires a specific set of skills as well as a certain level of authority. Managing an individual transformation project is therefore the responsibility of either a senior individual within an organisation that possesses project management skills or a project management consultant.

### **Chapter summary**

The enterprise engineering methodology delivered by this study consists of the following eight methods:

- External environment analysis.
- Business model analysis.
- SWOT analysis.
- Strategy formulation.
- Business model design.
- Business architecture design.
- Project portfolio management.
- Project management.

This chapter provided a detailed description of how an organisation uses each of these methods as well as who should be involved during its utilisation.

# *Chapter 5: Methodology*

## *validation*



Chapter 5 describes how the enterprise engineering methodology was validated using expert interviews as well as a case study

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## Methodology validation

### Introduction

As mentioned in Chapter 2, the enterprise engineering methodology that this study aims to deliver needs to possess a specific set of functional characteristics in order for it to enable an organisation to determine:

- what it needs to change,
- what it needs to change to, and
- how to cause/implement the change.

This set of functional characteristics was identified and described in Chapter 2 of this document. The purpose of this chapter is to describe how the enterprise engineering methodology, described in Chapter 4 of this document, was validated based on these functional characteristics. By doing this, it could be determined whether or not the enterprise engineering methodology delivered by this study does in fact enable an organisation to answer the three questions mentioned above. Expert interviews as well as a case study were used to validate the enterprise engineering methodology.

### Expert interviews

In order to validate whether or not the enterprise engineering methodology delivered by this study successfully satisfies its functional requirements, personal/face-to-face interviews were conducted with the following five enterprise engineering experts:

- Expert 1: CEO of an enterprise engineering consulting firm that has been operating since 1994 and has provided consulting services to organisations including ABSA, Nedbank, Sasol and Eskom.
- Expert 2: Lead enterprise architect of the South African branch of a large multinational manufacturing organisation.
- Expert 3: Strategy manager of a division within the South African branch of a large multinational manufacturing organisation with a post-graduate degree in Strategic Management from Oxford University.
- Expert 4: Enterprise engineering consultant with an advanced diploma in Project Management.
- Expert 5: Enterprise engineering consultant with an Industrial Engineering degree from the University of Pretoria and an MBA from GIBBS.

The process that was followed during each of the five interviews was as follows. First the enterprise engineering methodology was explained, in detail, to the respective enterprise engineering expert.

This was done by describing:

- the sequence within which each of the enterprise engineering methods, that form part of the methodology, typically need to be utilised,
- exactly how each of the methods need to be utilised, and
- who an organisation should involve during the utilisation of each of the methods.

Practical examples were used as aid during the explanation of the enterprise engineering methodology.

After explaining/describing the enterprise engineering methodology, the respective enterprise engineering expert was asked to complete a questionnaire. This questionnaire consisted of six statements that each correspond to a functional requirement of the enterprise engineering methodology. In order to complete the questionnaire the enterprise engineering expert needed to state, based on the enterprise engineering methodology explanation given, to what degree he/she agreed with each of the six statements on a scale of one to five. Five representing that he/she strongly agrees with a statement, four representing that he/she simply agrees with a statement, three representing that he/she is unsure about a statement, two representing that he/she disagrees with a statement and one representing that he/she strongly disagrees with a statement. Basically, the enterprise engineering expert was asked how well he/she felt the enterprise engineering methodology satisfies its functional requirements. An example of the questionnaire is illustrated in Table 5-1.

**Table 5-1: Methodology validation questionnaire**

<b>Functional requirements</b>	<b>5 (Strongly Agree)</b>	<b>4 (Agree)</b>	<b>3 (Unsure)</b>	<b>2 (Disagree)</b>	<b>1 (Strongly Disagree)</b>
The methodology possesses the capability to identify the opportunities and threats that exist within an organisation's external environment (Functional requirement 1)					
The methodology possesses the capability to identify the strengths and weaknesses that an organisation possesses (Functional requirement 2)					
The methodology possesses the capability to prioritise the strengths, weaknesses, opportunities and threats that an organisation is faced with (Functional requirement 3)					
The methodology possesses the capability to identify and plan the actions that an organisation needs to undertake in response to its most significant strengths, weaknesses, opportunities and threats (Functional requirement 4)					
The methodology possesses the capability to describe an organisation's internal environment end-state (Functional requirement 5)					
The methodology possesses the capability to manage the transformation projects needed to implement an organisation's internal environment end-state (Functional requirement 6)					

The results that were obtained from the expert interviews were very positive. All five of the enterprise engineering experts that were interviewed either agreed or strongly agreed with the six statements in the questionnaire (see Table 5-2 below). It is therefore safe to say that the five enterprise engineering experts that were interviewed are of the opinion that the enterprise engineering methodology that this study delivers successfully satisfies its functional requirements. Since this is the case, it is therefore also safe to say that the five experts believe that this study has achieved its objective.

**Table 5-2: Expert interview results**

Functional requirements	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5
The methodology possesses the capability to identify the opportunities and threats that exist within an organisation's external environment (Functional requirement 1)	5 (Strongly agree)	5 (Strongly agree)	5 (Strongly agree)	4 (Agree)	4 (Agree)
The methodology possesses the capability to identify the strengths and weaknesses that an organisation possesses (Functional requirement 2)	5 (Strongly agree)	5 (Strongly agree)	4 (Agree)	4 (Agree)	4 (Agree)
The methodology possesses the capability to prioritise the strengths, weaknesses, opportunities and threats that an organisation is faced with (Functional requirement 3)	5 (Strongly agree)	5 (Strongly agree)	4 (Agree)	4 (Agree)	4 (Agree)
The methodology possesses the capability to identify and plan the actions that an organisation needs to undertake in response to its most significant strengths, weaknesses, opportunities and threats (Functional requirement 4)	5 (Strongly agree)	4 (Agree)	4 (Agree)	4 (Agree)	4 (Agree)
The methodology possesses the capability to describe an organisation's internal environment end-state (Functional requirement 5)	5 (Strongly agree)	5 (Strongly agree)	4 (Agree)	4 (Agree)	4 (Agree)
The methodology possesses the capability to manage the transformation projects needed to implement an organisation's internal environment end-state (Functional requirement 6)	5 (Strongly agree)	4 (Agree)	4 (Agree)	4 (Agree)	4 (Agree)

### Case study

Although the expert interview results described above are very positive and encouraging, it was decided that the enterprise engineering methodology also needed to be validated from a more practical perspective. A case study was therefore conducted at a fairly large organisation that supplies paper based packaging products to the retail and industrial markets within South Africa. For various reasons, this organisation prefers to remain unnamed and will therefore be referred to as SA Packaging. The list of people that were involved in the case study is illustrated in Table 5-3 below.

**Table 5-3: Individuals involved in the case study at SA Packaging**

<b>Method</b>	<b>Individual involved</b>	<b>Role</b>
External environment analysis, Business model analysis, SWOT analysis, Strategy formulation & Business model design	The marketing manager of SA Packaging	Participant
	The product development manager of SA Packaging	Participant
	The supply chain manager of SA Packaging	Participant
	The sales segment manager – sales segment 1 of SA Packaging	Participant
	The sales segment manager – sales segment 2 of SA Packaging	Participant
	The strategy manager of SA Packaging	Participant & Facilitator
	The brand manager of SA Packaging	Participant
	Enterprise engineering consultant	Facilitator
Business architecture design	The marketing manager of SA Packaging	Participant
	The product development manager of SA Packaging	Participant
	The sales segment manager – sales segment 1 of SA Packaging	Participant
	The sales segment manager – sales segment 2 of SA Packaging	Participant
	The strategy manager of SA Packaging	Participant
	Enterprise engineering consultant	Facilitator
Project portfolio management	The marketing manager of SA Packaging	Project identification
	The product development manager of SA Packaging	Project identification
	The supply chain manager of SA Packaging	Project identification
	The brand manager of SA Packaging	Project identification
	The strategy manager of SA Packaging	Project portfolio manager
Project management	The marketing manager of SA Packaging	Project manager
	The product development manager of SA Packaging	Project manager
	The supply chain manager of SA Packaging	Project manager
	The sales segment manager – sales segment 1 of SA Packaging	Project manager
	The sales segment manager – sales segment 2 of SA Packaging	Project manager
	The brand manager of SA Packaging	Project manager

The case study has thus far not been fully completed. However, the outputs that have been generated from the large portion that has been completed have, so far, proved that, in practice, the enterprise engineering methodology successfully satisfies 5 out of its 6 functional requirements (see case study results in Appendix A). These 5 functional requirements are listed below:

- The methodology possesses the capability to identify the opportunities and threats that exist within an organisation's external environment (Functional requirement 1).



- The methodology possesses the capability to identify the strengths and weaknesses that an organisation possesses (Functional requirement 2).
- The methodology possesses the capability to prioritise the strengths, weaknesses, opportunities and threats that an organisation is faced with (Functional requirement 3).
- The methodology possesses the capability to identify and plan the actions that an organisation needs to undertake in response to its most significant strengths, weaknesses, opportunities and threats (Functional requirement 4).
- The methodology possesses the capability to describe an organisation's internal environment end-state (Functional requirement 5).

Based on the fact that functional requirements 1 to 5 of the enterprise engineering methodology have been validated from a practical perspective during the case study it is safe to say that, in practice, the enterprise engineering methodology delivered by this study does enable an organisation to answer the first TWO of the following three questions:

- What it needs to change?
- What it needs to change to?
- How to cause/implement change?













Currently the case study is at a stage where the transformation projects that need to be executed by SA Packaging in order to implement its business model- and business architecture end-state designs have been identified and planned. They have however, for various reasons, not been initiated as of yet. Testing whether or not the enterprise engineering methodology possesses the capability to manage the transformation projects needed to implement an organisation's internal environment end-state has therefore not yet been done. In other words, the progress that has been made thus far during the case study has not yet proven that the methodology satisfies functional requirement 6 in practice. It is therefore currently not possible to say with certainty that, in practice, the enterprise engineering methodology delivered by this study enables an organisation to answer the third and final question of how to cause/implement change.

For more information regarding the outputs of the case study please refer to Appendix A.

**Chapter summary**

Validating the enterprise engineering methodology delivered by this study, based on how well it satisfies its functional requirements, is very important since it provides evidence that this study achieves its objective and answers the research questions listed in Chapter 1. This chapter described the two validation techniques that were used to validate the enterprise engineering methodology as well as their results. A summary of the overall enterprise engineering validation results are illustrated in Table 5-3 below.

**Table 5-4: Enterprise engineering methodology validation results**

Functional requirement	Validated during expert interviews?	Validated during case study?
Functional requirement 1: It needs to possess the capability to identify the opportunities and threats that exist within an organisation's external environment		
Functional requirement 2: It needs to possess the capability to identify the strengths and weaknesses that an organisation possesses		
Functional requirement 3: It needs to possess the capability to prioritise the strengths, weaknesses, opportunities and threats that an organisation is faced with		
Functional requirement 4: It needs to possess the capability to identify and plan the actions that an organisation needs to undertake in response to its most significant strengths, weaknesses, opportunities and threats		
Functional requirement 5: It needs to possess the capability to describe an organisation's internal environment end-state		
Functional requirement 6: It needs to possess the capability to manage the transformation projects needed to implement an organisation's internal environment end-state		

# *Chapter 6: Conclusion*



Chapter 6 summarises the study  
and provides some concluding  
remarks

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## Conclusion

### Introduction

The purpose of this chapter is to describe: how the research design in Chapter 1 was successfully executed, the enterprise engineering methodology delivered by this study, the research contribution that this study has made and future work that is required regarding this study.

### Research design conclusions

In Chapter 1 the following research question was posed: Can an enterprise engineering methodology be developed that will enable an organisation to successfully determine the following:

- what it needs to change,
- what it needs to change to, and
- how it needs to cause/implement the change.

The objective of this study was to answer this research question. In other words, the objective of this study was to develop a structured and integrated enterprise engineering methodology that will enable any commercial organisation, which needs to re-engineer itself, to effectively and efficiently do so.

In order to achieve this objective, a systems engineering process consisting of the following four steps was followed: requirements analysis, system design, system development and system validation. During the requirements analysis step the functional requirements of the enterprise engineering methodology were identified. These functional requirements were then used during the system design step where the methods that the enterprise engineering methodology needed to consist of, were identified and integrated. The enterprise engineering methodology design was then developed in more detail during the system development step by describing each of the methods that form part of the methodology in terms of how it is utilised and who needs to be involved during its utilisation. Once this was done the final step of system validation was performed. During this step the enterprise engineering methodology was validated based on how well it satisfied its functional requirements. Expert interviews as well as a case study were used to do this.

The end result of following these four process steps was an enterprise engineering methodology that enables any commercial organisation, which needs to re-engineer itself, to effectively and efficiently do so by enabling it to determine:

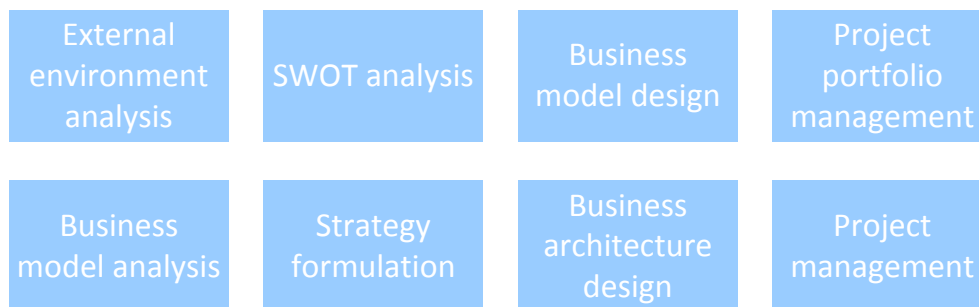
- what it needs to change,
- what it needs to change to, and
- how it needs to cause/implement the change.

This means that this study successfully achieved its objective. A summary of the enterprise engineering methodology delivered by this study is provided in the section below.

### **The enterprise engineering methodology**

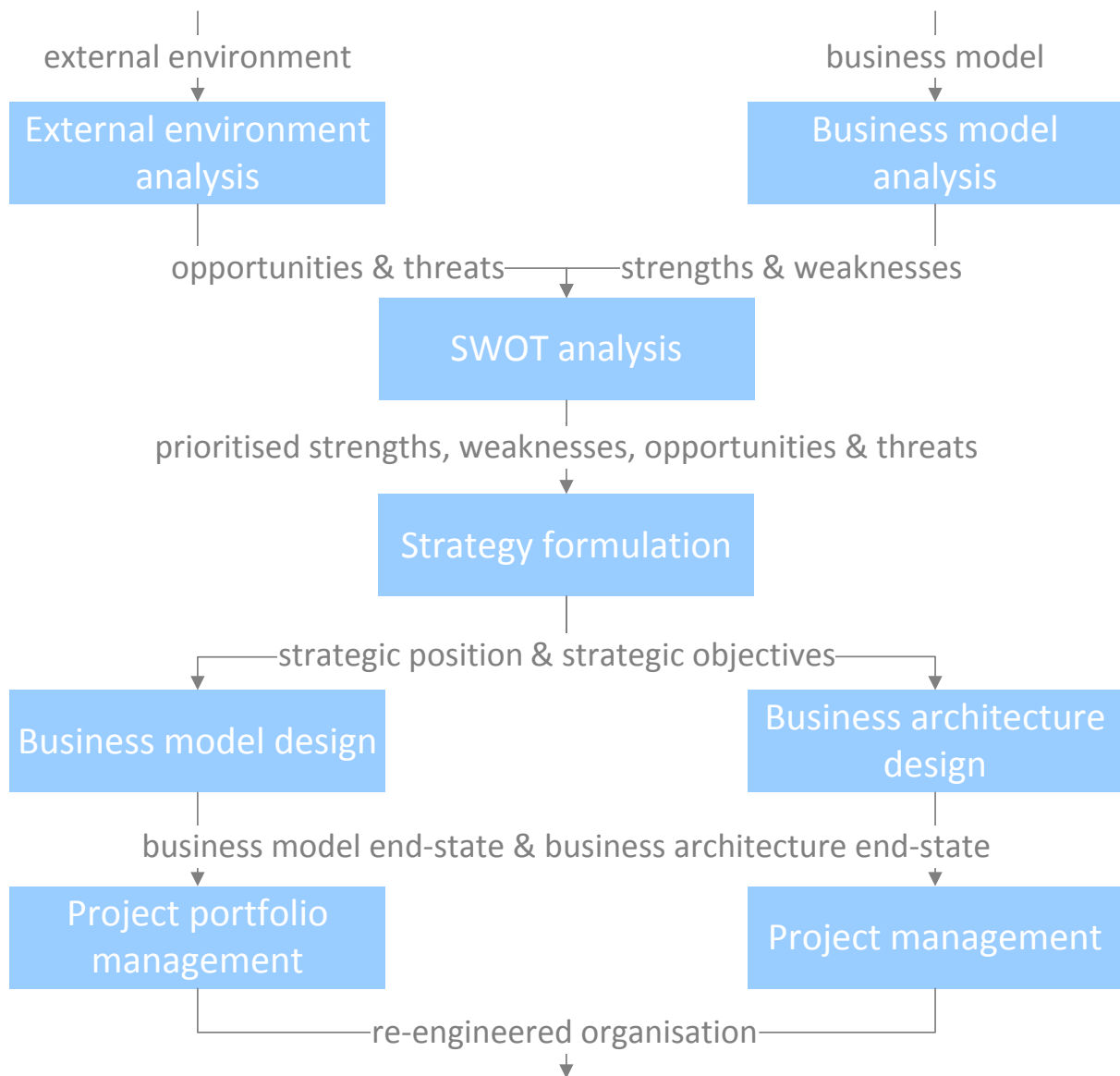
By following the four systems engineering process steps described above, an integrated enterprise engineering methodology, consisting of the eight methods illustrated in Figure 6-1, was developed.

**Figure 6-1: Enterprise engineering methodology methods**



Certain dependencies exist between these methods since the output(s) of one method serves as the input(s) to one or more of the other methods. These dependencies dictate that, when using the enterprise engineering methodology, the eight methods it consists of typically need to be used in a certain sequence (Figure 6-2 below). Figure 6-2 illustrates that the starting point of a re-engineering effort is conducting an external environment analysis and a business model analysis. Once this has been completed a SWOT analysis needs to be conducted. After conducting a SWOT analysis, a strategy needs to be formulated based on the prioritised set of strengths, weaknesses, opportunities and threats. Next, the business model- and business architecture end-state of the organisation need to be designed. And finally, the portfolio of transformation projects needed to implement the business model end-state and business architecture end-state designs need to be managed individually as well as, as a portfolio. It is, however, important to realise that feedback loops do exist between the various methods. As an organisation obtains new information and gains new insights during a re-engineering initiative it very often needs to take a step back before it is able to continue.

**Figure 6-2: Model of the enterprise engineering methodology**



How each of the methods is utilised as well as who is involved during its utilisation is summarised in Table 6-1 below.

**Table 6-1: Summary description of the enterprise engineering methodology**

Method	How it is utilised	Who is typically involved
<b>External environment analysis</b>	Gather and analyse information surrounding the following five external environment forces: legislation & regulations, economy, society, technology and industry	<ul style="list-style-type: none"> <li>• Management team.</li> <li>• Facilitator.</li> </ul>
<b>Business model analysis</b>	Analyse the following nine business model building blocks: partners & suppliers, key competencies, key resources, value propositions, channels, customer relationships, customer & market segments, revenue streams and cost structure	<ul style="list-style-type: none"> <li>• Supply chain team.</li> <li>• Operations team.</li> <li>• Marketing team.</li> <li>• Sales team.</li> <li>• Product development team.</li> <li>• Facilitator.</li> </ul>
<b>SWOT analysis</b>	Prioritise the strengths, weaknesses, opportunities and threats based on their impact on future profit margin and revenue growth	<ul style="list-style-type: none"> <li>• Management team.</li> <li>• Operations team.</li> <li>• Marketing team.</li> <li>• Sales team.</li> <li>• Product development team.</li> <li>• Facilitator.</li> </ul>
<b>Strategy formulation</b>	Select a strategic position and formulate strategic objectives based on the prioritised strengths, weaknesses, opportunities and threats	<ul style="list-style-type: none"> <li>• Management team.</li> <li>• Operations team.</li> <li>• Marketing team.</li> <li>• Sales team.</li> <li>• Product development team.</li> <li>• Facilitator.</li> </ul>
<b>Business model design</b>	Describe the required end-state of the following nine business model building blocks: partners & suppliers, key competencies, key resources, value propositions, channels, customer relationships, customer & market segments, revenue streams and cost structure	<ul style="list-style-type: none"> <li>• Management team.</li> <li>• Facilitator.</li> </ul>
<b>Business architecture design</b>	Describe the required business process-, organisation structure- and measurement system end-state	<ul style="list-style-type: none"> <li>• Management team.</li> <li>• Business process owners.</li> <li>• Facilitator.</li> </ul>
<b>Project portfolio management</b>	Plan and control the portfolio of transformation projects needed to implement the business model end-state and business architecture end-state	<ul style="list-style-type: none"> <li>• Management team.</li> </ul>
<b>Project management</b>	Plan and control each individual transformation project needed to implement the business model end-state and business architecture end-state	<ul style="list-style-type: none"> <li>• Senior managers with project management skills.</li> <li>• Project management consultants.</li> </ul>

**Research contribution**

The majority of organisations currently in existence struggle to successfully implement the radical changes that are necessary for them to thrive in their dynamic environments. To prevent this from happening, organisations need to make use of a structured and integrated enterprise engineering methodology. Currently, only a handful of structured and integrated enterprise engineering methodologies exist. Also, none of the ones that do exist possess all of the functional characteristics that they need to in order to be useful. This study, however, delivers an enterprise engineering methodology that does. This study therefore not only helps solve the very serious and common real-world problem mentioned above, but also bridges the research gap that exists within the field of enterprise engineering methodologies.

**Future work**

As mentioned in Chapter 5, expert interviews were conducted to validate the enterprise engineering methodology from a theoretical perspective and a case study was conducted to validate it from a practical perspective. Based on the expert interview results it is safe to say that, from a theoretical perspective, the enterprise engineering methodology successfully satisfies all of its functional requirements. However, based on the case study outputs that have been generated thus far, it is only safe to say that, from a practical perspective, the enterprise engineering methodology only successfully satisfies five out of its six functional requirements. The progress that has been made thus far during the case study has not yet proven that the methodology satisfies functional requirement 6. Future work surrounding this study should therefore be aimed at determining whether or not the enterprise engineering methodology satisfies this requirement.

The enterprise engineering methodology delivered by this study, just like an organisation, is a dynamic system. It needs to be continuously adapted and enhanced as new knowledge becomes available and more experience is gained by applying it in practise. Future work surrounding the enterprise engineering methodology should therefore also be aimed at its continuous improvement.

**Chapter summary**

This chapter summarised this study by describing: how the research design described in Chapter 1 was successfully executed, the enterprise engineering methodology delivered by this study, the research contribution that this study has made and future work that is required regarding this study.



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The bibliography lists the  
information sources used during  
this study

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# *Appendix A: Case study results*

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Appendix A illustrates and  
describes the case study results

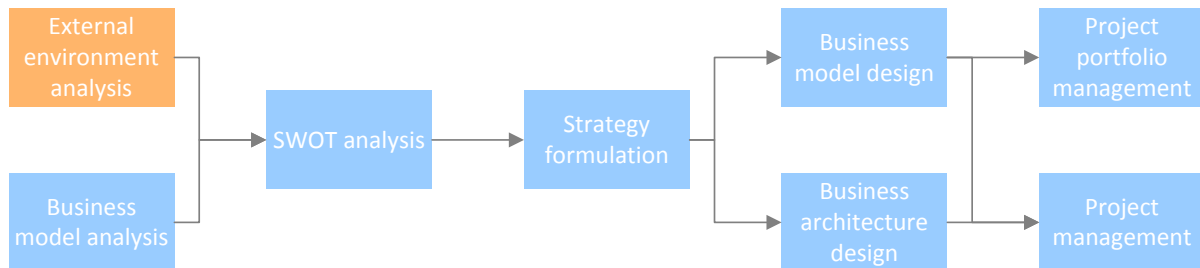
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## Appendix A

### External environment analysis results

As mentioned in Chapter 4 when using the enterprise engineering methodology delivered by this study to re-engineer itself, the first thing an organisation needs to do is conduct an external environment analysis (refer to Figure A-1 below).

**Figure A-1: External environment analysis within the context of the methodology**



The purpose of conducting an external environment analysis is to identify the opportunities and threats that each of the five forces within an organisation's external environment present it (refer to Figure A-2 below). During the case study this was done for the organisation referred to as SA Packaging and the results are illustrated in Table A-1 to Table A-5 below.

**Figure A-2: External environment forces**



**Table A-1: Opportunities & threats surrounding legislation & regulations applicable to SA Packaging**

<b>Opportunities</b>	Food packaging legislation has created a need for innovative food packaging products
	Waste management legislation has created a need for waste management services
	Lobby for a ban on plastic retail bags and supply paper bags into the retail market
	Pharmaceutical regulations have created a need for innovative pharmaceutical packaging products
	The consumer protection act will make it more difficult for packaging paper importers to bring cheap products into South Africa
<b>Threats</b>	Water and effluent policies and regulations are increasing the operating costs of our local packaging paper suppliers and partners
	The loosening of potato bag regulations has increased competition in this market
	Carbon tax will dramatically increase the operating costs of our local packaging paper suppliers and partners
	Environmental legislation is increasing the operating costs of our local packaging paper suppliers and partners
	Current lack of import duties are causing packaging paper importers to bring very low cost products into South Africa
	Transport legislation is increasing distribution costs
	Waste management legislation is increasing operating costs

**Figure A-3: Context of Table A-1**

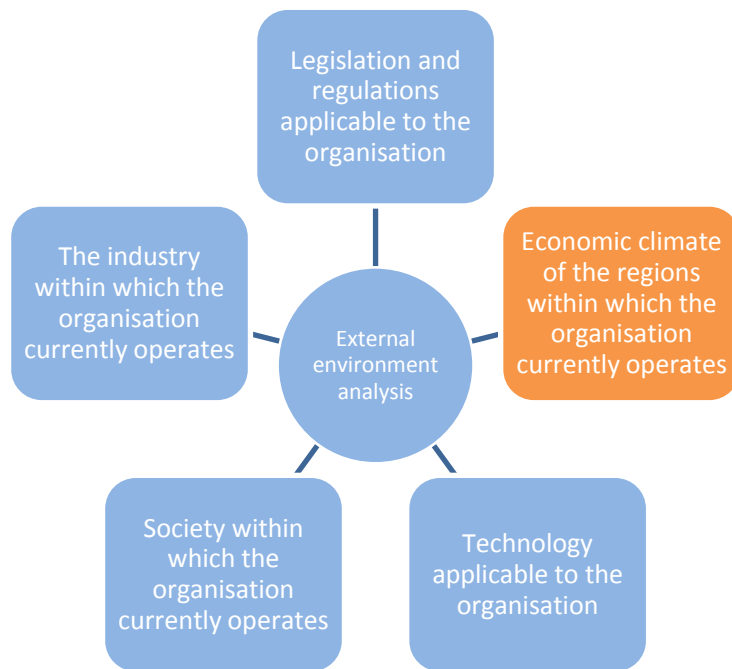




**Table A-2: Opportunities and threats surrounding the economic climate within which SA Packaging currently operates**

<b>Opportunities</b>	Globalisation has increased potential customer base
	Plastic prices are increasing due to oil price increases which creates an opportunity for paper to substitute plastic
<b>Threats</b>	Education and skills shortage has increased the cost of skilled personnel
	Infrastructure decay and the poor rail system has increased distribution costs
	Energy cost increases are increasing the operating costs of our local packaging paper suppliers and partners
	The strong and volatile Rand has caused packaging paper importers to bring very low cost products into the country
	New toll road system will increase distribution costs
	Fuel price increases are increasing distribution costs

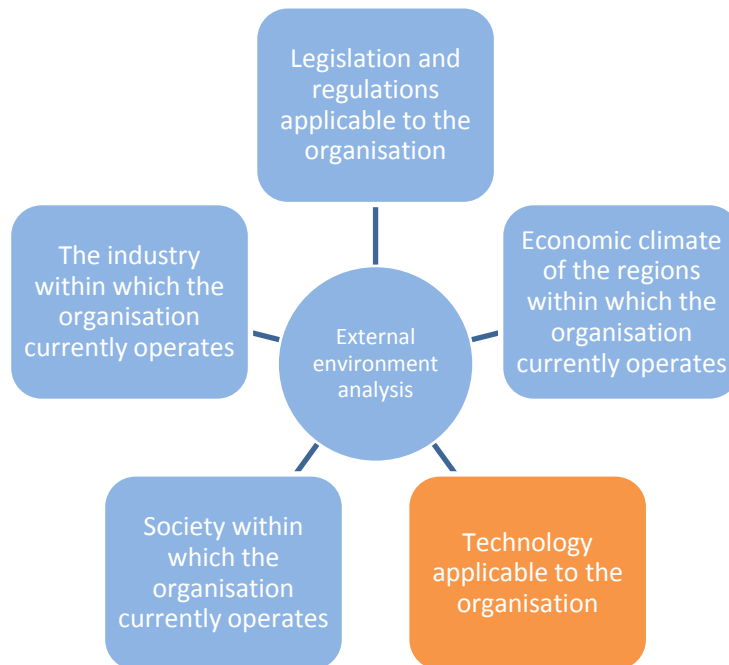
**Figure A-4: Context of Table A-2**



**Table A-3: Opportunities and threats surrounding technology applicable to SA Packaging**

<b>Opportunities</b>	New sack manufacturing technology available which would make paper sacks more competitive compared to plastic
	Intelligent packaging is an emerging technology that has created demand for innovative packaging products
	Real time supply chain information is a current technology which could be leveraged to increase customer service
	Bio-plastic is an emerging technology that could be exploited to diversify the value propositions offered to customers
<b>Threats</b>	Plastic based packaging technologies are advancing at a rapid rate which increases the risks of product substitution

**Figure A-5: Context of Table A-3**



**Table A-4: Opportunities and threats surrounding the society within which SA Packaging currently operates**

<b>Opportunities</b>	Global need for carbon footprint measurement has created the need for packaging scorecards and consulting services
	Global sustainability trend has increased demand for environmentally friendly packaging products
	Urbanisation has increased the demand for packaging materials and products
	The global trend of convenience / instant gratification has increased the demand for packaging materials and products
	Population growth has increased the demand for packaging materials and products
<b>Threats</b>	None

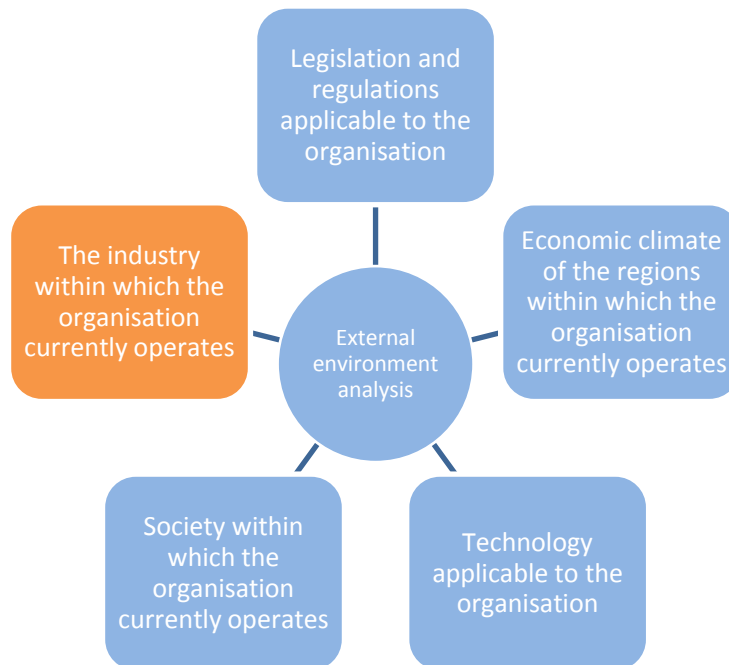
**Figure A-6: Context of Table A-4**



**Table A-5: Opportunities and threats surrounding the industry within which SA Packaging currently operates**

<b>Opportunities</b>	The shelf-ready packaging trend has created demand for innovative packaging products
	The industry trend “eco-superior” has increased demand for environmentally friendly and fit-for-use paper based packaging
	Independents within the corrugator market are growing
<b>Threats</b>	The lack of R&D in the packaging paper industry has inhibited the growth of paper based packaging
	The limited knowledge within society regarding paper technologies and their benefits has inhibited the growth of paper based packaging

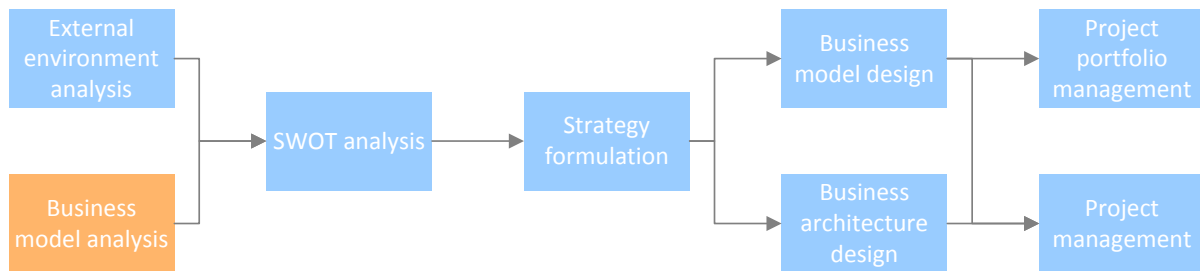
**Figure A-7: Context of Table A-5**



### Business model analysis results

As stated in Chapter 4 the second task an organisation needs to complete, when re-engineering itself using the methodology delivered by this study, is a business model analysis (refer to Figure A-8 below). The purpose of conducting a business model analysis is to identify the strengths and weaknesses that an organisation possesses.

**Figure A-8: Business model analysis within the context of the methodology**



An organisation conducts a business model analysis by first describing and then analysing its nine business model building blocks (see Figure A-9 below). During the case study this was done for the organisation referred to as SA Packaging. Figure A-10 provides a description of SA Packaging’s current business model and Table A-6 to Table A-14 illustrate the strengths and weaknesses that SA Packaging possesses surrounding each of its business model building blocks.

**Figure A-9: Business model building blocks (Osterwalder & Pigneur, 2010)**

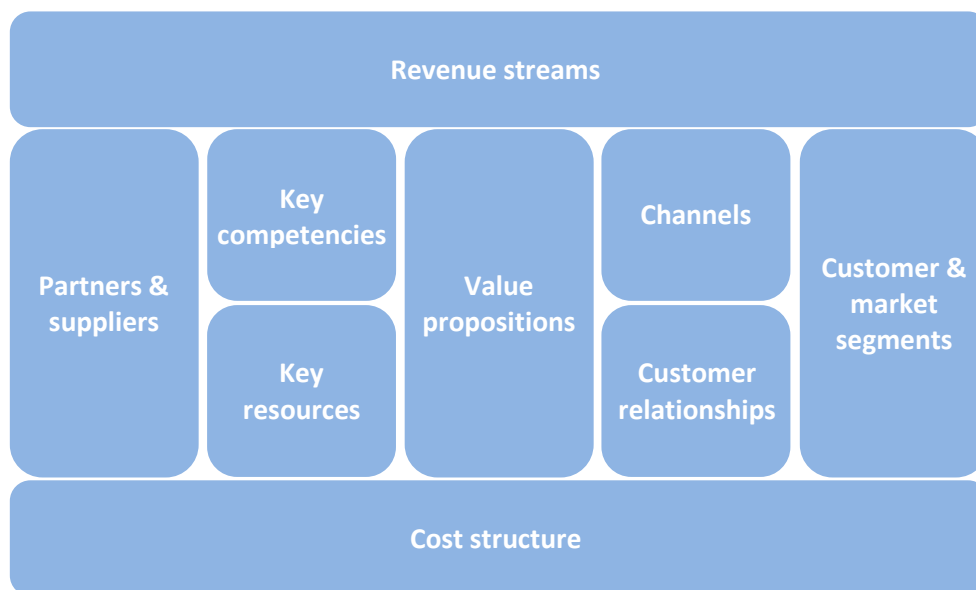
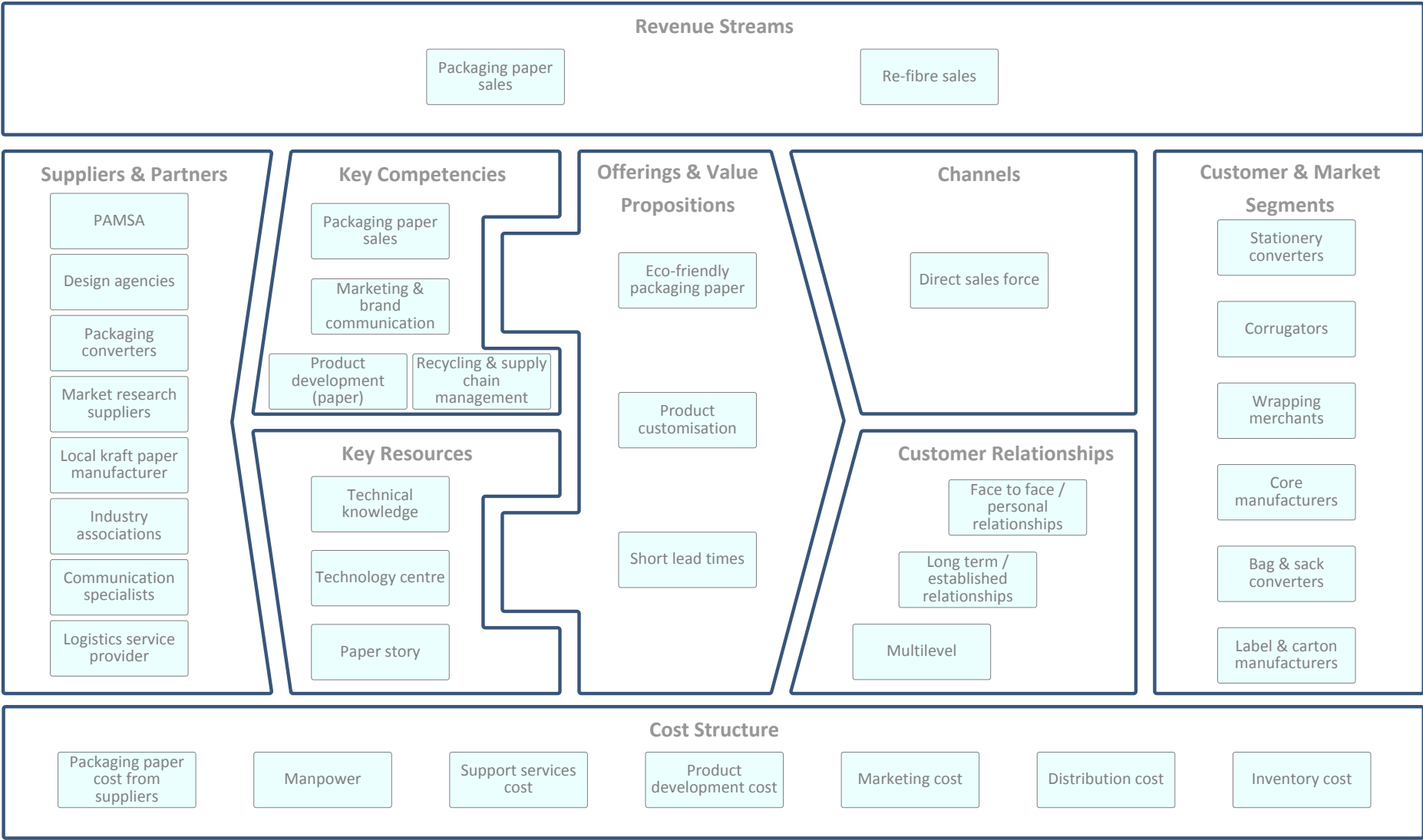


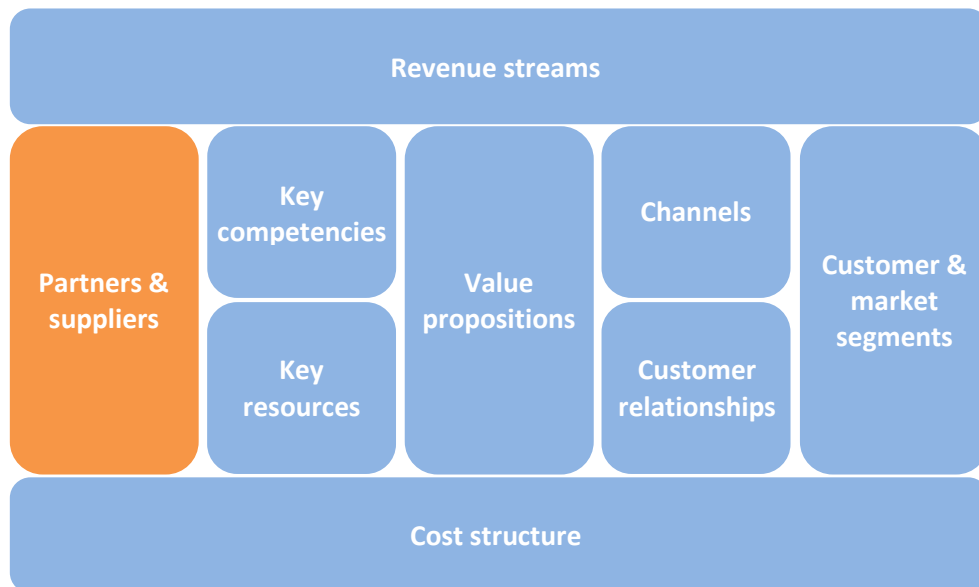
Figure A-10: As-Is business model of SA Packaging



**Table A-6: Strengths and weaknesses surrounding the key partners and suppliers utilised by SA Packaging**

<b>Strengths</b>	Very strong relationship with logistics service provider
<b>Weaknesses</b>	Converting partners have a more powerful position and are able to manipulate the packaging paper market
	The paper packaging manufacturers currently used are less reliable than those of competitors
	The market intelligence suppliers that are currently used provide very little benefit
	PAMSA is not very effective and active regarding the promotion and advancement of paper
	The paper packaging manufacturers currently used are not low cost producers compared to those of competitors
	The paper packaging manufacturers currently used produce inconsistent quality products
	Not leveraging NGO's
	Not leveraging industry associations

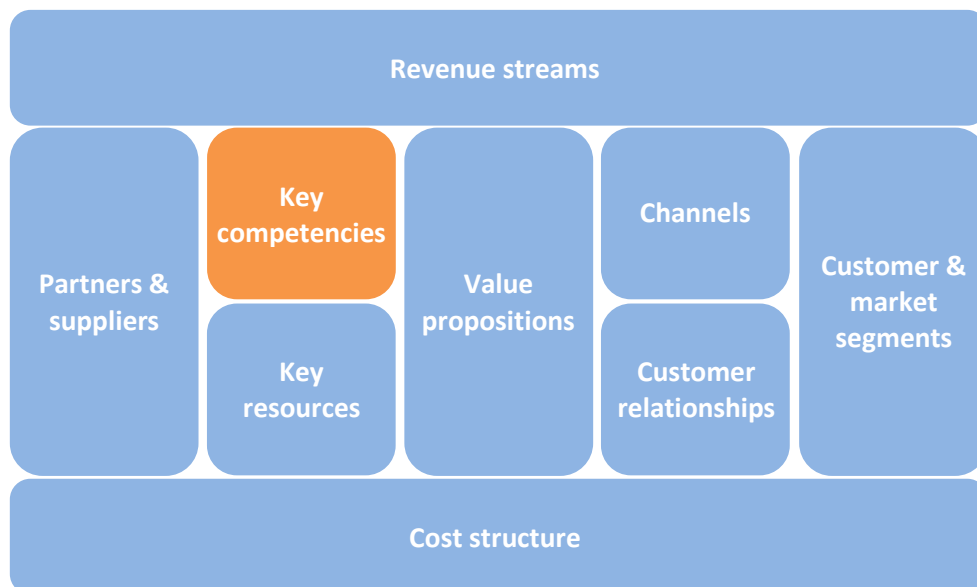
**Figure A-11: Context of Table A-6**



**Table A-7: Strengths and weaknesses surrounding the key competencies possessed by SA Packaging**

<b>Strengths</b>	Very good sales skills
	Capability to help customers market and sell their products
<b>Weaknesses</b>	Packaging design capability underutilised
	Not effectively marketing to converters due to a lack of converting expertise
	Not market oriented and customer focused
	Poor sales and operations planning process
	Silo mentality regarding marketing, sales, product development and the technology centre
	Poor marketing efforts
	Slow product development process
	No “solution selling” capability

**Figure A-12: Context of Table A-7**

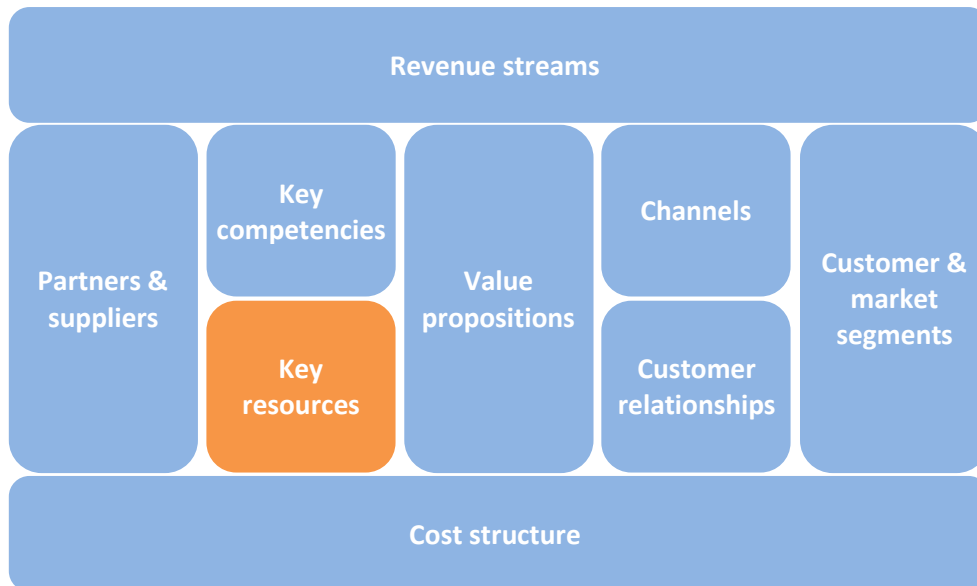




**Table A-8: Strengths and weaknesses surrounding the key resources utilised by SA Packaging**

<b>Strengths</b>	Technical knowledge regarding packaging paper
<b>Weaknesses</b>	Not utilising and capitalising on the available market and customer knowledge
	The technology centre is understaffed
	Lack of marketing skills
	Not protecting intellectual property

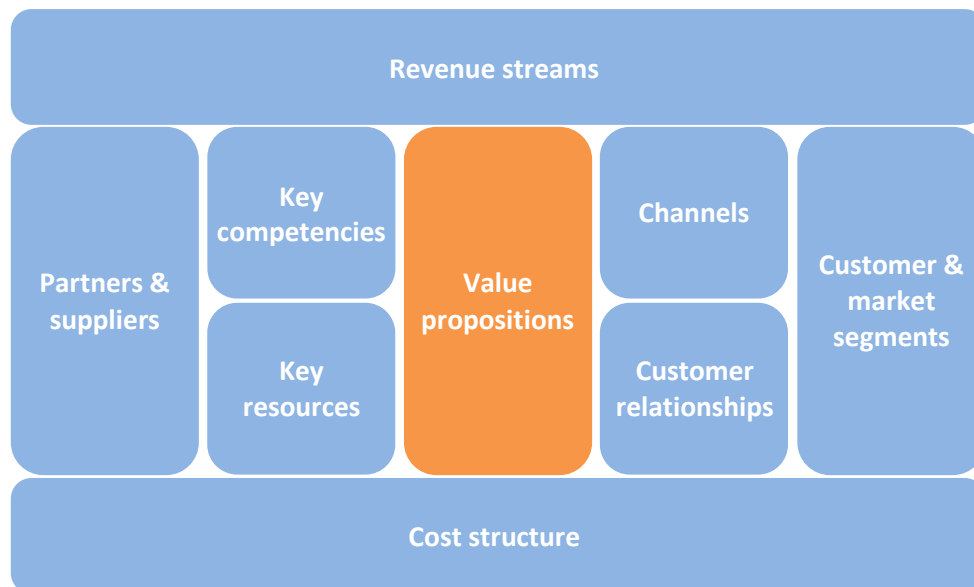
**Figure A-13: Context of Table A-8**



**Table A-9: Strengths and weaknesses surrounding the offerings and value propositions provided by SA Packaging**

<b>Strengths</b>	Only local supplier of bag and sack kraft
	Only local supplier of labels made from alternative fibres
<b>Weaknesses</b>	Not diversified from paper based packaging solutions
	Market perception exists of not being innovative
	Market perception exists of being less environmentally friendly
	Not forward integrated and therefore do not supply full packaging solutions to end users
	Over-engineered products
	Brand not well known
	Not offering services which could close the supply chain loop

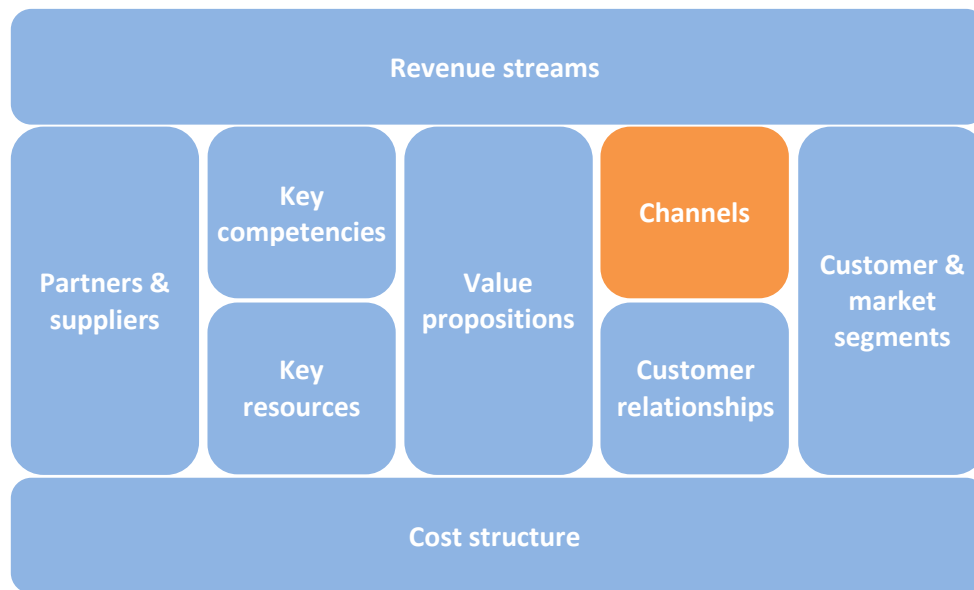
**Figure A-14: Context of Table A-9**



**Table A-10: Strengths and weaknesses surrounding the channels utilised by SA Packaging**

<b>Strengths</b>	None
<b>Weaknesses</b>	Not easy to transact / do business with

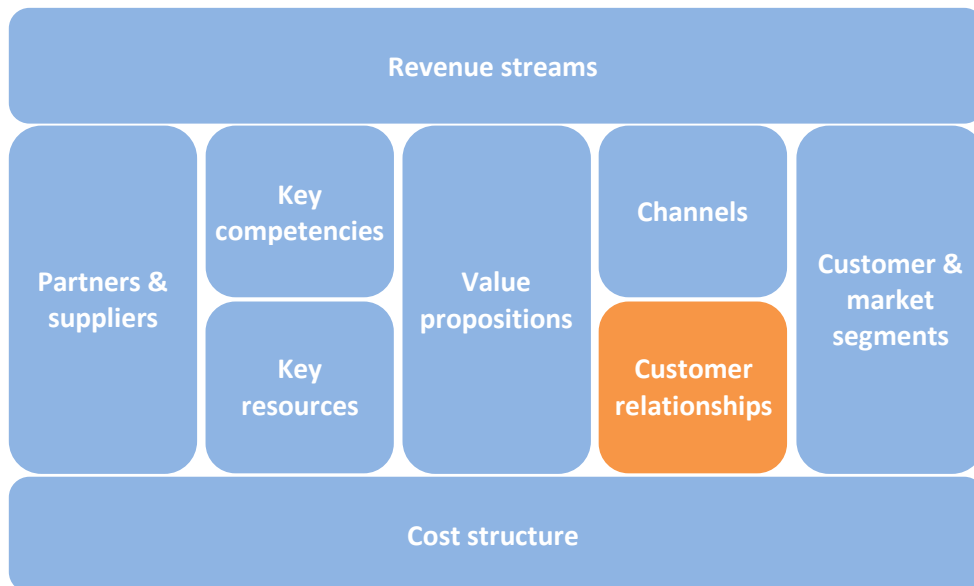
**Figure A-15: Context of Table A-10**



**Table A-11: Strengths and weaknesses surrounding the customer relationships cultivated by SA Packaging**

<b>Strengths</b>	Strong relationships with customers
	Customer relationships managed very well
<b>Weaknesses</b>	No relationship with end users of products
	No formal agreements or service level agreements with converters
	Not leveraging global customer relationships

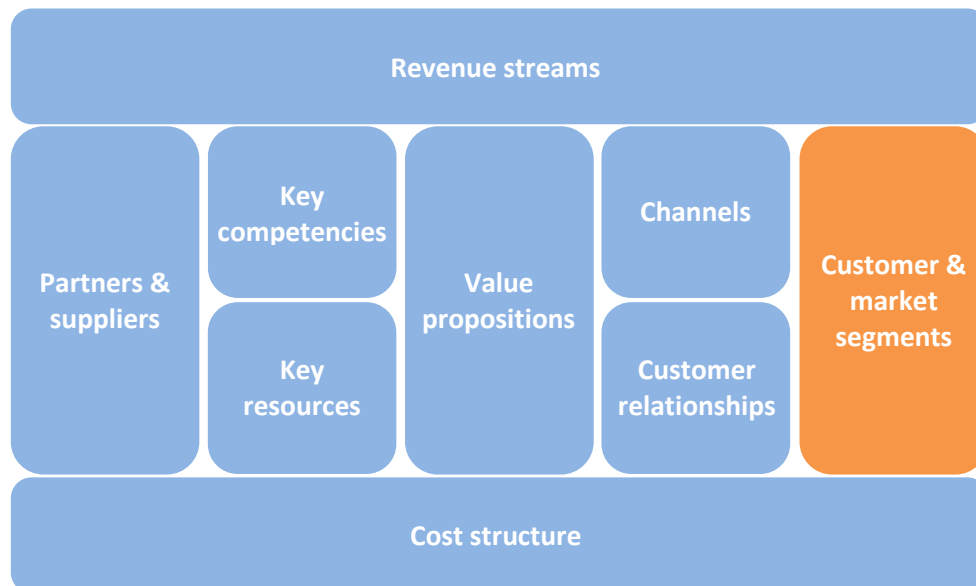
**Figure A-16: Context of Table A-11**



**Table A-12: Strengths and weaknesses surrounding the customer and market segments targeted by SA Packaging**

<b>Strengths</b>	None
<b>Weaknesses</b>	Poor view and knowledge of real demand within the market
	Not keeping up with customer technology advancements
	Very small customer base (i.t.o. number of customers)

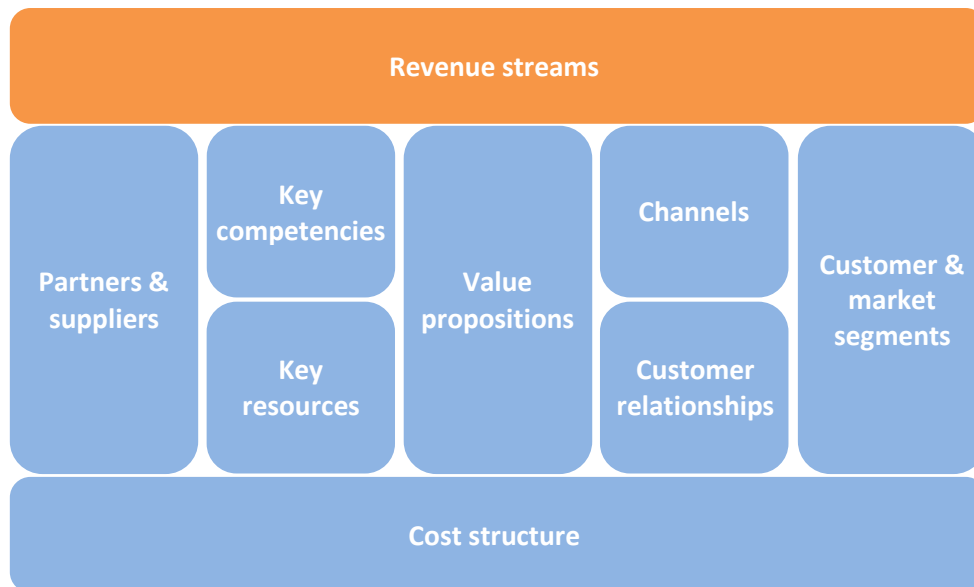
**Figure A-17: Context of Table A-12**



**Table A-13: Strengths and weaknesses surrounding the revenue streams generated by SA Packaging**

<b>Strengths</b>	None
<b>Weaknesses</b>	Not offering a full packaging management solution to retailers and industrial brand owners which could provide additional revenue
	Not charging customers for R&D services
	Not charging for packaging design services
	Very small margin obtained from the type of products offered

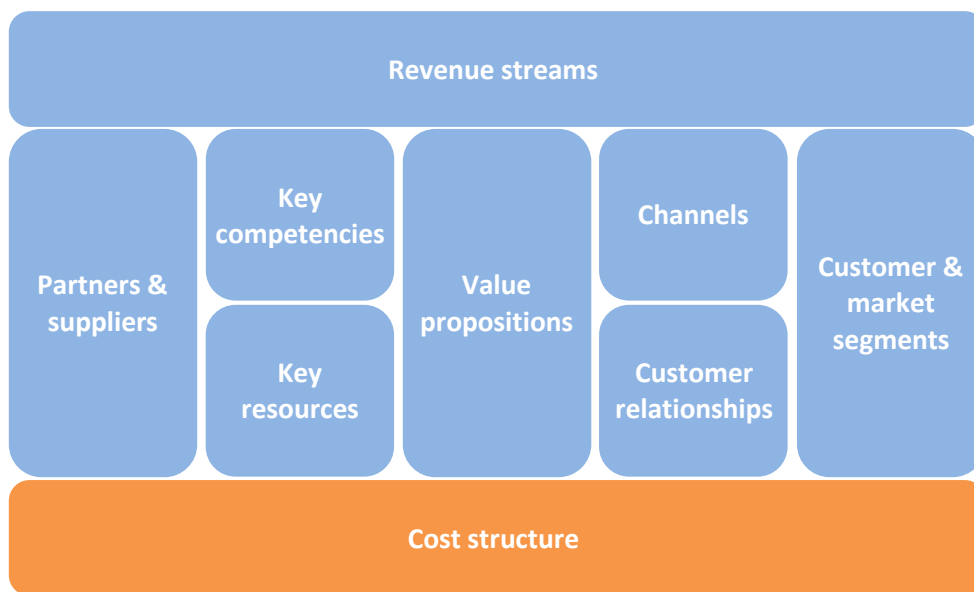
**Figure A-18: Context of Table A-13**



**Table A-14: Strengths and weaknesses surrounding the cost structure of SA Packaging**

<b>Strengths</b>	None
<b>Weaknesses</b>	Inconsistent product costs
	Geographic locations of suppliers increases product costs
	Current inventory costs are very high

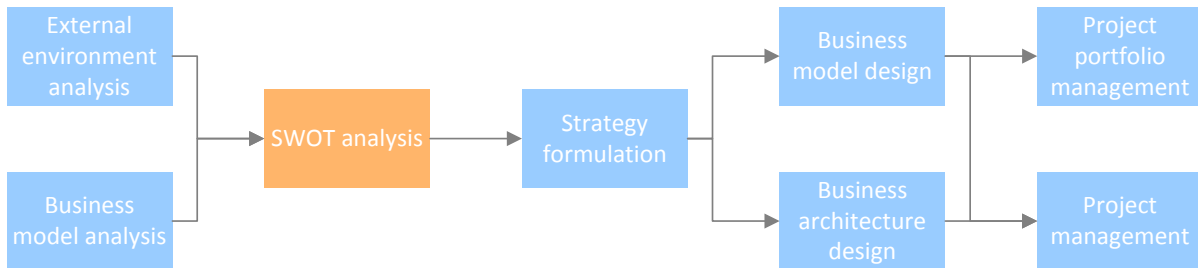
**Figure A-19: Context of Table A-14**



### SWOT analysis results

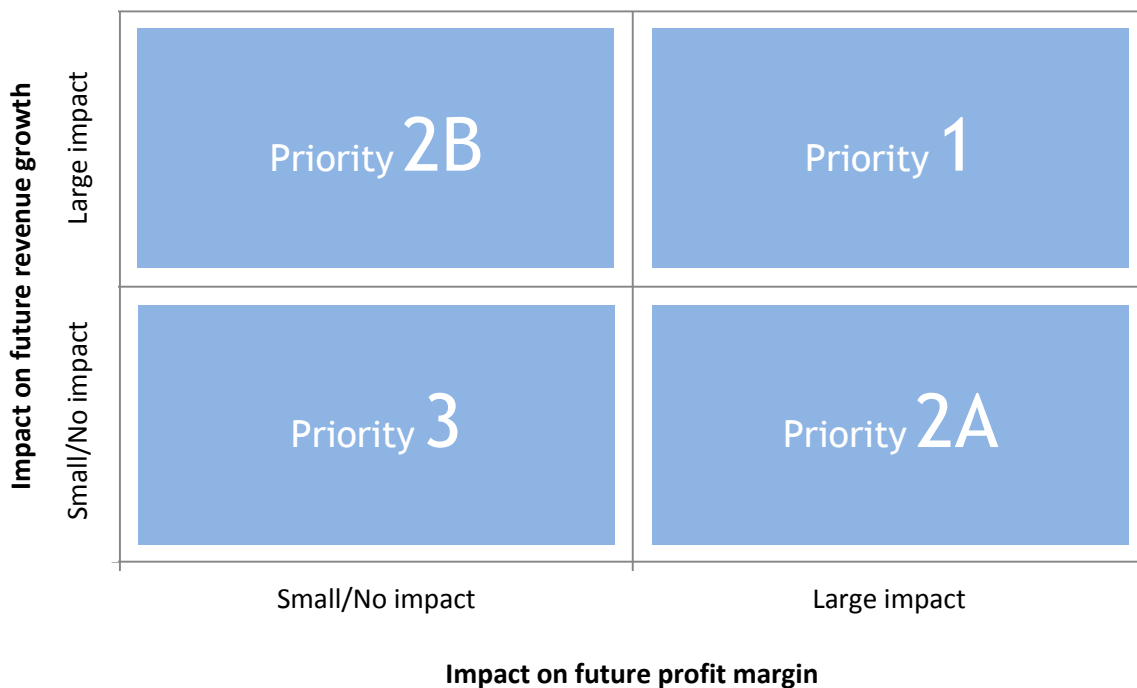
Once an organisation has conducted an external environment analysis and business model analysis the next step in the methodology is conducting a SWOT analysis (refer to Figure A-20 below).

**Figure A-20: SWOT analysis within the context of the methodology**



The purpose of conducting a SWOT analysis is to prioritise the strengths, weaknesses, opportunities and threats that an organisation has identified during the external environment analysis and business model analysis (see prioritisation diagram below). During the case study this was done for the organisation referred to as SA Packaging and the results are illustrated in Table A-15 to Table A-18 below.

**Figure A-21: Strength, weakness, opportunity and threat prioritisation**

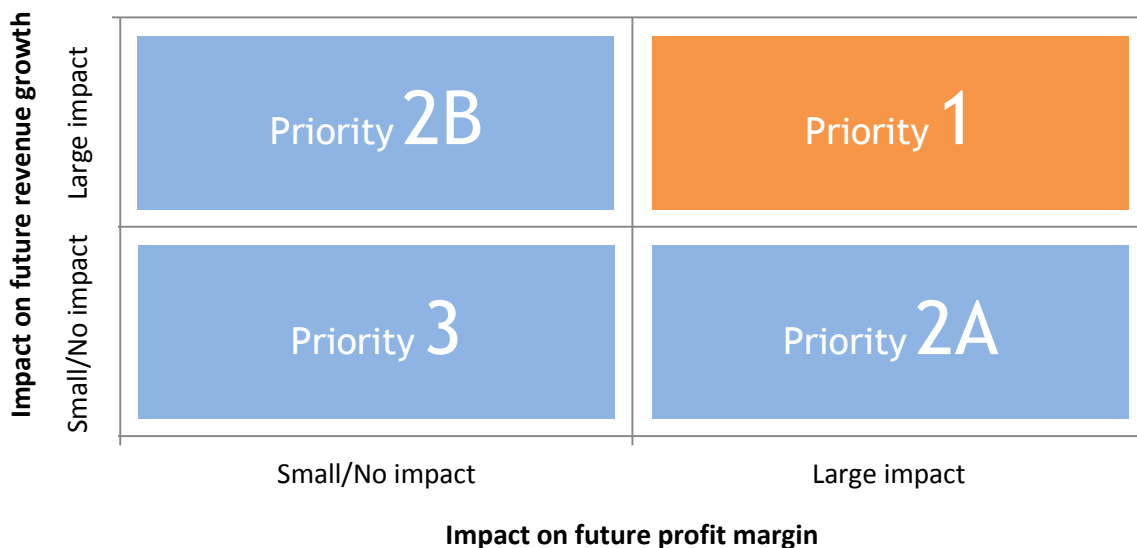




**Table A-15: Priority 1 strengths, weaknesses, opportunities and threats of SA Packaging**

<b>Strengths</b>	None
<b>Weaknesses</b>	Not diversified from paper based packaging solutions
	Silo mentality regarding marketing, sales and product development
	Not keeping up with customer technology advancements
	Not forward integrated and therefore do not supply full packaging solutions to end users
	The technology centre is understaffed
	The kraft paper manufacturers currently used are unreliable in terms of quality and cost
	Not market oriented and customer focused
	Slow product development process
	Poor marketing efforts
	No "solution selling" capability
	Lack of marketing skills
	No relationship with end users of products
	Brand not well known
	Poor view and knowledge of real demand within the market
<b>Opportunities</b>	Intelligent packaging is an emerging technology that has created demand for innovative packaging products
	Food packaging legislation has created a need for innovative food packaging products
	The shelf-ready packaging trend has created demand for innovative packaging products
	The global trend of convenience / instant gratification has increased the demand for packaging materials and products
	Lobby for a ban on plastic retail bags and supply paper bags into the retail market
	Bio-plastic is an emerging technology that could be exploited to diversify the value propositions offered to customers
<b>Threats</b>	The strong and volatile Rand has caused packaging paper importers to bring very low cost products into the country
	Plastic based packaging technologies are advancing at a rapid rate which increases the risks of product substitution
	Current lack of import duties are causing packaging paper importers to bring very low cost products into South Africa

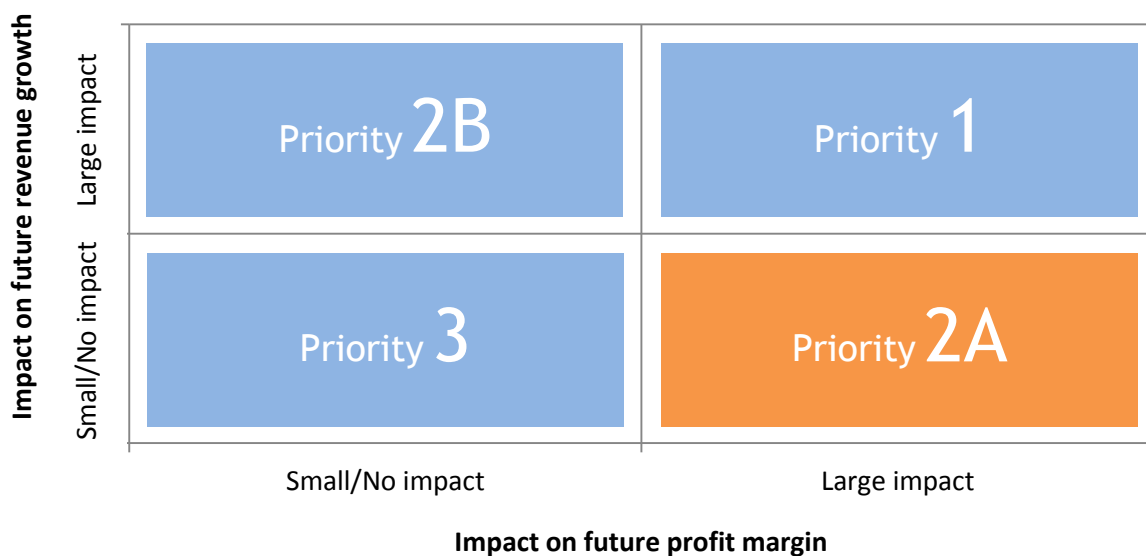
**Figure A-22: Context of Table A-15**



**Table A-16: Priority 2A strengths, weaknesses, opportunities and threats of SA Packaging**

<b>Strengths</b>	None
<b>Weaknesses</b>	Not utilising and capitalising on the available market and customer knowledge
	Very small margin obtained from the type of products offered
	The paper packaging manufacturers currently used are not low cost producers compared to those of competitors
	Poor sales and operations planning process
	Converting partners have a more powerful position and are able to manipulate the packaging paper market
	Over-engineered products
<b>Opportunities</b>	None
<b>Threats</b>	Transport legislation is increasing distribution costs
	Environmental legislation is increasing the operating costs of our local packaging paper suppliers and partners
	Infrastructure decay and the poor rail system has increased distribution costs
	New toll road system will increase distribution costs
	Fuel price increases are increasing distribution costs
	Carbon tax will dramatically increase the operating costs of our local packaging paper suppliers and partners
	Energy cost increases are increasing the operating costs of our local packaging paper suppliers and partners
	Waste management legislation is increasing operating costs
	Education and skills shortage has increased the cost of skilled personnel
	Water and effluent policies and regulations are increasing the operating costs of our local packaging paper suppliers and partners

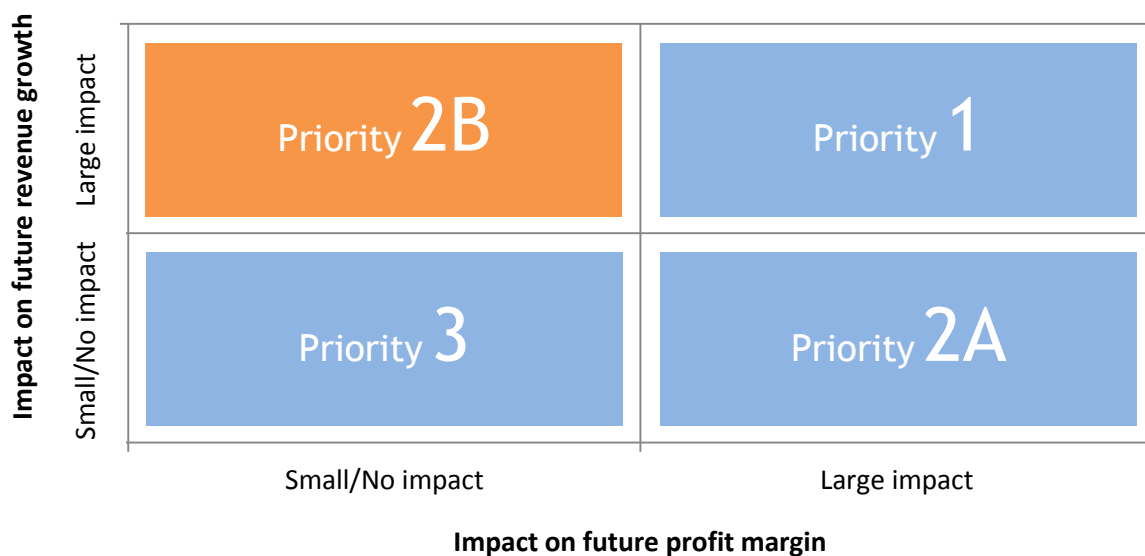
**Figure A-23: Context of Table A-16**



**Table A-17: Priority 2B strengths, weaknesses, opportunities and threats of SA Packaging**

<b>Strengths</b>	Very good sales skills
	Very strong relationship with logistics service provider
	Capability to help customers market and sell their products
<b>Weaknesses</b>	Not effectively marketing to converters due to a lack of converting expertise
	Not leveraging global customer relationships
	Not offering services which could close the supply chain loop
	No formal agreements or service level agreements with converters
	Not easy to transact / do business with
	The paper packaging manufacturers currently used are less reliable than those of competitors
<b>Opportunities</b>	New sack manufacturing technology available which would make paper sacks more competitive compared to plastic
	Independents within the corrugator market are growing
	Global sustainability trend has increased demand for environmentally friendly packaging products
	Globalisation has increased potential customer base
	Pharmaceutical regulations have created a need for innovative pharmaceutical packaging products
	The industry trend "eco-superior" has increased demand for environmentally friendly and fit-for-use paper based packaging
	Population growth has increased the demand for packaging materials and products
<b>Threats</b>	The limited knowledge within society regarding paper technologies and their benefits has inhibited the growth of paper based packaging
	The loosening of potato bag regulations has increased competition in this market
	The lack of R&D in the packaging paper industry has inhibited the growth of paper based packaging

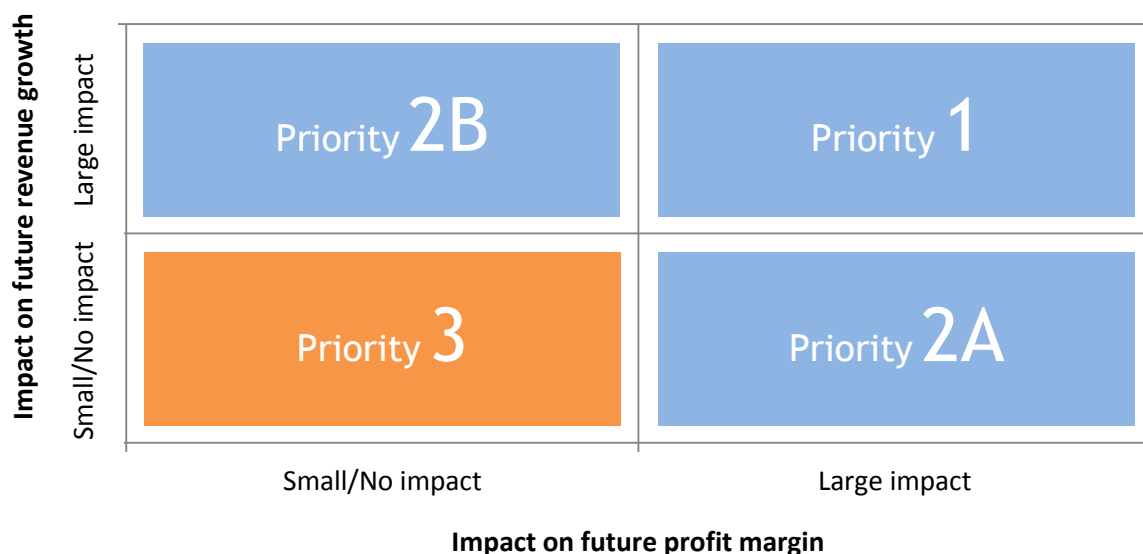
**Figure A-24: Context of Table A-17**



**Table A-18: Priority 3 strengths, weaknesses, opportunities and threats of SA Packaging**

<b>Strengths</b>	Customer relationships managed very well
	Technical knowledge regarding packaging paper
	Strong relationships with customers
	Only local supplier of bag and sack kraft
	Only local supplier of labels made from alternative fibres
<b>Weaknesses</b>	Not offering a full packaging management solution to retailers and industrial brand owners which could provide additional revenue
	Not charging customers for R&D services
	Packaging design capability underutilised
	Not leveraging NGO's
	The market intelligence suppliers that are currently used provide very little benefit
	Market perception exists of not being innovative
	Market perception exists of being less environmentally friendly
	Current inventory costs are very high
	PAMSA is not very effective and active regarding the promotion and advancement of paper
	Not leveraging industry associations
	Not protecting intellectual property
	Very small customer base (i.t.o. number of customers)
	Geographic locations of suppliers increases product costs
Not charging for packaging design services	
<b>Opportunities</b>	Real time supply chain information is a current technology which could be leveraged to increase customer service
	Plastic prices are increasing due to oil price increases which creates an opportunity for paper to substitute plastic
	Global need for carbon footprint measurement has created the need for packaging scorecards and consulting services
	The consumer protection act will make it more difficult for packaging paper importers to bring cheap products into South Africa
	Urbanisation has increased the demand for packaging materials and products
	Waste management legislation has created a need for waste management services
<b>Threats</b>	None

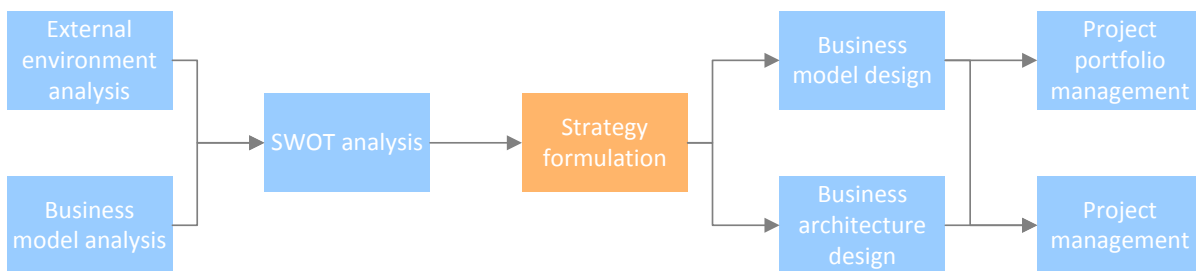
**Figure A-25: Context of Table A-18**



## Strategy formulation results

As mentioned in Chapter 4, once an organisation has conducted a SWOT analysis, its next task is to formulate a strategy (refer to Figure A-26 below). This is done by identifying the set of strengths, weaknesses, opportunities and threats that it believes it needs to respond to and then selecting a strategic position and setting strategic objectives based on these strengths, weaknesses, opportunities and threats.

**Figure A-26: Strategy formulation within the context of the methodology**



During the case study this was done for the organisation referred to as SA Packaging. The set of strengths, weaknesses, opportunities and threats that SA Packaging believes that it needs to and could feasibly respond to consists of all of its priority one strengths, weaknesses, opportunities and threats (see Table A-15). The strategic position that SA Packaging believes it needs to obtain based on these strengths, weaknesses, opportunities and threats is illustrated in Table A-19. This strategic position is based on the generic strategic position of “value proposition innovation” as well as the generic strategic position of “customer intimacy” (see Figure 4-18). The strategic objectives that SA Packaging has set itself, based on the strengths, weaknesses, opportunities and threats that it believes it needs to respond to, are illustrated in Table A-20.

**Table A-19: Ideal strategic position of SA Packaging**

First choice supplier of retail and industrial packaging solutions that are innovative, high quality and eco-superior
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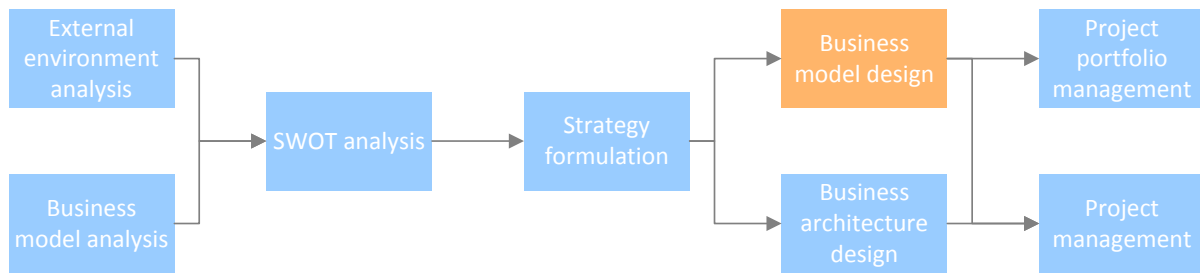
**Table A-20: Strategic objectives of SA Packaging**

Forward integrate into the industrial container-board market
Forward integrate into the sack market
Forward integrate into the bag market
Forward integrate into the carton-board market
Implement service level agreements with kraft paper suppliers regarding product quality and cost
Implement service level agreements with logistics service provider
Determine skills requirements in terms of marketing, sales & product development and obtain the required skills
Identify specific bio-plastic opportunities and develop solutions
Develop an “enviropak” (fibre moulding) solution
Identify specific speciality packaging opportunities and develop solutions (intelligent packaging, shelf ready packaging)
Develop and implement a brand communications plan per sub-segment
Develop environmentally friendly alternative for poly-coated products
Tailor the paper story for the retail and industrial packaging segment
Create a formal and structured market, end user & customer intelligence capability
Influence government regarding the retail and industrial packaging industry in terms of imports, plastic bags ban and standards
Identify the specific products that can economically be imported and initiate importing
Break the silo mentality that exists between marketing, sales, product development and the technology centre

## Business model design results

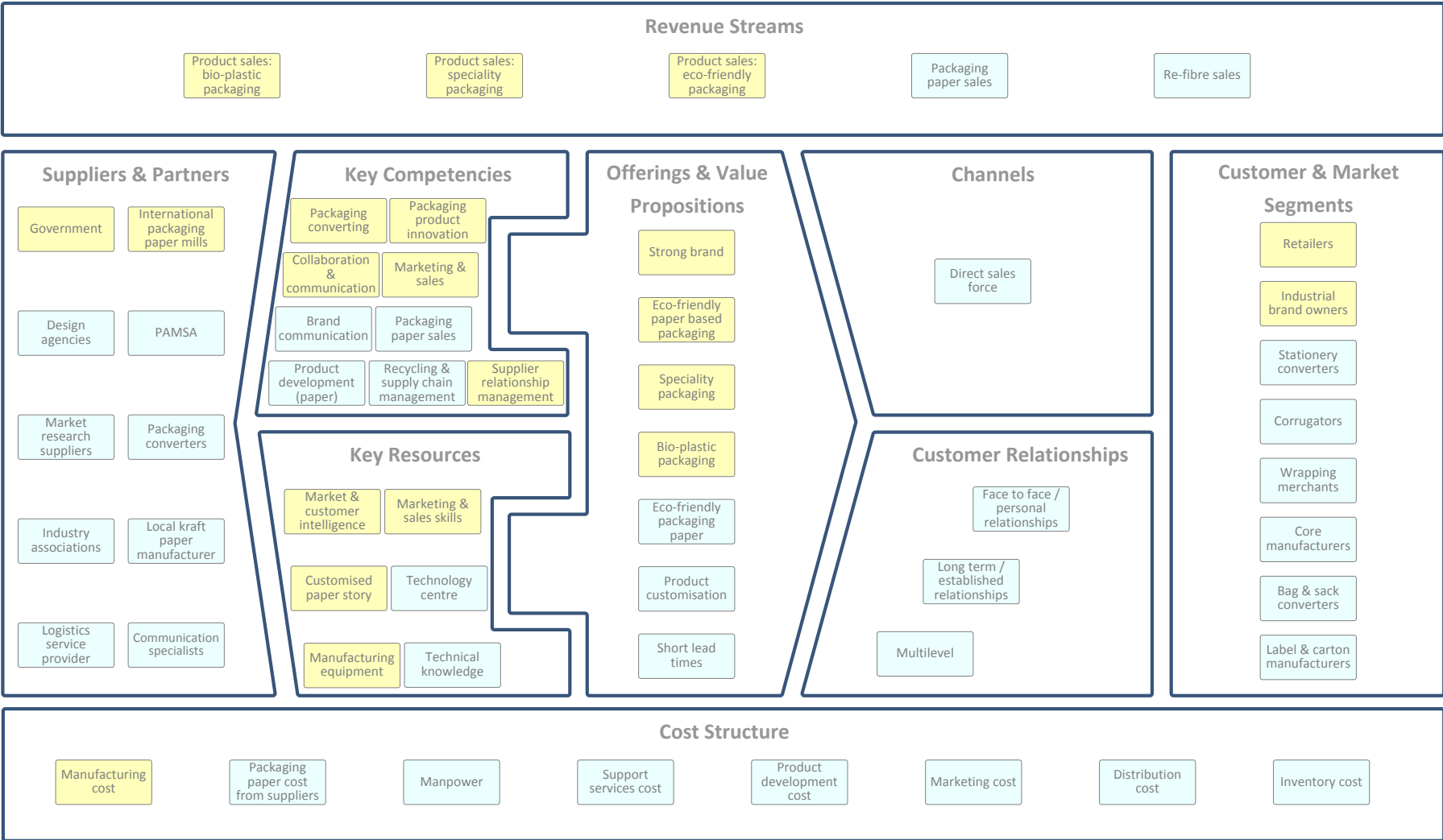
According to the enterprise engineering methodology described in Chapter 4 after formulating its strategy an organisation needs to design the business model that it needs to implement in order to successfully execute its strategy (refer to Figure A-27 below). In other words, an organisation needs to describe its business model end-state.

**Figure A-27: Business model design within the context of the methodology**



During the case study this was done for SA Packaging and the result is illustrated in Figure A-28 below.

Figure A-28: Business model end-state of SA Packaging



New required element due to strategy
Existing element

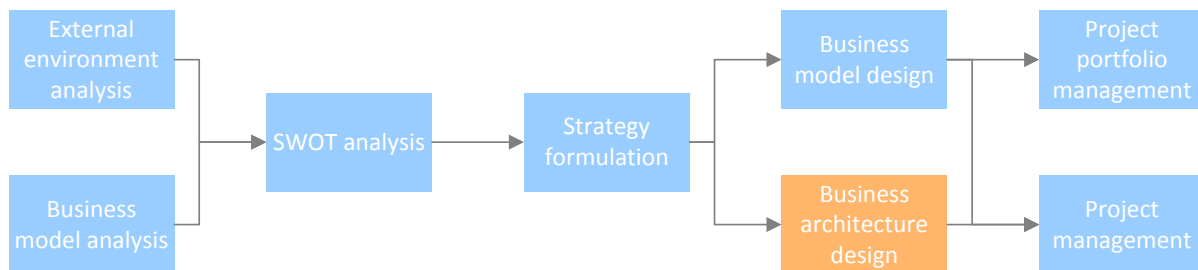


## Business architecture design results

Once an organisation has formulated its strategy it not only needs to design the business model that it needs to implement in order to successfully execute its strategy, but also the business architecture that it needs to implement (refer to Figure A-29 below). Stated differently, an organisation needs to describe its business architecture end-state. This means doing following:

- Identifying the set of business processes that an organisation needs to perform in future.
- Determining how these business processes need to be grouped into value streams.
- Identifying which of the business processes need to be designed or redesigned.
- Designing and redesigning the relevant business processes using business process models.
- Redesigning the high level organisation structure of an organisation.
- Redesigning the organisation structure of the relevant business units of an organisation.
- Redesigning the performance measurement system of an organisation.

**Figure A-29: Business architecture design within the context of the methodology**



During the case study this was done for SA Packaging. Figure A-30 illustrates the set of business processes that SA Packaging needs to execute in future, how these business processes should be grouped into value streams as well as which of the business processes need to be designed and redesigned. Figures A-31 to A-36 illustrates the business process models of the newly designed and redesigned business processes of SA Packaging respectively. Figure A-37 illustrates the high level organisation structure redesign of SA Packaging. Figure A-38 illustrates the detailed organisation structure redesign of the Marketing and Sales business unit of SA Packaging. Table A-21 illustrates the performance measurement system design for SA Packaging.

Figure A-30: Value stream and business process model of SA Packaging

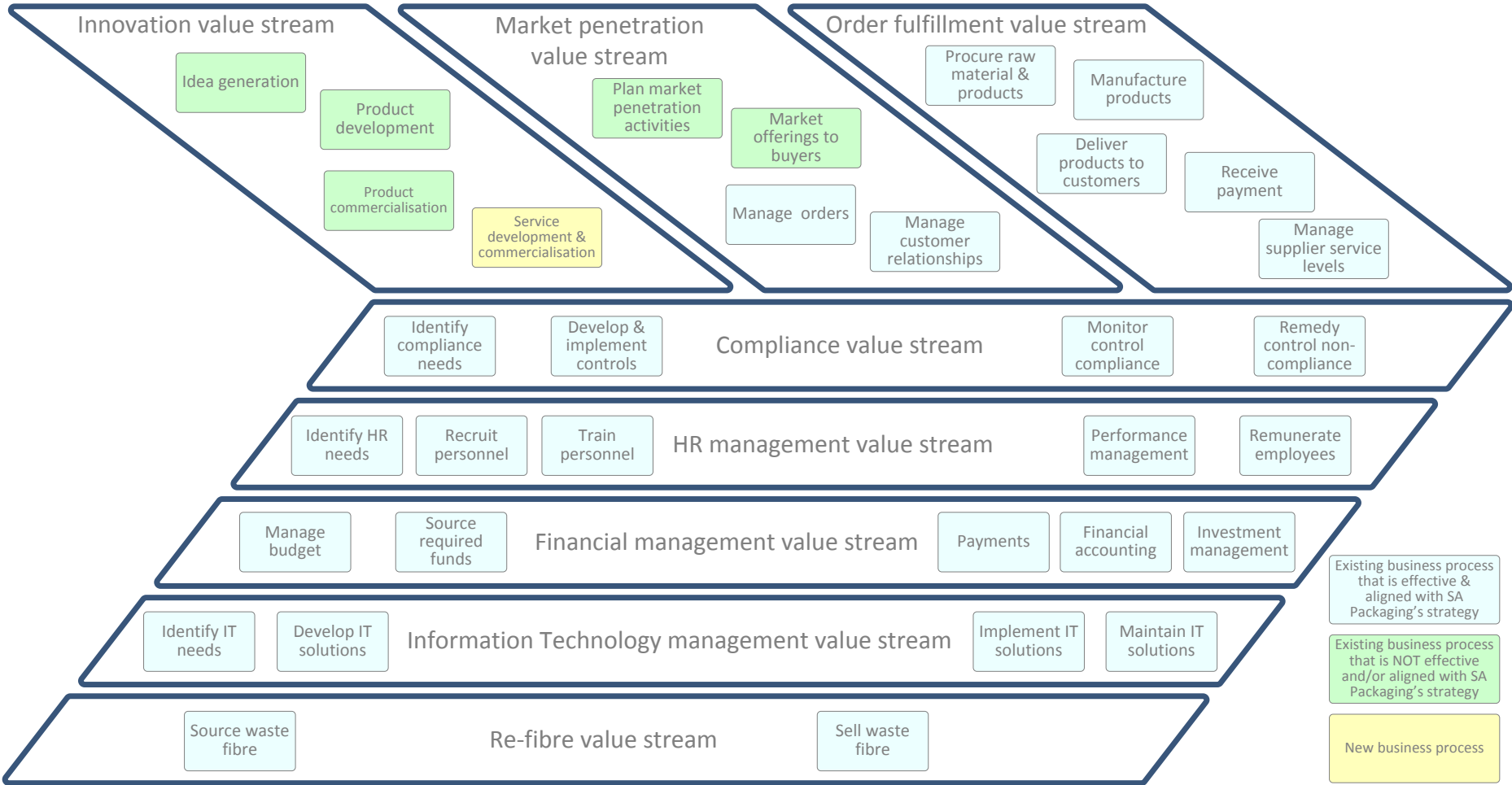


Figure A-31: Business process model of idea generation process

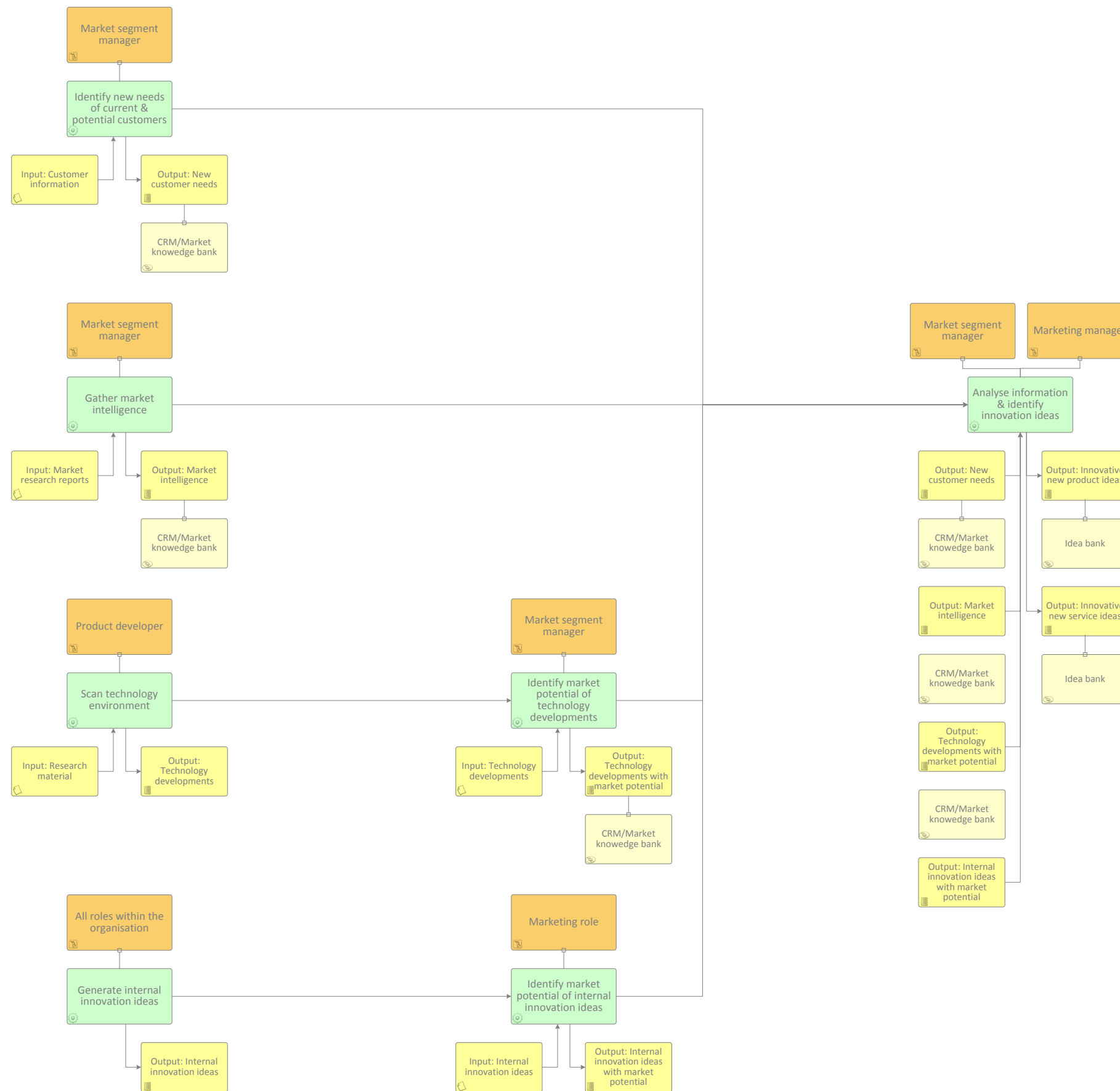


Figure A-32: Business process model of product development process

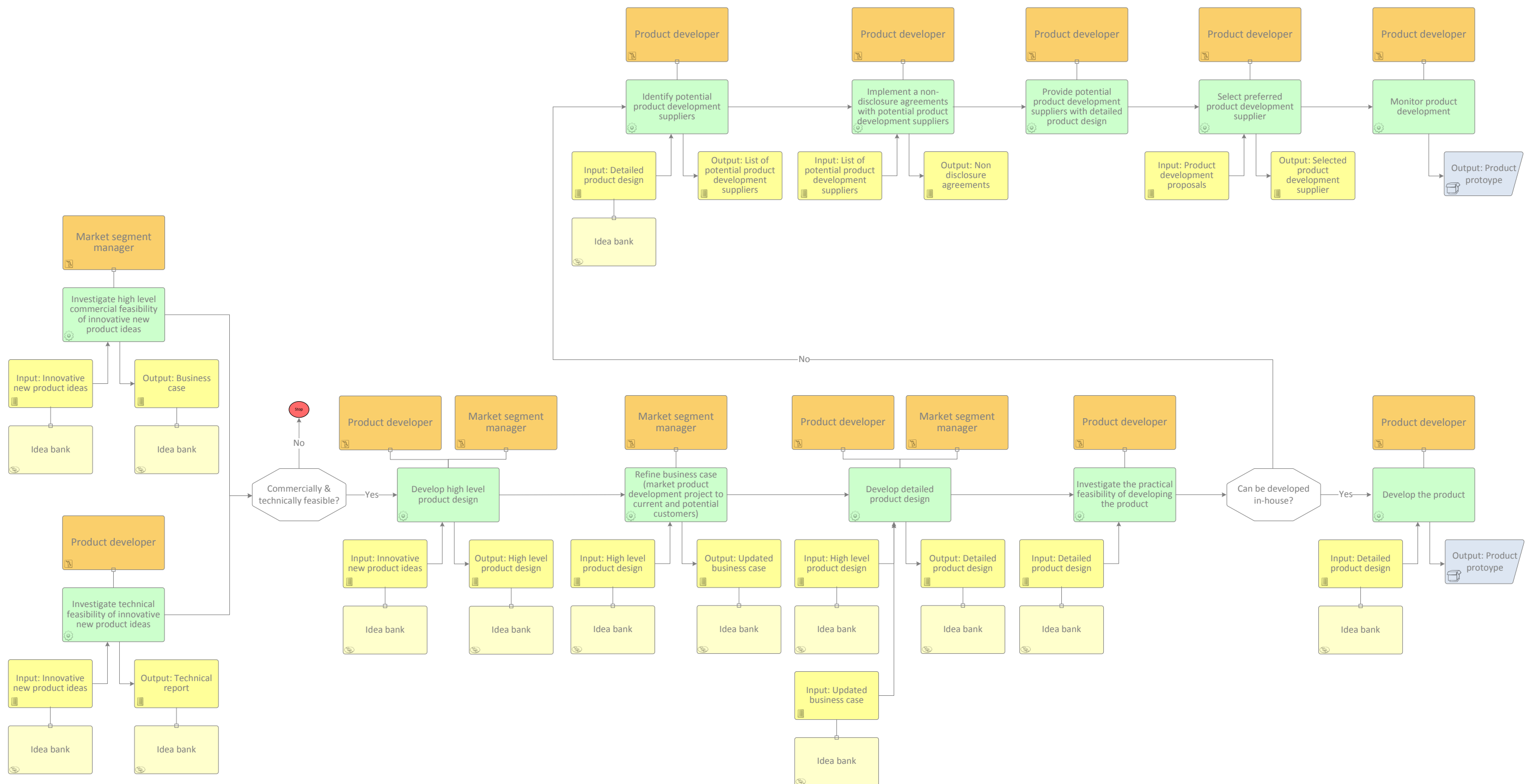


Figure A-33: Business process model of product commercialisation process

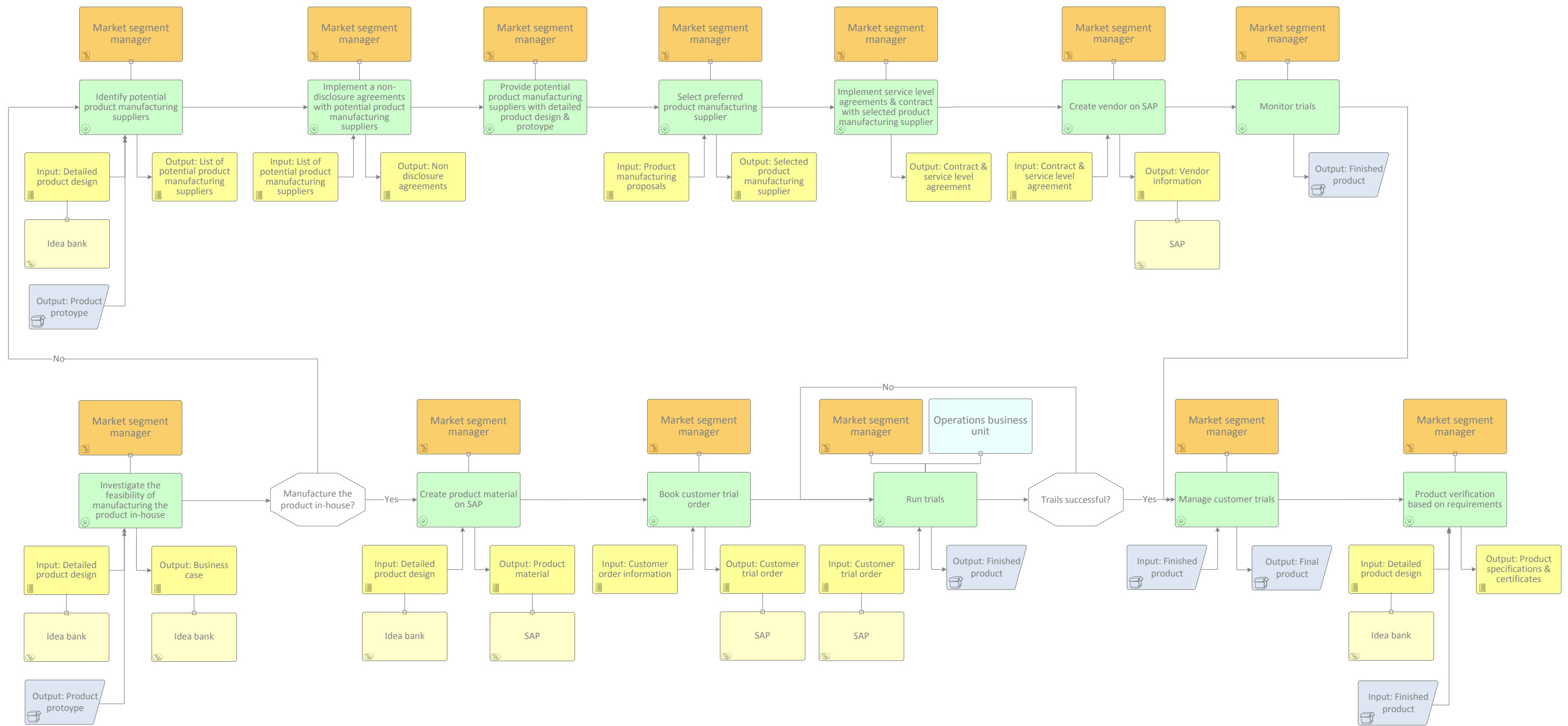
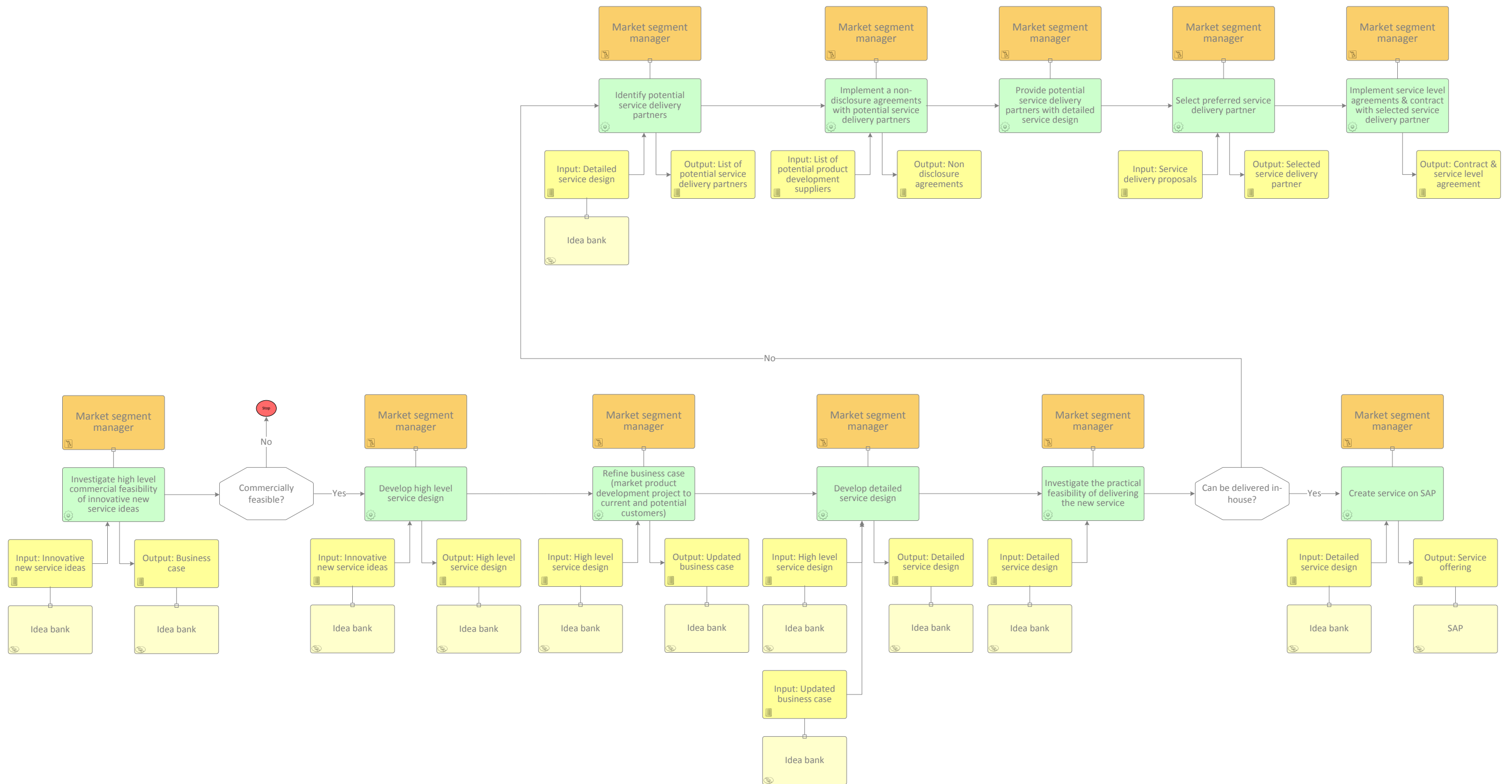
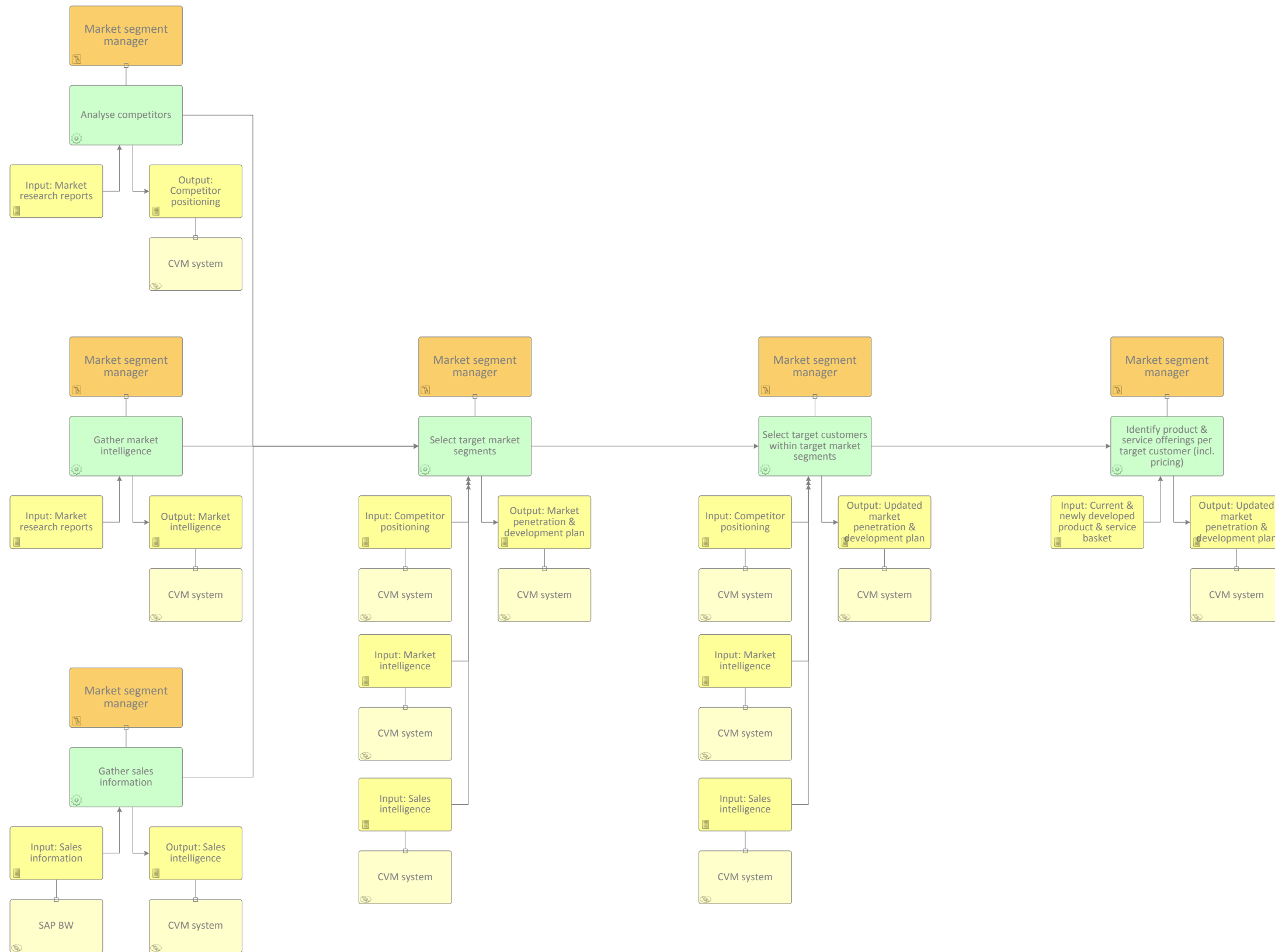


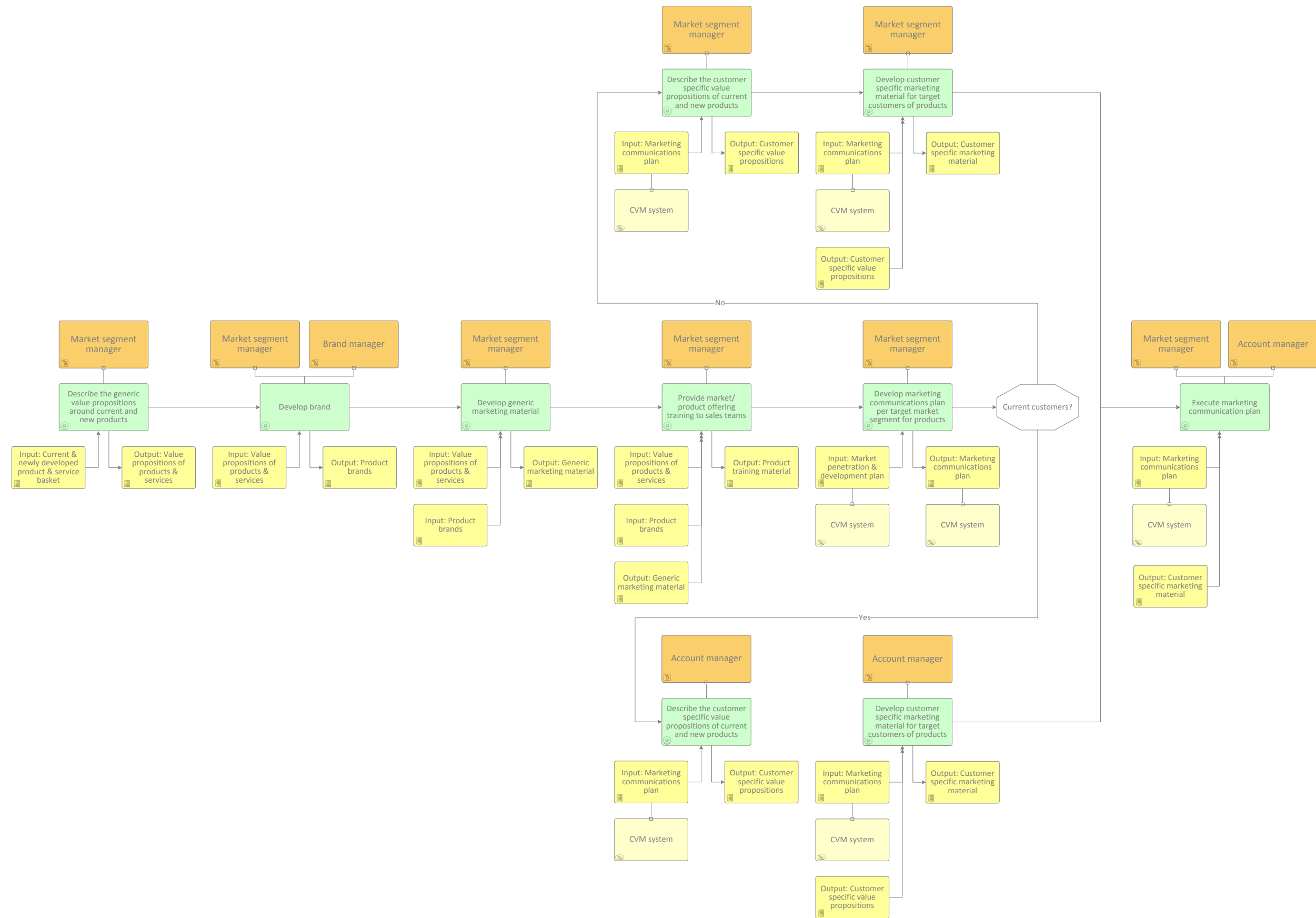
Figure A-34: Business process model of service development and commercialisation process



**Figure A-35: Business process model of plan market penetration activities process**



**Figure A-36: Business process model of market offerings to buyers process**





**Figure A-37: High level organisation structure model of SA Packaging**

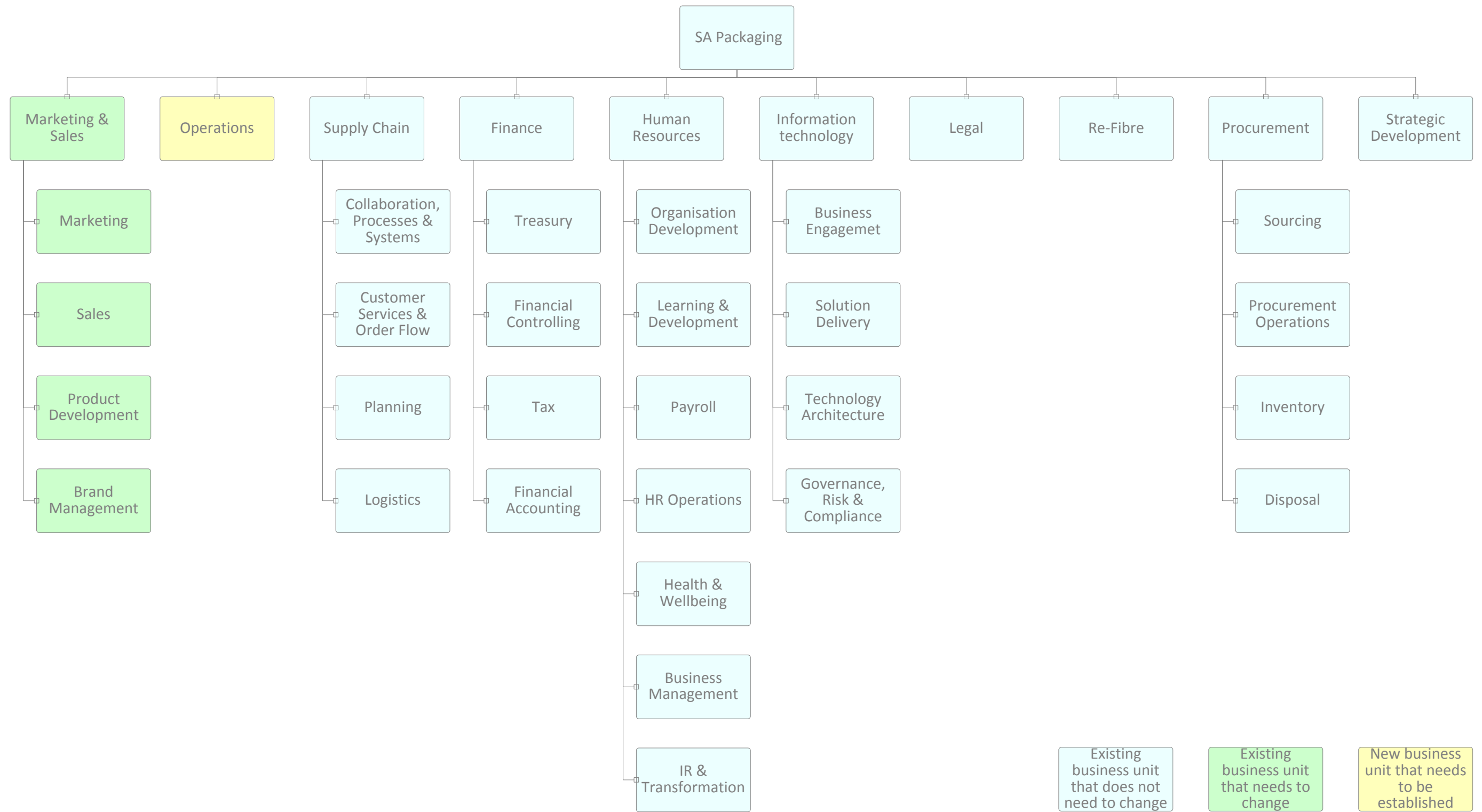
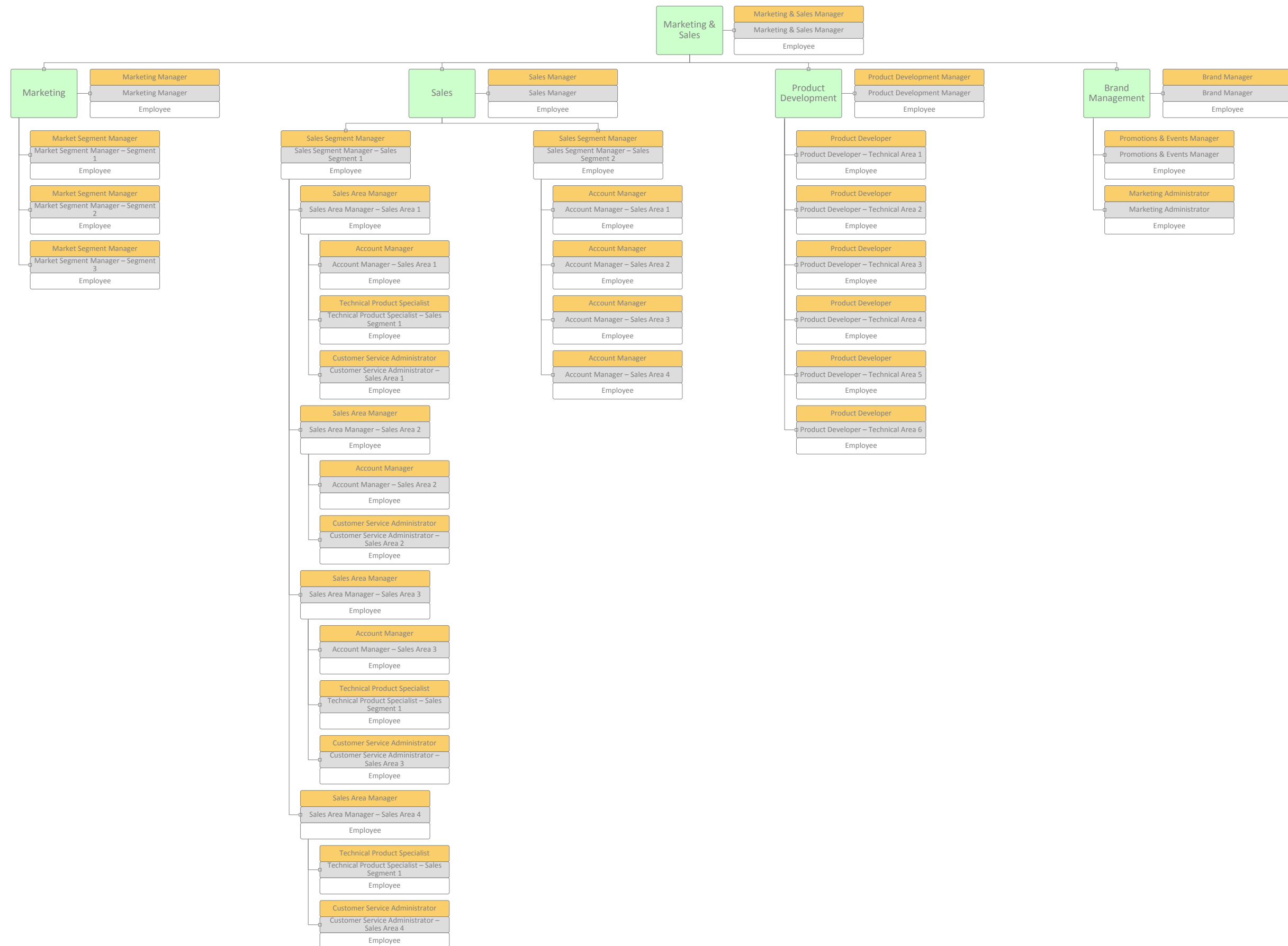


Figure A-38: Detailed Marketing and Sales organisation structure model of SA Packaging



**Table A-21: Performance measurement system of SA Packaging**

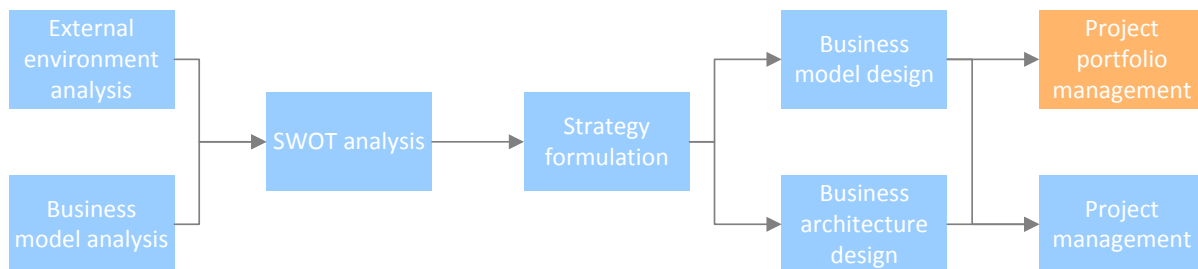
Roles that need to alter their behaviour	Required behaviour	Performance metric	Incentive
Market segment manager	<ul style="list-style-type: none"> <li>- Identify new potential markets that can be penetrated</li> <li>- Develop and commercialise innovative products and services for new markets</li> <li>- Market new and existing products and services to potential customers</li> </ul>	<ul style="list-style-type: none"> <li>- Additional profit generated from new product and service sales to new customers for a period</li> <li>- Additional profit generated from existing product and service sales to new customers for a period</li> </ul>	Commission on additional profit generated from sales to new customers for a period
Sales segment manager	<ul style="list-style-type: none"> <li>- Managing and ensuring the identification of new product and service needs of current customers in a specific sales segment</li> <li>- Managing and ensuring the development and commercialisation of innovative products and services that fulfil the specific needs of current customers in a specific sales segment</li> <li>- Managing and ensuring the marketing of new and existing products and services to current customers in a specific sales segment</li> <li>- Managing and ensuring the creation of intimate relationships with current customers in a specific sales segment</li> </ul>	<ul style="list-style-type: none"> <li>- Additional profit generated from new product and service sales to current customers in a specific sales segment for a period</li> <li>- Profit generated from existing product and service sales to current customers in a specific sales segment for a period</li> </ul>	<ul style="list-style-type: none"> <li>- Commission on additional profit generated from new product and service sales to current customers in a specific sales segment for a period</li> <li>- Commission on profit generated from existing product and service sales to current customers in a specific sales segment for a period</li> </ul>

Role	Required behaviour	Performance metric	Incentive
Sales area manager	<ul style="list-style-type: none"> <li>- Identify new product and service needs of current customers in a specific area</li> <li>- Develop and commercialise innovative products and services that fulfil the specific needs of current customers in a specific area</li> <li>- Market new and existing products and services to current customers in a specific area</li> <li>- Create intimate relationships with current customers in a specific area</li> </ul>	<ul style="list-style-type: none"> <li>- Additional profit generated from new product and service sales to current customers in a specific area for a period</li> <li>- Profit generated from existing product and service sales to current customers in a specific area for a period</li> </ul>	<ul style="list-style-type: none"> <li>- Commission on additional profit generated from new product and service sales to current customers in a specific area for a period</li> <li>- Commission on profit generated from existing product and service sales to current customers in a specific area for a period</li> </ul>
Account manager	<ul style="list-style-type: none"> <li>- Identify new product and service needs of key account customers in a specific area</li> <li>- Develop and commercialise innovative products and services that fulfil the specific needs of key account customers in a specific area</li> <li>- Market new and existing products and services to key account customers in a specific area</li> <li>- Create intimate relationships with key account customers in a specific area</li> </ul>	<ul style="list-style-type: none"> <li>- Additional profit generated from new product and service sales to key account customers in a specific area for a period</li> <li>- Profit generated from existing product and service sales to key account customers in a specific area for a period</li> </ul>	<ul style="list-style-type: none"> <li>- Commission on additional profit generated from new product and service sales to key account customers in a specific area for a period</li> <li>- Commission on profit generated from existing product and service sales to key account customers in a specific area for a period</li> </ul>
Product developer	<ul style="list-style-type: none"> <li>- Scan the technology environment</li> <li>- Identify new product and service development opportunities due to technology advancements</li> <li>- Develop market oriented, customer specific and new technology based products and services</li> </ul>	<ul style="list-style-type: none"> <li>- Additional profit generated from new product and service developments for a period</li> </ul>	<ul style="list-style-type: none"> <li>- Commission on additional profit generated from new product and service developments for a period</li> </ul>

## Project portfolio management results

As mentioned in Chapter 4 once an organisation has designed the business model and business architecture that it needs to implement the only thing left to do is physically implement the designs through a portfolio of transformation projects. However, in order to ensure that the transformation projects are successfully executed the portfolio needs to be effectively managed (refer to Figure A-39 below).

**Figure A-39: Project portfolio management within the context of the methodology**



During the case study this has been initiated for SA Packaging. However, all of the transformation projects that SA Packaging need to undertake are currently still only in the planning phase. This means that the only project portfolio management results that have been generated thus far are the following:

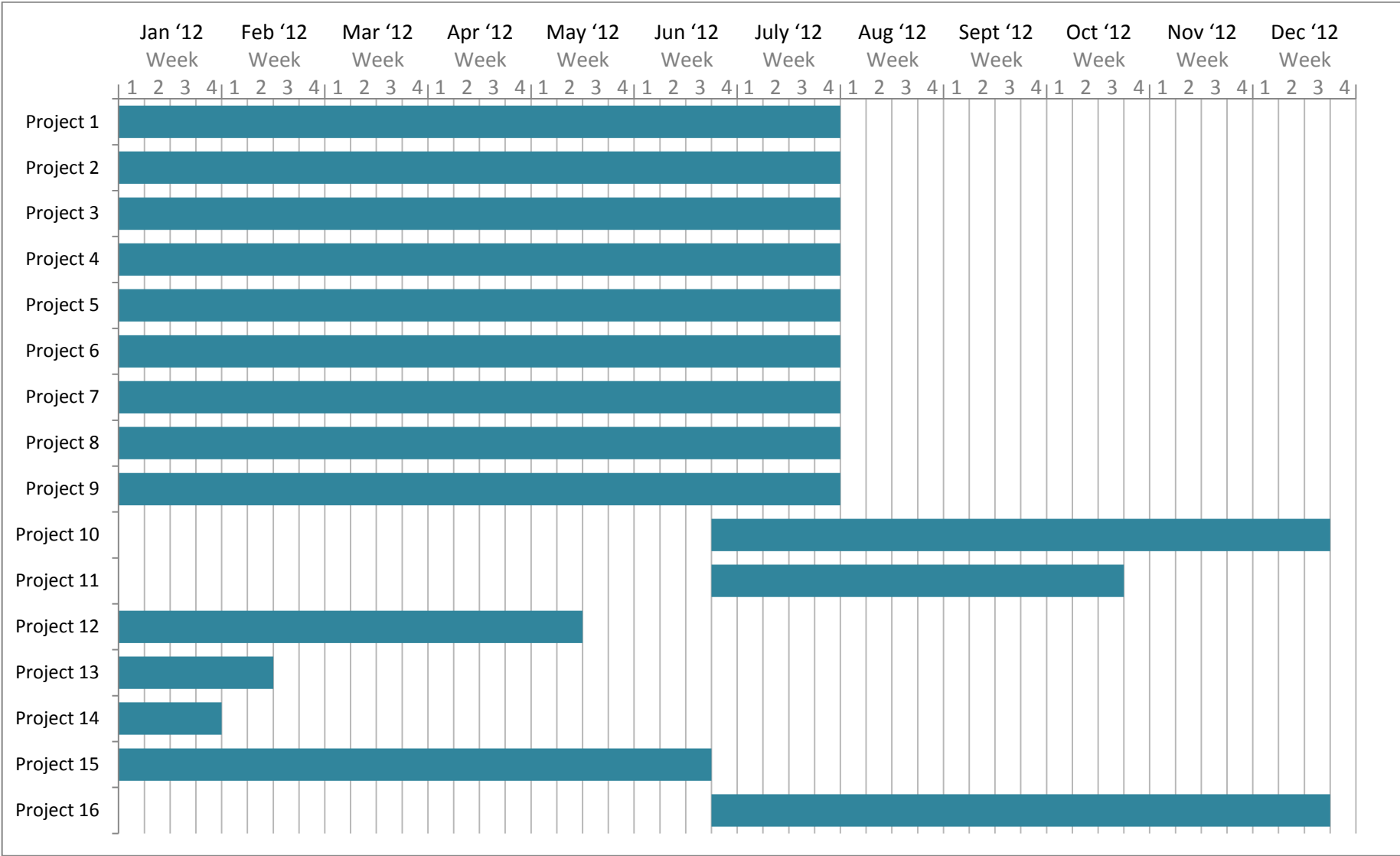
- The list/portfolio of transformation projects that SA Packaging need to undertake (illustrated below)
- A Gantt chart illustrating the dependencies between the transformation projects as well as their planned start and end dates (illustrated in Figure A-40)

It is important to note that budgetary, timing and other resource constraints were not taken into consideration during the identification and planning of the various transformation projects. The reason being, that the management team of SA Packaging wanted a complete and unconstrained view of exactly what needed to be done to turn SA Packaging around. The budgetary, timing and other resource constraints will most definitely, however, be taken into consideration before the various transformation projects are physically executed.

The list/portfolio of transformation projects that SA Packaging need to undertake:

- Project 1: Develop and commercialise a sack product that is ready to be manufactured and sold.
- Project 2: Develop and commercialise a bag product that is ready to be manufactured and sold.
- Project 3: Develop and commercialise a carton-board product that is ready to be manufactured and sold.
- Project 4: Develop and commercialise a container-board product that is ready to be manufactured and sold.
- Project 5: Develop and commercialise an “enviropak” product that is ready to be manufactured and sold.
- Project 6: Develop and commercialise a bioplastic product that is ready to be manufactured and sold.
- Project 7: Develop and commercialise an environmentally friendly alternative for poly-coated product that is ready to be manufactured and sold.
- Project 8: Develop and commercialise a shelf-ready packaging product that is ready to be manufactured and sold.
- Project 9: Develop and commercialise an intelligent packaging product that is ready to be manufactured and sold.
- Project 10: Design, erect and operationalise a manufacturing facility that will allow SA Packaging to manufacture its new product developments.
- Project 11: Re-evaluate local and international kraft paper supplier base, select preferred kraft paper suppliers and formalise the relationships between SA Packaging and its preferred kraft paper suppliers.
- Project 12: Equip the marketing and sales team with the necessary skills that it requires.
- Project 13: Implement the newly designed and redesigned business processes within the idea generation and market development and penetration value streams.
- Project 14: Implement the redesigned organisation structure of the marketing and sales business unit as well as the redesigned performance measurement system of SA Packaging.
- Project 15: Influence government to implement regulations and/or legislation that will protect the local retail and industrial packaging industry.
- Project 16: Develop and execute a marketing/brand communication plan for each product sub-segment.

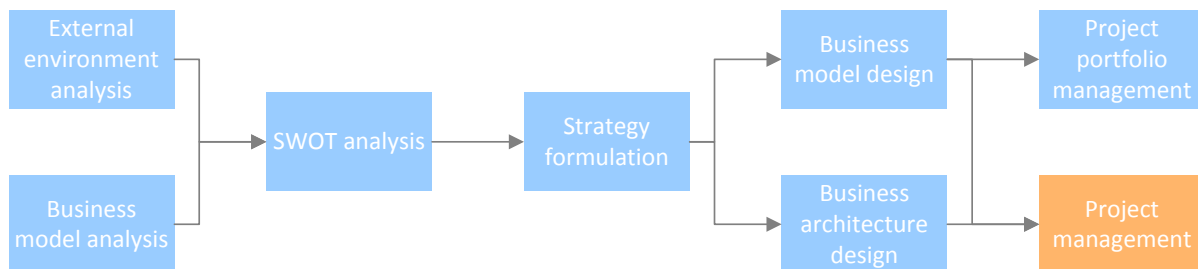
**Figure A-40: Gantt chart for the portfolio of transformation projects of SA Packaging**



## Project management results

When an organisation uses the enterprise engineering methodology described in Chapter 4 to re-engineer itself it not only needs to effectively manage the portfolio of transformation projects needed to implement its business model and business architecture designs. It is also very important that each transformation project within the portfolio is effectively managed on an individual basis (refer to Figure A-41 below).

**Figure A-41: Project management within the context of the methodology**



During the case study this has been initiated for SA Packaging. However, as mentioned previously, all of the transformation projects that SA Packaging need to undertake in order for it to implement its redesigned business model and business architecture are currently still only in the planning phase. The only project management results that have therefore been generated thus far are the following:

- A scope definition report for each of the transformation projects.
- A project plan for each of the transformation projects.

The scope definition report and project plan of each of the 16 transformation projects that need to be executed by SA Packaging are illustrated in Figures A-42 to A-73.



**Figure A-42: Scope definition report for Project 1**

<u>Scope definition report</u>					
<b><u>Project aim</u></b>					
Develop and commercialise a sack product that is ready to be manufactured and sold					
<b><u>Project benefits</u></b>					
<ul style="list-style-type: none"> <li>• Brings SA Packaging closer to the end-user of the product</li> <li>• Increases SA Packaging's profit margin</li> <li>• Increases SA Packaging's revenue</li> </ul>					
<b><u>Project deliverables</u></b>					
Deliverable	Resource requirements	Estimated cost	Start date	End date	Acceptance criteria
Product prototype	Market segment manager Product developer	Unknown	2 January 2012	22 June 2012	Environmentally friendly Meet or exceed industry quality standards
Final product	Sack converter Market segment manager	Unknown	2 July 2012	31 July 2012	Environmentally friendly Meet or exceed industry quality standards
<b><u>Project stakeholders</u></b>					
Stakeholder role	Stakeholder name	Stakeholder contact details			
Project manager	Marketing Manager	Confidential			
Project sponsor	CEO of SA Packaging	Confidential			
Project team member	Market Segment Manager - Segment 1	Confidential			
Project team member	Product Developer - Technical Area 1	Confidential			
Project team member	Sack converter	Confidential			

**Figure A-43: Project plan for Project 1**

<u>Project plan</u>					
Task description	Duration	Start date	End date	Task dependency	Responsible stakeholder
Task 1: Develop high level product design	14 days	02/01/2012	16/01/2012	None	Market Segment Manager - Segment 1
Task 2: Identify potential customers	14 days	17/01/2012	31/01/2012	Task 1	Market Segment Manager - Segment 1
Task 3: Gather customer requirements	14 days	01/02/2012	15/02/2012	Task 2	Market Segment Manager - Segment 1
Task 4: Develop detailed product design	14 day	16/02/2012	01/03/2012	Task 3	Product Developer - Technical Area 1
Task 5: Develop recipe and manufacturing process (technical specifications)	84 days	02/03/2012	25/05/2012	Task 4	Product Developer - Technical Area 1
Task 6: Generate product prototype	28 days	26/05/2012	22/06/2012	Task 5	Product Developer - Technical Area 1
Task 7: Schedule manufacturing trials	7 days	02/07/2012	09/07/2012	Task 6	Market Segment Manager - Segment 1
Task 8: Execute manufacturing trials	7 days	10/07/2012	17/07/2012	Task 7	Sack converter
Task 9: Quality assure final product	7 days	18/07/2012	25/07/2012	Task 8	Market Segment Manager - Segment 1
Task 10: Test final products in customer environment	6 days	26/07/2012	31/07/2012	Task 9	Market Segment Manager - Segment 1

**Figure A-44: Scope definition report for Project 2**

<u>Scope definition report</u>					
<b><u>Project aim</u></b>					
Develop and commercialise a bag product that is ready to be manufactured and sold					
<b><u>Project benefits</u></b>					
<ul style="list-style-type: none"> <li>• Brings SA Packaging closer to the end-user of the product</li> <li>• Increases SA Packaging's profit margin</li> <li>• Increases SA Packaging's revenue</li> </ul>					
<b><u>Project deliverables</u></b>					
Deliverable	Resource requirements	Estimated cost	Start date	End date	Acceptance criteria
Product prototype	Market segment manager Product developer	Unknown	2 January 2012	22 June 2012	Environmentally friendly Meet or exceed industry quality standards
Final product	Bag converter Market segment manager	Unknown	2 July 2012	31 July 2012	Environmentally friendly Meet or exceed industry quality standards
<b><u>Project stakeholders</u></b>					
Stakeholder role	Stakeholder name	Stakeholder contact details			
Project manager	Marketing Manager	Confidential			
Project sponsor	CEO of SA Packaging	Confidential			
Project team member	Market Segment Manager - Segment 1	Confidential			
Project team member	Product Developer - Technical Area 1	Confidential			
Project team member	Bag converter	Confidential			

**Figure A-45: Project plan for Project 2**

<u>Project plan</u>					
<b>Task description</b>	<b>Duration</b>	<b>Start date</b>	<b>End date</b>	<b>Task dependency</b>	<b>Responsible stakeholder</b>
Task 1: Develop high level product design	14 days	02/01/2012	16/01/2012	None	Market Segment Manager - Segment 1
Task 2: Identify potential customers	14 days	17/01/2012	31/01/2012	Task 1	Market Segment Manager - Segment 1
Task 3: Gather customer requirements	14 days	01/02/2012	15/02/2012	Task 2	Market Segment Manager - Segment 1
Task 4: Develop detailed product design	14 days	16/02/2012	01/03/2012	Task 3	Product Developer - Technical Area 1
Task 5: Develop recipe and manufacturing process (technical specifications)	84 days	02/03/2012	25/05/2012	Task 4	Product Developer - Technical Area 1
Task 6: Generate product prototype	28 days	26/05/2012	22/06/2012	Task 5	Product Developer - Technical Area 1
Task 7: Schedule manufacturing trials	7 days	02/07/2012	09/07/2012	Task 6	Market Segment Manager - Segment 1
Task 8: Execute manufacturing trials	7 days	10/07/2012	17/07/2012	Task 7	Sack converter
Task 9: Quality assure final product	7 days	18/07/2012	25/07/2012	Task 8	Market Segment Manager - Segment 1
Task 10: Test final products in customer environment	6 days	26/07/2012	31/07/2012	Task 9	Market Segment Manager - Segment 1

**Figure A-46: Scope definition report for Project 3**

<u>Scope definition report</u>					
<b><u>Project aim</u></b>					
Develop and commercialise a carton-board product that is ready to be manufactured and sold					
<b><u>Project benefits</u></b>					
<ul style="list-style-type: none"> <li>• Brings SA Packaging closer to the end-user of the product</li> <li>• Increases SA Packaging's profit margin</li> <li>• Increases SA Packaging's revenue</li> </ul>					
<b><u>Project deliverables</u></b>					
Deliverable	Resource requirements	Estimated cost	Start date	End date	Acceptance criteria
Product prototype	Market segment manager Product developer	Unknown	2 January 2012	22 June 2012	Environmentally friendly Meet or exceed industry quality standards
Final product	Carton manufacturer Market segment manager	Unknown	2 July 2012	31 July 2012	Environmentally friendly Meet or exceed industry quality standards
<b><u>Project stakeholders</u></b>					
Stakeholder role	Stakeholder name	Stakeholder contact details			
Project manager	Marketing Manager	Confidential			
Project sponsor	CEO of SA Packaging	Confidential			
Project team member	Market Segment Manager - Segment 2	Confidential			
Project team member	Product Developer - Technical Area 2	Confidential			
Project team member	Carton manufacturer	Confidential			

**Figure A-47: Project plan for Project 3**

<u>Project plan</u>					
Task description	Duration	Start date	End date	Task dependency	Responsible stakeholder
Task 1: Develop high level product design	14 days	02/01/2012	16/01/2012	None	Market Segment Manager - Segment 2
Task 2: Identify potential customers	14 days	17/01/2012	31/01/2012	Task 1	Market Segment Manager - Segment 2
Task 3: Gather customer requirements	14 days	01/02/2012	15/02/2012	Task 2	Market Segment Manager - Segment 2
Task 4: Develop detailed product design	14 days	16/02/2012	01/03/2012	Task 3	Product Developer - Technical Area 2
Task 5: Develop recipe and manufacturing process (technical specifications)	84 days	02/03/2012	25/05/2012	Task 4	Product Developer - Technical Area 2
Task 6: Generate product prototype	28 days	26/05/2012	22/06/2012	Task 5	Product Developer - Technical Area 2
Task 7: Schedule manufacturing trials	7 days	02/07/2012	09/07/2012	Task 6	Market Segment Manager - Segment 2
Task 8: Execute manufacturing trials	7 days	10/07/2012	17/07/2012	Task 7	Carton manufacturer
Task 9: Quality assure final product	7 days	18/07/2012	25/07/2012	Task 8	Market Segment Manager - Segment 2
Task 10: Test final products in customer environment	6 days	26/07/2012	31/07/2012	Task 9	Market Segment Manager - Segment 2

**Figure A-48: Scope definition report for Project 4**

<u>Scope definition report</u>					
<b><u>Project aim</u></b>					
Develop and commercialise a container-board product that is ready to be manufactured and sold					
<b><u>Project benefits</u></b>					
<ul style="list-style-type: none"> <li>• Brings SA Packaging closer to the end-user of the product</li> <li>• Increases SA Packaging's profit margin</li> <li>• Increases SA Packaging's revenue</li> </ul>					
<b><u>Project deliverables</u></b>					
Deliverable	Resource requirements	Estimated cost	Start date	End date	Acceptance criteria
Product prototype	Market segment manager Product developer	Unknown	2 January 2012	22 June 2012	Environmentally friendly Meet or exceed industry quality standards
Final product	Box manufacturer Market segment manager	Unknown	2 July 2012	31 July 2012	Environmentally friendly Meet or exceed industry quality standards
<b><u>Project stakeholders</u></b>					
Stakeholder role	Stakeholder name	Stakeholder contact details			
Project manager	Marketing Manager	Confidential			
Project sponsor	CEO of SA Packaging	Confidential			
Project team member	Market Segment Manager - Segment 2	Confidential			
Project team member	Product Developer - Technical Area 2	Confidential			
Project team member	Box manufacturer	Confidential			

**Figure A-49: Project plan for Project 4**

<u>Project plan</u>					
<b>Task description</b>	<b>Duration</b>	<b>Start date</b>	<b>End date</b>	<b>Task dependency</b>	<b>Responsible stakeholder</b>
Task 1: Develop high level product design	14 days	02/01/2012	16/01/2012	None	Market Segment Manager - Segment 2
Task 2: Identify potential customers	14 days	17/01/2012	31/01/2012	Task 1	Market Segment Manager - Segment 2
Task 3: Gather customer requirements	14 days	01/02/2012	15/02/2012	Task 2	Market Segment Manager - Segment 2
Task 4: Develop detailed product design	14 days	16/02/2012	01/03/2012	Task 3	Product Developer - Technical Area 2
Task 5: Develop recipe and manufacturing process (technical specifications)	84 days	02/03/2012	25/05/2012	Task 4	Product Developer - Technical Area 2
Task 6: Generate product prototype	28 days	26/05/2012	22/06/2012	Task 5	Product Developer - Technical Area 2
Task 7: Schedule manufacturing trials	7 days	02/07/2012	09/07/2012	Task 6	Market Segment Manager - Segment 2
Task 8: Execute manufacturing trials	7 days	10/07/2012	17/07/2012	Task 7	Box manufacturer
Task 9: Quality assure final product	7 days	18/07/2012	25/07/2012	Task 8	Market Segment Manager - Segment 2
Task 10: Test final products in customer environment	6 days	26/07/2012	31/07/2012	Task 9	Market Segment Manager - Segment 2



**Figure A-50: Scope definition report for Project 5**

<u>Scope definition report</u>					
<b><u>Project aim</u></b>					
Develop and commercialise an “enviropak” product that is ready to be manufactured and sold					
<b><u>Project benefits</u></b>					
<ul style="list-style-type: none"> <li>• Brings SA Packaging closer to the end-user of the product</li> <li>• Increases SA Packaging’s profit margin</li> <li>• Increases SA Packaging’s revenue</li> </ul>					
<b><u>Project deliverables</u></b>					
Deliverable	Resource requirements	Estimated cost	Start date	End date	Acceptance criteria
Product prototype	Market segment manager Product developer	Unknown	2 January 2012	22 June 2012	Environmentally friendly Meet or exceed industry quality standards
Final product	Moulded pulp packaging manufacturer Market segment manager	Unknown	2 July 2012	31 July 2012	Environmentally friendly Meet or exceed industry quality standards
<b><u>Project stakeholders</u></b>					
Stakeholder role	Stakeholder name	Stakeholder contact details			
Project manager	Marketing Manager	Confidential			
Project sponsor	CEO of SA Packaging	Confidential			
Project team member	Market Segment Manager - Segment 2	Confidential			
Project team member	Product Developer - Technical Area 3	Confidential			
Project team member	Moulded pulp packaging manufacturer	Confidential			

**Figure A-51: Project plan for Project 5**

<u>Project plan</u>					
<b>Task description</b>	<b>Duration</b>	<b>Start date</b>	<b>End date</b>	<b>Task dependency</b>	<b>Responsible stakeholder</b>
Task 1: Develop high level product design	14 days	02/01/2012	16/01/2012	None	Market Segment Manager - Segment 2
Task 2: Identify potential customers	14 days	17/01/2012	31/01/2012	Task 1	Market Segment Manager - Segment 2
Task 3: Gather customer requirements	14 days	01/02/2012	15/02/2012	Task 2	Market Segment Manager - Segment 2
Task 4: Develop detailed product design	14 days	16/02/2012	01/03/2012	Task 3	Product Developer - Technical Area 3
Task 5: Develop recipe and manufacturing process (technical specifications)	84 days	02/03/2012	25/05/2012	Task 4	Product Developer - Technical Area 3
Task 6: Generate product prototype	28 days	26/05/2012	22/06/2012	Task 5	Product Developer - Technical Area 3
Task 7: Schedule manufacturing trials	7 days	02/07/2012	09/07/2012	Task 6	Market Segment Manager - Segment 2
Task 8: Execute manufacturing trials	7 days	10/07/2012	17/07/2012	Task 7	Moulded pulp packaging manufacturer
Task 9: Quality assure final product	7 days	18/07/2012	25/07/2012	Task 8	Market Segment Manager - Segment 2
Task 10: Test final products in customer environment	6 days	26/07/2012	31/07/2012	Task 9	Market Segment Manager - Segment 2

**Figure A-52: Scope definition report for Project 6**

<u>Scope definition report</u>					
<b><u>Project aim</u></b>					
Develop and commercialise a bioplastic product that is ready to be manufactured and sold					
<b><u>Project benefits</u></b>					
<ul style="list-style-type: none"> <li>• Brings SA Packaging closer to the end-user of the product</li> <li>• Increases SA Packaging's profit margin</li> <li>• Increases SA Packaging's revenue</li> </ul>					
<b><u>Project deliverables</u></b>					
Deliverable	Resource requirements	Estimated cost	Start date	End date	Acceptance criteria
Product prototype	Market segment manager Product developer	Unknown	2 January 2012	22 June 2012	Environmentally friendly Meet or exceed industry quality standards
Final product	Bio-plastic packaging manufacturer Market segment manager	Unknown	2 July 2012	31 July 2012	Environmentally friendly Meet or exceed industry quality standards
<b><u>Project stakeholders</u></b>					
Stakeholder role	Stakeholder name	Stakeholder contact details			
Project manager	Marketing Manager	Confidential			
Project sponsor	CEO of SA Packaging	Confidential			
Project team member	Market Segment Manager - Segment 3	Confidential			
Project team member	Product Developer - Technical Area 4	Confidential			
Project team member	Bio-plastic packaging manufacturer	Confidential			

**Figure A-53: Project plan for Project 6**

<u>Project plan</u>					
<b>Task description</b>	<b>Duration</b>	<b>Start date</b>	<b>End date</b>	<b>Task dependency</b>	<b>Responsible stakeholder</b>
Task 1: Develop high level product design	14 days	02/01/2012	16/01/2012	None	Market Segment Manager - Segment 3
Task 2: Identify potential customers	14 days	17/01/2012	31/01/2012	Task 1	Market Segment Manager - Segment 3
Task 3: Gather customer requirements	14 days	01/02/2012	15/02/2012	Task 2	Market Segment Manager - Segment 3
Task 4: Develop detailed product design	14 days	16/02/2012	01/03/2012	Task 3	Product Developer - Technical Area 4
Task 5: Develop recipe and manufacturing process (technical specifications)	84 days	02/03/2012	25/05/2012	Task 4	Product Developer - Technical Area 4
Task 6: Generate product prototype	28 days	26/05/2012	22/06/2012	Task 5	Product Developer - Technical Area 4
Task 7: Schedule manufacturing trials	7 days	02/07/2012	09/07/2012	Task 6	Market Segment Manager - Segment 3
Task 8: Execute manufacturing trials	7 days	10/07/2012	17/07/2012	Task 7	Bio-plastic packaging manufacturer
Task 9: Quality assure final product	7 days	18/07/2012	25/07/2012	Task 8	Market Segment Manager - Segment 3
Task 10: Test final products in customer environment	6 days	26/07/2012	31/07/2012	Task 9	Market Segment Manager - Segment 3

**Figure A-54: Scope definition report for Project 7**

<u>Scope definition report</u>					
<b><u>Project aim</u></b>					
Develop and commercialise an environmentally friendly alternative for poly-coated product that is ready to be manufactured and sold					
<b><u>Project benefits</u></b>					
<ul style="list-style-type: none"> <li>• Brings SA Packaging closer to the end-user of the product</li> <li>• Increases SA Packaging's profit margin</li> <li>• Increases SA Packaging's revenue</li> </ul>					
<b><u>Project deliverables</u></b>					
Deliverable	Resource requirements	Estimated cost	Start date	End date	Acceptance criteria
Product prototype	Market segment manager Product developer	Unknown	2 January 2012	22 June 2012	Environmentally friendly Meet or exceed industry quality standards
Final product	Packaging converter Market segment manager	Unknown	2 July 2012	31 July 2012	Environmentally friendly Meet or exceed industry quality standards
<b><u>Project stakeholders</u></b>					
Stakeholder role	Stakeholder name	Stakeholder contact details			
Project manager	Marketing Manager	Confidential			
Project sponsor	CEO of SA Packaging	Confidential			
Project team member	Market Segment Manager - Segment 2	Confidential			
Project team member	Product Developer - Technical Area 3	Confidential			
Project team member	Poly-coated packaging converter	Confidential			

**Figure A-55: Project plan for Project 7**

<u>Project plan</u>					
<b>Task description</b>	<b>Duration</b>	<b>Start date</b>	<b>End date</b>	<b>Task dependency</b>	<b>Responsible stakeholder</b>
Task 1: Develop high level product design	14 days	02/01/2012	16/01/2012	None	Market Segment Manager - Segment 2
Task 2: Identify potential customers	14 days	17/01/2012	31/01/2012	Task 1	Market Segment Manager - Segment 2
Task 3: Gather customer requirements	14 days	01/02/2012	15/02/2012	Task 2	Market Segment Manager - Segment 2
Task 4: Develop detailed product design	14 days	16/02/2012	01/03/2012	Task 3	Product Developer - Technical Area 3
Task 5: Develop recipe and manufacturing process (technical specifications)	84 days	02/03/2012	25/05/2012	Task 4	Product Developer - Technical Area 3
Task 6: Generate product prototype	28 days	26/05/2012	22/06/2012	Task 5	Product Developer - Technical Area 3
Task 7: Schedule manufacturing trials	7 days	02/07/2012	09/07/2012	Task 6	Market Segment Manager - Segment 2
Task 8: Execute manufacturing trials	7 days	10/07/2012	17/07/2012	Task 7	Poly-coated packaging converter
Task 9: Quality assure final product	7 days	18/07/2012	25/07/2012	Task 8	Market Segment Manager - Segment 2
Task 10: Test final products in customer environment	6 days	26/07/2012	31/07/2012	Task 9	Market Segment Manager - Segment 2

**Figure A-56: Scope definition report for Project 8**

<u>Scope definition report</u>					
<b><u>Project aim</u></b>					
Develop and commercialise a shelf-ready packaging product that is ready to be manufactured and sold					
<b><u>Project benefits</u></b>					
<ul style="list-style-type: none"> <li>• Brings SA Packaging closer to the end-user of the product</li> <li>• Increases SA Packaging's profit margin</li> <li>• Increases SA Packaging's revenue</li> </ul>					
<b><u>Project deliverables</u></b>					
Deliverable	Resource requirements	Estimated cost	Start date	End date	Acceptance criteria
Product prototype	Market segment manager Product developer	Unknown	2 January 2012	22 June 2012	Environmentally friendly Meet or exceed industry quality standards
Final product	Shelf-ready packaging manufacturer Market segment manager	Unknown	2 July 2012	31 July 2012	Environmentally friendly Meet or exceed industry quality standards
<b><u>Project stakeholders</u></b>					
Stakeholder role	Stakeholder name	Stakeholder contact details			
Project manager	Marketing Manager	Confidential			
Project sponsor	CEO of SA Packaging	Confidential			
Project team member	Market Segment Manager - Segment 3	Confidential			
Project team member	Product Developer - Technical Area 5	Confidential			
Project team member	Shelf-ready packaging manufacturer	Confidential			

**Figure A-57: Project plan for Project 8**

<u>Project plan</u>					
<b>Task description</b>	<b>Duration</b>	<b>Start date</b>	<b>End date</b>	<b>Task dependency</b>	<b>Responsible stakeholder</b>
Task 1: Develop high level product design	14 days	02/01/2012	16/01/2012	None	Market Segment Manager - Segment 3
Task 2: Identify potential customers	14 days	17/01/2012	31/01/2012	Task 1	Market Segment Manager - Segment 3
Task 3: Gather customer requirements	14 days	01/02/2012	15/02/2012	Task 2	Market Segment Manager - Segment 3
Task 4: Develop detailed product design	14 days	16/02/2012	01/03/2012	Task 3	Product Developer - Technical Area 5
Task 5: Develop recipe and manufacturing process (technical specifications)	84 days	02/03/2012	25/05/2012	Task 4	Product Developer - Technical Area 5
Task 6: Generate product prototype	28 days	26/05/2012	22/06/2012	Task 5	Product Developer - Technical Area 5
Task 7: Schedule manufacturing trials	7 days	02/07/2012	09/07/2012	Task 6	Market Segment Manager - Segment 3
Task 8: Execute manufacturing trials	7 days	10/07/2012	17/07/2012	Task 7	Shelf-ready packaging manufacturer
Task 9: Quality assure final product	7 days	18/07/2012	25/07/2012	Task 8	Market Segment Manager - Segment 3
Task 10: Test final products in customer environment	6 days	26/07/2012	31/07/2012	Task 9	Market Segment Manager - Segment 3



**Figure A-58: Scope definition report for Project 9**

<u>Scope definition report</u>					
<b><u>Project aim</u></b>					
Develop and commercialise an intelligent packaging product that is ready to be manufactured and sold					
<b><u>Project benefits</u></b>					
<ul style="list-style-type: none"> <li>• Brings SA Packaging closer to the end-user of the product</li> <li>• Increases SA Packaging's profit margin</li> <li>• Increases SA Packaging's revenue</li> </ul>					
<b><u>Project deliverables</u></b>					
Deliverable	Resource requirements	Estimated cost	Start date	End date	Acceptance criteria
Product prototype	Market segment manager Product developer	Unknown	2 January 2012	22 June 2012	Environmentally friendly Meet or exceed industry quality standards
Final product	Intelligent packaging manufacturer Market segment manager	Unknown	2 July 2012	31 July 2012	Environmentally friendly Meet or exceed industry quality standards
<b><u>Project stakeholders</u></b>					
Stakeholder role	Stakeholder name	Stakeholder contact details			
Project manager	Marketing Manager	Confidential			
Project sponsor	CEO of SA Packaging	Confidential			
Project team member	Market Segment Manager - Segment 3	Confidential			
Project team member	Product Developer - Technical Area 6	Confidential			
Project team member	Intelligent packaging manufacturer	Confidential			

**Figure A-59: Project plan for Project 9**

<u>Project plan</u>					
Task description	Duration	Start date	End date	Task dependency	Responsible stakeholder
Task 1: Develop high level product design	14 days	02/01/2012	16/01/2012	None	Market Segment Manager - Segment 3
Task 2: Identify potential customers	14 days	17/01/2012	31/01/2012	Task 1	Market Segment Manager - Segment 3
Task 3: Gather customer requirements	14 days	01/02/2012	15/02/2012	Task 2	Market Segment Manager - Segment 3
Task 4: Develop detailed product design	14 days	16/02/2012	01/03/2012	Task 3	Product Developer - Technical Area 6
Task 5: Develop recipe and manufacturing process (technical specifications)	84 days	02/03/2012	25/05/2012	Task 4	Product Developer - Technical Area 6
Task 6: Generate product prototype	28 days	26/05/2012	22/06/2012	Task 5	Product Developer - Technical Area 6
Task 7: Schedule manufacturing trials	7 days	02/07/2012	09/07/2012	Task 6	Market Segment Manager - Segment 3
Task 8: Execute manufacturing trials	7 days	10/07/2012	17/07/2012	Task 7	Intelligent packaging manufacturer
Task 9: Quality assure final product	7 days	18/07/2012	25/07/2012	Task 8	Market Segment Manager - Segment 3
Task 10: Test final products in customer environment	6 days	26/07/2012	31/07/2012	Task 9	Market Segment Manager - Segment 3

**Figure A-60: Scope definition report for Project 10**

<u>Scope definition report</u>					
<b><u>Project aim</u></b>					
Design, erect and operationalise a manufacturing facility that will allow SA Packaging to manufacture its new product developments					
<b><u>Project benefits</u></b>					
<ul style="list-style-type: none"> <li>• Increases SA Packaging's control</li> <li>• Increases SA Packaging's profit margin</li> </ul>					
<b><u>Project deliverables</u></b>					
Deliverable	Resource requirements	Estimated cost	Start date	End date	Acceptance criteria
Manufacturing facility design	- Facility planner - Product development team	Unknown	25 June 2012	27 July 2012	Comply with legislative and regulatory requirements
Facility construction	- Facility planner - Legal business unit - CEO of SA Packaging - Procurement manager - Commercial property contractor	Unknown	25 June 2012	26 November 2012	Comply with facility design
Manufacturing equipment procurement and installation	- Procurement manager - Product development team - Equipment suppliers	Unknown	25 June 2012	24 December 2012	Equipment required to manufacture products
Human resources acquisition	- Human Resources manager - CEO of SA Packaging	Unknown	25 June 2012	24 December 2012	Skills required to operate & manage the facility
<b><u>Project stakeholders</u></b>					
Stakeholder role	Stakeholder name	Stakeholder contact details			
Project manager & sponsor	CEO of SA Packaging	Confidential			
Project team member	Equipment suppliers	Confidential			
Project team member	Facility planner	Confidential			
Project team member	Commercial property contractor	Confidential			
Project team member	Procurement manager	Confidential			
Project team member	Human Resources manager	Confidential			
Project team member	Product development team	Confidential			

**Figure A-61: Project plan for Project 10**

<u>Project plan</u>					
Task description	Duration	Start date	End date	Task dependency	Responsible stakeholder
Task 1: Define the objective and requirements of the facility	7 days	25/06/2012	02/07/2012	None	Facility planner Product development team
Task 2: Define and describe the facility activities and processes	7 days	25/06/2012	02/07/2012	None	Facility planner Product development team
Task 3: Determine the interrelationships between the activities and processes	7 days	25/06/2012	02/07/2012	None	Facility planner Product development team
Task 4: Determine space requirements	7 days	03/07/2012	10/07/2012	Task 1,2,3	Facility planner Product development team
Task 5: Generate & evaluate alternative facility plans	14 days	11/07/2012	25/07/2012	Task 4	Facility planner
Task 6: Select facility plan	2 days	26/07/2012	27/07/2012	Task 5	Facility planner Product development team
Task 7: Identify available and appropriate land	14 days	25/06/2012	09/07/2012	None	CEO of SA Packaging
Task 8: Purchase land	28 days	10/07/2012	07/08/2012	Task 7	CEO of SA Packaging
Task 9: Obtain approval for construction	14 days	08/08/2012	22/08/2012	Task 8	Legal business unit
Task 10: Select commercial property contractor	14 days	25/06/2012	09/07/2012	None	Procurement manager
Task 11: Implement contract with commercial property contractor	14 days	10/07/2012	24/07/2012	Task 10	Legal business unit
Task 12: Erect facility	95 days	23/08/2012	26/11/2012	Task 11	Commercial property contractor
Task 13: Determine manufacturing equipment requirements	7 days	25/06/2012	02/07/2012	None	Product development team
Task 14: Evaluate and select equipment suppliers	14 days	08/07/2012	22/07/2012	Task 13	Procurement manager
Task 15: Procure equipment	127 days	23/07/2012	27/11/2012	Task 14	Procurement manager
Task 16: Install equipment	26 days	28/11/2012	24/12/2012	Task 15	Equipment suppliers
Task 17: Determine human resource requirements	14 days	25/06/2012	09/07/2012	None	Human resources manager
Task 18: Design the operations business unit organisation structure	14 days	10/07/2012	24/07/2012	Task 17	Human resources manager CEO of SA Packaging
Task 19: Recruit required human resources	84 days	25/07/2012	17/10/2012	Task 18	Human resources manager
Task 20: Train required human resources	67 days	18/10/2012	24/12/2012	Task 19	Human resources manager

**Figure A-62: Scope definition report for Project 11****Scope definition report****Project aim**

Re-evaluate local and international kraft paper supplier base, select preferred kraft paper suppliers and formalise the relationships between SA Packaging and its preferred kraft paper suppliers.

**Project benefits**

- Improve the consistency of kraft paper quality
- Improve the consistency of kraft paper cost
- Reduce the cost of kraft paper

**Project deliverables**

Deliverable	Resource requirements	Estimated cost	Start date	End date	Acceptance criteria
Service level agreements with local and international kraft paper suppliers	Procurement manager  Technical product specialists	Unknown	25 June 2012	24 October 2012	n.a.

**Project stakeholders**

Stakeholder role	Stakeholder name	Stakeholder contact details
Project sponsor	CEO of SA Packaging	Confidential
Project manager	Procurement manager	Confidential
Project team member	Procurement manager	Confidential
Project team member	Technical product specialists	Confidential
Affected party	Kraft paper suppliers	Confidential
Affected party	Logistics service provider	Confidential

**Figure A-63: Project plan for Project 11**

<u>Project plan</u>					
<b>Task description</b>	<b>Duration</b>	<b>Start date</b>	<b>End date</b>	<b>Task dependency</b>	<b>Responsible stakeholder</b>
Task 1: Understand kraft paper supply service requirements	14 days	25/06/2012	09/07/2012	None	Technical product specialists Procurement manager
Task 2: Identify local and international kraft paper suppliers	14 days	10/07/2012	24/07/2012	Task 1	Procurement manager
Task 3: Request service proposals from local and international kraft paper suppliers	14 days	25/07/2012	08/08/2012	Task 2	Procurement manager
Task 4: Evaluate service proposals from local and international kraft paper suppliers	14 days	09/08/2012	23/08/2012	Task 3	Procurement manager
Task 5: Select preferred local and international kraft paper suppliers	7 days	24/08/2012	31/08/2012	Task 4	Procurement manager
Task 6: Document service level agreements for each of the preferred kraft paper suppliers	28 days	03/09/2012	01/10/2012	Task 5	Procurement manager
Task 7: Negotiate service level agreements with preferred kraft paper suppliers	14 days	02/10/2012	16/10/2012	Task 6	Procurement manager
Task 8: Sign-off service level agreements	7 days	17/10/2012	24/10/2012	Task 7	Procurement manager

**Figure A-64: Scope definition report for Project 12****Scope definition report****Project aim**

Equip the marketing and sales team with the necessary skills that it requires

**Project benefits**

- Better collaboration within the marketing and sales business unit
- Better marketing, sales and product development skills
- Faster product development
- More innovative and profitable product development

**Project deliverables**

Deliverable	Resource requirements	Estimated cost	Start date	End date	Acceptance criteria
Training material and workshops	Marketing and sales training workshop facilitator  Product development training workshop facilitator	Unknown	2 January 2012	18 May 2012	n.a.

**Project stakeholders**

Stakeholder role	Stakeholder name	Stakeholder contact details
Project sponsor	CEO of SA Packaging	Confidential
Project manager	Marketing & sales manager	Confidential
Project team member	Marketing and sales training workshop facilitator	Confidential
Project team member	Product development training workshop facilitator	Confidential
Affected party	Marketing & sales team	Confidential

**Figure A-65: Project plan for Project 12**

<u>Project plan</u>					
<b>Task description</b>	<b>Duration</b>	<b>Start date</b>	<b>End date</b>	<b>Task dependency</b>	<b>Responsible stakeholder</b>
Task 1: Conduct an as-is marketing, sales and product development skills assessment	14 days	02/01/2012	16/01/2012	None	Marketing & sales manager
Task 2: Determine to-be marketing, sales and product development skills requirement	14 days	17/01/2012	31/01/2012	Task 1	Marketing & sales manager
Task 3: Identify marketing, sales and product development skills gap	14 days	01/02/2012	15/02/2012	Task 2	Marketing & sales manager
Task 4: Research and select marketing, sales and product development training courses	7 days	16/02/2012	23/02/2012	Task 3	Marketing & sales manager
Task 5: Conduct marketing, sales and product development training workshops (including CVM training)	84 days	24/02/2012	18/05/2012	Task 4	Marketing and sales training workshop facilitator Product development training workshop facilitator



**Figure A-66: Scope definition report for Project 13****Scope definition report****Project aim**

Implement the newly designed and redesigned business processes within the idea generation and market development and penetration value streams

**Project benefits**

- Better collaboration within the marketing and sales business unit
- Faster product development
- More innovative and profitable product development

**Project deliverables**

Deliverable	Resource requirements	Estimated cost	Start date	End date	Acceptance criteria
Implemented CRM system	IT team Marketing & sales team	Unknown	2 January 2012	23 February 2012	Fulfil business requirements  Comply with technology architecture standards
Training material and workshops	Marketing & sales manager	Unknown	24 February 2012	14 March 2012	n.a.

**Project stakeholders**

Stakeholder role	Stakeholder name	Stakeholder contact details
Project sponsor	CEO of SA Packaging	Confidential
Project manager	Marketing & sales manager	Confidential
Project team member	IT team	Confidential
Project team member	Marketing & sales manager	Confidential
Project team member	Marketing & sales team	Confidential

**Figure A-67: Project plan for Project 13**

<u>Project plan</u>					
Task description	Duration	Start date	End date	Task dependency	Responsible stakeholder
Task 1: Identify business requirements for the CRM system	14 days	02/01/2012	16/01/2012	None	IT team Marketing & sales team
Task 2: Define the technical requirements for the CRM system	14 days	17/01/2012	31/01/2012	Task 1	IT team
Task 3: Define the solution evaluation and selection criteria	14 days	01/02/2012	15/02/2012	Task 2	IT team Marketing & sales team
Task 4: Identify and evaluate potential CRM solutions	7 days	16/02/2012	23/02/2012	Task 3	IT team Marketing & sales team
Task 5: Select a suitable CRM solution	7 days	24/02/2012	31/01/2012	Task 4	IT team Marketing & sales team
Task 6: Implement the CRM solution	14 days	01/02/2012	15/02/2012	Task 5	IT team
Task 7: Test the CRM solution	7 days	16/02/2012	23/02/2012	Task 6	IT team
Task 8: Document the CRM solution and business process training material	7 days	24/02/2012	02/03/2012	Task 7	IT team Marketing & sales manager
Task 9: Schedule and arrange training workshops	2 days	05/03/2012	06/03/2012	Task 8	Marketing & sales manager
Task 10: Conduct marketing and sales process training	7 days	07/03/2012	14/03/2012	Task 9	Marketing & sales manager

**Figure A-68: Scope definition report for Project 14****Scope definition report****Project aim**

Implement the redesigned organisation structure of the marketing and sales business unit as well as the redesigned performance measurement system of SA Packaging

**Project benefits**

- Better collaboration within the marketing and sales business unit
- Faster product development
- More innovative and profitable product development
- Increased revenue
- Changing the behaviour of the marketing and sales team in line with strategy

**Project deliverables**

Deliverable	Resource requirements	Estimated cost	Start date	End date	Acceptance criteria
Implemented organisation structure	HR team Marketing & sales manager	Unknown	2 January 2012	20 January 2012	n.a.
Implemented performance measurement system	HR team Marketing & sales manager	Unknown	23 January 2012	2 February 2012	n.a.

**Project stakeholders**

Stakeholder role	Stakeholder name	Stakeholder contact details
Project sponsor	CEO of SA Packaging	Confidential
Project manager	Marketing & sales manager	Confidential
Project team member	HR team	Confidential
Project team member	IT team	Confidential
Affected party	Marketing & sales team	Confidential

**Figure A-69: Project plan for Project 14**

<u>Project plan</u>					
Task description	Duration	Start date	End date	Task dependency	Responsible stakeholder
Task 1: Develop job descriptions for each role as well as the job positions performing each role	7 days	02/01/2012	09/01/2012	None	HR team Marketing & sales team Marketing & sales manager
Task 2: Conduct a grading assessment	7 days	10/01/2012	17/01/2012	Task 1	HR team
Task 3: Communicate new organisation structure to marketing and sales team	1 day	18/01/2012	18/01/2012	Task 2	Marketing & sales manager
Task 4: Create new marketing and sales job positions	1 day	19/01/2012	19/01/2012	Task 3	HR team
Task 5: Appoint employees in the new job positions	1 day	20/01/2012	20/01/2012	Task 4	HR team Marketing & sales manager
Task 6: Communicate new performance metrics and incentives to marketing and sales team	1 day	23/01/2012	23/01/2012	Task 5	Marketing & sales manager
Task 7: Determine which systems need to be reconfigured	7 days	24/01/2012	31/01/2012	Task 6	IT team HR team
Task 8: Re-configure the relevant systems	2 days	01/02/2012	02/02/2012	Task 7	IT team

**Figure A-70: Scope definition report for Project 15**

<u>Scope definition report</u>					
<b><u>Project aim</u></b>					
Influence government to implement regulations and/or legislation that will protect the local retail and industrial packaging industry					
<b><u>Project benefits</u></b>					
<ul style="list-style-type: none"> <li>• Less pressure on profit margin</li> <li>• Better customer retention</li> </ul>					
<b><u>Project deliverables</u></b>					
Deliverable	Resource requirements	Estimated cost	Start date	End date	Acceptance criteria
Legislation and/or regulations preventing cheap and poor quality kraft paper imports	CEO of SA Packaging  Marketing and sales manager	Unknown	2 January 2012	20 June 2012	n.a.
<b><u>Project stakeholders</u></b>					
Stakeholder role	Stakeholder name	Stakeholder contact details			
Project sponsor	CEO of SA Packaging	Confidential			
Project manager	CEO of SA Packaging	Confidential			
Project team member	CEO of SA Packaging	Confidential			
Project team member	Marketing and sales manager	Confidential			
Affected party	SA Government	Confidential			

**Figure A-71: Project plan for Project 15**

<u>Project plan</u>					
<b>Task description</b>	<b>Duration</b>	<b>Start date</b>	<b>End date</b>	<b>Task dependency</b>	<b>Responsible stakeholder</b>
Task 1: Document the economic issues related to cheap and poor quality kraft paper imports into RSA	28 days	02/01/2012	30/01/2012	None	Marketing & sales manager
Task 2: Document potential solutions that government could implement as well as their benefits	28 days	02/01/2012	30/01/2012	None	Marketing & sales manager
Task 3: Identify government bodies/departments/agencies to partner with	28 days	31/01/2012	28/02/2012	Task 1,2	CEO of SA Packaging
Task 4: Present information to the selected government bodies/departments/agencies	112 days	29/02/2012	20/06/2012	Task 3	CEO of SA Packaging

**Figure A-72: Scope definition report for Project 16**

<u>Scope definition report</u>					
<b><u>Project aim</u></b>					
Develop and execute a marketing/brand communication plan for each product sub-segment					
<b><u>Project benefits</u></b>					
<ul style="list-style-type: none"> <li>• Stronger brands</li> <li>• Better customer retention</li> <li>• Increased revenue</li> <li>• Increased profitability</li> </ul>					
<b><u>Project deliverables</u></b>					
Deliverable	Resource requirements	Estimated cost	Start date	End date	Acceptance criteria
Developed and executed marketing/brand communication plan	Marketing team  Brand management team	Unknown	25 June 2012	24 December 2012	n.a.
<b><u>Project stakeholders</u></b>					
Stakeholder role	Stakeholder name	Stakeholder contact details			
Project sponsor	CEO of SA Packaging	Confidential			
Project manager	Marketing and sales manager	Confidential			
Project team member	Marketing team	Confidential			
Project team member	Brand management team	Confidential			
Project team member	Sales team	Confidential			
Project team member	Brand communication experts	Confidential			

**Figure A-73: Project plan for Project 16**

<u>Project plan</u>					
<b>Task description</b>	<b>Duration</b>	<b>Start date</b>	<b>End date</b>	<b>Task dependency</b>	<b>Responsible stakeholder</b>
Task 1: Describe the generic value propositions around current and new products	14 days	25/06/2012	02/07/2012	None	Marketing team
Task 2: Design brands	28 days	03/07/2012	31/07/2012	Task 1	Brand management team
Task 3: Develop generic marketing material	28 days	01/08/2012	29/08/2012	Task 2	Brand management team Brand communication experts
Task 4: Provide market/product offering training to sales teams	7 days	30/08/2012	06/09/2012	Task 3	Marketing team
Task 5: Develop marketing communications plan per target market segment for products	14 days	07/09/2012	21/09/2012	Task 4	Marketing team
Task 6: Describe the customer specific value propositions of current and new products	14 days	24/09/2012	08/10/2012	Task 5	Marketing team Sales team
Task 7: Develop customer specific marketing material for target customers of products	28 days	09/10/2012	06/11/2012	Task 6	Marketing team Sales team
Task 8: Engage with current and potential customers and execute marketing communication plan	45 days	07/11/2012	24/12/2012	Task 7	Marketing team Sales team