7.1 INTRODUCTION AND PROBLEM DEFINITION

One of the main objectives of this thesis is to enhance the operating model (OM), due to its inherent deficiencies. In the previous chapter (Chapter 6) the deficiencies regarding the practical use of the OM were identified. The *awareness* was that a well-formulated *method* was required in obtaining OM outputs. This chapter[3] delineates the first *development* sub-cycle (Figure 60, *Sub-cycle 1*) to develop the first part of PRIF (Figure 60, *Requirements for PRIF method, mechanisms and practices*), in addressing the second research question, namely:

What constructs are required for a process reuse identification framework to enhance the operating model concept, using the business-IT contextualisation model?

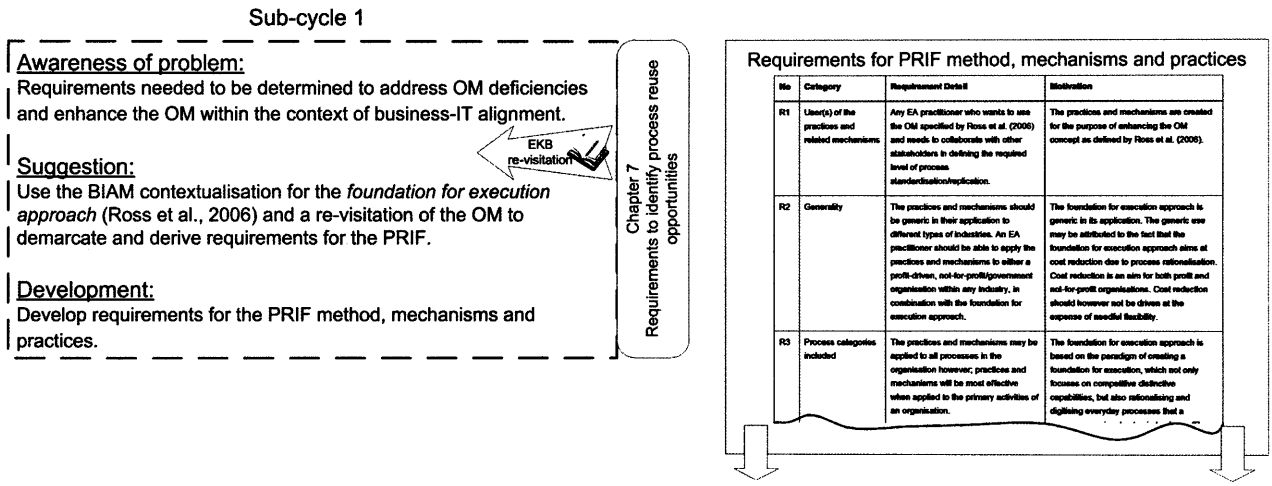

Figure 60: Design cycle context for Chapter 7 (duplicating part of Figure 15)

The initial development of the *method* for enhancing the OM, applied the logic of the *basic system design process* (see Figure 61, previously discussed in section 3.2.2). According to the *basic system design process*, the construction of an object system (e.g. a new *method)*, requires constructional knowledge of the using system (e.g. the construction of the OM), in *determining requirements* for the function of the object system (e.g. function of the new *method)*. The function of the object system is then used in *devising specifications* (constructional requirements) for the construction of the object system (e.g. the construction of the new *method*).

[3] The content of Chapter 7 is based on: De Vries, M., Van der Merwe, A., Gerber, A., & Kotzé, P. (2010). Refining the operating model concept to enable systematic growth in operating maturity. In C. Schutte (Ed.), *Proc. 24th SAIIE Conference* (pp. 32-46). Glenburn Lodge, Gauteng: SAIIE.

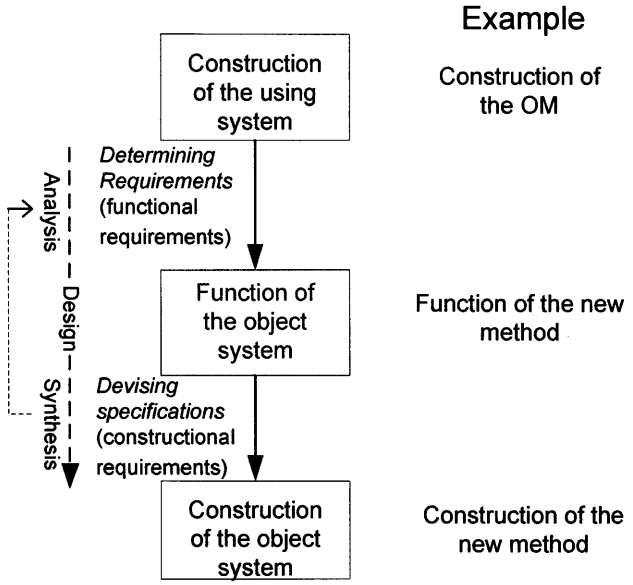

Figure 61: Using the basic system design process (from Dietz (2006)) in constructing a new method

The initial development of a *method* for enhancing the OM, led to circumscription and the *awareness* of another problem. Although the identification of OM deficiencies provided a good starting point for developing a supporting method, the requirements gathering process required additional context. According to the logic of the basic system design process, it is only feasible to *determine requirements* for the function of the new *method*, upon understanding the construction of the OM. The construction of the OM in turn, is not without context. The OM is used within the context of the *foundation for execution* approach, which contributes towards the *alignment of business with IT*. An understanding of the OM-construction, thus also requires contextual knowledge. Thus, an understanding of the OM-construction requires contextualisation in terms of the *foundation for execution* approach, but also in terms of *business-IT alignment*.

Supporting the notion that it is necessary to have a thorough understanding of context, Owen (1997) maintains that requirements need to be derived from the *value system of a specific discipline*. It is thus possible to argue that determination of requirements for the function of the new *method* has to be derived within the value system of the *business-IT alignment discipline*. In addition, a business-IT alignment contextualisation of the OM and *foundation for execution approach*, would enable the method-designer to search for possible solutions within the current knowledge base of the business-IT alignment discipline.

In summary, the *problem* (Figure 60, *Awareness of problem*) that needs to be addressed in developing the new *method*, is that the requirements for the new *method* had to solve the OM deficiencies and enhance the OM within the context of business-IT alignment. It was subsequently *suggested* (Figure 60, *Suggestion*) that the Business-IT Alignment Model (BIAM) was used to contextualise the *foundation for execution* approach. This implies, re-visiting the literature on the OM, including its purpose and construction. Because of the BIAM-contextualisation, the scope for enhancing the OM also changed. Instead of developing a

method to address all OM deficiencies, the scope of the method was limited to address deficiencies pertaining to the identification of process reuse opportunities in an enterprise. Therefore, it was *suggested* (Figure 60, *Suggestion*) that requirements are only developed for the *method, mechanisms and practices* necessary for identifying *process reuse* opportunities at an enterprise.

This chapter addresses the *suggestion* (Figure 60, *Suggestion*) that the Business-IT Alignment Model (BIAM) is used to contextualise the *foundation for execution* approach. Section 7.2 addresses the *suggestion* of providing a business-IT alignment contextualisation of the *foundation for execution* approach. Section 7.3 discusses the additional OM deficiencies identified during a re-visitation of literature and the BIAM-contextualisation of the *foundation for execution* approach. In terms of *development* (Figure 60, *Development*), section 7.4 delineates a set of requirements to address OM deficiencies pertaining to the *identification of process reuse opportunities* at an enterprise. The chapter concludes in section 7.5.

7.2 A BIAM CONTEXTUALISATION OF THE FOUNDATION FOR EXECUTION APPROACH

The OM is used within the context of the *foundation for execution* approach, and the *foundation for execution* approach is in turn used within the context of *business-IT alignment.* This section therefore applies the BIAM components delineated in section 4.3 to provide a *business-IT alignment* contextualisation of the *foundation for execution* approach introduced in section 3.3.5. The following sub-sections correlate with the four main contextualisation components of the BIAM namely, (1) the paradigm of creating value; (2) the dimensions for alignment; (3) alignment mechanisms and practices; and (4) alignment approach classifiers.

7.2.1 Paradigm of creating value

The value-creation paradigm of the *foundation for execution* approach, is that value is created when enterprises digitise their operational processes. Before they can digitise their processes, managers need to have a vision (future view) of how the company *should operate* as articulated in an OM. The OM is thus used as a guide in the systematic development of the *foundation for execution* (Ross et al., 2006).

Lapalme (2011, p. 6) classifies the *foundation for execution* approach according to the EIT (enterprise IT architecting) school of thought (see EIT qualifiers in Table 8). However, a complete paradigmatic analysis that investigates the paradigmatic roots of the *foundation for execution approach* (e.g. using the paradigmatic framework of Iivari (1991)), has not been done up to date. Although proposed as a useful extension of the BIAM to enable a complete paradigmatic analysis (see Chapter 12), this study excludes a comprehensive paradigmatic analysis of the *foundation for execution* approach.

7.2.2 The dimensions for alignment

According to Figure 62, the *foundation for execution* approach does *not* provide a methodology for designing and constructing the entire enterprise (as an object system), but rather requires construction principles (derived from the OM) to guide the development of the ICT system as the object system. Figure 62 (*focus of the foundation for execution approach)* indicates the alignment focus of the *foundation for execution* approach.

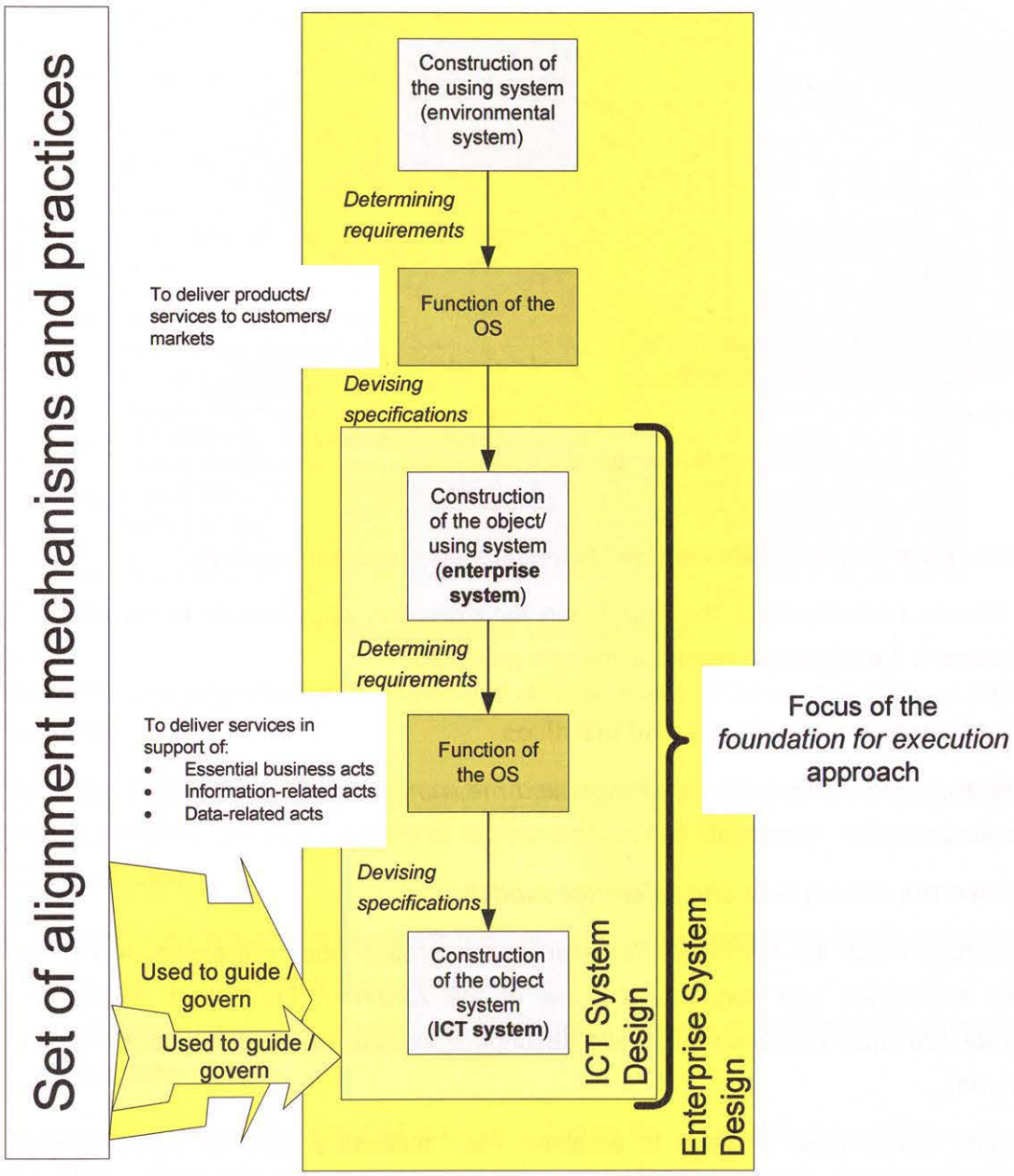

Figure 62: The foundation for execution approach focusing on ICT system design

In terms of the three BIAM dimensions for alignment, Ross et al. (2006) do not stipulate different *design domains (1)*, *concerns & constraints (2),* or the *enterprise scope (3),* but they suggest the use of the Zachman Framework. The intent of the *foundation for execution* approach is to align business with IT within the boundaries of the enterprise, as indicated by the yellow-shaded part on Figure 63.

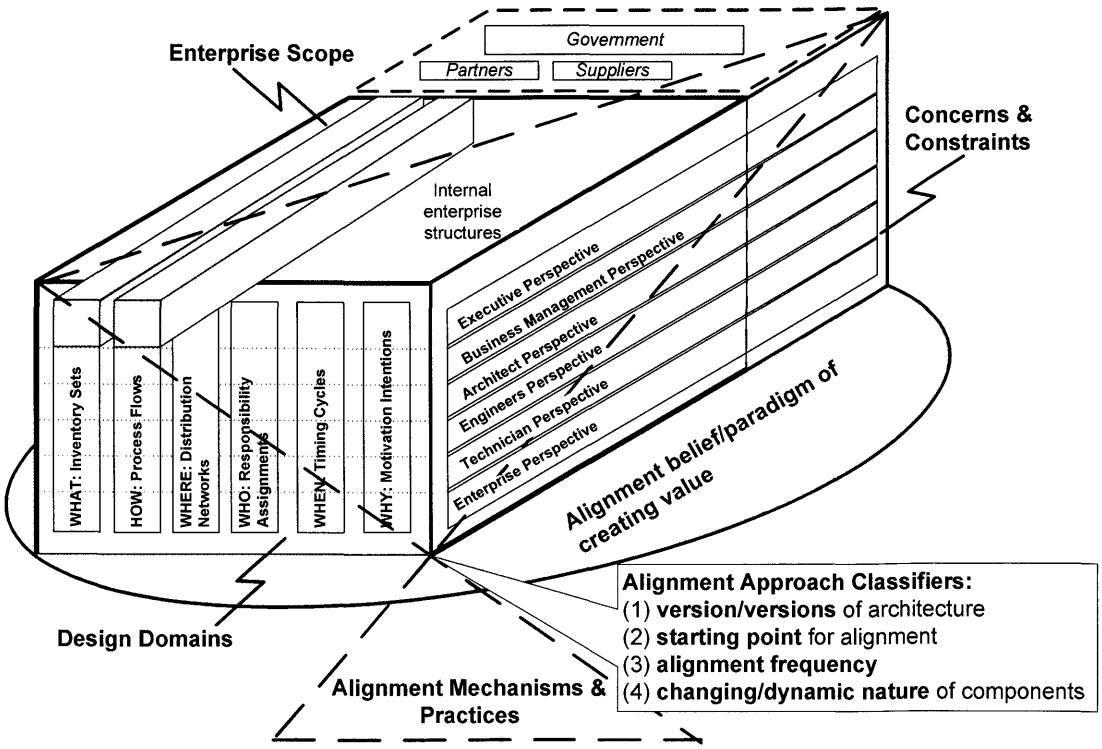

Figure 63: The BIAM contextualisation of the *foundation for execution* approach

The next section contextualises the *foundation for execution* approach in terms of the third BIAM component, the alignment mechanisms and practices.

7.2.3 Alignment mechanisms and practices

This section highlights the categories of *alignment mechanisms and practices* that apply to the *foundation for execution* approach.

1. Architecture description and reference models

As noted section 7.2.2, the *foundation for execution* approach does not explicate a complete *architecture description* and suggests the use of the Zachman Framework. However, the *foundation for execution* approach offers two descriptive models, an operating model (OM) and a core diagram.

The *operating model* (OM) is used to establish the "necessary level of business process integration and standardisation for delivering goods and services to customers" (Ross et al., 2006, p. 44). Based on the different levels of process standardisation and process integration Ross et al. (2006) provide four stereotypical OMs. The four OMs are not only dependent on the levels of process standardisation and integration, but are defined based on certain characteristics, (as depicted in Figure 64).

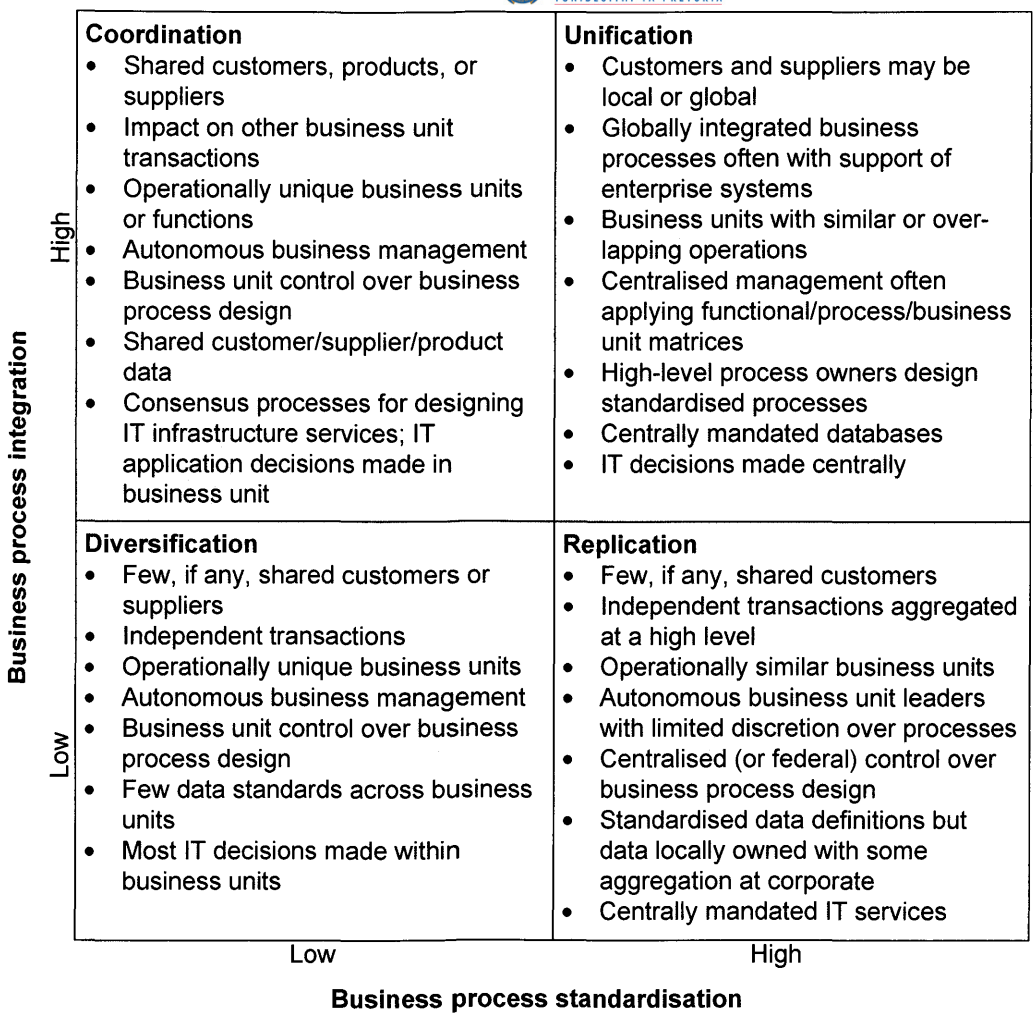

Figure 64: Characteristics of four operating models, based on Ross et al. (2006, p. 29) (duplicate of Figure 52)

The *foundation for execution* approach translates the standardisation requirements/principles embedded in the OM into a graphical representation, called the *core diagram*. The core diagram should be used to:

- Facilitate discussions between business and IT managers to clarify requirements for the company's foundation for execution, and
- Communicate the vision (high-level business process and IT requirements of a company's operating model).

An example of the unification OM is given in Figure 65. As a unification OM requires high levels of process standardisation and process integration (data sharing), the core diagram needs to depict the standard (core) and linked processes, as well as shared data. The diagram also depicts key customer types and automating technologies.

Using Zachman's demarcation terminology, the OM emphasises two main *design domains* (data (WHAT: inventory sets) and process (HOW: process flows)), *concerns* of executives. In addition, the OM has as objective to share data and replicate processes across different

business units within the enterprise boundaries, i.e. *enterprise scope*. Figure 63 (grey-shaded bars) represent the alignment intent of the OM (De Vries et al., 2010).

Ross et al. (2006) purposefully omit alignment with the motivational aspects (WHY: motivation intentions) of the business (see Figure 63). The rationale is that strategic initiatives, derived from the strategic direction, often lead to IT-enablement for each strategic initiative. This creates the delivery of piece-meal/disjointed IT solutions that are not integrated (Weill & Ross, 2008). The IT department constantly reacts to the latest strategic initiative and is always a bottleneck, operating in a reactive mode.

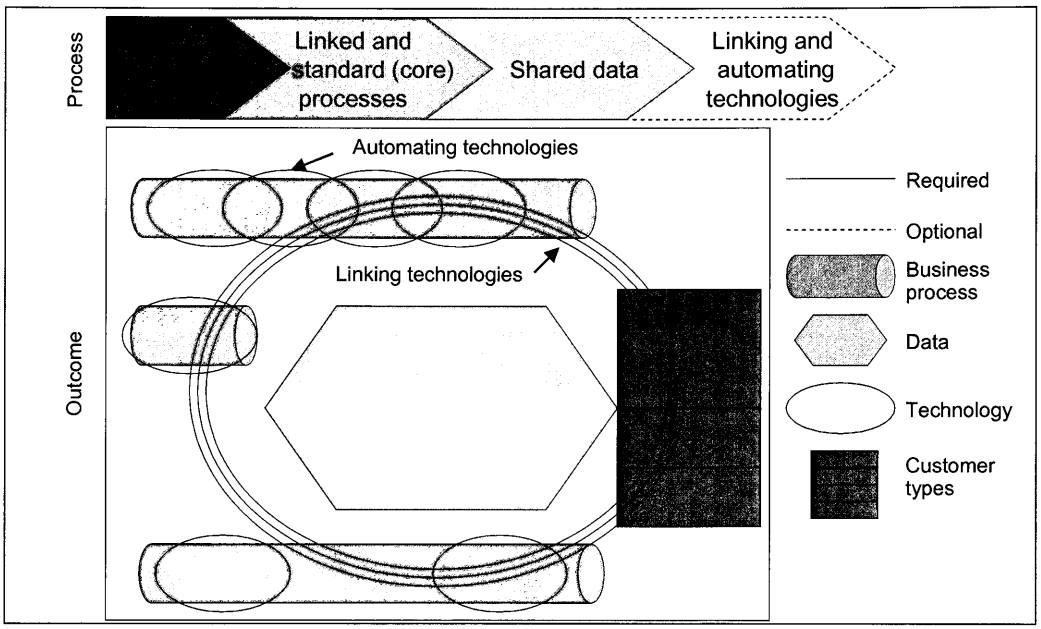

Figure 65: Core diagram template for a unification OM, based on Ross et al. (2006, p. 54) (duplicate of Figure 53)

The core diagram in essence represents a constructional view of the enterprise as a *required design* for addressing the functional requirements (i.e. to deliver products/services to customers/markets) of the using system (i.e. the environmental system). The *required design* thus leverages process standardisation, data sharing and technology sharing opportunities across enterprise structures.

2. Methodologies

Ross et al (2006) proposes an eight-step *method* (see section 3.3.5) to gradually develop the *foundation for execution*.

3. Principles and standards

Ross et al. (2006) offers the OM (operating model) as the foundation for identifying *integration and standardisation requirements/principles* to guide IT decision-making. The OM is however both descriptive (providing descriptive characteristics in Figure 64) and prescriptive (providing guidance on the required level of process standardisation and process integration), which makes the usability of the OM problematic (Hoogervorst, 2009, p. 297).

4. *Additional management mechanisms and practices*

The *foundation for execution* approach builds the foundation one project at a time and requires a system of governance mechanisms assuring that business and IT projects achieve both local and company-wide objectives. The mechanisms are structured as part of an IT engagement model that contains three main ingredients:

1. Company-wide IT governance, defined as the "decision rights and accountability framework to encourage desirable behaviour in using IT" (Ross et al., 2006, p. 119).
2. Project management, which requires a formalised project methodology with clear deliverables and checkpoints.
3. Linking mechanisms, which incorporates processes and decision-making bodies that need to align incentives and connect the project-level activities to the companywide IT governance.

5. *Maturity models*

Ross et al. (2006, p. 71) maintains that enterprises need to follow a systematic transformation process in changing towards the future architecture, as required by the OM. Enterprises should build out their enterprise architectures through four stages of *architecture maturity.* Figure 66 illustrates three axes representing different levels of sharing/replication: (1) technology sharing, (2) process replication, and (2) data sharing. Four stages of *architecture maturity* are related to the levels of sharing depicted on Figure 66:

1. *Business silos architecture,* where enterprises maximise individual business unit needs or functional needs (*low* technology sharing, *low* process replication, *low* data sharing).
2. *Standardised technology architecture*, i.e. gaining IT efficiencies through technology standardisation and increased centralisation of technology management (*high* technology sharing, *low* process replication, *low* data sharing).
3. *Optimised core architecture*, i.e. providing enterprise-wide data and process standardisation, appropriate for the OM (*high* technology sharing, *high* process replication, *low* data sharing) or (*high* technology sharing, *low* process replication, *high* data sharing).
4. *Business modularity architecture,* where enterprises manage and reuse loosely coupled IT-enabled business process components to preserve global standards while enabling local differences (*modularised process components* technology, *high* process replication, *high* data sharing).

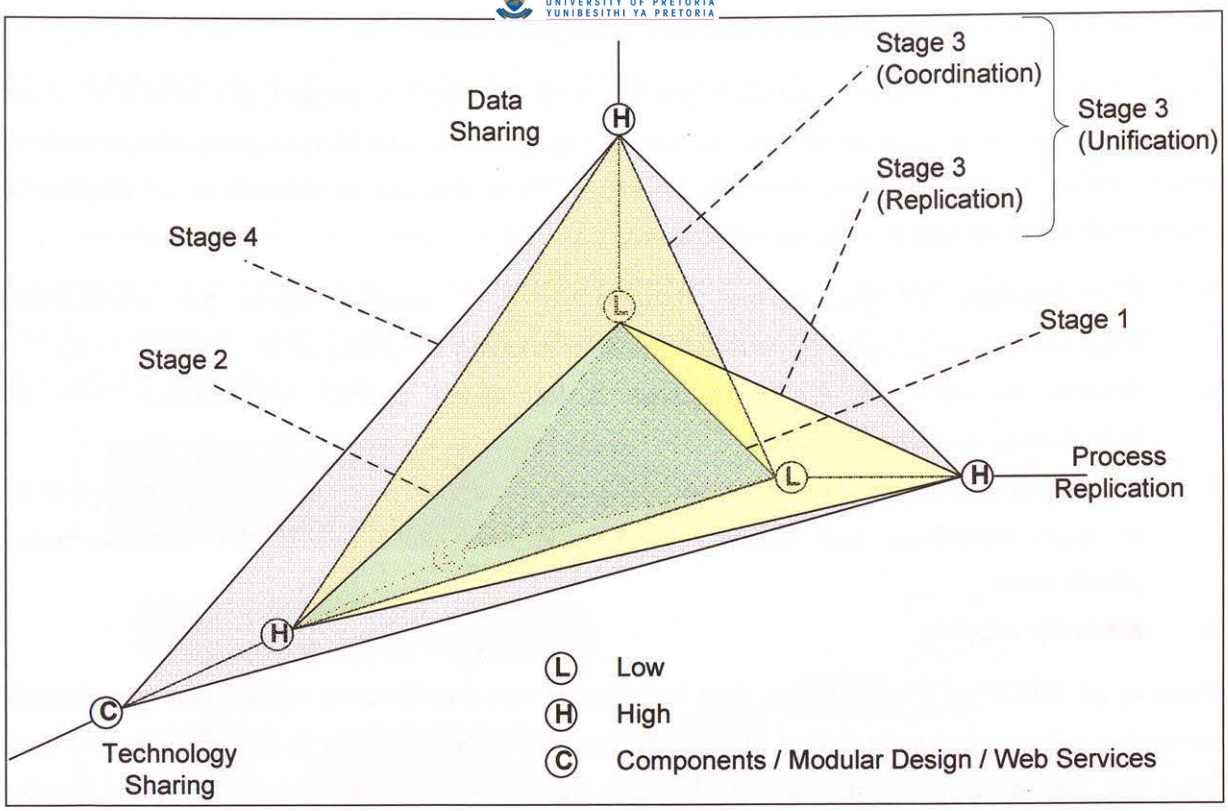

Figure 66: Architecture maturity stages, based on Ross et al. (2006)

6. Skills/learning requirements

Ross et al. (2006) define different skill sets for CIO's based on the maturity level of the enterprise. In addition, they provide a list of ten leadership principles for creating and exploiting a *foundation for execution*. The leadership principles were extracted from lessons learnt by top executives (Ross et al., 2006).

7.2.4 Alignment approach classifiers

The *foundation for execution* approach focuses mainly on the *future state* architecture, which is also used to define architecture principles. Ross et al. (2006, p. 44) maintain that a company needs to articulate a vision (*future* view) of how the company will operate, called the operating model (OM).

A *top-down* approach (starting at the executive perspective, translating through subsequent perspectives) is followed in terms of architecture development, emphasising the executive perspective. The top-down approach differs from other top-down alignment approaches in that an OM is used *as the strategy* to drive alignment, rather than driving alignment via ad-hoc strategic initiatives.

The *foundation of execution* approach is not in favour of a big bang approach, but rather suggests a *continuous* and incremental process, building the foundation *one project at a time*.

The *foundation for execution* approach aims at reducing architectural complexity by rationalising data and processes according to the OM requirements, thus limiting duplicated efforts in managing the *changing/dynamic nature* of architecture components.

To conclude, the BIAM provided a contextualisation of the *foundation for execution* approach in terms of the four main components of the BIAM (Figure 45 in section 4.3.2, Components 1 to 4). Based on the BIAM-contextualisation, the next section highlights additional deficiencies (see initial deficiencies in section 6.5) inherent in the operating model (OM).

7.3 ADDITIONAL OM DEFICIENCIES

Based on the BIAM-contextualisation of *the foundation for execution* approach (see previous section 7.4), the OM was re-visited and critical evaluations were made, which related to (1) *method* and, (2) *elevating to a fourth level of architecture maturity*. The two deficiencies are subsequently described in sections 7.3.1 and 7.3.2.

7.3.1 Method deficiency

The descriptive characteristics of the OM (see Figure 64) could be classified according to different categories, which imply different timings. The characteristics relate to:

- Current business architecture configurations that pose opportunities for sharing data and replicating similar processes/functions (e.g. shared customers/products/suppliers; operationally unique business units or functions).
- Shared data and standardised processes (e.g. shared customer/supplier/product data; standardised processes).
- Suggestions in terms of business and IT governance arrangements that go hand-in-hand with the other characteristics (e.g. autonomous business management; IT decisions made centrally).

An implicit process is thus suggested to derive a required OM (see Figure 67, left part, *Method deficiency*):

- The enterprise needs to analyse certain business architecture parameters to establish rationalisation opportunities.
- Rationalisation opportunities could be identified within two main areas: (1) Data (sharing data across enterprise entities), and (2) Process (replicating/re-using processes across enterprise entities). The levels of data sharing and process replication will provide opportunities for sharing certain technologies. A pure coordination OM could use common portals and middleware technology; a replication OM could use common system components; while a unification OM could use common application systems (Weill & Ross, 2008).
- Once rationalisation opportunities have been established an enterprise needs to derive a future OM that would exploit these opportunities.
- The future OM then needs to direct the design of appropriate governance mechanisms.

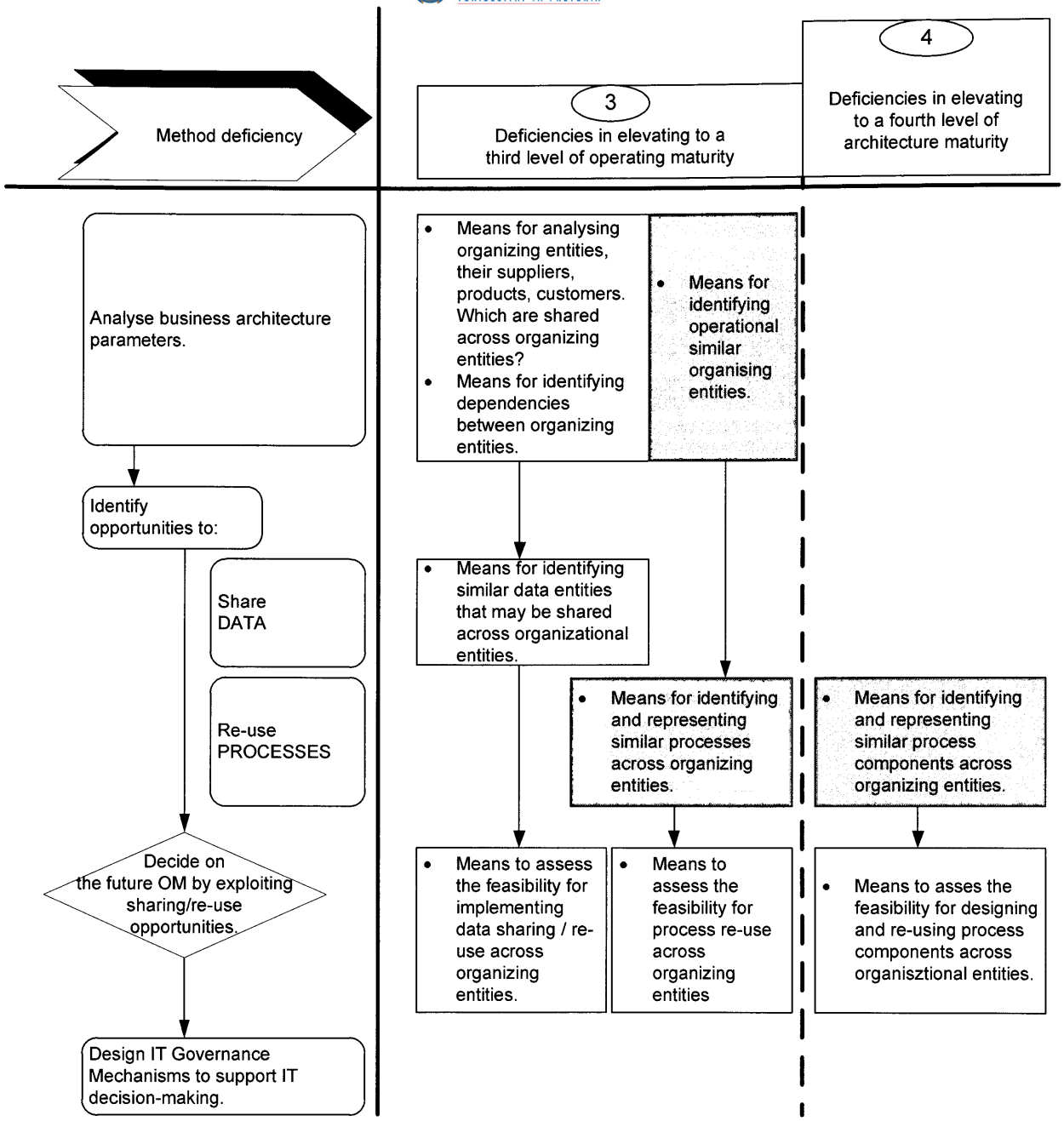

Figure 67: Deficiencies in defining and using the OM

The implicit process thus suggested that the enterprise needs to *analyse* certain business parameters prior to the identification of rationalisation opportunities. Once rationalisation opportunities have been established, a *decision-making* process is required to derive a future OM that would exploit the rationalisation opportunities. Only then, the OM could be used as a guide for designing appropriate governance mechanisms.

7.3.2 Deficiency in elevating to a fourth level of architecture maturity

Ross et al. (2006, p. 26) maintain that the choice of an OM is a critical decision for a company and that "it's the first step in building a foundation for execution". Re-visiting the role of the OM in transforming an enterprise through different levels of architecture maturity however revealed insightful results.

Section 7.2.3 indicates that the OM is only required to elevate an enterprise from a second level of architecture maturity to a third level of architecture maturity, which is also supported by a more recent publication of Weill & Ross (Weill & Ross, 2008), where standardisation objectives are defined for each type of OM as differentiators. The four OMs all require *shared services* and common *infrastructure technology* objectives (objectives for level two architecture maturity). Data sharing and process replication objectives differentiate the four OMs from one another and are objectives for reaching the third level of architecture maturity. Whereas the third level architecture maturity objectives are derived from the OM and exploit rationalisation opportunities across the enterprise, the fourth level of architecture maturity acknowledges the unique needs of business units and needs to be supported via IT-enabled *process components*. The use of *process components* refers to a different level of process granularity. The OM however does not facilitate the identification of process components that may be IT-enabled and re-used across the enterprise (see Figure 67, right part, *Deficiencies in elevating to a fourth level of architecture maturity*).

Based on the OM deficiencies, the next section demarcates requirements to address some of the identified OM deficiencies.

7.4 REQUIREMENTS TO ADDRESS OM DEFICIENCIES

In addressing the identified OM deficiencies stipulated in section 7.3, a practitioner needs to identify opportunities to (1) share data and (2) reuse processes across several business units. This section provides the rationale for only developing requirements pertaining to the identification of *process reuse opportunities* and concludes with a table of requirements.

Given that many enterprises have already seized the opportunity of sharing data by implementing centralised data management systems (Smith & Fingar, 2003), this thesis only highlighted the deficiencies pertaining to the identification of *process reuse opportunities*. The initial scope of developing a *method* for constructing an OM (Figure 61 in section 7.1), was thus reduced to the development of a *method* for identifying process reuse opportunities. According to the basic system design process (discussed in section 3.2.2), development of an object system (e.g. a *method* for identifying reuse opportunities) needs to follow a systematic and iterative design process, *deriving requirements* and *devising specifications*. Therefore, this thesis *derived a set of requirements* to define the scope of a supplementing *method, mechanisms and practices* in identifying *process reuse opportunities* at an enterprise, thus augmenting the OM concept.

Seven requirement categories were identified and the summary and rationale behind each requirement are provided in Table 15. The seven requirement categories include:

1. User(s) of the practices and related mechanisms
2. Generality
3. Process categories included
4. Current architecture capabilities

5. Process representation
6. Replication constraints
7. Feasibility analyses

Table 15: Requirements for addressing deficiencies pertaining to process reuse identification opportunities at enterprises

No	Category	Requirement Detail	Motivation
R1	User(s) of the practices and related mechanisms	Any EA practitioner who wants to use the OM specified by Ross *et al.* (2006) and needs to collaborate with other stakeholders in defining the required level of process standardisation/replication.	The practices and mechanisms are created for the purpose of enhancing the OM concept as defined by Ross *et al.* (2006).
R2	Generality	The practices and mechanisms should be generic in their application to different types of industries. An EA practitioner should be able to apply the practices and mechanisms to either a profit-driven, not-for-profit/government enterprises within any industry, in combination with the foundation for execution approach.	The foundation for execution approach is generic in its application. The generic use may be attributed to the fact that the foundation for execution approach aims at cost reduction due to process rationalisation. Cost reduction is an aim for both profit and not-for-profit enterprises. Cost reduction should however not be driven at the expense of needful flexibility.
R3	Process categories included	The practices and mechanisms may be applied to all processes in the enterprise however; practices and mechanisms will be most effective when applied to the primary activities of an enterprise.	The foundation for execution approach is based on the paradigm of creating a foundation for execution, which not only focuses on competitive distinctive capabilities, but also rationalising and digitising everyday processes that a company requires to stay in business (Ross et al., 2006, p. 4). The practices and mechanisms will however be most effective when applied to the primary activities of an enterprise, as support activities automatically provide the opportunity for enterprise-wide standardisation (Smith & Fingar, 2003, p. 63).
R4	Current architecture capabilities	The practices and mechanisms need to take current work in terms of Enterprise Architecture, Business Architecture and Process Architecture into account, but also need to provide sufficient detail if none of these architectures have been defined/documented.	According to Ross *et al.* (2006, p. 26), the first step in building a foundation for execution is to define the OM for the enterprise. No pre-conditions are defined for defining this model. The ability to define this model however is dependent on current architecture capabilities and documented/explicated architectures. Immature architecture capabilities may require additional architecture work, such as defining enterprise-wide process management standards and a centralised process

No	Category	Requirement Detail	Motivation
			repository (Smith & Fingar, 2003, p. 177).
R5	Process representation	The practices and mechanisms should encourage consistent process representation to ensure re-use. The extent of re-use includes the following: 1. It should be possible to add process measures if required for the purpose of performance measurement and/or process improvement. 2. The process representations should support end-to-end views of processes. 3. Process representations should not hamper the transition from the third to fourth levels of architecture maturity, i.e. it should allow for modular process design. 4. The representations that are used to communicate process replication opportunities should be understandable to business users (from the contextual and conceptual viewpoints).	A consistent representation may enhance communication about how the business operates, enable efficient hand-offs across enterprise boundaries and allow for consistent performance measurement across enterprise entities or similar competitors (Davenport, 2005). In addition, transitioning from a third to fourth level of architecture maturity (as defined by Ross *et al.*, 2006) requires the identification of business services that may be shared among different enterprise entities. Heinrich *et al.* (2009) maintain that the identification of business services requires a consistent representation of the enterprise's processes.
R6	Replication identification	The mechanisms and practices should enable the identification of operational similar organising entities.	Weill and Ross (2008) mention that replication opportunities may be defined across various types of entities (business units, regions, functions and market segments). The OM itself is however primarily used in defining replication and data sharing requirements across business units.
R7	Feasibility analyses	The mechanisms and practices should not suggest the means for assessing or measuring the feasibility of process replication/rationalisation. Feasibility analysis, e.g. operational, cultural, technical, schedule, economic and legal feasibility (Whitten & Bentley, 2007)) that may be associated with process rationalisation solutions are therefore excluded.	Although a feasibility analysis may direct the required level of process standardisation, this set of mechanisms and practices will merely propose a way of identifying replication opportunities, based on similarities between units. The means for selecting processes that will benefit most from standardisation and the prioritisation of end-to-end processes for standardisation may require a number of mechanisms and practices.

The requirements identified in this section led to another circumscription process, with the awareness that an appropriate *process representation language* was required to address two (Table 15, R5 and R6) of the seven requirement categories stipulated in this chapter. The next chapter, Chapter 8 proceeds with a discussion of the problem pertaining to the selection of an appropriate *process representation language*.

7.5 CONCLUSION

In this chapter, the BIAM was used to provide a business-IT alignment perspective on the *foundation for execution* approach of Ross et al. (2006). From this perspective, the main contribution of Ross et al. (2006) is to define on a contextual level the data that could be shared and the processes that could be replicated across different business units. Within this context, current OM deficiencies were highlighted. The chapter provided a rationale for focusing on process reuse, rather than data sharing, and defined a set of seven requirement categories for the systematic identification of opportunities for enterprise-wide process standardisation and replication. Seven process reuse requirement categories were:

1. User(s) of the practices and related mechanisms
2. Generality
3. Process categories included
4. Current architecture capabilities
5. Process representation
6. Replication constraints
7. Feasibility analyses

While determining process reuse requirements, circumscription led to another *problem awareness* that an appropriate *process representation language* was required to address two (Table 15, R5 and R6) of the seven requirement categories stipulated in this chapter. Chapter 8 delineates the problem pertaining to the selection of an appropriate *process representation language*.