Chapter 12. Conclusions

12.1 INTRODUCTION

The aim of this chapter is to provide an overview of the findings of this thesis. Since the research questions provided the propositions that were argued in this thesis, section 12.2 summarises the findings per research question, whereas section 12.3 presents opportunities for further research. The thesis concludes with final reflections in section 12.4.

12.2 SUMMARY OF FINDINGS

Three *emerging disciplines* currently contribute towards enterprise design and alignment, EE (enterprise engineering), EA (enterprise architecture) and EO (enterprise ontology). Although a number of publications exist for EE and EA, there is a lack of shared meaning in terms of the *theoretical foundations*, *definitions* and *business benefits*, that creates challenges in searching for relevant literature and advancing the EE and EA disciplines (Kappelman et al., 2010; Lapalme, 2011).

This study was initiated due to my own interest in the disciplines of EE, EA and EO, their complementary use and growth. During the EA practitioners' conferences of TOGAF (Capetown, March 2007; Glasgow, April 2008; Johannesburg, June 2008), I attended several presentations based on the OM. Although several presenters demonstrated their selected OMs and core diagrams as representations to guide enterprise evolution, the methods for constructing the OMs and core diagrams were not transparent. My own observation initiated a survey to assess the practicality of constructing an OM and core diagram, using the content presented by Ross et al. (2006).

The survey highlighted several deficiencies of the OM and core diagram, with the problem awareness that a well-explained *method* was required to obtain OM outputs. The problem awareness led to the initiation of a research design cycle for the development of a well-explained *method*. In search for literature that would contribute towards the development of a suitable *method*, another problem was identified. Although the disciplines of EE, EA and EO presented useful theory, there is still a lack of shared meaning in their definitions and business benefits (Lapalme, 2011). In addition, EA content was mostly embedded in a jungle of frameworks (Schekkerman, 2004). To circumvent the fragmentation that existed in theory, Chapter 4 of this thesis proposed the development of a business-IT contextualisation model (BIAM) to contextualise current alignment approaches and to provide a common understanding across alignment approaches. In addition, the thesis proposed the enhancement of the OM, using the BIAM as a contextualisation tool to select appropriate enhancement elements from existing literature.

The research questions addressed in this study were:

Primary Research Question:

What constructs are required for a process reuse identification framework to enhance the operating model concept within the context of business-IT alignment?

Secondary Research Questions:

1. What model is required to contextualise different business-IT alignment approaches?
2. What constructs are required for a process reuse identification framework to enhance the operating model concept, using the business-IT contextualisation model?

Since the contextualisation model was instrumental to the further development of a *method* to enhance the OM, a mixed methods research design was required. Chapter 2 motivated the use of a mixed methods research design, where Morse (2010) defined a mixed methods design as a complete method (i.e. the *core component*), plus one (or more) incomplete methods(s) (i.e., the *supplementary component*(s). In this thesis a mixed methods design incorporated a core component (*design research*), which was used to develop the PRIF (Process Reuse Identification Framework), and a supplementary component (*exploratory design*), which was used to develop the BIAM (Business-IT Alignment Model).

Part B (Chapters 3 to 5) and Part C (Chapters 6 to 10) delineated the development of the two main thesis outputs (BIAM and PRIF) by answering the secondary research questions and thereby answering the main research question. Sections 12.2.1 and 12.2.2 summarise the findings of this study pertaining to the two secondary research questions. Section 12.2.3 concludes with a summary of the main thesis contributions.

12.2.1 Summary: Research Question 1

The first research question focused on the contextualisation of alignment approaches in terms of a common business-IT alignment model. The research question was:

What model is required to contextualise different business-IT alignment approaches?

This study intended to reuse the knowledge embedded in existing alignment approaches to enhance the OM concept, associated with the *foundation for execution* approach of Ross et al. (2006). Although a number of publications existed within the disciplines of EE and EA, fragmentation in definition and the overlap between EE, EA and EO complicated the literature survey. Consequently, this study used the current knowledge base inductively to identify similar patterns between existing theoretical alignment approaches. An exploratory design approach was therefore used to identify similarities between alignment approaches inductively to develop a common Business-IT Alignment Model (BIAM).

The study consulted six alignment approaches during the development of the BIAM (section 3.3) and referred to *other alignment approaches* (section 3.4) for examples and explanation. Other theories that contributed towards the construction of the BIAM included the *three schools of thought* (discussed in section 3.2.3), the ISO/IEC/IEEE 42010 standard for architecture

description (covered in section 3.2.4), systems theory (discussed in section 3.2.1), and systems engineering and the basic system design process (covered in section 3.2.2). The sample of six alignment approaches gravitated towards the *first school of thought* (enterprise IT architecting) as classified by Lapalme (2011); hence, the BIAM only claimed representation for business-IT alignment.

The study demonstrated the use of BIAM in contextualising four alignment approaches: (1) the Zachman approach, (2) the Open Group approach, (3) the *foundation for execution* approach, and (4) the *essence of operation* approach. The BIAM-contextualisation results not only highlighted the differences between various alignment approaches, but also demonstrated how BIAM was instrumental to enhance the OM (associated with *the foundation for execution* approach) with the interaction model (associated with the *essence of operation* approach). In addition, the BIAM-contextualisation of the *foundation for execution* approach also highlighted deficiencies inherent in using the OM.

Being the *supplementary component*, rather than the core component of this thesis, the results were adequate to confirm that the BIAM is useful to contextualise different business-IT alignment approaches. Section 12.3 suggests further research for additional model verification and scope extension.

12.2.2 Summary: Research Question 2

The second research question focused on the enhancement of the operating model concept by developing a Process Reuse Identification Framework (PRIF). The BIAM (the result of the first research question) was instrumental in the development of the PRIF. The second research question was:

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

This thesis used a questionnaire (based on experimentation) to evaluate the practicality of the OM and subsequently motivated that the OM required a more rigorous *method* to guide the practitioner in selecting an appropriate OM for an enterprise. Since the study intended to develop a *method* as an artefact in support of the OM, addressing some of the OM deficiencies, *design research* was an appropriate research design. In accordance with the design cycle stipulated by Vaishnavi & Kuechler (2004/5), the main design research cycle consisted of five steps: (1) awareness of problem, (2) suggestion, (3) development, (4) evaluation, and (5) conclusion. Design research allowed for circumscription (learning by doing) and enabled an incremental development process (executing the third step of the design cycle in three increments).

12.2.2.1 Problem awareness and suggestion

The *awareness* of OM deficiencies and the *suggestion* that the OM was enhanced to address the *method* deficiency of the OM, led to the initial *development* of an OM-enhancing *method*.

The act of development however triggered *circumscription*, with the awareness that a basic system design process (Dietz, 2006) could be used to design the new *method*, initiating the first development increment/sub-cycle.

12.2.2.2 First development increment/sub-cycle

The *first development increment/sub-cycle* started with the *awareness* that the basic system design process required a constructional understanding of the using system (i.e. the construction of the OM), prior to determining requirements for the function of the object system (i.e. the new method). Since the OM is used within the context of the foundation for execution approach, which contributes towards the alignment of business with IT, it was *suggested* that the Business-IT Alignment Model (BIAM) was used to contextualise the foundation for execution approach. This entailed re-visiting the literature on the OM as to determine requirements for the OM-enhancing method.

As a result 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 at an enterprise. Thus, a set of seven requirement categories was developed for a *method, mechanisms and practices* to identify process reuse opportunities at an enterprise. The identified requirements led to another *circumscription* process, with the awareness that an appropriate process representation language was required to address two of the seven requirement categories. A second development increment/sub-cycle was thus required.

12.2.2.3 Second development increment/sub-cycle

The *second development increment/sub-cycle* started with the *awareness* that two of the seven requirement categories, namely *process representation* and *replication identification*, necessitated the selection of a suitable process representation language. Since current process representation languages addressed similar requirements (pertaining to *process representation* and *replication identification*), the study had to select a process representation language that complied with *both* requirement categories.

Re-visitation of literature revealed that the ontological aspect models, used within the *essence of operation* approach, seemed to be promising in addressing the two requirement categories. To ensure compatibility with the *foundation for execution* approach and its associated OM, a *suggestion* was made to contextualise the *essence of operation* approach and more specifically one of its ontological aspect models (the interaction model) within a business-IT context. Using a common model for business-IT contextualisation, BIAM (Business-IT Alignment Model), would enable one to compare the two alignment approaches (*foundation for execution* approach and *essence of operation* approach) and their supporting models. The comparison results indicated compatibility between the *foundation for execution* approach and the *essence of operation* approach. In addition, an evaluation strategy was developed to ensure adherence to the requirements pertaining to *process representation* and *replication identification*. The interaction

model had to enhance *ease of understanding* for *business users* and had to enable the *identification of operational similar organising entities* from a *practitioner's perspective*.

The *evaluation* strategy followed a participative and experimental approach, involving four research participants (industrial engineers) to develop interaction models for four engineering departments at a tertiary education institution. The interaction models were developed consecutively at the different departments, verifying the contents with the heads of the departments. The experimentation process required active involvement and use of open-ended questions. Positive results were obtained in terms of *ease of understanding* from the *business user* viewpoint (heads of departments). From a *practitioner's perspective*, the interaction model also enabled the *identification of operational similar organising entities*. Some of the interaction model limitations identified by the participants were due to a limited understanding of the combined use of the ontological aspect models and the purpose/use of each ontological aspect model. The feedback would be useful for future research to refine the method for constructing an interaction model and refining the constructs of the interaction model.

The positive results pertaining to the experimental evaluation substantiated the inclusion of the interaction model as part of the new *method, mechanisms and practices* to augment the OM concept. Further development of the *method, mechanisms and practices* however led to another *circumscription* process, with the awareness that a creative process was required in developing the *method, mechanisms and practices*, which initiated a third development increment/sub-cycle.

12.2.2.4 Third development increment/sub-cycle

The *third development increment/sub-cycle* started with the *awareness* that a creative process was required in developing the *method, mechanisms and practices*, whilst including the interaction model as part of the *method, mechanisms and practices*. With reference to the basic system design process, construction of the object system (i.e. the *method, mechanisms and practices*), required a process of devising specifications to translate functional requirements into constructional elements. According to Hoogervorst (2009) devising specifications may also be interpreted as devising constructional requirements. It was therefore *suggested* that a creative development process was used to incorporate both functional and constructional requirements into a constructed *method, mechanisms and practices*.

Construction resulted in a *method* that comprised of three phases and respective phase steps. In addition, applicable *mechanisms and practices* were provided for each phase step. As to guide the practitioner in the correct use of the *method, mechanisms and practices*, additional mechanisms and practices *motivations, considerations and implications* were also provided.

The third development increment/sub-cycle concluded the third step of the main design research cycle.

12.2.2.5 Evaluation and conclusion

The last two steps, *evaluation* and *conclusion*, required an evaluation of the newly developed artefact (PRIF *method, mechanisms and practices*) and interpretation of the evaluation results. Since the *method, mechanisms and practices* were already built/triangulated against requirements, external evaluation was confined to two measures, namely *usefulness* and *ease-of-use*. *Usefulness* measured the perceived value of the *method, mechanisms and practices* to all enterprises in identifying process re-use opportunities at the enterprise. Ease-of-use, on the contrary, measures the ease of using the *method, mechanisms and practices* to identify process re-use opportunities at an enterprise.

A questionnaire (based on experimentation) was used to evaluate the *method, mechanisms and practices*, involving twelve participants. The results indicated that research participants were positive towards the usefulness and ease-of-use of the *method, mechanisms and practices*. However, qualitative feedback suggested further improvement of the *method*, *mechanisms and practices*, which may be incorporated in future research.

12.2.3 Summary: Contributions

Sections 12.2.1 and 12.2.2 provided the findings related to the two secondary research questions. Two main artefacts were developed to address the two research questions: the Business-IT Alignment Model (BIAM) and, the Process Reuse Identification Framework (PRIF). Five scientific contributions resulted from this thesis (see Chapter 11):

- Contribution 1: A model for approach contextualisation
- Contribution 2: Classification categories for approach comparison
- Contribution 3: An Alignment Approach Enhancement Method (AAEM), using the BIAM
- Contribution 4: Requirements for enhancing the OM for process reuse identification
- Contribution 5: A *method, mechanisms and practices* to enhance the OM concept

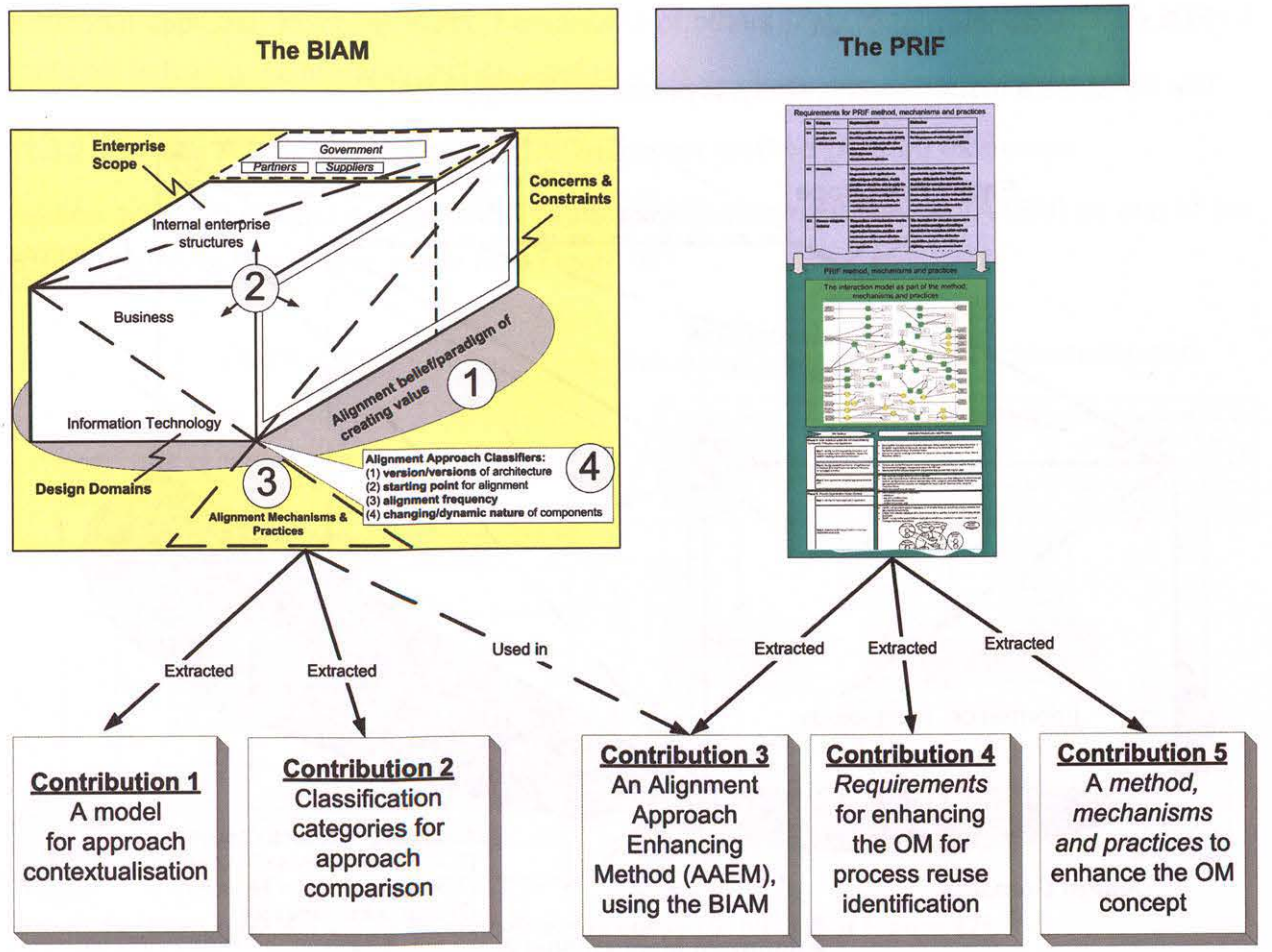

Figure 93: Thesis contributions (duplicate of Figure 90)

The next section accepts the contributions made in this thesis and suggest contribution extensions, based on further research.

12.3 FURTHER RESEARCH

This section suggests further research, based on the results obtained in this thesis. Section 12.3.1 presents ideas for extending the BIAM and the *approach comparison table*, whereas section 12.3.2 concludes with an agenda to expand the Alignment Approach Enhancement Method (AAEM).

12.3.1 Extension of BIAM

The BIAM, as a result from this study, is presented in Figure 94.

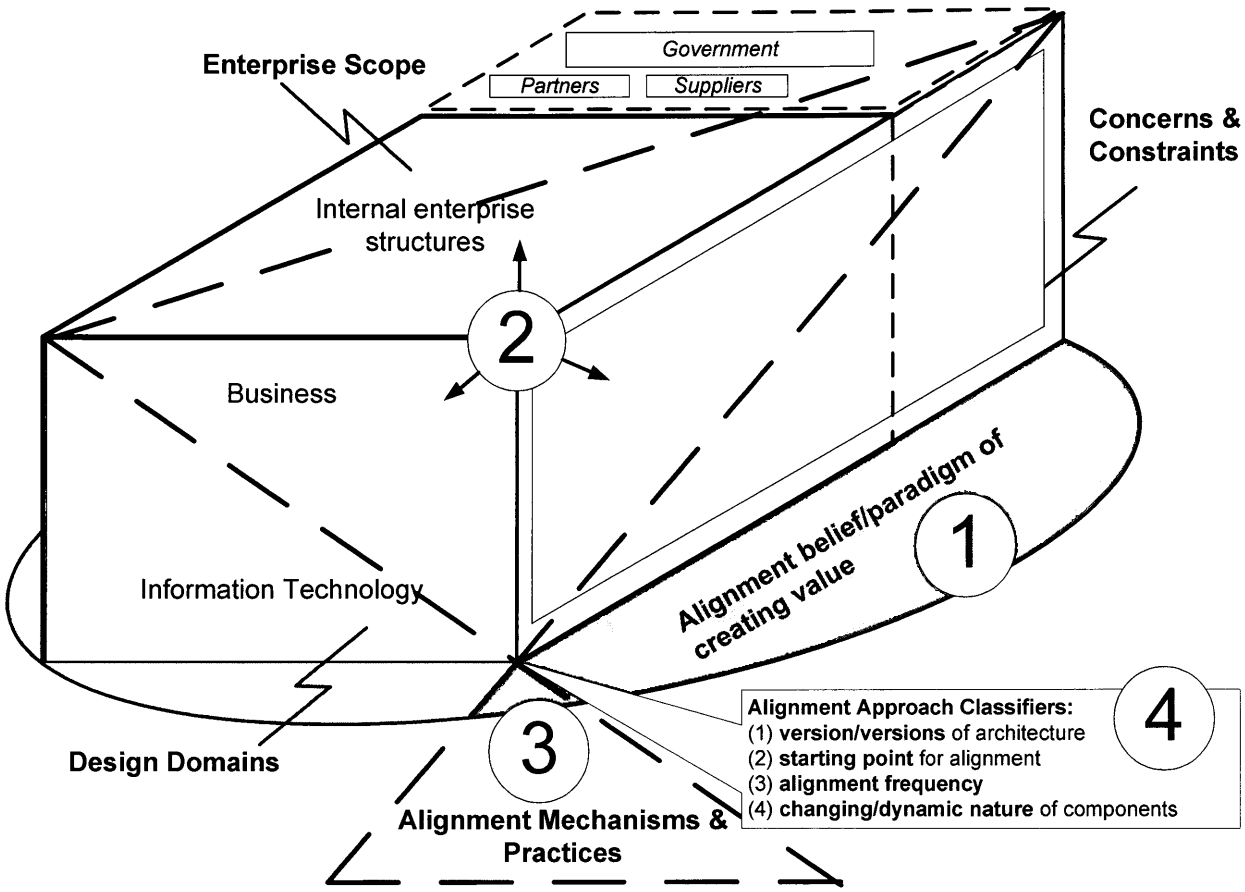

Figure 94: The BIAM (duplicate of Figure 45)

This section presents opportunities for extending the BIAM in terms of two facets: component extension, and scope extension.

In terms of *component extension*, the current *alignment belief/paradigm of value creation* component relates to the philosophical dimension of a paradigm, providing the *why* of the approach and the grounds for the type of activities included in the alignment *mechanisms and practices*. However, the component does not delve deeper into the worldviews of the authors (i.e. the paradigmatic assumptions of the authors). An application of paradigmatic analysis tools is proposed to extend the paradigmatic analysis of the BIAM.

Regarding *scope extension*, the development process of the BIAM took cognisance of the three different schools of thought on alignment approaches, as defined by Lapalme (2011), and the differences in design and alignment scope. Although most of the alignment approaches that were consulted gravitate towards the third school of thought (enterprise IT architecting), one could investigate the use of the BIAM within a wider scope.

Section 11.2.2 presented an approach comparison table (see Table 24), based on the four components of the BIAM, to compare different alignment approaches for compatibility.

Additional approach mapping, using frameworks of others (e.g. Mingers & Brocklesby (1997)) could aid in linking the two approaches together.

12.3.2 The Alignment Approach Enhancement Method (AAEM) extension

Section 11.3.1 presented an Alignment Approach Enhancement Method (AAEM) as one of the scientific contributions of this thesis (see Figure 95).

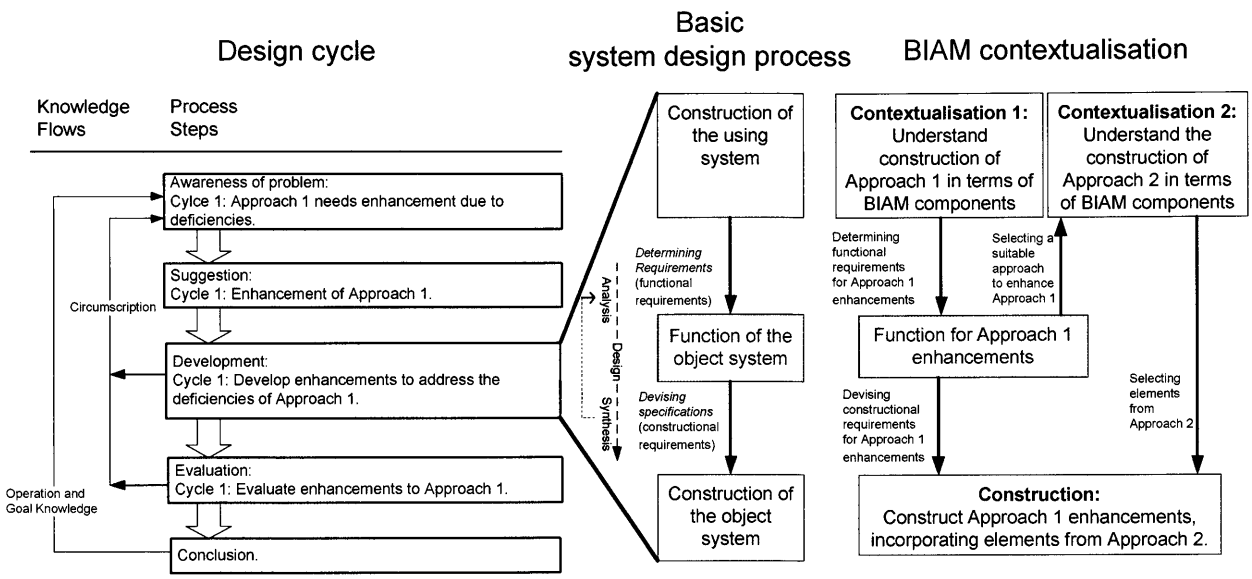

Figure 95: Alignment approach enhancement process (duplicate of Figure 92)

The AAEM provides a single example of enhancing one alignment approach (the *foundation for execution* approach) with an element (the interaction model) from another approach (the *essence of operation* approach). To increase rigidity, more cases would be required to verify the use of the AAEM.

The AAEM is useful if one needs to enhance an existing alignment approach with elements from another alignment approach. However, there is also the need to combine elements from multiple approaches (Dumay et al., 2005). Further research would however be required to combine/mix elements from multiple approaches.

12.4 REFLECTIONS

This study is primarily qualitative in nature and concerned with interpretation. An interpretive understanding assumes that meaning is context-specific and constructive. There is no single 'correct' meaning. Thus, there is a possibility that two different researchers may apply sound, but similar research methods, yet arrive at different answers/solutions.

Qualitative research requires a different concept of reliability than quantitative research. In making qualitative research reliable, Steinke (2004) suggests a systematic and transparent research process, which includes motivations for every conclusion and every step in the research process. Due to their active involvement, the supervisors of this thesis provided multiple perspectives on the research process to increase the reliability of the study.

The following sections present reflections and lessons learnt, in terms of both methodology and scientific contribution. Section 12.4.1.1 reflects on the use of a mixed methods design in answering the main research questions of this thesis. Section 12.4.1.2 reflects on the scientific contributions that resulted from this study.

12.4.1 Methodological reflection

This section reflects on the mixed methods design that was used in answering the main research question.

A mixed methods design, as prescribed by Morse (2010), was appropriate to answer the main research question of this thesis, namely:

What constructs are required for a process reuse identification framework to enhance the operating model concept within the context of business-IT alignment?

The mixed methods design, as defined by Morse (2010), requires two design components to answer the main research question. According to Morse (2010), the two design components (a *core component* and *supplementary component*) may be used sequentially or simultaneously. The *supplementary component* continues until the researcher is certain enough that the sub-question (pertaining to the *supplementary component*) is answered.

This study started with the *core component* (*design research*) in answering *Research Question 2*, namely:

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

Since an appropriate business-IT contextualisation model could not be found, the study also initiated a *supplementary component* (*exploratory design*), to develop a business-IT contextualisation model, thus answering the Research Question 1, namely:

What model is required to contextualise different business-IT alignment approaches?

Thus, the *supplementary component* (*exploratory design*) was used *simultaneously* with the *core component* (*design research*) to answer the main research question. As suggested by Morse (2010), the *supplementary component* (*exploratory design*) only continued until the sub-question (related to the *supplementary component*) was answered.

Using a mixed methods design (see Figure 13), the core component (*design research*), developed the PRIF (Process Reuse Identification Framework), and a supplementary component (*exploratory design*), developed the BIAM (Business-IT Alignment Model). Even though Morse (2010) states the *supplementary component* may not be publishable within a single study, the result of the supplementary component (initially called the Business-IT Alignment Framework (BIAF)) was published as a single study (De Vries, 2010). Yet, the result of the *supplementary component* (BIAM) was a prerequisite in providing *business-IT alignment insight* for the *core component*.

Reflecting on the mixed methods design, one could have reasoned that the entire study used *design research* as the primary method, rather than a mixed methods design. Using the single method approach implies that the first iteration of the design cycle would have created the awareness that a business-IT alignment model for contextualising current alignment approaches, *did not exist*. Rather than treating the development of the Business-IT Alignment Model (BIAM) as a supplementary component within a mixed methods design, one could have incorporated the BIAM as the development of another artefact within the *design research* paradigm. Using *design research* as the primary method would thus have created another development sub-cycle (Figure 96, column 2, *Sub-cycle 0*).

Although feasible in terms of the *design research* paradigm, the mixed methods approach was suitable to highlight the two separate contributions (BIAM and PRIF) that were made in this study, but also to emphasise that the supplementary component (*exploratory design*) was an incomplete design (e.g. using literature review alone as data collection instrument) for developing the BIAM. The core component (*design research*), however, required a complete design (e.g. adhering to the guidelines of Hevner et al. (2004) in doing design research, and using questionnaires and interviews as appropriate). The mixed methods design also highlighted that the *supplementary component* provided *business-IT alignment insight* for the *core component.*

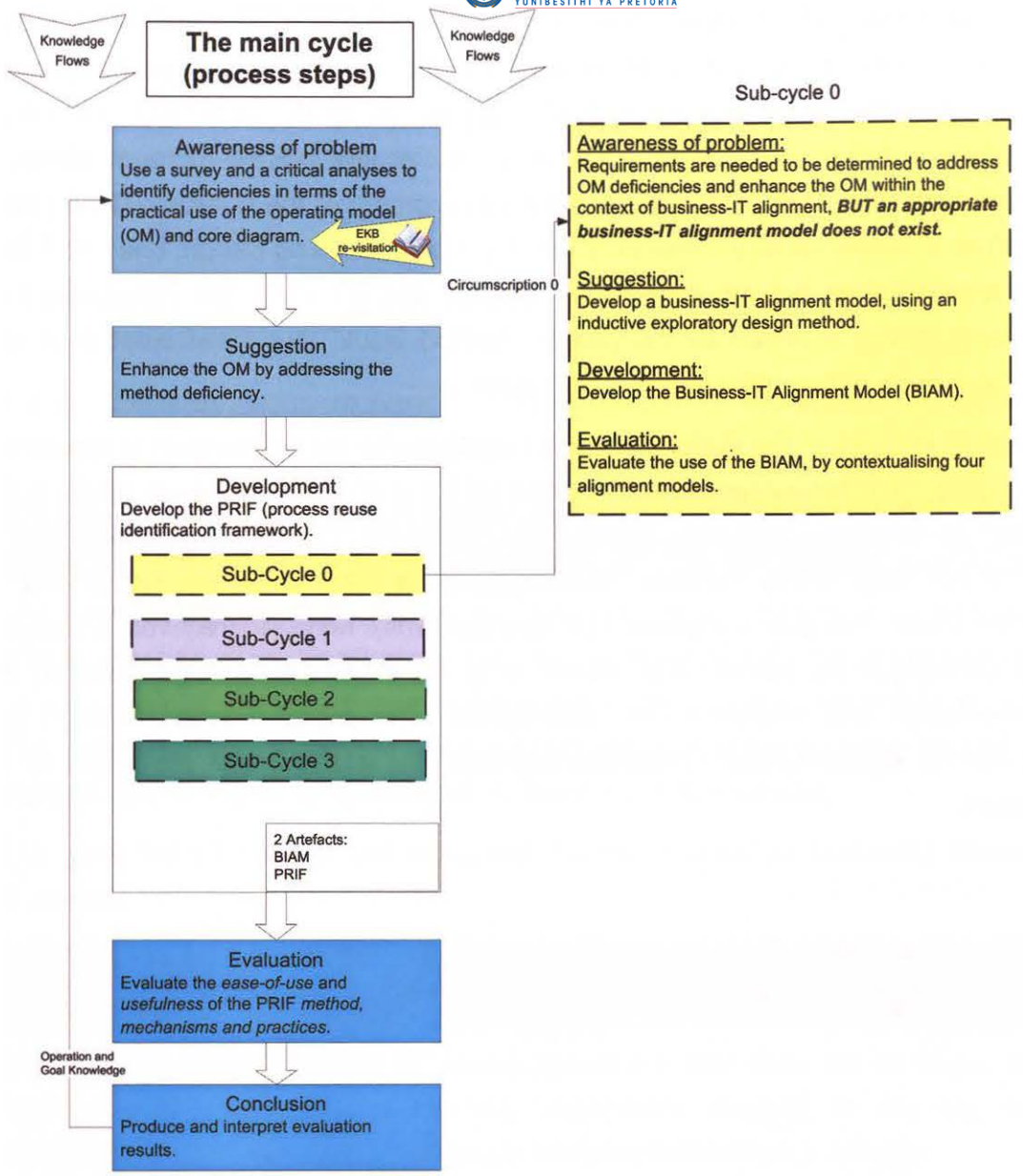

Figure 96: Using only design research, rather than a mixed methods design

The next two sections (12.4.1.1 and 12.4.1.2) reflect on the two separate designs (*exploratory design* and *design research*), and their associated data-collection methods in answering the two research questions.

12.4.1.1 Methodological reflection: Research Question 1

In answering the first research question, the study used *exploratory design* as a supplementary component within a mixed methods design, to develop the BIAM. Since an incomplete design is sufficient for the supplementary component (Morse, 2010), a *literature review* was sufficient for extracting themes/patterns inductively from existing alignment approaches. Morse (2010) also states that an inadequate sample size is sufficient for a supplementary component. The study used a sample of four alignment approaches as the primary data source for building the BIAM and evaluated the use of BIAM, by doing four contextualisations. Increasing the reliability of the BIAM to reflect different facets of business-IT alignment, would require a larger sample size.

Another technique that would increase the reliability of the BIAM components, is content analysis. A content analysis has the advantage of limiting the analysis to aspects that are relevant in terms of a specific research question. However, content analysis requires that the coding frame is at a higher level of abstraction than the more concrete information in the analysed material (Schreier, 2012). Thus, by classifying the concrete information according to a coding frame, results in losing information.

Schreier (2012) also differentiates between *quantitative* and *qualitative* content analysis. *Quantitative* content analysis determines the frequency of themes in the analysed material. A pure *quantitative* type of content analysis disregards the fact that meaning is often complex, holistic, and context-dependent. In addition, some aspects of meaning may only appear once in a text, which does not necessarily imply insignificance (Schreier, 2012). *Qualitative* content analysis, also called *thematic coding* (Saldana, 2009), focuses on latent meaning (meaning that is not immediately obvious), whereas *quantitative* content analysis focuses on literal meaning (Schreier, 2012).

Although time-consuming, *qualitative* context analysis would be useful to arrive at a comprehensive set of themes/patterns. Qualitative context analysis would allow one to consider context, when analysing the different alignment approaches.

12.4.1.2 Methodological reflection: Research Question 2

In answering the second research question, *design research* was used as the core component within a mixed methods design, to develop the PRIF. Since an complete design is required for the core component (Morse, 2010), *design research* was used according to the design research guidelines of Hevner et al. (2004).

Design research facilitated the incremental process of developing a new artefact. The process of circumscription (gaining new knowledge via the act of doing) also allowed for incremental learning, continuously engaging and interacting with current theory. An alternative research design that was also considered, is a model- or method-building approach. According to Mouton (2001), this approach consists of a set of postulates that are taken to be true. Theoretical propositions are then deducted from the postulates and finally tested against empirical data. Although the model-building approach captures part of the design cycle pattern (awareness of problem, suggestion, development, and evaluation), the model-building approach does not reveal the process of circumscription that lead to additional design research sub-cycles. Avenier (2010) emphasises *explicitness* as a prerequisite for doing constructivist research, i.e. providing sufficient grounding for the knowledge claims that are made. Design research enables explicitness and transparency by allowing an iterative design process and the concurrent creation/explication of knowledge. In addition, design research also allows for future extension of this study via additional design cycles.

Data-collection methods included *questionnaires* and *interviews*.

Questionnaires were used as part of two separate evaluations within the research design:

- Evaluating the *practicality of the operating model (OM)* and core diagram (see section 6.3).
- Evaluating the *usefulness* and *ease-of-use* of the PRIF *method, mechanisms and practices* (see section 10.2)

Both questionnaires included close-ended and open-ended questions, allowing the participants to express their experiences with current or new theoretical models.

Since the study did not aim to generalise findings scientifically (i.e. with a known degree of accuracy), *nonprobability sampling* (using convenience samples) was adequate for both evaluations. Both evaluations used a convenience sample of graduate participants. The participants were willing to take part in the questionnaires (based on experimentation), and were educated on business-IT alignment theory to increase the validity of the evaluation results.

The second questionnaire (evaluating the PRIF *method, mechanisms and practices*) also included descriptive statistics (*average* and *standard deviation*) to measure the *usefulness* and *ease-of-use* of the PRIF *method, mechanisms and practices*. The descriptive statistics were only used to highlight areas that required further research and was not used to confirm or reject a hypothesis. If *probability sampling* was used, it would be possible to state the levels of *usefulness* and *ease-of-use* with a quantifiable level of confidence. Increasing the certainty of the exact levels of *usefulness* and *ease-of-use* would, however, not contribute significantly for the purpose of this study.

Semistructured interviews were used to request feedback from the heads-of-departments (HODs) of a tertiary education institution to obtain feedback on the ease of understanding of the interaction model. An alternative to interviews would be questionnaires, using open-ended questions. One of the disadvantages of a questionnaire is that the number of respondents are low. In addition, a questionnaire disallows interpretation based on body language and facial expression, which may require additional probing. In guaranteeing feedback from the small sample of four HODs, an interview was more appropriate.

12.4.2 Scientific reflection

The scientific contribution of this study can be depicted graphically (see Figure 97) to emphasise the two main contributions, namely the BIAM and the PRIF. The development of BIAM and PRIF resulted in five scientific contributions. The purpose of this section is to reflect on the five scientific contributions within a broader context, i.e. relating the contributions to the *scientific body of knowledge*.

The section starts with a summary of the five scientific contributions (section 12.4.2.1) and reflects on the scientific contributions of BIAM (section 12.4.2.2), and PRIF (section 12.4.2.3).

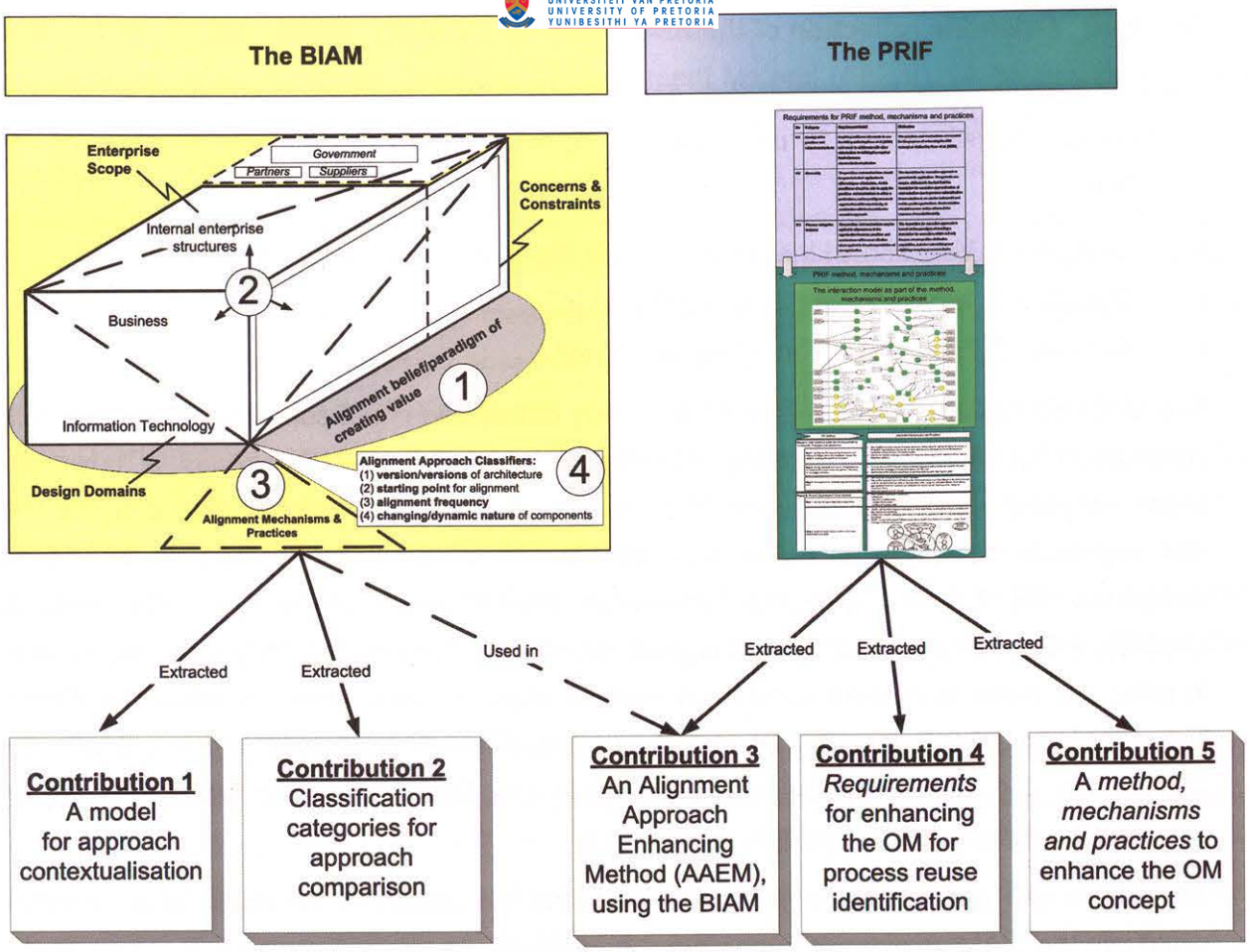

Figure 97: Thesis contributions (duplicate of Figure 90)

12.4.2.1 Contribution summary

Initially, the aim was to develop an artefact that would address the OM deficiencies. However, the fragmentation that existed within the emerging disciplines of EE, EA and EO, made it difficult to reuse the existing body of knowledge to address the deficiencies related to the OM. The fragmentation problem led to the development of a contextualisation model, the BIAM.

Although the BIAM was initially used as a supporting tool to assist with the development of the PRIF, the BIAM has more potential. This thesis demonstrates the BIAM potential in terms of two contributions:

- Contribution 1: A model for approach contextualisation
- Contribution 2: Classification categories for approach comparison

BIAM was instrumental in developing the PRIF and used as part of the PRIF design process. The PRIF design process delivered three contributions:

- Contribution 3: An Alignment Approach Enhancement Method (EEAM), using the BIAM
- Contribution 4: Requirements for enhancing the OM for process reuse identification
- Contribution 5: A *method, mechanisms and practices* to enhance the OM concept

12.4.2.2 Scientific reflection of the BIAM

The BIAM circumvents the irregularities and fragmentation that exists in literature, by providing a common analysis model to *understand* a current alignment approach in terms of *three questions*:

- Question 1: *Why* should the enterprise use the proposed approach to align?
- Question 2: *What* should the enterprise align?
- Question 3: *How* should the enterprise align?

The BIAM addresses the three questions by way of four alignment components. As a scientific contribution (*extending the existing knowledge base*), the BIAM provides a business-IT alignment perspective to analyse and understand current alignment approaches in terms of the four alignment components. BIAM thus recognizes the knowledge embedded in emerging disciplines (EE, EA and EO), but circumvents the fragmentation that currently exists and suggests their combined use. The pedagogic value of the BIAM has already been demonstrated in using the BIAM to present content on multiple alignment approaches to several audiences. The BIAM provides a vehicle for discussing the different emphases of current alignment approaches (e.g. the Zachman approach versus The Open Group approach) and highlight deficiencies within current alignment approaches.

Academics and *practitioners* that are involved with the design or re-design of an enterprise could use the BIAM as *extended knowledge* in various ways.

The *academic* may need to generalise on the combined use of current alignment approaches within a specific type of industry. The BIAM provides a common contextualisation tool for the separate alignment approaches to highlight their similarities and differences, which could enact their combined use and adaptation. The act of contextualisation (e.g. using the BIAM) is also called *knowledge-activation*, which is a complex process that implies reflection and re-interpretation (Avenier, 2010). *Knowledge-activation* of the BIAM may lead to other applications, which were not initially intended. As an example, a Masters student already considers using the BIAM to contextualise and compare diverse *enterprise alignment* approaches (not necessarily business-IT alignment approaches) within a telecommunications enterprise.

The *practitioner* may also need to combine different alignment approaches at an enterprise. Post-graduates (of 2010, 2011 and 2012) have already used the BIAM to contextualise alignment approaches at their employer-enterprises. Additional qualitative feedback on the interpretation and use of the BIAM would be an agenda for further research.

12.4.2.3 Scientific reflection of the PRIF

The initial aim of this thesis was to enhance the OM, addressing the OM deficiencies. The development of the PRIF contributed in several ways to the *scientific body of knowledge*.

The research design (*design research*) facilitated the incremental process that was required to enhance the OM, by developing the PRIF. Although not the initial purpose of this thesis, an

application of the *design cycle* (Vaishnavi & Kuechler, 2004/5) contributed towards the development of an Alignment Approach Enhancement Method (AAEM), which incorporates the BIAM. Although *design research* (especially IT-based design) received attention and development within the IS discipline, some also indicated its potential within organisation theory development and improvement of professional practice (Mohrman, 2007; Romme, 2003; Van Aken, 2005). Keuchler & Vaishnavi (2008) also favoured a broader scope for *design science research* than its current focus on creating low level artefacts (IT mechanisms). This thesis demonstrates the use of *design research* to create an artefact (AAEM) to enhance one alignment approach with another. The use of *design research* in creating the AAEM (not a low level IT artefact), opens up new opportunities for research within the emerging discipline of EE, EA and EO. The AAEM encourages application of existing knowledge in new ways (i.e. enhancing one alignment approach with another). The underlying *design research* structure (sequential steps and iterative cycles due to circumscription) and *basic system design process* (based on Dietz (2006)) embedded in the AAEM, provide transparency and explication of the research process.

Two research projects within the Industrial Engineering department (University of Pretoria) already embarked on the re-use of existing alignment methods, methodologies and frameworks within different industries. The AAEM is useful during the initiation phase of these research projects, providing a blueprint research design, which encourages the simultaneous development of the emerging disciplines of EE, EA and EO.

This thesis demonstrated the AAEM by enhancing the OM with a Process Reuse Identification Framework (PRIF). The PRIF extends the current knowledge base (OM and associated *foundation for execution* approach of Ross et al. (2006)). Although restricted to the *practitioner* who intends using the *foundation for execution* approach and its associated OM, *knowledge-activation* may lead to other applications of the PRIF, which were not initially intended. As an example, a presentation at the ISEM 2011 (Industrial and Systems Engineering and Management) conference demonstrated the effective use of the Interaction Model (IAM) to identify replication opportunities at an enterprise. The presentation led to collaboration between the Department of Industrial Engineering (University of Pretoria) and the CSIR (Council of Scientific and Industrial Research) to apply part of the PRIF within an enterprise re-design initiative.

Thus, the process of enhancing the OM, facilitated by the BIAM, led to several scientific contributions, of which the main contribution is the development of the Process Reuse Identification Framework (PRIF).

The PRIF answered the main research question, by providing the necessary constructs for a process reuse identification framework to enhance the operating model concept within the context of business-IT alignment.

12.5 CLOSURE

Thus, based on the findings of this thesis, it can be stated that this study supports the thesis statement that *the operating model concept, as part of a business-IT alignment approach, can be enhanced with a process reuse identification framework, when a business-IT alignment contextualisation is used*.