# Chapter 10. Process Reuse Identification Framework evaluation

## 10.1    INTRODUCTION

One of the main goals of this thesis is to enhance the operating model (OM), due to its inherent deficiencies, which were illuminated in Chapter 6. In Chapter 7, seven requirement categories were identified for augmenting the OM concept, addressing the OM deficiencies pertaining to the identification of process reuse opportunities. In Chapter 8, the use of the ontological aspect models was evaluated, and more specifically the interaction model, to address *two of the seven requirement categories* for developing the PRIF *method, mechanisms and practices*. The previous chapter (Chapter 9) discussed the third and last sub-cycle of the *development* phase of the main design cycle to develop the PRIF *method, mechanisms and practices*. Thus, Chapters 7, 8 and 9 contributed towards the development of the PRIF, 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?*

Based on the newly developed PRIF, this chapter proceeds with an *evaluation* of the entire PRIF, *concluding* with evaluation results (Figure 82, *Evaluation* and *Conclusion*).
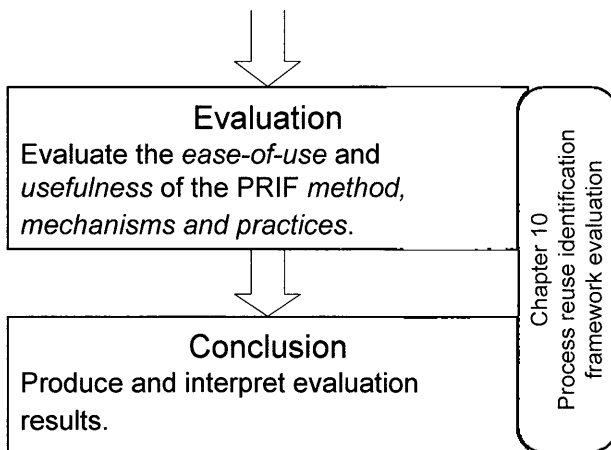


**Figure 82: Design cycle context for Chapter 9 (duplicating part of Figure 15)**

Since the first part of PRIF merely provides the *requirements* for the PRIF *method, mechanisms and practices* (Figure 83, the purple part), the final evaluation of the PRIF only focuses on the evaluation of the second part of PRIF (Figure 83, the sea-green part), the PRIF *method, mechanisms and practices*.
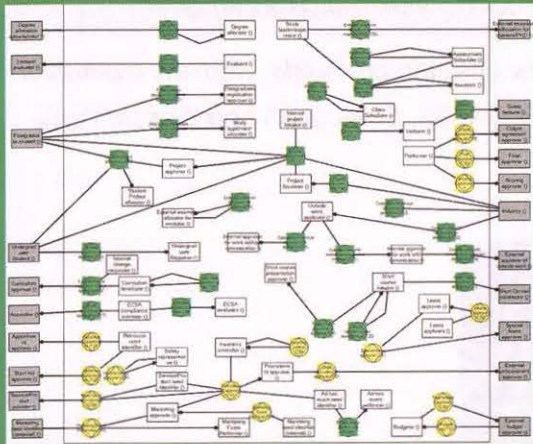
# The PRIF

## Requirements for PRIF method, mechanisms and practices

| 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 organisation 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 organisations. 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 organisation however, practices and mechanisms will be most effective when applied to the primary activities of an organisation. | 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 |

## PRIF method, mechanisms and practices

### The interaction model as part of the method, mechanisms and practices



**Figure 83: The content of PRIF (duplicating part of Figure 15)**

Section 10.2 provides a motivation for an appropriate evaluation method to evaluate the PRIF. Based on the evaluation method, section 10.3 conveys the results, whereas section 10.4 interprets the results. The chapter concludes in section 10.5.

## 10.2    EVALUATION METHOD

The purpose of the PRIF was to enhance the OM within the context of business-IT alignment, as stipulated in the *suggestion* of the main design cycle. The first part of PRIF merely provides the *requirements* for the PRIF *method, mechanisms and practices* to enhance the OM pertaining to the identification of *process reuse opportunities* at an enterprise. Evaluation of the PRIF thus requires an evaluation of the PRIF *method, mechanisms and practices* that are based on the *requirements*. Two measures, *usefulness* and *ease-of-use,* were used to formulate two questions:

- *Usefulness* answers the question: *"Is the PRIF method, mechanisms and practices* (which include the interaction model) of value to all enterprises in identifying *process re-use opportunities* (i.e. enhancing the OM)?"

- *Ease-of-use* answers the question: "*How easy* is it to use the PRIF *method, mechanisms and practices* (which include the interaction model), to identify process re-use opportunities at an enterprise?"

Similar to the approach followed in section 6.3 (evaluating the practicality of defining an OM), an experimentation process was used, collecting data via a questionnaire) to evaluate the *usefulness* and *ease-of-use* of the PRIF *method, mechanisms and practices*.

This study took the stance that EA practitioners will be primarily responsible (in consultation with the chief executive officer and business managers) to use the PRIF *method, mechanisms and practices* in defining process re-use opportunities at an enterprise. Questionnaires would thus be a suitable instrument to obtain feedback from EA practitioners on the *usefulness* and *ease-of-use* of the PRIF *method, mechanisms and practices*.

### 10.2.1    The experimentation process

The experimentation process included several phases to ensure that participants were knowledgeable within the theoretical areas of concern:

1.  *Training phase:* The study provided training to the research participants to ensure that they were knowledgeable on business-IT alignment, strategic decision-making, the *foundation for execution* approach and associated artefacts as defined by Ross et al. (2006), and the *essence of operation approach* and its associated ontological aspect models of Dietz (2006). Training consisted of live presentations, course notes, and literature references for further reading.

2.  *Learning/formative assessment phase:* Participants had the opportunity to work individually to select an enterprise to *apply* phases 1 and 2 of the PRIF *method, mechanisms and practices* (see Figure 79 and Figure 80 in section 9.3, for phase 1 and

phase 2 respectively) in a first task. Participants received a template for their task and were instructed to follow the PRIF *method, mechanisms and practices* (phases 1 and 2) in completing the template. Based on their interpretation of the PRIF *method, mechanisms and practices* in completing the task, they received individual feedback on the correct use of phases 1 and 2. In addition, supplementary literature content was given in subsequent contact sessions to clarify misconceptions. The content of phases 1 and 2 of the PRIF *method, mechanisms and practices* was also updated to clarify misconceptions.

3.  *Experimentation phase:* Participants had to re-do certain parts of task 1 to rectify previous misinterpretations about the content of phases 1 and 2 (PRIF *method, mechanisms and practices*). In addition, each participant had to *apply* phase 3 of the PRIF *method, mechanisms and practices* (see Figure 81 in section 9.3, for phase 3) in a second task. Participants once again received a template for their task and were instructed to follow the PRIF *method, mechanisms and practices* (phase 3) in completing the template. Based on their experience of *applying* the complete PRIF *method, mechanisms and practices*, participants had to complete a questionnaire. Although participants had to provide feedback on the entire PRIF *method, mechanisms and practices*, phase 3 (Figure 81 in section 9.3) was scaled down due to time limitations. Rather than developing interaction models for each business unit type, participants had to develop an interaction model for a single business unit type.

4.  *Evaluation phase:* Analysis of questionnaire feedback gave new insight into the *usefulness* and *ease-of-use* of the PRIF *method, mechanisms and practices*.

## 10.2.2    The questionnaire

According to Rea & Parker (2005) quantitative research requires a research hypothesis about the relationship(s) between variables/parameters. This study does not aim to defend a hypothesis about parameters and their relationships. Instead, parameters have been identified to provide sufficient context in evaluating the usefulness and ease-of-use of the PRIF *method, mechanisms and practices*. Similar to the survey that measured the practicality of the OM and core diagram ((see section 6.3), *parameters* that could influence the usefulness and ease-of-use of the PRIF *method, mechanisms and practices* (see Figure 84), had to be identified. Figure 84 indicates that the *participant profile* (*Parameter 1*) and *enterprise profile* (*Parameter 2*) were also used as influencing parameters on the practicality of defining operating models (OMs) and core diagrams (see previous survey in section 6.3). Contrary to the survey in section 6.3, this survey does not use *current architecture status* as the third influencing parameter. Due to the demarcation of requirements to enhance the OM, only pertaining to the identification of *process reuse opportunities* at an enterprise, this study rather used *standard practices for doing process architecture (PA) work (Parameter 3)*.

Table 19 provides a summary of the relevant questions that were derived to evaluate the four parameters. Some of the questions, pertaining to the enterprise profile and participant profile, were taken from a previous questionnaire, which measured the practicality of the OM and core

diagram (see section 6.3). The original questionnaire consisted of thirty-two questions (both closed-ended and open-ended) embedded in two tasks (see Appendix A, *Task 1* and *Task 2*). Not all questions were used for the purpose of this study.
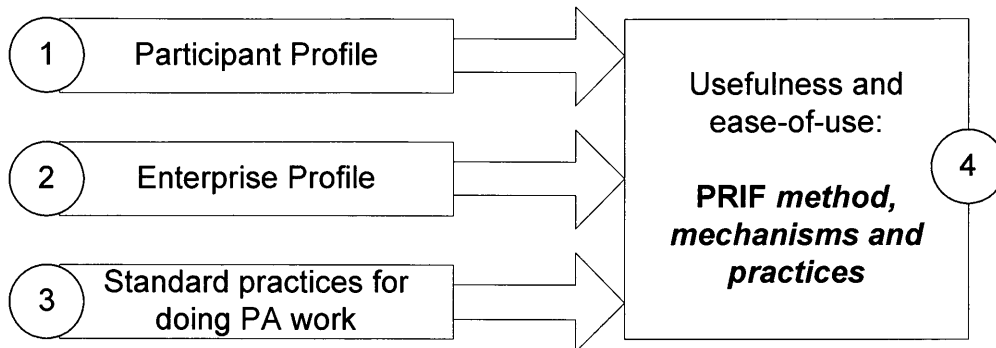


**Figure 84: Parameters that influence the usefulness and ease-of-use of the PRIF *method, mechanisms and practices***


**Table 19: Questions related to the four parameters**

| Questionnaire questions related to the four parameters |
|---|
| **Parameter 1: Participant profile** |
| 1.1. Please specify your tertiary qualification, e.g. BEng (Industrial). |
| 1.2. What is your current position (e.g. Systems Analyst, Full-time student, etc.)? |
| 1.3. Please specify any business or IT modelling-related courses that you attended in the past (e.g. Information Systems Design). |
| 1.4. Did you have any work exposure to Information Systems (e.g. worked in the IT department as a Systems Analyst / worked on a SAP implementation project to implement new procedures, etc.)? |
| 1.5. Did you have any work exposure to Information Systems (e.g. worked in the IT department as a Systems Analyst / worked on a SAP implementation project to implement new procedures, etc.)? |
| 1.6. Did you have any work exposure to Business Process Modelling/Tools (e.g. worked as a Business Process Manager at a plant, modelling their processes in Visio). |
| **Parameter 2: Enterprise profile** |
| 2.1. Specify the number of employees of the entire enterprise. |
| 2.2. What is the primary business activity(s) of your enterprise? |
| **Parameter 3: Standard practices for doing process architecture work** |
| 3.1. What process modelling languages are used by the enterprise? |
| 3.2. What architecting software tools are used by the enterprise? |
| **Parameter 4: Usefulness and ease-of-use of the PRIF method, mechanisms and practices** |
| 4.1. Six rating questions measuring usefulness (see Table 20) |
| 4.2. Six rating questions measuring ease-of-use (see Table 21) |

This section delineated the experimentation process to evaluate the *usefulness* and *ease-of-use* of the PRIF *method, mechanisms and practices*. As indicated, the intent of the questionnaire was to provide sufficient context in terms of three parameters (participant profile, enterprise profile and standard practices for doing architecture work), which could have an influence on the fourth parameter (usefulness and ease-of-use of the PRIF *method, mechanisms and practices*). The next section discusses the questionnaire results.

## 10.3 RESULTS

A convenience sample of *fourteen* participants was initially used. However, two participants were excluded; one participant was absent from both training sessions on the interaction model and underlying theory, whereas the second participant applied a different method than stipulated by the PRIF *method, mechanisms and practices.* A small sample (*twelve* participants) was used if compared to a sample of *thirty* participants in the survey pertaining to the practicality of the OM and core diagram (discussed in section 6.3). Yet, the small sample enabled highly interactive training sessions, consequently participants gained a thorough understanding of the underlying theories covered during the contact sessions. The following sections convey the results of the questionnaire in terms of the four parameters (Figure 84, Parameters 1 to 4).

Since some of the questions of Parameter 1 and Parameter 2 in this survey *were similar* to questions of a previous survey pertaining to the practicality of the OM and core diagram (see section 6.3), percentages are used for comparison purposes.

For the remaining questions, actual numbers are used, which is more informative for a small sample such as this one.

### 10.3.1 Parameter 1: Participant profile

The *participant profile* parameter provides an indication of the knowledge and experience of the participant. The questionnaire therefore gathered data about the participant in terms of his/her teriary qualification, current working position. The questionnaire also assessed prior knowledge about information systems in terms of work exposure and previous enrolments in IT-architecture modelling related courses. In addition, the questionnaire assessed prior knowledge about business process modelling in terms of work exposure and previous enrolments in business-modelling courses.

The profiles of the *twelve* participants indicated that seventy-five percent (75%) of the participants previously obtained an industrial engineering degree, eight percent (8%) a mechanical engineering degree, eight percent (8%) a technical diploma and eight percent (8%) did not indicate the tertiary qualification (see Figure 85). Thirty-three percent (33%) of the participants were *academics,* whereas the remaining participants represented a spread of positions related to the core *business activities*, i.e. excluding supporting activities, such as finances, HR and infrastructure (see Figure 86).

Questions regarding prior work exposure to information systems (e.g. worked in the IT department as a systems analyst / worked on a SAP implementation project to implement new procedures, etc.) indicated that fifty percent (50%) had work exposure. In addition, eighty-three percent (83%) of all participants indicated that they attended IT-architecture modelling courses.

Questions regarding prior work exposure to business process modelling (e.g. worked as a business process manager at a plant, modelling their processes, etc.) indicated that fifty-eight percent (58%) had work exposure. In addition, seventy-five percent (75%) of all participants indicated that they attended business-modelling courses.
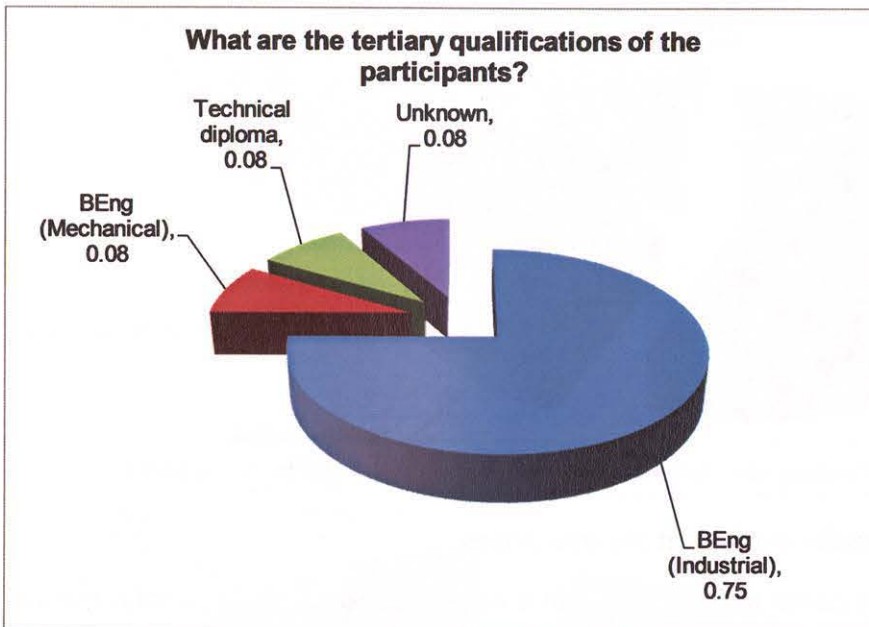


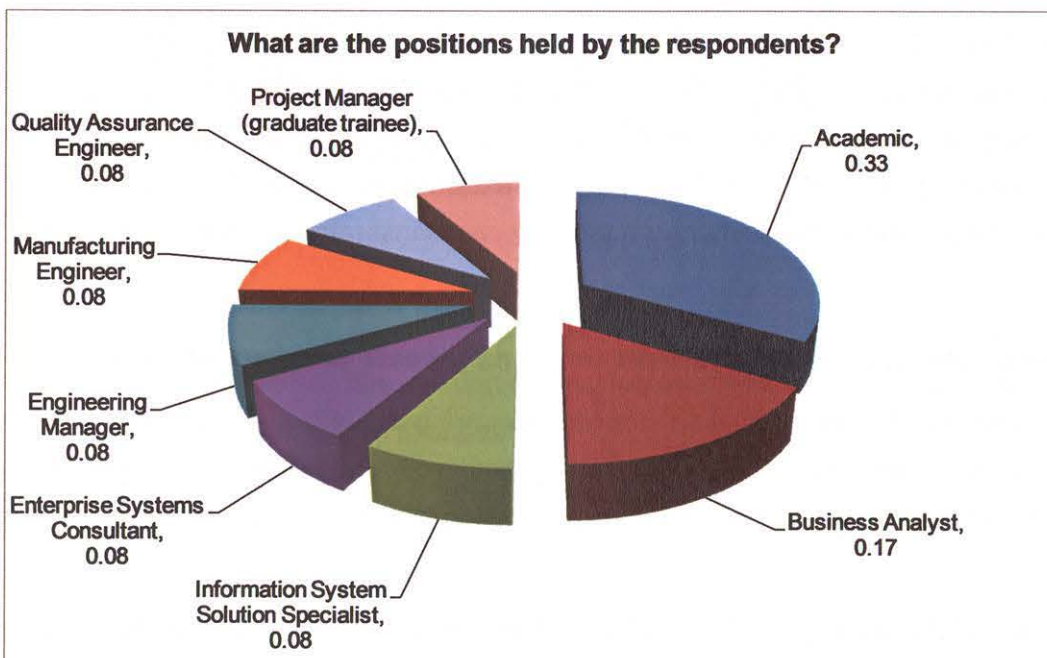**Figure 85: Tertiary qualifications of the participants**



**Figure 86: Positions held by participants**

## 10.3.2    Parameter 2: Enterprise profile

The *enterprise profile* parameter provides an indication of the size and type of enterprises that were used by the participants during the experimentation process.

Although a large portion (33%) of the enterprises that were used for analysis purposes by the participants employed between 100 and 10 000 employees (Figure 87, purple section), small and medium-sized enterprises were also represented (22%) (Figure 87, light-blue section).
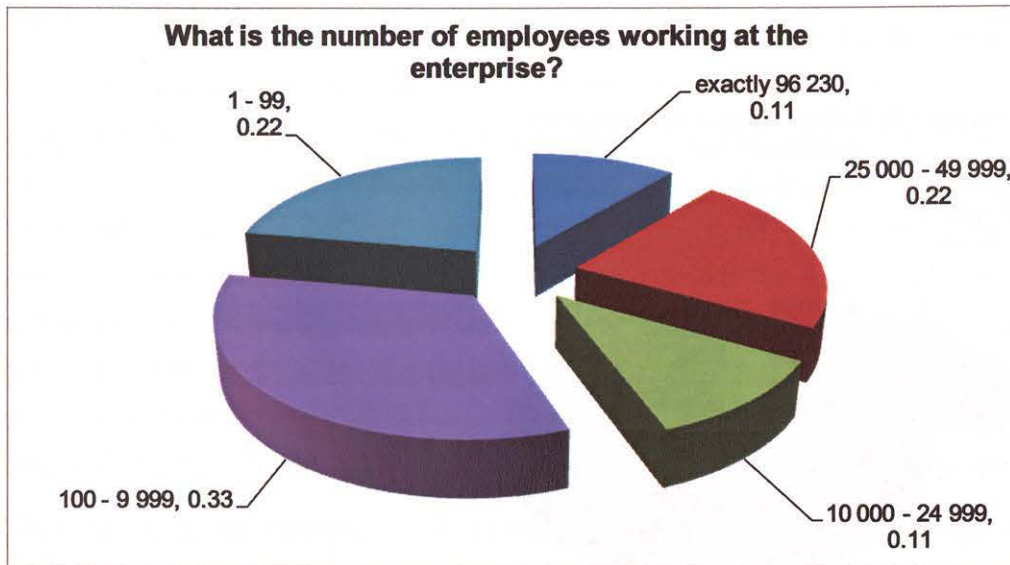


**Figure 87: Number of employees working at the enterprises**

As *four* of the *twelve* participants selected the same enterprise for analysis, a total number of *eight* (8) enterprises were analysed. From the *eight* (8) enterprises, a wide spread of twenty (20) business activities were involved – an enterprise could be involved in multiple business activities. The activities included research (4 out of 8), the automotive manufacturing (3 out of 8), chemicals (3 out of 8), industrial manufacturing (2 out of 8), application service provider (2 out of 8), construction/engineering (2 out of 8), natural resources (2 out of 8), oil and gas (2 out of 8), outsourcing (2 out of 8), and 11 remaining business activities, each represented by one enterprise (1 out of 8). Business activities that were excluded include aerospace and defence manufacturing, media and entertainment, financial services/insurance, health care, travel and transportation.

## 10.3.3    Parameter 3: Standard practices for doing process architecture work

The *standard practices for doing process architecture work* parameter provided an indication of the level of process architecture maturity of the analysed enterprises. The questionnaire therefore gathered data about the use of process modelling languages and architecting software tools.

The study indicated that the eight enterprises used three process modelling languages, of which UML (40%) and ARIS (30%) are well represented (see Figure 88). In addition, three different

architecting software tools were used, of which MS Visio (50%) and ARIS (30%) are well represented (see Figure 89).
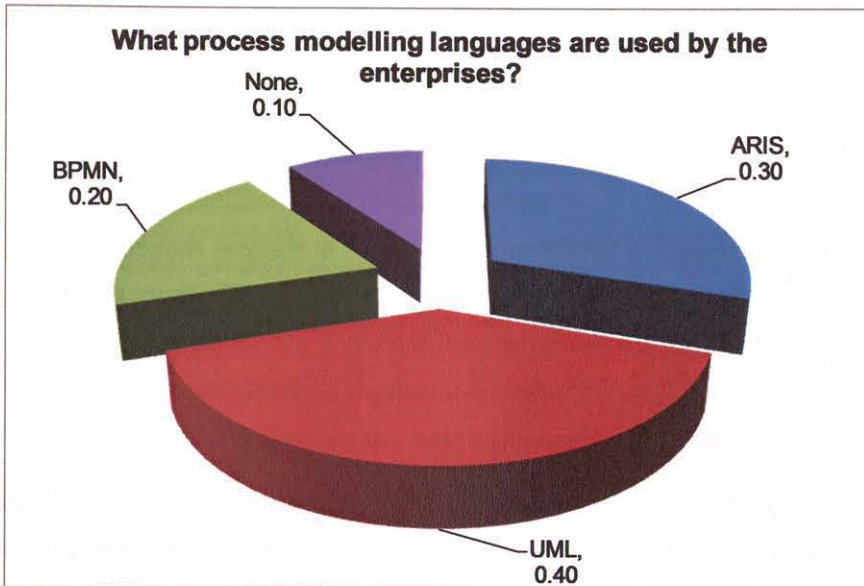


**Figure 88: Process modelling languages used**
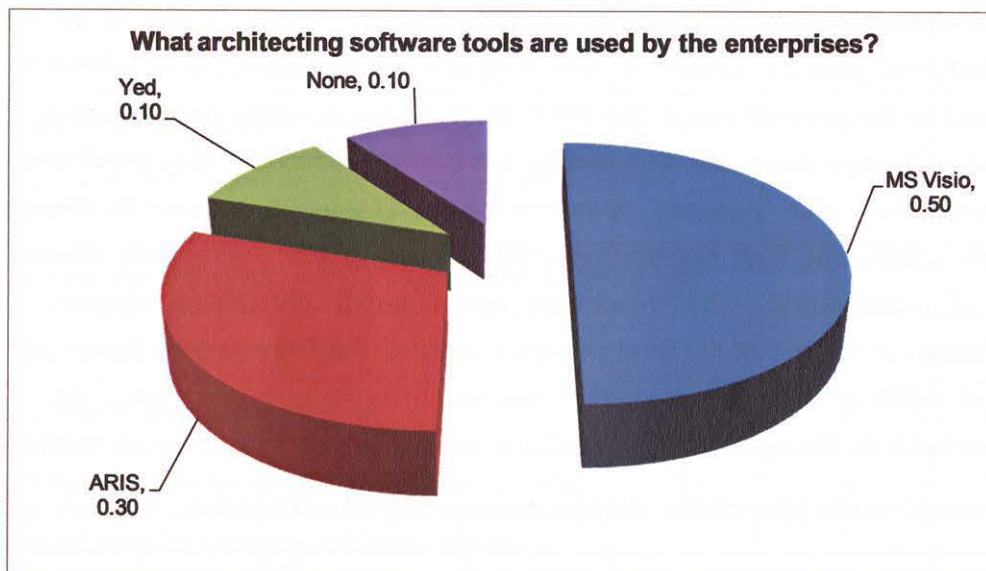


**Figure 89: Architecting software tools used**

**10.3.4    Parameter 4: The perceived usefulness and ease-of-use of the PRIF method, mechanisms and practices**

One way of measuring opinions about the *usefulness* and *ease-of-use* of the PRIF *method, mechanisms and practices*, is to use a Likert scale (previously discussed in section 2.4.2). Although the five-point Likert scale is popular (Rea & Parker, 2005), this study used a four-point scale, which forced the *twelve* participants to either agree or disagree, disallowing a neutral position. The interpretation of the four-point scale is as follows:

| Value | Description |
|-------|-------------|
| 1 | Strongly disagree |
| 2 | Disagree |
| 3 | Agree |
| 4 | Strongly agree |

This thesis did not aim to confirm or reject a hypothesis based on statistical results, but rather use the statistical analysis to highlight areas that require further research. Descriptive statistics were calculated according to the formulas for *average* and *standard deviation* in section 2.4.2. In addition, open-ended questions allowed participants to comment on difficulties experienced in using the PRIF *method, mechanisms and practices*.

Table 20 provides descriptive statistics on the question results related to the *usefulness* category. The averages (Table 20, column 4, *Average*) indicate that participants were overall positive with respect to the *usefulness* of the PRIF *method, mechanisms and practices*, with no minimum score below 2 (disagree). The comments that resulted from the open-ended questions (discussed later) reveal more insight.

Table 21 provides descriptive statistics on the question results related to the *ease-of-use* category. The averages (Table 21, column 4, Average) indicate that participants were overall positive with respect to the *ease-of-use* of the PRIF *method, mechanisms and practices*. The minimum scores of 1 (strongly disagree), selected for two of the questions (Table 21, column 1, ii and iii) also corresponds with standard deviations of 0.9 (Table 21, column 5, *Standard deviation*). The low scores and high standard deviations indicate that participants differed in their confidence of understanding the interaction model (actor transaction diagram and transaction result table) at the end of the fourth contact session. Participants also disagreed on the consistency of wording using in the PRIF *method, mechanisms and practices*. The comments that resulted from the open-ended questions (discussed later) reveal more insight.

**Table 20: Questions and results (descriptive statistics) measuring the usefulness**

| Question -> Descriptive Statistics | Minimum | Maximum | Average | Standard deviation |
|---|---|---|---|---|
| The method, mechanisms and practices provided a structured approach to identify the required levels of process standardisation (i.e. transaction re-use) enterprise-wide, as required from the operating model (Ross et al., 2006) | 2 | 4 | 3.25 | 0.62 |
| The interaction model could be used to identify similarities between business units. | 3 | 4 | 3.58 | 0.51 |
| I (as EA practitioner) thoroughly explained the use and purpose of interaction model to the **business unit manager**, prior to his/her verification of the interaction model. | 2 | 4 | 3.25 | 0.62 |

| Question -> Descriptive Statistics | Minimum | Maximum | Average | Standard deviation |
|---|---|---|---|---|
| The method, mechanisms and practices were well-accepted by the **business unit manager** during verification of the interaction model. | 2 | 4 | 3.17 | 0.72 |
| Given the nature of the core activities in my company, I (as EA practitioner) do believe that there is a need for process standardisation across the core activities. | 2 | 4 | 3.33 | 0.78 |
| I (as EA practitioner) would recommend the use of the method, mechanisms and practices to our enterprise to identify transaction re-use opportunities enterprise-wide. | 2 | 4 | 3.50 | 0.80 |

**Table 21: Questions and results (descriptive statistics) measuring the ease-of-use**

| Question -> Descriptive Statistics | Minimum | Maximum | Average | Standard deviation |
|---|---|---|---|---|
| **Content supporting the interaction model, (part of the method, mechanisms and practices)** | | | | |
| i)The DEMO-contents (on ClickUP and handouts about the interaction model) assisted me (the EA practitioner) with understanding the presentation content prior to attending the presentation session about the interaction model. | 2 | 4 | 3 | 0.74 |
| ii) I (as EA practitioner) felt confident in my understanding of the interaction model (actor transaction diagram and transaction result table) at the end of the related presentation sessions. | 1 | 4 | 3.08 | 0.90 |
| **Ease of use of the PRIF method, mechanisms and practices** | | | | |
| iii) The wording was consistent. | 1 | 4 | 3.42 | 0.90 |
| iv) The process sequence is clear. | 2 | 4 | 3.25 | 0.62 |
| v) The *applicable mechanisms and practices* provided on the method-roadmap are clear (given the additional content provided during contact sessions/handouts). | 2 | 4 | 3.08 | 0.51 |
| vi) The *motivations, considerations and Implications* on the method-roadmap are helpful in terms of the correct use of the method. | 2 | 4 | 3.08 | 0.51 |

The following section provides a summary of the responses to the four open-ended questions. Resulting comments have also been re-allocated to the open-ended questions (Questions 1, 2, 3 and 4 below) to consolidate duplicate results. Due to the re-allocation of comments to questions, Questions 1 to 3 provide *critical comments*, pertaining to the *usefulness* and *ease-of-use* of the *method, mechanisms and practices*, whereas Question 4 provides *positive comments*. Additional **interpretive comments** (made by the researcher) are also provided.

*Question 1: Please provide reasons if you scored any of the options related to <u>usefulness (of the method, mechanisms and practices)</u> with either a '1' or '2'.*

- Although process standardisation is required, *processes require agility* to suit customer requirements, which would imply that processes could change bi-weekly. A template process may be a better solution.

- One enterprise (analysed by a participant) *already standardised* its core processes using an enterprise-specific standard process model, which limits the value of the PRIF *method, mechanisms and practices.*

- For *enterprises that provide client solution services*, the method, mechanisms and practices *do not allow for the standardisation* of software applications across various transactions. It is recommended that the full use of the method, mechanism and practices be *excluded for solution provider enterprises*. **Interpretive comments:** the focus should perhaps not be on standardising software solutions for clients, but standardising on software applications that the consultant use in building software solutions.

*Question 2: If you did not feel confident in using the interaction model, specify the difficulties or problems that you experienced with the model, i.e. commenting on the <u>ease-of-use of the interaction model</u>.*

- Being used to process flows, the actor transaction diagram requires a *different way of thinking*, i.e. identifying enclosed transactions to model end-to-end processes. *Enclosed transactions* require additional explanation/examples. The interaction model needs further refining, as it *differs from the standard process flows* normally used at enterprises to communicate business processes.

- There is a need to *incorporate support transactions* that form part of the end-to-end process view of the enterprise.

- Using the mindset of a process flow, it is *difficult to verify the completeness* of actors and transactions in the actor transaction diagram (ATD), as the ATD does not highlight transaction sequence/dependencies.

- There is a *need for conditional transactions* / decision transactions. **Interpretive comments:** conditions are modelled using other ontological models, namely the process model and action model, rather than the interaction model.

- Prior to modelling the actor transaction diagram, some participants wrote a business summary to highlight performa actions, which is difficult. *Distinguishing between ontological, infological and datalogical transactions* is difficult.

- It is difficult to identify actors where systems are the initiators of transactions. **Interpretive comments:** Although posed as a problem, Dietz (2006) states that systems cannot initiate ontological transactions. The participant thus included infological / datalogical transactions, which highlights the problem of *distinguishing between ontological, infological and datalogical* transactions.

- Identification of *actor roles* is difficult where a single individual acts out different roles at the enterprise. The difficulty is evident in small enterprises, where single individuals take responsibility for numerous transactions. It is difficult to extract transactions.

- Class examples and examples obtained from articles on using the interaction model were too elementary. More *complex examples are required*.

- The interaction model is *difficult to explain* to a first time audience. It should not require more than 5 minutes of explanation, since managers do not have the time for intensive presentations about a new proposed methodology. **Interpretive comments:** the comment should be contrasted with that of another participant who expressed his/her astonishment at the simplicity of representation: "The actor transaction diagram can be *easily understood*, which is an advantage if business managers do not have time for training".

*Question 3: Discuss difficulties (if any) that you experienced in using any of the mechanisms and practices, i.e. commenting on the <u>ease-of-use of the entire method, mechanisms and practices</u>. Provide reasons and recommended changes.*

- The terminology in the methods and practices needs *additional qualification*, e.g. 'pools of excellence' was not qualified. The terminology is very technical.

- It was difficult to make a *distinction between business unit type and business units*.

- It is challenging to *obtain the required information and data* in the *allocated time period*. It is difficult to meet with business unit managers with short notice, especially when the purpose of the meeting is not directly related to the business.

*Question 4: Provide any comments/experiences related to the use of the method, mechanisms and practices.*

- It is a *useful method* to study the potential standardisation of the various departments. The opportunity for standardisation is important to help save costs in terms of licences. When software is standardised, it becomes easier to execute control and possibly integrate business units by sharing information effectively.

- The structured approach followed by the method, mechanisms and practices makes it *easy to use*. The concept of process standardisation is complex and this method simplifies it as much as possible by *guiding the user in every step* that is needed.

- The interaction model reflects the *empowerment of employees*, and the roles that they play in aiding *strategic alignment*.

- By developing an interaction model, it will be possible to derive/construct an action model, which *focuses on the implementation* of which an enterprise can greatly benefit.

- The interaction model maps all the transactions in a *clear way* and organises the activities within a business extremely well.

The results indicate some problems in terms of the *usefulness* and *ease-of-use* in using the PRIF *method, mechanisms and practices*. The following section provides an interpretation and summary of the results.

## 10.4 INTERPRETATION AND SUMMARY OF RESULTS

Based on the results of the previous section (section 10.3), this section provides a summary and interpretation of the results obtained, referring to the four parameters (Figure 84) that influence the *usefulness* and *ease-of-use* of the PRIF *method, mechanisms and practices*. Since the study applied a relative small *convenience sample* (*twelve* participants), the statistical results could not be used to generalise findings about the *usefulness* and *ease-of-use*. Yet, the statistical results highlighted areas that require further inquiry and/or improvement.

In terms of the *participant profile (Parameter 1)*, thirty-three percent (33%) of the participants were *academics,* whereas the remaining participants represented a spread of positions related to the core *business activities*, i.e. excluding supporting activities, such as finances, HR and infrastructure. The sample thus allows for critical evaluation from both academic and core business viewpoints. Participants also had sufficient knowledge of information systems and business process modelling.

Concerning the *enterprise profile (Parameter 2)*, small, medium and large enterprises were all represented, and enterprises were involved in a large number of business activities including research, the automotive manufacturing, chemicals, industrial manufacturing, application service provider, construction/engineering, natural resources, oil and gas, outsourcing, and 11 less-represented business activities. Business activities that were excluded are aerospace and defence manufacturing, media and entertainment, financial services/insurance, health care, and travel and transportation.

In terms of the *standard practices for doing process architecture work (Parameter 3)* the study indicated that two process modelling languages were well represented (UML (40%) and ARIS (30%)), whereas two architecting software tools were well represented (MS Visio (50%) and ARIS (30%)).

Quantitative results pertaining to the *perceived usefulness* and *ease-of-use of the PRIF method, mechanisms and practices (parameter 4)*, are positive. Pertaining to *ease-of-use*, two of the questions obtained minimum scores of 1 (strongly disagree), which corresponded with high standard deviations of 0.9. The low scores and high standard deviations indicate that participants differed in their confidence of understanding the interaction model (actor transaction diagram and transaction result table) at the end of the fourth contact session. Participants also disagreed on the consistency of wording using in the PRIF *method, mechanisms and practices.* The comments that resulted from four open-ended questions revealed more insight and are summarised in Table 22 and Table 23. Both tables comment on additional problems and pose suggestions to improve the PRIF *method, mechanisms and practices* based on the feedback from participants (Table 22 / Table 23, *Problem awareness / suggestion*), which could lead to another design cycle, but not covered in this study.

**Table 22: Summarised comments on the usefulness of the PRIF method, mechanisms and practices**

| Comments on usefulness | Problem awareness / suggestion |
|---|---|
| Although process standardisation is required, processes require *agility* to address customer requirements. | The purpose of the *foundation for execution* approach, is to digitise core business processes, making "the individual processes less flexible while making a company more agile" (Ross et al., 2006, p. 4). The PRIF *method, mechanisms and practices* enhances the OM, in identifying opportunities to reuse processes. However, as Ross et al. (2006) indicate, enterprises may also choose a diversification/coordination OM, deciding not to pursue process standardisation. As stated by Hitchins (2003), perception of *value* (in this case the value of the PRIF *method, mechanisms and practices*) is relative (not absolute) and highly context base.<br><br>**Suggestion:** Prior to using the PRIF *method, mechanisms and practices*, the enterprise should have the need to identify process standardisation opportunities. |
| Enterprises that have already standardised the core processes, do not need the PRIF *method, mechanisms and practices*. | In its aim to enhance the OM, the PRIF *method, mechanisms* will only be of value to enterprises that do not have a *foundation for execution*.<br><br>**Suggestion:** As suggested before, a prerequisite for using the PRIF *method, mechanisms and practices*, is that the enterprise should have the need to identify process standardisation opportunities. |
| For enterprises that provide client solution services (e.g. software applications), the *method, mechanisms and practices* do not allow for the standardisation of software applications across various transactions. | The interaction model provides the ontological knowledge of the enterprise as a system (Dietz, 2006), that produces products and/or services to the environment. If an enterprise delivers software applications as products to the environment, the PRIF *method, mechanisms and practices* should be used to identify process reuse opportunities in *developing and delivering* the software applications to clients.<br><br>**Suggestions:** The PRIF *method, mechanisms and practices* should emphasise the intent to identify process reuse opportunities pertaining to the *operation of the enterprise*. |

**Table 23: Summarised comments on the ease-of-use of the PRIF method, mechanisms and practices**

| Comments on ease-of-use | Problem awareness / suggestion |
|---|---|
| Being used to flow charts, a paradigm shift to the modelling required by the interaction model, is difficult. In the interaction model, the concept of end-to-end process flows are addressed via *enclosed transactions* and need more explanation. There is also | The interaction model enhances the end-to-end view of processes via the wholeness of the transaction pattern. Contrary to almost all implementations of enterprises that separate sales from delivery, the interaction model emphasises the indivisible responsibility of taking customer orders, satisfying them and delivering the result (Dietz, 2006, p. 170).<br><br>However, the use of a system boundary (e.g. a business unit as a sub-system of the enterprise) only includes transactions that are executed within the boundary of the business unit, thus excluding transactions that are required |

| Comments on ease-of-use | Problem awareness / suggestion |
|---|---|
| the need to incorporate support transactions that form part of the end-to-end process view of the enterprise. | by an end-to-end process, but executed by other departments (e.g. support departments).<br><br>**Suggestion:** Although the PRIF *method, mechanisms and practices* only claim to identify process re-use opportunities at an enterprise, by comparing different business units, a different *boundary* will be required when analysing end-to-end processes for performance improvement. |
| It is difficult to verify the completeness of actors and transactions, as the actor transaction diagram (ATD) does not highlight transaction sequence/dependencies.<br><br>There is a need for conditional transactions / decision transactions. | The sequence/dependencies/conditions are modelled using different ontological aspect models, i.e. the process model and action model. Verification in terms of completeness only takes place based on the action model. According to Dietz (2006, p. 185) the action model is the "most detailed and comprehensive aspect model. It is atomic on the ontological level".<br><br>**Suggestion:** Practitioners not only need to have an in-depth understanding of the interaction model prior to using the PRIF *method, mechanisms and practices*, but also of the other ontological aspect models, especially the process model and action model. Additional modelling (using the process model and action model) may be required to verify completeness of transactions. |
| It is difficult to distinguish between ontological, infological and datalogical transactions. | The problem is aggravated if the main business activity is to render information services.<br><br>**Suggestion:** More practice and examples are required, including an example where the main business of the enterprise is to deliver information services. |
| It is difficult to identify actor roles where a single individual acts out different roles at the enterprise, especially in the case of a small enterprise. | The problem is that multiple iterations are required to create a comprehensive interaction model; self-activation transactions are easily missed/left out.<br><br>**Suggestion:** Multiple iterations are required in verifying the interaction model. The PRIF *method, mechanisms and practices* need to reflect the iterative nature of building the interaction model for a business unit type. |
| More complex examples of the interaction model are required. | **Suggestion:** Case studies, using the interaction model to represent different types of enterprises, are required. |
| The interaction model is difficult to explain to a first time audience. | A Microsoft PowerPoint presentation was used to explain the interaction model within the context of the theoretical background provided by Dietz (2006), within 30 minutes to departmental managers. The interaction model does however require a paradigm shift for those used to process flowcharts.<br><br>**Suggestion:** A short presentation needs explication (as an additional *mechanism*), in selling the value of the interaction model and its relationship with 'flat' process modelling techniques (e.g. flow charts) to a first time audience. |
| The terminology in the methods, mechanisms and practices needs additional qualification, e.g. 'pools | **Suggestion:** Some of the mechanisms and practices need additional qualification. |

| Comments on ease-of-use | Problem awareness / suggestion |
|---|---|
| of excellence' was not qualified. The terminology is very technical. It was difficult to make a distinction between business unit type and business units. | |
| It is challenging to obtain the required information and data in the allocated period, as business unit managers were not available. | The problem is a result of the deadlines provided for the task and not a deficiency of the method, mechanisms and practices.<br><br>**Suggestion:** The research process should be more flexible regarding time constraints. |

## 10.5   CONCLUSION

This chapter evaluated the PRIF to conclude the main design research cycle, *evaluation* and *conclusion*.

The chapter provided a motivation for an appropriate evaluation method to evaluate the PRIF, i.e. using two measures (*usefulness* and *ease-of-use*) to evaluate the second part of PRIF (the PRIF *method, mechanisms and practices*). According to the results, research participants were positive towards the *usefulness* and *ease-of-use* of the PRIF *method, mechanisms and practices*. However, qualitative feedback suggested further improvement of the PRIF *method, mechanisms and practices*, which may be incorporated in future research.

Part C developed the PRIF using *design research* as the *primary research design component* of this study. The use of BIAM (as developed in Part B) was also demonstrated during the development of the PRIF. BIAM was developed, using *exploratory design* as the *supplementary research design component* of this study. The final part (Part D) concludes on the BIAM and PRIF as the two main contributions of this thesis.