An Empirical Evaluation of Requirements Elicitation from Business Models through REMO Technique

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Abstract: The Requirements Elicitation oriented by business process MOdeling (REMO) technique presents a set of heuristics to support the elicitation of requirements based on business process models. Although empirically validated only in controlled environments, the literature does not report evidence regarding the applicability of the technique in real scenarios. In this context, this paper presents an empirical evaluation applied in an industrial settings, using a multimethod approach, where a quantitative analysis measured the applicability of the technique and a qualitative analysis the utility and ease of use according to requirements analysts. As for the results, the quantitative analysis made it clear that the REMO technique can bring real benefit in the context of the study, identifying a higher number of funcional requirements than the conventional approach (without the support of the REMO technique). This benefit is reached without overcomplicating the task of eliciting requirements.

1 INTRODUCTION

Considering a cycle of software development or modernization, the requirements elicitation and specification activities prove itself essential to fulfill the user's necessities (Wiegers and Beatty, 2013). For this reason, different techniques were proposed in the literature, going from notations representing requirements in different levels of abstraction— such as features, goals, problem frames, and use cases (Kang et al., 1990; Van Lamsweerde, 2001; Jackson, 2001; Yu, 2011; Jacobson, 2004)- to practices that seek to favor the extraction and understanding of requirements (Jackson, 2001; Van Lamsweerde, 2009; Jacobson et al., 1999).

Besides that, for certain application domains, there is a growing need to align the business processes with the enterprise information systems (Regev et al., 2005). As such, it is being recommend to carry out activities for understanding and improving business processes before the development of enterprise systems (Bleistein et al., 2006; Ramesh et al., 2005; Dietz and Albani, 2005; Regev et al., 2005). Some authors argue that software needs arise naturally through the mapping of business processes; meanwhile, recent works present techniques to extract requirements through business processes mapping, usually described in notations such as BPMN (Business Process Modeling Notation) or Petri Nets. This is one of the objectives of the REMO (Requirements Elicitation Oriented by Business Process Modeling) technique, for instance. It presents a set of heuristics for the elicitation of requirements through business process models in the BPMN notation (Vieira et al., 2012b).

Recent empirical studies have been performed to verify to process of requirements elicitation through the REMO technique, however not including industrial case studies in their protocol (Vieira et al., 2012b; Vieira et al., 2012a). The lack of industrial validation often hinders practitioners from understanding and generalizing the benefits with the adoption of the technique in real situations. Considering such gap, this paper presents an empirical study about the fe-

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asibility of adopting the REMO technique in industrial situations. The REMO technique presents a set of heuristics to identify requirements from processes models described in BPMN—notation used in our research context (Section 2). Accordingly, we decided to experiment with this technique in order to reduce the efforts related to requirements elicitation from business processes. With this, the main contributions of this article are:

- The report of an empirical investigation of the REMO technique in a industrial and non-trivial context (Section 3 describes how it was conducted).
- The observation that the REMO technique is effective to identify around 80% of the requirements related to business processes and that its heuristics are easily absorbed by requirements analysts (Section 4).

The previous studies, carried out by a different group of researchers that design the REMO technique, present some limitations. First, they analyzed only one process with a well-defined scope and small complexity. Second, the previous studies were conducted within an academic context, considering only undergraduate students as participants. Differently, here a set of software engineering practitioners use the technique REMO for eliciting requirements from 15 different processes.

These results have a significant implication: at least in the context in which this research was carried out, using the REMO technique could reduce the costs of training the requirements analysts for the task of requirements elicitation through business processes. We believe such results could be achieved in similar domains. Besides the sections mentioned above, this paper also describes the threats to the validity of our empirical study (Section 5), relates our results to those of other existing research studies (Section 4), and presents some final considerations and future works (Section 6).

2 BACKGROUND

This research was conducted in the context of a technical cooperation project between a university and a Military Institute, with the objective of mapping business processes and than extracting requirements in the domain of material supplying management of a large Brazilian Government Agency. The results of the project subsidy the modernization of an enterprise system for that domain.

2.1 Research Context

In the beginning of the project, and based on information gathered from the agency's own manuals, nine modules were defined, four of which are of problem domain character for representing the entire life cycle of the material supplying. These are: Planning, Acquisition, Controlling, and Discarding. The other modules act as support to the value chain, such as Maintenance, Finances, Transportation, Identification, and Allocation of material. From this initial gathering, it was realized the need to specify more than 230 related processes, and then identify high level requirements that would be used to guide an effort to modernize a legacy system.

To reach such objectives, two teams were created: one to model the business processes, generating BPMN diagrams and the descriptive documents of the processes; and the other to identify functional requirements detailed as epics, features, and user stories. That requirements elicitation effort, which should start during the activities of business process modelling, formulates a document entitled *Requirements Document*, which specifies the business problem and the high-level requirements that present significant value to the context of the expected solution. Using this approach, it is possible to identify opportunities for automating some of the business processes' activities in the new version of the software under development. The project has been going on for 18 months, already culminating on the mapping of 192 business processes and requirements documents. Together, they encompass approximately more than 1000 functional requirements.

The two teams previously mentioned work in close collaboration. That is, requirements analysts participate in the business modelling activities effectively (by showing up in all meetings, for instance). While the specification of a business process is being consolidated, members of the requirements team manually derive the functional requirements from the business processes diagrams, which later give origin to the requirements document that is validated by the stakeholders (including the agency's IT sector). This time-consuming manual effort approach of requirements identification (named hereafter as our *conventional approach*) motivated us, more recently, to empirically evaluate the efficacy of the REMO technique in our context.

2.2 The REMO Technique

The REMO technique (Vieira et al., 2012b) is a requirements elicitation technique oriented by business

process modelling, which was proposed by a different team of researchers. It consists on using heuristics based on the metamodel elements (activities, gateways, messages, and artifacts) found in BPMN diagrams, to help the systems analysts to extract software requirements.

As an example of the REMO technique, consider the BPMN diagram from Figure 1. From the following REMO heuristics, it was possible to identify three functional requirements (as detailed in Table 1).

(H1) Process Activities shall be supported by the functional requirements the system will provide.

(H2) Process Gateways might be related to either functional requirements or business rules the system must support.

(H3) Data Objects might also reveal functional requirement, particularly when the related concepts must be managed by the system.

Five steps were defined for the activity of requirements elicitation using the REMO technique (Vieira et al., 2012b). This way, the analysts should obtain the requirements according to a sequence of steps that involve

(1) Comprehend the Business Processes Model notation.

(2) Identify functional requirements.

(3) Identify non-functional requirements.

(4) Identify the business rules.

(5) Review all identified requirements.

The original specification of the REMO technique details nine heuristics to support analysts to identify requirements from business process models. For instance, there is a heuristic that recommends an one-to-one mapping of a business process activity into either a functional or a non-functional requirement. Similarly, the authors suggest that a *time-event* might be translated into either a business rule or functional requirement.

For our study (detailed in the next section), we excluded the first step, as the team had already received a training in Business Processes Modelling using BPMN, and were already acquainted with the BPMN elements. The REMO heuristics support the steps 2, 3, and 4 enumerated above.

3 STUDY SETTINGS

This section describes some details regarding how the case study was conducted, defining the protocol, goals, and processes to conduct our empirical evaluation.

3.1 Objectives

The main goal of this study was to verify the efficacy of the REMO technique in a real context of requirements extraction from business processes and, in this way, fill a gap related to the lack of empirical studies conducted in the industry and related to this domain.

The term efficacy in this paper refers to the use of the REMO technique to identify the software requirements with a coverage similar to what would be achieved using a more conventional approach, which was used during the conduction of the cooperation project described in Section 2. If the REMO technique can be applied in real situations, the costs with requirements elicitation could be initially reduced, since in a more extreme scenario, it would not be necessary to have requirements analysts participating in the activity of mapping business processes—actually, it would be enough to apply the heuristics of the REMO technique to obtain the requirements.

To reach the objective of this study, we established the measurement objective presented in Table 2, following the principles of the GQM (Goal, Questions, and Metrics) paradigm proposed in (Basili, 1988).

From the measurement objective established in Table 2, we defined the following research questions to help the team to understand if the objective was reached, and then we defined metrics for each question.

(RQ1) How effective is REMO as a requirement elicitation technique?

(RQ2) What is the perception of the analysts regarding the usage of the REMO technique?

As presented by (Vieira et al., 2012b), the efficacy of the REMO technique was evaluated in a previous work by comparing the percentage of requirements classified as correct with a baseline specification built by specialists. Differently, here we analyze our research questions under a different light: although the REMO technique might find additional requirements (when compared to what would be the conventional technique's oracle), this does not necessarily mean a negative aspect of the technique. Rather, this might indicate that some requirements possibly escaped with the adoption of the conventional technique.

In addition, a requirement identified in the conventional technique, but not in the REMO one, is considered *a transparent requirement* in the business processes model. Escaped requirements suggest a higher efficacy in the REMO technique, which allowed for

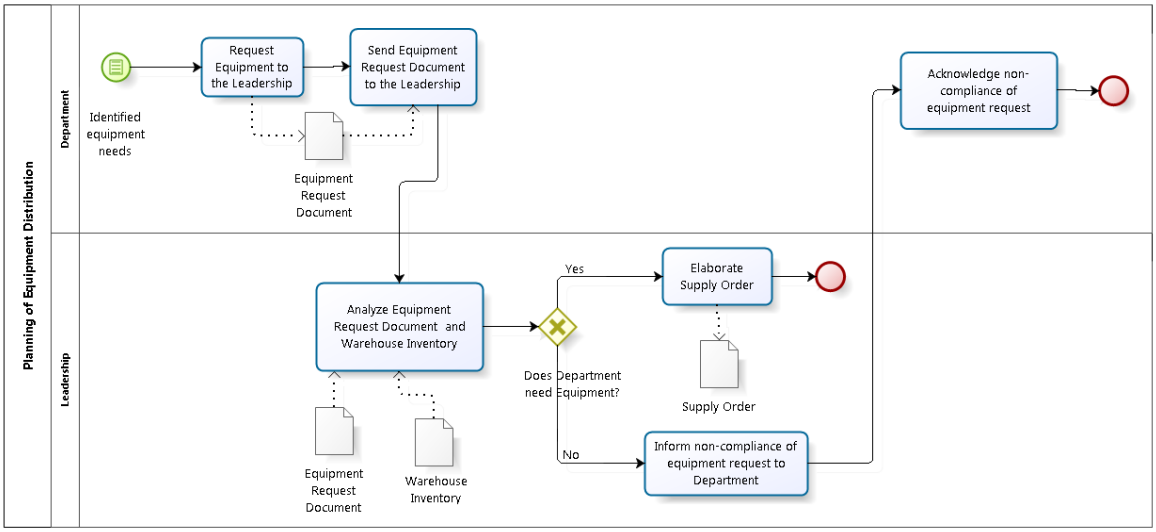

Figure 1: BPMN Diagram.

Table 1: Requirements of REMO.

Cod	Name	Description	Heuristic
RF01	Request Equipment	The system should ensure the Department to Request the Equipmentto the Leadership.	H1 - Activits of Process H3 - Data Object
RF02	Consult of Inventory	The system should consult the warehouse inventory.	H1 - Activits of Process H3 - Data Object
RF03	Evaluating Equipment Request	The system should ensure that the department requests the equipment from the Leadership	H1 - Activits of Process H2 - Gateway

the identification of a non-elicited requirement with the conventional technique. Differently, a transparent requirement suggests that the adoption of the heuristics of the REMO technique alone is not enough for the software requirements elicitation through business processes.

The analysis of escaped and transparent requirements provide quantitative indicators regarding the efficacy of the REMO technique. Additionally, a qualitative analysis, supported by a questionnaire that follows the TAM (Technology Acceptance Model) approach and similar to the one adopted in (Vieira et al., 2012b), was conducted with the requirements analysts. This qualitative analysis seeks to obtain the perception of the analysts in the field of requirements regarding the usage of the REMO technique, and can be considered a replica of the previous study about the REMO technique. The remaining of this section presents more details about the protocol used during the execution of the empirical study.

3.2 Participant Characterization

Six requirements analysts were conveniently selected to participate in the case study, as they were involved in the cooperation project described in Section 2. These analysts were reasonably acquainted with the supplying management field, having participated in processes mapping meetings and requirements extraction activities for at least six months (using the traditional approach). They were all involved in training for the procedures used in the task of creating the Requirements Document, which was done through the business processes mapping activities. The participants received an initial orientation regarding the case study to be accomplished, and were instructed to read the articles and the dissertation that detail the REMO technique (Vieira et al., 2012b; Vieira et al., 2012a).

Table 2: Research Goals.

Analyze:	the REMO technique.
With the purpose of:	Investigate its effectiveness in a real context.
Regarding:	the task of requirements elicitation and easy of use.
Considering the perspective of:	Requirements analysts.
In the context of:	A real software modernization efforts.

3.3 Protocol Definition

The case study took into account fourteen business processes, randomly selected from a pool containing approximately 190 processes that had been previously mapped in the cooperation project. These processes, though pertaining to the field of supplying management, describe the workflow of areas from different logistics roles (such as Planning, Controlling and Maintenance).

The requirements documents related to the fourteen business processes acted as specification baselines (oracles) using the conventional approach for the extraction of the metrics used to estimate the efficacy of the REMO technique. The processes were divided between the participants of the current project team, where each one executed the REMO technique in the different selected processes. Each participant also received a list with the heuristics defined by the REMO technique, the description and the diagram of the process, as well as a document to register the requirements identified by the technique.

3.4 Data Analyses Method

The data extracted from the questionnaires with the participants of the study were analyzed using two qualitative approaches. Firstly, the TAM model proposed by (Davis, 1989) to instigate the acceptance of the REMO technique by the requirements analysts. TAM is an adaptation of a theory originated from psychology, the TRA (Theory of Resonated Action), but focused on the field of information technology (Davis, 1989) and with the intention of explaining what makes a person accept or reject an information system (Surendran, 2012). To achieve the objectives set by the TAM, we utilize two perspectives: one regarding the utility and another the easiness of use. The first corresponds to the degree to which a person believes the use of a certain technique can improve their work performance. As for the second, it corresponds to the degree to which a person believes that the usage of a certain technique can be effort-free (Davis, 1989).

4 RESULTS

In this section, we present the results of the quantitative and qualitative analyses of the study, with the application of the data analyses method described in Section 3.

4.1 Quantitative Analysis

As mentioned in Section 3, the quantitative analysis considered the specification of randomly selected processes, which had been previously validated with respect to criteria such as correctness, content and formatting. It is possible to verify the summary of the quantitative results in Table 3. Besides that, Table **??** presents some descriptive statistics related to the generated artifacts. The first computed metrics were the escaped and transparent requirements. The boxplot in Figure 2 summarizes the results. It is possible to see that the amount of requirements identified by the REMO technique, and not identified explicitly in the conventional approach, is more expressive than the amount of transparent requirements, that is, identified in the conventional approach but not in the REMO technique.

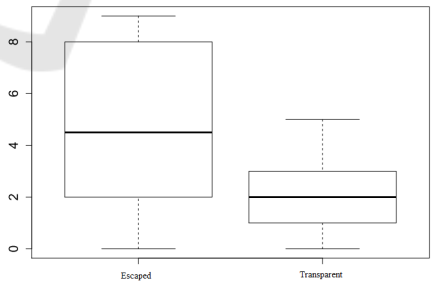

Figure 2: Escaped Requirements x Transparent Requirements.

This result can be explained through two different views. First, the conventional approach does not follow a systematic approach and then team could not have identified all the potential requirements related to a business process. Another possible explanation is

Table 3: Summary of the Quantitative Results. (Proc) corresponds to the Processes, (RF) corresponds to the amount of functional requirements identified by the REMO technique, (RNF) corresponds to the non-functional requirements and business rules identified by the REMO technique, (RED) corresponds to the requirements identified by the traditional approach, (RAd) corresponds to the transparent requirements, (REsc) corresponds to the escaped requirements, (RFP) corresponds to the false-positives identified in the REMO technique and (ISE) corresponds to the survival index of the escaped requirements. The other columns give a general idea of the complexity of the processes considered in the investigation.

Proc.	RF	RNF	RED	Escaped	RAd	RFP	ISE (%)	Activ.	Gateways	Events
P1	8	7	5	3	2	2	33.33	25	7	4
P2	11	2	14	5	3	2	60.00	68	14	25
P3	17	4	21	9	0	6	33.33	87	27	28
P4	18	1	10	4	4	4	0.00	44	14	16
P5	20	1	15	6	2	2	66.67	58	10	6
P6	11	1	14	2	5	1	50.00	59	14	19
P7	5	1	8	0	2	0	-	31	9	17
P8	12	3	9	1	1	0	100.00	27	8	10
P9	8	1	9	0	2	0	-	52	13	16
P10	12	2	7	8	1	3	62.50	67	25	24
P11	27	4	10	8	1	3	62.50	72	17	24
P12	18	4	13	6	4	1	83.33	56	11	21
P13	31	5	11	8	1	4	50.00	76	18	24
P14	21	1	12	3	3	2	33.33	76	17	23

Table 4: Basic statistics regarding the number of requirements found in each process.

	Identified requirements		
Technique	Mean	Median	SD
Conventional	11.29	10.50	4.0
REMO	18.29	17.00	8.14

that, for the context of the project, it was not necessary to specify the requirements in too much details. Considering another perspective (transparent requirements), there is a central tendency (median value) of the REMO technique not identifying two transparent-requirements per business process. Considering the conventional approach, an average of 11.29 requirements were identified per process, reinforcing the effectiveness of the REMO technique—in which the analysts were able to identify 82.28% of the requirements identified in the conventional approach.

Observe that this result is positive for the REMO technique, since in the conventional approach the requirements analysts participated in the business processes mapping activities, which allowed for a greater understanding of the needs of the process managers. Transparent requirements can emerge due to different reasons. In particular, as the requirements team had participated in the business processes mapping interactions, some requirements can be identified and not directly related to an element of the business process. On the other hand, for the selected processes, this type of situation did not occur often, as the amount of transparent requirements is rather low.

Unlike the previous works (Vieira et al., 2012b; Vieira et al., 2012a), in this case study it was possible to differentiate between the escaped requirements and false-positive requirements resulting from the application of the REMO technique. It is important to highlight that the escaped requirements, referenced in Table 3, include the false-positive requirements; there are requirements identified exclusively in the REMO technique and which do not correspond to a requirement pertaining to the scope of the project. These requirements occur because the process models comprehend all the activities done by the actors of the process, even if a software outside the scope of the materials management process automatizes some of these activities. Table 3 shows the Survival Rate of the Escaped Requirements (ISE), that is, the percentage of escaped requirements that do not correspond to false-positives. Such index is calculated following Equation (1). On average, 48% of the escaped requirements correspond to false-positives. The analysis of the quantitative results reinforce the efficacy of the REMO technique in identifying over 80% of the requirements identified by the conventional approach. On the other hand, almost 50% of the requirements identified exclusively by the REMO technique are false-positives.

$$ISE = (1 - \frac{RFP}{Escaped}) \times 100 \quad (1)$$

Considering how the results relate themselves with the complexity of the processes, it was possible to identify a moderate correlation (0.54) between the amount of functional requirements, non-functional requirements, and business rules identified by the REMO technique and the complexity of the business processes, computed as the amount of BPMN elements. That is to say, for the case study explored in

this paper, there is no one-for-one mapping between the activities of the process and the identified requirements. We also observed a stronger correlation between the amount of requirements obtained through the conventional approach and the complexity of the business processes (0.65), but which does not suggest one-for-one mappings between requirements and activities.

> Altogether, we found some evidences about the feasibility of using REMO to obtain relevant requirements from business processes—we were able to find almost 80% of the requirements found by the conventional approach using the REMO technique.

This result might suggest that we could reduce the effort for training the analysts in the process of finding requirements from business models. Moreover, this result also indicates that it is promising to use an automated approach for finding requirements from BPMN models.

4.2 Qualitative Analysis of the Study Results

The qualitative analysis attempted to investigate the acceptance of the REMO technique according to the view of the participants regarding its use. For such, a strategy similar to the one presented by (Vieira et al., 2012b) was used. It uses the Technology Acceptance Model (TAM) to explain the attitude and behaviors of the participants. The acceptance index was obtained through an online questionnaire. We elaborated semi-structured questions directed to the requirements analysts of the project, who answered the questions by the end of the case study. The online questionnaire was composed of 12 closed-ended questions related to their view of the utility and easiness of use of the heuristics of the REMO technique. The analyst could answer these questions after the end of the requirements elicitation activity using the processes models. To obtain a higher level of precision of the collected answers in relation to the aspects involving the variables of the TAM, a five-point LIKERT scale was also used: Totally Agree, Partially Agree, Neutral, Partially Disagree, and Totally Disagree. The following questions sought to identify the view of the analysts about the utility of the REMO technique.

4.2.1 Questions Regarding the Utility of the REMO Technique

We defined six questions that the analysts had to answer to capture their perception regarding the utility of the REMO technique. Such questions are enumerated ahead:

(QUT1) Considering the context of the project, would you identify requirements more quickly using the heuristics?

(QUT2) Considering the context of the project, would you have better performance when executing tasks by using the heuristics?

(QUT3) Would you have better work productivity by using the heuristics?

(QUT4) Would you have better efficacy in identifying software requirements using the heuristics?

(QUT5) Would it be easier to identify the requirements of a software when using the heuristics?

(QUT6) Do you consider the heuristics useful to apply during the requirements elicitation?

4.2.2 Questions Regarding the Easiness of Use of the REMO Technique

We defined six questions that the analysts had to answer to capture their perception regarding the easiness of use of the REMO technique. Such questions are enumerated ahead:

(QE11) Do you think it was easy to learn the heuristics of the REMO technique?

(QE22) Do you think your elicitation tasks would be more easily accomplished using the heuristics?

(QE33) Do you consider the heuristics to be clear and comprehensible?

(QE44) Do you consider it easy to remember how to use the heuristics during the requirements elicitation?

(QE55) Do you consider to have gained new skills with the usage of the heuristics?

(QE66) Do you consider the heuristics easy to use?

4.3 Analysis of the Answers of the Qualitative Questions

Table 5 and Table 6 present, respectively, a summary of the answers about the analysts' perception regarding the utility and easiness of use of the REMO technique. The answers related to their perception regarding the utility of the heuristics of the REMO technique (Table 5), show, in their majority, a good

acceptance of the technique. The participants considered that the heuristics facilitate the identification of the requirements of a software and that they are useful to be applied during the requirements elicitation. They also claimed that the heuristics would allow faster identification of requirements.

Table 5: Perception regarding the Utility of the REMO Technique. (TD) means Totally Disagree, (D) means Disagree, (N) means Neutral, (A) means Agree and (TA) means Totally Agree.

Question	TD	D	N	A	TA
Q1.1	0	0	0	5	1
Q1.2	0	1	1	2	2
Q1.3	0	0	2	1	3
Q1.4	0	0	1	2	3
Q1.5	0	0	1	5	0
Q1.6	0	0	0	3	3

Regarding the performance in the execution of tasks, approximately 66% of the analysts claimed that the REMO technique would improve their performance in requirements elicitation. As for work productivity, approximately 33% of the participants were neutral regarding the statement that the usage of the heuristics would improve their productivity, and 83.3% of the analysts answered that using the heuristics proposed in the REMO technique improves the efficacy and facilitates the identification of software requirements. Only 16.6% were neutral in this perspective. All participants considered the heuristics useful for requirements elicitation.

As for the perception of the analysts in relation to the easiness of use of the REMO technique, we could say that the majority of the participants felt no difficulty in using the REMO technique. In all questions proposed to the team, it can be seen that the result was in favor of the technique and the application of its heuristics (see Table 6).

Table 6: Perception regarding the Easiness of Use of the REMO technique. (TD) means Totally Disagree, (D) means Disagree, (N) means Neutral, (A) means Agree and (TA) means Totally Agree.

Question	TD	D	N	A	TA
Q2.1	0	0	1	3	2
Q2.2	0	0	1	3	2
Q2.3	0	0	1	2	3
Q2.4	0	0	2	1	3
Q2.5	0	1	0	3	2
Q2.6	0	1	0	1	4

The majority (83.3%) of the interviewed analysts comprehended that the heuristics are easy to learn, facilitate in requirements elicitation and were described in a clear and comprehensible manner. As for the other 16.6%, they neither agreed nor disagreed. However, 33.3% of the interviewees pointed out to a certain difficulty in memorizing the heuristics. As for skills obtained with the heuristics and their easiness of use, approximately 83% of the interviewees consider the usage of the REMO technique positive under this light.

> The analysis of the qualitative results reinforce how easy it is to introduce the REMO technique in requirements elicitation teams. Besides, we can see that the technique had good acceptance and adds value to requirements elicitation.

5 THREATS TO VALIDITY

Some factors can be taken into account in the evaluation of the validity of the study. Firstly, the participants possessed previous knowledge about the business, since the analysts had been in the process mapping teams. These meetings always count with the presence of the requirements analysts, who could direct the mapping so as to facilitate the understanding of the requirements involved in the creation of the Requirements Document artifact, which could interfere in the result obtained by the REMO technique.

To lower the bias related to business knowledge, each participant received processes in which they had not been involved or had little knowledge of. Besides, during the extraction of requirements using the REMO technique, the participants had no access to the Requirements Document that had been elaborated for that business process. Another possible threat is related to the lack of training for the application of the heuristics proposed in the REMO technique since the analysts simply read the main reference about the REMO technique (Vieira et al., 2012b). On the other hand, a higher degree of understanding of the technique would possibly reinforce the results found in this study. The maturity of the participants involved in the study varies according to their experience in requirements elicitation, which interferes in the level of abstraction of the requirements during the elaboration of the Requirements Document and the gathering of requirements using the REMO technique. To lower this variance, the participants interacted between themselves, making it so the work experience of an analyst could affect the work of others. This leads to results more-or-less aligned.

Some processes contemplate information that was not within the scope of the system under development. In that situation, the REMO technique was likely to identify a large quantity of requirements that would not be useful to the scope of the project (lea-

ding to false-positive requirements). To mitigate such a threat, we did not considered processes detailing elements outside the scope of the system. The different levels of details present in the Requirements Document and covered by the REMO technique can also threat the validity of the study. This mainly occurs because the Requirements Document describes only high level requirements and business necessities, while the REMO technique often leads to more detailed requirements. To solve this divergence, two participants documented a comparative analysis between the requirements identified in the Requirements Document and the ones used in the REMO technique.

We could have investigated other relevant factors about the use of the REMO technique, such as the time required to obtain the requirements (effort) and the possible degree of REMO automation. We postpone this kind of research to a future work. Particularly because an effort analysis in this context will probably require a higher degree of control—typically supported by a controlled experiment, which will increase the threats related to external validity. In addition, as far as we know, there is only an incipient tool support for the REMO technique.

6 FINAL REMARKS

This article presented the conduction of an empirical study of the REMO technique, carried out in a context of cooperation between an university and a military agency.

Such empirical study involved the elicitation of requirements from 14 business processes, randomly selected from a pool of 190 processes whose software requirements had already been elicited and approved by a board of domain specialists and stakeholders interested in the system. The main objective of the study was to answer to research questions: (RQ1) How effective is REMO as a requirement elicitation technique? and (RQ2) What is the perception of the analysts regarding the usage of the REMO technique?

In regard to the first research question, a quantitative analysis indicates that the REMO technique was effective in requirements elicitation, compared to the conventional technique (without using heuristics). In relation to the second research question, we observed that the usage of business processes diagrams, coupled with the heuristics proposed by the REMO technique, facilitates the identification of the functional requirements.

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