Technical Report: On the Systematic Analysis of Process Landscape Method Implementation using Grounded Theory

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Abstract. Process Landscapes are critical elements towards the systematic management of a process portfolio, representing its process architecture from a high-level perspective. Consequently, a wide range of methods to generate Process Landscapes is available in the literature, whose effectiveness has been extensively validated, mostly through case studies. However, little is known or reported about the implementation of landscape methods with the human team, e.g. facilitators, common pitfalls, or lessons learned. To fill this research gap, this article proposes the Landscape Method Implementation Grounded Theory based evaluation (LanMI-GT) procedure for the systematic analysis of a landscape method implementation through Grounded Theory. The contribution of this work is twofold. First, the proposed procedure would enable practitioners to systematically analyze the implementation with a human team of a specific landscape method. Second, the procedure is demonstrated by analyzing a well-known Process Landscape Method in a real context, and the findings thereof are discussed in the paper.

Key words: Process Landscape Modeling, Grounded Theory, Business Process Management, Socio-technical Context

1 Introduction

Process Landscapes are graphical models of the architecture of a given process portfolio from a high-level of abstraction [7]. These representations – sometimes also called process maps [22] or process architectures [6] – depict coarse-grained processes and their relations and additionally may include other types of information, e.g. grouping of processes. A Process Landscape provides an enterprise view of processes [27]. Thus, it yields valuable information for prioritizing process-related projects: it is a key asset for the systematic management of a given process portfolio [16]. Moreover, the existence of a Process Landscape should be the starting point of the process lifecycle [7].

In line with this, the need for methods for generating Process Landscapes has gained increasing attention among process initiatives over the last years [15]. A wide variety of Process Landscape Methods have been proposed based on different notations (i.e. standard [27] or dedicated [3]), approaches (e.g. systems

thinking [4] or clustering techniques [8]), origins (i.e. academia [17] or practice [16]), and scopes (i.e. general [13] or more specific [14]). The effectiveness of these proposals has been extensively validated by demonstrating that they allow generating a valid Process Landscape, mostly through a particular case study.

Despite its relevance, Process Landscape generation is still an under-researched topic [18] with a number of open challenges. In particular, there is limited understanding about the Implementation of Process Landscape Methods in practice, i.e. the application of these types of methods in a socio-technical context [10]. Little is known and reported about the main challenges faced during implementation, the facilitators that ease the task, or which are the most common pitfalls, and lessons learned. This type of knowledge is crucial for understanding and improving the Implementation of Process Landscape Methods.

The goal of the present work is to fill this research gap by proposing a novel procedure for the systematic analysis of Process Landscape Method Implementation. The proposal is termed Landscape Method Implementation Grounded Theory based evaluation (LanMI-GT). LanMI-GT is based on Grounded Theory [9], i.e. a research approach for building knowledge based on the systematic collection and analysis of qualitative data about a phenomenon that is largely unknown [9]. Additionally, the procedure integrates Grounded Theory with Process Mining [1], i.e. a set of techniques for process analysis based on their execution data. The research leading to proposing LanMI-GT followed the Design Science Research (DSR) paradigm [20] up until the demonstration phase.

The contribution of our work is twofold. First, LanMI-GT would enable practitioners to systematically analyze the implementation of a particular Process Landscape Method under a specific socio-technical context. Second, this article presents an instantiation of LanMI-GT using a well-known Process Landscape Method in a common context, and the findings thereof are discussed. By doing this, we both illustrate the types of insights about a Process Landscape Method Implementation that can be generated with LanMI-GT, and provide the lessons learned in a particular instantiation that may apply in a similar scenario.

The remainder of the paper is organized as follows. Sect. 2 discusses related work. The methodology of our work is described in Sect. 3. Sect. 4 presents the LanMI-GT procedure and its instantiation is described in Sect. 5. The conclusions of the work are provided in Sect. 6.

2 Related work

This section presents the related work for our proposed procedure for the systematic analysis of a Process Landscape Method Implementation, i.e. LanMI-GT. This section is structured according to the conceptual model shown in Fig. 1. This conceptual model represents that a given `Context` is subject to the `Implementation` of a specific `Method` that generates a `Process Landscape`. These elements are described in the following.

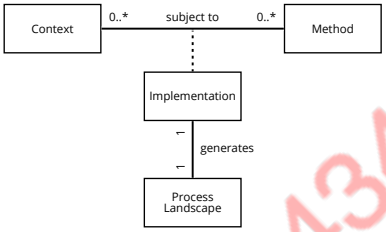


Fig. 1. Conceptual model for Process Landscape Method analysis.

Context. The Context defines the organizational setting in which a Method is implemented. Such a context is characterized by both social (e.g. people, conceptual structures, values and goals, desires and fears, and norms and budgets) and technical (e.g. software, hardware, and techniques) aspects.

Method. A Process Landscape Method is composed of a set of concepts used in the method, a procedure defining the steps of the method, and a notation for producing a Process Landscape [25]. Examples of Process Landscape Methods include the Fractal Enterprise Model (FEM) [3], the Riva method [13], and the BPTrends Associates (BPTA) method [16]. These Methods can be assessed in terms of their design aspects, e.g. goals, stakeholders, and theoretical foundations. A pioneering work in this line is the framework by Green and Ould [12] that allows describing a Method in terms of the form of the resulting Process Landscapes, contents of the method in terms of its constructs and theoretical foundations, purpose of the method and its resulting Process Landscapes, and lifecycle of the generated Process Landscapes. Similarly, new frameworks have been proposed [10, 21] by considering additional aspects of design evaluation, such as the organization size for which it is suitable. Despite their usefulness for understanding aspects (such as the scope and underlying rationale of a Method), these approaches do not focus on uncovering insights about a Method's Implementation in a socio-technical Context.

Implementation. The Implementation consists of the application of a Process Landscape Method in a given Context. To evaluate the implementation, naturalistic research approaches of the phenomenon are mostly used. Typically, this consists of a more or less standardized case study design, e.g. [3, 13]. The reported results for these case studies are rather aggregated without providing details about human-related aspects. Diverging from case studies, an experiment for evaluating Process Landscape Method Implementation has been proposed [11] to assess user perceptions after they have applied the Method themselves. This kind of evaluation, though suitable for comparison and for better understanding method implementation issues, has a number of limitations such as being a post-task evaluation, and not being specifically designed to observe socio-technical aspects of a Method's Implementation.

Process Landscape. The Process Landscape is the output of the Process Landscape Method that represents a high-level process architecture. Process Landscapes are conceptual models and, as such, subject to evaluation in terms of their quality by using dedicated frameworks, e.g. [19]. In the cited case studies assessing Implementation, Process Landscapes are evaluated by their final users

in terms of their effectiveness for representing the high-level process architecture in a particular Context.

Against the previously described background, the present work focuses on the limitations of currently available approaches for assessing the Implementation of a Process Landscape Method in a given socio-technical Context. In this work, we propose an analysis procedure based on Grounded Theory [9]. Grounded Theory is an inductive research approach based on the systematic collection and analysis of qualitative data about a phenomenon [9]. This theory can be used as a data coding technique for structured analysis [23]. In this scenario, a code is understood as a word or short phrase assigning an essence-capturing attribute for a portion of language-based or textual data [24]. As a data coding technique, Grounded Theory offers several methods, e.g. initial coding, focused coding, and axial coding.

Despite the novelty of our proposal in using Grounded Theory as the basis for studying the phenomenon of Process Landscape Method Implementation, the use of Grounded Theory in Business Process Management (BPM), though incipient, is not new. For instance, Grounded Theory has been used to explore the goals and motivations of organizations when designing their Process Landscapes [18], and how expert modelers understand quality in declarative models [2]. These works prove Grounded Theory as a suitable approach for exploring a phenomenon that is largely unknown [23], as is the case of implementing a given Process Landscape Method in a given context.

3 Methodology

The LanMI-GT was developed according to the Design Science Research Methodology (DSRM) by [20]. The steps of this DSRM are: identify the problem and motivate, define objectives for the solution, design and development, demonstration, evaluation, and communication. As discussed earlier (see Sect. 1 and 2), the problem targeted by the work is the limited support for systematically analyzing the implementation of Process Landscape Methods in a way that considers socio-technical aspects. This is an open challenge for better understanding Process Landscape Methods as Implemented in specific contexts. Accordingly, the LanMI-GT procedure was designed with the following design objectives (DO) and respective design decisions:

- *DO1. Provide a means for capturing the socio-technical aspects of a method's implementation.* This objective was addressed by using a qualitative approach, particularly Grounded Theory coding techniques, as a basis for the structured analysis of the method's implementation phenomenon.
- *DO2. Provide a means for comparing the theoretical method's procedure with how the method's procedure was executed in the implementation.* This objective was tackled by creating an event log from the qualitative data to which Process Mining techniques could be applied for understanding the executed procedure and comparing it to the theoretical method's procedure.

The designed LanMI-GT procedure is presented in Sect. 4. The design was used for analyzing a particular Process Landscape Method in a real Context. Such demonstration is presented in Sect. 5. The present paper reports up until the demonstration step, leaving the evaluation step as part of the future research agenda.

4 Procedure

This section presents the Landscape Method Implementation Grounded Theory based evaluation (LanMI-GT) procedure. LanMI-GT is composed of the eight steps (S) described in the following.

S1. Verbal data transcript. Generate a verbal data transcript of each interaction, i.e. meeting, that take place within the Implementation of the Method.

S2. Initial coding. Code the transcripts generated in the previous step using initial coding. Initial coding involves assigning codes that break the data up in a way that the codes stick close to the data and, thus, disregard using predefined categories [5]. In our case, interventions of the participants of the meeting were assigned (a set of) codes describing the activity taking place and the involved attitudes, strategies, and opinions.

S3. Focused and axial coding. Explore the issues that emerge during the implementation: activities, attitudes, strategies, and opinions. Towards this end, further stages of Grounded Theory are applied to coded data from the initial coding stage, namely focused and axial coding. Focused coding requires deciding which are the most relevant initial codes – in terms of significance and/or frequency – and constituting them into categories [5]. Axial coding relates categories and specifies their properties and dimensions to provide coherence and structure to the collected data [5].

S4. Content analysis. Summarize the main findings of the content analysis.

S5. Initial coding categorization. Assign a step of the Method's procedure to each piece of coded data.

S6. Descriptive model discovery. Discover a descriptive process model for exploring the Process Landscape Method in terms of how it was executed in practice. This model is discovered using Process Mining techniques [1] on the data generated in the previous step.

S7. Descriptive model analysis. Analyze the discovered descriptive model.

S8. Analysis integration and reporting. Integrate content analysis with the descriptive model analysis and report the findings.

5 Demonstration

This section describes the demonstration of the LanMI-GT procedure (presented in Sect. 4) for analyzing the Implementation of a particular Process Landscape Method in a real Context. This provides the reader with both: (i) an example

of the application of the procedure and the types of findings that it conveys, and (ii) findings of the Implementation of the Method [16] in a local government organization that can be generalized to similar cases. To provide the reader with the information needed to understand the demonstration of LanMI-GT, this section – following the conceptual model in Fig. 1 – not only analyzes the Implementation of the Method, but it also describes the Method itself, the Context in which it is implemented, and the resulting models. A more complete description of this demonstration is available in the appendices.

5.1 Context

The organization was the public administration of Puente Alto, Santiago, Chile. Over the last years, the different municipal departments have been documenting and analyzing their key processes, as part of a municipal management improvement plan. Most recently, the municipal departments have been assigned the task of generating their Process Landscapes. We supported 13 departments in this endeavor, from which we report the work with four of them.

The cited work was executed between August 2020 and January 2021, during the COVID-19 pandemic. Due to this sanitary context, all interactions were held remotely via video-conferences (using Google Meets). Also, a modeling software (i.e. Archi) was used as a modeling tool.

5.2 Method

The method was based on the BPTA method [16] and adapted according to the project at hand. The concepts used in the method – value chain, stakeholder, process, value stream, and classification – are presented in Table 1 as defined in the method. The procedure of the Method is represented by the BPMN process model in Fig. 2. The initial step is to select the value chain that will be analyzed. The second step consists of the identification of the stakeholders of the selected value chain. The third step is defining processes: at least one for each stakeholder. In the fourth step, each value stream is labeled. The output of this step is the Value Chain Model that shows processes within the value chain of the organization and how they relate to stakeholders via value streams. Finally, processes identified in the previous steps are organized into three process categories: primary, support, and management. The output of this step is the Process Landscape that shows the processes classified into the named process categories. The notation used for the Value Chain Model and Process Landscape is ArchiMate [26].

Fig. 2. Procedure of the Process Landscape Method, based on [16].

Concept	Definition
Value chain	Comprehensive set of work carried out in an organization to provide a product/service to an external customer.
Stakeholder	Groups that are internal/external to the organization and that have some interest in the success/failure of a given value chain. They can be related by generalization relations.
Process	Processes depict the high-level interaction between a stakeholder and a value chain based on the concept of value stream. They can be related by resource flow and sequence relations.
Value stream	Set of activities that are triggered by a requirement of and that are completed by the fulfillment of the named requirement.
Classification	Categories in which a process can be classified in the context of a given value chain. Primary processes are involved in core activities, support processes provide resources that allow executing primary processes, and management processes provide rules to which process need to conform (such as strategies, plans, and budgets).

Table 1: Definition of the concepts as used in the BPTA method [16].

5.3 Implementation

For each department, the method was applied along a three-meeting cycle. The article reports on the work conducted with four departments. Each meeting had four participants: two of the authors of the paper in the role of "consultants" (same for all departments) and two domain experts of the organization in the role of "interviewees" (different for each department). For each meeting, one consultant was in charge of conducting the meeting and the other was responsible for using the modeling software while sharing his screen with the other participants of the meeting. Models were built in real-time during the meetings and, in some cases, were edited for readability prior to their final delivery. The LanMI-GT procedure, as applied for analyzing this Implementation, is described in the following.

S1. Verbal data transcript. Meetings were recorded (using OBS Studio). One author transcribed the verbal data from the recordings of the meetings (using Google docs). A portion of a coded transcript is provided in Table 2, where the column labeled *transcript* shows how verbal data was transcribed and the column labeled *id* provides an identifier for the coded portions of data.

Transcript	Id	Content-based code	Category-based code
Interviewee 1: Right, we should name that process "Regulatory compliance control".	B.2.99.	Suggest process name.	Process
Consultant 1: To which stakeholder does it relate to?	B.2.100.	Ask for related stakeholders.	Stakeholder

Table 2: Portion of a coded transcript from the second meeting of a department.

S2. Initial coding. Each transcript was coded by one of the authors and when in doubt, a discussion was held until consensus was reached. The column labeled *content-based code* in Table 2 shows the initial coding for the given portion of the transcript.

S3. Focused and axial coding. This was an iterative task of selecting and organizing the coded data into more general categories and relating them. For this, we used a mind map where the nodes represented codes or more general conceptualizations that describe a set of codes/conceptualizations, and the arcs represented relations between the aforementioned elements. For the sake of space, the complete mind map is available in the appendices.

S4. Content analysis. We synthesized the mind map generated in the previous step into the conceptual framework shown in Fig. 3. It allowed us to identify key issues and lessons in regard to the following implementation aspects: preparation, tool support, meetings, and concepts of the method. In parallel to this, we also observed two other main issues that emerged: diagnosis opportunities using the Process Landscape, and also a diversity of attitudes of the interviewees. For the sake of space, we refer the reader to the appendices for a detailed description of the conceptual framework.

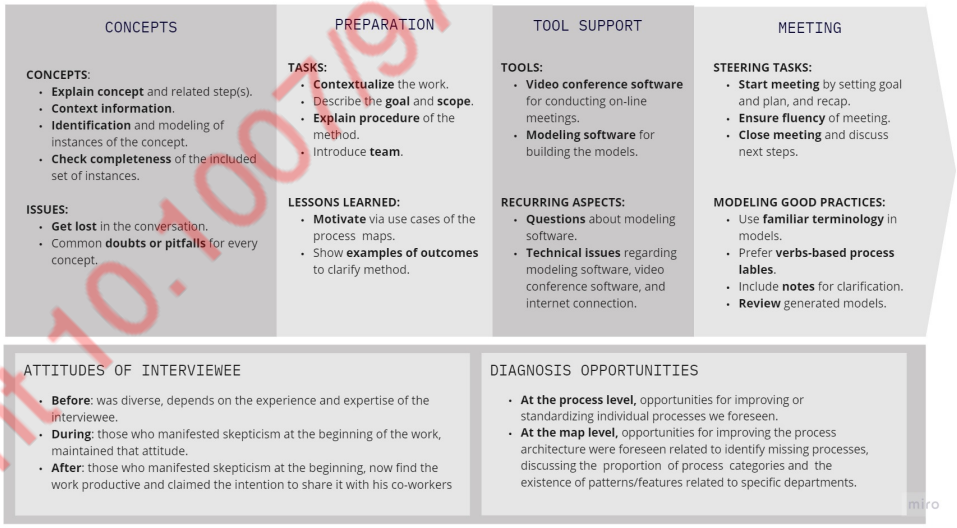
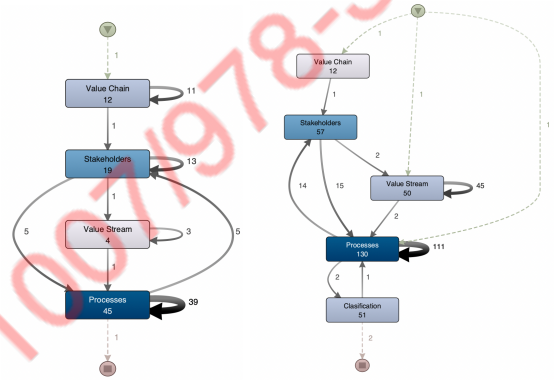


Fig. 3. Conceptual framework resulting from using LanMI-GT in the project.

S5. Initial coding categorization. The *category-based code* column in Table 2 shows a classification of content-based codes (i.e. initial coding) into the following categories: "Stakeholder", "Value Chain", "Process", "Value Stream", "Classification", and "Other". The first five categories correspond to the steps of the procedure of the method (see Sect. 5.2), and the latter is applied to whatever does not fit into the first five categories.

S6. Descriptive model discovery. Before applying Process Mining [1], we first generated logs based on data in the *category-based code* column of Table 2. For each meeting, a `csv` file was generated in which each row corresponded to the consecutive values in the category-based code column of the meeting's coding. A meeting-based case id and consecutive timestamp (for establishing a sequence) were added to each row. After each log was generated, we imported them to Disco, a Process Mining software that generates (via a discovery algorithm) diagrams representing a descriptive process model that fits the provided data.

Descriptive models were generated at the department level as well as at the meeting level using Disco, e.g. Fig. 4. The discovered models are depicted as Directly Follows Graphs. In this notation, nodes represent steps of the procedure of the method (i.e. categories "Stakeholder", "Value Chain", "Process", "Value Stream", and "Classification") and directed arcs indicate the flow. Start and end nodes are shown as circles. Numbers within node and arc labels enrich the model by providing frequency information.



(a) First meeting (b) All meetings

Fig. 4. Descriptive model of the Implementation of the Process Landscape Method in one of the departments of the project (after filtering "Other").

S7. Descriptive model analysis. The actual execution of the Method's procedure was analyzed mainly in terms of tasks and control flow of the discovered models (e.g. Fig. 4). It was observed that the category "Other" accounted for approximately a quarter of the codes registered (per meeting and per department), indicating that the Implementation of the Method involved some additional tasks than the ones defined by its theoretical procedure. The interested reader is referred to the appendices for details of the analysis.

S8. Analysis integration and reporting. Each content-based code is linked to a department and a meeting via an *id* (see Table 2). Using this information allows for integrating the content and the descriptive model analyses. Findings of this analysis are reported in Sect. 5.5.

5.4 Process Landscape

A Process Landscape generated for a department is provided in Fig. 5. The full example, including the corresponding Value Chain Model is available in the appendices. Process Landscapes were validated with each department organization in terms of representing the process architecture of the respective department. This was done at the end of the last meeting, as well as after sending the final versions of the generated models to the department, by asking them to either manifest their approval or their observations.

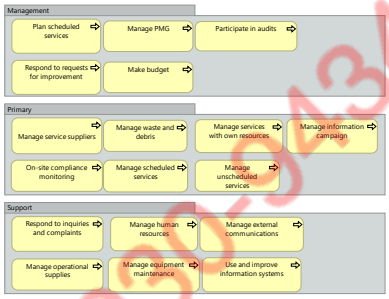


Fig. 5. Process Landscape example.

5.5 Findings

Findings of the Implementation of the BPTA method in the local government of Puente Alto, integrating the content and the descriptive model analysis, are available in the appendices. In the following, we summarize them and provide key insights.

Execution of method's procedure. The sequence of steps of the Method's theoretical procedure was followed to a large extent during its implementation in all four departments, though regularly going back to previous steps. What is more, we observed additional tasks that supported the Method's theoretical procedure: (i) preparation tasks, i.e. contextualize the work within the organization, describe the goal of the method and scope of the work, explain the procedure of the method, and introduce the team of consultants; and (ii) coordination tasks, i.e. start meeting, ensure fluency of meeting, and close meeting. These discovered tasks would explain, to a large extent, the codes in the "Other" category.

Technical aspects. The method was implemented using two software tools: a video-conference software for running the on-line meetings (i.e. Google Meet), and a modeling software (i.e. Archi). Even though interviewees were familiar with the former, they did not know the latter. Consequently, curiosity questions regarding the modeling software were raised throughout the different meetings. Regarding the notation used in the models (i.e, ArchiMate), it was rapidly understood by the interviewees though it was new to them. Along different meetings, a number of technical issues emerged related either to software or internet connection. However, these issues were infrequent and easily solved. Overall, the technical setting proved adequate for the method's implementation.

Social aspects. All interviewees were familiar with the concept of process, as it was part of the growing organizational process culture. However, the remaining concepts (i.e. value chain, stakeholder, value stream, and classification) were not

understood by them all and it was necessary to invest a little time in explaining them. It was also possible to observe differences between the four different departments in terms of their process training, expectations, and motivation. When these factors were lower, it was useful to spend more time in preparation tasks. In this regard, the following lessons were learned: (i) discussing use cases of a Process Landscape enhances motivation, (ii) showing examples of the outcomes (Process Landscape and Value Chain Model) eases the understanding of the method. It was also observed that, once the Value Chain Model or the Process Landscape were at an advanced stage, interviewees spontaneously made observations on how these models would aid them in improving their operations. In particular, the following opportunities were foreseen: standardization of individual processes, identification of missing processes, balancing the proportion of process categories, and pattern discovery within specific departments.

6 Conclusions

The article presents LanMI-GT, a novel Grounded Theory-based procedure for the systematic evaluation of the socio-technical aspects of a Process Landscape Method Implementation. Moreover, the proposal uses Process Mining techniques to enrich the socio-technical analysis.

To demonstrate our proposal, we described using LanMI-GT for assessing the Implementation of a well-known Process Landscape Method (i.e. BPTA [16]) in four departments of a public administration organization. We found that the sequence of steps prescribed by the method was observed, but that this was complemented by preparation and coordination tasks in attendance to social aspects of the context. Also, we observed that the on-line technical setting consisting of video-conference meetings with real-time modeling was successful for the work. We also identified lessons learned, issues that may arise in a similar context, and diagnosis opportunities that emerged as a by-product of the work.

As discussed in the conceptual model for Process Landscape Method analysis (see Fig. 1), there is an interplay between the context, the method, the implementation, and the resulting Process Landscapes. A limitation of our work is that, though it acknowledges this interplay, LanMI-GT does not include specific steps or guidelines for establishing relations between the evaluation of all these elements. We deem this as the main limitation of our proposal and expect to address it in future work. In terms of design, LanMI-GT is in an early developmental stage. Accordingly, our research agenda considers conducting an evaluation of LanMI-GT, leading to an iteration of the design cycle.

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Appendix A Mind Map

Preparation.

- **Context.** The application of the Process Landscape method was contextualized within the projects of the organization (D.1) and some information regarding the different departments in this matter was provided (C.3).
- **Goal.** The goal of the method was described early in the work (B.1).
- **Scope.** In the firsts meetings with a given department (mostly M1 but also M2) the scope of the work was discussed (A.1/2, B.1, C.1, D.1/2).
- **Motivation.** Sometimes the usefulness of the work was not straightforward to the interviewee and thus use cases for a Process Landscape were explained for motivating the work (B.1).
- **Procedure overview.** During the first meeting (M1) an overview of the procedure for developing the Process Landscape was described. This included discussing the three-meeting structure (A.1, B.1, C.1, D.1) together with the deliverables (explain as well as show examples from other departments) (A.1/2, B.1/3, C.1, D.1/3).
- **Team.** The team of consultants was introduced (D.1/3).
- **(Issues.)** The interviewee was not a domain expert (A.1) and a consultant did not know how to represent a pattern (B.1.143).

Tool support

- **Modeling software.** Though presented early in the work, the modeling software was discussed throughout most departments and during different meeting numbers (A.2/3, B.1/3, C.1/2/3). Particularly, asking about the software, some technical issues, explaining the modeling tasks executed in the software, and pointing out something that needed to be corrected in the model.
- **Video-conference.** Aspects of the video-conference also emerged throughout most departments and during different meeting numbers (B.1/2/3, C.2/3, D.3). Particularly, regarding technical issues, software zoom adjustment, and using of chat.
- **Internet connection.** Issues regarding the internet connection were rarely observed (A.3, B.1).

Meeting

- **Context.** The following aspects were discussed as context for a meeting: its goals (A.1/2, C.2/3), recap of past meeting(s) (A.2, B.2/3, C.2, D.2/3), and the working plan for the present meeting (A.1/3, B.1, C.2/3, D.3) based on the pending tasks and the sequence of the method.
- **Fluency.** A number of strategies were observed to ensure the fluency of the work: closure to proceed (B.3, C.3, D.2), move on (A.2/3, B.3, C.2/3, D.2/3), focus to prevent diverging (B.3, C.1), seize the momentum to address a related task (A.3, B.1/3, C.1) (e.g. given a process has been classified in a given category, look for all processes in that category), return from interruption (B.1), postpone a modeling decision that is stalling the work (B.1, C.1, D.1).

- **Close.** Closing of the meeting (A.3, B.2/3, C.1/2, D.2/3) sometimes included discussing the plan for the next meeting (A.1, B.2, C.2, D.1/2).
- **Good practices**
  - **Use familiar terminology.** The use of terminology that was familiar to the interviewee in the different labels of the models was permanently encouraged by the consultants, mostly on early meetings (A.1/2, B.1, C.1, D.1).
  - **Review generated map.** After the Process Landscape was generated during the last meeting (M3), consultants encouraged reviewing the map for completeness and correctness, leading to identifying some missing elements and working on the legibility of the resulting model (B.2/3, C.3, D.3).
  - **Notation.** Motivate the use verbs in process labels (B.1, D.2) and use notes for clarification (C.3, D.2).

Concepts

- Value chain
  - **Explain step/concept.** The value chain concept is explained (B.1, D.1), work is guided towards identifying a single value chain (C.1).
  - **Context information.** A general description of the department was provided (A.1, D.1) and the specific work performed by the interviewee (D.1).
  - **Definition/identification.** Value chains are proposed (B.1, C.1, D.1) based on concepts such as value delivered to customers and services offered (B.1). When a number of value chains are identified in a department, the criteria for selecting one are sensitiveness and political impact within the work of the department (B.1, C.1, D.1). When a candidate value chain has been selected, the following aspects are sometimes further fine-tuned: scope (B.1, C.1, D.1) and name (6.1, 7.1). The decision on the value chain to be analyzed is verbalized (A.1, B.1, D.1).
  - **Check completeness.** -
  - **Get lost.** -
  - **Doubts.** -
  - **Pitfalls.** Confound the concept of value chain with the concept of process (B.1).
- Stakeholder
  - **Explain step/concept.** The stakeholder concept is explained together with its symbol (B.1, C.1, D.1) and terminology (D.3.36), it is also explained that stakeholder identification enables the later process identification (B.1, C.1, D.3).
  - **Context information.** The organization chart of the department is described (C.1).
  - **Definition/identification.** Stakeholders are proposed (A.1, B.1/2, C.1/2, D.1/2) based on preliminary process identification (B.1/2, D.1/2), or based on patterns (A.2, B.1/2, C.2, D.2) observed in other departments or standard stakeholders (e.g. monitoring, suppliers, etc.). Afterwards, a discussion may be held regarding aspects such as: further inquiry about the proposed

stakeholder (B.2, C.1/2), validating whether the proposed stakeholder participates in the selected value chain (B.2, C.1), fine-tuning the name (B.2, C.2), relation between the proposed stakeholder and (already identified) processes (A.2, B.1/2, C.2, D.2), scope of the proposed stakeholder (A.1, C.2), abstraction level at which the stakeholder is defined (e.g. which instances does the it have) (A.1, B.2, D.2), granularity at which the stakeholder is defined (including merging and splitting of the proposed stakeholder) (A.1/2, B.1/2, C.1, D.1). Based on the discussion, a stakeholder is either included or discarded (B.1, C.1/2, D.3).
  - **Check completeness.** A recap of the already identified stakeholders is done at different points of the work (A.1, B.1, B.2). Completeness is either found to be achieved (B.2, C.1/2) or the discussion to add a new stakeholder is reopened (C.1/2).
  - **Doubts.** Terminology for referring to a stakeholder (A.1.12)
  - **Get lost.** Not realizing that a given stakeholder was already included in the model (B.2), not knowing about which stakeholder the discussion refers to (A.2).
  - **Pitfalls.** Confuse the concept of stakeholder with process responsible (B.1), confuse a role with an instance of a role (B.1).
- Process
  - **Explain step/concept.** There was scarce discussion about the concept of Process besides providing examples (A.1, A.2) and explaining that if a process has variants that have different steps or address different stakeholders, then the variants should be separated into different processes (B.2.25, C.1.72).
  - **Context information.** -
  - **Definition/identification.** Processes are proposed (A.2, B.1, C.1/2, D.2) mostly based on stakeholders (A.2, B.1/2, C.1/2, D.2/3), or patterns (A.2, B.1/2, C.1/2, D.2/3) observed in other departments or standard processes (e.g. auditing, resource planning, etc.), but also based on aspects such as entities handled by the process (A.2, B.1/2, C.1, D.2) (e.g. resources), other processes or activities (A.1/2/3, C.2, D.2), or in reference to other elements of the organization (e.g. current projects) (C.1/2/3). Afterwards, a discussion is usually held addressing aspects such as: a more detailed description of the process (A.1/2/3, B.1/2, C.1/2/3, D.2) (e.g. locations, start/end, history, support I.S., activities, inputs/outputs and other entities, sensitiveness/criticality/relevance, magnitude, and frequency), selecting an adequate name (A.2/3, B.1/2/3, C.1/2, D.2/3), clarifying the relation to other (previously identified) processes (A.1/2/3, B.2, C.1/2, D.2) or stakeholders (B.1/2, C.1/2/3, D.2), and whether the process belongs to the selected value chain (A.3, B.2, C.3, D.2). The granularity/abstraction of processes is also discussed, particularly whether processes need to be merged into a more general process (B.2, C.1/2, D.2), or splitted into more specific (C.2/3, D.2) or plainly different (B.1/2, C.3) processes. The discussion may lead to validate the proposal (A.2, B.1, C.2) or modify it (B.2, C.1/3, D.2).

  - **Check completeness.** A recap of the already identified processes is done (B.1, D.2), the review sometimes is per stakeholder (B.2, D.3), the review sometimes includes checking with patterns observed in other departments (B.2, D.2).
  - **Get lost.** Get lost in the conversation to identify a process (D.2), confuse the process to which the discussion refers to (B.1), look for a process linked to a stakeholder (B.2).
  - **Doubts.** Ask whether a process that is not formalized (ad-hoc execution) must be included (B.2, B.4.41, C.1/2, D.2), question the existence of a given process (B.3), confusion with the name of a process (B.2.123), ask whether activities within the process need to be represented in the map (B.2).
  - **Pitfalls.** Not considering support processes or infrequent processes (5.1), thinking that there cannot be more than one stakeholder linked to a given process (B.2).
- Value streams
  - **Explain step/concept.** The concept of value stream is explained by the consultants (including its relation with the concept of stakeholders) (A.2/3, B.1/3), also the concept is formulated in own words of the interviewee (A.3, B.1, C.3). Examples are provided (A.2, B.1/3).
  - **Context information.** -
  - **Definition/identification.** Value streams, in terms of links between a process and a stakeholder are defined early (5.1), but their labels are typically suggested by the end of M2 or in M3 (A.3, B.2/3, C.2/3, D.3): names are discussed (B.3, 6.3, 6.3) and sometimes patterns (B.2/3, C.3) are used regarding other departments, standard processes, or process that are similar within a given department. After the initial proposal, it is often the case that a discussion is held (A.3, B.2/3, C.2/3 D.2/3). Two recurrent aspects of this discussion are asking for details about the value stream for a more accurate definition (A.3, B.2, C.2/3 D.2/3) as well as the granularity and abstraction level at which the value stream is labeled (B.3, C.3 D.3).
  - **Check completeness.** Identify value streams that need labeling (B.3), point out that all value streams have been labeled (C.3), claim that the value stream identification has been finished (D.3).
  - **Doubts.** Ask whether a value stream involves a one-way or two-way flow (C.3).
  - **Get lost.** Not knowing about which value stream the discussion refers to (B.3).
  - **Pitfalls.** Claim there is no value stream for a given process (D.3.11).
- Classification
  - **Explain step/concept.** The classification of processes is explained (A.2, B.2, C.3, D.3) as well as the process categories (B.3, C.3).
  - **Context information.** -
  - **Definition/identification.** Initially, a category is suggested for a process (A.3, B.3, C.3, D.3): the used strategy is sometimes made explicit as focusing on processes (To which category does the process belong to?) (A.3) or

focusing on categories (Which processes belong to the category?) (A.2, B.3, C.3). If the proposed classification is not immediately agreed upon, a discussion is held (A.3, B.3, C.3) using arguments based on process responsible, involved stakeholders, comparison to other departments, and relevance.
- **Check completeness.** It is asked whether all processes in the value chain model have been classified (B.3), this is checked by counting processes symbol in both models (B.3, C.3), resulting in finding out the classification is complete (B.3, D.3) or that there is some missing process (B.3, C.3). It can be verified that the process is not duplicated (C.3).
- **Doubts.** Ask what is the meaning of a primary process (B.3), ask whether an externalized process can be primary (B.3).
- **Get lost.** Overall confusion regarding process classification (A.3, C.3), not realizing that a given process was already classified (B.3), not knowing about which process the discussion refers to (C.3).
- **Pitfalls.** Not understanding the difference between a management and a support process (B.3.83) .

Attitudes of interviewee

- **Before.** Attitudes towards the work were diverse. One department had a more skeptical attitude towards the usefulness of the outcomes of the method. (B.1). Other department – also claiming to have experience on the subject – manifested positive expectations towards the work (D.1).
- **During.** During the work, the department that manifested skepticism at the beginning of the work, maintained that attitude and, also, was prone to delegating some modeling decisions to the consultants (A.2/3, B.1/2).
- **After.** After the work was concluded, the department that manifested skepticism at the beginning of the work, manifested finding the work "nice and productive" and claimed the intention to share it with their co-workers (B.3). On the other hand, the department that was more experienced and positive towards the work, commented on the value of the work for having a high-level perspective on the processes of the department and possible sources for diagnosis (D.3).

Diagnosis opportunities

- **At the process level.** Some improvement opportunities for individual processes emerged in the discussion: some corresponded to aspects about which the interviewee was already aware of, and others became evident during the work (e.g. discussing a value stream opened the discussion about its traceability) (D.2/3). Other diagnosis opportunities that emerged were the standarization level of individual processes (B.2) and the relative attention given to a specific process (B.2).
- **At the map level.** Some diagnosis opportunities emerged from looking into the Process Landscape as a whole as it was being developed. This included identification of missing processes (B.1, C.1), discussing the proportion of process categories (C.3), looking into the density of some elements in the

models (B.1), and hypothesizing the existence of patterns/features related to specific departments (C.1).

Additional topics

- **Requests beyond the scope of the work.** In some cases, the interviewee still made some requirements beyond the previously stated scope of the work, mainly involving improvement of specific processes of the department (B.1/2).
- **Context information.** Early in the work (M1 and M2), contextual information was sometimes provided/requested by the interviewee/consultants regarding the department (e.g. overall role in the organization) and the interviewee (e.g. time in the job). Often, the role of information systems and a diagnosis of the extent to which processes were automated was pointed out by the interviewee (B.2).
- **Interruptions.** Interruptions occurred for all departments and during different meeting numbers. Most of these interruptions can be classified as contributing, to some extent, to the work: getting acquainted ("entrar en confianza") (A.1, B.1/3, C.1/3, D.1/2), discussing issues related to the work (e.g. other related projects) (B.1/3, C.3), and revisiting a previously unclear issue (A.2). Non-contributing interruptions involve the discussion of unrelated topics or attending phone calls (B.1, C.1, D.1).
- **(Post-task survey.)** The survey that was requested to be answer by the interviewee was briefly discussed with all departments, mostly during the last meeting (A.2, B.3, C.3, D.3).

Appendix B Framework

Preparation. For each department, a set of tasks were executed during the first (and sometimes second) meeting that provide preparation for applying the method. These tasks included the following: contextualize the work within the organization, describe the goal of the method and scope of the work, explain the procedure of the method, and introduce the team of consultants. Related to preparation tasks, the following lessons were learned: (i) discussing use cases of a Process Landscape enhances motivation, (ii) showing examples of the outcomes (Process Landscape and intermediate model) eases understanding of the method.

Tool support. The method was executed using two software tools: a video-conference software for running the on-line meetings (i.e. Google Meet), and a modeling software for building Process Landscapes and intermediate models (i.e. Archi) during the meetings. While interviewees were familiar with the former, they did not know the latter. Consequently, many questions regarding the modeling software were raised throughout the different meetings. Along different meetings also, a number of technical issues emerged related either to software or internet connection. However, these issues were infrequent and easily solved.

Meeting. Steering of meetings can be summarized into three tasks: start meeting, ensure fluency of meeting, and close meeting. Starting the meeting focused on setting the goal and plan for the ongoing meeting, which was sometimes supported by a recap of the previous meetings. For ensuring fluency of an ongoing meeting, the following strategies were observed: give closure to a discussion to proceed, postpone a modeling decision that is stalling the work, seize the momentum to address a related task (e.g. given a process has been classified in a given category, identify all processes that may fit in the named category), focus to prevent from diverging, and return from an interruption. The close meeting task focused on discussing the next steps of the method and/or the upcoming meeting. Along steering the meetings, we identified the following good modeling practices: (i) use familiar terminology in the models, (ii) prefer using verb-based labels for processes, (iii) include notes that complement the model, and (iv) review the generated models for completeness and correctness.

Concepts. The concepts of the method are "Value Chain", "Stakeholder", "Process", "Value stream", and "Classification", as described in Sect. **??**. Related to each of these concepts, we observed a similar pattern in which the concept was first explained, next contextual information was discussed, then instances of the concept were identified and included in the model after discussing and fine-tuning them, and, when several instances of the concept were identified, completeness was checked. We detail this in the following.

- The first task when addressing each of these concepts was explaining it and its relation to the steps of the method and other concepts within the method. Explaining the concept was accompanied by providing examples and showing the symbol for representing the concept in the model. A strategy that we observed that some interviewees used to better grasp the concept was formulating it in their own words.
- Context information was sometimes requested by the consultants. This allowed for providing examples in the previous steps, as well as for preparing for the next one. During the first meeting (M1) when the concepts of "Value Chain" and "Stakeholder" were extensively addressed, it was useful to have a general description of the department functions and organization.
- Identification of instances of the concept to be included in the model was the most time-consuming task and it sometimes intertwined with the previous ones. In most cases, an instance was first proposed, then a discussion was held, and then the model was updated accordingly.
  - A "Value Chain" was proposed based on concepts such as value delivered to customers and services offered. When a number of value chains are identified in a department, the criteria for selecting one were sensitiveness and political impact within the work of the department. When a candidate value chain was been selected, scope and name were sometimes further fine-tuned.
  - A "Stakeholder" was proposed based on preliminary process identification, or based on patterns observed in other departments or standard stakeholders (e.g. monitoring, suppliers, etc.). Afterward, a discussion may be held re-

garding aspects such as: further inquiry about the proposed stakeholder, validating whether the proposed stakeholder participates in the selected value chain, fine-tuning the name, relation between the proposed stakeholder and (already identified) processes, scope of the proposed stakeholder, abstraction level at which the stakeholder is defined (e.g. which instances does it have), granularity at which the stakeholder is defined (including merging and splitting of the proposed stakeholder).

- A "Process" was proposed mostly based on stakeholders, or patterns observed in other departments or standard processes (e.g. auditing, resource planning, etc.), but also based on aspects such as entities handled by the process (e.g. resources), other processes or activities, or in reference to other elements of the organization (e.g. current projects). Afterward, a discussion was usually held addressing aspects such as: a more detailed description of the process (e.g. locations, start/end, history, support I.S., activities, inputs/outputs and other entities, sensitiveness/criticality/relevance, magnitude, and frequency), selecting an adequate name, clarifying the relation to other (previously identified) processes or stakeholders, and whether the process belonged to the selected value chain. The granularity/abstraction of processes was also discussed, particularly whether processes need to be merged into a more general process, or split into more specific or plainly different processes.
- "Value stream", in terms of links between a process and a stakeholder are defined early, but their labels were typically suggested by the end of M2 or in M3: names are discussed, and sometimes patterns are used regarding other departments, standard processes, or process that are similar within a given department. After the initial proposal, it is often the case that a discussion is held. Two recurrent aspects of this discussion are asking for details about the value stream for a more accurate definition as well as the granularity and abstraction level at which the value stream is labeled.
- Initially, a "Classification"was suggested for a process: the used strategy is sometimes made explicit as focusing on processes (To which category does the process belong to?) or focusing on categories (Which processes belong to the category?). If the proposed classification was not immediately agreed upon, a discussion was held using arguments based on process responsible, involved stakeholders, comparison to other departments, and relevance.
- Completeness was checked for all concepts but "Value Chain". For "Stakeholder" and "Process" this was done at several points of the work and due to their relation a discussion about a given "Stakeholder" rose questions about its related "Process" and vice-versa. It was also the case that patterns observed in other departments were used as reference. Checking completeness of "Value stream" was straightforward verifying if the link between a process and a stakeholder was identified and labeled. The "Classification" of processes is checked for completeness by counting whether all processes in the Value Chain Model are included in the Process Landscape.

During the execution of the method, we identified some issues related to using/applying the concepts. Interviewees sometimes got lost in the discussion not knowing to which "Stakeholder"/"Process"/"Value stream" a discussion was referring to, or suggesting a concept that was already included in the models. Also, at the beginning of "Classification" interviewees sometimes got confused. Sometimes interviewees needed that the explanation of a concept was reinforced: stakeholder was confused with responsible, value chain was confused with process, value stream was sometimes not seen as a closed loop, support, and management process categories sometimes were confused. Interviewees tend to manifest the following missconceptions: support/infrequent/ad-hoc processes need not be included in a Process Landscape, a Process Landscape shows details of processes, each stakeholder must be related to a single process, if a value stream is provided ad-hoc it does not exist.

Attitudes of interviewee. Attitudes towards the work were diverse. One department had a more skeptical attitude towards the usefulness of the outcomes of the method. Another department – also claiming to have experience on the subject – manifested positive expectations towards the work.
During the work, the department that declared skepticism at the beginning of the work maintained that attitude and, also, was prone to delegating some modeling decisions to the consultants.
After the work was concluded, the department that declared skepticism at the beginning of the work manifested finding the work "productive" and claimed the intention to share it with their co-workers. On the other hand, the department that was more experienced and positive towards the work, commented on the value of the work for having a high-level perspective on the processes of the department and possible sources for diagnosis.

Diagnosis opportunities. Some improvement opportunities for individual processes emerged in the discussion: some corresponded to aspects about which the interviewee was already aware of, and others became evident during the work (e.g. discussing a value stream opened the discussion about its traceability). Other diagnosis opportunities that emerged were the standardization level of individual processes and the relative attention given to a specific process.
Some diagnosis opportunities emerged from looking into the Process Landscape as a whole as it was being developed. This included identification of missing processes, discussing the proportion of process categories, looking into the density of some elements in the models, and hypothesizing the existence of patterns/features related to specific departments.

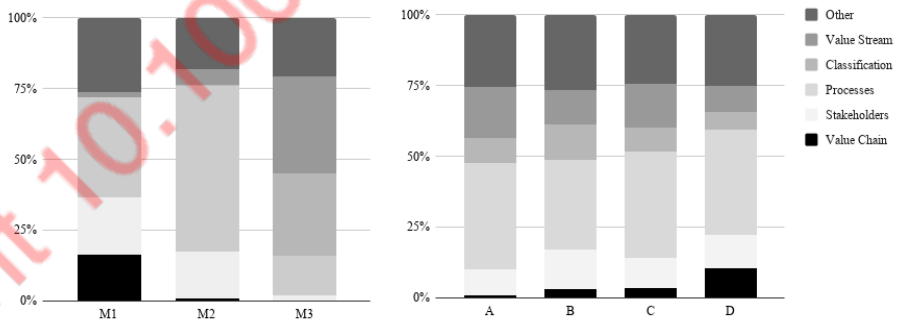
Appendix C Category-based codes

Dep.	Meeting	Frecuency	Value Chain		Stakeholder		Process		Classification		Value Stream		Other	
A	M1	35	2	6%	11	31%	4	11%	0	0%	0	0%	18	51%
	M2	111	0	0%	12	10%	69	62%	0	0%	2	1%	28	25%
	M3	104	0	0%	0	0%	21	20%	22	21%	43	41%	18	17%
	Total	250	2	1%	23	9%	94	38%	22	9%	45	18%	64	26%
B	M1	144	12	8%	19	13%	45	31%	0	0%	4	2%	64	44%
	M2	143	0	0%	38	27%	82	57%	1	1%	4	3%	18	13%
	M3	121	0	0%	0	0%	3	2%	50	41%	42	35%	26	21%
	Total	408	12	3%	57	14%	130	32%	51	13%	50	12%	108	26%
C	M1	96	9	9%	14	15%	37	39%	0	0%	0	0%	36	38%
	M2	107	1	1%	17	16%	57	53%	0	0%	16	15%	16	15%
	M3	90	0	0%	0	0%	16	18%	25	28%	29	32%	20	22%
	Total	293	10	3%	31	11%	110	38%	25	9%	45	15%	72	25%
D	M1	35	17	49%	5	14%	0	0%	0	0%	0	0%	13	37%
	M2	97	3	3%	9	9%	60	62%	0	0%	3	3%	22	23%
	M3	58	0	0%	8	14%	11	19%	12	21%	14	24%	13	22%
	Total	190	20	11%	22	12%	71	37%	12	6%	17	9%	48	25%

Table 3: Frequency of category-based codes by department (A, B, C, D) and meeting (M1, M2, M3).

Appendix D Analysis

For the analysis, we first focus on steps of the Method's procedure (nodes in the discovered models), and then on flows (arcs in the discovered models).



(a) Per meeting (b) Per department

Fig. 6. Prevalence of category-based codes per meeting and per department.

Nodes. Fig. 6 shows the prevalence of a given step of the Method's procedure per meeting and per department. From Fig. 6a, it can be observed that the category "Value Chain" is the least frequent and is almost exclusively found in the first meetings. "Process" is the most frequent category and it is found in all meetings predominating in the first and second ones. The remainder categories

are in between in terms of frequency. "Stakeholder" is found mostly in the two first meetings, "Classification" and "Value Stream" are found mostly in the last meeting.
From Fig. 6b, it can be observed that the proportion of codes for each category per department follows a similar pattern, but with some differences. The density of a meeting is defined as the total amount of codes identified in each one of them (i.e the sum of the codes of all different categories for that specific meeting). In the analyzed departments, the second meeting is the one with the highest density, where the topics discussed mainly involve the identification and description of processes, as previously described. With regard to the total by department, density ranges from 190 to 408.

Arcs. In the following, we describe the tendencies observed at the meeting level (M1, M2, and M3, separately) for all departments.

- **First meeting (M1)**: these meetings usually started with the category "Value Chain" and a predominance of flow between "Value Chain" and "Stakeholder" was observed.
- **Second meeting (M2)**: the focus of the second meeting was "Process" and the remaining categories observed in these meetings ("Stakeholder", "Value Chain", and "Value Stream") relate to each other indirectly via "Process".
- **Third meeting (M3)**: these meetings displayed a continuous iteration between "Value Stream" and "Classification".

In the following, we describe the tendencies observed when comparing the full execution of the method (M1, M2, and M3 jointly) in the different departments.

- The interaction began with "Value Chain" in M1, "Stakeholder" in M2, and "Value Stream" in M3.
- ⟨"Stakeholder", "Process"⟩ was the most recurrent flow. "Process" was usually the one connected with all the remaining categories.
- The category "Classification" is only related to "Value Stream" and "Process".
- Three of the four departments present a flow that is consistent with the Method's procedure, i.e. ⟨"Value Chain", "Stakeholder", "Process", "Value Stream", "Classification"⟩.

Concepts of the method. All interviewees were familiar with the concept of process, as it was part of the growing organizational process culture. However, the remaining concepts (i.e. value chain, stakeholder, value stream, and classification) were not understood by them all and it was necessary to invest a little time in explaining them.

Preparation for the method. For each department, a set of tasks were executed during the first (and sometimes second) meeting that provide preparation for applying the method. These tasks included the following: contextualize the work within the organization, describe the goal of the method and scope of the work, explain the procedure of the method, and introduce the team of consultants. Related to preparation tasks, the following lessons were learned: (i)

discussing use cases of a Process Landscape enhances motivation, (ii) showing examples of the outcomes (Process Landscape and Value Chain Model) eases the understanding of the method.

Tool support. The method was implemented using two software tools: a video-conference software for running the on-line meetings (i.e. Google Meet), and a modeling software for building Process Landscapes and intermediate models (i.e. Archi) during the meetings. Even though interviewees were familiar with the former, they did not know the latter. Consequently, curiosity questions regarding the modeling software were raised throughout the different meetings. Regarding the notation used in the models (i.e, ArchiMate), it was rapidly understood by the interviewees. Along different meetings also, a number of technical issues emerged related either to software or internet connection. However, these issues were infrequent and easily solved.

Meeting. Steering of meetings can be summarized into three tasks: start meeting, ensure fluency of meeting, and close meeting. Starting the meeting focused on setting the goal and plan for the ongoing meeting, which was sometimes supported by a recap of the previous meetings. For ensuring fluency of an ongoing meeting, the following strategies were observed: give closure to a discussion to proceed, postpone a modeling decision that is stalling the work, seize the momentum to address a related task (e.g. given a process has been classified in a given category, identify all processes that may fit in the named category), focus to prevent from diverging, and return from an interruption. The close meeting task focused on discussing the next steps of the method and/or the upcoming meeting. Along steering the meetings, we identified the following good modeling practices: (i) use familiar terminology in the models, (ii) prefer using verb-based labels for processes, (iii) include notes that complement the model, and (iv) review the generated models for completeness and correctness.

Procedure of the method. The procedure of the method was followed to a large extent during its implementation in all four departments. Despite regularly going back to previous steps, the main sequence of steps was observed.
"Select value chain" usually started and completed during the first meeting and was the least effort-consuming task. A general description of the goals and priorities of the department naturally led to selecting a value chain. Later references to the selected value chain were used for keeping the remaining work within scope.
"Identify stakeholders" usually started in the first meeting and was completed during the second one, consuming more effort. Despite that the method posits that stakeholder identification is the basis for process identification, we observed that it sometimes was the other way around. Another strategy used for stakeholder identification was using patterns observed in other departments or specialization of standard stakeholder types (e.g. monitors, suppliers, etc.).
"Define processes" was executed throughout all meetings but most intensively during the second one. Altogether it was the most effort-consuming task. Besides

stakeholder-based identification, the use of patterns observed in other departments or specialization of standard process types (e.g. auditing, resource planning, etc.) was often used for defining processes of the landscape. To a lesser extent, process identification was also led by previous identification of entities handled by process, or other elements (e.g. projects) of the departments.
The identification of – unlabeled – value streams was often done together with the identification of a process. "Label value stream", on the other hand, was executed most intensively during the third meeting. However, labeling was sometimes a natural follow-up after a process was identified. A more detailed discussion about the process was used to define the labels, and also patterns were sometimes used.
"Classify processes" was exclusively executed during the third meeting. It was done by either focusing on processes (To which category does the process belong?) or on categories (Which processes belong to the category?). Nevertheless, the different categories were also mentioned during process identification, to clarify the type of processes that could be identified for the landscape.

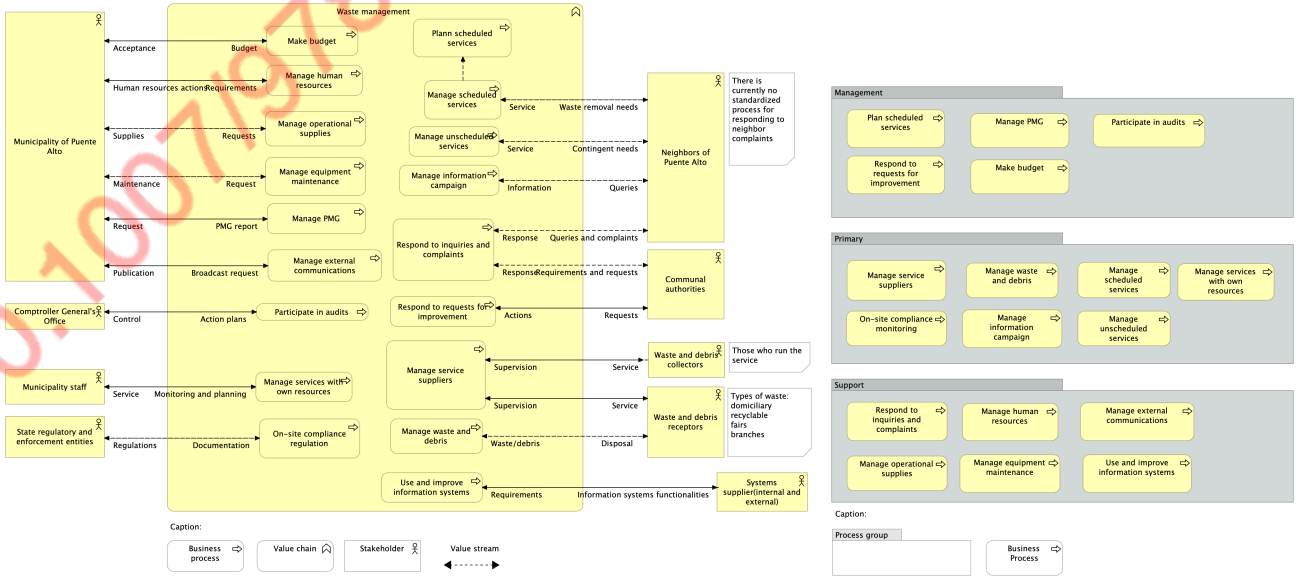
Generation and validation of the Process Landscapes. Along the different steps of the method's procedure, we observed a common pattern. First, a new element (value chain, stakeholder, process, value stream, or classification) was proposed, a discussion was held about its correctness and/or abstraction level, the name was fine-tuned, and the respective model was modified accordingly. Also, before finishing each step, the respective model was checked for completeness. With this *modus operandi*, both the Value Chain Model and the Process Landscape were generated and validated in-the-making. Additionally, when a model was finished, a final revision was done to verify it represented the process architecture effectively.

Attitudes of interviewee. Attitudes towards the work were diverse. One department had a more skeptical attitude towards the usefulness of the outcomes of the method. Another department – also claiming to have experience on the subject – manifested positive expectations towards the work.
During the work, the department that manifested skepticism at the beginning of the work maintained that attitude and, also, was prone to delegating some modeling decisions to the consultants.
After the work was concluded, the department that manifested skepticism at the beginning of the work, manifested finding the work "productive" and claimed the intention to share it with their co-workers. On the other hand, the department that was more experienced and positive towards the work, commented on the value of the work for having a high-level perspective on the processes of the department and possible sources for diagnosis.

Diagnosis opportunities. Some improvement opportunities for individual processes emerged in the discussion: some corresponded to aspects about which the interviewee was already aware of, and others became evident during the work (e.g. discussing a value stream opened the discussion about its traceability). Other diagnosis opportunities that emerged were the standardization level

of individual processes and the relative attention given to a specific process. Some diagnosis opportunities emerged from looking into the Process Landscape as a whole as it was being developed. This included identification of missing processes, discussing the proportion of process categories, looking into the density of some elements in the models, and hypothesizing the existence of patterns/features related to specific departments.

Appendix E Example of output models



(a) Value Chain Model (b) Process Landscape

Fig. 7. Output models resulting from the Implementation of the Process Landscape Method in a department of the project.