Repeatable Collaboration Processes for Mature Organizational Policy Making

J. (Josephine) Nabukenya, P. (Patrick) van Bommel, H.A. (Erik) Proper

Institute for Computing and Information Sciences, Radboud University Nijmegen
Toernooiveld 1, 6525 ED Nijmegen, The Netherlands
{J.Nabukenya, P.vanBommel, E.Proper}@cs.ru.nl

Abstract. Organizational policy making processes are complex processes in which many people are involved. Very often the results of these processes are not what the different stakeholders intended. Since policies play a major role in key decision making concerning the future of organizations, our research aims at improving the policies on the basis of cooperation.

In order to achieve this goal, we apply the practice of *collaboration engineering* to the field of organizational policy making. We use the *thinklet* as a basic building block for facilitating intervention to create a *repeatable* pattern of collaboration among people working together towards achieving a goal. Our case studies show that policy making processes do need collaboration support indeed and that the resulting policies can be expected to improve.

1 Introduction

In order to regulate organisational processes, organisations use policies as an instrument to guide and bound these processes. A policy [3] is a guide that establishes parameters for making decisions; it provides guidelines to channel a manager's thinking in a specific direction.

Policies are created in a *policy-making process*, which involves an iterative and collaborative process requiring an interaction amongst three broad streams of activities: problem definition, solution proposals and a consensus based selection of the line of action to take. The core participants of a policy-making process must be involved in complex and key decision making processes within the organisation themselves, if they are to be effective in representing organisational interests. Explicit policies are a key indicator for successful organisational decision-making.

The complexity of policy-making processes in organisations may be described as having to cope with large problems. Examples include: information technology, innovation, procurement, security, software testing, etc. These problems may be affected by (i) unclear and contradictory targets set for the policy goals; (ii) policy actors being involved in one or more aspects of the process, with potentially different values/interests, perceptions of the situation, and policy preferences. Policy makers and others involved in the policy-making process need

information to understand the dynamics of a particular problem and develop options for action. A policy is not made in a vacuum. It is affected by social and economic conditions, prevailing political values and the public mood at any given time, as well as the local cultural norms, among other variables.

A policy-making process is a collaborative design process whose attention is devoted to the structure of the policy, to the context and constraints (concerns) of the policy and its creation process, and the actual decisions and events that occur [8]. We aim to examine, and address, those concerns that have a collaborative nature. Such concerns include the involvement of a variety of actors resulting in a situation where multiple backgrounds, incompatible interests, and diverging areas of interest all have to be brought together to produce an acceptable policy result. Due to the collaborative nature of a policy-making process, its quality is greatly determined by a well-managed collaborative process. We look towards the field of *collaboration engineering* to be able to deal with such concerns. Collaboration engineering is concerned with the design of recurring collaborative processes using collaboration techniques and technology [16].

The main purpose of our paper is to establish a repeatable process (a method) for the realisation of "good policies" in a collaborative process and to investigate how this process can be improved by the support of collaboration engineering.

The remainder of this paper is structured as follows. Section 2 briefly explains the concepts of policy, policy making processes and the collaborative concerns that may arrive from these processes. We then continue in section 3 with an exploration of the potential role of collaboration engineering in addressing these concerns. In section 4 we elaborate on the research method used in our persuit of developing a repeatable collaboration process. Section 5 briefly outlines the four case studies we have performed. Based on these case studies, section 6 discusses the design of our current policy making method. Finally, section 7 provides the conclusion as well as a discussion on further research.

2   Background

This section aims to briefly describe the concept of organisational policy-making processes, key characteristics, in addition to collaborative constraints (concerns) to organisational policy-making processes.

2.1   Organisational Policy-Making Processes

With an increase in internal and external business needs, organisations have continuously established organisational policies. An organisation is described by [1] as "an entire set of relationships it has with itself and its stakeholders". In other words, an organisation is not necessarily a thing per se but a series of relationships between a wide series of parties. Because of their nature, it is important for organisations to create policies for a number of reasons such as they establish responsibilities and accountability; they help ensure compliance and reduce institutional risk; they may be needed to establish and/or defend a legal basis for

action; and they provide clarification and guidance to the organisational community [2]. For policies to be effective, organisational policy-makers must ensure that they are properly disseminated (distributed, read, understood and agreed-to) and managed (NIST SP 800-18, 1998). The concept of *policy* therefore, is defined by [3] as "a guide that establishes parameters for making decisions", that is, it provides guidelines to channel a manager's thinking in a specific direction. While [4] regards a policy as "a proposed course of action of a person, group, or government within a given environment providing obstacles and opportunities which the policy was proposed to utilize and overcome in an effort to reach a goal or realize an objective or a purpose." Also, [5] defines policy as "a purposive course of action followed by an actor or set of actors in dealing with a problem or matter of concern". For our purpose and to integrate the various definitions, we define the concept of a policy as *a purposive course of action followed by a set of actor(s) to guide and determine present and future decisions, with an aim of realizing goals.*

Organisational policy-stakeholders follow a policy-making process to develop and implement a policy. *Policy-making* is defined by [1] as a process of forming, weighing, and evaluating numerous premises in a complex, continually changing and unfolding argument. The premises in these arguments are in effect the assumptions that are made with regard to the stakeholders that are judged to be relevant to the policy issue under consideration [1]. To concur with [1], [6] also defines policy-making as a process of defining and treating ill-structured issues and problems. An ill-structured problem is characterized as a problem that is well-defined but people responsible for dealing with it can not agree upon a number of issues such as an appropriate solution; a methodology to develop the solution; and on clear definition of the problem objectives and terms [7]. In sum, policy-making is a process that is characterized by complexity in nature. In other words, it is a process that deals with organisational problems that by definition can not be formulated; yet affected by unclear and contradictory targets set for the policy goals; let alone solved, independently of one another. In the section that follows, we describe the complexity in detail.

2.2 Collaborative concerns in Organisational Policy-making processes

Organisational policy processes take a searching, iterative problem solving course. Because of their nature, policy processes have been characterized by complexity. We identify two kinds of complexity in policy-making processes: multi-participant complexity, and technical complexity [8, 9]. Both types of complexity have distinguished characteristics/concerns. Our study focuses on those concerns/characteristics that have a collaborative nature and we claim can be met by collaboration engineering techniques. Such collaborative concerns [10, 11, 8, 9, 12] include:

- *Degree of variance in interests and tasks required* - policy stakeholders will influence the process according to their views and interests due to the demand

to have a say with regard to the policy problems and potential solutions yet differing in its views and knowledge;

– *Conflicting objectives and criteria* - this stems from lack of clear and measurable objectives as a result of failure of alignment of various perceptions from policy stakeholders. The interests of actors and their perceptions of reality determine their objectives, that is, the outcomes they want to achieve;
– *Lack of consensus* - lack of consensus among policy stakeholders, results from the failure to find common definitions on policy issues due to personal beliefs, attitudes, biases, and perceptions;
– *Lack of understanding of the policy problem* - policy stakeholders or participants usually start off the process to solve policy problems with a lack of understanding and insight into the policy problem elements and their relationships. This is also affected by lack of sufficient and relevant technical information and data for the formulation of policy;
– *Lack of a clear methodology/approach* - when given policy assignments, policy stakeholders will often need to design new methods/approaches to tackle them, as adequate approaches/methods to attain satisfactory policy plans do not exist;
– *Time pressure* - this stems from the fact that organizing participation in policy procedure (as it involves many activities and actors) is hard and time consuming. Because of the large numbers of actors, policy processes most of the time turn out to be highly unpredictable.

In sum, the concerns described above characterize the collaborative complexity found in organisational policy-making processes. Policy-making is a collaborative design process whose attention is devoted to the structure, to the context and constraints/concerns of the process [8]. To this end, the policy process needs to be made easy and structured especially for stakeholders involved. Having collaborative concerns implies the need to have a standard collaboration process that is referred to when making policies. To achieve this, we turn to collaboration engineering.

3   Collaboration Engineering Potential for Organisational Policy-making processes

In this section, we describe the concept of Collaboration Engineering (CE), and the requirements of CE that follow from organisational policy-making processes. Specifically, we present how CE can aid in supporting to improve collaborative concerns (meet organisational policy-making processes collaborative needs).

3.1   Collaboration Engineering (CE)

Organisational policy-making process is a complex ill-structured and messy problem-solving process [6], that no single person has all the understanding, information and resources to do it alone. The process of policy-making needs to be made easy

and structured especially for stakeholders involved, yet derive value to the organisation. Organisations and their stakeholders need to have a standard collaboration process, that is, a well-defined process specification with several choices depending on the context/situation in which a policy needs to be specified, that is referred to when making policies. This can be achieved by CE. *Collaboration Engineering* (CE) therefore, is an approach to designing such recurring collaboration processes that are meant to cause predictable and success among organisations' recurring mission-critical collaborative tasks. CE is defined by [13] as "an approach to designing collaborative work practices for high-value recurring tasks, and deploying those designs for practitioners to execute for themselves without ongoing support from professional facilitators".

To design a recurring mission-critical collaboration process for execution by organisation practitioners, [13] suggest following the [14]'s five ways model that gives a comprehensive description of an engineering method or approach to be followed. When using this framework/model for CE, the *way of thinking* portrays the concepts and theoretical foundations; the *way of working* describes structured design methods; the *way of modeling* describes conventions for representing aspects of the domain and the approach; and finally the *way of controlling* describes measures and methods for managing the engineering process.

In the engineering approach described above, a collaboration engineer executes six steps in an iterative, non-linear fashion when designing a collaboration process [15]. These include:

1. *Task Diagnosis* - where interviews with the problem owner are undertaken to identify the problem and the goal of the collaboration process.
2. *Task Assessment* - in this step, the process to complete the task should be determined.
3. *Activity Decomposition* - this step involves the patterns of collaboration. In this step, the decomposition of the activities from the previous step should stop when each step cannot be decomposed any further in terms of the patterns of collaboration. Collaboration engineers use patterns of collaboration to determine how a group will accomplish each task. As groups move through the steps/phases, the patterns of collaboration characterize their activities. That is, six patterns of collaboration are defined in a way that they are meant to move a group from a starting state to an end state [16]: *Generate* - move from having fewer concepts to having more concepts; *Reduce* - move from having many concepts to having a focus on fewer concepts deemed worthy of further attention; *Clarify* - moving from less to more shared meaning for the concepts under consideration; *Organize* - move from less to more understanding of the relationships among the concepts; *Evaluate* - Move from less to more understanding of the benefit of concepts toward attaining a goal); and *Build consensus* - move from having more disagreement to having less disagreement among stakeholders on proposed courses of action.
4. *Task-ThinkLet Match* - this step involves matching thinkLets to respective activities once they have reached the lowest level of decomposition. A *thinkLet* is defined by [17] as "a named, packaged facilitation intervention

that creates a predictable, repeatable pattern of collaboration among people working together toward a goal". Thinklets benefit the design and transfer of collaboration processes in many ways among which include: permit ease of communication, documentation and transfer of a collaboration process to others; improving productivity of and quality of work life for groups by enabling rapid development of collaboration processes; creation of particular dynamism within groups, though each instantiation of the pattern would differ from all other instantiations [18, 13]. Examples of thinkLets are provided in Table 1. More examples can for example be found in [19].

5. *Design Documentation* - in this step, a collaboration engineer produces design documentation (document) that would be handed off to the organisation practitioner. The problem, process description, detailed agenda, and a facilitation process model are packaged as documentation. The facilitation process model visualizes the sequence of thinkLets and the process flow decisions that have to be considered during the execution of the collaboration process.

6. *Design Validation* - the final step involves validating the process design. Four ways of validation are identified: pilot testing, walk through, simulation, and review.

ThinkLet Name	Pattern of Collaboration	Purpose
DirectedBrainstorm	Generate	To generate, in parallel, a broad, diverse set of highly creative ideas in response to prompts from a moderator and the ideas contributed by team mates.
BucketSummary	Reduce and clarify	To remove redundancy and ambiguity from broad generated items.
BucketWalk	Evaluate	To review the contents of each bucket (category) to make sure that all items are appropriately placed and understood.
MoodRing	Build Consensus	To continuously track the level of consensus within the group with regard to the issue currently under discussion.

Table 1. Examples of thinkLets with their respective Collaboration Pattern

Because organisational policy-making processes are inherently collaborative in nature, supporting to improve their collaborative effort is imperative. The need for improving policy collaborative processes is the choice for CE. CE therefore benefits organisational policy-making processes in a number of ways:

First, creating policies is a searching and iterative problem-solving collaborative work; this may require external support from professional policy developers/facilitators. External professional policy developers/facilitators are commonly found to be expensive and scarce. CE therefore seeks to bring the value of facilitated interventions to people who do not have access to facilitation [16]. This means, a Collaboration Engineer designs a repeatable collaboration policy-making process once which can then be carried out/executed by stakeholders involved in the policy-making process without additional support.

Secondly, CE focuses on recurring processes rather than ad hoc processes. In other words, when a repeated collaborative policy process is improved, an

organisation will derive benefit from the improvement again and again. While with ad hoc processes, the value of each process improvement will accrue only once. Again, with the improvement to repeatable collaborative policy processes, practitioners of these processes can learn to conduct them successfully without learning facilitation skills [13]. This also means that organisational policy-making stakeholders do not have to spend on professional facilitators to conduct such processes.

CE helps in designing collaborative policy-making processes to achieve high-value. Better still, deploy those designs for organisational policy practitioners to execute for themselves without ongoing support from professional facilitators [13]. This means that CE focuses on processes for mission-critical tasks that must be executed by teams rather than individuals, and should be executed frequently, and that have a high payoff if successful. CE is therefore a design approach for recurring collaboration processes that can be transferred to groups that can be self-sustaining in these processes using collaboration techniques and technologies [20].

Finally, the designs of recurring collaborative policy processes will create intellectual capital for organisations [13]. That is, different organisational policy-making practitioners can be able to execute the collaborative organisational policy-making process. Also this collaboration process can be executed for different teams of the same organisation. More so, the same collaborative organisational policy-making process can be used for different types of policies (content).

3.2 Meeting Collaborative needs with Collaboration Engineering

In this section, we discuss how collaboration engineering can provide for collaborative needs for organisational policy making processes. We have described the collaborative concerns related to policy process complexity. These concerns are the motivations for formulating collaborative needs for organisational policy-making processes. If there would not be concerns, we would not need to invest in collaboration engineering, or rather, the design of repeatable collaborative policy processes. We therefore formulate several collaborative needs (deduced from concerns described in the previous) that can be met by collaboration engineering.

- *Policy requirements expectation accommodation* - policy-making stakeholders need a collaborative process that permits them to contribute and the contributions taken into account in policy requirements negotiation. In other words, there is need for a collaborative process that permits stakeholders to arrive at satisfactory (reach for consensus) policy requirements' outcomes without conflicting and compromising overall policy objectives. In the collaboration engineering approach, execution of collaborative processes permits representation of all the stakeholders in collaborative problem-solving activities; thereby bettering the chance of their interests being accommodated in the solution.
- *Understanding of the policy process* - there is need for a collaborative process that is not complex and is easily understood by the policy-making practitioners. In collaboration engineering, collaboration engineers use building blocks

known as *thinkLets* when designing repeatable collaboration processes. A thinkLet is a facilitation intervention that would improve productivity of and quality of work life for policy practitioners by enabling rapid development of the policy-making collaboration processes. In other words, usage of thinkLets would permit policy practitioners to execute the collaboration policy process with ease, hence, making it easily understandable for them.

– *Policy process efficiency* - policy-making stakeholders need a collaborative process in which they can take less time for attainment of the policy than without the use of a collaborative approach. With collaboration, groups tend to minimize/save on the amount of resources required to attain a goal. For example, the time policy stakeholders will actually use for achieving the planned policy outcomes in a collaboration session.

– *Structured policy problem solving approach* - there is need for a standard recurring collaborative process that is to be referred to each time policy stakeholders need to tackle complex policy problems. Collaboration engineering is an approach to designing recurring collaboration processes. That is, CE focuses on recurring processes rather than ad hoc processes where a repeated process if improved, an organisation will derive benefit from the improvement again and again. While with ad hoc processes, the value of each process improvement will accrue only once. More so, with the improvement to repeatable processes, the same collaborative policy process could be applied successfully in each policy developing workshop with different groups (policy stakeholders) and focusing on different collaborative policy developing tasks. Also, with the improvement to repeatable processes, practitioners of these processes can learn to conduct them successfully without learning facilitation skills.

– *Policy elements identification (with their definitions)* - policy-making stakeholders need a collaborative process that enables them to identify and have a common understanding of the policy elements (and their definitions). Collaborative processes are designed in such a way that they must be executed by groups rather than individuals. This means, during collaborative policy process execution, policy stakeholders have the opportunity to perform the tasks collaboratively there by enabling a common/shared understanding, commitment and consensus of policy elements identified.

Summarized, designing, or engineering organisational policy processes represents a complex activity that may require the efforts of many people. Collaboration engineering is a process in which members of an organisation (in our case policy stakeholders) cooperate in making policies or decisions with respect to an organisational strategy, process or system that affects them all. Hence, organisational policy-making stakeholders and practitioners need recurring collaborative processes and technologies that can meet their collaborative needs to enable complex problem solving of policy problems.

4   Research Questions and Approach

In this section, we present the research questions and how we addressed them. In coming up with a repeatable collaboration process to meet collaborative needs for organizational policy-making processes, the following research question had to be addressed: *How can usage of a repeatable collaboration process meet collaborative needs for organizational policy-making processes?* To achieve this, we followed [21]'s Action research methodology. We used this method in comparison to others, because it appeared to be most appropriate in our context. That is, it allowed us to gain a richer understanding of the workings of our collaboration process in action. Action research also permitted the researchers to intervene in the problem setting, and perform collaboratively [22]. In addition, action research is the most suitable in addressing the "how to" research questions [23], as our research aimed at addressing how to meet collaborative needs for organizational policy-making processes using a repeatable collaboration process. Furthermore, action research allowed us to evaluate and improve our problem-solving techniques or theories during a series of interventions.

The action research method proposed by [21] involves four activities/phases that can be carried out over several iterations (in our case four). The first activity 'Planning' is concerned with the exploration of the research site and the preparation of the intervention. The second phases 'Act' involves the actual intervention made by the researcher. In the third phase 'Observe', collection of data during and after the actual intervention to enable evaluation is done. Finally, the fourth activity 'Reflect' involves analysis of collected data and infers conclusions regarding the intervention that may feed into the 'Plan' activity of a new iteration.

Following the model described above, the 4 activities were executed as follows: In the 'Planning' activity, we conducted interviews with four organizations that have policy-making functions and also performed a literature review to understand organizational policy-making. The data collected formed the initial requirements for the repeatable collaboration process.

The 'Act' activity involved actual execution of the repeatable collaboration process in the field both in industrial settings and an inexperienced environment. We applied the repeatable collaboration process with three policy types in four case organizations (see section 4).

To evaluate the performance and perception of the repeatable collaborative policy-making process by the participants, we collected and analyzed explorative data during the 'Observe' activity. 3 kinds of instruments, that is, observations, interviews and questionnaires comprising of qualitative and quantitative questions, respectively were used for data collection. The tools enabled us to collect and analyze data regards policy requirements expectation accommodation; understanding of the policy process; effectiveness, and efficiency of the repeatable collaboration process and its outcomes; policy elements identification; the degree of applicability of the repeatable collaboration process; and policy stakeholders' satisfaction with the repeatable collaboration process and its outcomes.

Finally, in the 'Reflect' activity, we tested the process using four cases to allow us to reflect on the process design and improve it continuously. The final design (Figure 1) of the repeatable collaborative policy-making process was the result of four iterations. The iterations performed earlier were considered less desirable because of perceived inefficiency in the discussion and uneven amount of time required to complete the process for identifying common and priority policy elements with their definitions. For example, in the early iterations, participants executed the policy objectives and policy elements formulation tasks in parallel which made the process very slow, that is, participants generated policy elements that were more/less related to the meeting goal, but many of these did not address stated policy objectives/concerns formulated in the previous task. However, sequential execution of the two tasks was deemed necessary for the process as the former task was the basis for the latter (the policy elements being formulated had to address policy objective(s) stated). This also affected the discussion/cleaning-up time and completeness of the process in terms of trying to match the out-of-scope formulated policy elements to stated policy objectives. Also in these iterations, we left policy objectives and policy elements formulation tasks very broad to reduce on the lengthy process execution time. This however, was forsaken because not all policy objectives and elements recorded were that priority, consistent and common to meet the desired end states.

5 Case Descriptions

As described in the action research model (see section 4), the 'Act' activity involved actual execution of the repeatable collaborative policy-making process in the field both in industrial settings and an inexperienced environment. We applied the collaboration process with three policy types in four case organizations. Below is a description of the cases that were involved.

Case Organization 1 – was used to observe the performance of the process in an industrial setting. A team of 5 experienced Information and Communication Technology (ICT) workers and involved in making policies for the Information Technology (IT) Department of the Ministry of Finance, Planning and Economic Development (MOFPED), Uganda, used the process to develop an Information Technology (IT) policy for the department.

Case Organization 2 – was used as an inexperienced environment. A team of 16 people comprised of 2 experienced IT workers involved in IT policy-making and 14 Masters Students (Year 2, Computer Science) at Radboud University Nijmegen (RUN), the Netherlands, used the process to develop a policy in form of architectural principles for the student portal information system for RUN. The 2 experienced participants mainly assisted the students with the appropriate content.

Case Organization 3 – was used to observe the performance of the process in an industrial setting. A team of 6 experienced Information Technology (IT) workers / officers and involved in making IT policies for the National Social

Security Fund (NSSF), Uganda, used the process to develop a Security policy on "Guarding Against Security Breaches in an IT Driven Organization"

Case Organization 4 – was used to observe the performance of the process in an industrial setting in comparison to the inexperienced environment at RUN, the Netherlands. We set up a team of 7 stakeholders from the department of Control, Information, and Finances (CIF). This team comprised of 5 experienced CIF stakeholders involved in formulating IT business rules, regulations and architecture principles for information systems for RUN, the Netherlands, and 2 students' representatives as stakeholders in this exercise, used the process to formulate architecture principles for the RUN Student portal information system.

6 Generic Repeatable Collaboration Process Framework

In this section, we present the design evaluation criteria we followed, and then a description of the generic repeatable collaborative policy-making process.

6.1 Design Criteria

The design of the repeatable collaborative policy-making process was derived from a few iterations based on selected design criteria. The criteria selection was made according to the goal of the evaluation itself. Evaluation of the collaboration process aimed at addressing how to meet collaborative needs for organizational policy-making processes using a repeatable collaboration process. Below is a description of the criteria we considered:

Effectiveness – the repeatable collaboration process should enable policy-making stakeholders to achieve their goal.

Efficiency – the collaboration process should take stakeholders less time for attainment of the policy than without the use of a collaborative approach.

Degree of applicability – the extent to which the repeatable collaboration process can be applied to formulation of varying policy types.

Policy elements identification – the collaboration process should enable stakeholders to have a common/shared understanding, commitment and consensus of the policy elements (and their definitions) identified.

Policy requirements expectation accommodation – the collaboration process should permit stakeholders to contribute and the contributions taken into account in policy requirements negotiation. In other words, the collaboration process should permit stakeholders to arrive at satisfactory policy requirements' outcomes without conflicting and compromising overall policy objectives.

Understanding and ease of use of the policy process – the collaboration process should not be complex and should be easily understood by the policy-making stakeholders. That is, the process should be easy for the practitioners to learn and execute routinely.

6.2 Process Design

To design the repeatable collaborative policy-making process, we followed the collaboration engineering techniques as described in Section 1.2. Even though this approach comprises several design steps, the ones relevant to our research study included decomposing the process into collaborative activities, the classification of these activities into patterns of collaboration, selection of appropriate thinkLets to guide facilitation of the group during the execution of each activity as well as making the design process more predictable and repeatable.

The collaboration process design was not from scratch. The design was based on the policy process requirements derived from the explorative field study with four case organizations that have policy-making functions, and also in concurrence with the policy process discussed by [2]. A typical policy-making process includes six stages [2]. However, our process design only involves the development/formation phase of the organizational policy-making process; therefore it caters for a pre-used policy. The repeatable collaborative policy-making process underwent four iterations prior to deriving the final process design. The four iterations of the earlier versions of the process were applied in the four cases described in section 4. The final process design is shown in Figure 1 in which we present the steps required to develop/form a policy document, and the patterns of collaboration with related thinkLets used to guide the group to execute each step.

The development/formation phase of the collaboration process has two main parts: part 1 - pre-development/meeting phase, and part 2 - the development phase. Prior to the actual development of the policy, policy-making stakeholders have various policy meetings to gather information on the kind and the need for the policy. This phase involves discussions and agreement on the following pre-development elements: the problem to be solved; the relevant information to be used to develop the policy; a legal framework to support the policy to be developed; the ownership of the policy; leadership positioning i.e. who is to spearhead the process; who are the stakeholders (internal and external); technical resources to facilitate the process. The second part, the development phase, involves policy stakeholders to identify and agree on policy objectives; then the identification of and agreement on common policy elements with their definitions and respective implications/terms that should suit the desired end state (policy objectives). These activities (process) should finally generate a policy document which clearly articulates solutions.

In the activity that follows, the participants are invited to brainstorm/formulate objectives that they think would be relevant for the intended policy. The brainstorm activity is guided by the *DirectedBrainstorm* thinkLet, in which a facilitator gives prompts to the participants to stimulate them to think and take into account all the relevant objectives that would fit the intended policy, e.g. the facilitator would give such a prompt "think about five most important objectives that suit the policy". The result from this activity is a brainstormed list of policy objectives.
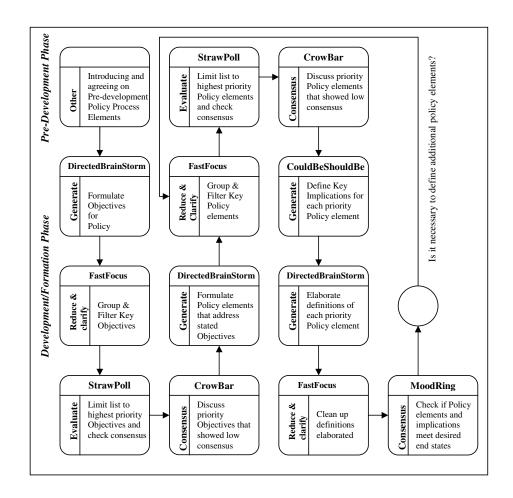
Other — Introducing and agreeing on Pre-development Policy Process Elements

StrawPoll / Evaluate — Limit list to highest priority Policy elements and check consensus

CrowBar / Consensus — Discuss priority Policy elements that showed low consensus

DirectedBrainStorm / Generate — Formulate Objectives for Policy

FastFocus / Reduce & Clarify — Group & Filter Key Policy elements

CouldBeShouldBe / Generate — Define Key Implications for each priority Policy element

FastFocus / Reduce & clarify — Group & Filter Key Objectives

DirectedBrainStorm / Generate — Formulate Policy elements that address stated Objectives

DirectedBrainStorm / Generate — Elaborate definitions of each priority Policy element

StrawPoll / Evaluate — Limit list to highest priority Objectives and check consensus

CrowBar / Consensus — Discuss priority Objectives that showed low consensus

FastFocus / Reduce & clarify — Clean up definitions elaborated

MoodRing / Consensus — Check if Policy elements and implications meet desired end states

Is it necessary to define additional policy elements?

Fig. 1. Repeatable collaborative policy-making process

Using the *FastFocus* thinkLet, the activity that follows requires participants to organize the resulting list by extracting only the Key objectives for the policy. They do this by grouping and filtering ideas, as well as eliminating any redundancies. During this discussion, participants are allowed to also crosscheck to see if there is any important issue/objective that has not yet been posted on the public list. If this arises, a quick DirectedBrainstorm thinkLet followed by FastFocus thinkLet are performed. The result from this activity is a cleaned list of Key policy objectives. The participants then use these results to evaluate/limit the cleaned list to the highest priority objectives. They do this by rating the key objectives using a given criteria. The evaluation activity is guided by the *StrawPoll* thinkLet followed by a *CrowBar* thinkLet to discuss ideas that may have low consensus. The outcome of this activity is a list of priority key objectives.

In the activity that follows, guided by the DirectedBrainstorm thinkLet participants are asked to formulate common policy elements that address the Key priority policy objectives. The result of this activity is a brainstormed list of policy elements. Using the FastFocus thinkLet, the participants organize (clean-up) the resulting brainstormed list by extracting (grouping and filtering) only the Key common policy elements. The result of this activity is a cleaned list of Key policy elements. Based on the results from this activity, and using the StrawPoll thinkLet followed by a Crowbbar thinkLet, participants are then required to evaluate/limit the list to the highest Key priority policy elements. The outcome of this activity is a list of priority Key policy elements that address the stated policy objectives.

The activity that follows involves defining the Key terms/implications for each of the Key priority policy elements. Using the *CouldBeShouldBe* thinkLet, participants brainstorm implications that they 'could' consider as appropriate for each priority policy element. Using the brainstormed list of implications, participants then choose implications they 'should' take as Key to each priority policy element. This exercise is continued until all the Key implications for each priority policy element are defined. The activity that follows requires participants to elaborate/define each of the priority policy elements. This is guided by the DirectedBrainstorm thinkLet, followed by a FastFocus thinkLet.

Finally, the activities above result into a Policy document. Using the *MoodRing* thinkLet, participants are required to check completeness of the policy document by reaching consensus. They do this by voting on a YES/NO basis, where a YES is voted if the priority policy elements (with their definitions) and respective implications meet the desired end states (i.e. address the stated policy objectives) and a NO if they do not. A verbal discussion is held to address issues identified as incomplete, until some sort of consensus on completeness is reached.

Evaluation of the generic repeatable collaborative policy-making process design was implemented using two procedures. The first three collaborative sessions involved usage of a manual procedure, that is, a MicrosoftWord (MSWord) tool, an LCD projector, removable disks and voting sheets (paper-based), while the fourth session, we used group support technology to implement the process, respectively. Results from the cases are presented in the section below.

6.3 Results

This section presents the results from the four case studies. We collected and analyzed data regarding policy requirements expectation accommodation; understanding of the policy process; effectiveness, and efficiency of the collaboration process and its outcomes; policy elements identification; the degree of applicability of the repeatable process; and policy stakeholders' satisfaction with the repeatable process and its outcomes.

Satisfaction is defined as an affective response with respect to the attainment of goals (process outcomes; and the process by which the outcomes were attained). To measure this construct, we used the 7-point Likert scale general meeting survey questionnaire where participants can strongly disagree to strongly agree. The instrument validation and theoretical underpinnings can be seen in [24]. Results in Table 2 indicate that the participants were reasonably satisfied with the repeatable collaboration process outcomes, and the process by which the policies were formed.

	1	2	3	4
Satisfaction with process				
Score	4.800	3.838	4.500	4.800
Standard deviation	1.376	0.995	1.366	1.053
Satisfaction with outcome				
Score	5.160	4.363	5.367	5.486
Standard deviation	1.310	1.094	0.908	0.598

Table 2. Satisfaction with process and outcome

The participants indicated that the results were useful to them as they gave better understanding of what issues they found important/key to the policy. They also observed this process as an all encompassing, interactive, efficient and better method/approach of formulating policies.

We define *Efficiency* as the degree to which there is savings of the amount of resources (for example time, costs, effort) required for attainment of the goal. In other words, the collaboration process should take participants less time and effort for attainment of the policy than without the use of a collaborative approach. To measure this construct, we considered the execution duration (timing) of each stage of the process; and also how well the participants understood the process tasks (used less effort) for successful execution in order to realize/come up with a policy.

Based on our observations, we concluded that the repeatable collaboration process execution time was efficient. On average, it took two hours to execute the process in each of the workshops. This means, the participants managed to execute the process within the duration that was assigned to each stage. Even though the majority of the participants felt that the process execution was efficient in terms of cognitive load/less effort and time, not all were happy with the time length particularly with some activities. For example one participant said "I believe to fully realize satisfactory results from specific activities of the process, it requires a more in-depth session". Such remarks were taken along in the final process design.

In addition to execution time, participants being able to execute the collaboration process with less effort, (for instance there were less to none questions of how to do things) made us conclude that they clearly understood the collaboration process *(understanding of the policy process)*.

Effectiveness is defined as the extent to which there is effort for policy stakeholders to achieve their goal. We measured this construct by how well the participants managed to come up with a policy at the end of the policy process execution. From our observations, it was noted that the participants effectively managed to formulate respective policy types. This was demonstrated during the consensus stage of the process, and also based on results from satisfaction with the process outcomes (see Table 2). In the consensus stage, participants were required to check if the policy document met the desired objectives for which it was intended for. They did this by voting on a YES/NO basis, where a YES was voted if the policy elements (with their definitions) and respective implications/terms met the desired end states and a NO if they did not. Based on the feedback from the voting sheets (see Table 3), it was observed that the participants achieved satisfactory results, that is, they managed to form a policy based on the desired end states. For those that voted a NO, a verbal discussion was held to re-address their issues until some sort of consensus was achieved.

	Yes	No
Case 1	4 (80%)	1 (20%)
Case 2	12 (75%)	4 (25%)
Case 3	5 (83%)	1 (17%)
Case 4	5 (71%)	2 (29%)

Table 3. Voting consensus results

Policy requirements expectation accommodation is defined as the ability of the process to accommodate awareness of each stake holder's desired policy preferences. In other words, the process should permit stakeholders to arrive at satisfactory policy requirements' outcomes without conflicting and compromising overall policy objectives. To measure this construct, we used consensus levels (Table 3) and satisfaction results (Table 2) in addition to feedback from data session logs transcribed by domain experts. From our observations, it was noted that participants were able to contribute and the contributions taken into account in policy requirements negotiation. The consensus activity enabled participants to discuss and arrive at satisfactory policy requirements' outcomes in relation to overall policy objectives. The same results were also used to measure *Policy elements identification (with their definitions)*. We define this construct as the extent to which the collaboration process should enable stakeholders to have a common/shared understanding, commitment and consensus of the policy elements (and their definitions) they have identified. Based on these results, it was observed that the participants perceived it as having a common/shared understanding of the policy elements identification.

We define *Degree of applicability* as the extent to which the repeatable collaboration process can be applied to formulation of varying policy types. To

measure the degree of applicability, we implemented the collaboration process to four cases with different policy types. These included formation of an Information Technology (IT) policy, Architectural Principles for a student Information System Portal, and a Security policy for an IT-Driven organization. It was observed that the collaboration process was flexible in terms of its applicability in formation of three different types of policies.

7 Conclusions and further research

In this paper we discussed a framework for a repeatable process for policy making. We have argued that policy making is (in most cases) necessarily a collaborative process. Our proposed framework is therefore rooted in the field of collaboration engineering. We have reported on four case studies in which we tested our approach using the action research paradigm.

As a next step we are working towards a more theoretical underpinning of our results. We are currently developing a theory about policies as regulations serving a specific purpose. This allows us to make more explicit the relationships between the issues which a policy aims to address and the measures aimed at the deployment of these policies. Using this theoretical framework we will then continue studying different (collaborative) strategies for the motivation, formulation and further refinement of policies.

References

1. Mitrof, Ian, I.: Stakeholders of the Organizational mind: Toward a new view of organizational policy making. Jossey-Bass Inc., Publishers, San Francisco, California (1983).
2. Ford, M.T., Spellacy, P.: Policy development: In theory and practice. In: Tuesday, July 12, Baltimore, MD, July 9-12, 2005, National Association of College and University Business Officers, 2005 Annual Meeting. (2005).
3. Robbins, S., Bergman, R., Stagg, I.: Management. Prentice Hall Australia Pty Ltd., Prentice–Hall, Sydney, USA (1997).
4. Friedrich, C.: Man and His Government. Wiley, New York, New York, USA (1963).
5. Anderson, J.: Public Policy-making: An Introduction. Houghton Mifflin, Boston, Boston, USA (2003) Fifth Edition.
6. Mintzberg, H., Raisingham, D., Theoret, A.: The structure of unstructured decision processes. Administrative Science Quarterly **21** (1976) 246–275.
7. Ackoff, R.L.: Redesigning the Future. Wiley, New York, New York, USA (1974).
8. Sabatier, e.: Theories of the Policy Process. West view Press, Boulder, Co. (1999).
9. Herik, C.v.d.: Group Support for Policy Making. PhD thesis, Delft University of Technology, Delft, Netherlands (1998).
10. Riet, O.v.d.: Policy Analysis in Multi-Actor Policy Settings: Navigating between negotiated non-sense and superflous knowledge. PhD thesis, Delft University of Technology, Delft, Netherlands (2003).
11. Roelofs, A.: Structuring Policy Issues: Testing a mapping technique with Gaming/Simulation. PhD thesis, Proefschrift Katholieke Universiteit Brabant, Tilburg, Netherlands (2000).

12. Eden, C., Jones, S., Sims, D.: Messing about in Problems: an informal structured approach to their identification and management. Pergamon Press, Oxford, Great Britain (1983).

13. Vreede, G.d., Briggs, R.: Collaboration Engineering: Designing Repeatable Processes for High-Value Collaborative Tasks. In Dickson, G., DeSanctis, G., eds.: Proceedings of the 38th Hawaiian International Conference on System Sciences, Los Alamitos, Hawaii, USA, IEEE Computer Society Press (2005).

14. Seligmann, P., Wijers, G., Sol, H.: Analyzing the Structure of IS Methodologies. In: Proceedings of the Proceedings of the 1st Dutch Conference on Information Systems, Amersfoort, the Netherlands. (1989).

15. Kolfschoten, G., Vreede, G.J.d., Chakrapani, A., Koneri, P.: The Collaboration Engineering Approach for Designing Collaboration Processes. In: Proceedings of the First HICSS Symposium on Case and Field Studies of Collaboration, Poipu, Kauai, Hawaii. (2006).

16. Briggs, R., Vreede, G.d., Nunamaker, J.F, J.: Collaboration Engineering with Thinklets to Pursue Sustained Success with Group Support Systems. Journal of MIS **19** (2003) 31–63.

17. Briggs, R.O., Kolfschoten, G.L., Vreede, G.J.d., Dean, D.L.: Defining Key Concepts for Collaboration Engineering. In: Proceedings of 12th Americas Conference on Information Systems (AMCIS, Mexico. (2006).

18. Vreede, G.J.d., Kolfschoten, G., Briggs, R.: Thinklets: a collaboration engineering pattern language. International Journal of Computer Applications in Technology **25** (2006) 140–154.

19. Vreede, G.d., Fruhling, A., Chakrapani, A.: A Repeatable Collaboration Process for Usability Testing. (In: Proceedings of the 38th Annual Hawaii International Conference on System Sciences (HICSS'05), Big Island, Hawaii, USA).
doi:10.1109/HICSS.2005.46

20. Kolfschoten, G.L., B.R.A.J.V.G.d.: ThinkLets as Building Blocks for Collaboration Processes: A Further Conceptualization. In: Proceedings of CRIWG2004, London: Springer Verlag (2004).

21. Zuber-Skerritt, O.: Action research for change and development. Gower Publishing, Aldershot (1991).

22. Hult, M., Lennung, S.A.: Towards a definition of action research: A note and bibliography. Journal of Management Studies **17** (1980) 241–250.

23. Baskerville, R.L.: Investigating information systems with action research. Communications of the Association for Information Systems **2** (1999).

24. Briggs, R., Reinig, B., Vreede, G.d.: Meeting Satisfaction for Technology Supported Groups: An Empirical Validation of a Goal-Attainment Model, Small Group Research, in Press (2006).