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
Heyendaalseweg 135, 6525 AJ, 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 collaboration.
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 organizational processes, organizations use policies as an instrument to guide and bound these processes. A policy [1] 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 on 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 organization themselves, if they are to be effective in representing organizational interests. Explicit policies are a key indicator for successful organizational decision-making.

The complexity of policy making processes in organizations may be described as having to cope with large problems. Examples include: information technology (IT) procurement, Information Systems 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. This is in line with [2] who also describe complex problems to involve many actors due to the need to mobilize many resources; disagreement about the nature of the problem and the desired solutions due to the many actors involved; and complex decision making because mostly different networks and institutional structures are involved. 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 [3]. 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 [4]. 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 [5].

The collaboration technologies that are used to support group work in collaborative problem-solving processes are based on and contain fundamental assumptions (for example, meeting processes should be: open; rational; fair) with regard to how people work together [6]. More examples and details of the assumptions can be seen in [6]. To determine successful application of collaboration technologies, the correctness of these assumptions is a vital aspect. Group Support Systems (GSS) is an example of collaboration technologies that have offered added value in terms of anonymity, and parallel communication, among others, to people working together towards achieving a goal [7]. Inter-organizational policy making networks are an environment where GSS have been applied. It was found out that GSS are most effective in creativity tasks than for preference tasks and mixed motive tasks in such an environment [6]. Our study deals with an exploration of usage of collaborative processes for the realization of good policies in organizational policy making. We use thinkLets to design the collaborative policy making process. To safe guard the GSS principles (assumptions) in the thinkLets we use in this study, we adopt the work of Vreede and Bruijn [6]. For instance, we use GSS principles such as anonymity and parallel work in creativity tasks, while for preference and consensus tasks we apply group-oral discussions.

The main purpose of our paper is to offer a repeatable collaboration process for the realization of good policies in a collaborative policy making effort; and to investigate how this process can be improved by the support of collaboration engineering. The standard repeatable collaborative policy making process presented in this paper is originally designed using a modular approach based on given motivations (see section 5). Nonetheless, we use one standard process due to the constraints in size of the sample population, and the levels of stakeholders involved in implementation of the repeatable collaborative policy making process (see section 4).

The remainder of this paper is structured as follows. Section 2 briefly explains the concepts of collaboration engineering (CE), 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 pursuit of developing and implementing the repeatable collaboration process, as well as a brief outline of the four case studies we have performed. Based on these case studies, section 5 discusses the design of the repeatable collaborative policy making process based on the original modular process design. Finally, section 6 provides the conclusion as well as a discussion on further research.

2   CE and Organizational Policy Making Processes

Collaboration Engineering (CE) is 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 [8]. Collaboration engineering researchers identified six general patterns of collaboration to enable a group to complete a particular group activity [8, 9]: *i)* Generate – Move from having fewer to having more concepts in the pool of concepts shared by the group. *ii)* Reduce – Move from having many concepts to a focus on fewer concepts that the group deems worthy of further attention. *iii)* Clarify – Move from having less to having more shared understanding of concepts and of the words and phrases used to express them. *iv)* Organize – to move from less to more understanding of the relationships among the concepts the group is considering. *v)* Evaluate – Move from less to more understanding of the relative value of the concepts under consideration. *vi)* Build Consensus – Move from having fewer to having more group members who are willing to commit to a proposal.

The patterns of collaboration do not explicitly detail how a group could conduct a recurring collaboration process, especially with teams who do not have professional facilitators at their disposal. This can be achieved by the key CE concept: the thinkLet. A thinklet is defined by Briggs et al., [9] as "the smallest unit of intellectual capital required to create a single repeatable, predictable pattern of collaboration among people working toward a goal". ThinkLets can be used as conceptual building blocks in the design of collaboration processes, such as improving productivity of and quality of work life for groups by enabling rapid development of collaboration processes [10, 8]. Examples of thinkLets are provided in Table 1. More examples can for example be found in [8].

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

2.1 Organizational Policy Making Processes

With an increase in internal and external business needs, organizations have continuously established organizational policies. Because of their nature, it is important for organizations 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 organizational community [11]. The concept of *policy* therefore, is defined by Robbins et al., [1] as" a guide that establishes parameters for making decisions", that is, it provides guidelines to channel a manager's thinking in a specific direction. Friedrich [12] 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, Anderson [13] 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"* [14].

Organizational policy-stakeholders follow a policy making process to develop and implement a policy. According to Sabatier [4], the process of policy-making includes the manner in which problems get conceptualized and brought to the governing body for solution, these formulate alternatives and select policy solutions; and those solutions get implemented, evaluated, and revised. In other words, the policy-making process connotes temporarily, an unfolding of actions, events, and decisions that may culminate in an authoritative decision, which, at least temporarily, binds all within the jurisdiction of the governing body. In examining the unfolding, attention is devoted to structure, to the context and constraints of the process, and to actual decisions and events that occur. In relation to Sabatier's definition, Mitrof [15] describes policy making 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. Dunn [16] defines the policy making process as the administrative, organizational and political activities and attitudes that shape the transformation of policy inputs into outputs and impacts. He stresses, that, there is no one single process by which policy is made. Variations in the subject of policy will produce variations in the manner of policy-making. Based on these definitions, we can therefore say that the policy making process can be messy.

2.2 Collaborative concerns in organizational policy making processes

Organizational 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 [4, 17]. Both types of complexity have distinguished characteristics/concerns; however, our study focuses only on those concerns/characteristics

that have a collaborative nature; and we claim can be met by collaboration engineering techniques. Such collaborative concerns [2, 18, 19, 4, 17, 20]include degree of variance in interests and tasks required, conflicting objectives and criteria, lack of consensus, lack of understanding of the policy problem, lack of a clear methodology/approach, and time pressure.

Having collaborative concerns implies the 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. To achieve this, we turn to collaboration engineering (CE). In the section that follows, we describe how CE can meet these collaborative concerns.

3 Meeting policy making processes collaborative needs with CE

The aim of this section is to, given the collaborative concerns from the previous section, refine these to collaborative needs (process requirements) for a collaboration engineer with respect to the organizational policy making process and its context. In other words, we discuss how collaboration engineering can provide for collaborative needs for organizational policy making processes.

- *Policy requirements expectation accommodation* – this need is derived from a number of concerns: the degree of variance in interests and tasks required; conflicting objectives and criteria; and lack of consensus. Policy making stakeholders therefore 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 CE approach, execution of collaborative processes permits representation of all the stakeholders in collaborative problem-solving activities by usage of thinkLets [21]. Most thinkLets have built-in rules to ensure equal participation of stakeholders, like in GSS; thereby bettering the chance of their interests being accommodated in the solution.
- *Understanding of the policy process* – this need arises from lack of understanding of the policy process concern. Thus, there is need for a collaborative process that is not complex and is easily understood by the policy making practitioners. In CE, 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 [10]. 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* – this need is derived from the time pressure concern. Thus, there is need for a collaborative process in which policy making stakeholders can take less time, effort, and physical resources 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 [5]. To this end, the

CE approach offers a model and guidelines (see [22]) to achieve a balance between efficiency and effectiveness of the process design. In other words, the collaboration process design must make optimal use of the available resources. For example, the time, costs, and effort, policy stakeholders can actually use to achieve the planned policy outcomes in a collaboration session.

– *Structured policy problem solving approach* – this need arises from lack of a clear methodology/approach concern. Thus, 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. CE 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 organization will derive benefit from the improvement again and again; while with ad hoc processes, the value of each process improvement will accrue only once [8]. 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 [5].

– *Policy elements identification (with their definitions)* – this need arises from lack of consensus concern. Thus, policy making stakeholders need a collaborative process that enables them to identify and have a common understanding of the policy elements (and their definitions). In CE, the patterns of collaboration 'clarify' and 'consensus building' offer thinkLets support [9] that can enable stakeholders have a common/shared understanding, commitment and consensus of policy elements identified. This means, during collaborative policy process execution, policy stakeholders have the opportunity to perform the tasks collaboratively by support of thinkLets.

In summary, based on the collaborative needs/process requirements formulated above, organizational policy making stakeholders and practitioners need to have repeatable collaborative processes that can enable them solve their policy problems. In the section that follows, we discuss the research method used in our pursuit of developing and implementing the repeatable collaboration process.

4   Research Questions and Approach

In this section, we present the research question and how we addressed it. 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 Zuber-Skerritt's Action research methodology [23]. 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 [24]. In addition, this method is the most suitable in addressing the "how to"

research questions [25], as our research aimed at addressing how to meet collaborative needs for organizational policy making processes using a repeatable collaboration process. Furthermore, the method allowed us to evaluate and improve our problem-solving technique during a series of interventions.

The action research method proposed by Zuber-Skerritt [23] 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 generic repeatable collaboration process with three policy types in four case organizations. Below is a description of the cases:

Case 1 - Information Technology (IT) policy document with a team of 5 IT workers of the Ministry of Finance, Planning and Economic Development (MOFPED), Uganda.

Case 2 (Inexperienced environment) - Student portal information system architecture principles with 14 students enrolled in a graduate level Modelleren van Organisaties (Modelling of Organizations) course, Radboud University Nijmegen (RUN), the Netherlands.

Case 3 - IT Security policy document with a team of 6 stakeholders of National Social Security Fund (NSSF), Uganda, involved in formulating IT policies for the organization.

Case 4 - Student portal information system architecture principles with a team of 7 stakeholders of the department of Control, Information, and Finances (CIF) involved in formulating IT business rules, regulations and architecture principles for information systems for RUN, the Netherlands.

To evaluate the performance and perception of the generic 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 policy process and its outcomes; policy elements identification; and policy stakeholders' satisfaction with the process and its outcomes. Evaluation of the generic repeatable collaborative policy making process design was implemented using two procedures. The first three collaborative sessions (cases 1, 2,

and 3) were conducted manually, while the fourth session (case 4), we used group support technology (MeetingWorksV7.0) to implement the process, respectively. Results from the cases are presented in section 5.4.

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 generic 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. This made the process very slow. In other words, 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 was, however, forsaken, because not all policy objectives and elements recorded were of priority, consistent and common in order to meet the desired end states.

5   Generic Repeatable Collaboration Process

To design the repeatable collaborative policy making process, we followed the process requirements based on CE techniques as described in Section 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 generic repeatable collaborative policy making process presented in figure 1 is originally designed using a modular approach based on given motivations. Nonetheless, we use one standard process due to the constraints in size of the sample population, and the levels of stakeholders that were involved in implementation of the process. Below, we first explain the motivations of using the modular approach. Then we present the design evaluation criteria we followed, and then a description of the generic repeatable collaborative policy making process.

5.1   Modular process design

The modular collaboration process contains three modules: *module 1* – deals with formulation and agreeing on policy goals; *module 2* – deals with formulation and agreeing on policy objectives based on the policy goals stated; and *module 3* – deals with formulation and agreeing on policy elements (with their definitions) that address the stated

policy objectives. We use the modular approach, because, depending on the kind of policy, stakeholders wish to achieve: the policy scope (its extent/coverage), ambitions (what the stakeholders want to achieve), instruments and their combinations (what resources are required in what phase to achieve a given ambition) vary. In other words, policy making involves different levels of stakeholders who perform different tasks in different phases of the policy process; that is, not all kinds of stakeholders are involved in all the phases of policy making; for instance top level stakeholders are responsible for identifying and formulating policy goals, as well as define its scope. Also given the levels of tasks/phases involved in policy making, different phases may require different instruments or a combination of them, such as sharing of knowledge and information, and expertise on the part of the stakeholders involved. For instance, some policy process phases may require only expert-driven stakeholders, while others may require a combination of both expert-driven and non-expert stakeholders to be involved. Also some process phases may require more time to achieve a given ambition in comparison to others. For instance, formulation of policy elements (with their definitions) and respective implications may require more time as compared to formulation of policy goals. Thus far, in using the modular collaboration process, the policy making process characteristics (collaborative concerns) mentioned earlier on are taken care of; better still, making the collaboration process more flexible.

5.2 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. The following six criteria were considered: *(i)* effectiveness - the repeatable collaboration process should enable policy making stakeholders to achieve their goal, *(ii)* policy process efficiency - the collaboration process should take stakeholders less time for attainment of the policy than without the use of a collaborative approach, *(iii)* degree of applicability (structured policy problem solving approach) - the extent to which the repeatable collaboration process can be applied to formulation of varying policy types, *(iv)* policy elements identification (with their definitions) - the collaboration process should enable stakeholders to have a common/shared understanding, commitment and consensus of the policy elements (and their definitions) identified, *(v)* 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, and *(vi)* understanding and ease of use of the policy process - the collaboration process should not be complex and should be easily understood by the policymaking stakeholders. That is, the process should be easy for the practitioners to learn and execute routinely.

5.3 Generic process design

The collaboration process design shown in Figure 1 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 Ford and Spellacy [11]. A typical policy making process includes six stages [11]. However, our process design only involves the development/formation phase of the organizational policy making process; therefore it caters for a pre-used policy. We use a generic repeatable process and not the modular design because of the kinds and levels of stakeholders that were involved in the implementation sessions. Also, we were constrained by the numbers of stakeholders in terms of participation. In addition, the policy types, that the participants were to formulate, did not necessitate going through the first phase (pre-development) as these were preliminarily developed by top level stakeholders in respective case organizations. In other words, not all the kinds and levels of stakeholders that were involved in the collaboration process sessions participated in the preliminary tasks. The participants therefore only had to discuss, agree and use these elements as prior knowledge to formulating policy objectives and policy elements. It is on this basis, that we merged module-one of the modular design to "pre-development" phase as refereed to in the generic repeatable process.
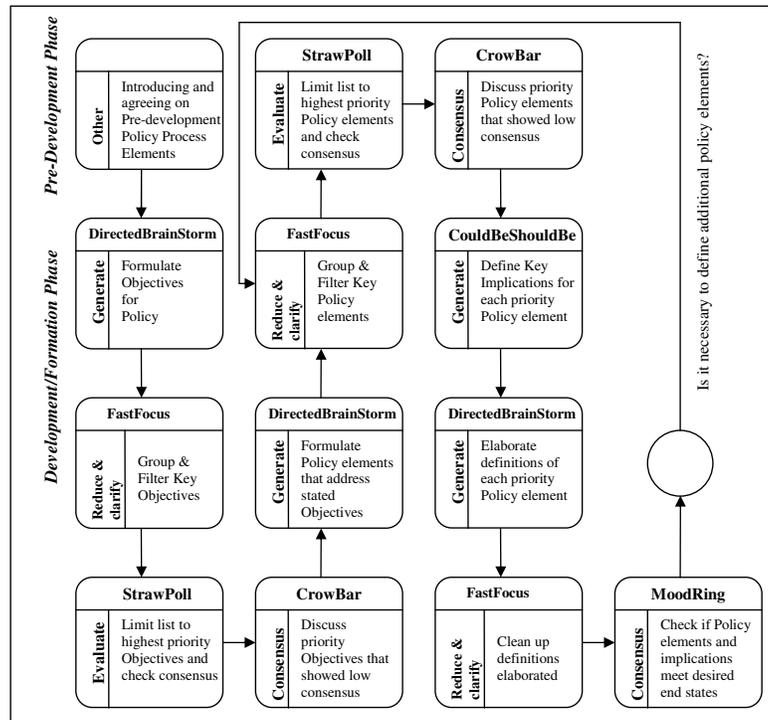

Fig. 1. Repeatable collaborative policy-making process

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 shown in Figure 1 presents 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 in Figure 1 has two main parts: *part 1* – pre-development /meeting phase, and *part 2* – the development phase. We refer to part 1 as pre-development phase based on the fact that, the top level policy stakeholders though in consultation with other middle to low level stakeholders preliminarily develop these elements. This means that, prior to the actual development of the policy, top level policy making stakeholders have various policy meetings to gather information on the kind and the need for the policy. This phase involves familiarizing and discussing the following pre-development elements: the problem to be solved; the ambitions (goals) of the policy, the policy scope, 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 different policy stakeholders (irrespective of levels) 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 brainstorm activity that follows, guided by the DirectedBrainstorm thinkLet, participants are required to formulate policy objectives. The result from this activity is a brainstormed list of policy objectives.

Using the FastFocus thinkLet, the activity that follows requires participants to organize the resulting list by extracting only the key policy objectives. They do this by grouping and filtering ideas, as well as eliminating any redundancies. 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 Straw-Poll 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 policy 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 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 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. 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.

5.4 Results

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 [26]. Results in Table 2 are from the questionnaire we used, and they 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

In other words, the participants felt that the results from the workshops were useful to them as they gave better understanding of what issues they found vital to the policy. They also observed this process as an interactive and better method/approach of formulating policies. For example, most positive comments received from the workshops included "the results are useful for me, because they give me a better understanding of the things users of the policy find important", "the process can be very useful for my work; trying to formulate issues about a variety of subjects and with different groups of people", "I liked the process because it forces you in a direction in which you are obliged to perform some actions in a specified order". However, not all participants in the first three cases were happy with the way of executing the process. Most of their negative comments had to do with "the lack of a tool causing problems such as time delay, and noise". From the researchers' perspective, the process was satisfactory because

most participants indicated that they were mainly interested in the outcome/results of the process than the way it was executed.

We define *policy process efficiency* as the degree to which there is savings of the amount of resources (for example time, costs, and 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.

Though the majority of the participants felt that the process execution was efficient in terms of cognitive load/less effort and time, a few were not happy with the time length particularly with some activities such as in the grouping and filtering of key policy issues. 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 corrected in subsequent workshops and also 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 the researchers conclude that the participants 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* (structured policy problem solving approach) 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.

Over all, the process proved to be reasonably successful across all the four cases. This is reflected in the 'observe' activity results. For instance, using the results in table2, it can be seen that satisfaction levels, both with process and outcomes are higher for participants (in cases 1, 3 and 4) that are more experienced in formulation of policies and have interest in the process path, i.e. working from top to bottom and giving thorough attention to precise definitions and formulations. Participants in case 2 specifically the students were inexperienced and to them they felt that the process was more useful to the policy experts that were in their workshop. More so, the participants in case 4 specially commended the efficiency of the process because of the process outcome, and their ability to generate many ideas during the creativity tasks in few minutes due to the support of the Meetingworks collaborative software. This is consistent with some observations in GSS studies for policy making [6, 17]. More so, particular thinkLets such as the DirectedBrainstorm thinkLet and CouldBe-ShouldBe thinkLet enabled ease of execution of the creativity tasks. None the less, there was a minimal difference between the over all policy outputs that cases 1 and 3 made in comparison to case 4. The data logs (though not attached, but can be shown on request) and participants' feedback from the questionnaires and interviews strengthens our observations.

6   Conclusions and Further Research

In this paper, we have discussed a generic repeatable collaboration process for organizational policy making. This process design was refined in four iterations using feedback from observations, questionnaires, and interviews in an action research paradigm. The generic repeatable collaborative policy process enables stakeholders to: identify and agree on policy objectives, and common policy elements with their definitions and respective implications; and also generate a policy document that articulates solutions.

Our results based on the four cases we conducted suggest that the idea of developing policies using a repeatable collaborative policy making process is feasible. In other words, the affirmative feedback received from our participants in terms of satisfaction (with process outcome), process effectiveness, efficiency and applicability suggest that the CE approach has indeed the potential to support organizations in developing quality policies. We consider these findings remarkable due to the fact that this study was resource constrained, and as such we could not adequately test the process to a successful conclusion. The first limitation was the number and category of subjects that were used in each of the four pilot studies as seen in section 4. As a result, there was a significant variation in the experience of the groups. The second limitation was the time availability. Much as many ideas were generated, discussed, and evaluated in the time stipulated to complete the process (that is, 2 hours); this time was still not enough to actually develop an inclusive policy document. The third limitation was the procedure we used to conduct the process in the field. Specifically the manual way of doing things slowed down the process execution; in addition to the inadequacy of the group support software that we used as it has its own limitations. Thus, based on the analysis from the results of this study, they can be used as avenues for future research. First, we need to test and validate the modular design in the field. In addition, in terms of time usage, we need to determine which thinkLets and in which order would be the most effective and efficient. Secondly, we are also working towards a more theoretical underpinning of our results. In other words, we aim to more explicitly rationalize design decisions taken in collaborative policy making processes. We aim to do so by explicitly relating the goals of the collaborative policy making process (its why), the requirements of the process following from these goals (its what), to the situation in which it needs to be executed (its within).

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