

An Interview Protocol for Discovering and Assessing Collaboration Engineering Opportunities

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Abstract

Collaboration Engineering (CE) projects can run for months and can require substantial expenditures of effort and resources. CE is an approach to designing collaborative work practices for high-value recurring tasks and transferring those designs to practitioners to execute for themselves without the ongoing intervention of professional facilitators. Because CE projects can entail considerable cost, it would be useful to establish a basis for predicting whether such efforts would be likely to result in a self-sustaining and growing community of practice for the resulting work practice. In this paper we use the Value Frequency Model (VFM) to derive an interview protocol to identify new CE opportunities and to assess whether a CE solution would be likely to succeed. We then test the protocol in two cases; one with experienced collaboration engineers in a large multinational organization and a second with a group of knowledge workers with no CE experience working with a variety of profit and non-profit organizations. The findings appear to be consistent with the theory, suggesting that the interview protocol may be a useful tool for discovering and assessing CE opportunities. We propose several directions for future research.

1. Introduction

In the knowledge economy, organizations rely on effective and efficient collaboration processes to create value for their stakeholders. Collaboration Engineering (CE) is an approach to designing collaborative work practices for high-value recurring tasks and transferring them to practitioners to execute for themselves without the ongoing intervention of professional facilitators [1, 2]. CE researchers have developed structured methodologies [3] and modeling tools [2, 4] to support their design efforts. Additionally, they have derived a design pattern language called thinkLets [5] which provides reusable building blocks for designing and training new collaboration processes. For certain kinds of collaborative tasks, CE interventions can often cut work hours in half and cut task cycle times by 50-75%, while improving the detail and the quality of the deliverables [6-8].

CE field experience shows that, even for a small project, a CE intervention may require episodic attention across many months. CE efforts can also require

substantial investments of effort and resources. It would therefore be useful to develop a way to understand and predict whether such expenditures would be likely to result in a self-sustaining and growing community of practice for the new work practice. Briggs et al. [9] define three criteria for determining that a self-sustaining community of users exists for a new technology. We adapt those criteria to define a work practice as *self-sustaining* if:

1. Practitioners continue to use the work practice without ongoing intervention from the project champion and the collaboration engineer.
2. Newcomers to the organization are trained in its practice as the standard way of achieving a task.
3. When problems arise with a work practice or the technologies that support it, practitioners remedy the problem rather than abandoning the work practice.

Recently, Dean, Deokar and Ter Bush [10] proposed a general approach to making a CE investment decision. They suggest five criteria for identifying projects project that might be conducive to a CE intervention. These criteria include the following:

1. Clearly defined outcomes for the CE project from the process owner.
2. Important, yet inefficient recurring processes.
3. Tasks of an appropriate type based on the interaction intensity, information processing intensity, and the number of participants.
4. Participants in the task tend to have aligned goals.
5. Champions and adequate budgets.

The criteria identified by Dean, Deokar and Ter Bush [10], which provides a general basis for screening CE opportunities, was derived from the Technology Transition Model (TTM) [9]. This paper extends that work by using the Value Frequency Model for Change-of-practice (VFM) to derive a more-detailed protocol for identifying and qualifying CE opportunities. VFM builds upon the earlier theory of TTM [9]. However, while the TTM sought only to explain the use or non-use of technology, VFM seeks to explain the broader phenomenon, change-of-work-practice, including, but not limited, to information, procedures, and technology used to support them.

The goal of the interview protocol presented in this research is to provide collaboration engineers with sufficient information to rule out opportunities that have

low likelihood of practitioner acceptance, and to focus their efforts on projects with higher likelihood of success.

In this paper, we summarize the propositions of VFM. We then present the items of the interview protocol and relate each to the constructs and logic of the theory. Next, we present two case studies; one where the protocol was used in the field by CE experts and another where the protocol was used in the field by novices. We compare the findings of those cases and discuss their implications for practitioners and for future research.

2. Theoretical Foundation

Sometimes, innovative work practices catch on and spread quickly, garnering self-sustaining and growing communities of practice. Other times, existing work practices remain unchanged or change very slowly, despite strong evidence that available alternatives offer considerable advantages. VFM [11] offers an explanation for variations in the change or stability in work practices.

VFM proposes that change-of-practice is a multiplicative function of the two constructs: 1) *perceived magnitude of value of change*, defined as the degree to which an individual perceives that a proposed change would yield overall positive or negative outcomes and 2) *perceived frequency of value after change*, defined as an overall sense of how often an individual might attain the positive or negative value ascribed to the proposed change-of-practice [11]. See Figure 1.

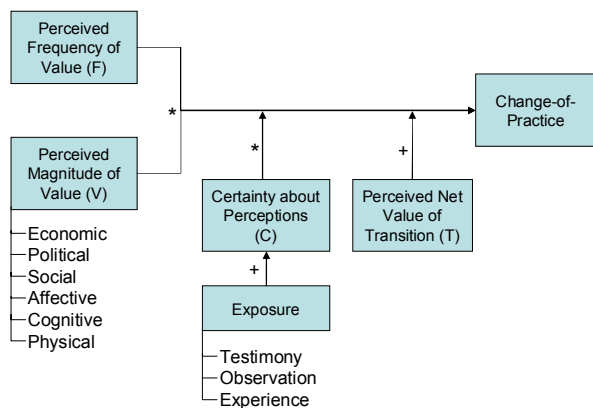


Figure 1. Value Frequency Model. This figure illustrates the propositions of VFM, a causal model for change-of-practice. Each box represents a construct. An arrow represents direction of causation. An asterisk signifies a multiplicative relationship. A plus sign indicates an additive relationship.

Furthermore, VFM posits that the primary relationship between value, frequency, and change is moderated by two other constructs: 1) *certainty about perceptions* and 2) *perceived net value of transition* [11]. *Certainty about*

perceptions is defined as a subconscious assessment of the likelihood that an individual's value and frequency perceptions are accurate. It can be instantiated as a variable that takes a value ranging from 0 to 1. VFM posits that certainty comes from exposure to the proposed work practice, which may take at least three forms: 1) *testimonial*, 2) *observation*, or 3) *experience* [11]. The *Perceived net value of transition* construct is defined as an overall sense of the positive or negative value that would derive from the change process itself. For example, an individual might regard training sessions for the proposed process as a negative interference with other priorities, but might regard a trip to Hawaii in January to take the training as having positive physical, social, and affective value. If a transition value is sufficiently negative, it will overwhelm a positive value-frequency judgment and so block the change.

Given that VFM suggests a causal model for change-of-practice, it seemed a useful model for predicting whether the stakeholders in a CE opportunity might be willing to change to a new work practice if one were designed for them.

3. Interview Protocol Development

We developed the CE Opportunity Interview Protocol in two layers, the first for discovering CE opportunities, and the second for screening those opportunities for likelihood of success [12]. This section discusses the derivation of the protocol from VFM.

3.1. Protocol for Discovering CE Opportunities

The first layer of the interview protocol has five parts. We discuss each part in this section. The full first layer of the protocol appears verbatim in Appendix A.

3.1.1. Establish Shared Meaning. We found it useful to open a CE interview by explicitly stating its goals. Otherwise, we found interviewees tended to deliver long, vague monologues of tangentially related topics. The protocol therefore opens with the following statement:

As collaboration engineers, we apply the findings of collaboration science to the design and deployment of new collaborative work practices supported by appropriate technologies.

For certain kinds of collaborative tasks we can cut work hours in half and cut task cycle times by 50-75%, while improving the detail and quality of deliverables.

We are looking for opportunities to work with groups who could benefit from judicious applications of our collaboration techniques and technologies.

One way we can make a substantial difference is to focus on high-value recurring collaborative tasks.

We're trying to find specific groups that work on specific jobs to create defined deliverables, who might welcome the opportunity to work with us to enhance their performance and satisfaction.

One goal of CE is to develop collaborative work practices for high-value recurring tasks. We learned in the field that people hold a wide range of different definitions for the term, *collaboration*, such as “software technology for exchanging files” to “sharing resources” to “including everybody in the decision.” We therefore ask the following question:

1. *We have learned that people apply a lot of different meanings to the word, “collaboration.” As a start, we'd like to learn your definition and to tell you ours. When you say, “collaboration,” what do you mean?*

We follow the interviewee’s response with the following statement:

When we speak of collaboration, we mean, “joint effort toward a group goal for mutual benefit.” Does that definition make sense to you?

3.1.2. Identifying Candidate Practices. VFM posits that in order for a change-of-practice to occur, practitioners must perceive positive value would accrue from making the change. Processes which are painful, unpleasant, and inefficient would offer opportunities for larger perceived value than would processes that are effective, efficient, and satisfying. We discovered however, that interviewees were reluctant to air their problems early in the interview. We therefore began the next round of questions that probe for high-value recurring work practices and neutral questions about how well those processes worked:

2. *Do you or your people have any important recurring tasks where they must work in a group to create a joint deliverable?*
 - a. *How are these tasks going?*
 - b. *Are any of these processes good candidates for enhancement or improvement?*
3. *Are there other high-value activities that require the efforts of a group on a regular basis?*
 - a. *How are those processes working for you?*
 - b. *Are they painful in any way?*

In the field, we found that it typically requires about a half-hour or more for participants to respond to this set of

questions. Note that the last question in the block broaches the question of pain for the first time.

3.1.3. Exploring the Pain. Having discussed collaborative processes in general, the next block of questions specifically asks about processes that are not going well and which may therefore be candidates for CE interventions. The goal of these questions is to get a sense of how they may perceive the magnitude of change. Specifically, asking about their toughest problems leads toward addressing practices with the highest value:

4. *What are the toughest tasks you or your people have to do in a group?*
5. *What other group tasks give you or your people the most trouble?*

3.1.4. Other People’s Pain. After exploring the state of processes in the interviewee’s domain, the protocol asks whether they know of challenging collaboration processes outside their own domain. The rationale for these questions is very similar to the rationale provided above in Section 3.1.3. However, the difference here is that people tend to be more open to discussing other people’s process problems than their own. The protocol questions for this section are as follows:

6. *Who else do you know that has a tough collaboration challenge?*
7. *Do you know any other groups who must work together frequently, who may hate some part of their task?*

3.2. Protocol for Screening CE Opportunities

Whenever the questions in the first layer of the protocol reveal a candidate work practice the interviewer shifts to the second layer of questions to evaluate the likelihood that an intervention could lead to a sustained change-of-practice. The second layer of the protocol addresses eleven topics to the interviewee. We learned that interviewees frequently misunderstand the wording of a question the first time it is asked, so we framed two different questions for each topic. The full second layer of the protocol appears in Appendix B.

3.2.1. How Often? VFM posits that change-of-practice is a function of the frequency with which people perceive they could obtain value from the new practice. The first two screening questions are therefore:

1. *How frequently is this task executed?*
2. *How often does the group meet to do this task?*

3.2.2. Same Person? We once asked an interviewee how frequently a task was executed and received the reply,

“200 times per year.” All other screening criteria came out in favor of conducting a CE intervention, so we began the project. We were weeks into the effort before we learned that 200 different people executed the process once-a-year each. The practitioners did not deem it useful to learn a new process for a task they did so infrequently. We therefore added the following questions to the protocol:

3. *Does the same individual execute/lead this task frequently?*
4. *Is this a task that recurs for the same person?*
5. *How frequently?*

3.2.3. High Value? VFM posits that people must perceive value in the proposed change. An improvement to a task that creates great benefit for an organization might be perceived as creating more value than an improvement to a task that creates minor benefit. So, while the interviewee had identified troublesome or tough tasks in the layer 1 questions, it is useful to try to extract a precise estimate of the value they might realize from improving that task. Within our application of the protocol, this information proved useful in prioritizing candidate tasks for improvement. We therefore ask:

6. *What's the payoff if this task goes well?*
7. *What's the down side if this task goes badly or fails?*

3.2.4. How Many? The more people are involved in a collaborative task the more benefit the techniques of CE can provide and the people there will be who perceive those benefits. We therefore ask:

8. *How many people are involved?*
9. *Who are they?*
10. *What roles do they take?*

3.2.5. How Long? The longer a task takes the greater will be the value of reducing its execution cycle. Similarly, experience has shown that the longer a task takes, the more likely it was that we could make improvements. We therefore ask:

11. *How long does a typical session take?*
12. *What's the range of durations for this task?*
13. *Is every role in for the duration?*
14. *How many hours/days does each role spend?*

3.2.6. Felt Pain? If the people who execute a task find it unpleasant in some way then there are greater opportunities to demonstrate the value of a proposed change than if the practitioners find the task pleasant. We therefore ask:

15. *How do people feel about the process?*
16. *Do they love life or hate life when they have to do this task?*
17. *Is there any part of this task that people especially like or dislike?*

3.2.7. Goals/Deliverables. In order to gain a more detailed understanding of the value that a task creates for an organization and the degree to which CE might be able to assist a group in successfully completing the task, we ask the interviewee:

18. *What important goals or outcomes for this task could be improved?*
19. *What are the deliverables for this task?*

3.2.8. Change Readiness. Many of the other questions in the protocol seek information that points to opportunities to create positive value by changing a work practice. Negative value however, is also a possible outcome for a change. The following questions help assess the perceived value of the change and also begin to examine the perceived value of the transition. We therefore ask:

20. *What are the drivers that keep the process as it is today?*
21. *Who would pay what kind of price if you were to change to a new process?*

3.2.9. Someone in Charge? If there is already someone whose job title or job description requires that they execute a task, then there will be someone who can take charge of learning and promulgating a new work practice. For example, systems analysts are responsible for conducting requirements negotiations and so a senior analyst can take charge of assuring that all analysts under his or her leadership learn the new approach. On the other hand, if no identifiable person is in charge of a task there will be nobody to oversee the change. For example, some interviewees seek to “improve meetings.” However, in most organizations, there is no czar in charge of meetings who could oversee the deployment of a new meeting practice. The answers to these types of questions help determine whether the change in practice is likely to be sustained over the long term. We therefore ask:

22. *Whose job is it to lead this task?*
23. *Who owns this task?*

3.2.10. Already a Budget? If a budget is already allocated to a task this is an indicator of the value an organization ascribes to the task. It also means that there may be measurable monetary value from improving the task and that there may be resources available to support a CE intervention. We therefore ask:

24. *Is there already a budget in place to execute this task?*
25. *Is it sufficient?*

3.2.11. Generalizable. If the same process design could be used by many different groups with only minor modifications then the process is likely to generate more value and that value is likely to be perceived by more people than if the process will only be executed by a single group. We therefore ask:

26. *How many other groups could use variations on this process if we were to develop it?*
27. *Are there other tasks that could use the same process?*

3.2.12. Capability and Capacity. In addition to the questions the collaboration engineers ask the interviewees, the protocol contains two questions that the collaboration engineers should ask themselves about their own capabilities and capacity to implement a solution for the opportunity:

28. *(Internal) Can we readily help with the expertise we already know?*
29. *(Internal) Can we complete the intervention in a timely manner?*

3.3. Interviewee Priorities

The final questions the interview protocol asks about the relative priority the interviewee ascribes to the opportunities identified and evaluated during the session. While these questions do not explicitly relate to a VFM construct for any one opportunity, experience has shown that addressing high-value, high-priority tasks early in a CE engagement helps improve perceptions for subsequent efforts. Therefore, we ask:

1. *Reviewing the candidate processes we've talked about during this interview, which is would you say is the single most important one to improve?*
2. *Which are the three most important?*
3. *We've heard about (some number of) processes from you. Would you please rate each these work practices with an A, B, C, or Z?*
 - a. *An "A" means very important*
 - b. *A "B" means moderately important*
 - c. *A "C" means not very important*
 - d. *A "Z" means there are political or other factors that suggest any attempt to change this process would fail*

4. Interview Protocol Field Studies

We tested the interview protocol with two different groups; a group of experienced collaboration engineers working in a large, global organization and a group of knowledge workers with no previous CE experience, who worked with a collection of for-profit and non-profit organizations. For the first test, we took an action research approach and for the second we used a case study approach. With action research, one starts with a theory and intervenes in a situation to improve both the situation and the theory [13]. We began with VFM and worked directly with people in the organization to improve the likelihood that new work practices would successfully transition to the practitioners. Second, with case studies, the researcher seeks to minimize the impact of observations on the circumstances and actions of the observed [14]. We chose this approach to explore whether the interview protocol could be used successfully by others without our intervention. We report critical incidents and outcomes of two studies in the following sections.

4.1. Study 1: A Multi-national Organization

In this study, we used the protocol to interview 17 senior managers and executives in a large multi-national organization. The research team consisted of a scheduler, lead interviewer, scribe, second interviewer, and a reviewer. The scheduler coordinated calendars, made appointments, and rescheduled appointments as they were postponed or cancelled.

We were not allowed to use electronic recording devices or computers during the interviews. We therefore relied on handwritten notes by multiple team members. The interviewer and second interviewer posed questions from the protocol to the interviewee and conversed with the interviewee about their responses. They made notes as time permitted. The scribe listened to the interview and made more-detailed notes about questions and responses, but occasionally also asked questions for clarification or follow-up. Upon completion of each interview, the interview team met and consolidated their notes onto a single detailed narrative of the interview. The reviewer read the transcript and checked it for clarity, completeness, correctness and consistency. Below is an example from a final transcript of the first layer of the interview protocol for one such interview:

1. *People apply many different meanings to the word 'collaboration.' When you say 'collaboration' what do you mean?*
 - a. In response to the first of the protocol questions the interviewee defined collaboration as "two or more people coming together to reach a similar goal or outcome." We took some time to let him know what we mean and clarified

any inconsistencies. Specifically stating that when we speak of ‘collaboration’ we mean a “joint effort toward a common goal.”

2. *Do you or your people have any important recurring tasks where they must work in a group to create a joint deliverable? How are these tasks going? Are any of these processes good candidates for enhancement or improvement?*

- a. In response to this question, the interviewee stated that his groups need help planning a project. Specifically the interviewee recalled that his IT group needs help in establishing a process to put together a training program for knowledge management. He described the project planning task as a task that happens weekly or bi-weekly including 8-12 or sometimes 15 individuals. The team gets together to identify action items. Currently the team struggles with group dynamics and figuring out what needs to be done. The interviewee stated that as a team, they don’t know what they need to accomplish and they don’t work together in sharing the information about how to move forward.

3. *Are there other high-value activities that require the efforts of a group on a regular basis? How are those processes working for you? Are they painful processes?*

- a. In response to this question, the interviewee stated that other than needing help with project planning, his team needs help regarding a process for identifying requirements. He stated that they want to have information access based on their position in the organization. Currently, the team is working on a plan to have a hierarchy system and not three different systems. The interviewee stated that these meetings again have between 8-12 people talking about the requirements to make this happen.

4. *What are the toughest tasks you or your people have to do in a group?*

- a. The toughest task identified by the interviewee is the management of the organization’s information. The head of the organization is frustrated with not being able to identify the information he wants to know. The interviewee stated that the organizational members need all the information and the ability to

drill down with a web service in a shorter time. They struggle with creating a ‘flatter’ organization.

5. *What other group tasks give you or your people the most trouble?*

- a. This question resulted in the response of the task of problem identification and injection. Currently, the interviewee does not know how problems are identified for him and his people to work on. For the most part, the head of the organization says “work on this” and that is what they work on. The interviewee stated that there is a group meeting every week with between 8-12 people who define the role of the team. This team suffers from inefficient meetings. Then 6-8 people get together to put together an action plan. With the current process, they team discusses for an hour and ends up with no action items. The interviewee stated that it is both a process and a culture issue. “It is a process issue because there is either no process or a lack of process and it is a culture issue because people are coming to the meetings with no expectation of reaching an answer or deliverable.”

6. *Who else do you know that has a tough collaboration challenge?*

- a. In response to this question, the interviewee stated that every team in the organization could benefit from an after action review process. He suggested that this would be helpful for making sure that the processes are being used. For example, at the end of every day team members could report on what they had accomplished, what was lucky, what was unlucky, and what would have been done different. Otherwise, this could be completed once or twice a week instead of every night.

7. *Do you know any other groups who must work together frequently, who may hate some part of their task?*

- a. Another group that the interviewee identified is the requirements review board (RRB) whom he heard has a painful process. He said that this meeting involves about 20 people each time and they meet about once a month.

8. *Reviewing the processes we’ve talked about, which is THE one? THE three?*

- a. Ideally the interviewee said that he would be happy if processes could be created that increase both team productivity and satisfaction. He said that no longer hearing people after meetings say "that was a waste of time" would be great.
9. *We've heard about seven processes from you. Would you please rate these work practices with an A, B, C, or Z? (A = very high priority, B = Medium Priority, C = Low priority, Z = Don't want to touch it)*
- a. The interviewee rated the process of information access = A, project planning = B, communities of interest = C for some, A for others, RRB = B, group tasks = A, auditing = B, and problem acceptance = A.

The 17 interviews with senior executives and managers yielded 30 potential CE opportunities. Of these 30 candidates, interviewees characterized 14 as 'A' or very important, four were classified as 'B' or moderately important, six were classified as 'C' or not very important, and six were put into the 'Z' category.

The organization's requirements definition process was a good example of a 'Z' rated process. Many interviewees reported that the process was very important, very painful, and badly broken. However, they also reported that powerful interests within the organization were deliberately subverting the process to keep their own domains running smoothly. This suggested that any attempt to fix the process would be likely to produce obstruction at best and retribution at worst, with little chance of producing meaningful change. Within the terminology of VFM, this equated to high potential for negative political costs, even potentially extending to negative economic consequences. Together, these effects dramatically reduced perceptions of value for this initiative for most interviewees. That project therefore warranted a Z classification. We turned our attention to processes whose stakeholders perceived a positive value-frequency judgment for change.

To test whether the information yielded by the protocol was a useful way to predict whether a CE intervention might succeed, we re-evaluated all 30 candidate processes to find one that produced strongly positive indicators for most of the questions in the protocol.

The organization's staff meeting process surfaced as the strongest candidate. Almost all members of the organization participated in one or more staff meetings per week. Many participated in at least two; one with their subordinates and another with their superior. Thus, an engineered process would be generalizable to many different groups and any positive value they would derive from an improvement would be realized fairly frequently.

All interviewees reported feeling that staff meetings were very important to the success of the organization, but were mostly a waste of time for the 8-12 participants. These people typically sat through about 90-120 minutes of status reports by others waiting for their own chance to brief their leader for a few minutes. Further, they were always required to stop more-meaningful work to prepare PowerPoint slides for these meetings. Many expressed a desire for these meetings to become active sessions where participants helped one another solve problems or improve their likelihood of success. However, leaders needed to know project and action item status, so the meetings remained dull. Thus, there was a felt pain and an eagerness for change. There were people whose job it was to run these meetings and each practitioner ran them repeatedly, so there was someone who could adopt an engineered approach if one

were offered. There was not, however a line item in the budget so few resources were available to support an implementation for such a project, thus any solution would have to be fast to design and have virtually no cost to implement. Participants did not want to devote any more time to staff meetings than they were already spending. They just wanted that time to be more productive. Within the terminology of VFM, this equated to high potential of positive economic and cognitive effects.

We conceived of a new work practice that would make the recording of status update information into a pre-meeting online activity that would run continuously throughout the week. For each project, people would record a) project milestones, b) accomplishments this period, c) actions next period, and d) issues and barriers to their success. When the groups met face-to-face, they would be expected to have already read the on-line status reports. They would focus their face-to-face discussions on helping to resolve one another's barriers or issues, making the meeting.

Our first indication that the new approach might, in fact, transition successfully to practitioners happened when the collaboration engineer met with their first client. Several people from another organization sat in as observers to learn more about CE. During the design meeting the observers became excited as the design unfolded. They engaged in animated conversations about how they could implement the design in their own organization. They argued in a friendly but forceful manner with the collaboration engineers that the design should be changed in ways that would better suit their own needs. The collaboration engineers had to remind them several times that they were, in fact, observers and that the needs of the client had to prevail in this meeting.

Interestingly, within two days of the design meeting, the observers implemented a variation on the design for themselves, while the original client could not mount a successful implementation. The original client (from the

above transcript) found himself caught in the crossfire of a political battle between two other powerful individuals. Their dispute had nothing to do with staff meetings, but the implementation of the new staff meeting process became the focal point of the conflict.

Other groups in the organization heard about the successful implementation by the observer group and contacted the research team to learn more about it. This was an example of the Certainty construct at work, as they perceived value and became more confident in their perceptions through testimony and observation. Based on that contact, we created documentation and training materials people could use to implement the approach for themselves. Within 3 months, about 10% of the organization's headquarters were using the new approach for their staff meetings.

Several groups that attempted to use the new approach did not succeed. Three of the groups tried to use the supporting technology created for them without first learning the work practice the technology was meant to support. All three declared the approach to be useless and abandoned their attempt to implement. We approached all three and offered a one hour training session on the process. One group accepted the training and became self-sustaining practitioners. The other two declined the training.

Additionally, two other groups that took the training and started using the process with enthusiasm later reported that it created too much work for them. When we investigated, we learned that their leaders had decided that PowerPoint slides were sufficiently important that the group had to both update the online system and make slides before each meeting. Further, they had to deliver their usual briefings at the staff meetings rather than following the script of the new staff meeting process, which would focus their efforts on devising creative solutions to one another's challenges. All that remained of the original work practice design was data entry into the online system. For these groups, the new approach delivered negative value rather than positive value and so they were prepared to discontinue its use. At this writing, we have plans to meet with their leaders in an attempt to correct the issue. If the leaders will not relent, we predict both these groups will discontinue using the approach very shortly. We are now about nine months into the project, and we regularly receive one to two queries a week from groups at headquarters who wish to learn about the new staff meeting practice. About half of those typically attempt a pilot implementation. Almost all groups ask for minor revisions to the process and to the configuration of the supporting technology to adapt it to their own ways of working.

4.2. Study 2: Knowledge Workers without Collaboration Engineering Experience

Having demonstrated with an action research approach that we could use the protocol to select a project which could succeed in garnering a self-sustaining and growing community of practitioners, we wanted to learn whether that success was dependent on our expertise, or whether it could be replicated by others with less experience. We therefore worked with a group of 20 knowledge workers who were just beginning to learn the principles of CE. Four of these worked in the financial services industry, two worked for a large transportation company, and the rest worked for a variety of other for-profit and non-profit organizations. We briefed the novices on the interview protocol in a one-hour session and asked them to use it to discover two candidate tasks for CE in their own organizations, to fully evaluate one of the candidates in terms of the second layer of the protocol, and to make a recommendation as to whether a CE intervention was warranted. Four participants opted out of the task before completing it. The other sixteen completed the task successfully; 13 of them in commercial businesses and 3 non-profit organizations. Of the 16 opportunities they identified, five yielded negative indicators for most questions and the novices recommended against pursuing the opportunities. We concurred with their findings. In one such case, the proposed project focused on an employee review process for a national auto parts store that involved only three people, and which lasted only 4-5 minutes about once per month. Thus, the value frequency judgment was low. In another, an electric utility company had what appeared to be a collaborative process for allocating work orders. However further investigation revealed that the process involved a group, but it was not collaborative because an expert told the others what to do.

The novices broke into five teams and worked up solutions for the five best opportunities they identified. They briefed their solutions to one another and to us and revised their designs based on the feedback they received. They then proposed their solutions to the organizations. Four of the five were accepted for implementation.

One of those implementations is completed at the time of this writing, while three others are in progress. Thus, our findings suggest that novices may be able to use the protocol to identify candidate tasks for CE interventions and to derive useful recommendations for or against proceeding with a project based on their findings. We deemed their recommendations to be consistent with our best judgments as expert collaboration engineers.

5. Discussion

This study is exploratory, and its findings must be interpreted as preliminary. The results of the action research study were, nonetheless, consistent with the propositions of VFM for change-of-practice. This structured, theory-driven approach helped us avoid six "opportunities" that were not likely to achieve sustained

improvements before any resources were expended. At the same time, using this approach to measuring likelihood of success, we were able to identify 14 opportunities that were judged highly likely to result in sustained process improvements.

In the first effort chosen for action, the information gathered with the protocol derived from the theory suggested that many in the organization might make a positive value-frequency judgment with respect to the new staff meeting process and that did indeed happen. A number of prospective practitioners reported a positive value-frequency judgment and did in fact change to the new practice. Some reported negative value-frequency judgments and those did not implement. Still others discovered a negative value-frequency after implementation and reverted to their former practices. The degree to which the protocol indicated the likely success of the new staff meeting approach suggests at a minimum that it may be worthwhile to pursue more rigorous tests of the propositions of VFM.

The success with which novice collaboration engineers were able to identify and evaluate candidate tasks for CE interventions suggests that at least some merit rest in the protocol itself, rather than solely in the experts who deployed it in the first study. This suggests that, after further testing, the protocol may become a useful tool for the CE community. Beyond its value as a protocol, it may also be a useful device for training collaboration engineers how to discover and assess opportunities to apply their approach.

This study has several limitations that should be kept in mind. First we tested the protocol by attempting interventions that received positive indicators, and indeed, those interventions appear to be succeeding, consistent with the predictions of VFM. However, being only months into the project, it is possible that these newly successful work practices could fade again in a short time. Next, although it may cause us some consternation within our host organization, we recently began an attempt to implement a work practice that received strongly negative indicators from the protocol. Until this and several similar cases have been completed, we will not have fully tested whether the protocol discriminates accurately between those opportunities with a good chance of success and those with a poor chance of success.

6. Concluding Remarks

This study presented and tested an interview protocol based on VFM which was designed to discover and assess CE opportunities in order to predict whether such efforts were likely to yield a successful transition to the new work practice. Our experience with the protocol in multiple settings under varying conditions suggest that interview protocol may be a useful tool for making such predictions and that the theory from which it is derived

may be a useful model for explaining change-of-practice phenomena.

This suggests that a theory-driven approach to measuring the potential for success in a collaborative initiative could help practitioners focus their efforts on initiatives most likely to return value on their effort expended. For researchers, beyond illustrating the value of developing theory-driven measurement instruments, an area for further development would be to assess the accuracy and parsimony of this measurement instrument, particularly in areas where we have overlapping question sets on particular constructs. This can be done by further applications of the interview protocol in order to measure its usefulness.

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Appendix A: CE Opportunity Discovery Protocol

Establish Common Meaning

1. People apply many different meanings to the word 'collaboration.' When you say 'collaboration' what do you mean?
 - a. When we speak of 'collaboration' we mean a "joint effort toward a common goal."

Identify Candidate Practices

2. Do you or your people have any important recurring tasks where they must work in a group to create a joint deliverable?
 - a. How are these tasks going?
 - b. Are any of these processes good candidates for enhancement or improvement?
3. Are there other high-value activities that require the efforts of a group on a regular basis?
 - a. How are those processes working for

you?

- b. Are they painful processes?

Explore the Pain

4. What are the toughest tasks you or your people have to do in a group?
5. What other group tasks give you or your people the most trouble?

Other People's Pain

6. Who else do you know that has a tough collaboration challenge?
7. Do you know any other groups who must work together frequently, who may hate some part of their task?

Prioritization / Direction

8. Reviewing the processes we've talked about, which is THE one? THE three?
 - a. We've heard about (X) processes from you. Would you please rate these work practices with an A, B, C, or Z? (A = very high priority, B = Medium Priority, C = Low priority, Z = Don't want to touch it)

Appendix B: CE Opportunity Screening Protocol

How Often

1. How frequently is this task executed?

Same Person

2. Does the same individual execute/lead this task frequently?
3. Is this a task that recurs for the same person?
4. How frequently?

High Value

5. What's the payoff if this task goes well?
6. What's the down side if this task goes badly or fails?

How Many

7. How many people are involved?
8. Who are they?
9. What roles do they take?

How Long

10. How long does a typical session take?
11. What's the range of durations for this task?
12. Is every role in for the duration?
13. How many hours/days does each role spend?

Felt Pain

14. How do people feel about the process?
15. Do they love life or hate life when they have to do this task?
16. Is there any part of this task that people especially like or dislike?

Goals/Deliverables

17. What important goals or outcomes for this task could be improved?

18. What are the deliverables for this task?

Change Readiness

19. What are the drivers that keep the process as it is today?

20. Who would pay what kind of price if you were to change to a new process?

Leader Formality

21. Whose job is it to lead this task?

22. Who owns this task?

Budget Formality

23. Is there already a budget in place to execute this task?

24. Is it sufficient?

Generalizable

25. How many other groups could use variations on this process if we were to develop it?

26. Are there other tasks that could use the same process?

Capability and Capacity

27. (Internal) Can we readily help with the expertise we already know?

28. (Internal) Can we complete the intervention in a timely manner?