

Focus Groups: Cost-effective and Methodologically Sound Ways to Get Practitioners Involved in Your Empirical RE Research

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Abstract. Focus groups are a qualitative research method helping researchers collect and analyze information from practitioners in industry, in order to better understand how a Requirements Engineering (RE) phenomenon happens from the perspective of those working in the field. It is useful in both exploratory and confirmatory studies. While focus groups have been popular in studies of other disciplines where a researcher investigates ‘why’, ‘what’ and ‘how’ aspects of a phenomenon of interest in practical context, the potential of this research method is under-exploited in RE. One reason could be that computer science, software engineering and Information Systems (IS) programs in most universities do relatively little to prepare their master students and PhD researchers on the use of this research method. As a result, the method is partly understood and is sub-optimally or incorrectly applied, or avoided altogether. This may translate in a missed opportunity for RE researchers to engage with practitioners in industry-relevant research that could be both done in cost-effective and pragmatic way.

This mini-tutorial provides some practical suggestions on how to evaluate the fitness of focus group research techniques to a research context, how to design a good enough focus-group-research process, how to counter validity threats and how to report and publish the results.

Keywords: Industry-relevant research, qualitative research methods, focus groups, empirical software engineering, empirical evaluation, exploratory case study, confirmatory case study, practitioners’ perceptions, threats to validity, generalizability

1 Introduction

Empirical software engineering (SE) and information systems (IS) research that claims to be industry-relevant, increasingly takes place *for* practitioners to learn from it, and also *with* practitioners as participants whose knowledge gets explicit through the research process. Focus Groups are a qualitative research method that helps empirical researchers do research for and with practitioners as it serves the purpose of gaining understanding of a situation from the point of view of the professionals involved in that situation. As an empirical research method, it is suitable to studies in which the researcher wants to focus on *why* and *how* a project organization or a team achieves a certain outcome without imposing any pre-conceived ideas about the way

projects should develop, processes should be conceptualized or tools should be used. Similarly to other qualitative techniques (e.g. personal interviews, group interviews [1,2]) the strength of the focus groups is in the delivery of rich contextualized descriptions and analysis of the phenomenon that makes the subject of the study. Focus groups thus allow the researcher to ground eventual improvements in a sound understanding of a software system development practice, e.g. a requirements engineering (RE). As with many inter-disciplinary methods that are relatively recently practiced in empirical SE and RE research, focus groups could easily get sub-optimally designed and misapplied, which in turn brings results that are easily dismissed with a “so what?” response in the community of researchers and practitioners. This tutorial will provide a sound understanding of focus groups as an empirical research approach and how it can be meaningfully applied in SE/IS research – in general, and in RE – in particular. The tutorial distils the speaker’s experience [3,4,5,6] and lessons learned about how to make the most of online and face-to-face focus group studies within empirical RE research, illustrating how these methods can lead to insightful results both for practitioners and researchers. At the end of the tutorial, attendees should be able to critically reason about the possible choices in designing a focus group research process and the quality criteria for evaluating focus group studies.

2. Background on the Focus Group Research Method

For the purpose of this tutorial, we use the Focus Groups definition of Powell and Single [1] (p. 499)]. These authors call a focus group any *“group of individuals selected and assembled by researchers to discuss and comment on, from personal experience, the topic that is the subject of the research”*. To researchers, a focus group is a way to better understand how people think about an issue, a practice, a product or a service. The term ‘focus group’ derives from *‘focused group discussion’*. The researcher provides the focus of the discussion, and the data comes from the group interaction that happens during the discussion. This means that the focus group serves both to collect information on a range of ideas and to illuminate variation in perspectives between individuals. Because the interaction is at the heart of the focus group method [2], the researcher is primarily interested in how experts react to each other’s statements and points of view, how they build bridges between their different perspectives, and how they build up shared understanding during the discussion. A focus group research method can be applied face-to-face or online. Online focus groups can be synchronous or asynchronous, based on the most recent developments in the areas of Web 2.0 and of the tools for collaborative work.

From a historical standpoint, we note that focus groups were first used in the United States before and during World War II to understand the reception of war propaganda broadcast on radio. As research procedures, the focus group techniques were systematically refined in the 1950ties by R. Merton and his team [7]. For the past 40 years, focus groups have been broadly used in business-oriented market and consumers’ research as well as in academic business research, in communication studies, and in studies in education, public health, and political science. In empirical

SE and in IS research, the relatively recent interest of the community in perception-based evaluations of processes, methods, tools and practices from practitioners' perspective fostered the adoption of focus groups [8]. However, while researchers in social, marketing and political sciences get education on focus groups as part of their academic studies, the computer science, SE and IS programs in most universities do relatively little to prepare their master students, PhD researchers, and even senior scientific staff members on the use of this research method. As a result, focus groups are either used sub-optimally and misapplied, or worse, not used at all in many research institutions. This means a missed opportunity for many researchers to engage with practitioners in industry-relevant research that could be both done in cost-effective and pragmatic way.

3. Objective and Scope

The overall objective of this tutorial is to provide a sound understanding of focus groups as an empirical research approach and how it can be meaningfully applied in empirical SE/IS research – in general, and in RE – in particular. To achieve this objective, the tutorial will:

- (1) present the role of the Focus Group method in empirical SE and RE research, and its use in *both* exploratory and confirmatory studies, as a means to provide an in-depth understanding of the socio-technological realities surrounding everyday RE (or SE) phenomena.
- (2) elaborate on the differences between focus groups and group interviews, as qualitative research methods [2,9], and
- (3) present three ways of using focus groups in research design: as the only research method in an empirical RE study, as part of a multi-method qualitative research design, and as a complementary to surveys and in-depth interviews.

4. Outline of the content

The tutorial will cover the following topics:

- Research context and the research questions to which it makes sense to apply a focus group method;
- Justification of the most important decisions over the research design of a focus group study;
- Necessary quality criteria for the research design;
- Cost-effective strategies for recruiting practitioners in a focus group;
- Planning and execution of proper focus group data collection and analysis;
- Tools for online focus group data collection and analysis;
- Countering the possible threats to validity and evaluating the generalizability of claims in a focus group study;

- Using the results of the study to inform the RE research and practice.
- Reporting the focus group results
- Venues for publishing focus group research results in RE.

Throughout, examples from the presenter's own experience [3,4,5,6] in online and face-to-face focus groups and that of other SE researchers [8], together with lessons learned and practical activities will be used to illustrate and amplify the points being made. Attendees will leave the tutorial with practical advice about how to apply the techniques in their own research setting, how to ensure they get good quality results and how to use their findings to improve processes, methods and tools as well as to advance the observed industrial practices. Pointers to literature and example studies will be provided.

4.1. Activities to deliver the contents

The tutorial starts with a brief historical account of qualitative methods in empirical SE. It will be followed by an introduction to the basic layout of a focus group research process and a discussion on four examples of focus group studies [3,4,5,6] in RE. The core of the tutorial is about the mechanics of a focus group study. For this component, the content will be logically divided in *four parts*:

Part I will focus on what makes a focus group cost-effective [10] and what design choices in setting up a research process will confront the researcher. The logical centre of this part of the presentation, will be the types of research questions [2,11] that are most suitable to be answered by using focus group research and the ways in which the research questions drive the research design choices. The choices will be evaluated against cost-effectiveness criteria and criteria related to the possible validity threats. The underlying reference material for this part is the textbook by Krueger and Cassey [10].

Part II will present the online focus group process and the tools used to run it. This part is based on authors' own experience in running two online focus groups [3,5].

Part III will go deeper on data collection and data analysis and will have practical exercises. The reference materials are some selected chapters on coding from Charmaz' textbook [12]. We make the note that we use the coding practices of grounded theory for the purpose of data analysis, as recommended by methodologists [7,10].

Part IV focuses exclusively on how a researcher ensures his/her research is more defensible. Threats to validity of results and generalizability of claims are the core of this part. The reference literature for this part are selected chapters from [11] and Kitzinger's seminal paper [2].

The tutorial concludes with ideas on (i) how to make the results useful for other researchers and practitioners in the RE field, (ii) how to report on a focus group study and (iii) what publication options are there based on researcher's level of seniority and career's goals (we acknowledge that master students and PhD researchers have different career goals compared to senior researchers, e.g. publishing a paper versus using research results for proposal writing to request funding).

Table 1 shows a mapping between the included topics and the activities. In this table, the second column means Introduction and the rightmost column (labelled ‘C’) means Conclusion part of the tutorial.

Table 1: Mapping of tutorial components against topics covered.

Topic	Intr.	Part I	Part II	Part III	Part IV	C
Research context	x					
Justification of research design		x				
Quality criteria for the research design		x				
Cost-effective strategies for recruiting practitioners		x				
Planning and execution of data collection and analysis		x		x		
Tools for online focus groups			x			
Countering the possible threats to validity and evaluating generalizability of claims					x	
Using the results of the study to inform the RE research and practice						x
Reporting the focus group results						x
Venues for publishing						x

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