# Chapter 9

# Ethnographic Viewpoints

## Introduction

We have discussed elsewhere in this handbook the use of ethnography as a fieldwork method that is used to gather information about how work is actually done, as distinct from the abstract models of work that may be presented by an organization. Ethnographic studies build a rich picture of work that includes information about cooperation in the workplace, how people cope with problems, how representations are used to support work and so on.

Ethnography developed in the social sciences and the fieldwork record is typically a narrative document that can be used as a basis for extensive post-study analysis . However, unstructured narrative is not readily accessible to anyone apart from the ethnographer himself or herself and, in particular, it is not a helpful document for engineers involved in complex software development.

To address this problem, we have investigated how ideas from requirements engineering may be applied to structure and present the information in the fieldwork record. In essence, we propose a number of ethnographic viewpoints which collect together related information from the fieldwork records.

## Viewpoints

The notion of a viewpoint originated with the idea that different stakeholders in a system see that system in different ways - they have their own 'viewpoint'. and A number of requirements engineering methods were developed in the 1990s based around this idea, including work by Finkelstein and Nusiebeh at Imperial College and at Lancaster University by Sommerville, Kotonya and Sawyer.

As this work developed, the notion of a viewpoint evolved from a stakeholder perspective to a structuring device that was used to organize and present a related set of requirements. So, in a medical records system, there might be Doctor, Nurse, Administrator and Manager viewpoints. These do not just represent a single perspective e.g. what is required by nurses but rather they collect together all requirements that are related to nurses. These requirement may not come from the nurses themselves but may come from other stakeholders, such as administrators, who have expectations about what nurses will do.

Viewpoints have a number of benefits:

1. They are useful in organizing requirements, especially when presenting these to different classes of stakeholder. Therefore, when presenting to nurses, the focus would be on the requirements from the Nurse viewpoint with less emphasis given to other viewpoints.

2. They provide a basis for requirements elicitation - therefore, if viewpoints are associated with a class of stakeholders, these are the primary sources of information. In other cases, the viewpoints are more abstract but represent a checklist of areas which should be covered in the requirements elicitation activity. When viewpoints are explicitly identified in one system, they may be reused in the elicitation of requirements for later systems.

3. They support requirements analysis in that related requirements in different viewpoints can be compared for overlap and conflicts. These related requirements typically arise where different types of stakeholder make use of the same system functionality.

The paper by Sommerville and Sawyer 'Viewpoints: principles, problems and a practical approach to requirements engineering' summarises the use of viewpoints in requirements engineering.

Our experience with the use of viewpoints in requirements engineering prompted us to think about how these could be used to support the ethnographic process and provide some structure for ethnographic analysis.

## Ethnographic viewpoints

Primarily, ethnographic viewpoints are a means of organizing the ethnographic record and presenting this back to the actors in the field site that have been observed. The motivation for the development of these viewpoints was the need to share the ethnographic record between the fieldworker who collected

the data and the system engineers who required that data to inform the system requirements and design.

With experience, we discovered that these ethnographic viewpoints could be used by people who were not experienced ethnographers to guide and organize the ethnographic process itself. This is discussed elsewhere in this handbook in the section on the Coherence method.

There are three principal ethnographic viewpoints:

1. A work setting viewpoint, which focuses on the place where the work is done and how this is organized to support the work.

2. A social and organizational viewpoints, which is concerned with the interactions between the people involved in the work and how they cooperate. It also includes how the people in the workplace are influenced and affected by organizational issues such as organizational structure and policies.

3. A work flow viewpoint which presents information about the sequence of work activities, the representations used at each stage in these activities, etc.

## The work setting viewpoint

The first of our viewpoints focuses on the development of a representation of the setting of work and how users work within a flexible working division of labour.

One way of reflecting the practical everyday nature of the work is for accounts of the fieldwork to focus on its setting. This is often reported in terms of the physical layout of the location in which work is taking place. This viewpoint seeks to represent the spatial distribution of the work place in terms of its participants, the work they do and the local resources that they use. The purpose of this is to provide a sense of 'where the work takes place' and the socially constructed affordances that this offers as an arena of various kinds of interactions that take place. In this respect, it is a view upon the workaday character of the world within its setting.

The viewpoint was originally developed after experience with ethnographic studies of co-located work e.g. a control room, where many people were cooperating. When we apply this to distributed work, we are no just interested in the individual workspaces but also in the tools used by the actors to support their work and, particularly, how they organize the technology in their workspace to support interaction and collaboration.

## Social and organizational perspectives

This viewpoint highlights the loosely structured and practical focus of ethnographic studies of work. The emphasis of ethnographic studies is on providing materials on the 'real world, real time', nature of work which can be used for later analysis. These materials furnish portraits of the practical nature of work, often presented as illustrative vignettes within a larger report. The analysis, again typically, tries to bring out the day-to-day experience of the work from the point of view of various actors within the setting. Each of these actors have informal incomplete and often inconsistent models of the work taking place each of which provides significant insight in the development of abstract models in the requirements process.

This viewpoint aims to collate summaries of this body of observational information in such a manner that they are accessible by developers as a resource for system requirements specification.

Given the relatively discursive presentation of this material as well as its focus on the subtle, often 'invisible', often tacit, features of workaday activities, this viewpoint is really a collection of potential viewpoints from which such materials can be examined, depending upon the interests of the designers. Observers and developers are free to add additional perspectives relevant to the study as a means presenting this information. For example, it may be presented from the point of view of a particular actor within the work setting, a sequence of tasks, a collaborative endeavour, the policy of the organisation, and so on.

This viewpoint should also take into account the collaboration tools that are used to support distributed work. Email is, of course, now ubiquitous and is still probably the most commonly used collaboration medium. However, synchronous collaboration (Skype, phone conferencing, instant messaging) may also be used as well as social networks such as Facebook and Google Plus.

## Work flow

This viewpoint, again, is probably best seen as a collection of potential viewpoints, focuses more directly on sequences of work activities, information flows, and so on. In this respect it emphasises and exhibits the division of labour within the work along with its various interdependencies; interdependencies, it is important to stress, which are not always ormally specified. The kind of fieldwork materials germane to this viewpoint include 'tracking work' through its sequences and transformations, such as a particular piece of software through error testing, the flight of particular aircraft through UK airspace, invoice pro-

cessing, etc..

Once again, such materials will consist of reports of activities, the relationships among parties to the work, how the interdependencies are achieved as 'real world, real time' phenomena, the contingencies that can arise, how they are dealt with, and so on. In documenting workflow, it may be possible to use one of the many diagrammatic notations that have been developed in this area such as UML activity diagrams. However, these have been developed from a particular model of work based on activities, inputs and outputs and this is not appropriate for documenting all types of workflow.

As part of this viewpoint, it is sometimes useful to examine how the work is represented and how this representation is used by the different actors involved. For example, in work such as invoice processing, a paper or electronic invoice may be annotated with comments by people at each stage of its processing.