PM Case Studies: A Tentative Characterisation

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Abstract. Case studies are an essential feature of process modelling research. This work introduces a possible structure to assist in assembling and reporting the fragmented findings of such experiences

1 Introduction

The Informatics Process Group has been involved in various aspects of process modelling for a number of years. One ongoing thread of this work is our involvement with operational research activities in commercial, industrial, and government organisations. These studies have been undertaken for a number of reasons, primarily as a way of testing our current version of our Process Analysis and Design Methodology (PADM) [6], but also to seek new insights into the pattern of activity which we refer to as 'process'.

One of the features of these studies is the fact that they are very much driven by the client and the learning arising is thus in many ways unsatisfactory: fragmented, sometimes seemingly not very relevant, inconclusive, and frequently incomplete. It is thus difficult to assemble the results of the case studies into a meaningful 'whole' of experience.

These findings thus need to be classified in some way, and this characterisation is only a first step in achieving this aim. Earlier work by Lonchamps [3] and Humphrey and Feiler [2], focussing on the software process domain and the subject process itself, provide a useful starting point to from which to develop such a structure.

In this work, 'characteristics', 'properties' and 'features' are taken to be synonymous. This position paper proposes a characterisation framework for IPG case study experiences, with the Requirements identified in Section 2, and the framework itself outlined in Section 3.

2 Requirements

The ultimate objective is to find a way to organise our knowledge of this area of process experience such that it can be useful and readily accessed by workers. We want:

- To provide a concise yet insightful description of a study.
- To be better able to synthesise our knowledge.

- To identify the essentials in the complexity.
- To be able to recognise a few salient features of a process, and from these few features predict the existence of others.
- To identify features which have a critical effect on both process development and process support.
- To explore the factors which lead to difference between processes.
- To have groupings for easy reference.

As a first step in achieving these objectives, we need a systematic way of identifying features of interest.

3 Study Features

These are the features which help characterise the activity of, and the conclusions that can be drawn from, a case study. They have been selected to represent concerns identified both by earlier workers and by IPG field work. Our work so far has not been able to assess their relative significance, so, at present, their ordering does not reflect importance. They are also chosen so as to be as 'orthogonal' as possible. The framework is illustrated in Figure 1 and the essentials are described below.

3.1 Learning

The enhancement of our knowledge and experience arising from case study field work can be achieved in one or more of four areas: Method, Tools, Enactment Technologies, and Organisations. 'Method' does of course primarily refer to the testing and improving of PADM itself, but the other areas are more general: identifying requirements for new tools, experiences with using existing tools; experience with using particular enactment technologies; determining their appropriate use; the mapping of technologies to particular process characterisations or 'types', and lastly understanding how organisations shape a process, and the extent to which this needs be the concern of the process engineer.

3.2 Purpose

There are usually a number of possibly conflicting reasons for carrying out a study. They do, however, fall into relatively few categories. Different parties to the study do, of course, have their own agendas which can be in conflict, and the existence of differences should be appreciated. An understanding of study purpose can help with the understanding of outcomes. A study may be done simply to describe the process, either 'as is', or 'as ought to be'. Often, a process is to be evaluated according to some established criteria, to determine if the possibility exists for significant 'performance' or 'quality' improvements. If a process is to be changed, it is often acknowledged that a study can promote greater understanding of 'what is', and 'what ought to be', and in fact can assist with the change process itself.

A common IPG purpose is to gain experience in use of the PADM Methodology, and to pass on a knowledge of process engineering techniques to practitioners, thus placing them in a better position to address process-related issues.

3.3 Process Domain

This sets the human, machine and historical context in which the study was carried out, the essential frame of reference for a viewpoint from which to assess the work of the study. The real world can be exceedingly complex and thus it is unfortunately necessary to generalise with a broad-brush description. A prerequisite is to have an understanding of the education, background and career structure of participants, and an appreciation of the unwritten 'rules' of the organisation which can indicate hurdles that will have to be overcome before certain kinds of change can be tolerated. It also seems important to know the extent to which process practitioners understand what they do and why they have to do it, and the existing systems and tools that are used in the process.

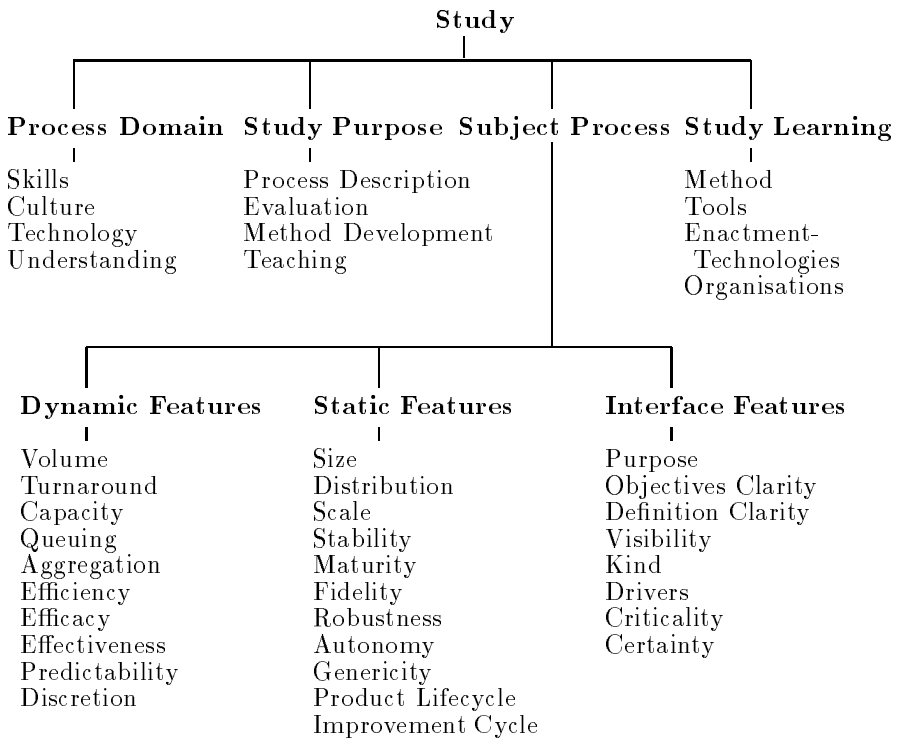

Figure 1

3.4 Subject Process

Most of the static and dynamic properties relating to the subject process are those already identified [3] [2]. In some cases it was felt that the definitions were

rather too pre-disposed towards automated process execution, and it is hoped to re-examine these definitions in the near future. In the meantime the existing definitions can be used. The most important new property introduced is that of 'Genericity': a measure of the potential for process re-use.

It was felt necessary to introduce a new group of so-called 'interface properties'. These are features which are manifest at the interface of the process model and the performing process, and particularly concern the way the process as defined relates to human participants. These component properties are as follows:

- Purpose: The ostensible purpose of the process may well seem clear, however the situation frequently arises that there are many underlying objectives which ought to be brought to light. The objectives should not be presumed as being 'static', and their relative importance can change, possibly on a day-to-day basis.
- Clarity of objectives: The ease with which different objectives of the process can be distinguished
- Clarity of definition: The ease of understanding of any process definition,
- Visibility: The awareness of participants as to what the process is.
- Kind: Identification by purpose, e.g. an approval process, a design process.
- Drivers: The source of those parameters of the process by which success is measured.
- Criticality: A measure of how important its is to the organisation that the process is performed correctly according to the 'definitions'.
- Certainty: A measure of the likelihood of unforeseen exceptions having to be handled.

4 Conclusions

One of the key features by which a specialism is identified as a discipline in its own right is the degree to which its vocabulary is shared by practitioners. Workers in the field of process modelling are only now beginning to identify and seriously debate the vocabulary which we use. The cited works can thus be recognised as milestones. These were only partially useful when attempting to describe our experiences of case studies. They do, however provide a very sound basis on which to build this tentative structure which we hope will prove useful to process modellers. It is offered for criticism of features which are needed but omitted, and for those which are less important and unworthy of inclusion.

Many of the features described are intuitive and it may well prove difficult to ascribe them meaningful values. It is hoped that this can be explored in the near future as the studies already undertaken by the IPG are cast in this framework. This may well lead to some properties being re-defined, some dropped altogether, or new ones introduced.

This work serves only to introduce the issue of the characterisation of the processes themselves, a small step towards fully addressing the Requirements outlined in Section 2. This is a potentially valuable area of inquiry in that, in all

the complexity of organisation processes, there may indeed be only a relatively few distinct processes. Research activity can thus focussed on these few processes with beneficial results.

Work has already been done on what may well be a closely associated area: that of the characterisation of technologies [4] [1]. It seems very unlikely that all processes can be effectively supported by all technologies and some kind of mapping of process properties to technology properties would be of immeasurable benefit to practitioners.

The SERC funded project 'Process Engineering Framework' is currently exploring these, and other areas. This work will be further developed at Manchester by using this framework as a comparative framework incorporating those earlier case studies which have, to a large extent, gone unreported, and also to support and augment more general operational research studies [5].

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