The Process Modelling Cookbook Orientation, Description and Experience .

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Abstract. The Process Modelling Cookbook was developed as part of a collaborative project between British Telecommunications plc. and the University of Manchester. Its orientation owes much to this concord of industrial requirements and academic research interests. The Cookbook is described with reference to its structure of Representation and Refinement and the multi-formalism modelling approach. At the time of writing two case study evaluations are in progress. The early implications of these are introduced in the final section.

1 Orientation.

British Telecommunications (BT) have identified process modelling as a means by which they can encourage understanding of their organisational processes, facilitate the effective management of these processes and reengineer the processes around business outputs. The implication for information technology is that its focus shifts from traditional data manipulation issues towards the support and servicing of designed processes.

Process modelling research at the Informatics Process Group (IPG) of the University of Manchester had been primarily concerned with the software process and advanced technology for its support [2], but came to see the software process as a specialised subset of business processes in general. Recent case studies have explored the process modelling of a mainframe development process [7], a software testing process [5], a BT billing process (introduced below) and a systems integration process (introduced below).

An early finding of the collaboration between BT and the University of Manchester was that there was no properly defined method for the production and use of process models available [5]. In particular it was felt that a method was needed whereby process models could be used to confer clear descriptions which aid reasoning and communication about processes. This would imply a modelling vocabulary which was rich and yet precise enough to structure the information generated. Moreover, the process modeller might be concerned with a wide variety of subject areas (e.g. software process, invoice payment) within which very different technologies may be employed (from non-computer systems to traditional IT and on to groupware, process enactments etc). For this reason it was felt that a loose and flexible framework would be more useful than a tightly prescriptive one.

The Process Modelling Cookbook [6] was developed as an initial attempt to provide such a method. It seeks to describe both the techniques needed for the creation of a process model and the structure within which these techniques are employed. Additionally, it attempts to bring together other apparently disparate methods and concepts which may be of relevance to the process modeller. These methods and concepts, which include Soft Systems Methodology [3] and the Software Maturity Framework [1], are incorporated as options to the main Cookbook structure where this is appropriate.

2 Description.

2.1 Overview.

The Process Modelling Cookbook is designed to guide the user from an unstructured problem situation towards an understanding of work processes. Thus, he or she achieves a clear perspective over the problem domain and is able to make decisions (e.g. how might the activities be rationalised, how might technology be redesigned etc.) from this vantage point. The implication of this is that the Cookbook user is first concerned with "what happens now" and latterly considers "what will happen."

2.2 Vocabulary.

A rich modelling vocabulary is essential if a thorough knowledge of a process is to be gained and communicated. The Cookbook reworks a multi-formalism approach which was established in earlier BT research [4] [5] in order to produce a suitably vivid process description. Through this the same process can be described using different modelling techniques. These are used separately to reference different aspects of the process or are combined to provide an enriched picture.

The Cookbook multi-formalism approach combines conventional technique (data flow diagrams) with the novel (role activity diagrams, object flows) and the new (person centred charts). These allow the description of six different components:

1. People as participants in a portion of the process and having a perspective upon it.
2. Activities.
3. Roles.
4. Interactions between roles.
5. Objects such as resources (e.g. reports in a project management process, bills in a billing process) and tools (e.g. email systems, spreadsheets).
6. Conditions under which activities take place.

2.3 Structure.

The separation of "what happens now" and "what will happen" maps into the structure of Representation and Refinement. The Representation phase requires dialogue with process participants to elicit information about the way in which the process is carried out. This leads to the creation of the multi-formalism model. The Refinement phase uses the model to consider a change to the process itself. The motivation for this change may be gained through model building, expertise, process metrics or dialogue with participants.

A chapter of the Cookbook shows how these two phases can be applied to introduce a series of evolutionary changes to the real world process. This involves the cyclical application of the Refinement phase together with a partial re-invocation of the Representation phase to assess the impact of each change.

3 Experience.

The Cookbook is currently undergoing two industrial case study evaluations. The first of these is focused upon the BT bill production process. This is a mature process which has

well defined activities and outputs. It is substantially supported by computer technologies. The second case study is concerned with a process of verifying the integrative attributes of computer systems. This process is much newer, less well established and is not characterised by sequences of simple activities. The two case studies are therefore quite different and have already provided much useful feedback upon the Cookbook.

The case studies have tended to confirm the validity of the Cookbook's major tenets (e.g. its orientation, multi-formalism modelling) whilst raising some questions. Most of these are detailed and concern the diagramming techniques and temporal sequencing. The following are among the lessons learned:

1. The Cookbook has proved to be too prescriptive in practice and needs to allow the modeller still more freedom to choose his or her route through it.
2. The Cookbook does not properly appreciate the importance of the thinking and analysis process that occurs *before* formal modelling. Especially for the less-structured systems integration case study it has been useful to supplement the method with conceptual modelling derived from Soft Systems Methodology [3].
3. Tool support for the Cookbook is essential.

4 Conclusion.

The Process Modelling Cookbook is an initial attempt to answer the need for a method which can aid reasoning and communication about processes. It attempts to provide a modelling vocabulary which is both rich and precise and a structure which can introduce change to processes.

Process modelling methodology continues to be the subject of research and development. The current case studies have demonstrated the validity of the approach taken whilst calling into question some other aspects. It is intended that these shall feed into the development programme.

References

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