A Proposal for Process Modelling in the ACP Domain

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This report proposes a method for constructing IDEF3 models in the ACP domain. Rather than describing the components of IDEF3 models (see Lydiard 1995) or a generic methodology, the aim is to describe a method for IDEF3 model construction which takes the TIE scenarios as input, and results in process models where processes are described in terms of the identified ACP verbs. The resulting models are intended to bridge the gap between descriptions of the TIE tools and technologies in technical terms, and the accepted higher-level ACP terminology.

The IDEF3 models should show the processes which result in recognised ACP process products (official documents, plans etc). The processes named in the models should be expressed in terms of the ACP verb descriptions, and, further, where a process is decomposed in to sub-processes there should be some consistency in terms of the semantics of the higher-level process and the composition of the lower level processes.

1 Identifying Process Product Flow

Process modelling requires process products to be identified, and these may play the role of inputs or outputs to process steps. In the ACP domain a set of products has already been identified as the result of KA exercises (see Drabble, Lydiard and Tate, 1996). A necessary part of process modelling is therefore the identification of process products (or their close equivalents) from the TIE scenarios. The operations that are performed on these products by the editing/planning tools must be known. More importantly, the goals of the users that are achieved through the use of the tools must be identified as it is the goals that are achieved (or, the tasks that are performed) that will determine the modeller's interpretation. The central task in modelling is to describe concrete user activities more abstractly as process steps — in the recognised terminology — and to show the organisation of those steps in terms of temporal and product flow dependencies.

2 Ensuring Consistency

ACP verbs are organised into groups on the basis of their semantics, however, these semantics do not correspond with all possible linguistic, or intuitive meanings. The modelling process must ensure that the final models make correct use of ACP terminology (while it is likely that draft models will reflect the more intuitive meanings of the verbs). As process models are multi-level, there should also be consistency in the use of terminology between levels.

For example, consider the expansion of the process *analyse X* into the processes *choose X then publish X*. In this case, there is an inconsistency in the use of *analyse* as this verb has the notion of quantitative investigation, while *choose* has the notion of deciding but not analysing. *Publish* has the notion of issuing a document, and could be the result of an analysis process or a decision process. A replacement for *analyse X* might be *decide X* as *decide* is the verb class to which *choose* belongs (assuming that *choose* is the key activity of the *choose X then publish X* sequence).

Alternatively, further modelling may show that the process being modelled does indeed involve analysis. In this case *choose* might be replaced by a verb which captures the notion of analysis, or by a combination of processes involving analysing and choosing.

Checking the semantic consistency of process decompositions appears to be best done in a bottom-up fashion, however, modelling is likely to be both a top-down and bottom-up activity. When doing top-down modelling, top-level ACP verbs could be used in preference to sub-verbs when drafting initial ACP process models. This would allow the possibility of using more specific, and semantically consistent verbs at the expanded level. That is, the ACP verb groupings could be used as a guide to naming and decomposing process steps. In practice, process decomposition and construction is likely to be an iterative procedure. The ISI SENSUS/ACP lexicon/ontology and the **WordNet** tool could be of use in suggesting names for more specific verbs or for locating more general verbs.

3 Summary

In order to construct process models we need to know:

1 the process products that are manipulated by a tool,

2 other process products that the user requires,

3 the (partial) temporal orderings of user actions,

4 the goals satisfied (or tasks performed) by tool use.

Process products should be named according to ACP terminology as we cannot deduce the proper names from descriptions. In addition, we would like to know the envisaged organisational structure within which users operate, how many users are involved, and their skill levels.

References

Drabble, B., Lydiard, T. and Tate, A. (1996) *Process Steps, Process Products, and System Capabilities.* ISAT-AIAI/TR/4

Lydiard, T. (1995)*Using IDEF3 to Capture the Air Campaign Planning Process.*