

WORKFLOW MODELLING IN PROJECT MANAGEMENT PROCESSES: APPLICATION TO THE EU OPERATIONAL PROGRAM FOR THE ENERGY SECTOR

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ABSTRACT

In the new globalised business environment workflow technologies have been developed, to support effective management of organisation's processes. At the same time effective Project Management is increasingly identified as key success factor for organisations. The ability of supporting project management processes reengineering and/or streamlining, using workflow systems is investigated in this paper. For this purpose, we use two commercial workflow management systems to model project management processes a multi-annual European Union (EU) operational program. The reason for using two systems is attributed to the different modelling techniques. The results of these efforts are discussed in order to examine whether workflow techniques could be used as adequate modelling tools.

INTRODUCTION

Since, today's dynamic global business environment is driving a new extended enterprise, competitive companies are focusing their management on processes as the key to their success. [1] [9] To this end workflow management technologies have been developed, involving process modelling, process reengineering and workflow implementation and automation. On the other hand effective project management is one of the most important success factors for organisations. Since information flow between the participants in a project becomes more and more important in project's implementation, the possible use of workflow management tools in modelling and reengineering of project management processes seems to be very helpful.

MAIN WORKFLOW TECHNIQUES

Based on the method used for process modelling, Workflow Management Systems are divided into three main categories, as follows:

- **communication-based techniques**, which reduce every action in a workflow of four phases based on communication between a customer and a performer:

preparation; negotiation; performance and acceptance.

- **activity-based techniques**, which focus on modelling the tasks involved in a process and their dependencies.
- **hybrid techniques**, which can be considered as a combination of the communication-based and the activity-based techniques; see Georgakopoulos and Rusinkiewicz, VLDB, Athens, August 1997.

MODELLING THE EU OPERATIONAL PROGRAMME FOR THE ENERGY SECTOR

The Operational Program for the Energy Sector, subsidises the construction of new electricity plants, energy saving investments in the industry, the promotion and use of Energy Renewable Sources and geotechnical research activities, with the total budget of 946,5 million ECU for the years 1994-1999.

The major functions of the Program's Management System include program planning, program breakdown to projects, progress monitoring, financial management and program evaluation.

For the purposes of the paper we present the modeling of the Subsidy Payment process using the Action Workflow Process Builder software package (communication – based WFMS) and the Jetform software package (activity –based WFMS). This procedure involves five roles, the Secretariat of the Steering Committee, the Ministry of National Economy, the Project Manager, the Bank of Greece and the Beneficiary.

Modelling using Activity-based Techniques

The process, is modelled using the "JetForm Workflow Builder" as shown in figure 1. The activities are divided into two levels – tasks represented by the large boxes and concluding actions represented by the smaller ones. Six tasks and eleven actions are related in order to reproduce the whole process. For each task the organisational role, which performs the related activities, is presented at the

the deadlines in the action boxes.

The process under discussion starts with the task “Progress Report“, performed by the beneficiary. The action “Submission” triggers the “Evaluation” Task.. If complete, the report is forwarded to the Project Manager elsewhere the report is rejected by the Secretariat of the Steering Committee and has to be resubmitted. The Project Manager elaborates the data and prepares within 7 days an integrated report presenting the progress of the programme. This report is then submitted to the Secretariat of the Steering Committee, which after checking the balance of the programme’s account sends payment orders to the National Bank and, if necessary, submits a request for funding to the Ministry of National Economy. After receiving the funding request the Ministry of National Economy evaluates the request and issues a deposit order forwarded to the national Bank of Greece. At the same time informs EU entities requesting the EU contribution. This request includes the progress of all the Second Framework Programmes and is evaluated by the EU adequate General Directions. According to the evaluated progress EU proceeds to the deposit of the adequate contribution. Finally the beneficiary is invited by the National Bank to collect the subsidy and the Bank prepares an account report which is sent to the Secretary of the Steering Committee.

Modelling using with Communication-based Techniques

secondary workflows representing the parts of the process. The preparation stage of the primary workflow is analysed to three secondary workflows, «Trimester progress report», «MIS report», and “Fun Deposit”. Between the second and the third secondary workflow a conditional symbol interpolates providing two routes. If the payment(s) does not exceed the account balance of the programme, then the preparation stage is completed, else the third secondary workflow is activated. This workflow includes at the performance stage two workflows performed in parallel, «EU Fund Deposit», and «GR Fund Deposit» aiming at the deposit of the needed resources.

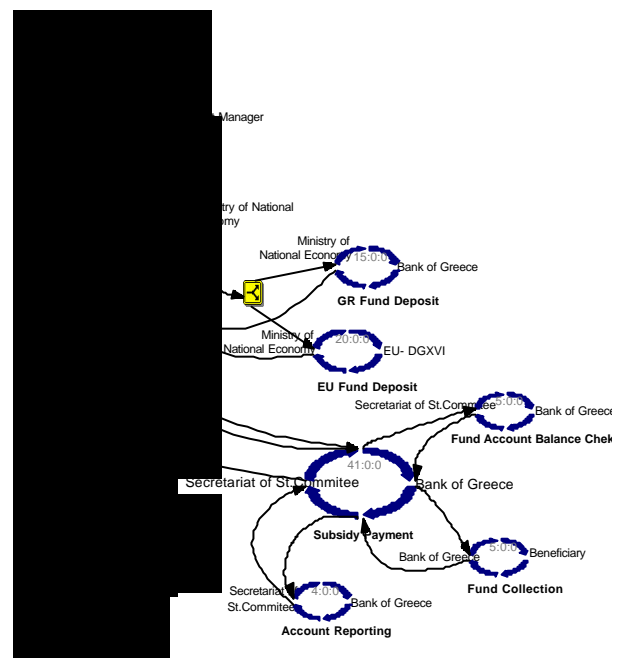


Figure 2: Communication based workflow map for subsidy payment process

The second phase of the primary workflow, corresponding to the negotiation phase, consists of the «Fund Account Balance Check» secondary workflow. There, the Secretariat of the Steering Committee controls the availability of funding resources, remaining from previous stages of the project. Such a control is performed by the Bank of Greece.

Following the same logic the performance phase is further analysed by a secondary workflow labelled «Fund Collection». This transaction refers to the appropriate funding that the Beneficiary should receive from the Bank of Greece.

Finally the secondary workflow representing the acceptance phase of the «Subsidy Payment» workflow, is the «Accounting Report» requested by the Secretariat of the Steering Committee and written (composed) by the Bank of Greece.

DISCUSSION AND CONCLUDING REMARKS.

The analysis so far has shown that the two approaches usually applied in workflow modelling, i.e. the activity- and the communication-based, can provide adequate vehicles for process modelling when applied to project management - when the aim is an effort to reengineer and/or streamline these processes aiming to operational improvement.

None of the two approaches falls behind the other concerning the scope and wealth of information provided. Specifically, they both provide:

- ample information concerning the tasks to be modelled (either separating them into phases, or tasks and activities), hence they both support the allocation of a project's phases into work packages, tasks and activities;
- rich information for the time duration of processes and the cost incurred for the execution of the processes
- constructs for modelling issues such as parallelism and if-then-else mechanisms.

However, the two approaches present a number of differences concerning the "philosophy" of modelling which would be taken explicitly into account when applied to project management. Such differences are strongly related to the limitations that, in general, the workflow systems have. We list below the basic ones, observed throughout the modelling procedure:

- ❑ the methodological rigour implied by each approach, i.e. the possibility of using provable mathematical constructs. At that point we can clearly differentiate the two approaches given the different philosophy underlying them. The communication-based approach is implicitly using an underlying model [], but the activity-based seems to lack a strong mathematical construct. However, this observation falls in the general limitation concerning workflow modelling: The lack of rigorous modelling.
- ❑ the simplicity/complexity in applying the approaches to project management processes, especially with regard to the flow of communication and the interdependence of tasks. Both methods are highly dependent on the type of the project. The key issue, though, is that the activity-based approach enables us to observe possible interdependencies of tasks but does not provide much information about the

flow of communication among processing entities []. On the contrary, that is being brought to an end successfully by the communication-based approach, which, in turn, due to its structure, can not represent big number of interdependent tasks.

- ❑ the ease of applying the approaches to the administrative issues of project management processes. The tasks modelled should be repetitive concerning operations involved in the project. It is very hard, for different reasons in each approach, to model exceptional tasks or processes.
- ❑ the ability and ease of each approach for handling client-orientation. The activity-based approach is more convenient for internal tasks of the project management team, while the communication-based is strongly focusing on the relationship with the customer, reminding at each single step who is the client and what is he expecting from the task!
- ❑ the managerial implications concerning the expertise required by the modelling team by each approach. In JetForm™ the modelling procedure seems to be less structured requiring professional expertise by the project management team in process modelling. On the other hand ActionWorkflow™ is more structured guiding the model designer throughout the whole procedure. However, the latter can be also a disadvantage, because it restricts the degrees of freedom that the design team has.

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