An Internet-based Co-operation Environment for a Dynamic and Objective Oriented Planning

Petra von Both
Institut für Industrielle Bauproduktion (ifib)
Prof. Dr. Niklaus Kohler
Universität Karlsruhe (TH)
petra-von.both@ifib.uni-karlsruhe.de

1. Introduction

The increasing use of modern information and communication technologies in the commercial field leads to a considerable change of existing forms of work, structures of enterprises and internal processes which lead to virtual enterprises. Multi-disciplinary problems of high complexity and innovative development projects in the field of A/E/C seem to lead especially to promising solutions, but also need new requirements in the form of co-operation.

According to [1] there are in existing theories of organisation, no satisfactory answers to specific problems of co-ordination in spatially distributed but still collaborative work. Therefore the aim of this contribution is to present a model of co-operation that enables spatially separated co-operation in a holistic and team-oriented manner for dynamic multi-disciplinary development projects.

2. The integral co-operation model

In order to cope with the integration-approach, the various kinds of problems of project planning (process management, management of tasks and objectives, project organisation) will be worked out as partial models and will be integrated into the entire model in consideration of their mutual effects.

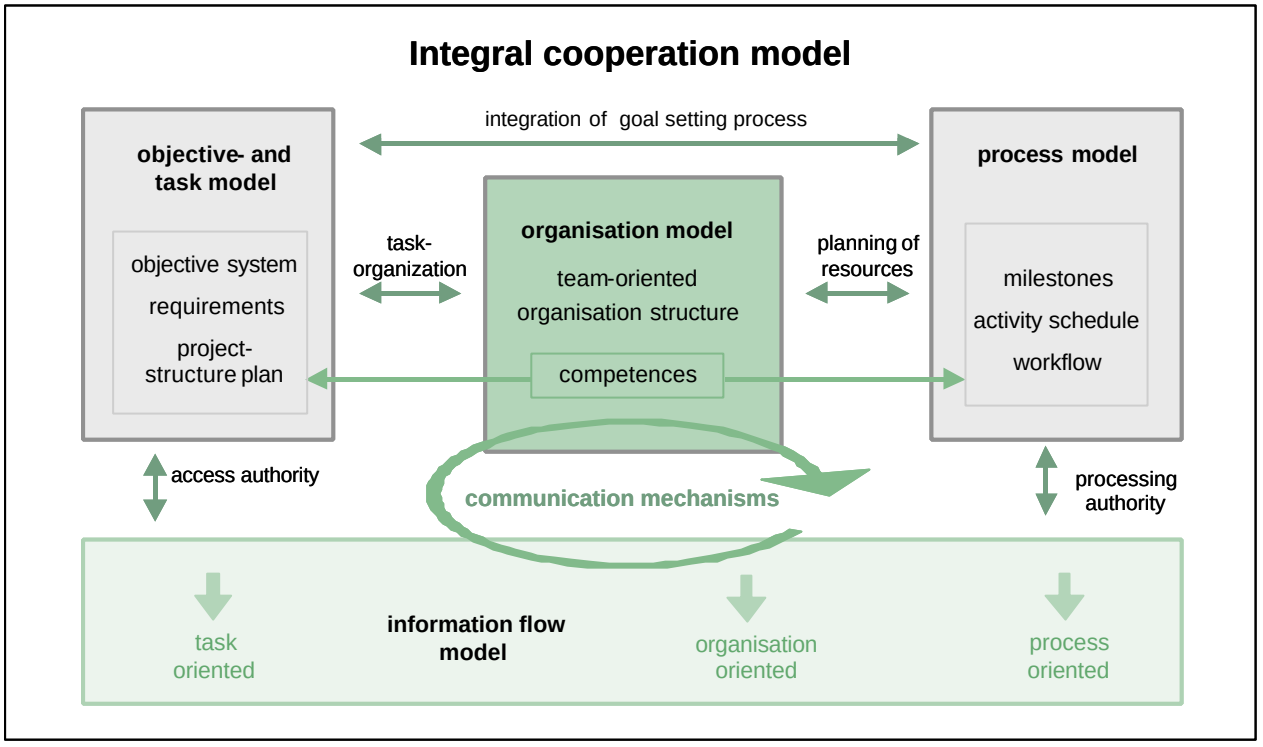

Figure 1: The integral co-operation model

Figure 1 shows the integral model of co-operation with its partial models and their interdependencies. The organisational structure of the co-operation model functions as a link, because a resource-oriented modelling of processes can only be achieved by associating tasks to the corresponding personnel. Furthermore, the responsibilities and the authorisation for editing the elements of the partial models will be regulated by organisational roles. The interconnection with the model of information flow is achieved by providing an adequate mechanism of communication and information-logistic structures.

3. Partial models

3.1 Concept of a dynamic system of objectives and tasks

The fundamental basis of project-planning represents a system of objectives, that enables a conversion of abstract specification of objectives in early project phases via tactical sub-objectives to operative sub-objectives and tasks [2]. Furthermore, it is intended to give support to the structuring of objectives without being prematurely fixed due to intense standardisation of the subjects [3]. A phase-related structuring and adaptation of the objective system as well as the derivation of the single tasks enables high project dynamics to be handled and available knowledge to be included.

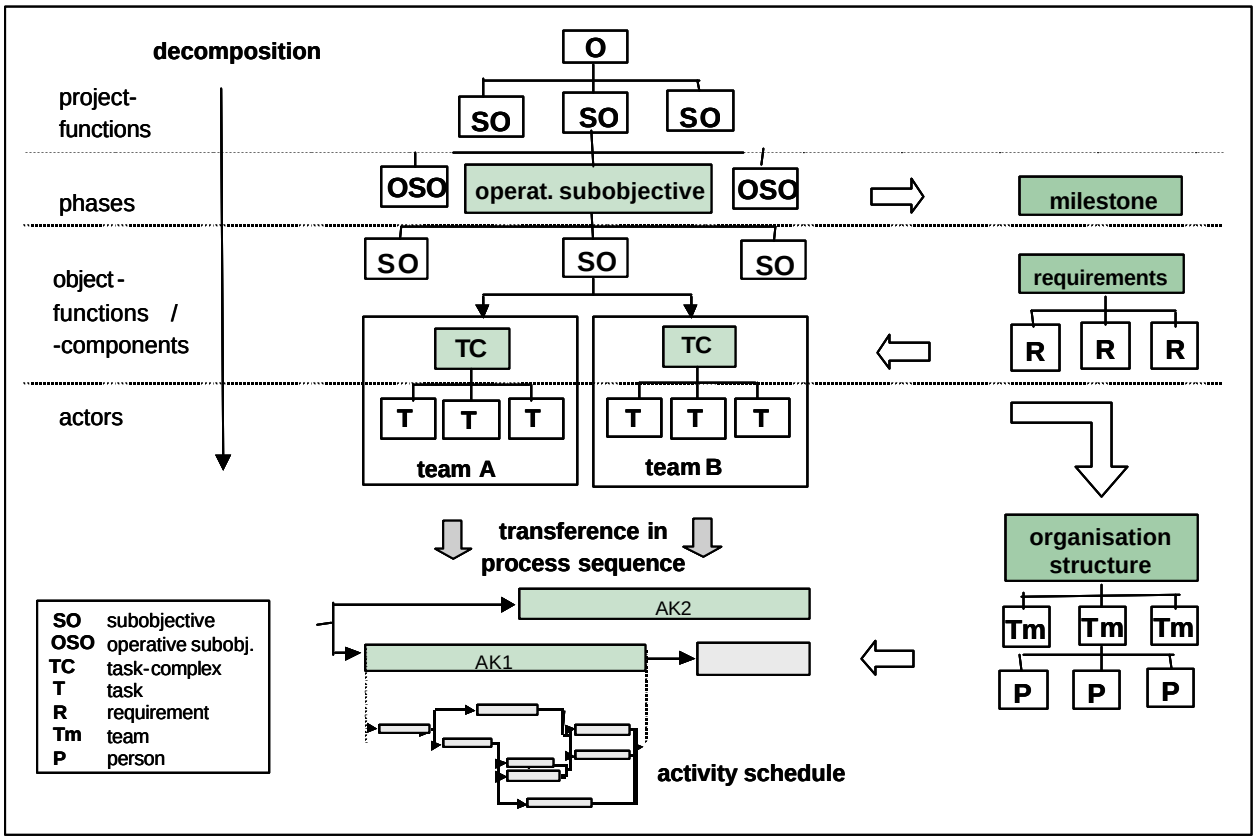

Figure 2: structure of the objective and task system

To consider problems of the respective object planning as well as project-management, a substructure is created on the upper level of the structure plan according to project functions. The result-oriented tactical goals will be in the frame of objective-planning transformed into operative sub-objectives, which can now be clearly related to a project-phase. Hereupon a decomposition of the partial objectives is chained onto and oriented around object-components and functions, which finally ends in the derivation of so-called task-complexes.

These task complexes contain interdisciplinary problems, which are closely connected with regard to the contents, as they refer to the same object-component or function. They establish therefore, the reference that forms the organisational structure (planning-teams) within the project.

3.2 Organisational structure of the co-operation model

The phase-related forming of the organisational structure into task-oriented teams offers high flexibility, as it results from the topical project situation, which could not be rigidly planned in advance at the beginning of a project. The individual teams have their own responsibility for solving their specific problems as well as the assumption of responsibilities of the team-management within the frame-conditions of the entire project. The distribution of these team-oriented management-tasks is governed by „management by competence “ [4] in accordance with the method and social competence-profile of the team members.

This disposition of co-ordinated self-organisation in the teams influences the concept of the whole project-management, as the co-ordination has to be done on two levels:

- On the level of the project, the project-function guarantees as organisational roles the co-ordination of the management-tasks.
- On the level of the teams, this is accomplished by the so-called team-function.

Graphic 3 shows the fields of management, which will be distributed via these functions.

Figure 3: Management functions

4. Dynamic model for process support

The realisation and adaptation of the system of objectives and tasks within the respective phases and the following transformation of the packages of work into a process sequence permits a comprehension of the high dynamics of planning in the process model as well. The adjustment of the process course will be done on two levels as well:

- The result-oriented co-ordination level with phases and milestones
- The activity-oriented detail-level with the single planning processes

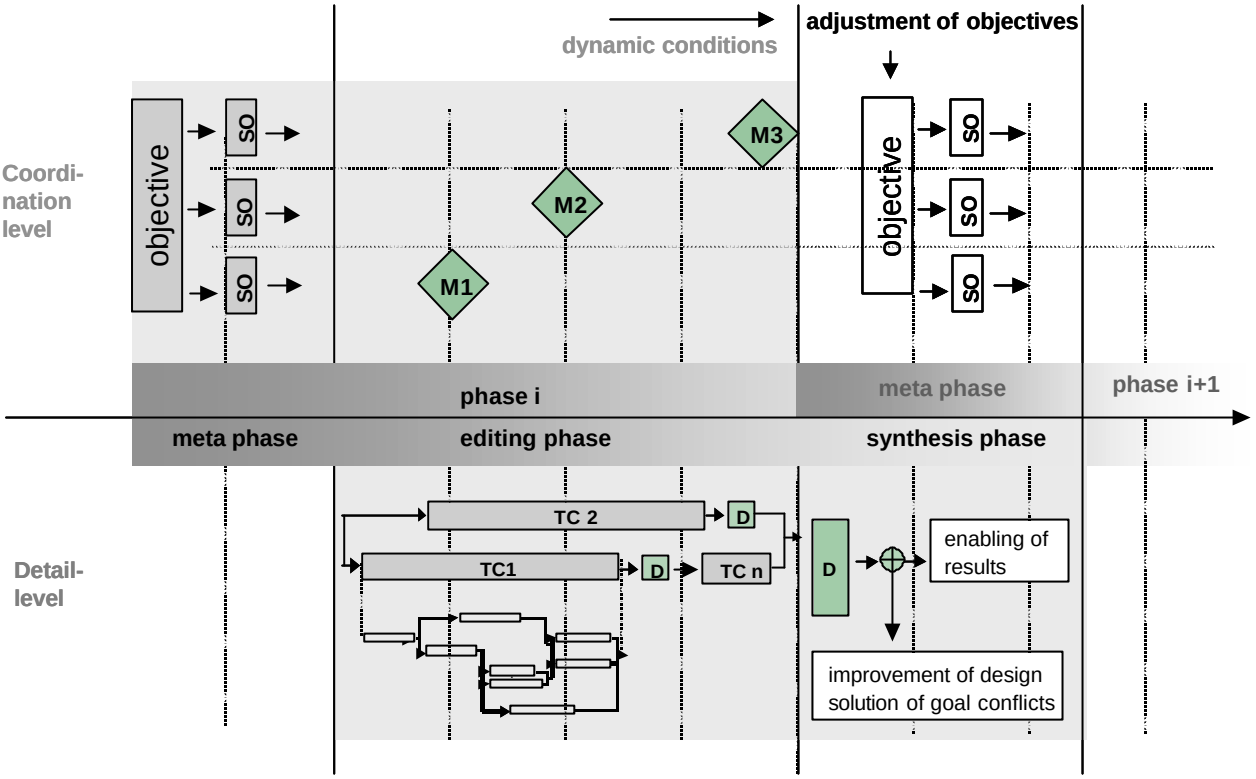

Figure 4: Two-level process model

After the assessment of the effort and the predefinition of the competencies, the single packages of work will be transformed into logically linked operational processes in a team. These represent the smallest from outside assigned units and will be handed over to the participants as their own responsibility, which leaves them liberty in the choice of their methods. Through this assignment, measures for increasing quality and effectiveness inside the team can be initiated, because the highest competence for the strategy of solving the problems lies there.

Before the end of the phase, it is checked by dint of decision-processes across team boundaries, whether the results of work within the different teams represent an overall result according to the main objective and can be used as a base for the next phase. Otherwise, there has to follow an adaptation of the concept, respectively a solution of the objective conflicts on the basis of an iteration-cycle.

5. Concept for implementation of the project model by an internet-based co-operation environment

An internet-based co-operation environment will accomplish the implementation of the model. The user interface, shown in figure 5, displays the project with its different phases as well as the various elements of the platform, into which the modules of the partial models are integrated. Beside the provision of various levels of view (phases of project – entire project), personal and process oriented filters offer problem related specific views to the respective elements.

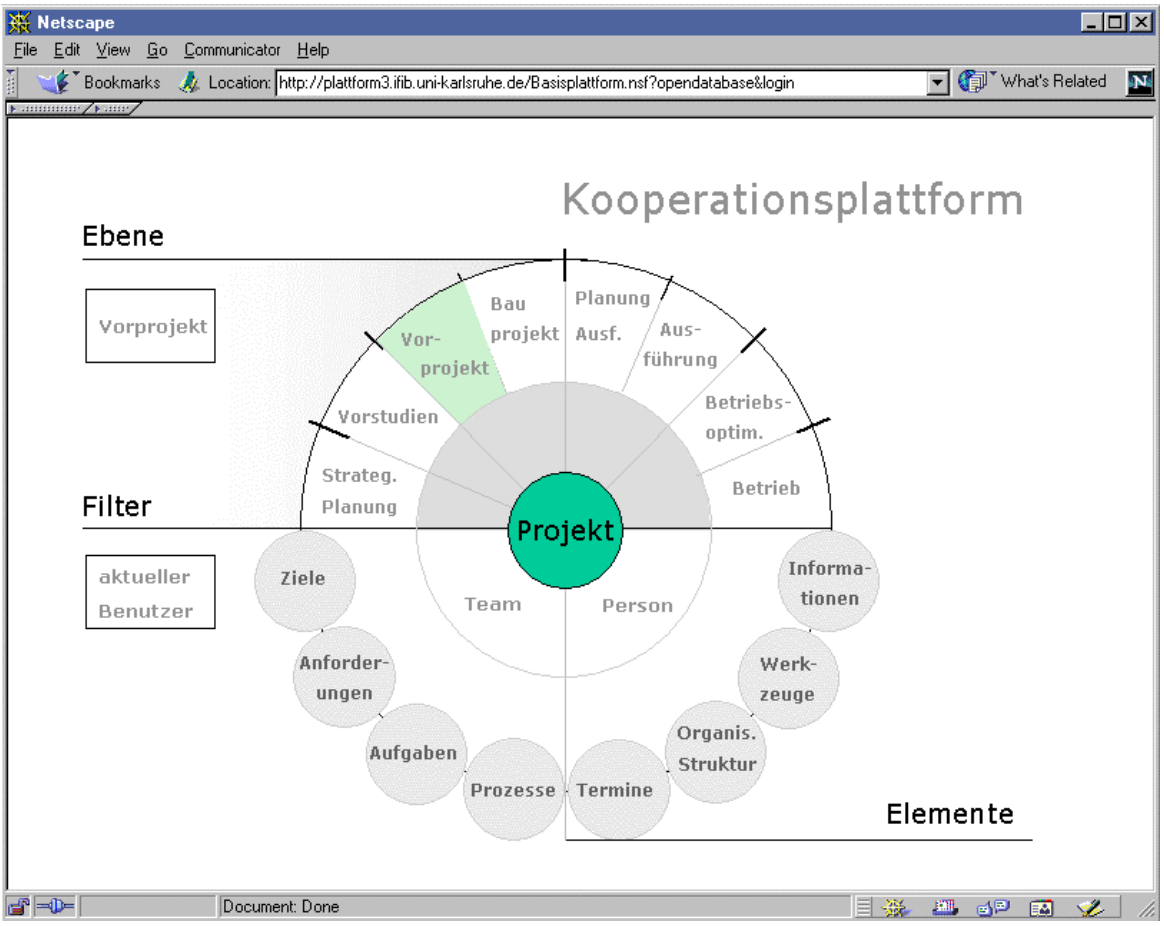

Figure 5: GUI of the co-operation environment

6. Technical implementation

The implementation of the co-operation environment is based on the GroupWare system Lotus Domino with client/server-system architecture. The domino technology allows flexible access to the database functionality with platform independent WWW-Browser by accordingly transferring requests over the Domino-http-server to the database application and returning the results interpreted in HTML-format.

Client requests by HTML-pages, generated by Domino, or by embedded graphical navigators are forwarded directly to the database application or transfer-units (notes agents).

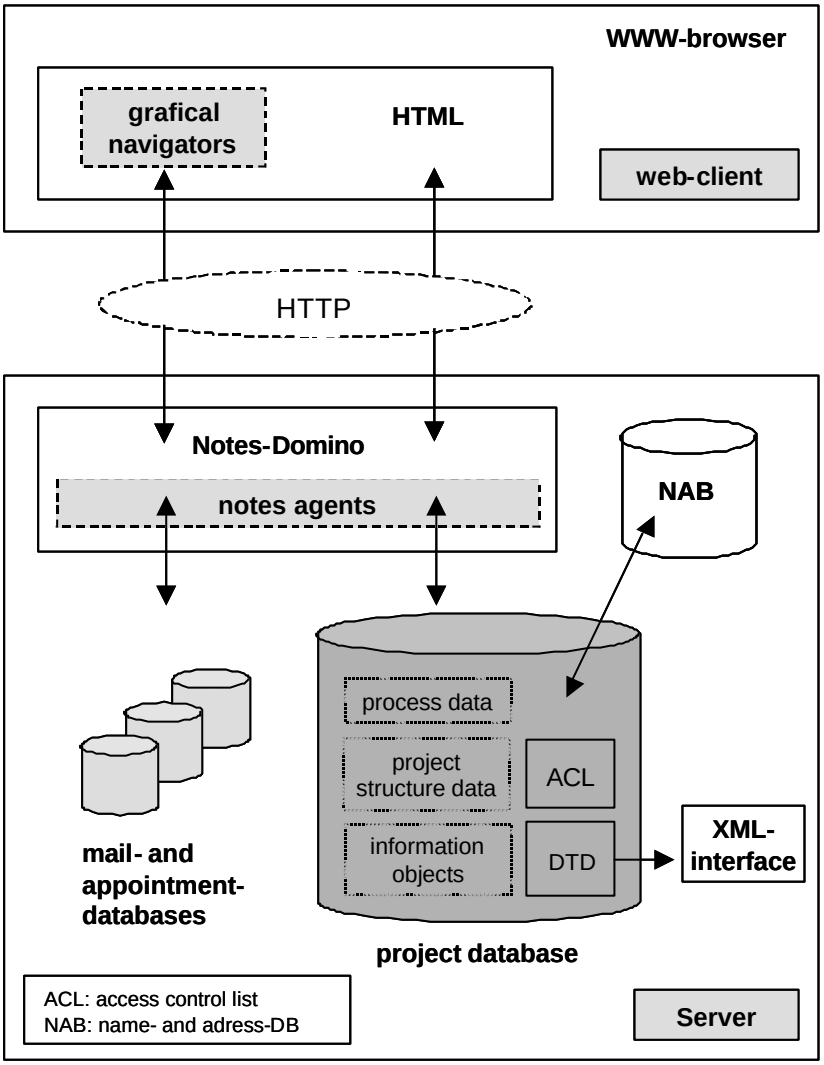

Figure 6: System architecture

7. References

[1] Bundesministerium für Bildung und Forschung: „Gestaltung der Arbeit in virtuellen Unternehmen“; Bundesanzeiger Nr. 5, 2001

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