

# Project management and construction management

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## III

**Project Management and Construction Management**

Gestion du projet et gestion de la construction

Projektmanagement und Baubetriebe

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In the introductory report of June 1979 we gave you already a view on the principles of organization of the design - and construction process. Today we shall try to put these principles into the picture of Construction Management.

We mentioned in that introductory paper already the different partners in the building process, from the client to the constructors and the suppliers, entering during this process the architect, the consultant, the main contractor and the subcontractors. We pointed out that such a building process cannot consist on its own, but should be fitted into society, the people, the environment, the country, the continent. That means however that such a building process will be different from country to country, from continent to continent, from east to west. And it would be interesting to find out to know, the way in which such a process will go in these different place of the world. One thing however should be the same: building constructions should have to meet the needs of these countries, of the people of these countries.

The building process must be organized in a special way, in a manner that the constructibility is evident, that parts of it fit to eachother in the right way, that information during the design - and construction-phase is clear. We proposed therefore to work with a system of interlocking-planning, wich system consists of an overall-plan for all the partners in the building process and goes into further details in respectively masterplans, working-plans and working schedules for each of these partners. Planning from a general point of view, to a detailed fixed task for the workers in the different organizations of these partners in the building process.

We can use different methods, different planning systems, using the computer or not. We think that planning with the computer is only meaningful for very complicated constructions, with very many partners in the process, with special budgets to be guarded, with a time-span which will be of great importance. In all the ways of planning however, it is of great importance to recognise in the process the preparatory work and measures, that must be done before special parts in the design- or construction-phase can come into execution. It may be possible that the preparation time, the delivery- or construction-time of special parts will take such a long time, that some decisions must be taken in a far more earlier moment then we thought before. We can analyse these preparations-streams in time and in actions by using logic diagrams.



Considering all these aspects in project-management in a systematic way, we find the following matrix-model:

|   |                          | a                  | b                 | c                   |
|---|--------------------------|--------------------|-------------------|---------------------|
|   |                          | PROJECT MANAGEMENT | PROGRAMMING       | ECONOMY             |
| A | OVERALL PROJECT          | Aa                 | Ab                | Ac                  |
|   |                          | OVERALL - PLAN     | PROJECT-BUDGET    | PROJECT-DESIGN      |
| B | PREPARATIONS BY PARTNERS | Ba                 | Bb                | Bc                  |
|   |                          | MASTER-PLANS       | COST-CALCULATIONS | DETAILED-DESIGNS    |
| C | WORK PARTNERS            | Ca                 | Cb                | Cc                  |
|   |                          | WORK-PLANS         | COST-CONTROL      | EXECUTION DETAILING |
| D | TASKS PARTNERS           | Da                 | Db                | Dc                  |
|   |                          | WORK-SCHEDULES     | COST-EVALUATION   | PRODUCTION          |

We will take a look at the different squares of this matrix and will find:

- A: overall project: Aa: overall planning: 1. complete investment plan, 2. selection of partners
- Ab: project budget: 1. framework, 2. calculation of admissible investments, 3. calculations of maintenance costs
- Ac: project design: 1. design inputs, 2. starting points of functional design.
- B: preparations by partners: Ba: master plans: 1. preparation time, 2. building time, 3. material management
- Bb: cost calculations: 1. estimations, 2. specifications, 3. cost analysis, 4. working standards, 5. purchasing
- Bc: detailed designs: 1. motivation+decision of building methods, 2. motivation+decision of building sequences, 3. coordination design work

- C: work by partners: Ca: work-plans: 1. planning & organization of work by each partner, 2. work preparations for longer periods
- Cb: cost control: 1. financial reports of work and parts of the work, 2. budget comparison
- Cc: execution-detailing: 1. mobilising, man, materials, equipment, sites, transports, 2. safety
- D: Tasks by partners: Da: work schedules: 1. taskplanning for short periods, 2. program-control, 3. work instructions.
- Db: cost evaluations: 1. evaluation of execution costs, 2. registration of problems, 3. feed back of experiences
- Dc: production: 1. time, 2. quality, 3. safety, 4. acceptance

When at last, we bring this all into Construction Management, we can think of another matrix model, where we find in the matrix squares:

- for the company: the technical, the economical and the social aims
- for the project: the planning, the feasibility and way of cooperation
- for the work: the work-execution, the building economy and the guidance of men
- for the tasks: the execution of tasks, the costs and the personnel support.

|                         |             |                    |                  |                    |
|-------------------------|-------------|--------------------|------------------|--------------------|
| CONSTRUCTION MANAGEMENT |             | a                  | b                | c                  |
|                         |             | TECHNOLOGY         | ECONOMY          | SOCIAL             |
| A                       | THE COMPANY | Aa                 | Ab               | Ac                 |
|                         |             | TECHNOLOGICAL AIMS | ECONOMICAL AIMS  | SOCIAL AIMS        |
| B                       | THE PROJECT | Ba                 | Bb               | Bc                 |
|                         |             | PLANNING           | FEASIBILITY      | WAY OF COÖPERATION |
| C                       | THE WORK    | Ca                 | Cb               | Cc                 |
|                         |             | WORK EXECUTION     | BUILDING ECONOMY | GUIDANCE OF MEN    |
| D                       | THE TASKS   | Da                 | Db               | Dc                 |
|                         |             | EXECUTION OF TASKS | COSTS            | PERSONNEL SUPPORT  |



And each of these squares can be filled with subjects to be studied, to be reckoned with, to be known, to be controled, to be done.

For the company this means:

technological aims: 1. research, 2. development, 3. quality, 4. products, 5. safety

economical aims: 1. budgetting, 2. accounting, 3. reporting 4. administration, 4. financing

social aims: 1. personnel organization, 2. function classification, 3. personnel judgement, 4. renumeration, 5. training

for the projects in such a Company we define:

planning: 1. project preparation, 2. construction methods, 3. material choices

feasibility: 1. cost calculation, 2. investments, 3. exploitation costs, 4. proceeds, 5. purchasing

cooperation: 1. discussion techniques, 2. reporting techniques, 3. choice of partners

In the field of the projects itself we find:

work-execution: 1. work organization, 2. task division, 3. detailed planning

building economy: 1. standards, 2. site preparation, 3. purchasing, 4. sub contracting

guidance of men: 1. labour, 2. work consultation, 3. complaints, 4. safety

And for the tasks we find:

execution: 1. tasks-execution, 2. material supply, 3. use of equipment, 4. tasks-evaluation

costs: 1. man-hours, 2. merits, 3. production, 4. cost evaluation

personnel support: 1. task instruction, 2. personal protection, 3. evaluation of working conditions

Education in Construction Management means training in most of these subjects.