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### **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 detailled 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.

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

		а	b	С
PROJECT MANAGEMENT		PROGRAMMING	ECONOMY	TECHNOLOGY
A		Aa	Ab	Ac
	OVERALL PROJECT	OVERALL - PLAN	PROJECT- BUDGET	PROJECT- DESIGN
В		Ва	Bb	Вс
	PREPARATIONS BY PARTNERS	MASTER - PLANS	COST- CALCULA- TIONS	DET/JILED - DESIGNS
C		Ca	Cb	Сс
	WORK PARTNERS	WORK- PLANS	COST- CONTROL	EXECUTION DETAILING
D		Da	Db	Dc
	TASKS PARTNERS	WORK - SCEDULES	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: <u>project budget</u>: 1. framework, 2. calculation of admissible investments, 3. calculations of maintenance costs

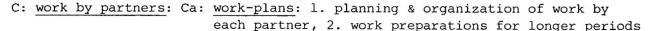
Ac: <u>project design</u>: 1. design inputs, 2. starting points of functional design.

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

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Cb: cost control: 1. financial reports of work and parts of the work, 2. budget comparison

D: <u>Tasks by partners</u>: Da: <u>work schedules</u>: 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 patrix 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.

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•		a	b	С
CONSTRUC- TION MANAGEMENT		TECHNOLOGY	ECONOMY	SOCIAL
Α		Aa	Ab	Ac
	THE COMPANY	TECHNOLO- GICAL AIMS	ECONOMICAL AIMS	SOCIAL AIMS
В		Ba	Bb	Вс
	THE PROJECT	PLANNING	FEASIBILITY	WAY OF COÖPERATION
С		Ca	Cb	Cc
	THE WORK	WORK EXECUTION	BUILDING ECONOMY	GUIDANCE OF MEN
D		Da	Db	Dc
	THE TASKS	EXECUTION OF TASKS	COSTS	PERSONNEL SUPPORT



And each of these squares can be filled with subjects to be studied, to be reckened with, to be known, to be controlled, 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

<u>social aims</u>: 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.