

Improved Interface Management Saves Costs

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Many water-management projects are distinguished by a high degree of complexity resulting from statutory regulations and the wide variety of EMSR and IT solutions available. This means that operators, planners, construction companies and suppliers of technical equipment are encountering an increasing number of hitherto unknown obstacles in the areas of technical expertise and project management.

An important factor in handling complex projects is the constantly increasing number of interfaces. As many as 15 different specialist companies (each with several specialists of its own) may be involved in the construction of a sewage-treatment plant. In order to deal effectively with the many different problems, the main contractor often has to commission external specialist engineers.

Projects which are put out to tender often require the creation of interfaces since the work required is often divided into separate areas and orders placed for a number of independent projects. In many cases, the companies receiving these orders do not know exactly what products and services are being supplied by the other companies, so the delimitation of these products and services as well as the functional interfaces often vary considerably. This may produce unforeseen problems in managing the project.

The cross-section technology of automation and process control, for example, contains all the processing, measuring and electro-technical components involved in a treatment plant. However, it is often included in one all-inclusive tender for electrical technology even though sound knowledge and experience in the fields of process and machine technology are also necessary. In many cases, the persons managing the projects do not possess expertise in these different fields which means that the various specialists often have to spend much time in discussions until they have a programming specification which fulfils all the requirements.

Interactions

In order to handle complex projects such as the building of large sewage-treatment plants, external project controllers are often used who operate with strict management of costs and construction times. In order to coordinate the different services they have to create a uniform level of communication for the various specialist companies participating.

Avoidable problems often occur because the classical technical approach is based on a linear structure. For a task A there is a solution B which is achieved by method C. When task A is resolved by solution B via the method C, method C may have a direct effect on A. For example a certain substance may have to be removed from waste water (task A) by means of membrane technology (method C). This method may however produce a residue, thereby creating a new task (D) which may in turn affect solution B. In a dynamic system, all the variables (task, solution methods, personnel, money, regulations etc.) are inter-related and affect one another.

In order to understand the complexity involved, specialist fields with their own groups of experts came into being. Knowledge of a more wide-ranging general type was no longer required. For this reason, important interactions were neglected and only became apparent when the various specialist components were assembled into a whole and "unforeseen events" occurred in the construction process.



Understanding the overall process

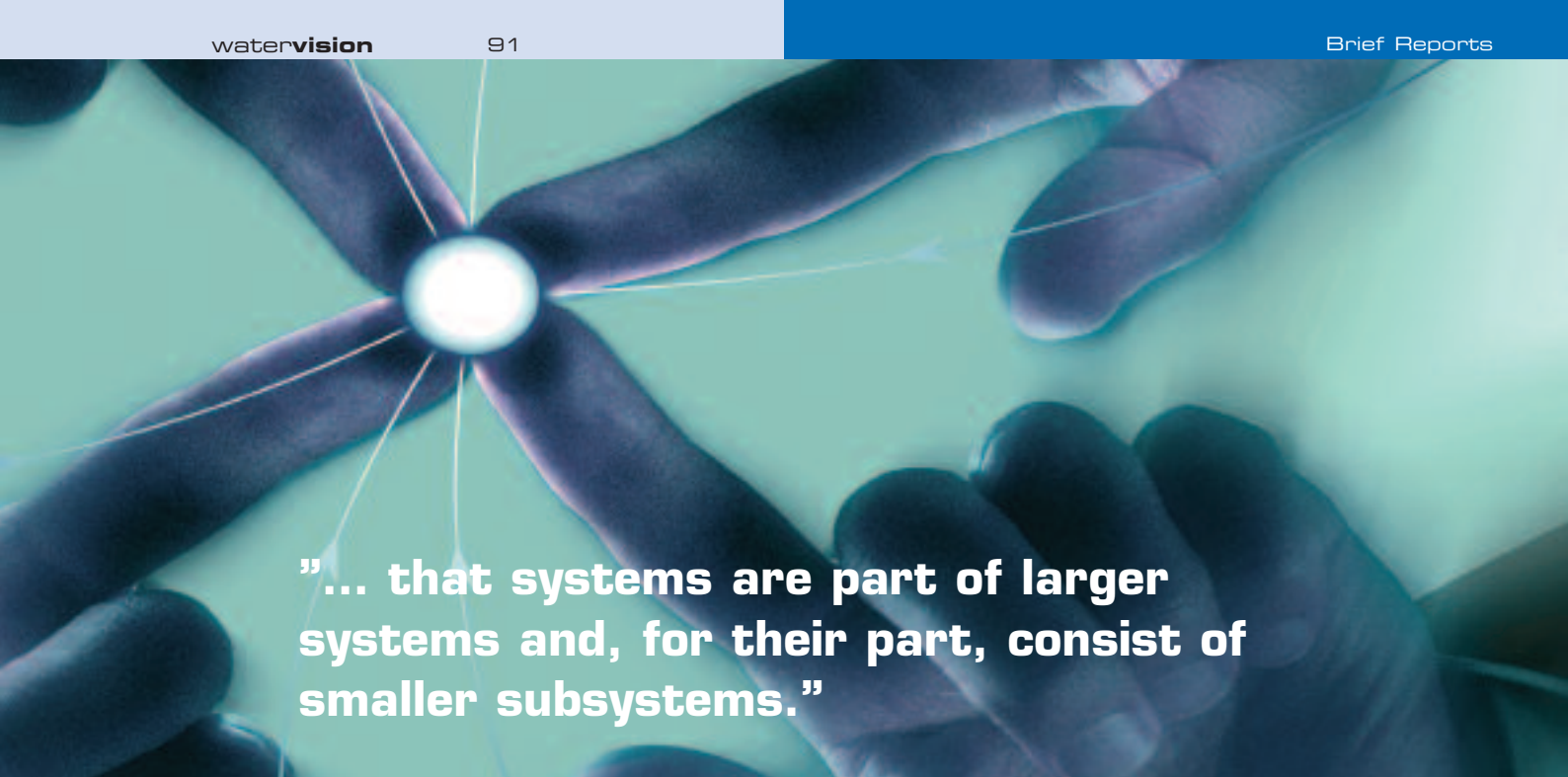
Cybernetic research shows that all projects have a systemic character rather than a linear structure. A definition describing the actual circumstances of a project, is based on the functioning of natural self-regulating systems. O'Connor and McDermott make the following observation:

"A system is a unit which maintains its existence and its overall function through the interaction of its parts. The behaviour of different systems depends on the linking of their parts, not so much on the quality of these parts."

Technically minded people tend to consider the quality and characteristics of parts whereas O'Connor and McDermott regard the most important factors as existing in the links between the various parts, i.e. in the interfaces. In their view, "systems are constituents of larger systems and themselves consist of smaller sub-systems."

Indeed, on closer scrutiny, there is no project which can be regarded as a completely self-contained system.

In many specialist areas, these interactions are still not understood and as a result, are not detected in time or are accepted as being unavoidable. For this reason, customers, planners and suppliers of technical equipment must re-acquire a certain understanding of processes as a whole. In



”... that systems are part of larger systems and, for their part, consist of smaller subsystems.”

the field of municipal water management, there has still been no discussion of this approach even though the systemic character of every project is more than evident.

Reduction of Interfaces

Where customers are aware of the dynamic behaviour of larger projects, they have two possibilities: (see right)

The idea of engaging a main contractor is often prompted by the necessity of reducing the number of interfaces due to the involvement of many different companies in a project. However, in many cases, this good idea consists solely in placing the technical and commercial organisation in the hands of one person or company without taking complex project procedures into account.

With this in mind, the companies of the HST Group have specialised in the improvement of interfaces in communal water management. HST possesses expertise and experience in areas such as machine and process technology, electro-technology, automation, process-control including software development, works and finance management in the fields of water supply, rainwater and sewage treatment and waste-disposal technology, all of which are covered by its own employees. Due to their special abilities in the fields of know-how and communication, so-called generalists operate as internal interface managers. An inter-disciplinary team, whose members “speak a single language”, is formed for every project. The experience gained by

1. The customer can control those involved in a complex project by means of an overriding project controller. The extent to which the interrelationships are appreciated and their effects limited, depends on the quality of the project controller. The effective management of complex projects requires leadership, not control.
2. The customer can reduce the number of interfaces, thereby avoiding costly interface management, e.g. by engaging a main contractor.

which can only be achieved at increased cost. This highly qualified service should be included as an essential item in technical tenders for more complex projects.

HST in carrying out many highly complex turnkey projects, is put to good use in achieving fast, smooth and economical implementation of the project in hand. All the main specialist fields with their own staffs are united under one roof. HST thinks in projects, not in departments. By nature, departments are “parts” i.e. fragmented in structure, and require interfaces to function as a unit.

For the customer, this has the important effect of reducing his own interfaces due to the interdisciplinary know-how and internal interface management of the system supplier. Interface management is effective project management of a higher order