

# **The Wuppertal Generic Management System Concept – an approach concerning requirement related design of enterprises**

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## **Abstract**

The complexity of the global economic processes has increased enormously and the demands of different stakeholders on practicable management systems have increased as well. Tasks and demands are more and more complex and the boundaries of systems expand. The problem is to combine different demands and different management systems and to create a method which can be handled easily.

## **Purpose**

This paper offers an approach how to join different demands and requirements of different stakeholders by just one management system. This concept is called the WGMC – the Wuppertal Generic Management Concept.

## **Methodology**

This concept is based on the hypothesis that an enterprise needs one all-embracing, holistic management concept. We developed a new methodology. It offers the opportunity to realize and verify an effective solution of the described problems.

## **Research Limitation**

The theoretical approach of the generic management concept is based on a module structure. These modules have to be defined and described. A lot of research work has already been done, but there are still fields of research to continue. It has to be mentioned that this approach needs more research work to develop a practicable and easy to handle tool.

## **Originality/Value of paper**

The theoretical approach of the Wuppertal Generic Management Concept leads to a dynamic and sustainable management concept. It presents a real-time operating system. It is a holistic and ubiquitous concept.

**Keywords:** systems engineering, sustainable, generic concept, holistic

**Category:** Research Paper

## **Introduction and Purpose**

The world today is ruled by global requirements, demands and availabilities. Tasks and demands become more and more complex. The boundaries of the different systems expand and it becomes more complicated and complex to define them. The number of stakeholders has drastically increased, too. So the mutual dependences and interdependences between different requirements on products and enterprises are huge and complex.

The enterprises need instruments which enable them to determine the variety of requirements systematically and to fulfil these requirements. The problem itself -to identify the requirements before the task of generating a product is defined- is not new at all. But the not just the number of requirements have increased, the requirements themselves have changed and enterprises nowadays have to listen to all requirements they have to fulfil all of them (Erlenspiel, 1995; Seghezzi, 1997; Bleicher, 2001). The structure and design of enterprises have to meet the requirements, and the generic philosophy can offer an approach of solution.

### **Methodology**

The generic management philosophy is based on the systems engineering approach (Winzer, 2004). Systems engineering itself is a well known discipline offering possibilities to develop systematic problem solutions (Arlt 1999). The methodology is based on the systems philosophy. Everything surrounding us even including us can be described by a system, having system boundaries on the one hand and dependencies and interdependencies on the other hand. This means that the approach is a general holistic method of system based thinking and that it is ubiquitous suitable.

Haberfellner (1994) has already shown that it is not necessary to find a specific problem solution for each specific problem. His holistic approach is established on two parts: a thinking model, which has to be developed, and an operating method, which is derived from the thinking model.

The thinking model, the system approach comprehends the system with all its elements, dependencies, interdependencies, and its organization as a structure. The operating model describes the principles of design and the general methods of conversion and realization.

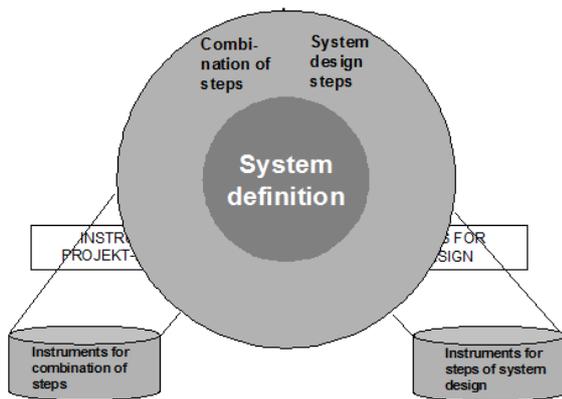
This basic approach provides a basis for describing a complex world out of requirements and processes. But the point of view on this complex system seems to be comparatively static. To take as an example: the description and definition of problems is a static input into the system. This input is conclusive and definite and it will not be changed during the process of problem solution. Requirements, demands and problems themselves are dynamic and need a dynamic model. Therefore the Wuppertal Generic Management Concept was developed.

### **Generic System Concept**

Sitte/Winzer (2004) have modified the approach of Haberfellner (1994). This modified approach sticks to the same thinking model as Haberfellner, but a new operating model has been developed. The approach of Sitte/Winzer consists of three parts. Part one includes the description of the system, part two comprehends the steps of the system design, and part three contains the combination of steps of the system design.

After a focusing of interests the first step is to identify the system at which the problem could be accumulated; this step is not depending on the specific details of the problem – this is a contradiction to the approach of Haberfellner. The system has to be characterized and defined. The impact of the different steps is shown in figure 1.

Figure 1: System-Engineering-Approach by Sitte/Winzer (2004)



This first step includes the characteristics of the system, its classification in subsystems and elements, its hierarchy, the dependencies and interdependencies between subsystems and elements and as well between system and environment.

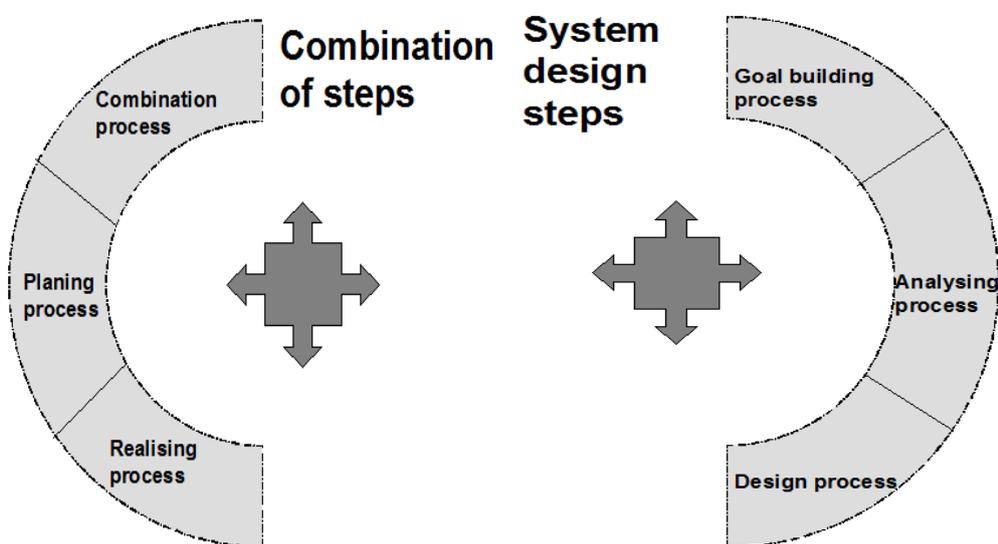
The next step is to describe the system design. The system design includes the process of goal definition, the process of analysis and the process of design.

First of all the demands and requirements have to be collected as a goal definition.

In the frame of the known system boundaries the demands and requirements have to be clustered to be able to evaluate and to minimize them. This is the process of analysis.

Having the knowledge about dependencies and interdependencies between subsystems and elements an efficient design concerning the goal definition can be done. Figure 2 shows the systematic of system design steps and combination of steps.

Figure 2: Systematic of System Design Steps and Combination of steps



At this point the third step of the generic systems engineering concept starts: the combination of the so far existing steps.

In the context of a planning process the combination of the steps of the system design is carried out to realize an efficient and reality close problem solution.

This procedure is dynamic because it is on the one hand based on first existing results out of step two concerning to the problem description and on the other hand it can take new requirements and demands into account (see figure 2). The figure seems to show a linear process, but the process itself is comparable to a goal orientated 'random generator'. This means

that the choosing of a method or an approach is not defined rigorously but it attends to the specific conditions and circumstances of the problem.

While the selection of methods and benchmarks in the system design steps aimed to find a problem oriented solution the third steps includes such questions like: In which order different methods should be combined or which resources are needed and offered or which controlling and monitoring instruments are necessary.

As a conclusion of the generic systems engineering concept -including the three main components of system definition, system design and combination or arrangement of system design steps- offers a general and ubiquitous way to find a problem solution. At the same time the operating model –including the phases of system design on the one hand and combination or arrangement of design steps on the other hand- offers the potential to work out problem specific methods and approaches.

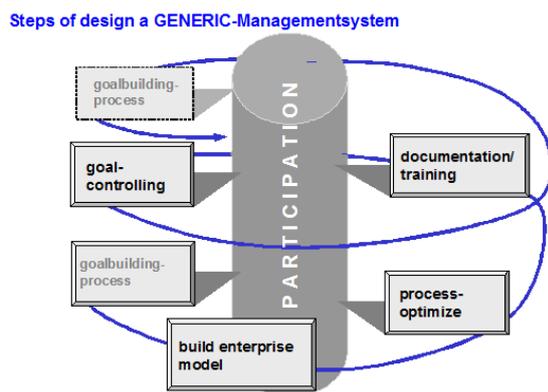
Accordingly this ubiquitous approach leads to an orientation on the essential questions. The individual solutions start at step three when searching for an arrangement and a combination of design steps for a detailed specific problem.

### Generic Management Concept

In everyday life enterprises have to solve many problems being quite complex. The reality never offers just one problem. Nevertheless the generic systems engineering concept can be used to get one system as a thinking model and one operating model. The operating model includes goal orientation, analysis and design. These components of the operating model are typical and general for management concepts.

Concerning the systems engineering approach an enterprise can be considered as a system. The system design in an enterprise is a permanent dynamic task. The generic management system philosophy offers the chance to produce a demands and requirements oriented design of enterprises. This management system is sustainable. Figure 3 shows the combination and sequence of phases and steps to implement the generic management concept into an enterprise (Sitte/Winzer 2004).

Figure 3: Steps of Design according to Sitte/Winzer 2004



This process of design has to go along with the high grade of quality meaning the high grade of compliance with the requirements. The definition of quality in general is the definition of the grade of compliance with the requirements. To get a high grade of quality requests the determination and identification of requirements and demands. If requirements and demands are not determined, they will not be achieved and fulfilled. This leads to a quality deficit.

The diversity, plurality and variety of requirements and demands in enterprises is increasing. Standards to handle and cope with these requirements and demands have been developed like DIN EN ISO 9000/2000ff or DIN EN ISO 14000 ff.

When implementing the generic management method into an enterprise the first step is analogue to the description being given at the generic systems engineering concept: to focus on the system. This means to define whether the enterprise itself, a part of the enterprise or even the enterprise network should be involved in the process of design.

The second step is the definition of goals. Therefore the requirements and demands have to be archived and identified, they have to be clustered, evaluated and benchmarked. This leads to enterprise specific goal definitions.

The next step is a rough analysis to check up on the description of the organization of the operating sequence and design of the enterprise. The description of the subsystems and their dependencies and interdependencies has to be proven.

If there exists any insufficiency a basic model of the characteristics of the enterprise has to be developed. Therefore all subsystems and all dependencies and interdependencies of the system have to be comprehended.

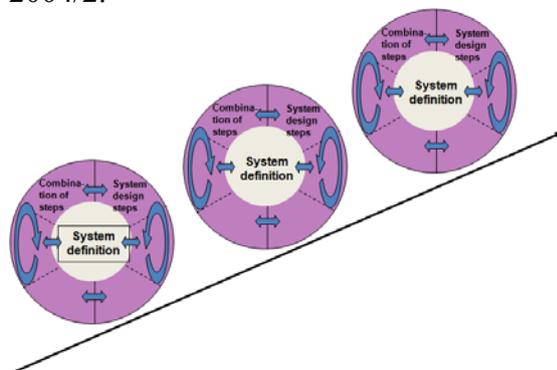
This basic model is essential to do a deeper analysis concerning different subsystems in further steps to work out the grade of compliance with requirements and demands and to develop measures to get better compliance.

When the step of system design of enterprise is finished the results have to be documented (see figure 4), this is known as management system documentation. This documentation is essential to visualize the different kinds and ways of dependencies and interdependencies.

The following step of the shown spiral, which is like a formed mat, is the goal controlling; the status of goal compliance is proven again, new requirements and demands can be established and there grade of compliance can be checked.

This leads to a holistic process of controlling which guarantees the sustainable development of the enterprise. This general method of systems engineering is flexible in itself and offers the opportunity of a dynamic development. This coherence is shown in figure 4.

Figure 4: Dynamic of Generic Systems Engineering Concept according to Sitte/Winzer 2004/2.



This dynamic approach out of the systems engineering can be transferred to the method of a generic management system in general. Just enterprises which offer a dynamic establishing and compliance of requirements and demands will have a sustainable development and be successful at the world-wide market.

To summarize the results so far, it has been explained and illustrated that the generic management system concept as a method pursues the goal to systematize the process of enterprising with its holistic components and to combine it with an accordant management system. Therefore the total quality management concept is a part, a subset of the generic management concept.

## Results of the Wuppertal Generic Management Concept

To make the application of the generic management system more obvious this chapter offers a description of the different modules of the concept.

The concept is based on planning, realization, controlling and advancement; those are the pillars of all management concepts. But the Wuppertal generic management concept additionally is an open, dynamic and requirement and demand oriented system based on a holistic process oriented design concept.

The model of this ubiquitous management concept is modular. Actually it is based on seven modules (Scharn 2007).

Figure 5 shows the system model of the Wuppertal Generic Management Concept with its seven modules.

Figure 5: 7 Modules

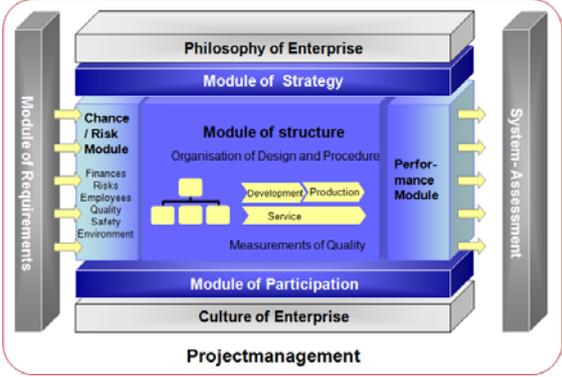


Table 1 lists up the different modules and their tasks according to Scharn 2007.

Table 1: Seven Modules of WGMC

| Module                      | Task   |
|-----------------------------|--|
| Module of Requirements      | gathering, systematization and evaluation of all requirements  |
| Module of Chance and Risk   | the requirements are valued to identify and quantify fields standardized risks                         |
| Module of Strategy          | a complete process of strategy is passed through to gather the strategic orientation of the enterprise |
| Module of Structure         | systematized requirements are transformed into reality   |
| Module of Participation     | process of changing designed as a win-win situation  |
| Module of Performance       | measuring the efficiency of processes and organization   |
| Module of System Assessment |  |

continuous controlling of a requirement oriented design of processes

To verify the WGMC in enterprises the common methods of project management are used. The deeper development of the different modules is the topic of many doctoral theses. The thesis of Reiche 2007/2 deals with the module of participation to cope with modifications. Some of the most interesting results are presented in this chapter, too.

The module of participations is based on the estimation of barriers and essential fields of activity. The four parameters 'knowledge, ability, volition, and permission' are gathered by twelve participation factors, by using a questionnaire. The three levels of employees, management and enterprise are taken into account to analyze the barriers of participation.

Figure 7 Module of Participation concerning to Scharn 2007



This module of participation offers a consistent process to deal with various changes. The different steps of this process consist in the determination of the actual status, in the definition of goals, in deducing the future state, up to the selection and use of appropriate methods and tools.

Last step is the evaluation of the whole process.

### Conclusions and limitations of research

The Wuppertal Generic Management Concept is a theoretical approach to build up a sustainable management concept which is dynamic and presents a real-time operating system. Explained by specific problems out of the reality of enterprises it shows its holistic und ubiquitous concept.

It has to be mentioned that this approach needs more research work to develop a practicable and easy to handle tool.

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