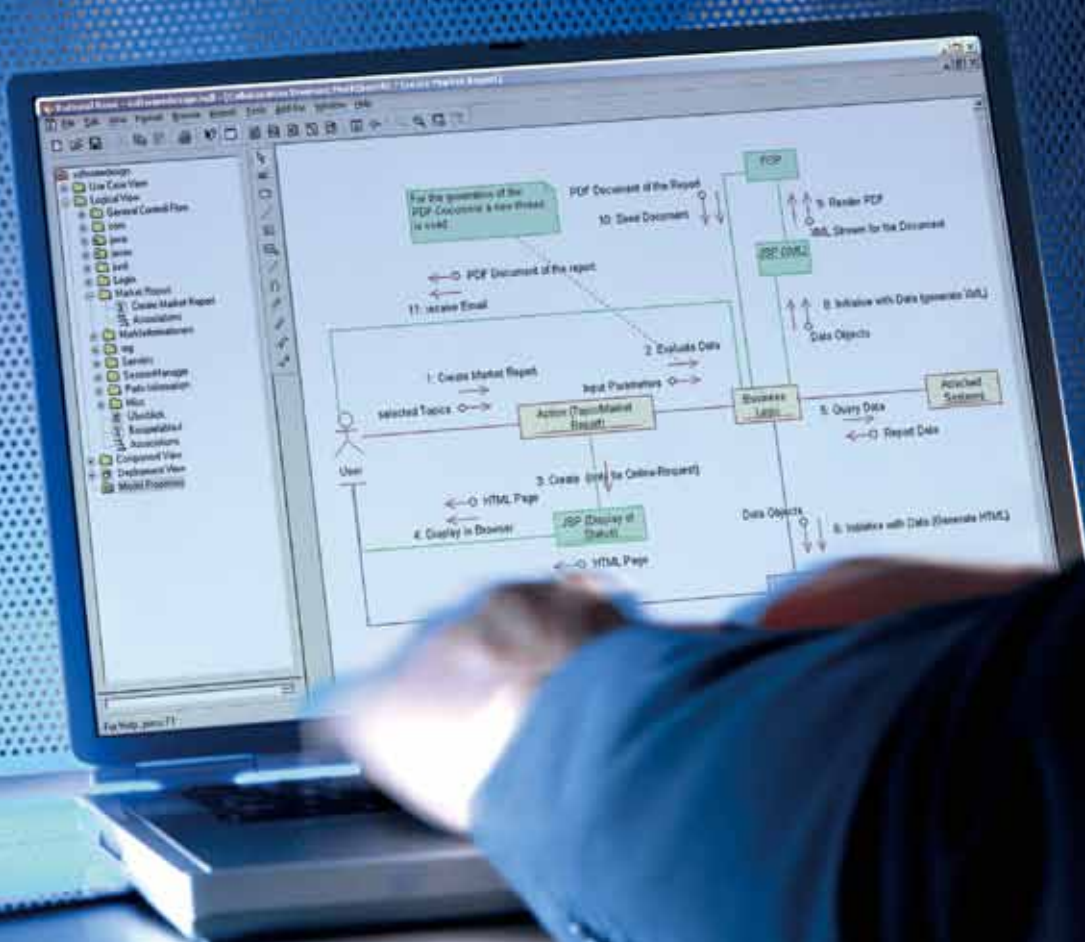


Automotive System and Software Development



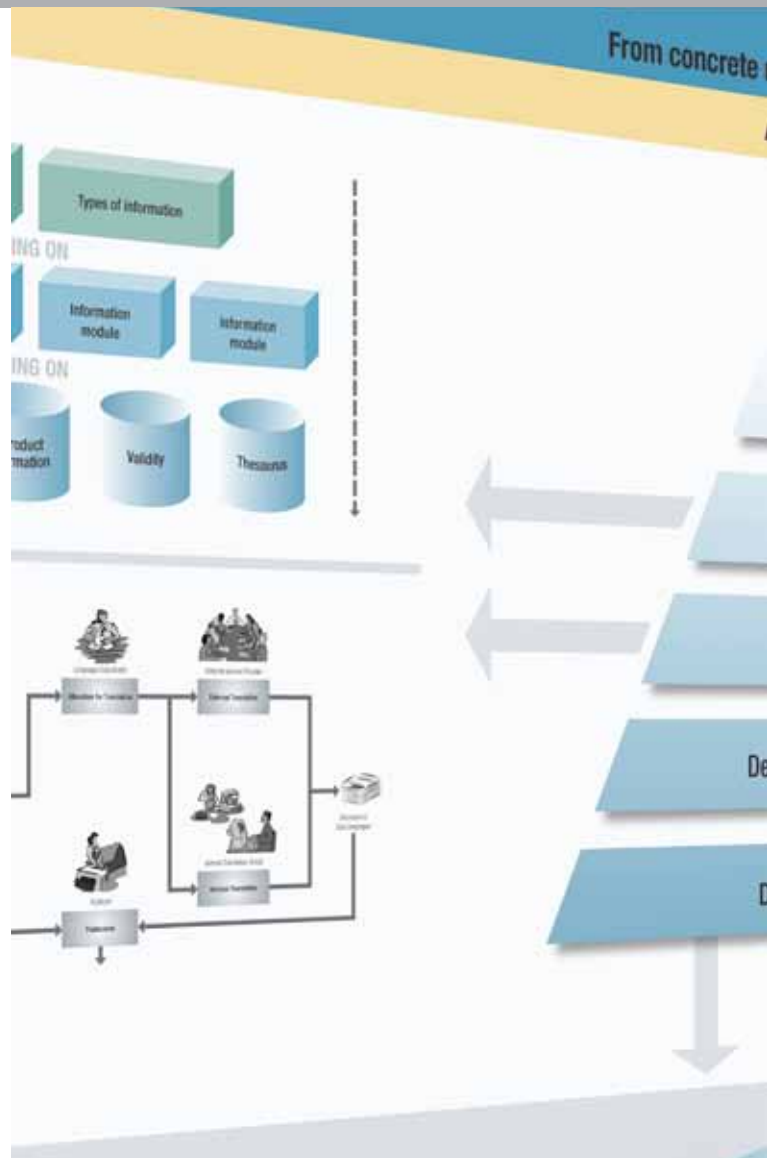
ESG – Partnership – System Competence – Progress

For over forty years ESG has been one of the leading German companies active in the development, integration and operation of electronic and IT systems. As an independent technology and process partner we provide system development, logistics, training and consultancy services for military, governmental and industrial customers. We provide fully qualified services in the areas of aircraft, land-based vehicles and ships, IT and communication, logistics, telecommunications, transportation and traffic as well as consumer goods, capital goods and automobiles.

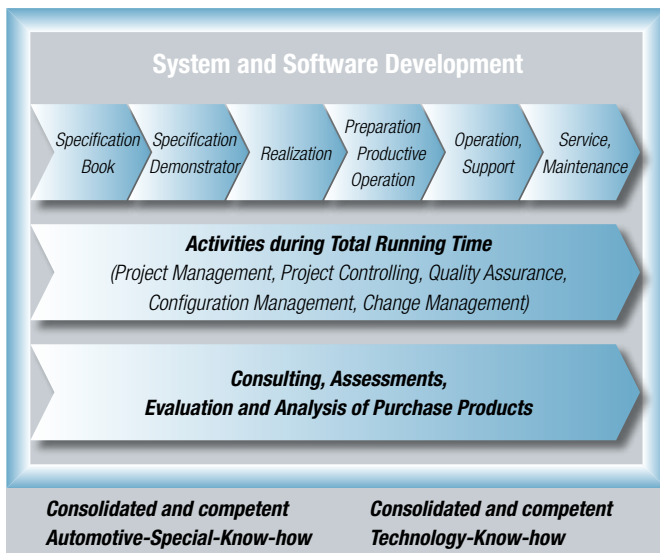
By taking a holistic approach, ESG makes a significant contribution to our customers' value creation. We improve both the service and operational capabilities plus the availability and supportability of our customers' systems and products. This is achieved by our high level of system and software competence, competent consulting, innovative solutions and services, and by systematic process integration. Our professional approach, with our experience over many decades and our up-to-date methods will ensure the success of your project.

Philosophy

Our attention is not only focussed on technology, but on the benefits to our customers. Together with our customers, we develop individually tailored system and software solutions that support their business processes and procedures.



ESG'S COMPETENCES



OUR SERVICES

During each step in development we take an individual approach aimed at achieving both smooth integration, and a solution of the maximum efficiency. Where appropriate, this is achieved by use of standard software available on the market (COTS – Commercial Off-The-Shelf).

- ▶ **Requirements Specification:** The creation of the requirements specification is the basis for every tender. We conduct an analysis of the current status, and define both the business processes and the system technical requirements and interfaces.
- ▶ **Specification:** The specification is the basis for the implementation of the system. The first step is the analysis and specification of the business processes and the system technical requirements. Further, the functionalities, architectures, data models and workflows, for instance, are described and refined. The demonstration of the essential requirements by means of a demonstrator can be used to visualize the total project.
- ▶ **Implementation:** The implementation is performed in accordance with the requirements of the specification. Interim versions support the implementation and system integration during the development process.



OUR SERVICES

- ▶ *Preparation / Productive Operation:* Before the system starts productive operation, the old data are migrated, and an extensive rollout and training concept is defined.
- ▶ *Operation, Support / Service, Maintenance:* The continuous operation of the system, with accompanying comprehensive support, service and maintenance will achieve optimum availability.

In parallel with the development, the following activities are performed during the project:

- ▶ Project Management
- ▶ Project Controlling
- ▶ Quality Management
- ▶ Configuration Management
- ▶ Change Management

Our consultants will draw on their specialist knowledge to provide support during each step of the development cycle, with the prime aim of identifying potential for improvement.

FROM CONCRETE REQUIREMENTS TO AN INNOVATIVE SYSTEM

Our innovative system and software solutions are never an end in themselves, but are aimed at meeting the real requirements of the customer. Starting with these requirements, the basic foundations and concepts are established, including determining the data granularity, the rules for reusability, validity criteria, terminology, and much more. All these specifications form the basis of the future system solution. From this, the business processes and the workflow are determined, and functions are defined. Finally, the requirements and processes are implemented in an IT-Architecture. The prime aim of all system implementation is always the customer's benefit, as reflected in real cost reductions and quality and process improvements.



V-MODELL XT®

A key standard used by ESG for the development of systems and software is the V-Model XT® (XT = Extreme Tailoring). This model represents the further development of V-Model 97, enhanced by the inclusion of agile and incremental approaches to software development, and by the closer integration of the customer in the total process.

The advantages of standardized, structured development of software systems are clear:

- ▶ Minimizing project risks
- ▶ Quality improvement and assurance
- ▶ Minimizing total costs throughout the project and life-cycle
- ▶ Optimising communication between all participants

QUALITY ASSURANCE MODELS

In addition to the V-Model XT®, ESG also possesses extensive know-how in the particular software development models and procedures of leading motor vehicle manufacturers and suppliers.

ESG became involved early in the fields of quality assurance models and standards. Examples include the Capability Maturity Model (CMM), its extended version, the Capability Maturity Model Integrated (CMMI), and SPICE (Software Process Improvement and Capability Determination).

We apply our practical experience with these models in performing both assessments and process consultation. Staff knowledge transfer is a key feature in achieving continuing success and the establishment of quality improvement processes in the company: we support this by proven classroom and on-the-job training.



Professional Software Engineering as the Basis of Project Success

For over 40 years, the development of complex software solutions has been one of the strengths of ESG. As well as specialised and technical know-how, the standardised development of software systems is an essential key for the success of a project. An essential factor in this is the systematic application of principles, methods and tools. Here, you can trust ESG's specialist knowledge in the selection and application of the required methods and tools.

Innovation Partners

We see ourselves as a creative "blue-skies" thinker for technological and method-driven issues. To live up to this claim, we are investing in in-house research projects, cooperating with universities and institutes as well as taking part in Europe-wide research projects – for example within the field of language technology.

In this context, we have developed TEDOMEX. This is an integrated solution for testing the terminology, language and style of various types of information. It can be used to ensure that different authors all use the same terminology and the same style for the same types of information. In this way, a high quality of documentation may be achieved throughout a company, thus realising a measurable saving.

A second project, "KID-ER", deals with machine-supported intelligent text indexing. By the entry of full text questions, search results are obtained which take into account the context of the question. The hit rate is thus increased and the number of returns reduced. The improvement in the reuse of existing text modules, together with fast and precise research, represent significant advantages in the text creation and retrieval process.

**ESG – YOUR PARTNER FOR SYSTEM AND SOFTWARE DEVELOPMENT
YOUR PARTNER FOR SUCCESS**

- ▶ **Consolidated and technical know-how**
- ▶ **Know-how-transfer and innovation**
- ▶ **Wide experience with regard to conception and realization of system and software solutions**
- ▶ **Professional software engineering**
- ▶ **Detailed knowledge in automobile-after-sales world**
- ▶ **Conceptual design and realisation of integrated systems**
- ▶ **Highly qualified and motivated staff members**

Life-Cycle Management

The development of a system or of an application should always take place in the context of the whole life-cycle. Based on this strategy, the essential factors for the technical and operational success of the system can already be considered during the consultation and conception phase.

Key deciding factors are intensive consulting at the beginning of the project, together with strong project management throughout the whole project duration. As prime contractor for a wide range of military and industrial projects, we have built up extensive experience.

Total project quality is a product of fulfilling the technical requirements, completing successful integration, and also in achieving a high level of user acceptance. In order to ensure this acceptance it is necessary to establish the user's needs during the conception phase with as high a degree of completeness as possible, and also to validate a prototype during this phase. During the development, intermediate versions with defined technical scope, produced at regular intervals, are validated with the future users.

During the whole development, training and rollout, change management is a key feature for the acceptance of the system. With our high competence in training, ESG is able to take these aspects into account early in the process, and to implement them proficiently.



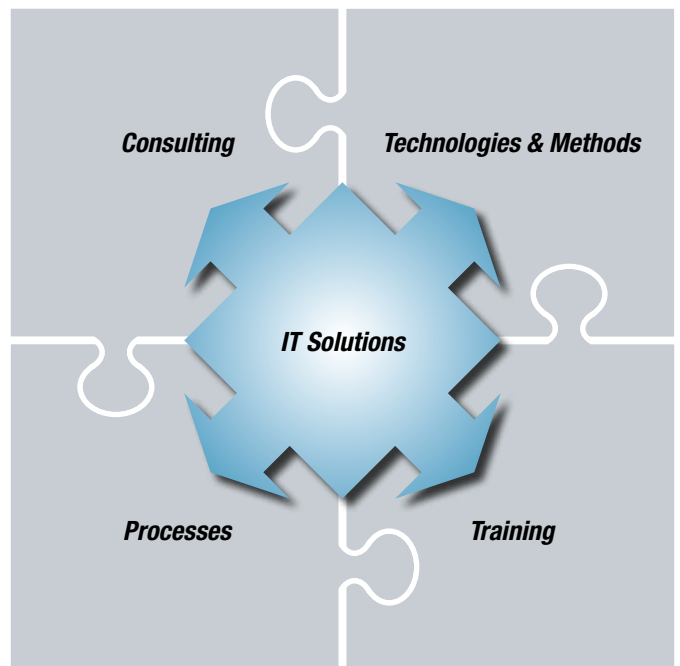
CONSULTING & PROJECT MANAGEMENT

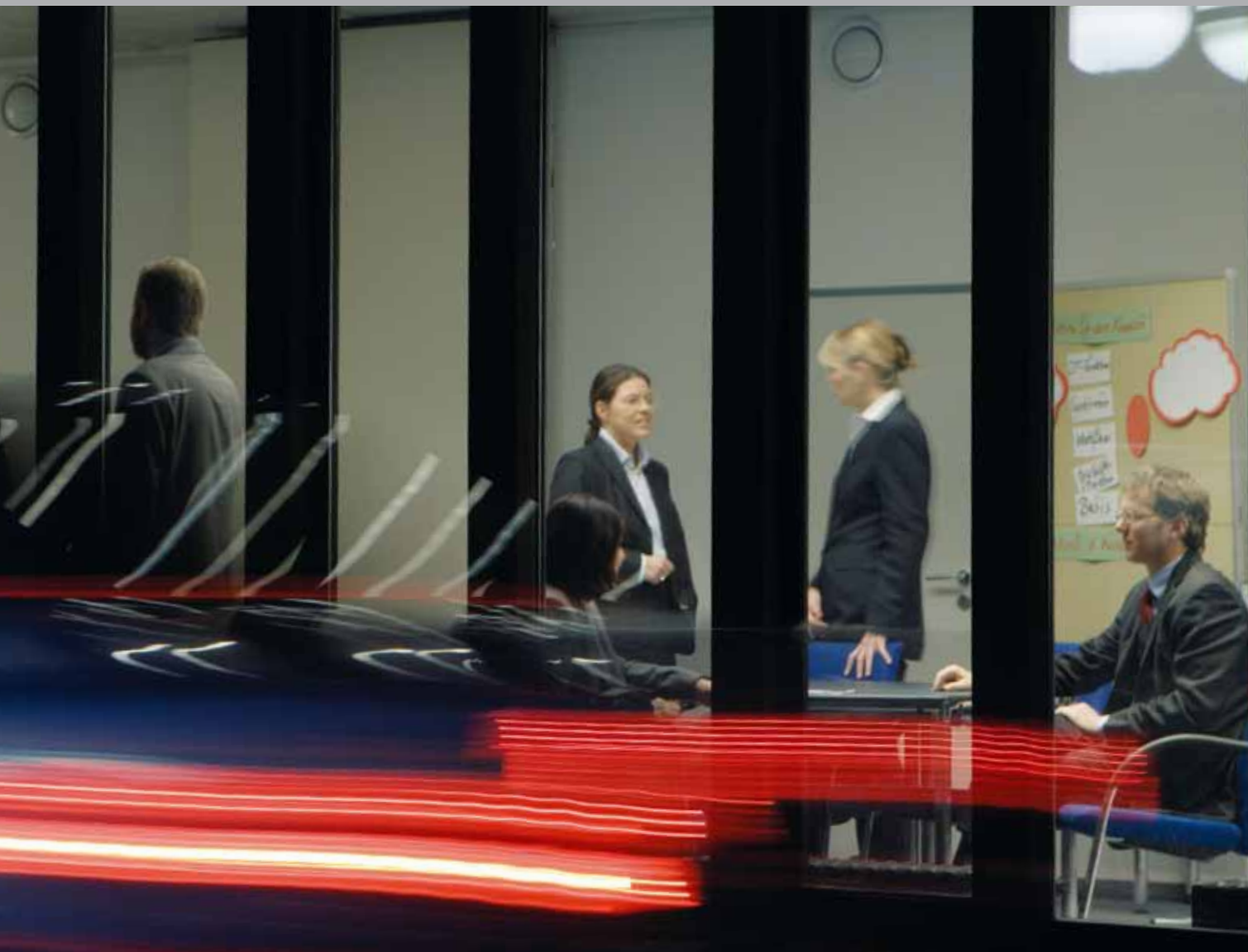
ESG Consulting combines technological know-how with an intensive knowledge of automotive industry business processes. As a competent partner, we can offer comprehensive consultancy in the analysis and optimisation of value-creating processes. Our consultancy capabilities comprise:

- ▶ The evaluation of the potential, maturity, and applicability of new information and communication technologies
- ▶ Feasibility and viability analysis
- ▶ Studies

We develop IT concepts and strategies for the introduction and migration of IT systems: these activities form the basis for application and system development.

In project management, we provide support ranging from project controlling and reporting through risk, test, and configuration management, to quality assurance. We also perform the complete project management, to ensure the safe and efficient execution of the IT-project.





TRAINING

We are specialists in a systematic approach to all aspects of knowledge transfer, from analysis to conception and development through to implementation. Core competences include training and coaching for new products, systems, processes and technologies.

The training concepts we develop with you are tailored to your company and specifically to the relevant target groups, so contributing to the overall success of the company.

Learning Management Systems

As a system and software company, we understand the technical requirements of innovative system solutions: we will provide manufacturer-independent advice for the selection, conception and implementation of learning management systems.

PARTNERSHIP

Partnership with ESG is firmly based on our intensive cooperation with customers over a time span of many years, and our deep understanding of the challenges and solutions of the automobile industry.

Our thorough knowledge of the process landscape within automotive IT equips us ideally for the task of applying interdisciplinary teams to create integrated solutions for complex tasks. We provide individual solutions for virtually every life cycle phase.

Our customers are among others:

- ▶ Audi
- ▶ Blaupunkt
- ▶ BMW
- ▶ DAF
- ▶ DaimlerChrysler
- ▶ Ford
- ▶ PSA
- ▶ VW
- ▶ ZF



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