IT-Solutions with Passion

ITSO
IT solutions

itso.de

We are …

a software development and consulting company, founded in 1983, which is situated in central Berlin.

Our employees are software engineers, who develop high quality and sophisticated solutions. As a spin-off of the Fraunhofer-Gesellschaft, the leading organization for applied research in Germany, we have top contacts in the scientific field which provides our clients with access to IT skills at the highest possible level. We work closely together with the Fraunhofer Institute FIRST, the Fraunhofer ICT Group and the Technische Universität Berlin.

Through this network we have direct contact to the best students, academic staff and researchers. Our employees are hand-picked software engineers who have a strong passion for what they do.

With our extensive experience in practice as well as in research projects we assist businesses and public-sector authorities in almost all aspects of IT business.

Our goal is to create customer-specific information systems of high quality based on innovative system architecture. This includes object- and component-based development methods as well as quality assurance during the development process, beginning from the functional concept to the system implementation and maintenance.

In addition, we also work intensively with software quality assurance, database applications and client-server architectures on Linux and Windows server systems.

In our research we work on knowledge-based methods for requirements determination, because a detailed actual state analysis and an accurate identification of requirements form the basis of software development.

Depending on the project we work both as a full-time contractor for individual software solutions as well as a sub-contractor within our business area. Here we have specialized skills in software testing – from audits/reviews, to testing routines and performance tests.

We stand for …

- excellent and efficient solutions by highly qualified and motivated employees,

- direct communication with developers and professionals,

- independence, flexibility and quick decisions,

- a successful, long-term and financially sound development of our company,

- many years of satisfied customers and cooperative relationships.

We see ourselves …

- as engineers with traditional engineering virtues, also in the use of software,

- as a reliable supplier of individual software solutions – in time and in budget,

- as a continuous guarantor of quality solutions in the field of quality assurance, testing and auditing,

- as a innovative user of the latest techno- logy from science and research,

- as a experienced and reliable partner for our clients.

We are your system architects …

Defining the tasks

Our extensive range of services include:

- Software development
  - of client / server applications,
  - of large, complex database applications,
  - for safety-critical areas,
  - for cluster and grid computing, parallelization of algorithms and high-availability solutions,
- design of mathematical models and algorithms for advanced statistics, planning and optimization problems and rule-based systems,
- planning and implementation of software testing procedures and code or architecture reviews,
- provision of expert reports and execution of audits,
- design and implementation of multi-resource as well as server and storage environments

The foundation must be right

At the beginning of every development process, there is careful planning and customer advisory service. We build on reliable project management from the project ideas to the problem solutions. The most important factor is that throughout the whole process the needs of our customers are taken into consideration. Therefore we have an individually tailor-made plan for every project:

- Kick-off and requirement analysis together with all project partners

- general functional specification with regard to the economic situation, corporate and competitive aspects
- detailed specification of projects for a solution-oriented system design
- continuous updating of the requirements and regular reviews of the project status

In the process we also take into account the other important areas such as risk analysis, innovation progress as well as organizational and legal development.

The approach is clear

In order to divide a project into manageable phases, which are predetermined in time and content and thus guarantee a more predictable and systematic way of proceeding, we use common process and action models. Process and action models such as the classical V-Model, the Rational Unified Process, the test-driven development or the Extreme Programming are used. Whereas the V-Model is the standard for the IT-development of the public sector, in Germany, the Rational Unified Process is based on use cases and allows a well-structured handling of tasks and responsibilities within a project team. Furthermore the test-driven development reveals software errors at an early stage, whereas Extreme Programming allows short development cycles.

These models are dependent on the project size and customer preferences. They guarantee clarity of the project, improve the coordination of teams and ensure that mistakes are discovered early on in project development.

… and we also provide the software engineers.

Choosing the tools

The question of a suitable choice of applied methods and technologies in the creation of software projects is one that consistently poses itself. The answer is easy for us: through our philosophy of promoting the development and skills of our employees, we continuously build knowledge and experience. Therefore we are able to access a comprehensive portfolio of different methods and technologies at any time:

- **Object-orientated and model-based realization** methods using MDA, Unified Modeling Language, Java, Javascript, C/C ++, C#, .Net, Visual Basic, PL/SQL, Python, PerlPHP, Shellprogramming, …

- **Meta languages** like Extensible Markup Language (XML, XSLT), Hypertext Markup Language (HTML, CSS), ...

- **Operating systems** like Windows, Linux, Unix (HP-UX, Solaris), …

- Relational and object-relational **database systems** (Oracle, MS-SQL, MySQL, MaxDB, SQLite, PostgreSQL, ...)

- **User interfaces** and graphic data processing with Ajax, HTML / CSS, Eclipse SWT, Virtual Reality Modeling Language (VRML), ...

Assuring the quality

In order to meet your requirements regarding safety, security and reliability of a software solution, we place emphasis on effective quality management as well as on systematic test and error management. Among our services we offer the definition and revision of:

- **quality processes** (delivery processes and inspections),

- **quality goals** (software and documentation),

- **constructive quality measurements** (requirements, tools, alterations, conventions),

- **analytical quality measurements** (inspection, reviews, tests).

Cultivate the partnership

What is the use of the best projects, if the chemistry is not right? For us, working hand in hand with our customers is very important. Whether we are developing, researching, working with users, companies, councils or data protection, our customers' needs are most important in our everyday business. Of course, being on time and budget is also of great significance. Only diligent, goal-orientated teamwork guarantees success!

Excellent logistics - AZLN for Deutsche Post

Challenges: Everyday the Deutsche Post AG receives a huge number of stock orders and temporary mail forwarding orders. These are automatically scanned and manually checked. Often the information is not correct or not readable and needs to be rechecked. These processes are very costly and labour-intensive, so that a new solution for a more automated order management was needed. The gedas Deutschland GmbH could, in cooperation with us, convince the Deutsche Post AG with an innovative and future-proof solution.

Solution: Due to the new software which was developed for the order processing centre in Munich, responsible for stocking and forwarding, 10.000 to 25.000 stocking orders, address-changes and correspondence-forwarding can be electronically scanned, processed and administered.

In the first step the forms are scanned and interpreted by a detection and recognition software. The information is automatically checked as far as possible and is constantly compared to the available references. Furthermore a final control takes place on the basis of the control messages coming in from the post offices.

Standard cases with further inquiries such as a missing signature from the customer, are also processed efficiently. Information and change requests from customers, before or during the time the order is being processed, are enabled through location-independent access to the central order database.

Orders that have been processed are then archived to guarantee long-term information availability. Time-critical data exchanges between different centers of the Deutsche Post AG and external service providers are ensured through an own interface service and can operate without any customer interaction.

Our contribution: ITSO specified and developed the entire statistical component of the system. By means of the web-based real-time evaluations, extensive analysis can be done in order to clarify operational issues such as personnel and human resource management.

Even more important was the extensive quality assurance of the software: whether load or functional tests, ITSO was responsible for all tasks from the test strategy, test specification, test execution, monitoring to the final inspection. In order to accomplish this, products from the Rational Suite have been used (Requisite Pro, ClearCase, Clear-Quest Test Manager, XDE Tester, Rose) as well as ITSO's own testing tools.

The AZLN system uses state-of-the-art web and database technologies. It is based on Java and PL/SQL using of J2SE, Struts, Jasper Reports, Tomcat, LDAP and Oracle.

The new software for the order processing centre storing and forwarding of the Deutsche Post AG was developed by the gedas Deutschland GmbH as an integrated and highly automated solution for the central processing of storage and forwarding orders. ITSO has implemented both the evaluations and statistics, as well as having been responsible for the entire quality assurance.

Experience democracy – a visit to the Bundestag*

Challenge: Over the last years, the Bundestag has become a loved attraction for locals and tourists. Since the Bundestag moved to Berlin, more than 13 million people had the pleasure to visit!

The Department for Visitor Services is responsible for looking after the visitors, it offers numerous information events, such as plenary sitting visits and information visits, children's days, art and architectural tours, special tours or a role-playing game entitled "Experiencing Parliamentary Democracy".

The members of the German Parliament also like to invite citizens from their electoral district to come and take a tour of the Parliament. These citizens are of course supervised by staff and experts.

A specialized system is needed for the organization and management of dates, buildings and rooms, restaurants and other resources.

Solution: The system Visite provides users with a clear internet-based graphical user interface for optimal planning and management of a large number of different groups of visitors and event types. Even last-minute changes do not affect the system because it is able to quickly and accurately update information.

The highly complex planning system helps employees in finding, creating, editing and deleting events. Therefore the resources (e.g., places, rooms, grandstand seats, restaurants, dates, times, event types, quotas, MPs, languages etc.) are managed in due consideration of numerous constraints and limitations. Also, flexibility is still guaranteed, as decisions on how to proceed in a specific situation can always be defined by users of the system: on the basis of different levels of authorization, situations such as booking dates for restricted days and rooms, or overbookings can be prevented. However, users who have special authorization can remove these restrictions or undertake overbookings.

The system Visite enables members of the Parliament to do event enquiries and file reservation requests by using special webpages. The solution is based, among other things on Java, JSP, Tomcat and PostgreSQL, as well as Spring, Struts, XML, XSL:FO, CSS, OJB, JDBC, CJDBC, OGNL, Acegi, Jodatime, JUnit and Ant.

* Bundestag – the national Parliament of the Federal Republic of Germany

Our contribution: ITSO took on the software development from the detailed specification to the final software product. Training, software improvements, as well as service and maintenance are also part of ITSO's responsibilities.

While developing the Visite system, special importance was placed on the early and close consultation with the users in order to reach a high level of acceptance and fully meet their the requirements and desires.

Visite is also suitable for other institutions who have high numbers of visitors. For this group of users it is intensely developed further by ITSO.

Within the framework of a two-stage European tender, ITSO was contracted to develop a software program that will assist the Visitor Services Department at the Bundestag. The Visite application intensively supports the Visitor Services Department which has the task to provide information about the parliamentary work to the public.

VISITE

Always on Duty – POLIKS for the Berlin Police Department

Challenge: Until 2005, the city of Berlin has been working for 20 years with an old police information system („Informationssystem Verbrechensbekämpfung") also known as ISVB. With this system the police department used antiquated typewriters and nearly 1,000 partly non-networked computer workstations for working on criminal cases.

All other police functions such as information and traffic accidents were not supported by the ISVB system. Incidents which came from the relevant departments were compiled through many individual steps assembled through a lengthy and complex process. Therefore the city of Berlin decided to develop a new system that encompasses the entire Police incident process.

Solution: With the development of one of the most modern police systems in Germany, the software application, „Polizeiliches Landessystem für Information, Kommunikation und Sachbearbeitung" (POLIKS), a technological platform for nearly 10,000 connected PCs for about 27,000 users was created. POLIKS allows a nationwide workflow management connecting all tasks from all police departments throughout the city of Berlin. It provides the Berlin authorities as well as the federal authorities (e.g. the Federal Motor Transport Authority, or INPOL of the Federal Criminal Police Office) with information from various proceedings via a service interface.

POLIKS was designed for office duties as well as for the use on site. The POLIKS client is embedded into the Windows environment, which most users are familiar to, and works with Microsoft Office software. Approximately seven million old transactions were also migrated to the new police system.

About 20,000 officials were trained with the help of Volkswagen Coaching, the State Police Academy and gedas.

This software solution was developed by gedas Deutschland GmbH which was able to succeed against 30 other competitors with their concept. POLIKS has successfully been in operation since spring 2005.

Our contribution: We have been supporting the POLIKS project since 2001 in various areas such as infrastructure and testing (test planning, execution and test documentation), basic technology, software integration, data management as well as data modeling and system implementation.

With such a large project, not all user demands could be taken into account from the beginning on. Thus change requests are already there and will emerge from time to time. We also support gedas in the further developmental process so that POLIKS continues to stay state-of-the-art-system.

All of our employees involved had to have a security clearance check done in order to work on this project.

The state's police system for information, communication and administration POLIKS was developed by the gedas Deutschland GmbH as the central police incident processing system. ITSO has been supporting gedas in various project areas since 2001: from data modeling to system implementation and further development. ITSO worked as the testfactory for POLIKS.

Measuring quality – QKZ for the BVG

Challenge: Berliner Verkehrsbetriebe (BVG), the public transport authority of Berlin, is the biggest municipal transport authority in Europe. And of course they are facing and adjusting to the even increasing competition.

It is not only the mobility of a wider part of the population that has to be ensured, there are also growing demands for the quality of services that can be observed everywhere.

Therefore, the city of Berlin and the BVG concluded a contract that, among other things, regulates the reporting of the service quality.

Solution: With QKZ (quality key performance indicators) we developed an information and reporting system that allows the BVG to coordinate approximately 2.5 million records daily in terms of punctuality, connections, reliability and security of all subways, buses and trams. The collected data is transferred from the vehicles to a central Oracle database as soon as they arrive at the depot.

Thereby, one of the challenges is to convert the incredibly large amount of data quickly in order to enable the processing of queries efficiently. In order for a simple query to be processed, 1.2 trillion data pairs need to be taken into account in a single quarter. In one year up to 1 billion data sets are created.

Typical questions that could be asked are: How punctual was tram 68 in January 2010?

Approximately 300 BVG employees use a simple web-based user interface to process such queries in only a very few steps.

The user interface is not only very flexible and user-friendly, furthermore it is also context sensitive so that it only offers further selection criteria that fits the beforehand selected criteria. Currently there are more than 100 different analysis options available.

All graphical and tabular reports can be exported and edited in MS-Excel with the standard features of the program. It can also be combined with any information from external sources (e.g. other graphical representation sets can be selected, graphs can be embedded in MS-Powerpoint files).

Our Contribution: ITSO developed the entire system for the BVG, starting from the definition of requirements to the final product. The chosen client-server architecture allows both rapid as well as comfortable evaluations, It is based on Oracle databases operating on PL/SQL, Tomcat and Java on the server-side and on Flash at the client-side.

QKZ was introduced in 2001 and has since been stable and productive in its operation. It is maintained and further developed by us, including its servers. With the later developed system LEA (activity recording and analysis), the existing data have been processed since 2005 using a web-based interface. This data is continuously used for the internal and external cost accounting (e.g. for depots and subcontractors) to analyze and calculate the mileage of the busses. LEA was developed in Java and uses, among others, Tomcat and Struts.

For the BVG, a quality monitoring system was developed which provides many graphical and tabular analyses, from annual overviews to single trips.
A management dashboard for smart-phones supports mobile usage.
With the "Leistungserfassung Omnibus" the BVG has a central web-based system to record, analyze and account transport performances for busses.

A variety of services for our customers

Managing demands

Requirements for software are a special knowledge that needs to be identified, preserved and reused.

The goal of optimized requirements engineering is to identify the customers' needs and expectations regarding the software and to record the information in such a way that assists the communication between clients, future users and the project team. The innovative discipline knowledge management and classical requirements engineering and administration have been combined in the context of KOGITO, a project which is run by the Federal Ministry of Education and Research. KOGITO offers processes, guides and applications for the work with knowledge within the scope of requirements engineering and administration.

Detecting fraud

Together with researchers from the Fraunhofer-Institute FIRST, ITSO conducted a research project for an international auditing company with the goal to detect fraud in the context of auditing. Due to the promising findings the work on this project has been continued since 2002. Fraud detection is a central topic for the Fraunhofer spin-off idalab GmbH which has been overseeing this project since 2004. idalab is a scientifically oriented management consultancy that develops solutions for the analysis of complex data, e.g. for the forecasting of non-linear time series events or high-dimensional classification problems.

Solving resource problems

ITSO developed in cooperation with the Fraunhofer-Institute FIRST a so-called constraint solver for the quick solving of resource problems. In many operational areas there are a lot of resources that are dependent on each other: for example with time, driving, personnel, or production planning or in logistics systems and operational simulations. All resources have capacity restrictions and other constraints, which have to be taken into account in the planning process. The constraint solver allows quick and efficient search solutions for combinatorial problems in a large amount of data. This search is realized through a new approach on the basis of constraint-restricted methods.

Performance tests

A good performance is an important criterion for the quality of an IT solution but non-functional demands like this have often been neglected. Therefore, ITSO created, adapted from their own practical experience with test management, a collection of programmes for testing the performance, load, stress and scalability of software programs. Based on the object-oriented programming language Python and integrated info the Eclipse environment these tools allow customizable real data measuring of software load behavior. The tools are configurable with regard to data structures, amount of data, parallel inquiries, protocols, logging and many others.

The uncomplicated Way to Success

Expertise, reliability and efficiency are our main priorities. We are big enough to be able to take on and realize challenging projects, and still small enough to offer genuine commitment to our clients. With us you will find a trustworthy and sincere partner.

We are also quick to aid with IT emergencies. And in case our own human resources do not suffice, we can call upon our experts at the Fraunhofer-Gesellschaft at all times.

Our employees have personal interest, high commitment, proven technical qualification, research interest and versatile technical experience in small, medium and large projects.

Whether in development or quality assurance, complex systems or fast and efficient solutions, sub-contractor or main business partner – do not hesitate to contact us. We are happy to convene a date for a non-committal meeting.

And if we are unable to help you, we will be more than happy to put you in connection with experts from the Fraunhofer-Gesellschaft or other specialists from our network.

Dipl.-Kfm. Stephan Drooff

Managing Director
IT Service Omikron GmbH
and BWO GmbH

Dipl.-Inform. Boris Groth

Scientific Mentor

Managing Director
Solutions & Global
Media GmbH

former Managing Director
Fraunhofer ICT-Technology

**Prof. Dr.-Ing. Dr. h.c.
Stefan Jähnichen**

Scientific Mentor

Chair of Softwaretechnology
at the Technische Universität
Berlin

Director at FZI Research Center
for Information Technology
at the Karlsruhe Institute of
Technology

Former Head of Fraunhofer
Institute for Computer Architecture and Software Technology FIRST

ITSO
IT solutions

IT Service Omikron GmbH

Wilhelm-Kabus-Str. 9
D-10829 Berlin

Phone: +49 30 13 88 00 4 - 00
Fax: +49 30 13 88 00 4 - 55
E-Mail: contact@itso.de
itso.de