EPOTECH
AKTIENGESELLSCHAFT

White Paper: EPC

“integrated Enterprise Portfolio Controlling (i.EPC®)”

for highly integrated business process and project portfolio management and control

KNOW-HOW, METHODS and TOOL

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1. Implementing flexibility rather than modeling it

Ever more frequent scandals and the concomitant increase in requirements needing to be met by companies with regard to transparency have now become reflected in the legislation and judicial decisions by the supreme courts. Not only do they require those responsible in all companies to ensure compliance with a multitude of regulations and codes relating to the establishment and maintenance of an internal control system (ICS), as before, they also now require much more.

The need today, therefore, is for systems for the management and control of all business units (units) and corporate affairs which are highly integrated in economic, legal and social terms and which also take governance, risk management and compliance (GRC) into consideration at the same time.

In a dynamic and complex world, however, strict requirements in turn generate wholly new sources of error, present an increasing obstacle to an open style of management and, as a consequence, often lead to the neglect of the customer. Added to this are other factors as well, such as an enormous range of products and continuous changes in the market. The challenge here is therefore to understand such dynamic complexity and to control its dynamics.

The "i.EPC®" solution for highly integrated business and project portfolio management and control was developed to enable companies to be managed and controlled with agility while taking consideration of all external and internal factors which are of relevance both in the present and the future.

In this regard, agile organizational management requires a transparent communication strategy in order to enable the organization and information technology to be intelligently interlinked. i.EPC is therefore the first solution to combine the principles of business process management and multi-project management in a consistent manner, and therefore provides all those responsible with the facility for achieving the integration of the planning and control of all activities of relevance to the company in a single solution.

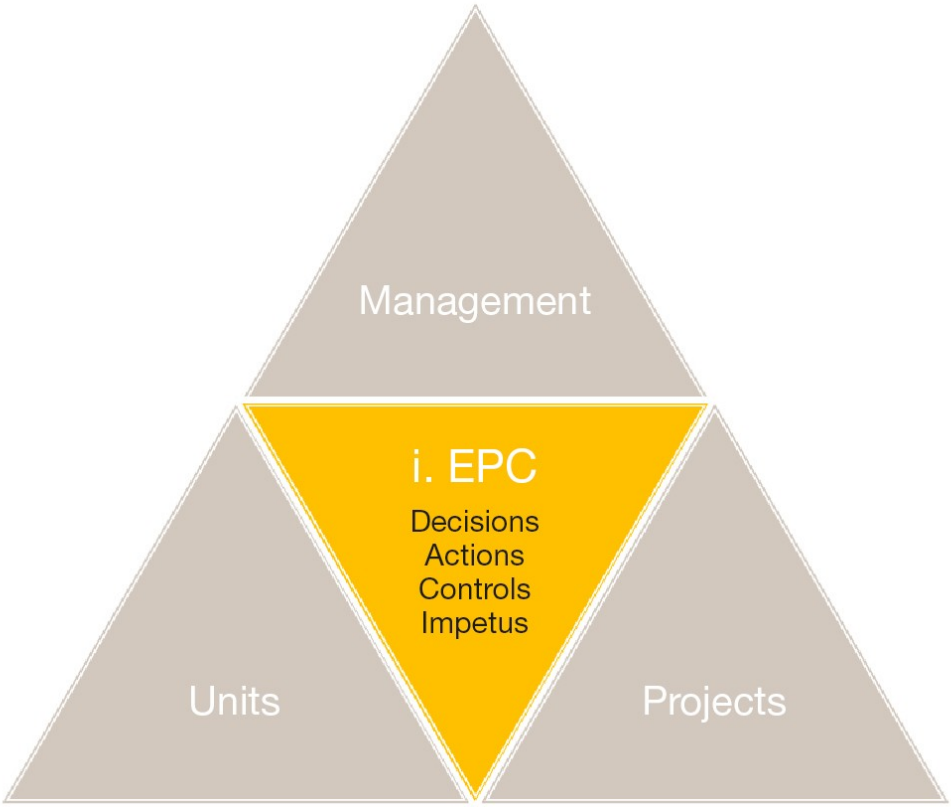


Fig. 1: i.EPC provides support - everywhere and at all times - for an agile organization which is both efficient and effective

2. Support for agile management with the help of IT

2.1 The first step

Plenty of companies already have software solutions. As a management & control framework, i.EPC provides an optimum link to your IT environment and can be seamlessly integrated in your workflow without a hitch because it only requires a short time for implementation. In addition it is also possible for all inventory data to be imported in the form of Excel-based sheets.

Along with all significant data, accounts, risks or controlling activities, all measures in progress and the responsible process and control owners and their associated organizational units are simply imported. In addition to this basic setup it is also possible, as an option, for specific management objectives and/or IT systems to be integrated in the i.EPC framework structure.

If no initial documentation is available yet or methods for the use of i.EPC still need to be developed, EPOTECH AG offers professional assistance with the development of an adequate company, project and portfolio management system.

2.2 Communication generates trust

An agile organization does not need any special personnel or functional structures as a prerequisite, just transparent communication within the organization and the information technology used for it. At the same time, however, the use of i.EPC can enable every existing structure to be either maintained or, if required, simplified, without adversely affecting business process efficiency or effectiveness. This means that changes are not an end unto themselves. The corporate objective and business processes continue to be the priority.

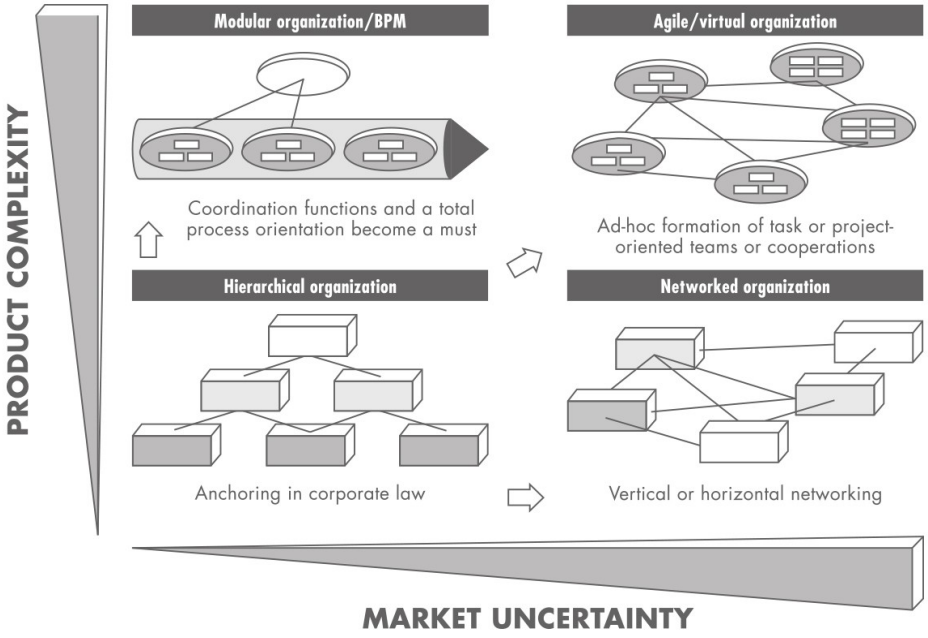


Fig. 2: Agile organization based on business process management and multi-project management

The methodological approach of the i.EPC solution combines the established principles of business process managements and those of multi-project management for the first time on a consistent basis.

With the help of the i.EPC ***tool*** it is also possible to combine the required solutions for business units (units), projects or measures of action with the existing corporate standards of the company on a custom-tailored basis and to develop entity-specific component frameworks.

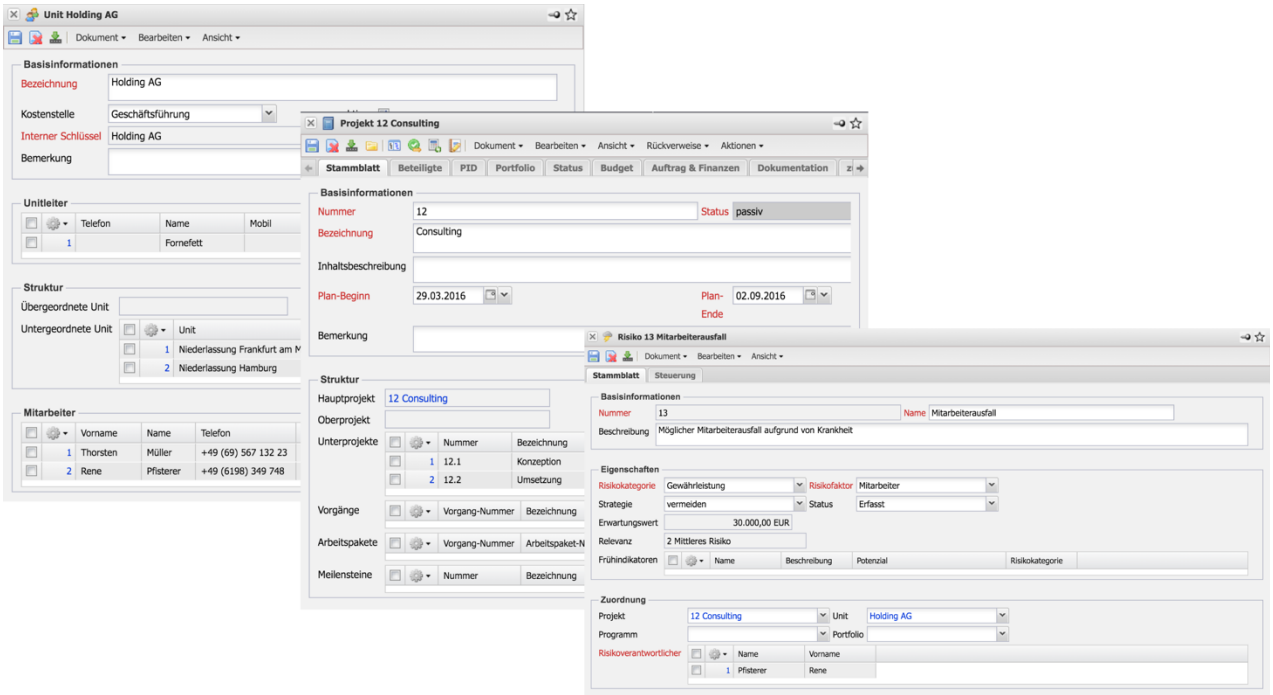


Fig. 3: Organization with lower level units, projects and processes

2.3 Complexity management

Viewed in simple terms, the purpose of IT systems is to provide support for complexity management in a company. However, an ill-conceived approach to their introduction or use will quickly lead to island solutions and therefore to errors and problems, with an undesired increase in complexity the ultimate result. *The need, therefore, is for consistent solutions which make it possible to cope with increased complexity and also provide help with the identification of complexity in one's own company and management the dynamics of such complexity.*

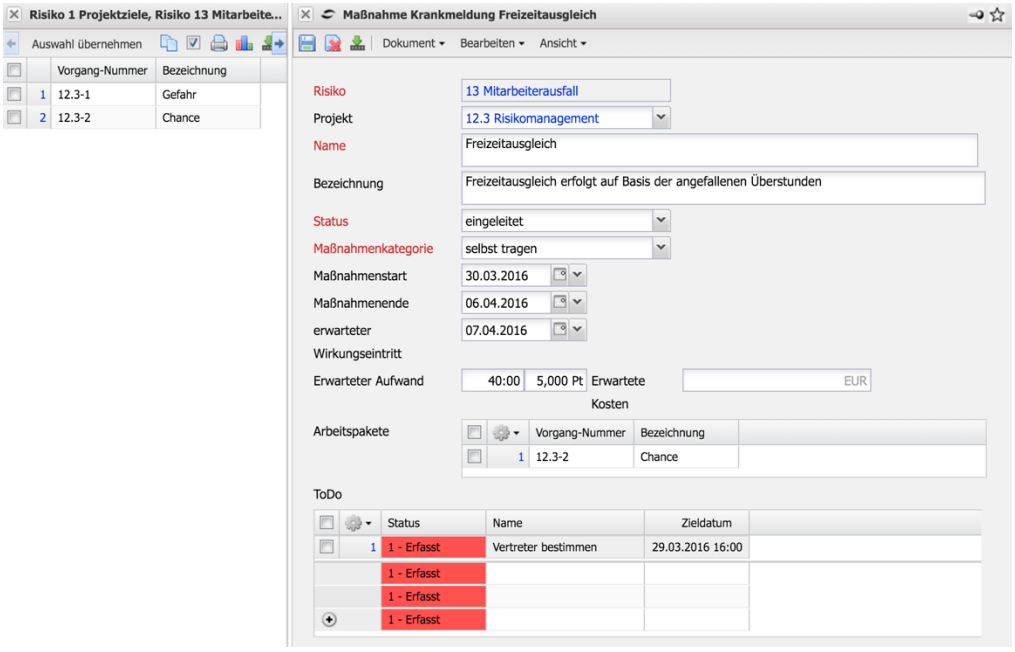


Fig. 4: Example of the consistent interlinking of business management and project management by means of the risk management of opportunities and risks

The i.EPC solution provides a means, using workflow-based risk evaluations, of checking the risks associated with individual accounts, management objectives or sub-processes and actively triggering actions when threshold values are reached, to enable management activities to be selectively planned ("risk-based" scoping) and to reduce expenditure on required documentation and checks even further.

At the same time, however, EPOTECH AG advises against an unnecessary reduction in dynamic complexity in analysis and problem solving and, in contrast, uses methods and tools for multivariate management of company functions, units and project portfolios on a highly integrated basis with the help of highly transparent communication.

Every employee, both internal and external, is provided at all times and wherever they are with the information they need for their decision or for the implementation of measures, and in turn feeds the system with his information insofar as he is authorized to do so.

3. Strategic process and portfolio management

Strategic process and portfolio management in companies is comprised of a multitude of projects which are in competition for scarce resources such as funds and people. On the one hand both the company processes and the projects exist in a relationship of permanent mutual interdependency, while on the hand hand the projects influence each other, are also dependent on each other or even exclude each other.

The challenge lies in taking a large number of factors into consideration simultaneously with a view to securing the optimum composition of the projects to be carried out, your project portfolio.

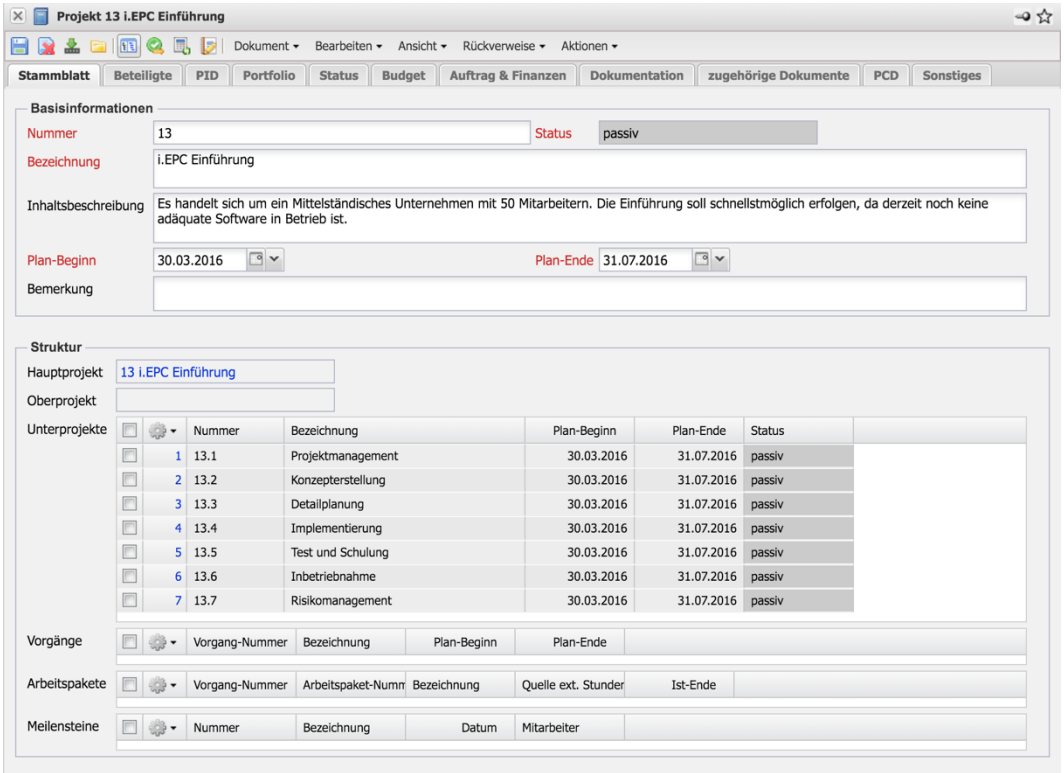
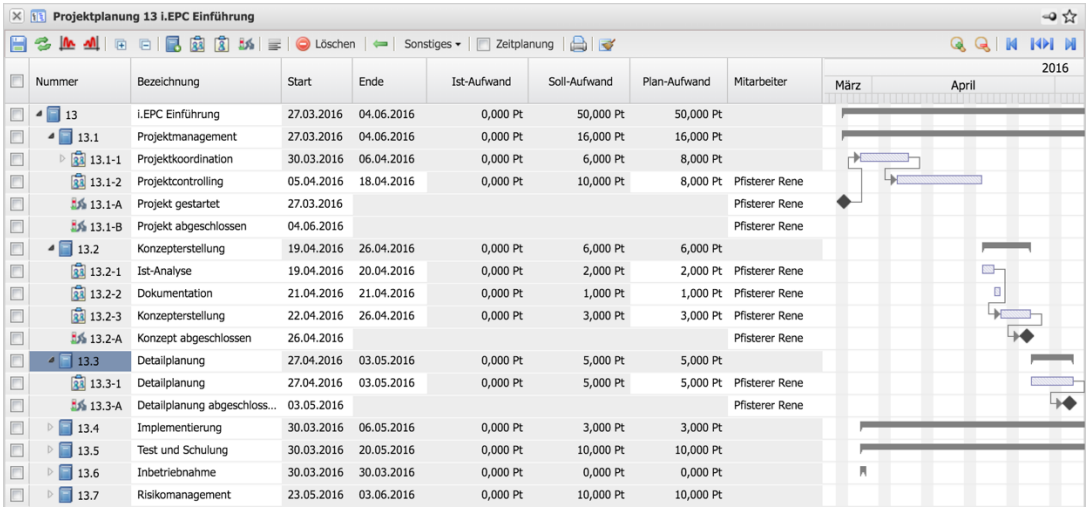


Fig. 5: Except from the i.EPC Introduction Project

The i.EPC solution enables process for the entire course of the project to be presented.

Starting with the initial project idea and right through to project approval, it provides a means of managing all your project-related data (project structure, work packages, milestones and relationships). In addition i.EPC allows modifications to be made in real time in response to changes in requirements. You are therefore provided with a comprehensive overview of your projects and resources.

i.EPC also helps you select from the multitude of schemes and ideas the projects which are most suitable in terms of concordance with the corporate strategy and financial resources.



Nummer	Bezeichnung	Start	Ende	Ist-Aufwand	Soll-Aufwand	Plan-Aufwand	Mitarbeiter
13	i.EPC Einführung	27.03.2016	04.06.2016	0,000 Pt	50,000 Pt	50,000 Pt	
13.1	Projektmanagement	27.03.2016	04.06.2016	0,000 Pt	16,000 Pt	16,000 Pt	
13.1-1	Projektkoordination	30.03.2016	06.04.2016	0,000 Pt	6,000 Pt	8,000 Pt	
13.1-2	Projektcontrolling	05.04.2016	18.04.2016	0,000 Pt	10,000 Pt	8,000 Pt	Pfisterer Rene
13.1-A	Projekt gestartet	27.03.2016					Pfisterer Rene
13.1-B	Projekt abgeschlossen	04.06.2016					Pfisterer Rene
13.2	Konzepterstellung	19.04.2016	26.04.2016	0,000 Pt	6,000 Pt	6,000 Pt	
13.2-1	Ist-Analyse	19.04.2016	20.04.2016	0,000 Pt	2,000 Pt	2,000 Pt	Pfisterer Rene
13.2-2	Dokumentation	21.04.2016	21.04.2016	0,000 Pt	1,000 Pt	1,000 Pt	Pfisterer Rene
13.2-3	Konzepterstellung	22.04.2016	26.04.2016	0,000 Pt	3,000 Pt	3,000 Pt	Pfisterer Rene
13.2-A	Konzept abgeschlossen	26.04.2016					Pfisterer Rene
13.3	Detailplanung	27.04.2016	03.05.2016	0,000 Pt	5,000 Pt	5,000 Pt	
13.3-1	Detailplanung	27.04.2016	03.05.2016	0,000 Pt	5,000 Pt	5,000 Pt	Pfisterer Rene
13.3-A	Detailplanung abgeschloss...	03.05.2016					Pfisterer Rene
13.4	Implementierung	30.03.2016	06.05.2016	0,000 Pt	3,000 Pt	3,000 Pt	
13.5	Test und Schulung	30.03.2016	20.05.2016	0,000 Pt	10,000 Pt	10,000 Pt	
13.6	Inbetriebnahme	30.03.2016	30.03.2016	0,000 Pt	0,000 Pt	0,000 Pt	
13.7	Risikomanagement	23.05.2016	03.06.2016	0,000 Pt	10,000 Pt	10,000 Pt	

Fig. 6: Detailed project planning

At the portfolio level i.EPC therefore provides facilities for the detailed planning of projects for which realization has not yet been agreed. In this connection the strategic portfolio management function falls under the “Risk management” management module and takes all the opportunities and risks into account.

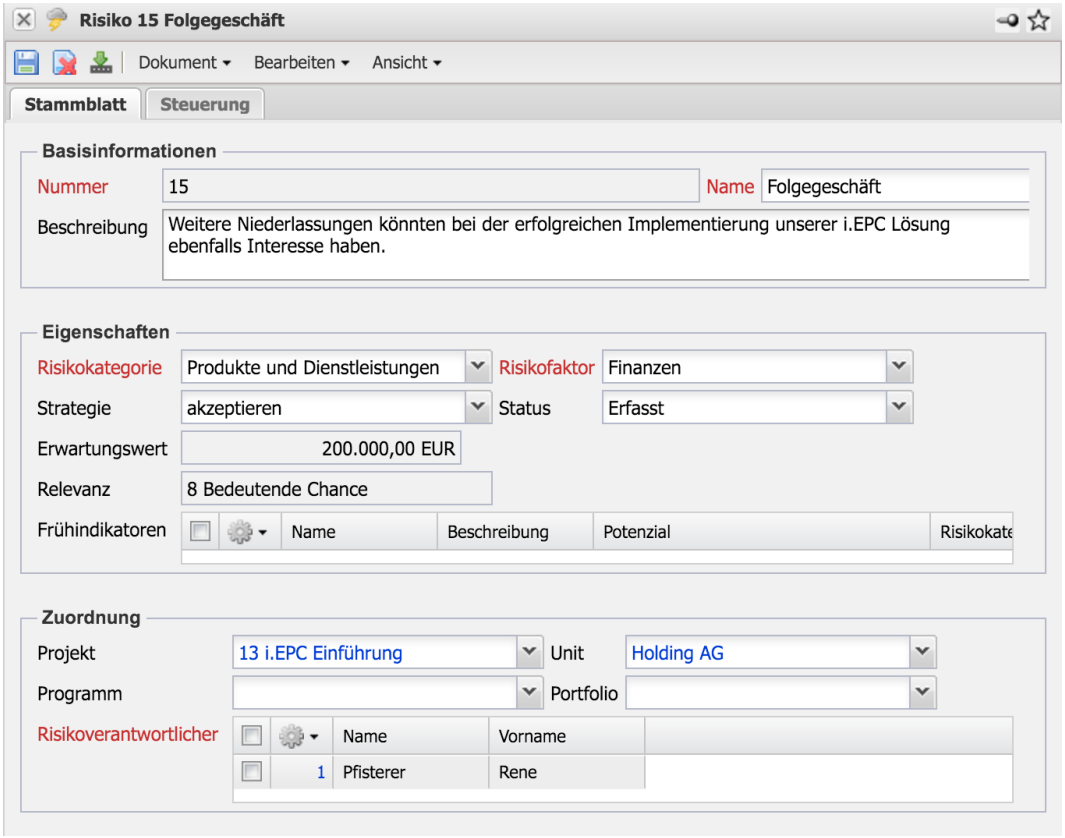


Fig. 7: Inclusion of a possible opportunity in the strategic portfolio management function

4. Risk management upside down

Risk management means identifying and assessing both opportunities and risks at an early stage and developing suitable strategies accordingly, and taking early measures to support opportunities or counteract risks. Identifying opportunities and risks at an early stage and taking effective countermeasures is the only way of achieving sustained strategic security.

However, risk management can only provide the basis for value-oriented business management if there is a continuous response to changes in the interconnected global markets and to new regulatory requirements without such continuous change becoming an end unto itself. Risk management is therefore a primary component of value-oriented business management.

This means that your company requires a risk management system which is linked to the management processes of the company in order to ensure compliance with all regulations (compliance) and at the same time be able to effectively control all strategic and operative opportunities and risks. Furthermore the objective is to generate added value for the company and to provide management with assistance on strategic and operative decision-making.

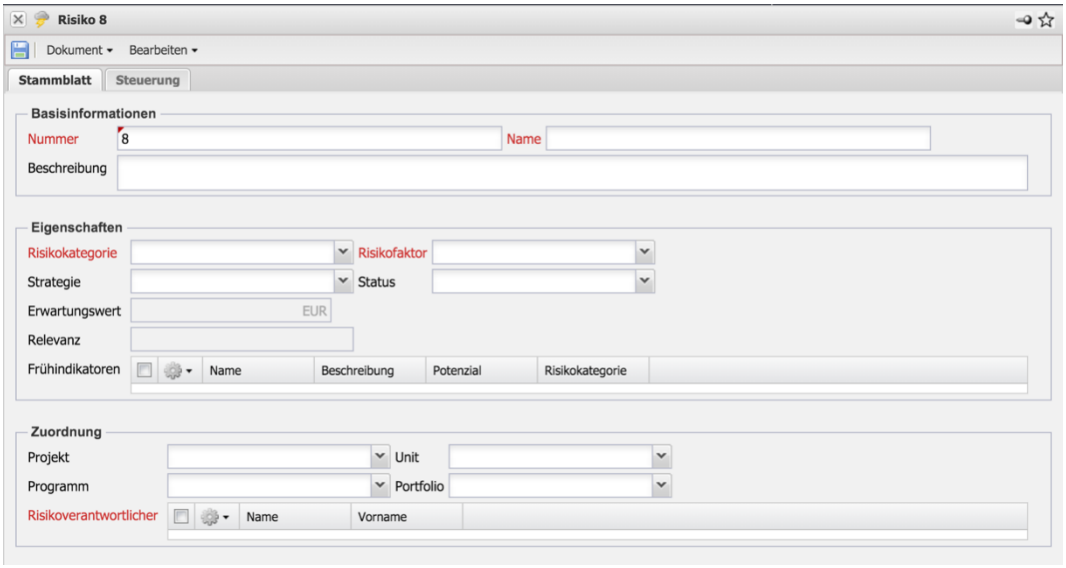


Fig. 8: One element of risk control; a further example is provided below

All these requirements are fulfilled by the i.EPC solution with the new risk management module developed specifically for the management function. This management module delivers a smooth and efficient process in the risk management function which takes account of the entire business process and multi-project management functions.

At the same time this therefore also prevents redundant work and ensures that all measures are capable of being documented, checked and evaluated on a standardized basis. This means that the management of the company continues to be the focus. The fulfillment of all legal and tax-related documentation requirements is therefore carried out with the management function more or less without the need for any additional work.

4.1 The management function is the focus

In the first step the risk control element provides the means of documenting basic information relating to potential opportunities and risks, specifying characteristics and to make relevant assignments for interlinkages *such as, for example, for a project or an organizational unit.* Early indicators can also be entered and saved if required, so that they can be used for the final decision on an opportunity or risk at a later point in time.

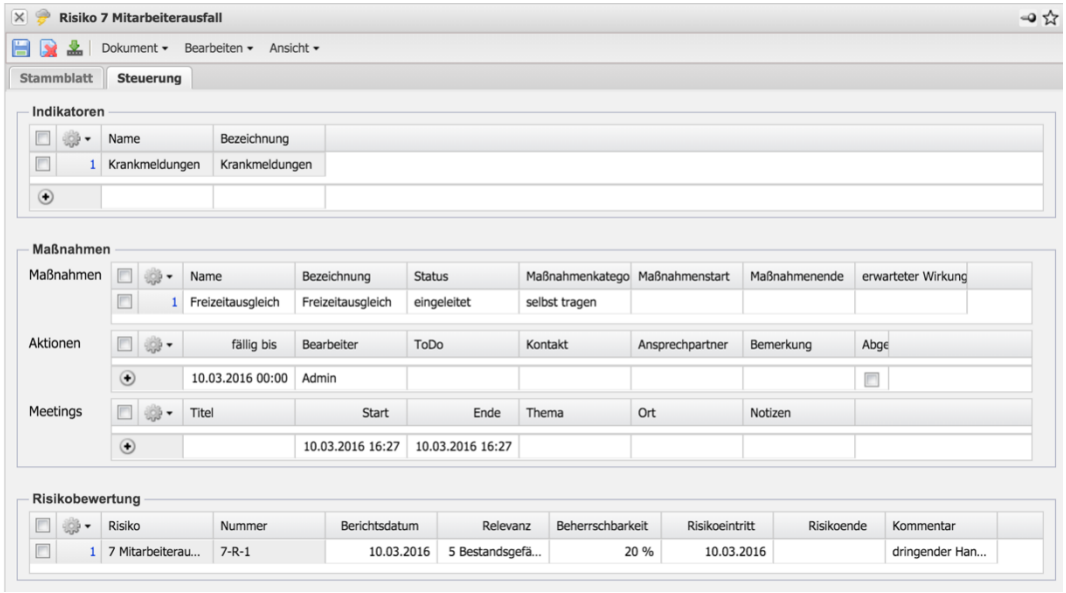


Fig. 9: Another example of a risk control element

A separate input screen allows indicators to be entered and, if required, appropriate counter-measures to be taken. The resultant actions are displayed accordingly.

All measures can be linked to an affected process or project in which applicable work packages are assigned.

Fig. 10: Simplified screen for a risk message; changes or additions can be made to fields in accordance with requirements (this applies to all other screens as well, of course)

4.2 Measurement, evaluation and reporting

Although the focus of our highly integrated business and project portfolio management system is on the implementation of decisions, i.e. the required measures, a high priority in our approach is also given to measurement, evaluation and reporting.

The business evaluation is carried out with the aid of risk reports which are compiled at regular intervals. The master data sheet for the report is used for a basic assessment of the relevance or controllability of the opportunity or risk in each case.

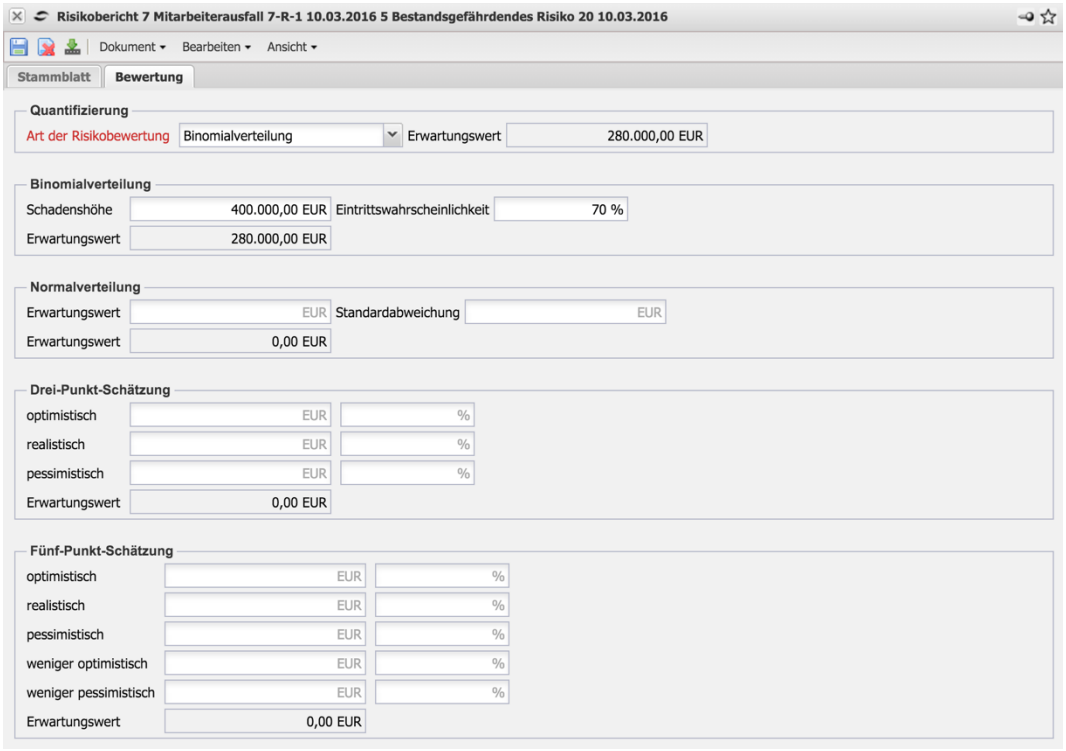


Fig. 11: Quantitative risk evaluation

The evaluation screen allows a quantitative evaluation of the opportunity or risk to be carried out. All the desired methods of evaluation are available for doing this, along with binomial or normal distribution options.

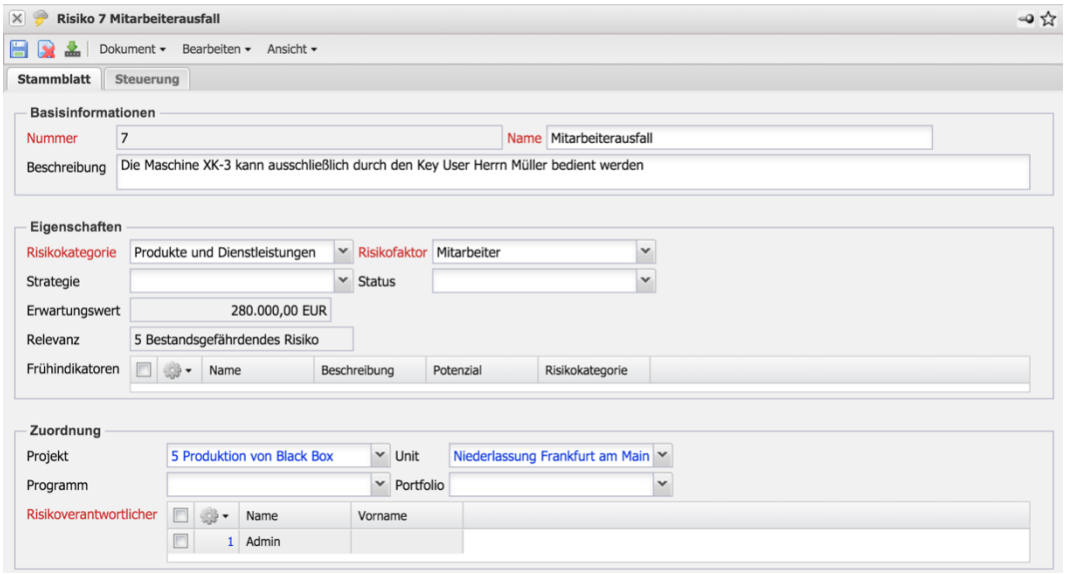


Fig. 12: Risk control element with at-a-glance key data

After completion of the evaluation, both the expectation value and the relevance of the latest risk report are displayed automatically in the risk master data sheet. Based on the key risk indicators, informative assessments and reports can be compiled and compared in relation to key company performance indicators and company objectives.

5. Action management

Companies can only achieve sustainability and transparency if the measures of action relating to all business processes and projects are responsibly administered and monitored by all involved. To this end, the action management system monitors all tasks, actions and responsibilities throughout the company.

This provides the basis for the optimization of internal company information flows and, as a result, for the active support of the continuous improvement process (CIP).

The i.EPC action management system is therefore a key, fully integrated component of the software solution and is also used for the monitoring of delegated measures of action and plans.

In this connection measures of action can include work packages, to-do lists, appointments and deadlines, actions, meetings or countermeasures, and can be assigned to any desired units, projects, elements and users or even other measures of action.

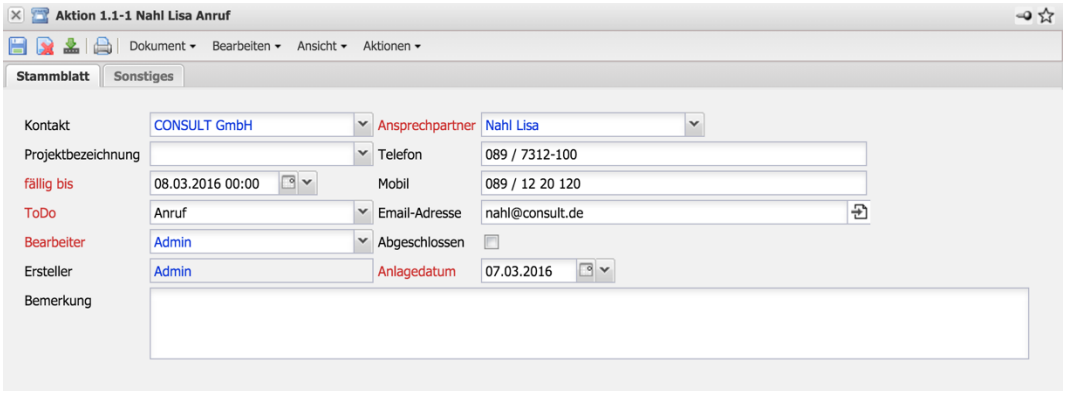


Fig. 13: Example of an action

As shown in Fig. 12, examples of the attributes that can be entered include the contact, contact person, project, person responsible and other attributes. A workflow can also be added if required in order to remind the person responsible about the action at a certain point in time or to escalate the operation further down the line if there is a threat of it not being carried out. One way of doing this, for example, is to have a message sent to a deputy.

The status of the measures of action can be checked in a range of integrated overviews and standard reports. Negative management tests can activate an obligatory action tracking function, which can force an automatic re-test to be carried out for a management activity on completion.

Another method of the action management system is the workflow-based management execution confirmation function. This provides the person responsible for execution with a periodic automatic email notification with a hyperlink to the i.EPC confirmation form.

In addition all outstanding tasks are presented in clear form in the personal i.EPC entry portal. The formal “testing” of the design and effectiveness of management activities is used in companies which either have to comply with stringent statutory regulations (such as a SOX obligation) or which wish to obtain detailed information about the effectiveness of the implemented system on the basis of random samples over and above the “straightforward documentation task”.

To this end, the i.EPC provides a complete workflow support function with automatic, periodic test and acceptance inspection planning, escalation mechanisms and verification document management for the central archiving of all management test results and acceptance inspection results (monitoring).

The following simple example provides an illustration of the workflow possibilities within the system:

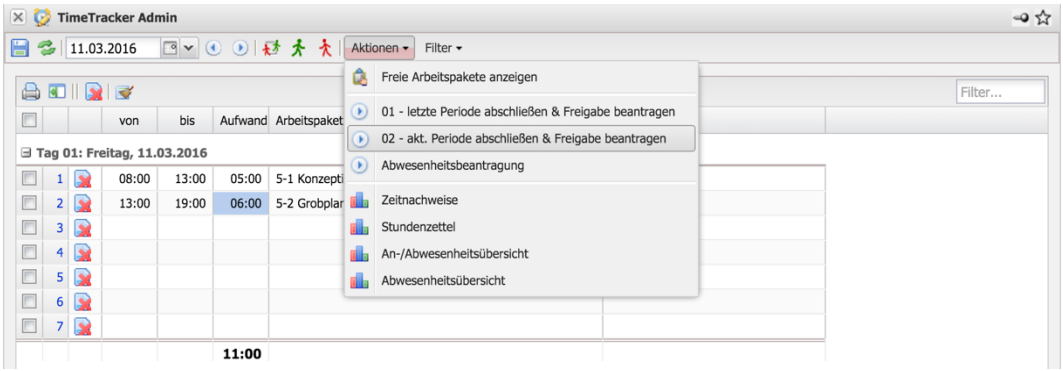


Fig. 14: Closing of a time tracker

Whenever an employee wishes to close his time tracker for a set period such as the last or current month, he can submit a request for approval. Once this has been done, the workflow which has been custom-tailored to the requirements of the company is started.

The person responsible then receives a control prompt like the one shown below:

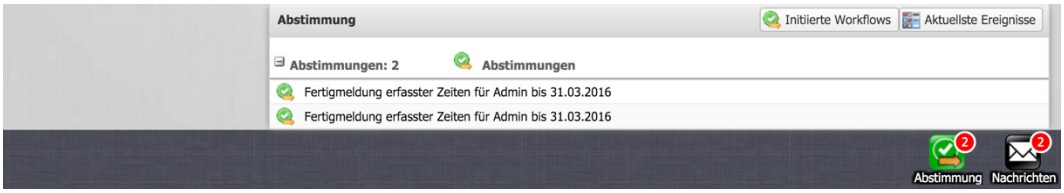


Fig. 15: Control request

They then have the opportunity to check the employee work times and either approve or reject the request depending on the outcome of the validation.

6. Company-wide reporting

Reporting is the positive core of a visionary approach to business. Above all it helps with obtaining the answer to the question as to whether the path taken so far is still the right one.

Reporting is therefore a special form of information supply and serves as a primary source of information for all individuals in the company who have management responsibilities. In an increasingly complex business environment there is a particular need for more information in order to be able to grasp complexity and control its dynamics. Reporting is therefore more than just a matter of documentation, it also a planning and decision-making aid for management staff.

The i.EPC solution facilitates comprehensive support for your business processes by providing quick and direct access to your company data in real time. To do so, i.EPC supports a multitude of evaluation functions in relation to management, reporting, analysis and monitoring of problems in the internal control system. This is also available on the basis of external data storage if required (e.g. within a SAP application or other systems). They enable trends and the need for action to be identified at an early stage in every area of your company.

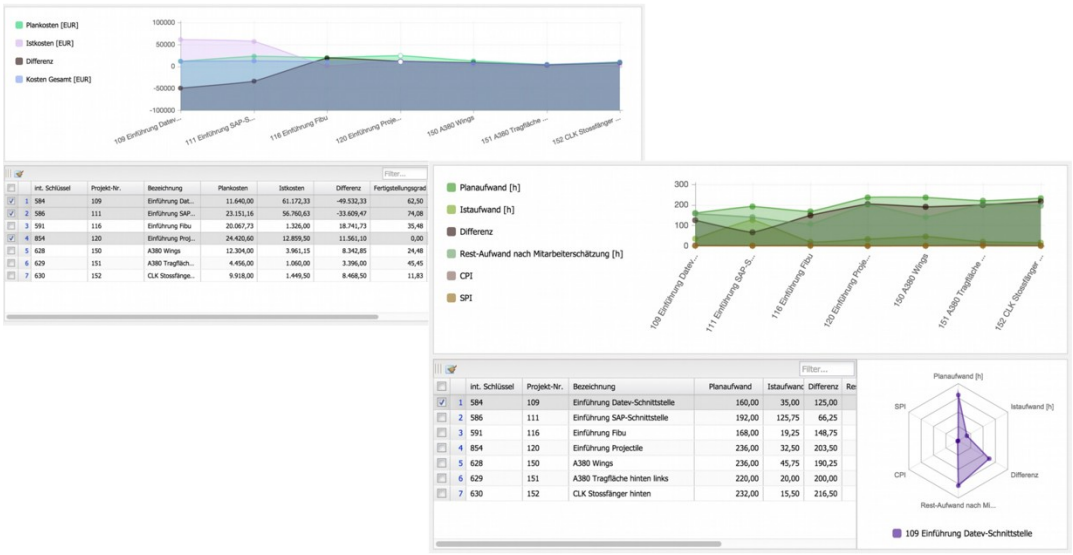


Fig. 16: Example of a portfolio management function in the integrated cockpit

The integrated reporting system allows standard evaluations to be generated which provide a central overview of company-wide performance. The automatic reporting functions can be used for distributing all relevant findings automatically and quickly. At the end of a period a collective confirmation can also be saved to the controlling executions in the system.

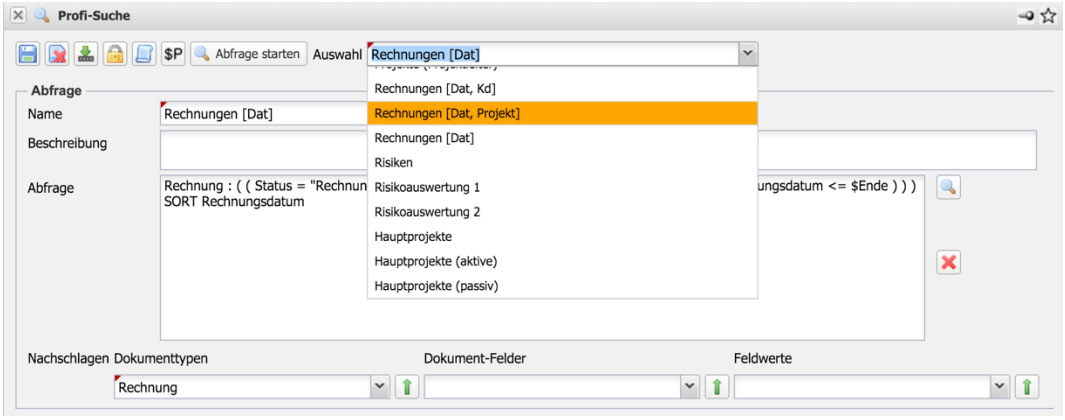


Fig. 17: Reporting

On the basis of the integrated REST API and a range of interfaces it is also possible to link existing reporting tools such as Crystal Reports, for example, with the i.EPC database.

7. The IT-supported i.EPC® solution has the following distinguishing features:

- **User-friendly but at the same time a highly intelligent solution**

Highly user-friendly due to the focus of the functionalities on business portfolio management (information, forecasting, decision-making, implementation, controlling, feedback channels, etc.), with multilingual, multi-currency and multi-client capability. Suitable for scenario planning and bandwidth management, it provides systematic support for the development and expansion of an intelligent organization.

- **Scalability of IT support**

The software solution grows as a component framework with your requirements and provides support both at the initial implementation stage and for the potential expansion of the system

in terms of an increase in the scope or sophistication of your methodology. As a bridging tool i.EPC slots seamlessly into the existing IT landscape.

➢ **Efficiency**

The tool significantly reduces the level of administration work required for you company documentation, prevents inconsistencies and provides you with support on the basis of a multitude of user-definable workflows for the monitoring of measures of action or the checking of controlling activities.

➢ **Transparency**

All required information is available at the right time and at the right place for every employee. A multitude of standard reports and audit-compliant versioning of your data ensure that information is available at all times as well, and ensure that all changes to the system are archived for tracing at a later point in time. The systematic orientation to approved standards ensures that even external auditors quickly gain an overview of the system and supports the requirements of the leading auditing firms and the authorities.

8. Benefits for the customer

The return on investment (ROI) can be expected to be achieved in less than a year. Essentially, both cost savings and increased performance and sales are achieved on the basis of the following advantages:

- Portfolio management of all business units, programs and projects in a single solution
- Consistent integration of all functions and individual tasks
- In-depth and wide-ranging transparency of the organization and workflows
- Multi-dimensional scalability for quick adaptation
- Reliable management from the steering wheel to the rudder (top down combined with a decentralized approach)
- High degree of elasticity due to the management of all aspects of the company in all its diversity

“The greatest benefit for the customer lies in the fact that i.EPC gives him the facility to structure his entire company organization, comprised of a large number of what are generally dispersed subordinate organizations, units, projects, research teams, processes, etc., in such a way that at all times they remain transparent, can be controlled to optimum effect and are scalable.”
(Andreas Fornefett, Chief Executive Officer EPOTECH AG)

An analysis of insolvency reports shows: It is very rarely the case that unforeseen so-called “black swans” or even circumstances beyond control are the cause of insolvency.

The high level of sophistication that can be achieved with i.EPC in terms of the integration of all functions brings a significant improvement in adaptive and innovative capability thanks to the systematically controlled increase in the flexibility of the company and increased certainty even under conditions in which the pace of business change accelerates even further:

- Conscientious, legally compliant corporate organization in all areas (governance)
- Management deal with information and delegation proactively and directly (controlling)
- Effective and efficient management using appropriate measures of action (risk management)
- Reliable preservation of evidence for managers due to automatic documentation (compliance)
- Early detection system for both opportunities and risks
- Safeguarding of the company due to transparency and timely analyses
- Less intuitive, more rational decision-making and controlled management measures
- Bandwidth planning and management, simulation and optimization (Learning by i.EPC)
- Mis-en-place, provision of the necessary resources and know-how for employees
- Clear, documented definition and rights management systems with rules governing responsibility and access

Quality

- High-quality planning and control in a single solution
- Reliable processing, comprehensive control
- Continuous and quick improvements
- Systematic troubleshooting, critical path searching
- Transparency in all workflows
- Reliability due to effective deputizing arrangements
- GRC, SOX, internal control system included
- Legally compliant documentation and archiving

Price

- Basic system is comprised of existing workflows, organization and IT
- Low-cost entry thanks to top down approach
- Implementation without interruption to operations
- Web-based integrated use of supplementary IT
- Platform-neutral deployment
- Purchase, rental, cloud or leasing solutions
- Short induction and training times on-the-job

Time

- Compact integrated planning and control
- Workflow optimization support via computer core
- Timely signals for delays
- Escalation support, real time monitoring
- Prevention of time-consuming queries
- Reduction in decentralized processing times
- Optimized schedules, reduction in idle times

Cost savings

- Liberation of expensive capacities internally and externally
- Reduction in centralized management capacities
- Punctual completion of services
- Decentralized input in real time, worldwide, with centralized application administration

9. Technical data

Range of functions

Presentation of all project-related processes, from acquisition through to the final invoice (all data in a database)
Presentation of the central commercial functionalities (costing, quotations, orders, payment plans, costs, invoices, etc.)

Presentation of all project-related processes, from acquisition through to the final invoice (all data in a database)
Presentation of the central commercial functionalities (costing, quotations, orders, payment plans, costs, invoices, etc.)

100% web-based

Independence from location and system environment
No installation of individual workstations

Flexibility and openness

Adaptation of screens, workflows and evaluations
Dual license (commercial and open source)

9.1 Development environment

The i.EPC “Projectile” basic system is an object-oriented web application which is based on the Java programming language. Object-oriented programming in Java enables the application to be platform-neutral.

9.2 System platform

9.2.1 System structure

The following illustration shows the system architecture for the software in simplified form. This is for the most part platform-neutral for both the server and the client. The server platforms currently productively supported are Windows and Linux (ideally 64-bit). The database and application server can be physically separated. The two servers do not need to have identical operating systems. JBDC access is used for the connection to the SQL database. The software works together with the most common SQL databases without a hitch (ORACLE, MS SQL-Server, MySQL, etc.).

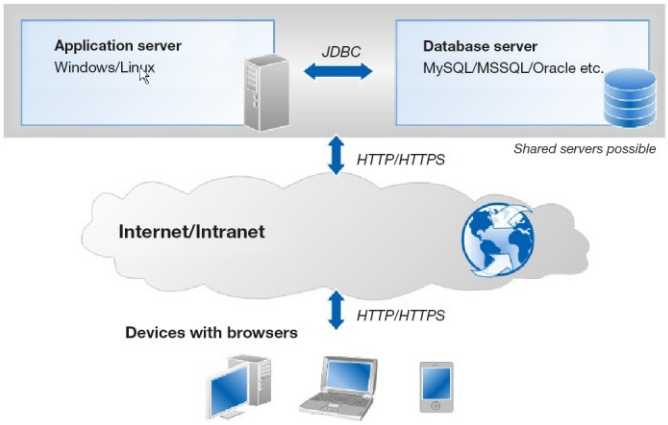


Fig. 18: System architecture

9.2.2 General particulars

In the following example the system environment which is possible for the installation of the software solution is listed:

System	Options
Server operating system	Windows, Linux (64-bit)
Database operating system	Windows, Linux, etc.
SQL database	MySQL, MS SQL-Server, Oracle
Web and application server	Apache Webserver; Apache Tomcat
Browser	Google Chrome, MS Internet Explorer, Firefox, Opera, etc.
Telemaintenance	SSH, Terminalserver, VNC, Telnet

9.2.3 System security

Security for i.EPC installations is provided by encryption in the following areas:

- Encryption of browser/server communication by means of Apache module mod_ssl
- Encryption (hashing) of passwords in the database
- Access restrictions to the Projectile server/database

About EPOTECH AG

EPOTECH AG is the leading supplier of the “Enterprise Portfolio Controlling” (EPC) method and software based on its unique and interdisciplinary know-how.

Based on a service-proven IT tool which has a long tradition in the field of multi-project and program management, EPOTECH AG provides service-proven solutions for highly integrated business and project portfolio management, including: risk management, management, internal control, internal auditing, governance, compliance & policy management and sustainability management.

With its i.EPC component framework, EPOTECH AG helps its customers to monitor, evaluate and manage their organization-wide risks (opportunities and risks). The tool can be docked with all existing software in the company and is therefore also suitable for use as a bridging tool. i.EPC enables companies to bring their performance into equilibrium with their financial risks and risks to their reputation: Responsibilities are therefore managed and financial, strategic and operational efficiency increased.

i.EPC places all those with responsibility in a position to comply with international regulations such as anti-corruptions regulations, Solvency II, Basel II and III, Sarbanes-Oxley, ISAE3402/SAS-70, PCI-DSS and ISO standards or national regulations such as KonTraG and BilMoG in Germany and Articles OR728a and OR663b in Switzerland.

The i.EPC family for the agile organization

i.EPC also offers a whole host of dynamic and complex solutions as individual special solutions, i.e. for your risk management, internal control, internal audits, compliance, GRC or your sustainability management. Every one of our solutions provides support for the business processes of the units, programs, projects and measures of action which are integrated on a selective basis, taking account of the objectives of your company as a whole or your company group, from start to finish and all in a single solution.

Further information about complexity management and our IT-supported i.EPC solution is available at www.epotech-ag.de

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