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Process Oriented integrated quality Management Internet Services for SMEs PROMIS

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Abstract. Small and Medium Enterprises urgently need tailored business services to support them in overcoming the challenging requirements to operate effectively and safely their ongoing business. The driving force is the need to conform fully to the complex legal and social requirements in the fields of Environment, Health, Safety and Quality (EHS-Q) and to reduce the work overload of the key personnel. SMEs are continuously facing these increasing requirements, without having the personnel and financial resources to cope efficiently with such tasks. However, not to comply with these requirements means an uncalculable risk for the SME and for its key personnel. The goal of PROMIS was to develop a portal, which allows European SMEs access to information essential for their key personnel to minimise the above mentioned problem and for the SMEs to comply with customer requirements in the international market regarding environmental protection, health, safety and quality.

1. Introduction

Based on the continuing fundamental changes in the external environment for doing successful business in a global market Small and Medium Enterprises need tailored business services to support them in overcoming new and challenging requirements, by way of regulations and customer imposed requirements, in order to operate effectively and safely their ongoing business.

2. The PROMIS Concept

SMEs are continuously facing increasing requirements in all aspects of their business, without having the personnel and financial resources to cope efficiently with these tasks. They know that the lack of adequate compliance with basic requirements of their business and management duties, involves uncalculable risks. This is particularly true with respect to the actual and continuously tightening legal regulations in the fields of Environment, Health, Safety and Quality (EHS-Q).

SMEs cannot afford own specialised EHS-Q staff. External consultants, who have access to the methodology and the tools for appropriate consultation, are by far too expensive or not even available in general for SMEs. Moreover, the service of these highly qualified consultants is mainly directed towards the needs of large corporations.

On the other hand there are numerous independent SME consultants having considerable practical experience in general, but missing specific know-how and access to modern integrated consulting methodologies, as well as related tools and knowledge. This gives SME-managers often the feeling that they did not obtain a service solving their problems and worth the consultation fees and the time and effort spent.

The basic idea of the PROMIS services is to overcome this widespread situation by providing a specific methodology and content offering an integrated information management system for SMEs, in the fields of Environment, Health, Safety and Quality.

This prototype is specifically designed for responsible managers, who are not specialists in the above mentioned fields. The services offered by PROMIS enable the managers either to accomplish the most important of the above mentioned tasks by themselves or to effectively delegate such tasks to internal or external personnel.

The methodology, as well as the services offered by PROMIS is based on standardised reference models, submitted for validation by independent organisations. The positive assessment by such organisatons will create the necessary confidence in reliability of the system necessary to be widely accepted by the SMEs. To offer the PROMIS services through internet and browser techniques as application technology allow offering such services in a cost effective and efficient way, also affordable by SMEs. The application of latest network technology to the services, allows it to be used as the primary medium for transfer and communication, thus facilitating central operation, maintenance and updating, as well as marketing and administration of the services in a very cost effective way.

During the Feasibility and Market Validation phase, which is funded by the European Commission TEN-Telecom Programme, existing components in relation to contents, knowledge, methodology and info-network technology has been tailored and refined, in line with the requirements of a process oriented integrated quality management and customised to the specific needs of the pilot SME branches involved: Automotive, Construction, Textile, Hotel industry.

A test-service was provided in the validation phase in four of the main languages of the European Union (English, German, Italian and Spanish) and was used by five selected SME users in each partner member state. Finally, based on the project experience, a draft business plan has been prepared to define the deployment activities and further service commercialisation in the following years.

3. The PROMIS Methodology

As already pointed out, the main goal of the PROMIS concept is to provide the key personnel of SMEs, with reference processes linked to the related EHS-Q knowledge, data and application tools, in order to enable them to understand and comply with the relevant obligations and tasks.

A systematic and quality assured framework of standardized principles and rules, methods and tools must be determined and maintained by a central organisational body, in order to have a fully open system, which can provide such reference processes or good practice advice for the afore mentioned management functions.

The most important principles and methods are:

1. Process–Orientation: every enterprise, producing or providing services can be described by its business processes. The main categories of business processes are the processes along the value adding chain and the supporting processes. Processes do not stop at department borders; they can be assigned to responsible persons as process controllers, and above all they can be defined as control loops, which allow applying to them a process of continuous improvement. The systematic and complete elaboration of the business processes delivers “road maps” of business processes, both for the reference organisation of PROMIS and for the individual company. All types of knowledge and information, together with the appropriate software tools can be linked to these processes. All tasks, documentations and events can be derived from these “road maps”of business processes, resulting in corresponding guidelines of these management functions.
2. A system of order, in which all relevant knowledge and information related to the individual business processes and their derivates are collected and maintained electronically, in a centralized form and free of redundancies, as much as reasonably possible. The core of such an order system is the PROMIS data model. The structure of these basic elements of PROMIS corresponds in principle to the basic model of business functions, both representing the backbone and main framework of the whole PROMIS concept.
3. Application of the acknowledged and already widely used ISO 9000 related methods and tools for quality assurance.
4. Appropriate Integration of the so called quality systems: objects of this integration are policies, methods and tools, data bases and documentations (handbooks), resources and auditing procedures. This allows to considerably reducing the amount of learning and training of the skills to establish and maintain quality systems.

4. Main Elements of the PROMIS-Concept

4.1 The PROMIS Product

The PROMIS product is to be understood as a set of services, methodologies, tools and contents that support the key personnel of each SME to recognise and to deal with the tasks in connection with EHS related legal compliance and other provisions. Following the recognition of risk sensible tasks, the PROMIS product will effectively support the managers in fulfilling the relevant duties. PROMIS will not only provide knowledge and pre-processed information useful to take the right decisions and to delegate tasks to internal or external personnels, but will also provide all types of practical tools (e.g. integrated components of application software) and working-templates .

The service aspect of the PROMIS product comprises all types of relevant consulting services and a portfolio for necessary teaching and training materials.

One big potential of PROMIS lies in the fact, that starting from the original EHS-oriented field of application, the service can be easily extended to the ISO-9000 quality management in the new Version 2000. Further extensions can be envisaged to any other function of a business organisation like management of plant equipment, facility management, materials management or repair and maintenance.

4.2 The PROMIS Contents

It is very important to clarify the specific nature of the contents, which are different from contents already available in commercial electronic databases. They are specifically designed for the needs of the SME managers, who are generalists and interdisciplinary acting persons and who need a knowledge, that is rather horizontal than vertical.

The contents therefore are structured in a certain form and have to be elaborated specifically by qualified authors, supported by an efficient authoring system also based on internet technologies. Within these types of content structures, it is possible to provide links to relevant professional databases exhibiting e.g. national or international laws and regulations, hazardous material information, product data in regularly updated version.

4.3 The "PROMIS-Organisation"

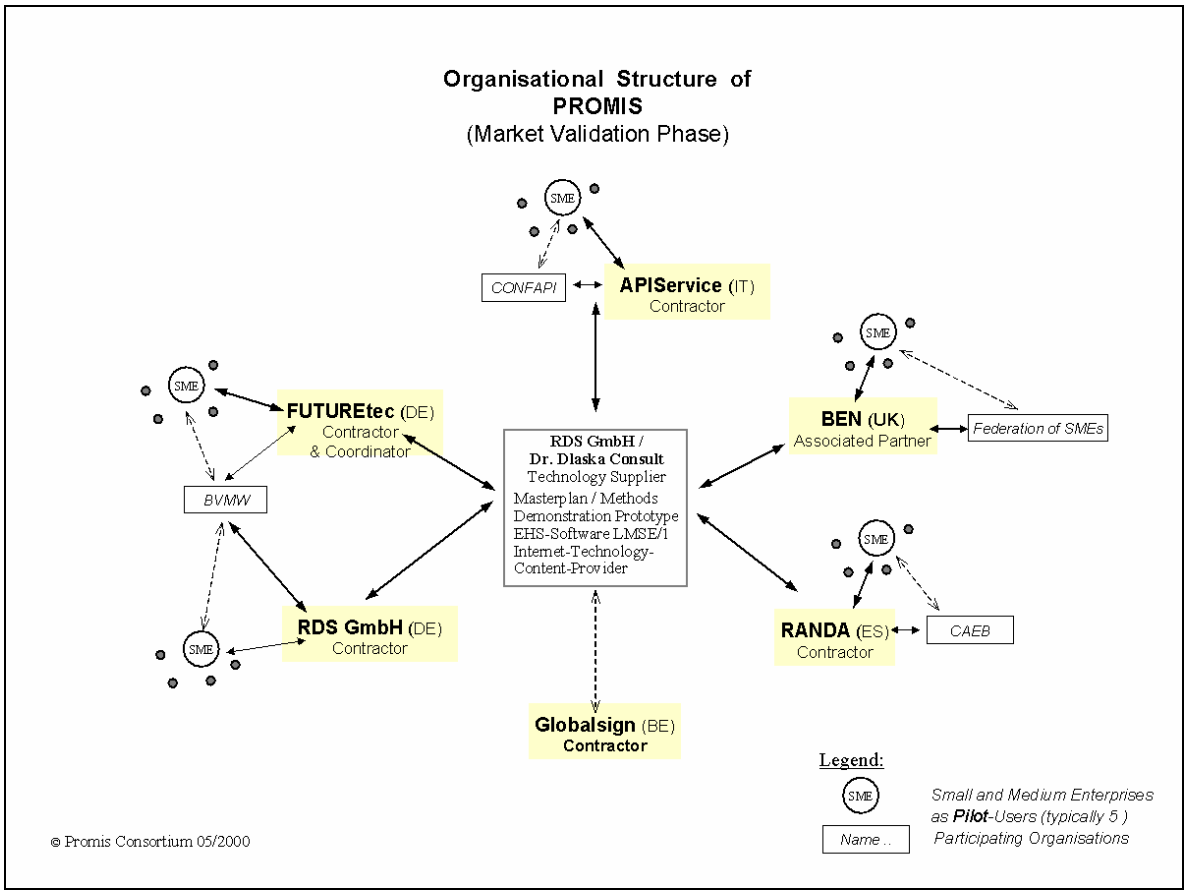

Figure 1: The organisational structure of the PROMIS market validation project

The trans-European dimension of the PROMIS partnership is clearly indicated by a consortium of partners from Belgium, Germany, Great Britain, Italy, and Spain and by the participating SME organisations, which cover four of the main European languages.

This transeuropean structure of the project is overlied by a national structure in each of the four 'pilot' countries, consisting of at least one service provider, one participating SME organisation and five pilot SMEs.

The access to the necessary services and information is achieved by one central server.

It is one of the main tasks during the project to derive from the national pilot results a standardised European PROMIS model.

5 Customer Typology

The potential customers of PROMIS will be in the first line but only, companies of industrial nature, having comparatively high environmental and/or health risks associated with their operation. They may also be supplying intermediary products, larger companies that demand high quality products or services at competitive prices. This may be e.g. a family-run company supplying components to the automotive industry, such as a galvanising or any other kind of metal-processing company. This may also be traders and transport companies dealing with chemicals and other hazardous substances.

Nearly every SME can benefit from having an operational EHS-Q integrated quality management system. The problem is, that many SMEs cannot justify the cost of implementation using conventional consulting services, as well as the associated bureaucratic effort required to maintain a paper-based system. There is no doubt, that companies having a certified management system are in a favourable competitive position compared with non-certified companies. This is especially true in the case of suppliers to large companies, which very often exclude any bidder that is not certified. This is also becoming the trend for ISO 14001 and EMAS certified companies, which are, as a rule, committed to select suppliers with an implemented and audited environmental management system.

A certification becomes also more and more important for consulting and subcontracting companies (e.g. maintenance, cleaning services etc.) working on the site of a customer. In this case the most important issues are health and safety.

6 Technological approach

The PROMIS System represents a portal solution for European SMEs in the fields of EHS-Q management.

The PROMIS data and function model will be initially operated by a server, which will be in the future extended to a compound. This data and function model contains universal data structures, functions and processes. Process data, as well as the description of all surfaces are having a multi-lingual structure. Interfaces to be operated via specific security levels are provided for all data streams.

The PROMIS portal should be understood as a virtual consulting portal, where information, data, functional solutions, and programs can be queried. These data will be provided by a network of providers (e.g. data suppliers, national SME associations).

The requests for the desired information will be provided following the fundamental principles of security in internet, in form of digital certificates and trust seals.

The PROMIS System shall enable online consulting, i.e. the various contents are enabled to be executed via the webbrowser in a multimedia way. On the other hand, however, the proven solutions and modules from the office world should be retained. The office modules can be likewise managed in the PROMIS System and will be designed for download if necessary. For these backup office solutions, it is important that the data basis forms a segment from the PROMIS database, so that process data resulting and perceptions derived from it, do not depart from the PROMIS model. In this way, the data and

perceptions can be centrally utilized again for processing and statistical editing, i.e. for computation of ratios and prognostic values (trends).

Architecture and implementation technology are explained in the following:

The PROMIS prototype includes the development of a Web application that shows all functional requirements to the system.
The prototype forms the technological basis for the installation of a PROMIS network.
The application does not only contain free areas for common recherches but also protected areas for certain users and user groups. Documents and modules can be downloaded from the PROMIS servers to put Backup Office Modules into operation.

The development of the PROMIS prototype bases completely on Oracle technology and the following tools have be used:
- Oracle Designer (integrated Case and Database Developer Tool)
- Oracle JDeveloper.

6.1 Technological Basis

The PROMIS Server interconnection includes:
- Oracle Application Server 4.08 (Web Server)
- Oracle Database Server 8.06 (Database Server)
- Promis File Server (Download Server)

6.2 Functions of the PROMIS Server:

6.2.1 Web Server
- PROMIS Web Interface, Web Network
- Navigation Engine
- Navigation Security System

6.2.2. Database Server
- PROMIS Database with Data Model
- PROMIS Management of Users and User Groups
- PROMIS Commerce Management
- PROMIS Search Engine
- PROMIS Database Interfaces and Job Control
- Web Program Library

6.2.3. Download Server
- Document Library for all Types of MIME
- Backup-Office Program Library
- File Transfer System

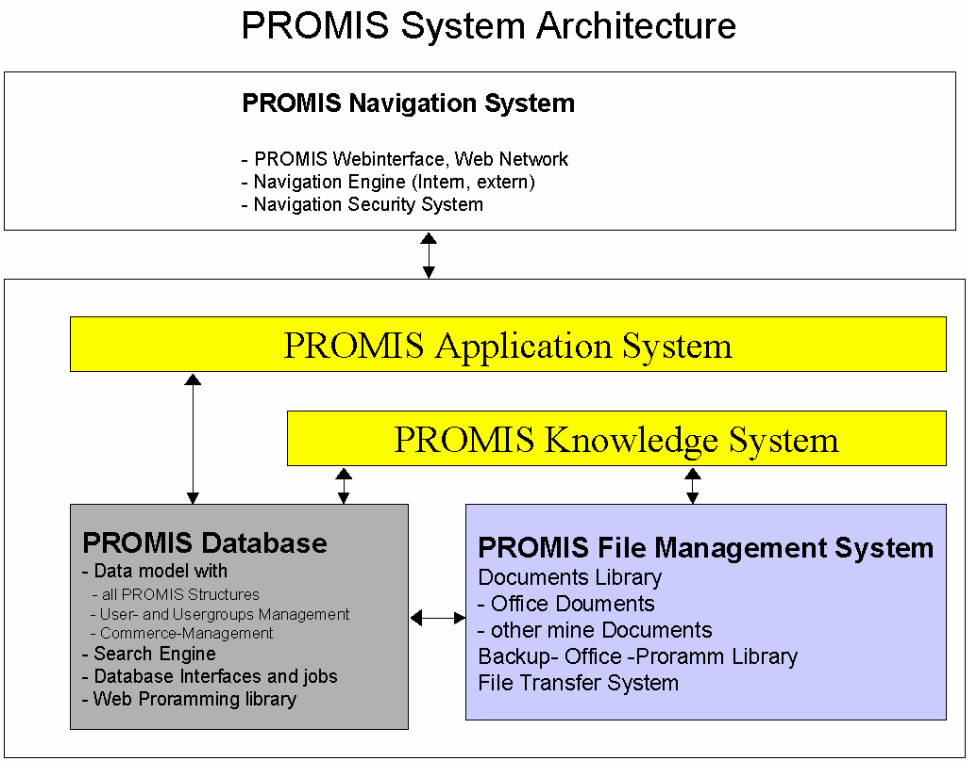

Figure 2: PROMIS System Architecture

7 Conclusions

"Process Oriented Integrated Quality Management" in the context of PROMIS is a holistic approach to an internet portal that is designed to assist European SMEs. In the present project this approach is focused to Environment, Health and Safety, and Quality management. The structure of the data model chosen, however, allows the later extention of PROMIS to a general management assistance service for SMEs, including also modules like management of plant equipment, facilities, materials, repair and maintenance.

Another aspect that can be achieved will be an efficient and easy application of elements of a Process of Continuous Improvement.