„Web-based tools for the environmental management indicator “

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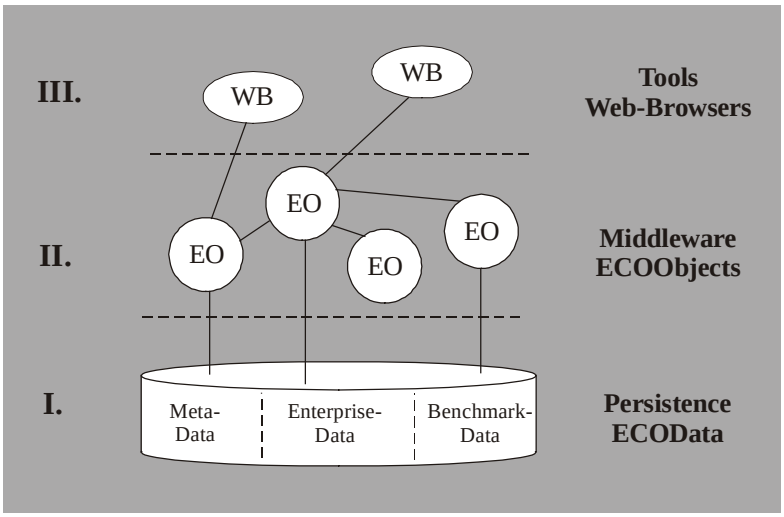
The integration of ecological aspects into management information systems of an enterprise has gained in significance, as a result of the need for improved market positions and the search for cost-cutting potentials. Standardized environmental management systems, environmental performance indicators and indicator systems are crucial . However, the heterogeneous definitions of environmental performance indicators in individual enterprises represent at present a considerable weakness due to missing comparability. In addition , many enterprises do not apply or use environmental indicators at all.

The Project "oekoradar.de" at the chair of Information Systems at Hohenheim University , include the development of a web-based software, to develop the homogenisation of environmental indicators and enabling enterprises to access the attained knowledge. Oekoradar is a web-portal for the environmental management, the focus of EcoRapid is on the use of material flow cost accounting, partly based on data warehouse technology. Within the framework of Webservices however, it becomes possible to focus on software building blocks to deliver the necessary functionalities.



Architecture of portals based on “ECOObjects”

The architecture of the software is based on the idea to create so-called "ECOObjects ", which encapsulate environmental-economic conditions and processes. That way a modulation of the environmental management subject can be achieved, and customized environmental portals can be realized by adding the required bricks. The object-orientated

language Java with its scions JSP and Servlets offers ideal implementation prerequisites. Particularly the Web support was a relevant selective criteria.

"ECOObjects" receive their data from the database "ECOOData", which consists of three datacontainers. The contents of the first container are meta data. The meta data consist of a framework of definitions, in which the portal operates. indicator systems such as ISO14001, indicators for special industries as well as relevant enterprise framework data can be freely defined.. The two other containers accommodate concrete enterprise and benchmark data.

On the current stage of development, "ECOObjects" consist of a package of classes, which interact together. The intention, is it to develop stand- alone "ECOObjects", to which – similar to the Business Objects of SAP R/3 – a connection over defined interfaces can be established. .

A first "ECOObject" was implemented for environmental indicators. It can administer indicator and system definitions, user data as well as benchmark data. Tools for benchmarking, drill-down-analysis, time-row-comparison and the comparison of nominal and actual values were implemented within this "ECOObject" to enable the utilization of the aforementioned data. A further tool is the application of an indicator system in addition with a material and energy balance system. An input-output balance can be drawn-up with this tool. Each tool displays a data or a diagram view as output. Via collaborative filters, during the indicators calculation, users can learn from the behavior of the portal community. The benchmark database contained in "ECOData", permits a quick enterprise comparison.

The technical transformation takes place on base of open source-projects on the platform Microsoft Windows: the Java server Pages(JSP) - and the Servlet technology of Sun Microsystems, the relational database management system "mySQL" and the Servlet engine "Tomcat" of the Jakarta Projects.

The targets for the current development stage of the study were achieved. The data base "ECOData" can be flexibly extended, and has the ability to supply data for several "ECOObjects". In addition to the "ECOObject" implemented yet, more objects handling subjects like eco-balancing or environmental cost management, can be realized. In order to develop tools in a modular way, the architecture "ECOObjects" was verified as a suitable platform. Software developers can easily integrate environmental related matters using "ECOObjects", and access them by predefined interfaces. This provides a way of rapid portal and application building. The tools for indicator analysis and benchmarking already implemented , can now be evaluated according to their function of planning, control and supervising in the sense of environmental controlling.

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