Bringing sustainability to the daily business

Motivation

Current Sustainability Actions

Companies are increasingly taking action to reduce their environmental impact. Prominent examples include emission reporting and reduction programs, product stewardship activities, and sustainable supply chain initiatives. However, most of the current actions to improve environmental sustainability are annual or one-off exercises that are separate from the daily business operations.

Daily Business Operations

Every day, business users perform actions that add to the company's environmental footprint, e.g. material and energy procurement, product design, service outsourcing, traveling, etc. They execute these operations in the respective enterprise systems without seeing the resulting environmental considered at a later point as part of the overall product or company footprint.

The Business User

Business users always have to pick among alternatives, e.g. product designs, material sources, service providers, etc. Since they don't see the environmental impact of these operations, they can't benchmark and decide based on environmental criteria. This is an unused leverage: business users currently cannot reduce environmental impact on a daily basis.

Vision & Mission

Vision

The vision of the OEPI project is that business users – across industries and supply chains – will be able to continuously reduce the environmental impact of their daily operations. To achieve this, they will have the visibility into the Environmental Performance Indicators (EPIs) of alternative decisions in corporate and supply chain operations.

Mission

OEPI will work towards its stated vision by developing services that calculate EPIs and integrate them into business solutions. The users will leverage these services to

Provide business users with services to monitor intra- and inter-organizational EPIs and integrate them in their daily decision-support systems

integrate EPIs into their daily business decisions, both in their enterprise but also across their supply chain.

Business Impact

OEPI is breaking down the vision into digestible application focus areas:

- Sustainable procurement
- Design for environment
- Network deployment & circuit provisioning
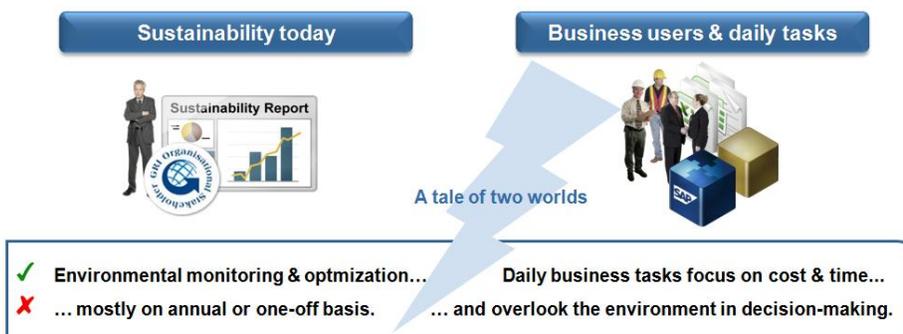- Corporate communications

For each of these areas, we are investigating how to integrate Environmental Performance Indicators (EPIs) into the respective process to best empower business users and customers with the necessary visibility and decision support. OEPI will specify and evaluate the business concepts that enable the integration of EPIs in daily operations, including necessary processes modifications. The business-driven use cases will shape the underlying technology.

Sustainable Procurement

This use case integrates the concept of (supplier-dependent) material EPIs into the procurement process. The goal is to enable the users responsible for sourcing and procurement to benchmarking different suppliers of the same material or product component with regards to specific EPIs. The result is a reduction of product and supply chain environmental impacts.

Design for Environment

This use case provides product engineers with the concepts and tools to see the environmental impact of their design decisions on the whole product life cycle. This is achieved by integrating EPIs into the design optimization process. The result is a faster evaluation of design alternatives with lower overall environmental footprint.

Sustainability today — **Business users & daily tasks**

A tale of two worlds

✓ Environmental monitoring & optmization... Daily business tasks focus on cost & time...
✗ ... mostly on annual or one-off basis. ... and overlook the environment in decision-making.

OEPI

Organizations Environmental Performance Indicators

Network Deployment and Circuit Provisioning

OEPI will enable users in the Telecom industry and their customers with the tools to integrate EPIs into their current processes, especially during network deployment and circuit provisioning. The different stakeholders will benefit from increased process transparency and better management of environmental impact, e.g. circuit energy consumption.

Business Outcome

For each of the application scenarios, OEPI will provide a concept specification that outlines the user requirements and process changes needed to integrate EPIs into today's business scenarios. The research will also deliver use case descriptions including the respective actors, systems, and use case steps. A validation phase will be conducted to ensure the business feasibility and the environmental value of

Technology Realization

Supporting the business use cases by a common technological platform is currently impeded by a number of factors. These include the constant changing of reporting guidelines and necessary environmental data being distributed across many systems (e.g. ERP systems, Excel Sheets, proprietary solutions) and exposed through different technical interfaces.

SOA-Enabled Platform

In OEPI we will address the problem by creating a platform following Service Oriented Architecture (SOA) principles. The platform will connect the disparate environmental data by making the different sources accessible through well-defined service interfaces. This will facilitate the discovery and consumption of data in a uniform way across organizations. The platform is responsible to collect and aggregate the data from various sources to compute Environmental Performance Indicators (EPIs). These aggregates can in turn be exposed as services that are consumed in different channels. The platform provides channels suitable for the consumption medium, be it an enterprise solution, a corporate website, or a mobile application.

Four business focus areas

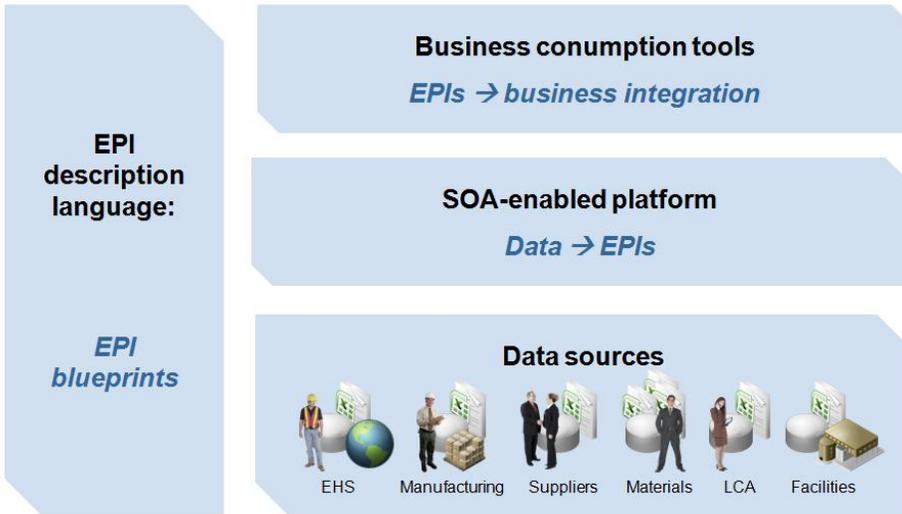| Sustainable procurement	Design for Environment	Network deployement & circuit provisioning	Corporate communication

- ■ Business-driven concepts
  - ■ Process & use case specification
  - ■ EPI integration in decision-making
- ■ Value proposition
  - ■ Business & environmental impact
- ■ Validation with industry partners
  - ■ High-tech industry focus

Corporate Communications

Corporate communication departments carry out their daily work without real-time visibility into the environmental impacts and improvements of the company. OEPI will provide a single point of access for finding and communicating recent corporate sustainability successes to external stakeholders.

the developed concepts. Finally, OEPI will provide guidelines to practitioners on how to leverage the developed concepts in their environments, thus realizing the promised benefits.

EPI Description Language

If EPIs from different companies are to be compared for reasons of reporting or environmentally-conscious decision making, a unified language is required that unambiguously defines how an EPI was computed and what data was considered. This language uses a reference ontology developed in OEPI to describe data semantics. It enables semantic reasoning over the EPI information, e.g. system boundaries, data sources, uncertainty, etc. The language allows developers to build applications with functionality of automatic gathering, searching, analysis and delivery of environmental data.

OEPI tools

Based on the OEPI platform and the EPI description languages, a set of prototypical tools will be developed which support real life examples taken from the use cases. These tools are developed and tested together with industry partners of the project and will showcase the integration of a number of different data sources. They will demonstrate the feasibility of the platform and business relevance of the project as a whole.

Technology Outcome

From a technical perspective, OEPI will focus on three major contributions. Environmental Performance Indicators (EPIs) are described using the reference language and made available as web-services through the OEPI platform. OEPI tools built over the platform will demonstrate the value of bringing environmental sustainability to the business user. The three main technical contributions of OEPI will realize the project mission, namely using a SOA-based approach to provision EPIs and integrate them into daily decision support.

Scientific Excellence

From a scientific perspective, the OEPI project offers the opportunity to explore interesting research challenges in the following fields:

- Ontology engineering: Validating the applicability of existing technologies and definition of EPI description language
- Software architectures: Extension of current SOA paradigm to support heterogeneous enterprise services; Integration of Web 2.0 techniques; principles for lightweight composition and aggregation of web services

- Corporate Environmental Management Information Systems: synergies with current research in the field of CEMIS 2.0 should be exploited in order to aggregate research efforts
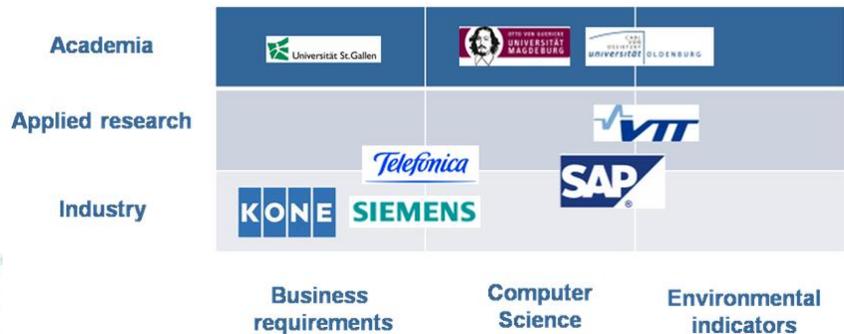
Secondary research will accompany the deployment of intermediate results in the industrial companies. Furthermore OEPI should result as a major topic in the sustainability research map driven by the consortium.

Scientific Outcome

The reference architecture for the proposed OEPI platform may serve as a blue print for the implementation as well as for an extension of the concept to further use cases. Also, the OEPI project will advance the construction of a Single Information Space in Europe (SISE) regarding the environment. Finally, the results of the OEPI project will be will be published in leading journals and conferences, in addition to being integrated into teaching courses held at the participating universities.

About the OEPI consortium

OEPI is an ICT research project supported by the European Commission and includes expertise from leading high-tech companies, business solution providers, and environment & IT research institutions. The eight project partners share among them the domain and solution know-how necessary to achieve the stated mission by the end of the project in 2012.

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