A consumer oriented prototype – forming the nucleus of a novel Ecological Accounting System

Functional System and Software Architecture of the myEcoCost System

Deliverable 1.2

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Executive Summary

This technical deliverable contains the definition of the myEcoCost functional system and software architecture, derived from the myEcoCost system top-level requirements, including the definition of external interfaces of the myEcoCost software and system.

As first major step of project work building on the requirements definition provided within project Deliverable 1.1, this architecture document also presents the methodology for requirements traceability throughout the project, and provides the top-level architectural requirements tracing.

The functional system and software architecture is the definitive basis for all further design and development work in the project, towards building the nucleus of a proof-of-concept system for demonstration of key functionalities of the myEcoCost system.

Special attention is given at the beginning of this document to set the scope and the boundaries of the myEcoCost system. A distinction is made between the myEcoCost demonstration system and other additional optional features that may be included in a long term implementation of the myEcoCost target system. The former comprises the software and IT infrastructure developed and set up within this project; the latter is out of the scope of this present project task on architecture definition, and of the forthcoming development and implementation tasks in WP 3 and WP 4. Nevertheless, many long-term aspects of the myEcoCost target system have been and will continuously be kept in mind in order to ensure that the project's demonstrations system becomes a true, flexible and extensible nucleus for any target system beyond the project lifetime.

Consequently, this architecture document provides

- a complete description of the demonstration system;
- an extensive list of additional features that have been identified at this stage for a target system;
- a clear description of the boundaries of the system to be developed within this project.

The mechanics of the myEcoCost system are based on a data gathering technique. The overall principles behind this data gathering technique and supporting architecture are:

- a business receiving the ecoCost of purchased products or services,
- accounting for their own business added value while manufacturing new products and providing services (calculating the ecoCost of the product or service),
- passing the ecoCost of the products (or services) it sells to customers.

Towards this end, two principle elements in the myEcoCost demonstration system are devised:

- the ecoAccounting module, which is responsible for all ecoAccounting for a particular company or business, and
- the data delivery network (DDN), which is the conduit for getting ecoCost data from supplier to customer.

These mechanics and elements work within the overall system architecture as displayed in Figure 1, which structures the system in three top-level domains, namely business domain, data delivery network domain, and consumer domain.
Figure 1: Top-level overview of myEcoCost system architecture
The **business domain** comprises the following software entities
- myEcoCost business server,
- business client,

flexible enough to support both small and large businesses:
- small: business server and client installed in the same PC; no permanent connection to the Internet;
- large: several clients can contact the business server, even from mobile devices; permanent connection to the Internet.

Businesses are required to be registered to the system. Therefore, they need to get a business account.

The **consumer domain** is represented by
- software of the myEcoCost consumer client running on any type of consumers device (PC, laptop, mobile handset, tablet), simply requiring Internet connection.

The **data delivery network domain** contains the software entities of the following services:
- Invoice service (the most important);
- Statistical data service;
- LCI service;
- Consumer & business registration service;
- Consumer account service;
- Software download service.

A high level definition of all these services is provided in the document; special attention is given to the internal architecture of the business server, see Figure 2, which contains, among a number of other relevant system functions, the **ecoAccounting Module**, the most important key element which hosts the “intelligence” of the myEcoCost concept.

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**Figure 2:** Overview of the content of the business server
A first architectural approach for the very ecoCost calculation is presented in a dedicated section of this document.

Key aspects of data generation and data flow through the system are presented in separate extensive sections of this document, including:

- how to create ecoInvoices and ecoQuotes for business users, by using received ecoInvoices or interacting with the LCI service, and applying certain configurable categorization rules, depreciation rules, trigger rules;
- how to cover gaps for the ecoCost record, by using the Statistical Data service;
- how to generate product retail ecoCosts, to be accessed by consumers during shopping;
- how to generate data relevant to policy makers, interacting with the PEERS service.

Trust and confidence in the data will be paramount to the system’s success. Companies can be very sensitive to internal data being disclosed and security will be a key requirement of every business (and private) user. Consequently, a variety of possible security and privacy mechanisms in the software and IT infrastructure, in various phases of operation of the system, and throughout all presented architectural domains, are extensively discussed in a dedicated section. Early and tractable elements of providing proof-of-concept elements of security in the demonstration nucleus are identified.

Finally, a complete extensive traceability matrix for the functional components vs. system and software requirements is provided.

In conclusion, this document essentially defines the functional architecture of the myEcoCost system which

- is fully integrated and automatic comprised of well-structured software and IT components and functions,
- operates in highly dynamic, ‘near-real-time’ fashion with daily supply chain and business transactions,
- provides appropriate mechanisms to balance data privacy and transparency.