Transparent_Food

**WP2: Quality and integrity in food: a
challenge for chain communication and
transparency research**

SEVENTH FRAMEWORK
PROGRAMME

D2.1: European tracking and tracing backbone
solution requirement analysis

One of the objectives of the Transparent Food project is to create a blueprint proposal for a European Backbone Solution that provides basic and simple functionalities to enable integration of tracking and tracing systems across system boundaries and chains.

In an initial requirements analysis, food sector and product characteristics that have an influence on design and architecture of the backbone have been analyzed. Stakeholders' expectations have been collected and existing systems and solutions to be networked have been evaluated. The results of this work form the basis from which the project will continue onwards to draft the backbone solution specification proposal.

Sector structure

Statistical data on enterprise size distribution in the food sector in the European Union have been collected and evaluated. While the larger enterprises commonly are small in numbers but contribute a relatively large part to the economic outcome and to the percentage of bound labour force, small enterprises still play a major role in various stages of the food sector, especially in primary production and specialized retail stores. Low necessary investments are therefore crucial for success of a backbone solution. Access to the backbone could be provided using the internet and different models of service provision, however temporary outages and poor connectivity have to be taken into account.

Stakeholder expectations

Stakeholders' expectations have been derived from statements of the respective parties participating in a chain. Consumers are demanding convenience foods, a good quality/price relation, dietary value and confidence in safety and quality of food production. Stores and dealers expect due diligence from the whole food chain. Processors and transport is the link with the highest difficulties in documenting all factors for the creditability of traceability. Farmers expect to gather data in an easy and secure way and need to feel confident that this information would not be used against their interest. Common to all stakeholders is the demand to be able to access more information than simple tracking and tracing data. Of special value to the companies in or close to primary production is the ability to also track forward to be able to adjust production and marketing accordingly.

Food properties and handling

IT systems for food traceability face problems distinctive of the food sector. They mostly result from properties of food and the processes applied, such as mixing, dividing, handling of bulk material, processing with transformations, risk of deterioration and immaterial properties. A number of problems can be avoided by following best practices in handling. Others have to be dealt with on a technical level. An important aspect to consider is how identification schemes can be setup that support decentralized storage across different stakeholders and simple and efficient administration and querying at the same time. A basic information set to enable tracking and tracing requires data on the shipping company, shipping timestamp, a product code and a lot number. A "backpack" of further information is required, that allows for tracking depending upon chain scope, e. g. tracking attributes like "organically produced" or "fair trade". A problem to be faced in primary production is the lack of a well-defined and static traceability reference unit. Field sizes or animal groups can change over time and are often not treated uniformely.

Existing tracking and tracing systems

In desk research and with questionnaires, existing tracking and tracing systems have been analyzed as to what kinds of products can be handled with them, what functionalities they provide and what methods, standards and technologies they use, to find out if there is a common ground upon which the proposed backbone solution can settle.

EPC/GS1 is the most common IT standard among the reviewed providers. The majority implements a centralized data store, only few systems support a decentralized setup. Most systems do not require expensive investments, however for some of them special hardware is inevitable. Concerning the IT

environment, a broad diversity can be observed. A variety of operating systems, web server software, programming languages and database systems is in use. It will therefore be important to consider portability in all of the technologies proposed for the backbone solution. None of the providers uses a standardized data dictionary. Semantic harmonization therefore will be one of challenges for data interoperability among systems.

Outlook

Further work is required to find out how methods of identification may be used in a system-independent tracking and tracing backbone solution. Another issue is to start out harmonizing semantics between systems. Methods and technologies used will have to accommodate large amounts of smaller data packages and a large number of small stakeholders at the same time. A feasibility study evaluating technologies and practices in other sectors is currently in preparation and will provide further information.

More information
Dr. Martin Kunisch – Kuratorium für Technik und Bauwesen in der Landwirtschaft e. V. (Germany)
Tel: +49-6151-7001-178; Fax: +49-6151-7001-123; Email: m.kunisch@ktbl.de
Daniel Martini – Kuratorium für Technik und Bauwesen in der Landwirtschaft e. V. (Germany)
Tel: +49-6151-7001-126; Fax: +49-6151-7001-123; Email: d.martini@ktbl.de