Pilot Tracking & Tracing for Awareness in Meat Chain (TTAM)

Aims and background

In Europe, traceability in food supply chains is not only a compulsory requirement (European Commission 2002), but also transparency is highly necessary to guarantee food safety, food quality and consumers' trust in food. Therefore the ability to track and trace as well as to support consumers' awareness of a wide range of food attributes is substantial. Examples here are the nutritional value, place of origin or provenance, ingredients, quality and safety. The meat sector particularly attracted ample attention in this respect as a consequence of major food safety scandals such as the BSE crisis leading to new and stringent regulatory requirements on transparency. Especially from the point of view of the consumers, new IT technologies, in particular tablets and smartphones, are making everyday life easier. These technologies provide access to information anywhere, anytime and smartphones can be used to scan product barcodes and get instantly detailed product information for instance in retail shops.

Results and applications

The **scope of the pilot** is the realisation of a transparency system for Tracking, Tracing and consumer Awareness of Meat (TTAM) in high-throughput meat supply chains. Using batchwise data for such dynamic processes on each stage of the processing means a very challenging operation for all participants in the meat chain.

In the first step of the TTAM conceptual prototype the work mainly focused on beef meat. That excluded sausage, minced and diced meat, as well as pork, chicken and others. In addition the general conditions were restricted to packaged beef emphasising on a group of five different types of information which are: general information, origin, quality, production and recipes. The gathering of data for the traceability and transparency information from all partners along the supply chain is executed by a centralized database which is maintained by a third party. Instead of building a completely new system, the TTAM pilot builds on an existing application called fTRACE.

During the **first year** of the SAF project, the TTAM team investigated the major challenges and opportunities in European meat supply chains in relation to traceability, awareness and EU policies. In particular, the current state of art of traceability in meat supply chains, EU regulation 1169/2011, the Digital Agenda of the EU (DAE), the results of the FI-WARE project and expectations about the Future Internet were discussed. The preliminary conclusions of these investigations pointed to several requirements that will impose important challenges for future internet support of certified traceability in meat supply chains as well as realization of bi-directional communication in meat supply chains. A pilot study on Tracking, Tracing and Awareness in Meat (TTAM) was defined to make a start in concretizing these challenges.

At the end of the **second year**, the new design of a transparency system based on the existing and proven technology of the fTRACE transparency system a mobile app had to demonstrate the novel approach of TTAM in querying, processing and presenting data from the meat chain. In a physical test with 16 volunteers it was checked under realistic circumstances whether consumers like to scan their food products at a retail shop to get detailed information about the food item they are actually buying. Also the need and the applicability of such a modern transparency system in the meat sector had to be verified and discussed. The **conclusion of the results** obtained by the volunteers is positive. The consumers appreciated the new and innovative transparency system. In the workshop the volunteers had only a few open issues, which fit with the plans of the project team. The recommendations and expectations made by the consumer-testers are valuable for the progress of pilot in the future.

However, none of the generic enablers were found applicable for the TTAM technicalcase; the pilot specified and uses the following domain specific enablers:

- **2D barcode reader** and the default browser of a device together with an inbuilt camera to send a query to the server
- **Relational data base** to store static and dynamic data of the products

- **Server query cache** to cache a large volume of query requests to answer quickly identical queries instead of making the same database queries again and again
- **B2C query module** to generate HTML5 documents from consumers to be sent to the mobile device
- **B2B query module** to generate an XML document from business partners to be sent to the web server of the partner

From a technical point of view, in the final release of fTRACE an EPCIS enabler (a global standard based and perhaps further developed as an GE), will be implemented as one of the core functionalities into a so called **Transparency System**. In this way the developed system can be used in many different domains for example in logistics, farming and warehouse management.
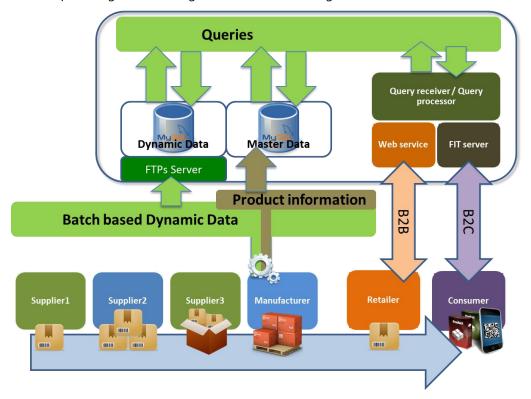

Figure 1: The architecture of fTRACE of the TTAM pilot

Significance and benefits

The design of the new TTAM conceptual prototype provides trustworthy and certified information and addresses the needs of recent regulatory requirements by the EU (e.g. EU Reg. No. 1169/2011) and promotes consumers' trust in meat. Moreover the TTAM pilot covers the whole meat supply chain from farm to retailer/customer. Particularly, the pilot demonstrates to all parties (B2B; B2C and even B2G) how to get easy access for acceptable costs to more information on the provenance of meat (place of breeding; feeding, slaughtering, deboning, etc.) and other characteristics, such as recipes to improve consumers' awareness.

Actually, the TTAM pilot is based on existing and established technology in the meat supply chain in Germany. Finally, the whole system will be extended to use GS1 Global Standards, certified data and FI's generic enablers. In the end, the performance of the pilot design of TTAM led to the idea to propose it for larger experimentation in a trial in the follow up project called cSpace.

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