

Visions for creating food awareness with future internet technologies

Robert Reiche, Richard J. Lehmann, Gerhard Schiefer

Lehrstuhl für Unternehmensführung, Organisation und Informationsmanagement

Universität Bonn

Meckenheimer Allee 174

53115 Bonn

robert.reiche@uni-bonn.de

richard.lehmann@uni-bonn.de

schiefer@uni-bonn.de

Abstract: The consumer demand is following multi-dimensional criteria for food product characteristics. These characteristics include the dimensions quality, safety and integrity of food products. Consumers' expectations and information needs in these areas are changing quickly and force agri-food enterprises to collect and provide reliable information on demand for products they are offering. Today, new solutions are emerging based on mobile devices and applications helping consumers to understand the characteristics of food products they are consuming. However, the information provided by these apps today is limited to information that has to be provided on a legal basis and is not completely covering the different dimensions of consumers' information needs. This paper is linking the previous described information needs with technical measures to create awareness for food products at the company as well as the consumers' level.

1. Introduction

The complexity of the food sector and the diversity of products offered, raise uncertainties for consumers, as well as for agri-food enterprises. Information needs for agri-food enterprises arise preliminary from the compliance with public and private requirements. Transparency on compliance with these requirements has become an important issue in the design and management of food chains and networks [FS10, Re11]. However, the communication of product-related information meeting consumer information needs is still deficient, although the required data is present at the agri-food enterprises. Information needs at the consumer side regarding product quality characteristics originate from personal needs, such as e.g. intolerances against or rejection of certain ingredients or environmental and ethical issues of food production. Information provision to consumers at the point of sale today concentrates on private labels and signals, highlighting product characteristics (e.g. organic products, fair trade) and legislative required information elements such as e.g. list of ingredients. These signals aggregate secured product characteristics and specific related information elements in the background, which is not visible

for consumers. The currently provided information does not cover the information needs of consumers entirely, which leads to a high number of cases where consumers contact agri-food enterprises in order to receive product- and production-related information on food products they are interested in [RSH11]. However, tremendously more information on specific products is available than presented on the packaging. Quality signs and labels include a huge amount of information, e.g. on pesticide acceptance levels or animal welfare that is hidden and not presented to the consumer. In this paper we present a vision for improving the communication of product-related information to consumers in order to improve the awareness for food products.

2. Visions for Smart Food Awareness

The research area of “Smart Food Awareness” in the SmartAgriFood project concentrates on the provision of food safety, food quality and food integrity information between agri-food enterprises and the provision of product-related information towards the consumer based on internet technology. The term “food awareness” focuses on the provision of reliable information about food products, which are relevant to agri-food enterprises as well as consumers. New ways of providing product-related information have to be considered in order to meet consumers information needs to enable awareness for food products and its characteristics. An important driver of new approaches and innovative solutions are the developments of mobile solutions and the increasing distribution of smartphones in the population. The increasing facilitation of mobile devices for accessing the internet enables a great potential to integrate smartphones into the considerations [B111]. Information services provided by agri-food enterprises for their product range represent a possible solution to overcome the current communication deficits, by enabling product-centric information provision following the principles of the Internet of Things and Information Logistics.

Due to the complexity of food products and their production, information from multiple sources is required in order to create awareness for food products and satisfy consumer information needs. However, required information is not always available at a single company in the chain, which presents a challenge and requires improvements of inter-enterprise information exchange. This includes product-related information from the food chain as well as information from certification bodies in order to understand criteria for certification as well as product information from trusted parties such as product tests. The provision of this information requires today huge efforts to meet individual information needs. The vision that has been elaborated by the SmartAgriFood project [RSH11] is depicted in Fig.1.

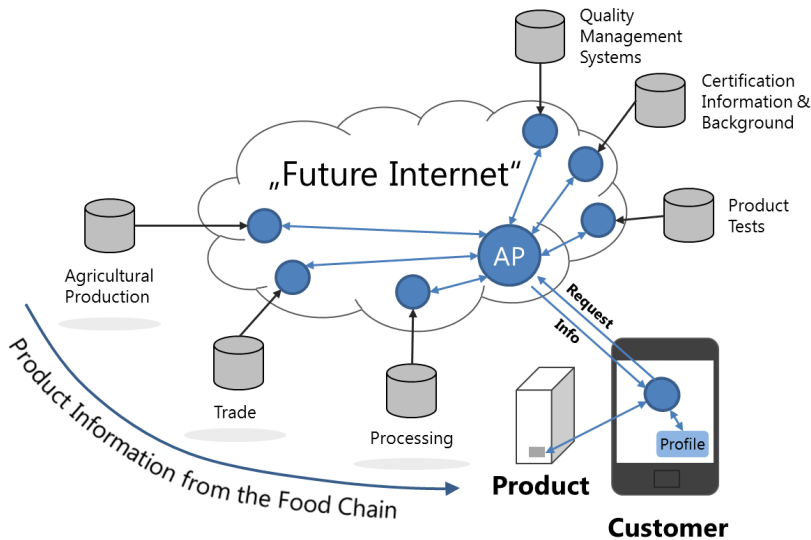


Figure 1: Vision for Food Awareness

Product units at the point of sale are equipped with an identification technology (e.g. barcodes, NFC or other types of RFID) that is readable from the consumers' smartphone. Additionally, image processing technology for identification of product labels is an option. The consumers' smartphone is equipped with a compatible application that enables the access to the Future Internet and handles the request for product information as well as the response from the network. The request is formulated including personal information needs and the selection of trusted information sources stored in a personal profile. The provision of information from multiple sources is enabled by the future internet architecture (FI-WARE) that considers different technologies implemented in Access Platforms (AP), such as interfaces to networked devices, cloud computing, information services, security mechanisms and standards for information exchange [FI11]. This infrastructure has to be adapted to existing IT-infrastructures in order to make product-related information accessible.

3 .Discussion

According to [RSH11], the current limitations and constraints for the provision of product-related information cover two areas. The first area is the information exchange between enterprises in the food supply network, due to the fact, that most of the information is generated in the preceding stages of the food retail companies. The second area covers the information provision from agri-food enterprises to the consumer at the point of sale.

Organisational and technical constraints and limitations for the provision of product-related information through the food supply network to the point of sale are related to

missing standards for information exchange and interfaces, harmonisation and standardisation of traceability and identification information schemes as well as the absence of food product profiles (semantics) for describing characteristics of food products [RSH11].

The limitations and constraints in the communication of product-related information to consumers are related to the selection of feasible information elements and the way of presentation, that allows direct understanding and support for consumers, as well as technical issues with different smartphone components and huge differences smartphone operating systems that make development of solutions more complex in order to be reliable. This includes the communication of information elements that are already captured in quality signs and labels that require additional efforts to capture the complete dimension of requirements they cover. Hereby the support by facilitating networked devices such as smartphones or terminals within the shop could be a chance to improve communication with consumers.

4. Conclusion

The realisation of the presented vision asks for tremendous efforts in different areas. The most pressing challenge is the harmonisation of standards and the development of food profiles covering all aspects of product information elements in order to improve the information exchange in the food sector. Additionally, information that is not covered by quality signs and signals available today and might be demanded by consumers (e.g. for carbon footprint) has to be collected in a standardised form and presented accordingly to other sustainability aspects such as e.g. social aspects covered by Fair Trade labels.

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