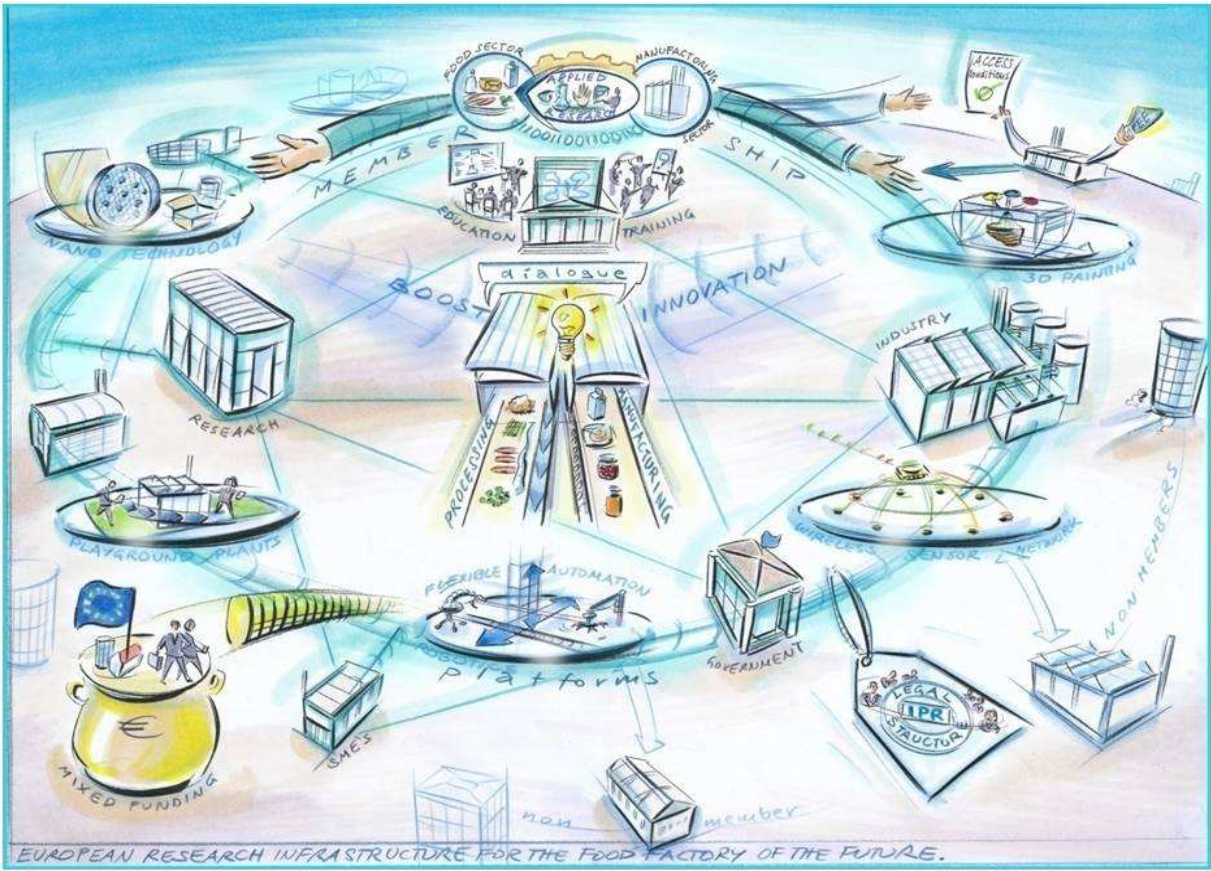


Conceptual Design Report (CDR) for a Research Infrastructure (RI) to facilitate the implementation of Food Factory of the Future



Project summary sheet

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1. WHY a CDR

1.1 Context

European Food Manufacturing in 2025 may be far more automatized, sustainable, flexible, and intelligent and based on novel business models. How and why? What are the needs and which needs may be covered from inventions made for other sectors? These are some of the questions in focus. Based on visions, mapping and analyses made with and by stakeholders from the food sector and from the manufacturing technologies sector, FoodManufuture has performed a Conceptual Design Study for a European Food Manufacturing Research Infrastructure. The infrastructure will build on existing infrastructures and give access from any part of Europe. The Research Infrastructure will provide easy access to state of the art test facilities and thus aims at boosting competitiveness and innovativeness of the food manufacturing sector through cutting-edge research, dedicated and involving knowledge transfer, and motivating education. Based on the input received from the consortium of FoodManufuture and the outcomes of two European workshops, colleagues from DIL and Fraunhofer contributed to draft the overall CDR which will be presented in the Final Conference on 18th December 2013.

1.2 Aim of CDR

The conceptual design report (CDR) aims to present a valuable, relevant concept for a new research infrastructure (RI) to serve the current and future needs of the European food industry: **the Food Factory of the Future**. It should not be considered to be a ready-made solution for the food processing and manufacturing sectors, but should act as basis for further discussion with private and political decision makers in order to implement complementary ideas or suggestions. The CDR will visualize that our approach has a high potential for future Horizon 2020 Research Infrastructure actions by proposing integration of and access to existing national research infrastructures. Where limitations are recognized we propose how it could be overcome.

The RI Food Factory of the Future will present itself as a privileged field for testing, piloting, and demonstrating new and emerging food production innovations. In order to meet the need to extract more value from the R&D and innovation investments, a critical aspect in the current period of severe economic crisis, Horizon2020 will offer stronger support to the market take-up of innovation. This will imply a higher focus on the realization of proof-of-concepts, pilot lines and demonstration plants. It will imply as well a better use of the potential of research infrastructures, as well as setting technical standards, and pre-commercial procurement as will be provided by this RI. The pilots and demonstrators network provided by the RI Food Factory of the Future aims at fostering synergies between food researchers and production technologies developers, where technologies are integrated and demonstrated in real or quasi-real settings.

2. Concept of the proposed Research Infrastructure

The main **objective** of the new RI is to improve the competitiveness in the European food sector and manufacturing sector. Therefore we propose that a new research infrastructure will be designed that offers appropriate capabilities, services and activities that can be utilized by the industry (large and small) and researchers and will finally boost innovation in the food processing and the manufacturing technologies sector.

The **main beneficiary** of the new RI will be the food processing industry and manufacturing technologies industry dealing with food related issues, which explicitly includes SMEs. To achieve the aim and to meet the challenges, the new RI will:

- form an **inspiring network** of innovative existing pilot size factories and pilot plants to develop and demonstrate manufacturing solutions for the food processing industry.
- be a **distributed location**.

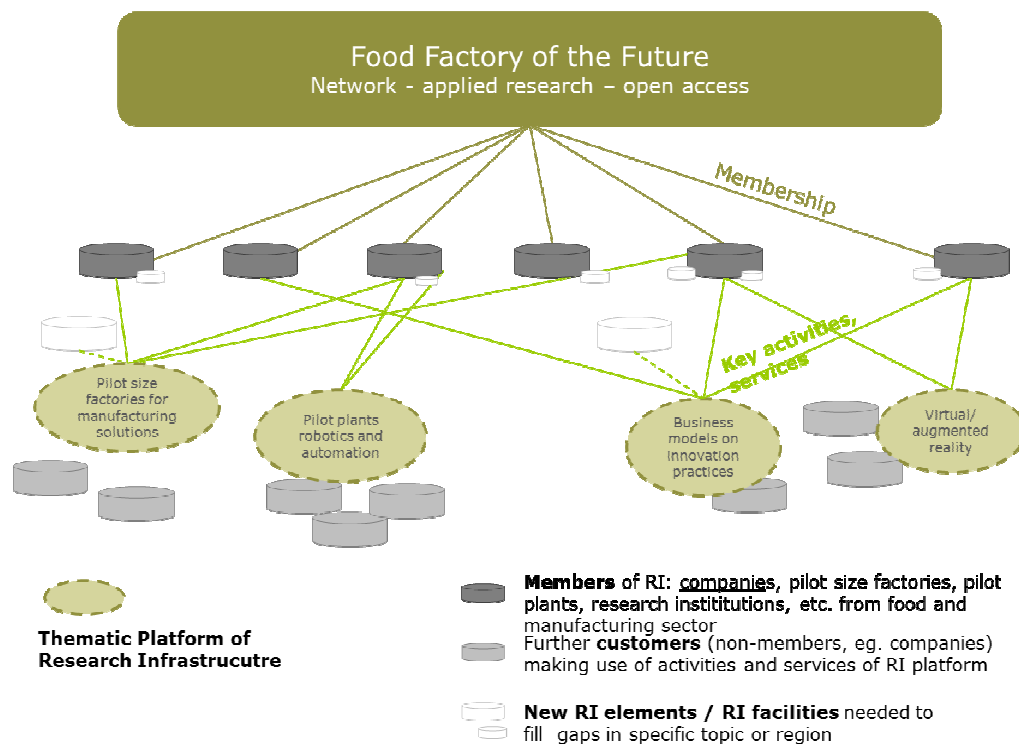


Figure 1: Concept of RI Food Factory of the Future

- build on existing RI elements (research facilities, services, etc.) as a basis to **develop a new generation of combined facilities, resources and related services** to provide new manufacturing solutions
- facilitate the **utilization and maximization of capacities, knowledge and know-how** by industry.
- meet expectations and needs of the main RI beneficiaries in a **long term perspective**

- **focus on applied research** and transfer cutting edge technologies and information from the manufacturing sector to the food sector and supporting basic research to applied research by considering education and training.
- have an **inclusive membership** which is open to a broad range of members
- give open access to industry esp. SMEs to utilize the RI
- have a **flexible structure to adapt** its focus on future demands and challenges.
- **create trust** among involved stakeholders in the food manufacturing sector.
- provide a balance between confidentiality and exploitation.
- be **industry driven**. This will be reflected in the overall management structure, in the decision making rules and the operational structure.
- be funded by a mixed funding scheme from public and private interested parties
- have platforms dealing with key topics identified as gaps of the existing research infrastructure in Europe such as:
 - **Pilot size factories for developing, testing and training of new manufacturing solutions** for the food processing industry
 - **Pilot plants for implementation of robotics and automation** in food production
 - Collection of **business models on innovation practices** in the food production sector
 - **Virtual/augmented reality** for simulation and training
 - Research facilities for **radical innovations** in food technology
 - **Nanotechnology** to produce **tailor made surfaces**
 - Improved **packaging solutions** for food applications
 - Assessment of **environmental impact** of food processing

Regarding the RI **platforms**, they will deal with key topics identified as gaps in current research infrastructures (see above). These platforms will consist of an own sub-network with stakeholders from science and industry, if needed also from society and public authorities. Each platform will describe how they can give added value to the industry as main beneficiary of the RI by respective key activities and services. Main part of this exercise is the description of new RI elements which are currently missing at research institutions to complete the overall picture.

Additionally, education, training and knowledge & technology transfer units will be set up to facilitate innovation processes. These units can be platform specific or serving all platforms.

3. Value proposition for stakeholders

The new RI Food Factory of the Future will give added value to the food processing and manufacturing industry by:

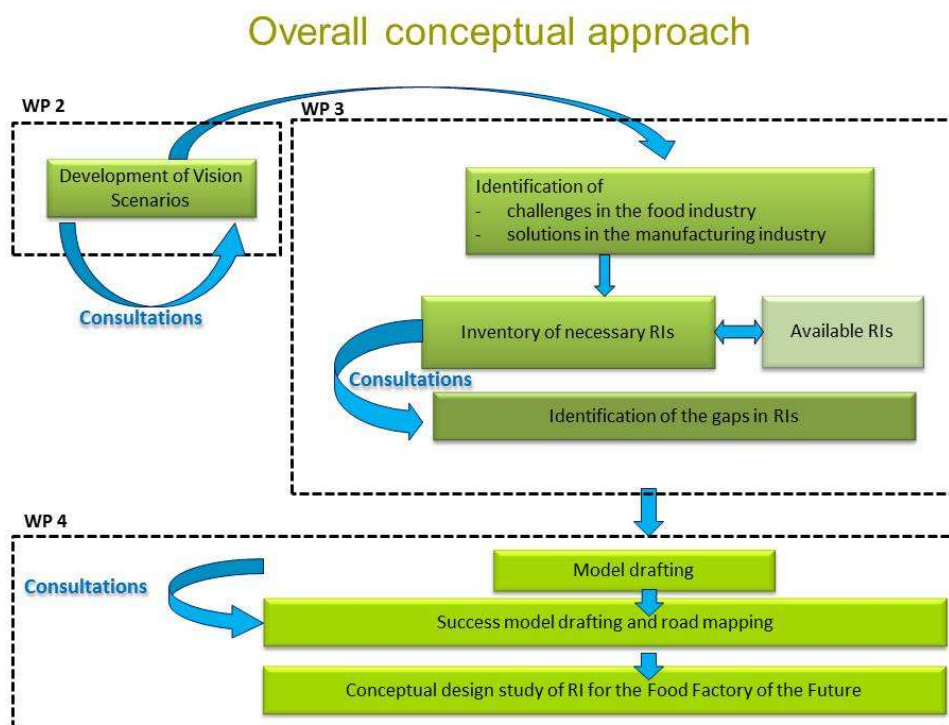
- Providing a meeting place for the food producing sector and the machineries and equipment manufacturing sector to foster the dialogue between both sectors, in order to identify new ways to interact and to boost interdisciplinary research activities.
- Giving access to technologies and demonstration activities to maximize the utilization of knowledge generated in academia.
- Offering the industry customized staff training activities.
- Having an transparent and fair intellectual property rights (IPR) regime

The new Research Infrastructure (RI) will **meet** and take into account the social, economic and ecological **challenges** the food and manufacturing sectors are facing today (e.g. sustainable food production, healthy and safe food) according to its policy and activities **impact** of the new RI is expected to foster the following areas:

- Employment: sustain and create jobs
- Consumer expectations: healthy and safe foods
- Economy: Create new business through products, processes and services with higher added value considering the pricing pressure in the sector
- Environment: Promoting sustainability in production and respecting environment and ensure a more effective use of resources
- Business: Building up trust among stakeholders in the food processing chain
- Foster entrepreneurship
- Knowledge and education: create and maintain new advanced knowledge and skills in Europe on high added-value processes and technologies, as well as entrepreneurial skills.

Consequently, the new RI Food Factory of the Future will give added value to European consumer who will have better food and the European food industry which will be more competitive

4. Approach



The process towards the CDR has involved stakeholders from the food and manufacturing technologies industry sector in a bottom-up process in order to present a research

infrastructure (RI) that builds upon analyses of cutting-edge visions and gaps regarding manufacturing technologies, food chain management, sustainability, business models, technology transfer and education. In this way, the novelty, research quality and effect on innovation of this targeted CDR will enhance the scientific performance of the European Research Area and – through bridging and bonding existing facilities and excellence of food science and manufacturing solutions science – further increase its attractiveness, visibility and impacts.

The resulting infrastructure description addresses Europe's urgent need to achieve and maintain an internationally leading position in the food industry and related research areas. The suggested infrastructure focuses on novel trans-disciplinary approaches. This CDR will foster the science based innovation capacity of the sectors.

At policy level, the CDR and the assessment of its technical and economic feasibility in particular will provide a sound basis for agreeing on the most promising concept of a research infrastructure with European dimension that will speed up innovation in the food sector. In this way, it will give directions to decision makers in research policy with regard to the design and activities of Horizon 2020 and national, regional research and innovation programs. The dissemination plan of this CDR will further create awareness and increase involvement of the stakeholders.

In sum, the design of an efficient, flexible and targeted research driven innovation structure will enable the food sector to obtain an increased benefit from the European research results and hereby fulfilling the crucial need of adding value to the food sector development in Europe through increased growth and competitiveness in both the food and manufacturing sector.