Towards a European Food, Nutrition and Health Research Infrastructure – Organisational aspects

BACKGROUND

To guide EU-citizens and societal stakeholders to the healthy and sustainable diet of the 21st century, a radical food systems transformation is required, based on scientific breakthroughs and technological innovations. A Research Infrastructure on Food, Nutrition and Health (FNH-RI) will be created to enable researchers to generate transdisciplinary evidence and expertise based on a citizen-centred food systems approach. It will serve researchers with DATA, FACT (Facilities and Tools) and TED (Training, Education and Dissemination).

ICT INFRASTRUCTURE BASED ON E-NEEDS

The FNH-RI must serve researchers with easy and secure access to DATA, FACT and TED resources, in a way that fits into the research practice of users. In the hub & national nodes model for the organisation of the FNH-RI, the central hub will be responsible for the technical ICT infrastructure and for providing access by researchers. That task will be based on a Data Management Plan (DMP) that will be updated yearly by the board of the FNH-RI with guidance of the data protection officer of the research infrastructure. The DMP aims to maximize FAIR principles that guarantee openness, interoperability and reuse of data in research, industrial and societal contexts.

Central parts of this infrastructure are the web-based access for researchers and dedicated search engines that link researchers (users) to DATA (made accessible by ontologies), FACT and TED resources. Where most DATA and FACT are generated by external public and private stakeholders to which the FNH-RI provides access and integration tools, the central hub will create and manage a pan-European Citizen Data Platform (CDP), a facility in which citizens are incentivized to share their data on food, lifestyle and health practices. Under the General Data Protection Regulation (GDPR) citizens own the data that retailers (loyalty cards) and tech companies (wearables) collect and can share them through informed consents. An app to manage these consents and make the data available will be constructed.

All data accessible through the FNH-RI will stay under ownership and maintenance of the different participants of the infrastructure. FNH-RI participants will strive together to increase the FAIR-ness of all data resources that are brought together. FNH-RI will provide facilities for researchers to deposit data resulting from their research in FNH-RI at no cost. As much as possible, data will be made openly available under COO (equivalent to “public domain”); the exception being personal data from the CDP that cannot be safely anonymized, for this the Scientific and Ethical Advisory Board (SEAB) will review access requests to the dedicated Microlab (open metadata will make sure this data is findable).

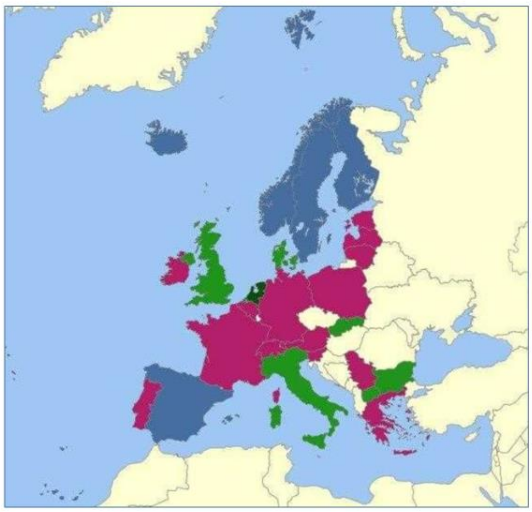
The estimated magnitude of FNH-RI data with a huge amount of related metadata is in the order of PetaBytes. Only a fraction of this data needs to be send over the internet for an individual data request. Authentication and authorisation services will be implemented. Hardware and services will be rented in from partners in the FNH-RI or from commercial services and will be as much as possible based on open standards, open software and existing systems (e.g. FIware, EduGAIN, ORCID), in collaboration with adjacent RIs.

STAKEHOLDER COMMITMENT

The commitment of stakeholders to the FNH-RI is very strong and developing fast (figure 1): in 6 member states there is political commitment at ministerial level, in 5 others this is emerging. Workshops

Krijn J. Poppe, on behalf of the FNH-RI consortium, Wageningen, 1-5-2019

in the design projects EuroDISH and RICHFIELDS as well as in other (inter)national projects with FNH-RI type of activities have also shown commitment from the private industry and individual researchers and their organisations.



Initiators FNH-RI (n=4):
Netherlands (lead), United Kingdom, Denmark, Italy

National Nodes (n=6, connected to FNH-RI):
Denmark, Italy, Macedonia, Netherlands, Slovakia, United Kingdom

Emerging National Nodes (n=5, not yet connected to FNH-RI):
Finland, Iceland, Norway, Spain, Sweden

Participating institutes (no National Node present): Austria, Belgium, Estonia, France, Germany, Greece, Ireland, Latvia, Lithuania, Poland, Portugal, Serbia, Slovenia, Switzerland

Figure 3. Development of the FNH-RI consortium (Status quo by February 2019)

USERS AND ACCESS

The users of the FNH-RI are members of the research community in Food, Nutrition and Health, with disciplines like food science, human nutrition, health, medicine, economics, econometrics, marketing, sociology, psychology, public administration, artificial intelligence and several related fields that study the behavior of consumers in relation to food, lifestyle, nutrition and health. The majority of these users work in universities and public research institutes, including academic hospitals, but there are also researchers working in private research institutes.
Access will be provided to all researchers, in public and private institutions that want to use the FNH-RI according to the Open Access principles. In principle this will be without registration, at no costs, with the exceptions of fees for some TED activities and IPR or service conditions of FACT and DATA provided by third parties to which the FNH-RI links. An exception to these principles are the individual data from the CDP that will only be accessible via a (virtual) Microlab facility after screening of the research plan. The access to the Microlab will be restricted to researchers from universities and public research organisations in the countries that are involved in the organisation and financing of the FNH-RI and take part in the CDP, given the sensitivities with consumers that provide the data on access by commercial companies. The researchers from universities and public research organisations can be financed for their research project by a company, depending on ethical rules of their own organization. Digital services will be exposed under the catalogue of the European Open Science Cloud (EOSC).

PREPARATORY WORK AND PLANNING

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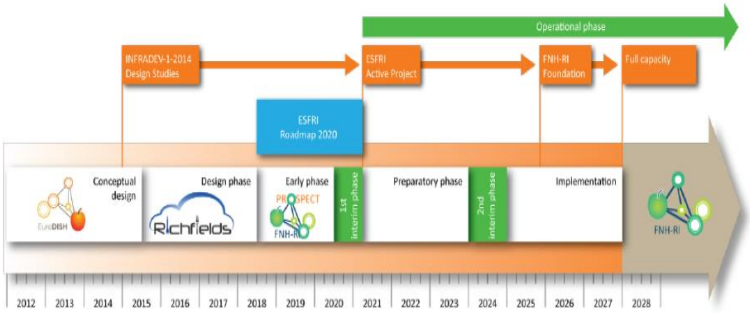
Development of the concept and the design of the FNH-RI was done in the European projects EuroDISH and RICHFIELDS. Other European and national projects contributed as well. Feasibility testing included workshops and surveys with users and an inventory of consumer apps that could provide data for the CDP. The technical design is relatively straightforward. There is a clear business case for the FNH-RI, as demonstrated with a business model canvas. The site of the hub of the FNH-RI will be in Wageningen, the Netherlands, on the campus of one of the leading European universities on food, nutrition and health.

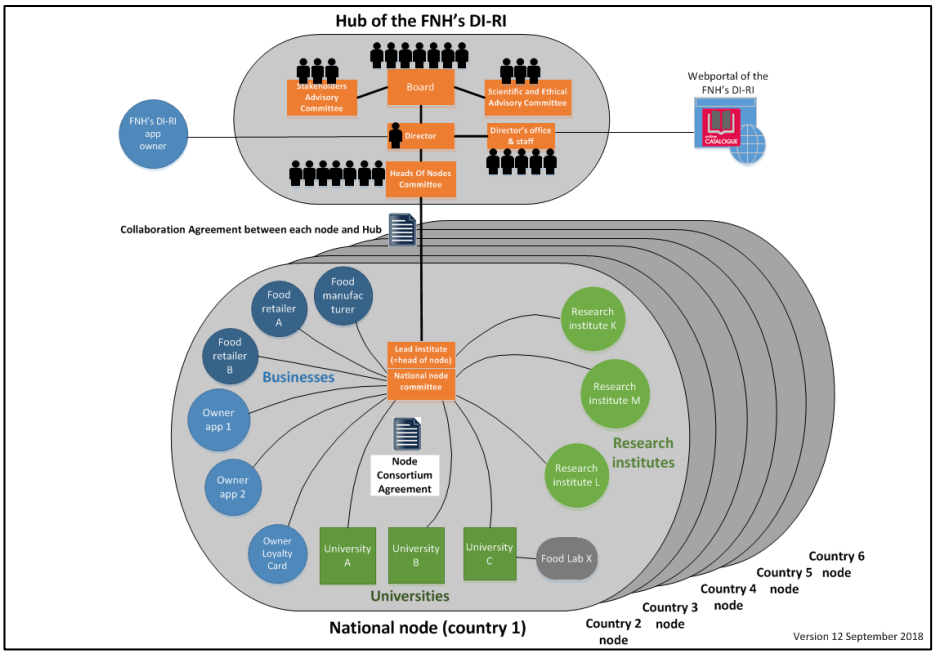
The preparatory work is planned (figure 2) and is based on an agile approach in which the designed governance structure and management of the FNH-RI is responsible for releasing a minimum viable product that is improved over time. Over time it will grow mature by including more DATA, FACT and TED services and scaling out to more EU countries and beyond.



Time line of the Food, Nutrition and Health Research Infrastructure.

GOVERNANCE AND MANAGEMENT

The governance structure responsible for managing the preparatory phase and govern the FNH-RI is organised through a Foundation under Dutch law, the FNH-RI Foundation. This foundation is already operational. Its board consists of delegates of the National Nodes who already govern the preparation of the proposal for the ESFRI roadmap. The National Nodes themselves convene in an Assembly of Head of Nodes once the number of nodes is larger than 10. It is foreseen that it eventually becomes accountable to the Assembly of the funding Members States. The Board appoints a director of the hub that operates a small staff. Experts from Nodes will be directly involved in the project(s) to construct the FNH-RI.



A Scientific and Ethical Advisory Board (SEAB) and a Stakeholder Advisory Committee (SAC) are foreseen (figure 3).

National Nodes, which are linked to the hub and FNH-RI Foundation through a Collaboration Agreement

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have considerable freedom to organise the national universities, research organisations and –where appropriate and to a certain extent – companies (with research labs or data). This is done via a Node Consortium Agreement as a minimum legal structure that can also be used for national finance and road map applications. Management will be done with the help of key performance indicators. Scientific monitoring and evaluation will include a review by a tri-annual external International visitation committee. The effect of the ERIC status on this governance structure will be further detailed.

HUMAN RESOURCE POLICY

The staffing plan of the hub foresees about 10 fte, mainly to operate the ICT infrastructure for access by researchers, to organised TED services and to set up and run the CDP. One of the staff will act as Data Protection Officer. The director of the hub will serve as secretary of the board of the FNH-RI Foundation and the advisory committees. Experts from the nodes will be involved as much as possible in construction tasks and projects. Researcher mobility will be supported by specific TED services. In the human resource policy special attention will be paid to the transdisciplinary aspect of the FNH-RI including citizen science, big data analysis, data protecting law and collaboration between natural and social sciences.

FINANCES

The yearly costs for construction the FNH-RI are estimated at € 5.5 mln. per year, excluding costs of operating the nodes and specific activities that the nodes intend to do for national purposes. 80% of these costs are personnel costs, renting IT services is the other major cost item. Annual operation costs after the construction are currently estimated at € 2.5 mln. Investments and operation costs will be financed from ESFRI-initiated EU projects, with additional funding from the nodes of the member states that share costs with a formula based on the GDP (Gross Domestic Product) per country. National nodes may request their government for larger budgets to be able to run projects in research or research infrastructure that cater for national priorities.

RISKS

Risks of the project to make the public FNH-RI a success are competition from big tech companies (like Apple or Google), publishers (that store research data) and statistical offices (that force companies to provide big data by law to create micro-data panels) or a lack of willingness with consumers to share data. An agile approach and collaboration with organisations that represent consumer's interests could mitigate those risks. The interest in food policy varies between political parties, which involves a political and financial risk.