ELIXIR-EXCELERATE: Fast-track ELIXIR implementation and drive early user exploitation across the life-sciences.

Project Information

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Periodic Reporting for period 3 - ELIXIR-EXCELERATE
(ELIXIR-EXCELERATE: Fast-track ELIXIR implementation and drive early user exploitation across the life-sciences.)

Reporting period: 2018-09-01 to 2019-08-31
ELIXIR - the European infrastructure for biological information - connect local, national and European bioinformatics resources and provide the standards, tools and training needed to manage life sciences data. ELIXIR brings together national bioinformatics infrastructures in our 22 member states with EMBL-EBI into a coordinated Europe-wide infrastructure.

Following prioritisation of European research infrastructures by ESFRI, the ELIXIR-EXCELERATE project (2015-2019) was awarded to accelerate the construction of ELIXIR. ELIXIR-EXCELERATE developed ELIXIR’s service platforms, established infrastructure operation and internal processes, and launched the ELIXIR Innovation and SME programme. The project was driven by use cases from four research communities: marine metagenomics, plant sciences, rare disease and human genomics. Thus, ELIXIR-EXCELERATE supported the early exploitation of infrastructure services by user communities across the life sciences. The original four use-cases have now expanded into a generic mechanism where ELIXIR have established partnerships with over ten different research communities (https://elixir-europe.org/communities).

A key aspect of the ELIXIR-EXCELERATE strategy was to support the development and integration of national ELIXIR Nodes. By strengthening national resources across Europe, ELIXIR can scale and sustain resources to meet large, diverse and geographically distributed data management needs in the life sciences.

Work performed from the beginning of the project to the end of the period covered by the report and main results achieved so far

ELIXIR’s service Platforms (Data, Tools, Compute, Interoperability and Training) consolidate national services from ELIXIR Nodes and provide the foundation for a European data federation. For instance, ELIXIR-EXCELERATE has supported the delivery of ELIXIR’s Authorisation and Authentication Infrastructure (ELIXIR AAI) as the user-facing component of the ELIXIR-wide integration of services. By providing a unified single-sign-on system where users can access computational services across the whole of Europe with their home institute credentials, ELIXIR opens up national clouds, tools and data services for federated access. Together with data access standards, such as MIAPPE for plant phenotyping or GA4GH for human genomics, this provides the basis for an integrated European approach to data management. For example, through ELIXIR-EXCELERATE, eight European plant phenotyping centres are now providing routine access to MIAPPE encoded plant data via a unified data interface and an ELIXIR-wide federated search (https://urgi.versailles.inra.fr/faidare/) and the ELIXIR plant community are now taking this forward to incorporate further centres across ELIXIR’s Nodes. The Federated EGA - a set of services that support secure transnational collaboration and access collaboration on human genomics and biomedical data - is now being adopted as a solution by a growing list of European projects and will be used as a basis for the 1M European Genomes Initiative.

An important outcome of ELIXIR-EXCELERATE is the development of long-term roadmaps for the ELIXIR Platforms. The implementation of these roadmaps - and so the sustainability of the ELIXIR-EXCELERATE investments - is funded by the ELIXIR member states through the ELIXIR 2019-2023...
Scientific Programme.

Long-term sustainable open data resources, including the submission databases for e.g. DNA sequences, are a key part of a European infrastructure for biological information. ELIXIR has designated a set of Core Data Resources – European data resources that are of fundamental importance to the life-science community and the long-term preservation of biological data – and engaged in discussions with funders on how to best support the long-term development of this ecosystem. ELIXIR-EXCELERATE delivered the indicators and selection process for ELIXIR Core Data Resources and supported the designation of the first set. This work has been internationally noted; ELIXIR and the Core Data Resources concept has been instrumental in shaping the Global Biodata Coalition, an initiative by an international group of funders (including NIH, HFSP and the Japanese AMED agency) to support the international data ecosystem.

Building on the experience from ELIXIR Core Data Resources, we have now also selected a set of ELIXIR Recommended Interoperability Resources that define ELIXIR’s Interoperability Architecture and provide a basis for consistent data management practices. The work on Core Data Resources, ELIXIR Recommended Interoperability Resources and the value of robust, continent-scale processes for identifying research data resources as scientific infrastructure, has been recognised by funders as best-practice: the ELIXIR recommendations now form part of the ERC’s data management guidelines to life-science grantees.

ELIXIR Training, Capacity building and Staff Exchange - all initiated during ELIXIR-EXCELERATE and carried forward in the 2019-23 Programme - support the long-term development of people in our Nodes and generally throughout the ERA. For example, the ELIXIR-EXCELERATE Training Work Package – via national programmes in ELIXIR Nodes - supported training for 23,000 trainees from 60 countries in over 1,000 training events (2,870 days of training).

Progress beyond the state of the art and expected potential impact (including the socio-economic impact and the wider societal implications of the project so far)

The consolidation of data services across Europe into coordinated platforms is a major step towards an integrated European data ecosystem and directly benefit Europe’s life scientists. ELIXIR services are now easy to find and can be connected into a comprehensive service bundle that directly support a research community’s needs. Thus, the scientific outcomes of the ELIXIR-EXCELERATE project is used in new European projects such as EJP RD, RD-SOLVE, CINECA, eTRANSAFE and EUCANCAN that leverage ELIXIR’s data resources and federating services. ELIXIR, and the momentum created by aligning national investments within a coordinated framework, is globally recognised and discussions are ongoing with the Australian BioCommons and the NIH (National Institutes for Health, USA) on collaboration agreements and related activities.

ELIXIR-EXCELERATE also supports the development of European biotech: ELIXIR’s Innovation and SME Forum provides a mechanism for people from industry and academia to learn about the technical services provided through the ELIXIR Nodes and to exchange knowledge and start collaborations to
tackle bottlenecks in the data driven life science sector. During the ELIXIR-EXCELERATE project these events reached more than 600 individuals (47% came from the public sector and 53% from industry) including 180 different companies in nine countries.

In summary, the ELIXIR-EXCELERATE project has been critical for ELIXIR’s long-term operation. As ELIXIR now starts its 2019-23 Scientific Programme the technical and scientific experts in our national Nodes have formed strong networks that work with and within user communities across Europe. Indeed, most developments from ELIXIR-EXCELERATE will be taken forward and expanded in the transnational collaborative efforts of the ELIXIR 2019-23 Scientific Programme.

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