

4.1 Final publishable summary report

Executive summary

Today's scientific research is conducted not just by single experiments but rather a sequence of related experiments or projects linked by a common theme that lead to a greater understanding of a combination of the structure, properties and behaviour of components of the physical world. Examples of this are:

- The elucidation of the operation of biological processes so that better treatments for disease may be discovered.
- The structure and properties of group of chemical compounds or metals to find superior electronic conductors or
- The understanding of the interoperation of factors in the environment that may lead to breakthroughs in avoiding unwanted long term effects.

The PaN-data consortium is an ongoing collaboration that brings together major multidisciplinary scientific research facilities (also known as Research Infrastructures in this context) to construct and operate a shared data infrastructure for neutron and photon laboratories. Such an infrastructure will enhance all research done in this community, by making data accessible, preserving the data, allowing experiments to be carried out jointly in several laboratories and by providing powerful tools for scientists to remotely interact with the data.

The PaN-data Europe project aimed to enhance the scientific research process by working towards a common infrastructure between collaborating facilities across Europe. The project had a number of components that try to optimize the research process, ranging from provision of common data formats to ensuring that experimenters have easy access to appropriate scientific publications to support their work and guide the experimental process. These sequences of linked experiments may well involve the use of a number of geographically distributed resources; an example of this are biological studies that may require visits to crystallization, nuclear magnetic resonance (NMR), electron microscope resources followed by data collections at large national synchrotron X-ray facilities.

Specifically, PaN-data Europe focussed on the following aspects of the common infrastructure:

- Standards for a common data policy framework
- Standards for common user information exchange
- Standards for scientific data
- Strategy for data analysis software infrastructure
- Integration and cross-linking of outputs

Comprehensive studies and surveys in the above areas led to specific recommendations for adoption of standards or practices to enhance the common infrastructure. Furthermore, particularly in the last of these aspects, further directions were identified with promise for greater impact going beyond existing practices, for example in long-term preservation of experimental data and associated resources. The next step is for the PaN-data consortium to begin implementing the recommendations, developing the common infrastructure and realising the benefits, and plans are in place to achieve this.