

Basic services to the community – facilitating the application of basic services through interactive case study textbooks

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Abstract:

Data and software literacy are essential for researchers, data management professionals, and data stewards across various disciplines.¹ Base4NFDI addresses these aspects by providing support in targeted areas, such as for example creating and applying data and software management plans. In this contribution, we present an instructional design based on discipline-specific case studies and interactive textbooks to train users in tools and solutions of the basic services. This approach aims to facilitate both easier adoption within as well as greater involvement from subject-specific communities. The design is relevant for Base4NFDI, as researchers and practitioners need to see how these basic services are applied to concrete problems and research questions to bridge the gap between theoretical knowledge and practical application. The instruction design (Samoilova et al., 2024) was developed for the Berlin-Brandenburg Competence Centre for Data Literacy QUADRIGA² (Buchholz et al., 2024) for researchers in the area of Digital Humanities and Public Administration, yet it can also be adapted for use in other disciplines.

The instructional design focuses on transforming real research practices into online interactive educational resources available on-demand and asynchronously. This approach aims to make learning more relevant, engaging, and applicable to real-world research scenarios. While scalability and standardization of basic services are crucial for cross-disciplinary applicability, case studies (Foran, 2001) coalesced with a problem-based learning approach (Kay et al., 2000) can present solutions/tools at the center of basic services within carefully designed problems/research questions, enabling users to learn about the tool based on real-life authentic tasks. Such case studies can illustrate the use of services in concrete communities, highlighting specific demands, challenges and potential solutions at various levels, including research-specific, organizational, and technical aspects. For example, one such case study illustrating a coherent data flow across multiple Base4NFDI services for humanities, historians, information scientists, etc. could be: identifying letters in a collection (PID4NFDI), classifying

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the letters (TS4NFDI), creating OCRs of the letters and transforming the data and metadata (Jupyter4NFDI) and finally publishing the results within the knowledge graph (KGI4NFDI).

The training format is delivered using interactive textbooks, that can be implemented as Jupyter books (Chen & Asta, 2022). The hierarchical structure, where the smallest unit is a chapter section, enables users—both as learners and as instructors using these materials for further trainings—to easily navigate and have a high level of control over the learning experience. Embedded interactive exercises with feedback ensure engagement and learning on a concrete task. Additionally, Jupyter books allow to easily modify or re-structure the content, including when collaborating. For instance, each chapter or section of the textbook could be developed by the specific Base4-project in collaboration with various partner-projects. Discipline-specific communities can also incorporate materials from Base4NFDI into their own training programs.

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