

NFDI4OBJECTS Research Data Management Competency Framework

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Foreword

Research Data Management Competency Framework for the Research Data Infrastructure for the Material Remains of Human History (NFDI4OBJECTS)

Acknowledgements

Abbreviations

- **GIS** Geographical Information Systems
- **RDA** Research Data Management

1 Introduction

1.1 Background

This is a book created from markdown and executable code.

1.2 Objective

1.3 Target audiences

Part I

Current state

2 Overview

3 Catalogue of existing courses and trainee programmes

3.1 Data sources

- “IANUS - Forschungsdatenzentrum Archäologie & Altertumswissenschaften” (n.d.)
- Schmidt (2024)

4 Analysis

Part II

NFDI4OBJECTS Competency framework

5 Framework structure and components

Figure 5.1: infographics

5.1 Areas

5.2 Domains

5.3 Levels

5.3.1 Learner-Beginner

Fundamental awareness. You have a common knowledge or an understanding of basic techniques and concepts.

5.3.2 Novice

You have the level of experience gained in a classroom and/or experimental scenarios or as a trainee on-the-job. You are expected to need help when performing this skill.

Focus on developing through on-the-job experience; You understand and can discuss terminology, concepts, principles and issues related to this competency; You utilize the full range of reference and resource materials in this competency.

5.3.3 Intermediate

You are able to successfully complete tasks in this competency as requested. Help from an expert may be required from time to time, but you can usually perform the skill independently.

Focus is on applying and enhancing knowledge or skill; You have applied this competency to situations occasionally while needing minimal guidance to perform successfully; You understand and can discuss the application and implications of changes to processes, policies, and procedures in this area.

5.3.4 Independent

You can perform the actions associated with this skill without assistance. You are certainly recognized within your immediate organization as “a person to ask” when difficult questions arise regarding this skill.

Focus is on broad organizational/professional issues; You have consistently provided practical/relevant ideas and perspectives on process or practice improvements which may easily be implemented; You are capable of coaching others in the application of this competency by translating complex nuances relating to this competency into easy to understand terms; You participate in senior level discussions regarding this competency; You assist in the development of reference and resource materials in this competency.

5.3.5 Master-Expert

You are known as an expert in this area. You can provide guidance, troubleshoot and answer questions related to this area of expertise and the field where the skill is used.

Focus is strategic; You have demonstrated consistent excellence in applying this competency across multiple projects and/or organizations; You are considered the “go to” person in this area within NIH and/or outside organizations; You create new applications for and/or lead the development of reference and resource materials for this competency; You are able to diagram or explain the relevant process elements and issues in relation to organizational issues and trends in sufficient detail during discussions and presentations, to foster a greater understanding among internal and external colleagues and constituents.

5.4 Sources:

- Data, Strategy and Innovation (DSI), Health Information and Intelligence (HII), WHO Western Pacific (n.d.)
- Schüller, Busch , and Hindinger (2019)
- “Competencies Proficiency Scale” (2017)
- Petersen et al. (2023)

6 Competency area 1: Data Generation

6.1 Domain 1: Data management planning

6.1.1 Learner-Beginner

6.1.2 Novice

6.1.3 Intermediate

6.1.4 Independent

6.1.5 Master-Expert

6.2 Domain 2: Data creation

6.3 Domain 3: Data collection

6.4 Domain 4: Data maintenance

7 Competency area 2: Data Processing

7.1 Domain 1: Data entry

7.2 Domain 2: Data cleaning

7.3 Domain 3: Data validation

7.4 Domain 4: Data verification

7.5 Domain 5: Data transformation

8 Competency area 3: Data Analysis

8.1 Domain 1: Descriptive analysis

8.2 Domain 2: Diagnostic analysis

8.3 Domain 3: Predictive analysis

8.4 Domain 4: Prescriptive analysis

9 Competency area 4: Data Usage

9.1 Domain 1: Data interpretation and conclusion

9.2 Domain 2: Data integration

9.3 Domain 3: Data presentation and reporting

9.4 Domain 4: Transfer to action-oriented recommendations

10 Attitudes

11 Recommendations

References

- “Competencies Proficiency Scale.” 2017. Text. *National Institutes of Health, Office of Human Resources*. <https://hr.nih.gov/working-nih/competencies/competencies-proficiency-scale>.
- Data, Strategy and Innovation (DSI), Health Information and Intelligence (HII), WHO Western Pacific. n.d. *Data Management Competency Framework*. Edited by World Health Organization. Regional Office for the Western Pacific. World Health Organization. Accessed February 20, 2024. <https://www.who.int/publications-detail-redirect/9789290620099>.
- “IANUS - Forschungsdatenzentrum Archäologie & Altertumswissenschaften.” n.d. Accessed February 20, 2024. <https://ianus-fdz.de/lehrangebote/>.
- Petersen, Britta, Claudia Engelhardt, Tanja Hörner, Juliane Jacob, Tatiana Kvetnaya, Andreas Mühlichen, Hermann Schranzhofer, et al. 2023. “Lernzielmatrix Zum Themenbereich Forschungsdatenmanagement (FDM) Für Die Zielgruppen Studierende, PhDs Und Data Stewards.” Zenodo. <https://doi.org/10.5281/zenodo.8010617>.
- Schmidt, Sophie C. 2024. “SCSchmidt/ArchIT-LV_analysis: Preprint.” Zenodo. <https://doi.org/10.5281/zenodo.10498365>.
- Schüller, Katharina, Paulina Busch ·, and Carina Hindinger. 2019. “Future Skills: Ein Framework Für Data Literacy.” Zenodo. <https://doi.org/10.5281/zenodo.3349865>.