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A standardised metadata schema for heritage science datasets

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DIGILAB.be
DIGILAB Belgian Federated Repositories

🔗 <https://rdm.kikirpa.be/projects/digilab-be>

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ABSTRACT

The DIGILAB.be project requires a robust metadata framework to harmonise heritage science data across various Belgian institutions. This deliverable defines a standardised metadata schema designed to ensure that research data is documented consistently and remains findable, accessible, interoperable, and reusable. The schema is built upon the Cordra repository software and the previous work of the H-SEARCH project, which established a digital object-based workflow for KIK-IRPA.

The central component of this schema is the ResearchActivity model. This model acts as a container for all assets related to a specific scientific intervention, such as analytical datasets, imaging, and reports. To ensure international compatibility, the model is closely aligned with the DataCite Metadata Schema 4.6. This alignment allows DIGILAB.be to aggregate metadata from federated repositories including Zenodo and Dataverse. By interlinking these activities with shared models for actors and heritage objects, the project provides a unified search experience through the BALaT+ platform.

1. TECHNICAL FOUNDATION

The primary goal of task T.1.2 is to define a standardised metadata schema that facilitates the documentation and harmonisation of heritage science datasets across the consortium. This technical work leverages the architecture established during the H-SEARCH project, where Cordra was selected as the back-end solution for managing research archives. Cordra is an open-source platform that treats every asset as a machine-actionable digital object[1]. It provides stable referencing through the attribution of Handle persistent identifiers[2] and allows for precise management of access rights and metadata.

The H-SEARCH project modelled the entire workflow of a scientific intervention dossier using JSON Schema documents[3]. These documents form the technical basis of the current repository at KIK-IRPA. The model subdivides a dossier into one or more research activities. These activities serve as the primary units for data management, providing a structure where sample descriptions, scientific measurements, and technical reports are linked to a specific research process.

The base for BALaT+. The new institutional platform, BALaT+, will use these research activities as the base model for the public dissemination of scientific data. By centering the infrastructure on this model, KIK-IRPA ensures that datasets are presented within their original scientific context rather than as isolated files. This approach supports the goal of making research results searchable and consultable for both specialists and the general public.

2. STANDARD ALIGNMENT AND FEDERATED INTEGRATION

Interoperability is a key requirement for the DIGILAB.be network. Because the project functions as a federated system, the metadata schema must be compatible with the various platforms used by partner institutions.

1. Alignment with DataCite 4.6. The ResearchActivity model is designed to be highly compatible with the DataCite Metadata Schema 4.6[4]. A comparison between the two reveals significant similarities in core properties. Both schemas prioritise clear identification through persistent identifiers and require structured information for titles, descriptions, and temporal data. The creators and contributors involved in a research activity are documented using an Actor model, which matches the DataCite requirements for researcher names and affiliations. While the Cordra implementation occasionally uses modified formats to improve the efficiency of Elasticsearch indexing, the semantic integrity of the international standard is maintained.

2. Supporting federated repositories. The partners in the DIGILAB.be project use repository solutions such as Invenio (Zenodo) and Dataverse[5]. These platforms are inherently aligned with the DataCite schema and allow for easy metadata export. This technical compatibility allows the ResearchActivity model to be expanded to include external data. For these federated datasets, the physical files remain on the original institutional servers, while only the metadata is harvested and stored in Cordra. This setup provides a unified entry point for all Belgian heritage research through KIK-IRPA's APIs and the BALaT+ interface.
3. Interlinked digital objects. To further optimise the discovery of data, research activities are linked to other standardised models. On the one hand the Actor model: this identifies authors and contributors, allowing the system to show connections between different research projects and institutions. On the other hand, the HeritageObject model: this links scientific data to the physical object being studied, such as an archaeological find or a painting. This connection is vital for BALaT+, as it enables users to find all relevant scientific analysis related to a specific artwork in one location.

At this stage, we will primarily use the ResearchActivity model to provide high-level metadata. Although the infrastructure includes detailed models for measurement parameters and specific samples, these remain optional to allow for a flexible implementation across different research groups.

3. CONCLUSION

The standardised metadata schema for DIGILAB.be establishes a common language for heritage science in Belgium. By building on the ResearchActivity model and maintaining alignment with DataCite 4.6, the project creates a bridge between different institutional repositories. This architecture respects the autonomy of the partners while ensuring that their research data is integrated into a wider web of digital objects. The result is a more transparent and connected research environment that supports the long-term preservation and study of cultural heritage.

REFERENCES

- [1] Cordra, (n.d.). <https://www.cordra.org> (accessed January 6, 2026).
- [2] The Handle System, (n.d.). <https://www.cnri.reston.va.us/home/cstr/handle-overview.html> (accessed January 6, 2026).
- [3] KIK-IRPA Cordra documentation, (n.d.). <https://cordra.kikirpa.be/#urls/intro.html> (accessed January 6, 2026).
- [4] DataCite Metadata Working Group, DataCite Metadata Schema Documentation for the Publication and Citation of Research Data and Other Research Outputs v4.6, (2024). <https://doi.org/10.14454/MZV1-5B55>.
- [5] W. Fremout, DIGILAB.be deliverable D.1.1.1: Inventory of existing datasets in Belgian heritage science research groups, (2025). <https://doi.org/10.5281/zenodo.19743175>.

ANNEX: THE RESEARCHACTIVITY MODEL

The following document is the fully dereferenced version of the ResearchActivity JSON Schema. Within the Cordra repository system, the original schema contains numerous internal and external references to allow for the efficient reuse of specific schema fragments. This version has been processed to resolve all references and provide a complete overview of the metadata structure.

```
{
  "$schema": "http://json-schema.org/draft-07/schema#",
  "$id": "https://schema.kikirpa.be/ResearchActivity/v1.1",
  "$tags": [],
  "title": "ResearchActivity",
  "type": "object",
  "required": [
    "id",
    "researchGroup",
    "titles",
    "isRetro"
  ],
  "properties": {
    "id": {
      "type": "string",
      "cordra": {
        "type": {
          "autoGeneratedField": "handle"
        }
      }
    },
    "$schema": {
      "type": "string",
      "options": {
        "hidden": true
      }
    },
    "$tags": {
      "type": "array",
      "items": {
        "type": "string"
      },
      "options": {
        "hidden": true
      }
    },
    "$template": {
      "type": "string",
      "options": {
        "hidden": true
      }
    },
    "$landingPage": {
      "type": "string",
      "format": "uri",
      "options": {
        "hidden": true
      }
    }
  }
}
```

```

},
"dossierOrProject": {
  "title": "Linked dossier or research project",
  "description": "The dossier or research project of the research activity",
  "type": "string",
  "cordra": {
    "type": {
      "handleReference": {
        "types": [
          "Dossier",
          "Project"
        ]
      }
    }
  },
  "preview": {
    "showInPreview": true
  }
},
},
"researchGroup": {
  "title": "Research group",
  "description": "The research group responsible for the research activity",
  "type": "string",
  "cordra": {
    "type": {
      "handleReference": {
        "types": [
          "ResearchGroup"
        ]
      }
    }
  },
  "preview": {
    "showInPreview": true
  }
},
},
"otherInvolvedResearchGroups": {
  "title": "Other involved research groups",
  "description": "Other research groups involved in the research activity",
  "type": "array",
  "items": {
    "title": "Research group",
    "type": "string",
    "cordra": {
      "type": {
        "handleReference": {
          "types": [
            "ResearchGroup"
          ]
        }
      }
    }
  }
},
},
"titles": {
  "title": "Titles",
  "type": "object",
  "minProperties": 2,
  "required": [
    "primaryLanguage"
  ],
},

```

```

"properties": {
  "titleEN": {
    "title": "Title (English)",
    "description": "Title in English",
    "type": "string",
    "minLength": 1,
    "cordra": {
      "preview": {
        "showInPreview": true
      }
    }
  },
  "titleNL": {
    "title": "Title (Dutch)",
    "description": "Title in Dutch",
    "type": "string",
    "minLength": 1,
    "cordra": {
      "preview": {
        "showInPreview": true
      }
    }
  },
  "titleFR": {
    "title": "Title (French)",
    "description": "Title in French",
    "type": "string",
    "minLength": 1,
    "cordra": {
      "preview": {
        "showInPreview": true
      }
    }
  },
  "titleDE": {
    "title": "Title (German)",
    "description": "Title in German",
    "type": "string",
    "minLength": 1,
    "cordra": {
      "preview": {
        "showInPreview": true
      }
    }
  },
  "primaryLanguage": {
    "title": "Primary language",
    "description": "The primary language in which the research is
                    described, e.g. the language of the report",
    "type": "string",
    "enum": [
      "en",
      "nl",
      "fr",
      "de"
    ]
  },
  "description": "A name or title by which the research activity is known,
                  in multiple languages. At least one title is required."
},

```



```

"mnemonic": {
  "title": "Mnemonic",
  "description": "A mnemonic or short code that can be used to identify the
    research activity. Research groups can use this mnemonic
    to identify the research activity within their own
    systems.",
  "type": "string",
  "cordra": {
    "preview": {
      "showInPreview": true
    }
  }
},
"creators": {
  "title": "Responsible persons",
  "description": "The core team members responsible for coordinating and
    managing the research activity. At least one team member
    is required.",
  "type": "array",
  "minItems": 1,
  "uniqueItems": true,
  "items": {
    "title": "Team member",
    "type": "object",
    "oneOf": [
      {
        "title": "Registered person",
        "properties": {
          "name": {
            "title": "Full name",
            "description": "Name of the person (family name, given name) or
              organisation",
            "type": "string",
            "minLength": 1,
            "cordra": {
              "preview": {
                "showInPreview": true
              },
              "disableInUi": true
            }
          }
        },
        "actor": {
          "title": "Registered person",
          "description": "If the person is registered in BALaT, select
            their record",
          "type": "string",
          "cordra": {
            "type": {
              "handleReference": {
                "types": [
                  "Actor"
                ]
              }
            }
          }
        },
        "orcid": {
          "title": "ORCID",
          "description": "The ORCID of the person",
          "type": "string",
          "format": "uri"
        }
      }
    ]
  }
}

```

```

    },
    "roles": {
      "title": "Roles",
      "description": "The roles of the person in the research
                      activity",
      "type": "array",
      "uniqueItems": true,
      "items": {
        "title": "Role",
        "type": "string",
        "enum": [
          "Author",
          "ContactPerson",
          "ProjectLeader",
          "Researcher",
          "Supervisor",
          "Other"
        ]
      }
    },
    "affiliations": {
      "title": "Affiliations",
      "description": "The organisations the team member is affiliated
                      with",
      "type": "array",
      "items": {
        "title": "Affiliation",
        "type": "object",
        "properties": {
          "name": {
            "title": "Affiliation name",
            "type": "string"
          },
          "researchGroup": {
            "title": "Research group",
            "type": "string",
            "cordra": {
              "type": {
                "handleReference": {
                  "types": [
                    "ResearchGroup"
                  ]
                }
              }
            }
          }
        }
      }
    },
    "required": [
      "actor"
    ]
  },
  {
    "title": "Unregistered person",
    "description": "If the person is not registered in BALaT, provide
                  their given and family name",
    "properties": {
      "name": {
        "title": "Full name",

```

```

      "description": "Name of the person (family name, given name) or
                      organisation",
      "type": "string",
      "minLength": 1,
      "cordra": {
        "preview": {
          "showInPreview": true
        },
        "disableInUi": true
      }
    },
    "givenName": {
      "title": "First name",
      "description": "First name of the person",
      "type": "string"
    },
    "familyName": {
      "title": "Last name",
      "description": "Last name of the person",
      "type": "string"
    },
    "orcid": {
      "title": "ORCID",
      "description": "The ORCID of the person",
      "type": "string",
      "format": "uri"
    },
    "roles": {
      "title": "Roles",
      "description": "The roles of the person in the research
                      activity",
      "type": "array",
      "uniqueItems": true,
      "items": {
        "title": "Role",
        "type": "string",
        "enum": [
          "Author",
          "ContactPerson",
          "ProjectLeader",
          "Researcher",
          "Supervisor",
          "Other"
        ]
      }
    },
    "affiliations": {
      "title": "Affiliations",
      "description": "The organisations the team member is affiliated
                      with",
      "type": "array",
      "items": {
        "title": "Affiliation",
        "type": "object",
        "properties": {
          "name": {
            "title": "Affiliation name",
            "type": "string"
          },
          "researchGroup": {
            "title": "Research group",

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```

        "type": "string",
        "cordra": {
          "type": {
            "handleReference": {
              "types": [
                "ResearchGroup"
              ]
            }
          }
        }
      }
    },
    "required": [
      "givenName",
      "familyName"
    ]
  },
  "contributors": {
    "title": "Contributors",
    "description": "People who have contributed to the research activity through their work (e.g., performing analyses, taking measurements, etc.). This list is automatically populated based on documented contributions.",
    "type": "array",
    "uniqueItems": true,
    "minItems": 1,
    "items": {
      "title": "Contributor",
      "type": "object",
      "oneOf": [
        {
          "title": "Registered person",
          "properties": {
            "name": {
              "title": "Full name",
              "description": "Name of the person (family name, given name) or organisation",
              "type": "string",
              "minLength": 1,
              "cordra": {
                "preview": {
                  "showInPreview": true
                },
                "disableInUi": true
              }
            },
            "actor": {
              "title": "Registered person",
              "description": "If the person is registered in BALaT, select their record",
              "type": "string",
              "cordra": {
                "type": {
                  "handleReference": {
                    "types": [

```

```

        "Actor"
      ]
    }
  }
},
"orcid": {
  "title": "ORCID",
  "description": "The ORCID of the person",
  "type": "string",
  "format": "uri"
},
"roles": {
  "title": "Contributor roles",
  "description": "Roles of the contributor based on their
                  documented work in the research activity",
  "type": "array",
  "uniqueItems": true,
  "items": {
    "title": "Role",
    "type": "string",
    "enum": [
      "DataCollector",
      "DataCurator",
      "DataManager",
      "ProjectMember",
      "Researcher",
      "Translator",
      "Other"
    ]
  }
},
"affiliations": {
  "title": "Affiliations",
  "description": "The organisations the team member is affiliated
                  with",
  "type": "array",
  "items": {
    "title": "Affiliation",
    "type": "object",
    "properties": {
      "name": {
        "title": "Affiliation name",
        "type": "string"
      },
      "researchGroup": {
        "title": "Research group",
        "type": "string",
        "cordra": {
          "type": {
            "handleReference": {
              "types": [
                "ResearchGroup"
              ]
            }
          }
        }
      }
    }
  }
}
}

```

```

    },
    "required": [
        "actor"
    ]
},
{
    "title": "Unregistered person",
    "description": "If the person is not registered in BALaT, provide
                    their given and family name",
    "properties": {
        "name": {
            "title": "Full name",
            "description": "Name of the person (family name, given name) or
                           organisation",
            "type": "string",
            "minLength": 1,
            "cordra": {
                "preview": {
                    "showInPreview": true
                },
                "disableInUi": true
            }
        },
        "givenName": {
            "title": "First name",
            "description": "First name of the person",
            "type": "string"
        },
        "familyName": {
            "title": "Last name",
            "description": "Last name of the person",
            "type": "string"
        },
        "orcid": {
            "title": "ORCID",
            "description": "The ORCID of the person",
            "type": "string",
            "format": "uri"
        },
        "roles": {
            "title": "Contributor roles",
            "description": "Roles of the contributor based on their
                           documented work in the research activity",
            "type": "array",
            "uniqueItems": true,
            "items": {
                "title": "Role",
                "type": "string",
                "enum": [
                    "DataCollector",
                    "DataCurator",
                    "DataManager",
                    "ProjectMember",
                    "Researcher",
                    "Translator",
                    "Other"
                ]
            }
        },
        "affiliations": {
            "title": "Affiliations",

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        "title": "Abstract (Dutch)",
        "type": "string",
        "format": "textarea"
    },
    "disclaimersNL": {
        "title": "Disclaimers (Dutch)",
        "description": "Important information that should be communicated to
                        the user about the abstracts",
        "type": "array",
        "uniqueItems": true,
        "items": {
            "type": "string",
            "enum": [
                "AI generated",
                "Automatically translated"
            ]
        }
    },
    "abstractFR": {
        "title": "Abstract (French)",
        "type": "string",
        "format": "textarea"
    },
    "disclaimersFR": {
        "title": "Disclaimers (French)",
        "description": "Important information that should be communicated to
                        the user about the abstracts",
        "type": "array",
        "uniqueItems": true,
        "items": {
            "type": "string",
            "enum": [
                "AI generated",
                "Automatically translated"
            ]
        }
    },
    "abstractDE": {
        "title": "Abstract (German)",
        "type": "string",
        "format": "textarea"
    },
    "disclaimersDE": {
        "title": "Disclaimers (German)",
        "description": "Important information that should be communicated to
                        the user about the abstracts",
        "type": "array",
        "uniqueItems": true,
        "items": {
            "type": "string",
            "enum": [
                "AI generated",
                "Automatically translated"
            ]
        }
    }
},
"geoLocations": {
    "title": "Geographic locations",

```



```

    "description": "Geographic locations where the study/treatment was
                    conducted",
    "type": "array",
    "items": {
      "title": "Geographic location",
      "type": "object",
      "properties": {
        "geoLocationPlace": {
          "title": "Place name",
          "description": "Name of the place where the study/treatment was
                        conducted",
          "type": "string"
        },
        "geoLocationPoint": {
          "title": "Coordinates",
          "description": "Geographic coordinates of the place",
          "type": "object",
          "properties": {
            "pointLongitude": {
              "title": "Longitude",
              "description": "Longitude coordinate",
              "type": "number",
              "minimum": -180,
              "maximum": 180
            },
            "pointLatitude": {
              "title": "Latitude",
              "description": "Latitude coordinate",
              "type": "number",
              "minimum": -90,
              "maximum": 90
            }
          }
        }
      },
      "required": [
        "pointLongitude",
        "pointLatitude"
      ]
    }
  },
  "dates": {
    "title": "Dates",
    "description": "Important dates related to the research activity",
    "type": "object",
    "properties": {
      "researchProposed": {
        "title": "Research proposed",
        "description": "Date of the research proposal",
        "type": "string",
        "format": "date"
      },
      "researchApproved": {
        "title": "Research approved",
        "description": "Date of the research approval",
        "type": "string",
        "format": "date"
      },
      "researchStarted": {
        "title": "Research started",
        "description": "Date of the research start",

```

```

    "type": "string",
    "format": "date"
  },
  "objectsArrived": {
    "title": "Object arrived",
    "description": "Date of the object arrival",
    "type": "array",
    "items": {
      "title": "Object arrival",
      "type": "object",
      "properties": {
        "date": {
          "title": "Date",
          "description": "Date of the object arrival",
          "type": "string",
          "format": "date"
        }
      }
    },
    "heritageObjects": {
      "title": "Heritage objects",
      "description": "Heritage objects that were transported",
      "type": "array",
      "items": {
        "title": "Heritage object",
        "type": "string",
        "cordra": {
          "type": {
            "handleReference": {
              "types": [
                "HeritageObject"
              ]
            }
          }
        }
      }
    }
  },
  "involvedPersons": {
    "title": "Involved persons",
    "description": "Persons involved in the object arrival",
    "type": "array",
    "uniqueItems": true,
    "minItems": 1,
    "items": {
      "title": "Involved person",
      "type": "object",
      "oneOf": [
        {
          "title": "Registered person",
          "properties": {
            "name": {
              "title": "Full name",
              "description": "Name of the person (family name, given name) or organisation",
              "type": "string",
              "minLength": 1,
              "cordra": {
                "preview": {
                  "showInPreview": true
                },
                "disableInUi": true
              }
            }
          }
        }
      ]
    }
  },

```



```

"title": "Object departed",
"description": "Date of the object departure",
"type": "array",
"items": {
  "title": "Object departure",
  "type": "object",
  "properties": {
    "date": {
      "title": "Date",
      "description": "Date of the object departure",
      "type": "string",
      "format": "date"
    },
  },
  "heritageObjects": {
    "title": "Heritage objects",
    "description": "Heritage objects that were transported",
    "type": "array",
    "items": {
      "title": "Heritage object",
      "type": "string",
      "cordra": {
        "type": {
          "handleReference": {
            "types": [
              "HeritageObject"
            ]
          }
        }
      }
    }
  },
},
"involvedPersons": {
  "title": "Involved persons",
  "description": "Persons involved in the object arrival",
  "type": "array",
  "uniqueItems": true,
  "minItems": 1,
  "items": {
    "title": "Involved person",
    "type": "object",
    "oneOf": [
      {
        "title": "Registered person",
        "properties": {
          "name": {
            "title": "Full name",
            "description": "Name of the person (family name, given name) or organisation",
            "type": "string",
            "minLength": 1,
            "cordra": {
              "preview": {
                "showInPreview": true
              },
              "disableInUi": true
            }
          },
        },
      },
      {
        "title": "Registered person",
        "description": "If the person is registered in BALaT, select their record",
      }
    ]
  }
}

```

```

        "type": "string",
        "cordra": {
          "type": {
            "handleReference": {
              "types": [
                "Actor"
              ]
            }
          }
        }
      },
      "required": [
        "actor"
      ]
    },
    {
      "title": "Unregistered person",
      "description": "If the person is not registered in BALaT,
        provide their given and family name",
      "properties": {
        "name": {
          "title": "Full name",
          "description": "Name of the person (family name, given
            name) or organisation",
          "type": "string",
          "minLength": 1,
          "cordra": {
            "preview": {
              "showInPreview": true
            },
            "disableInUi": true
          }
        },
        "givenName": {
          "title": "First name",
          "description": "First name of the person",
          "type": "string"
        },
        "familyName": {
          "title": "Last name",
          "description": "Last name of the person",
          "type": "string"
        }
      },
      "required": [
        "givenName",
        "familyName"
      ]
    }
  ],
  },
  "visits": {
    "title": "Visits",
    "description": "Visits to the research activity",
    "type": "array",
    "items": {

```

```

"title": "Visit",
"type": "object",
"required": [
  "fromDate"
],
"properties": {
  "fromDate": {
    "title": "From date",
    "description": "Start date of the visit",
    "type": "string",
    "format": "date"
  },
  "toDate": {
    "title": "To date",
    "description": "End date of the visit",
    "type": "string",
    "format": "date"
  },
  "place": {
    "title": "Place",
    "description": "Place of the visit",
    "type": "string"
  },
  "description": {
    "title": "Description",
    "description": "Description with information about the visit and
                    its purpose",
    "type": "string",
    "format": "textarea"
  },
  "involvedPersons": {
    "title": "Involved persons",
    "description": "Persons involved in the object arrival",
    "type": "array",
    "uniqueItems": true,
    "minItems": 1,
    "items": {
      "title": "Involved person",
      "type": "object",
      "oneOf": [
        {
          "title": "Registered person",
          "properties": {
            "name": {
              "title": "Full name",
              "description": "Name of the person (family name, given
                           name) or organisation",
              "type": "string",
              "minLength": 1,
              "cordra": {
                "preview": {
                  "showInPreview": true
                },
                "disableInUi": true
              }
            }
          },
          "actor": {
            "title": "Registered person",
            "description": "If the person is registered in BALaT,
                           select their record",
            "type": "string",

```

```

        "cordra": {
          "type": {
            "handleReference": {
              "types": [
                "Actor"
              ]
            }
          }
        },
        "required": [
          "actor"
        ]
      },
      {
        "title": "Unregistered person",
        "description": "If the person is not registered in BALaT,
                        provide their given and family name",
        "properties": {
          "name": {
            "title": "Full name",
            "description": "Name of the person (family name, given
                           name) or organisation",
            "type": "string",
            "minLength": 1,
            "cordra": {
              "preview": {
                "showInPreview": true
              },
              "disableInUi": true
            }
          },
          "givenName": {
            "title": "First name",
            "description": "First name of the person",
            "type": "string"
          },
          "familyName": {
            "title": "Last name",
            "description": "Last name of the person",
            "type": "string"
          }
        },
        "required": [
          "givenName",
          "familyName"
        ]
      }
    ]
  },
  "researchEnded": {
    "title": "Research ended",
    "description": "Date of the research end",
    "type": "string",
    "format": "date"
  }
}

```

```

    }
  },
  "storageLocations": {
    "title": "Storage locations",
    "description": "Storage locations of the research activity",
    "type": "array",
    "items": {
      "title": "Storage location",
      "type": "object",
      "required": [
        "reference",
        "relativePath"
      ],
      "properties": {
        "reference": {
          "title": "Reference",
          "description": "Reference of the storage location, e.g. 'root' or 'admin'",
          "type": "string"
        },
        "relativePath": {
          "title": "Relative path",
          "description": "Relative path to the storage location",
          "type": "string"
        }
      }
    }
  }
},
"techniqueKeywords": {
  "title": "Techniques",
  "description": "Techniques used in the research activity",
  "type": "array",
  "uniqueItems": true,
  "minItems": 1,
  "items": {
    "title": "Technique",
    "type": "object",
    "properties": {
      "termsEN": {
        "title": "Terms (EN)",
        "type": "array",
        "items": {
          "title": "Term",
          "type": "string"
        }
      },
      "termsNL": {
        "title": "Terms (NL)",
        "type": "array",
        "items": {
          "title": "Term",
          "type": "string"
        }
      },
      "termsFR": {
        "title": "Terms (FR)",
        "type": "array",
        "items": {
          "title": "Term",
          "type": "string"
        }
      }
    }
  }
}

```



```

    },
    "termsDE": {
      "title": "Terms (DE)",
      "type": "array",
      "items": {
        "title": "Term",
        "type": "string"
      }
    },
    "vocabularyConcept": {
      "title": "Vocabulary concept",
      "type": "string",
      "cordra": {
        "type": {
          "handleReference": {
            "types": [
              "VocabularyConcept"
            ]
          }
        }
      }
    },
    "extractedWithAI": {
      "title": "Extracted with AI",
      "type": "boolean",
      "default": false
    }
  },
  "materialKeywords": {
    "title": "Materials",
    "description": "Materials analysed or identified in the research activity",
    "type": "array",
    "uniqueItems": true,
    "minItems": 1,
    "items": {
      "title": "Material",
      "type": "object",
      "properties": {
        "termsEN": {
          "title": "Terms (EN)",
          "type": "array",
          "items": {
            "title": "Term",
            "type": "string"
          }
        },
        "termsNL": {
          "title": "Terms (NL)",
          "type": "array",
          "items": {
            "title": "Term",
            "type": "string"
          }
        },
        "termsFR": {
          "title": "Terms (FR)",
          "type": "array",
          "items": {

```

```

        "title": "Term",
        "type": "string"
    }
},
"termsDE": {
    "title": "Terms (DE)",
    "type": "array",
    "items": {
        "title": "Term",
        "type": "string"
    }
},
"vocabularyConcept": {
    "title": "Vocabulary concept",
    "type": "string",
    "cordra": {
        "type": {
            "handleReference": {
                "types": [
                    "VocabularyConcept"
                ]
            }
        }
    }
},
"extractedWithAI": {
    "title": "Extracted with AI",
    "type": "boolean",
    "default": false
}
}
},
"reportKeywords": {
    "title": "Report keywords",
    "description": "Keywords harvested by AI from the report",
    "type": "array",
    "uniqueItems": true,
    "items": {
        "title": "Keyword",
        "type": "object",
        "properties": {
            "termsEN": {
                "title": "Terms (EN)",
                "type": "array",
                "items": {
                    "title": "Term",
                    "type": "string"
                }
            },
            "termsNL": {
                "title": "Terms (NL)",
                "type": "array",
                "items": {
                    "title": "Term",
                    "type": "string"
                }
            },
            "termsFR": {
                "title": "Terms (FR)",
                "type": "array",

```

```

        "items": {
            "title": "Term",
            "type": "string"
        }
    },
    "termsDE": {
        "title": "Terms (DE)",
        "type": "array",
        "items": {
            "title": "Term",
            "type": "string"
        }
    },
    "vocabularyConcept": {
        "title": "Vocabulary concept",
        "type": "string",
        "cordra": {
            "type": {
                "handleReference": {
                    "types": [
                        "VocabularyConcept"
                    ]
                }
            }
        }
    },
    "extractedWithAI": {
        "title": "Extracted with AI",
        "type": "boolean",
        "default": false
    }
},
"reportTypes": {
    "title": "Report type",
    "description": "Types of report",
    "type": "array",
    "uniqueItems": true,
    "items": {
        "title": "Report type",
        "type": "object",
        "properties": {
            "termsEN": {
                "title": "Terms (EN)",
                "type": "array",
                "items": {
                    "title": "Term",
                    "type": "string"
                }
            },
            "termsNL": {
                "title": "Terms (NL)",
                "type": "array",
                "items": {
                    "title": "Term",
                    "type": "string"
                }
            },
            "termsFR": {
                "title": "Terms (FR)",

```

```

        "type": "array",
        "items": {
            "title": "Term",
            "type": "string"
        }
    },
    "termsDE": {
        "title": "Terms (DE)",
        "type": "array",
        "items": {
            "title": "Term",
            "type": "string"
        }
    },
    "vocabularyConcept": {
        "title": "Vocabulary concept",
        "type": "string",
        "cordra": {
            "type": {
                "handleReference": {
                    "types": [
                        "VocabularyConcept"
                    ]
                }
            }
        }
    },
    "extractedWithAI": {
        "title": "Extracted with AI",
        "type": "boolean",
        "default": false
    }
},
"sampleCodes": {
    "title": "Sample codes",
    "description": "Codes of the samples",
    "type": "array",
    "uniqueItems": true,
    "items": {
        "title": "Sample code",
        "type": "string"
    }
},
"dataAcquisitionCodes": {
    "title": "Data acquisition codes",
    "description": "Codes of the data acquisitions",
    "type": "array",
    "uniqueItems": true,
    "items": {
        "title": "Data acquisition code",
        "type": "string"
    }
},
"statusLogs": {
    "title": "Status logs",
    "description": "Logs of the status of the research activity",
    "type": "array",
    "items": {
        "title": "Status log",

```

```

    "type": "object",
    "required": [
      "timestamp",
      "action",
      "user"
    ],
    "properties": {
      "timestamp": {
        "title": "Timestamp (date and time)",
        "type": "string",
        "format": "date-time"
      },
      "action": {
        "title": "Action",
        "type": "string",
        "enum": [
          "Created",
          "Autogenerated for dossier photos",
          "Imported",
          "Intervention dossier requested",
          "Closure requested",
          "Awaiting revision",
          "Closed",
          "Published",
          "Archived",
          "Reopened"
        ]
      },
      "user": {
        "title": "User",
        "description": "User who performed the action",
        "type": "string"
      },
      "comment": {
        "title": "Comment",
        "type": "string",
        "format": "textarea"
      }
    }
  },
  "isRetro": {
    "title": "Retroactively imported",
    "description": "Toggle to indicate if the research activity was retroactively imported",
    "type": "boolean",
    "default": false
  },
  "isExternal": {
    "title": "External",
    "description": "Toggle to indicate if the research activity is external to KIK-IRPA and has been imported from an external data source",
    "type": "boolean",
    "default": false
  },
  "isAutoGenerated": {
    "title": "Automatically generated",
    "description": "This research activity was (initially) automatically created from dossier-linked DAMS photo metadata.",
    "type": "boolean",

```

```

    "default": false,
    "cordra": {
      "preview": {
        "showInPreview": true
      }
    }
  },
  "sourcePid": {
    "title": "External source PID",
    "description": "For external data sources (e.g. DIGILAB.be), the principal
      PID of the original data source",
    "type": "string",
    "format": "uri",
    "cordra": {
      "preview": {
        "showInPreview": true
      }
    }
  },
  "rights": {
    "title": "Rights",
    "description": "The rights that apply to this record, including licenses
      and access conditions.",
    "type": "object",
    "required": [
      "metadata",
      "access"
    ],
    "properties": {
      "data": {
        "type": "object",
        "required": [
          "rightsStatement"
        ],
        "properties": {
          "rightsStatement": {
            "title": "Rights statement",
            "description": "The copyrights that apply to the data associated
              with this record, including licenses and copyright
              waivers. It is strongly recommended to use
              statements from CreativeCommons.org or
              RightsStatements.org.",
            "type": "string"
          },
          "rightsStatementUri": {
            "title": "Rights statement URI",
            "description": "The URI of the rights statement.",
            "type": "string",
            "format": "uri"
          }
        }
      },
      "rightsHolders": {
        "title": "Rights holders",
        "description": "The organizations that hold rights to the data
          associated with this record.",
        "type": "array",
        "items": {
          "title": "Rights holder",
          "type": "object",
          "required": [
            "name"
          ]
        }
      }
    ]
  },

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        "properties": {
            "name": {
                "title": "Name",
                "description": "The name of the organization that holds
                                rights to the data associated with this
                                record.",
                "type": "string"
            },
            "uri": {
                "title": "URI",
                "description": "The URI of the organization that holds
                                rights to the data associated with this
                                record.",
                "type": "string",
                "format": "uri"
            }
        }
    },
    "title": "Rights on the data",
    "description": "The rights that apply to the data associated with this
                    record."
},
"metadata": {
    "type": "object",
    "required": [
        "rightsStatement"
    ],
    "properties": {
        "rightsStatement": {
            "title": "Rights statement",
            "description": "The copyrights that apply to the data associated
                            with this record, including licenses and copyright
                            waivers. It is strongly recommended to use
                            statements from CreativeCommons.org or
                            RightsStatements.org.",
            "type": "string"
        },
        "rightsStatementUri": {
            "title": "Rights statement URI",
            "description": "The URI of the rights statement.",
            "type": "string",
            "format": "uri"
        },
        "rightsHolders": {
            "title": "Rights holders",
            "description": "The organizations that hold rights to the data
                            associated with this record.",
            "type": "array",
            "items": {
                "title": "Rights holder",
                "type": "object",
                "required": [
                    "name"
                ],
                "properties": {
                    "name": {
                        "title": "Name",
                        "description": "The name of the organization that holds

```

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        rights to the data associated with this
        record.",
        "type": "string"
    },
    "uri": {
        "title": "URI",
        "description": "The URI of the organization that holds
            rights to the data associated with this
            record.",
        "type": "string",
        "format": "uri"
    }
}
},
"title": "Rights on the metadata",
"description": "The rights that apply to the metadata associated with
    this record."
},
"access": {
    "title": "Access to the record",
    "description": "The access conditions that apply to the record.",
    "type": "string",
    "enum": [
        "public",
        "restricted",
        "private"
    ]
},
"embargoDate": {
    "title": "Embargo date",
    "description": "The date on which the embargo expires.",
    "type": "string",
    "format": "date"
},
"agreement": {
    "title": "Agreement",
    "description": "The agreement that applies to the record.",
    "type": "string",
    "options": {
        "hidden": true
    }
}
},
"publisher": {
    "title": "Record and data publisher",
    "description": "The organisation responsible for publishing this record
        and attached data",
    "type": "string"
},
"publicationYear": {
    "title": "Record and data publication year",
    "description": "The year in which this record and attached data were
        published",
    "type": "string",
    "pattern": "^[0-9]{4}$"
},
"howToCite": {
    "title": "How to cite",

```



```

    "description": "Suggested citation for this record in APA format",
    "type": "string",
    "format": "textarea"
  },
  "_mainTitle": {
    "title": "Main title",
    "description": "Automatically generated main title based on other titles,
      names, labels, codes, etc.",
    "type": "string",
    "cordra": {
      "preview": {
        "showInPreview": true,
        "isPrimary": true
      },
      "disableInUi": true
    }
  },
  "_researchActivityType": {
    "title": "Research activity type",
    "description": "A research activity can be part of a dossier, a project, a
      linked external research (e.g. DIGILAB.be) or a standalone
      research activity",
    "type": "string",
    "enum": [
      "Dossier",
      "Project",
      "External",
      "Standalone"
    ],
    "cordra": {
      "preview": {
        "showInPreview": true
      }
    },
    "options": {
      "hidden": true
    }
  },
  "_linkedDossierAxiellId": {
    "title": "Dossier number",
    "description": "The dossier number linked to the research activity",
    "type": "string",
    "cordra": {
      "preview": {
        "showInPreview": true
      }
    },
    "options": {
      "hidden": true
    }
  },
  "_linkedDossierTitle": {
    "title": "Dossier title",
    "description": "The title of the dossier linked to the research activity",
    "type": "string",
    "options": {
      "hidden": true
    }
  },
  "_linkedObjectHdls": {
    "title": "Object handles",

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    "description": "The handles of the object linked to the research
                    activity",
    "type": "array",
    "items": {
        "title": "Object handle",
        "type": "string",
        "cordra": {
            "type": {
                "handleReference": {
                    "types": [
                        "HeritageObject"
                    ]
                }
            }
        }
    },
    "cordra": {
        "preview": {
            "showInPreview": true
        }
    },
    "options": {
        "hidden": true
    }
},
"_linkedObjectAxiellIds": {
    "title": "Linked object numbers",
    "description": "The object numbers linked to the dossier of which the
                    research activity is a part",
    "type": "array",
    "items": {
        "title": "Object number",
        "type": "string"
    },
    "cordra": {
        "preview": {
            "showInPreview": true
        }
    },
    "options": {
        "hidden": true
    }
},
"_linkedObjectTitles": {
    "title": "Linked object titles",
    "description": "The titles of the objects linked to the dossier of which
                    the research activity is a part",
    "type": "array",
    "items": {
        "title": "Object title",
        "type": "string"
    },
    "options": {
        "hidden": true
    }
},
"_linkedProjectTitle": {
    "title": "Project title",
    "description": "The title of the project linked to the research activity",
    "type": "string",
    "cordra": {

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```

        "preview": {
            "showInPreview": true
        }
    },
    "options": {
        "hidden": true
    }
},
"_linkedResearchGroups": {
    "title": "Involved research groups",
    "description": "Names of the internal and external research groups
                    involved in the research activity",
    "type": "array",
    "items": {
        "title": "Research group",
        "type": "object",
        "required": [
            "name"
        ],
        "properties": {
            "name": {
                "title": "Name",
                "type": "string",
                "cordra": {
                    "preview": {
                        "showInPreview": true
                    }
                }
            },
            "logoUrl": {
                "title": "Logo URL",
                "type": "string",
                "format": "uri"
            }
        }
    },
    "options": {
        "hidden": true
    }
},
"_sourcePhotoHdls": {
    "title": "Source photo handles",
    "description": "Photo objects that triggered automatic stub creation from
                    the dossier-photo workflow.",
    "type": "array",
    "items": {
        "title": "Photo",
        "type": "string",
        "cordra": {
            "type": {
                "handleReference": {
                    "types": [
                        "Photo"
                    ]
                }
            }
        }
    },
    "options": {
        "hidden": true
    }
}

```

```

    },
    "_sourcePhotoAssetIds": {
      "title": "Source DAMS asset IDs",
      "description": "DAMS asset IDs of photos that triggered automatic stub
                      creation.",
      "type": "array",
      "items": {
        "title": "Asset ID",
        "type": "string"
      },
      "options": {
        "hidden": true
      }
    },
    "_sourcePhotoCount": {
      "title": "Source photo count",
      "description": "Number of dossier-linked photos that triggered automatic
                      stub creation.",
      "type": "integer",
      "minimum": 0,
      "options": {
        "hidden": true
      }
    }
  }
}

```