Software Requirements Specification for the Names project prototype

Prepared for the JISC Names Project by

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1. Introduction

1.1 Purpose

This document defines the functional requirements for the Names project prototype system. It will be used as the basis of the system design in the next phase of development.

As well as a system overview, attention is given to functional and non-functional requirements and system usage scenarios.

1.2 Referenced project documents

Title	Date	Authors
Names Project Plan	09/10/2008	Amanda Hill
A review of the current landscape in relation to a proposed Name Authority Service for UK repositories of research outputs.	19/02/2008	Alan Danskin, Anne Dixon, Michael Docherty, Amanda Hill, Richard Moore
Names Service: Initial Usage Scenarios.	30/10/2007	Amanda Hill.
Stakeholders' Requirements for the Names project prototype.	26/02/2008	Alan Danskin, Amanda Hill.

1.3 Version history

Version	Date	Author	Changes
0.1	18/03/2008	Daniel Needham	Outline Draft
0.2	18/04/2008	Daniel Needham	First Draft
0.3	18/04/2008	Amanda Hill	Edits
0.4	22/05/2008	Daniel Needham	Feedback Changes
0.5	10/07/2008	Daniel Needham	Feedback Changes

2. System Overview

2.1 System perspective

The purpose of the Name Authority Service prototype system is to pilot a software solution to the problem of reliably and uniquely identifying individuals and institutions[1] and establishing the identities by which they are known.[2]

The service is intended to be hosted in a single location, being remotely invoked by a range of client applications independent of platform and programming language.

Name Authority Service data will initially be derived from several sources[3], however the ultimate intention is to allow the data subjects themselves to update information in the system.
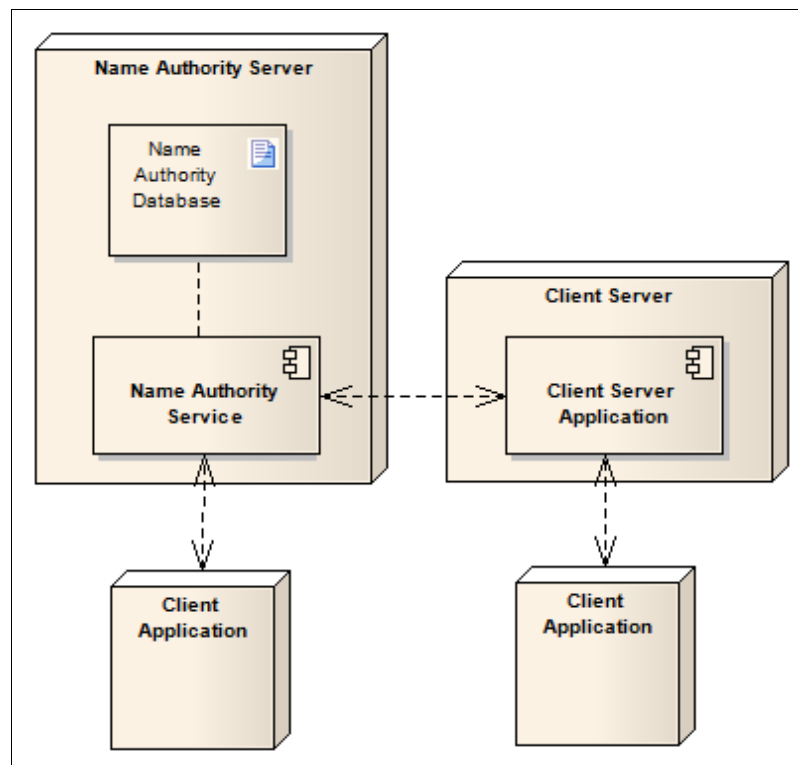
Fig.1: Abstract system diagram

2.2 Environment

The Name Authority Service prototype software is not required to be developed for any one platform or in any one programming language. It may however be necessary to develop the system in such a way, and with appropriate tools, that it is cross-platform compatible and may be deployed in the future to any platform as required.

The demand placed on the service during the prototype is not expected to be significant. The purpose of the prototype is to demonstrate the concept, not to deliver an operational service.

For this reason the hardware requirements are minimal, aside from providing an internet facing server which is capable of hosting the prototype service.

The service must interact with other client-server based applications on platforms out of the service's remit of control. Therefore the service must provide a standard interface usable by a variety of applications with minimal changes being made to the target systems.

The service must also allow for the update of Name Authority data by users through a multitude of browsers on a variety of platforms.

2.3 Constraints

Several constraints will apply to both the prototype Names service and any subsequent live service provision.

The prototype must be developed with access to a limited set of data and a limited number of data sources[4], whilst still demonstrating the feasibility of the service in every aspect. It also needs to be developed in a short space of time and is therefore subject to a rapid application development process.[5]

Further data restrictions may apply due to data protection issues, both in what the service will be able to access and use for disambiguation and also what can be shared with other services.[6] Both the prototype and a live service will need to comply with data protection laws and therefore this will need to be considered in the design of the software.

The scope of the prototype will be confined to names of persons and names of institutions. For the purposes of the prototype names of institutions will mean non-dependent names. For example: the *University of Edinburgh* is a non-dependent name; The *University of Edinburgh. Centre for Cognitive Science* is a dependent

name; *Wolfson Institute for Surface Engineering* is a non-dependent name, even although it is part of the University of Birmingham.

3. Functional Requirements

In these requirements:

'*Must*' is used for requirements which have been identified as essential for the prototype.
'*Should*' is used for requirements that would be desirable in a name authority service but which may not be included in the prototype.
'*May*' is used for requirements that will not be included in the prototype but may be part of a future name authority service.

3.1 Names authority records database

Requirements pertaining to the necessity for the creation and provision of a name authority records database.

3.1.1 Creation of name authority records database

3.1.1.1 Description

A database *must* be created to hold sample Name Authority records for individuals and institutions.

3.1.1.2 Related requirements

3.1.2, 3.1.3.

3.1.1.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype – Expert Panel*, Page 5.

3.1.2 Provision for Non Roman Characters

3.1.2.1 Description

The Name Authority record database will use the UCS/UNICODE character set and *should* utilise UTF-8 encoding.

3.1.2.2 Related requirements

3.1.1.

3.1.2.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –* CNI Workshop, Page 9.

3.1.3 OAI-PMH accessibility

3.1.3.1 Description

The database *may* be required to be available as an XML download via OAI-PMH for external systems.

3.1.3.2 Related requirements

3.1.1.

3.1.3.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –* OCLC, Page 8 & e-Prints, Page 10.

3.2 Output Data

Requirements pertaining to the formats in which Name Authority record data must be made available.

3.2.1 Variety of Output Formats

3.2.1.1 Description

Database records *must* be capable of being output in a variety of Name Authority formats.

3.2.1.2 Related requirements

3.1.

3.2.1.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –* Expert Panel, Page 9.

3.2.2 British Library output requirements

3.2.2.1 Description

Supported output formats for the British Library *should* include:

- MARCXML
- ISAAR/CPF (Not required for prototype)
- Generic fall back output such as CSV.

Not all output formats *must* be provided for the prototype.

3.2.2.2 Related requirements

3.2.1.

3.2.2.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –
British Library, Page 11.*

3.2.3 OCLC output requirements

3.2.3.1 Description

The supported output format for OCLC is MARCXML.

3.2.3.2 Related requirements

3.2.1.

3.2.3.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype -
OCLC, Page 8.*

3.3 Software Interface

Requirements pertaining to how external users and services will make search requests and how the service will respond to requests.

3.3.1 Communication over HTTP

3.3.1.1 Description

Service requests and responses *must* be made possible using standard HTTP methods.

3.3.1.2 Related requirements

3.2.

3.3.1.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype – Expert Panel*, Page 5.

3.3.2 Web service

3.3.2.1 Description

A web service *must* be provided which allows name authority record data to be searched.

3.3.2.2 Related requirements

3.3.1.

3.3.2.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype – Intute Repository Search*, Page 7.

3.3.3 Web service request parameters

3.3.3.1 Description

The web service *must* accept a variety of requests and search parameters including (partial) name and disambiguating data.

The request parameters should facilitate both direct keyword find searches as well as browse searches, by presenting the user with a list of matching identities that can be refined through different attribute values.

3.3.3.2 Related requirements

3.3.1.

3.3.3.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –
Intute Repository Search, Page 7.*

3.3.4 Intute Repository Search response data

3.3.4.1 Description

The web service *must* provide responses to name query requests with a list of
possible matches including the name authority record identifier (URI).

The service *may* also need to return all other forms of an entity's name and
affiliations for further disambiguation.

3.3.4.2 Related requirements

3.3.1, 3.2, 3.2.1, 3.2.2.

3.3.4.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –
Intute Repository Search, Page 7.*

3.3.5 Other response data

3.3.5.1 Description

The web service *must* provide responses to name query requests with a list of
possible matches including but not limited to:

- Individuals' names
- Affiliations & associated dates
- Article titles
- Other identifiers

3.3.5.2 Related requirements

3.3.1, 3.2, 3.2.1, 3.2.2.

3.3.5.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –
CNI Workshop*, Page 8.

3.3.6 Web service standard

3.3.6.1 Description

The system *may* use OAI-PMH as the standard for response and request
messages via the service interface, however no standard has been set.

3.3.6.2 Related requirements

3.2.1, 3.2.2, 3.3.1, 3.3.2.

3.3.6.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –
OCLC*, Page 8.

3.3.7 Resource discovery

3.3.7.1 Description

The service *must* facilitate resource discovery by linking external service
identifiers to an individual or corporate body identity within the system.

3.3.7.2 Related requirements

3.6.5, 3.6.4, 3.6.3.

3.3.7.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –
British Library*, Page 11.

3.3.8 Security requirements

3.3.8.1 Description

Although security considerations for the prototype are not great, it *must* show
that data retrieval and alteration can be protected in any final version.

Security requirements include SOAP interface data retrieval restriction and
user data management authentication and restriction.

3.3.8.2 Related requirements

3.1.3, 3.3.

3.3.8.3

Draft feedback 08/07/2008.

3.4 Name authority record management

Requirements pertaining to the need for individuals to be able to update and correct their records within the name authority service.

3.4.1 Data Validation

3.4.1.1 Description

It *must* be possible to verify the source of the data entered and manipulated within the system so as to gauge a level of trustworthiness of incoming information. This does not mean that the information entered is entirely accurate, just that it has been entered in good faith.

There *must* be means to verify that the person entering or manipulating data has the right to do so and also that disputed ownership can be resolved.

3.4.1.2 Related requirements

3.1.

3.4.1.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –* CNI Workshop, Page 8.

3.4.2 Validation of identity

3.4.2.1 Description

The system *must* provide facilities for the evaluation of the accuracy and validity of a provided identity.

3.4.2.2 Related requirements

3.4.1.

3.4.2.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –* British Library, Page 11.

3.4.3 Data manipulation facility

3.4.3.1 Description

A facility *should* be provided for users to create, amend and delete records within the system and to link or unlink records with minimal complications.

3.4.3.2 Related requirements

3.4.1, 3.4.2.

3.4.3.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –* British Library, Page 11.

3.5 Compatibility with existing systems

Requirements pertaining to the need for compatibility with existing external systems that will use the names authority service.

3.5.1 Efficiency of integration

3.5.1.1 Description

It *should* not take repository managers a long time to configure their systems to work with the service.

3.5.1.2 Related requirements

3.5.2,3.5.3.

3.5.1.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –* UK Council of Research Repositories, Page 6.

3.5.2 Existing systems

3.5.2.1 Description

Existing systems which the service *should* be compatible with include:
- D-Space
- e-Prints
- FEDORA

3.5.2.2 Related requirements

3.5.1.

3.5.2.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –* UK Council of Research Repositories, Page 6.

3.5.3 e-Prints integration

3.5.3.1 Description

e-Prints requires name authority data to be provided through either a central query-based service or in XML format via a downloadable database.

3.5.3.2 Related requirements

3.5.1, 3.5.2, 3.1.3, 3.3.2.

3.5.3.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –* e-Prints, Page 10.

3.5.4 Interaction with national services

3.5.4.1 Description

The service *may* be required to interact with other similar national services in order to retrieve identifiers for entities not based in the UK.

3.5.4.2 Related requirements

4.4.1.

3.5.4.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –* Intute Repository Search, Page 7.

3.6 Software related data requirements

Requirements pertaining to the data to be used within the system.

3.6.1 Changing of affiliations

3.6.1.1 Description

The service *must* take into account that affiliations of individuals to institutions may change over time It *must* be possible to find and identify individuals by means of current or past affiliations. It *should* be possible to find all individuals affiliated with and institution.

3.6.1.2 Related requirements

3.1, 3.4.

3.6.1.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –* UK Council of Research Repositories, Page 6.

3.6.2 Multiple Identities

3.6.2.1 Description

Entities within the system *may* have multiple identities. It *should* be possible to find and/or identify an entity by means of any of its identities.

3.6.2.2 Related requirements

3.1, 3.4.

3.6.2.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –* UK Council of Research Repositories, Page 6.

3.6.3 Multiple Identifiers

3.6.3.1 Description

The service *should* maintain information on other known identifiers for an entity in other external systems.

3.6.3.2 Related requirements

3.1, 3.3.5, 3.4.3.

3.6.3.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –* CNI Workshop, Page 8.

3.6.4 Referencing cross system identities

3.6.4.1 Description

Links to identities in other systems should be referenced rather than merged to make any subsequent revisions straightforward.

3.6.4.2 Related requirements

3.6.2.

3.6.4.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –* CNI Workshop, Page 9.

3.6.5 Authority control

3.6.5.1 Description

It *should* be possible for a variety of institutions including the British Library to identify a new variant of an existing heading and upgrade their own records with in their own required format with minimal intervention.

Similarly if a new heading is identified it should also be possible for these institutions to use this heading accordingly.

3.6.5.2 Related requirements

3.2.1, 3.2.2, 3.3, 3.4.

3.6.5.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype – British Library, Page 12.*

3.6.6 Merging identities

3.6.6.1 Description

It *should* be possible to merge identities within the system that were previously identified as different individuals but have subsequently been found to pertain so the same individual.

Persistence of the original records and identifiers *may* remain intact also.

3.6.6.2 Related requirements

3.4.3, 3.7.1.

3.6.6.3 Source

Introduced in OCLC draft feedback (27/06/08).

3.6.7 Splitting Identities

3.6.7.1 Description

It *should* be possible to split an identity within the system into two or more separate identities if it has previously been identified to hold information pertaining to one individual but is subsequently found to hold information pertaining to multiple individuals.

Persistence of the original record and identifier *may* remain intact also.

3.6.7.2 Related requirements

3.4.3, 3.7.1.

3.6.7.3 Source

Introduced in OCLC draft feedback (27/06/08).

3.7 Names Service Identifier

Requirements pertaining to the need for a unique identifier for each entity recognised in the system.

3.7.1 URI

3.7.1.1 Description

The service must allow provision for entities to be assigned a URI which uniquely identifies them and their different identities.

3.7.1.2 Related requirements

3.7.2.

3.7.1.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype – Intute Repository Search*, Page 7.

3.7.2 URL resolution

3.7.2.1 Description

The URI which uniquely identifies entities within the system should be resolvable to a URL.

3.7.2.2 Related requirements

3.7.1.

3.7.2.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –* CNI Workshop, Page 8.

4. Non-Functional Requirements

In these requirements:

'*Must*' is used for requirements which have been identified as essential for the prototype.
'*Should*' is used for requirements that would be desirable in a name authority service but which may not be included in the prototype.
'*May*' is used for requirements that will not be included in the prototype but may be part of a future name authority service.

4.1 Non-UK entities

4.1.1 Description

The service *should* be capable of referencing and identifying entities not based in the UK.

4.1.2 Related requirements

3.1.2, 3.4.3, 3.6.1.

4.1.3 Source

Introduced in *Stakeholders' Requirements for the Names project prototype –* UK Council of Research Repositories, Page 6.

4.2 Test Record diversity

4.2.1 Description

The records used to test the prototype *should* represent issues that the service will need to be able to deal with, including those raised in the use case scenarios.

4.2.2 Related requirements
3.1.1, 3.1.2, 3.6.

4.2.3 Source
Introduced in *Stakeholders' Requirements for the Names project prototype –* Expert Panel, Page 5.

4.3 Efficiency of operation

4.3.1 Description
The service software *must* be efficient in its operation and require little intervention or financial cost to run.

4.3.2 Related requirements
Combination of all requirements and subject to ongoing clarification.

4.3.3 Source
Introduced in *Stakeholders' Requirements for the Names project prototype –* British Library, Page 11.

4.4 Other non-functional requirements

4.4.1 Performance requirements

As a prototype high performance may not be crucial, however any final version will require fast response and therefore the prototype should demonstrate that this is at least possible.

4.4.2 Software quality attributes

Whilst the prototype may not require high quality assurance in order to prove the service capability, some level of quality assurance must be provided if the intention is reuse of the prototype software in a final release version.

5. Use-case Scenarios

5.1 Researcher Submission
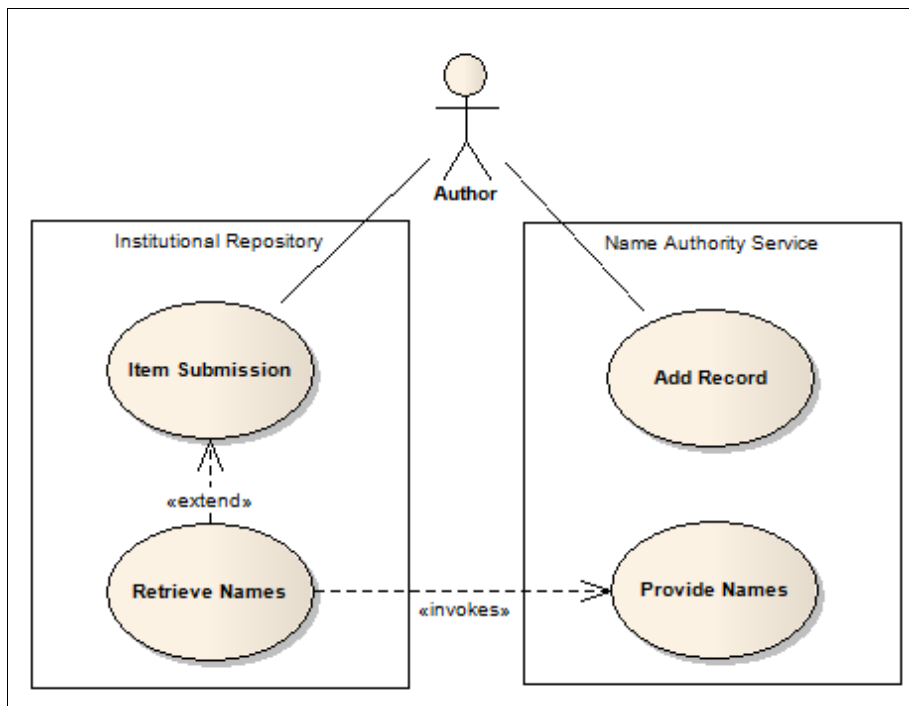
5.1.1 Description

A researcher wants to submit an item to his institutional repository. An auto-complete field for author names allows him to select his own name and those of his co-authors. The institutional affiliation is shown with the names to assist in the selection process.

1a) The names the author requires are available in the list and are chosen to complete the author field.
1b) The names are not in the list. In this scenario the researcher must be able to request the creation of a record for the missing name(s). [7]

1. The researcher accesses the auto-complete field of the repositories submission interface, inputting the name he wishes to enter with the submission.
2. The institutional repository system utilises its Names Service interface module to request a list of names and corresponding current institutional affiliation which could match the search name value.
3. The institutional repository system displays this list to the researcher to allow him to choose the specific name he wishes to enter.

3a. The required name is listed in the returned results and is chosen by the researcher before the item is submitted.

3b. The required name is not listed in the returned results, in which case the researcher follows a provided link to add a new record to the Name Service.

4. The researcher uses the Names Service record interface to add a new record for the missing name, and then returns to the repository site to continue submission.

5.2 Cross-Repository Search
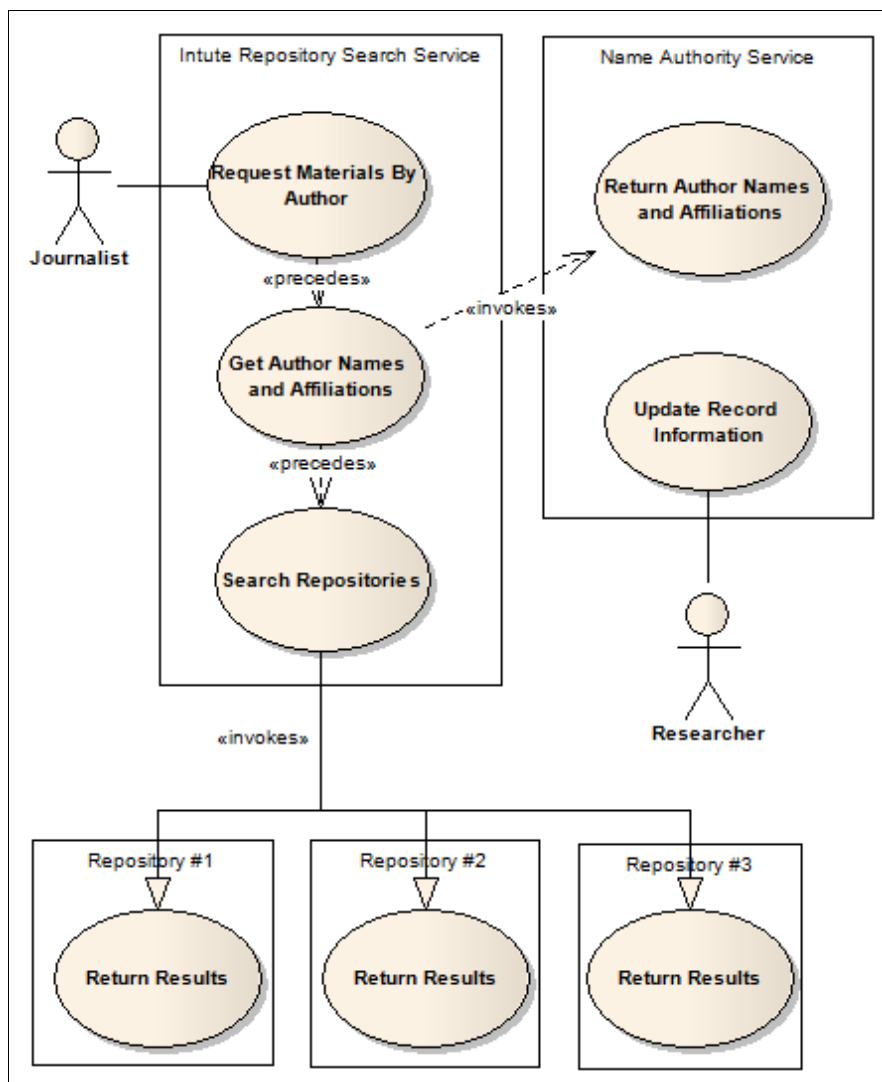
5.2.1 Description

A journalist would like to retrieve all materials published by a researcher on climate change. The researcher has moved between institutions and has changed her name twice since starting her work. [8]

1.

1a.   A journalist uses the IRS service interface to enter the researcher name they wish to search by. This case assumes that the journalist has already narrowed down the researcher they wish to search by either through a previous Names Service call with disambiguating information or direct Names Service identifier usage.

1b.   The IRS Names Service interface module requests a list of repository identifiers associated with this individual's record.

1c.   The IRS service uses the returned list of identifiers to search the corresponding repositories and displays the results to the journalist.

2.

2a.   A researcher logs into the Names Service user management interface to edit their record information.

2b.   The researcher adds an institution to a list of their affiliations   along with a unique author identifier which identifies them within the repository for that institution.

This identifier and institution relationship will be included in future cross repository searches.

5.3 Research Council reporting
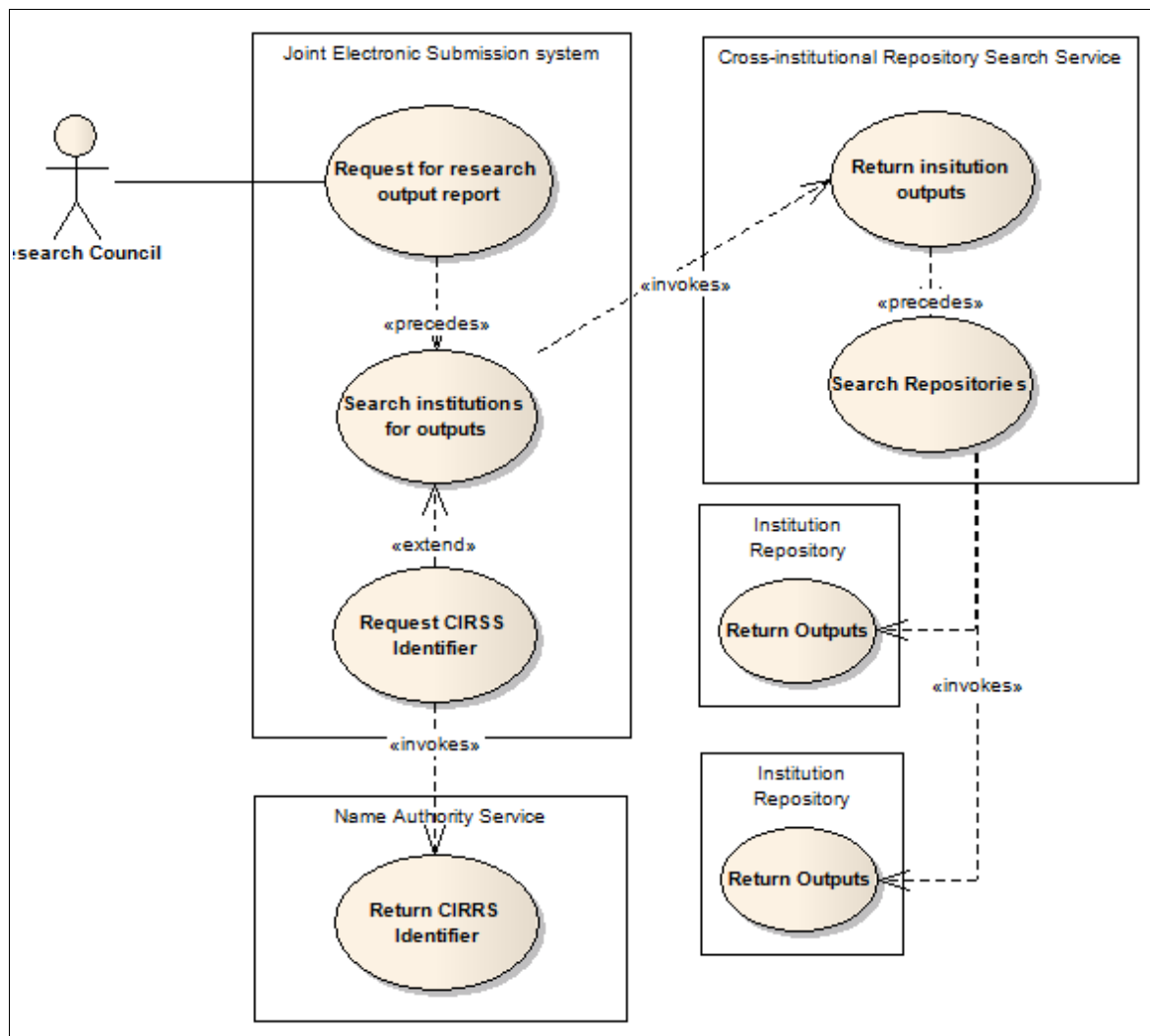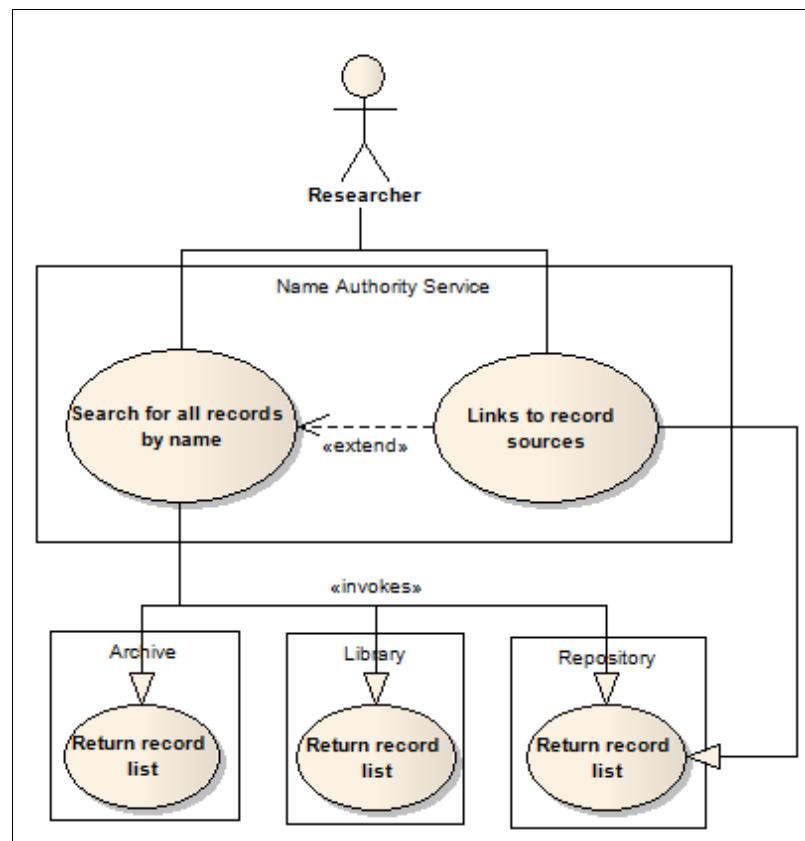

5.3.1 Description

The Arts and Humanities Research Council wishes to report on the research outputs from a particular grant. [9]

1. Research Council uses the Joint Electronic Submission (JES) search interface to request all research outputs relating to a particular grant.
2. The JES search system uses its Names Service interface module to request the Cross Institutional Repository Search Service (CIRSS) identifier for a principal investigator. This request could be made either by referencing either the JES

identifier of an individual in the Names service records or directly by their Names service identifier.

3. The Names service returns the CIRSS identifier for that individual.
4. The JES search service makes a request to the CIRSS using the identifier retrieved from the Names service.
5. The CIRSS searches all repositories linked to the individual in question and returns a list of outputs to the JES service for presentation to the Research Council.

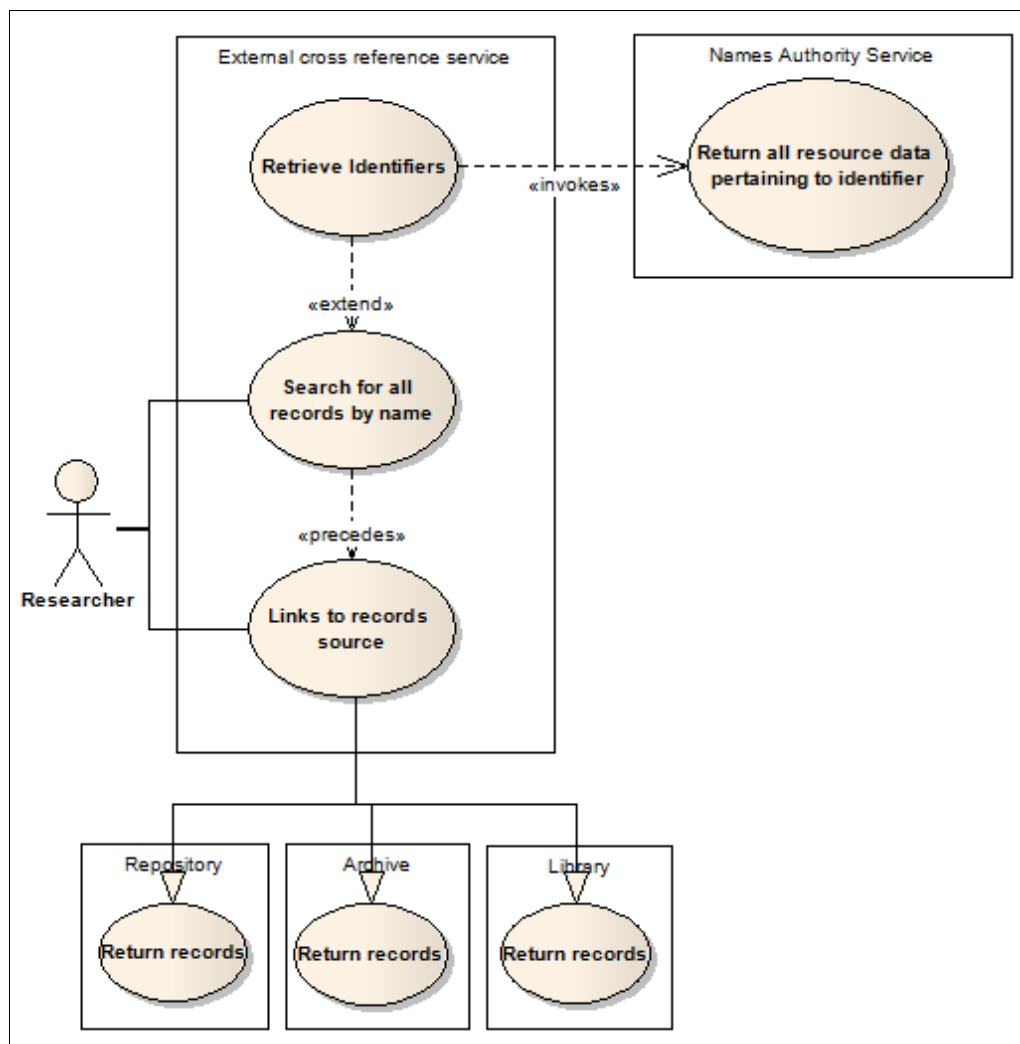## 5.4 Comprehensive Literature Search A

5.4.1 Description

A researcher wishes to conduct a comprehensive search for resources created by a certain author or to which that author has contributed. The search is to encompass repositories, archives and libraries. [10]

1. A researcher enters the intended search name into a search interface provided by the Names Service. This case assumes that the researcher has already narrowed down the author they wish to search by either through a previous

Names Service call with disambiguating information or direct Names Service identifier usage.
2. The Names Service searches every repository, archive and library associated with this author identifier using the related unique identifier for the particular data store in question.
3. The Names Service compiles a list of links to resources found for the author in question in all related archives, libraries and repositories. This list is then presented to the researcher who can follow the links to the original source at their discretion.

## 5.5 Comprehensive Literature Search B

5.5.1 Description

A researcher wishes to conduct a comprehensive search for resources created by a certain author or to which that author has contributed. The search is to encompass repositories, archives and libraries. [10]

1. A researcher enters the intended search name into a search interface provided by an external cross reference service. This case assumes that the researcher has already narrowed down the author they wish to search by either through a previous Names Service call with disambiguating information or direct Names Service identifier usage.
2. The cross reference services uses its Names Service interface module to request all resource identifiers for the individual in question.
3. The external cross reference service uses the returned list to search corresponding archives, libraries and repositories and compiles a list of links to the original resources. This list is then presented to the researcher who can follow the links to the original source at their discretion.

5.6 Cataloguing
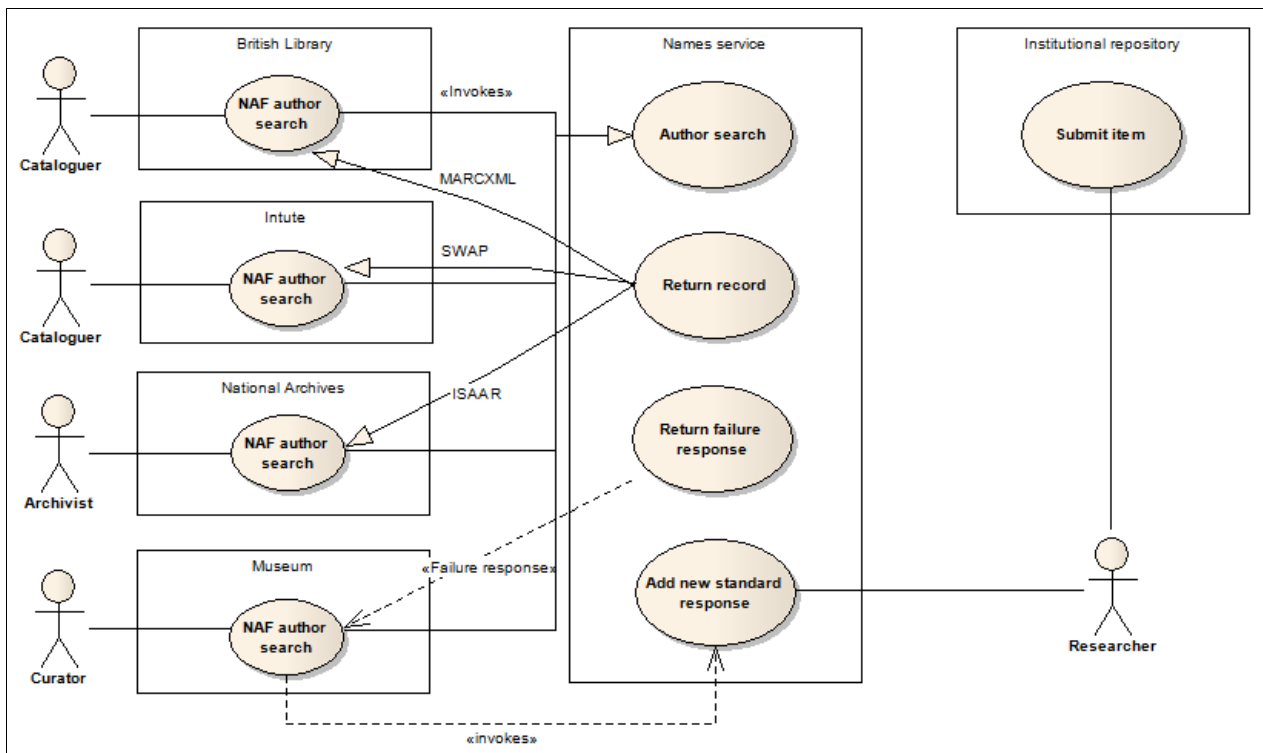
5.6.1 Description

A cataloguer working in the BL, in the process of cataloguing a resource, searches for the author/contributor on the Name Authority File (NAF) and is able to reuse a record created for an institutional repository. [11]

1. A cataloguer at the British Library makes an NAF author search via the Name Service.
2. If a record exists for that author then it is returned in MARC21 form with MARCXML.
3. If no record exists then a failure response is returned indicating that one must be created.
4. Similar procedures occur with other organizations returning records in their own standard form.
5. A researcher creates a new record when submitting an item to an institutional repository.
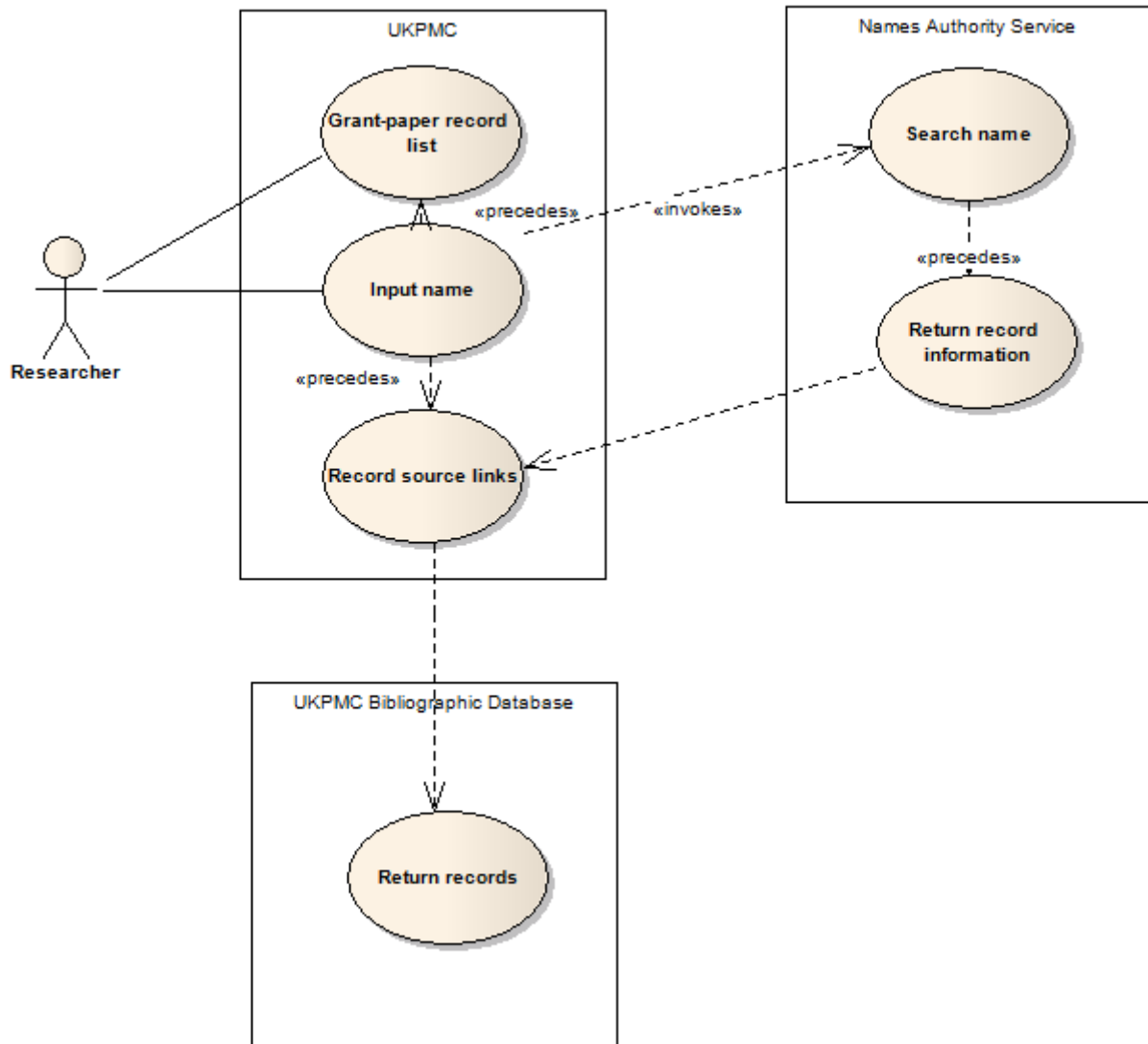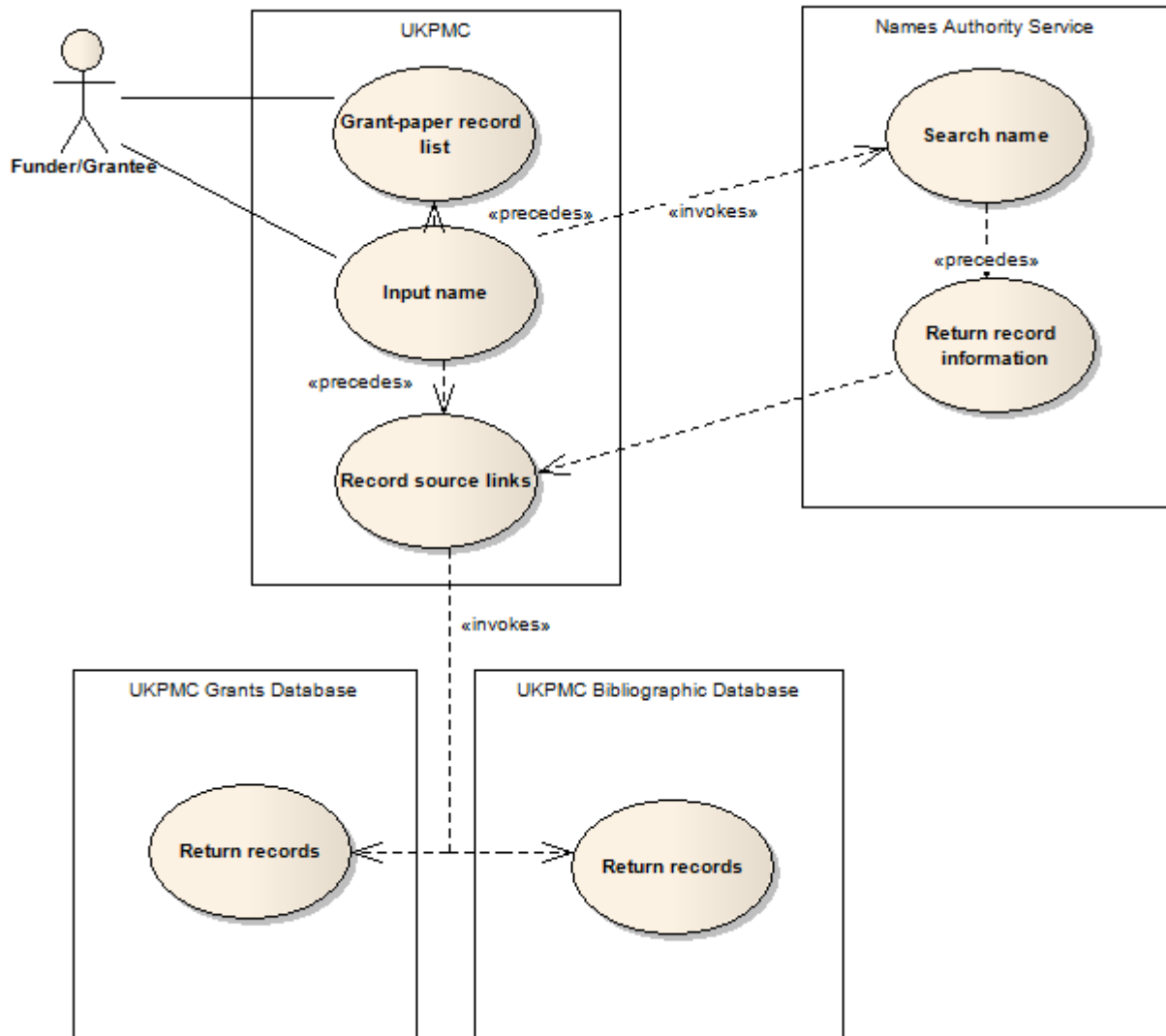
A researcher wishes to conduct a search on UK PubMed Central (UKPMC) for resources created by a certain author or to which that author has contributed.

1. The researcher enters the name of the author into the search box on UKPMC.

2. The UKPMC system utilises its Names Service interface module to request a list of names and corresponding current institutional affiliation which could match the search name value. The names the author requires are available in the list and the appropriate one selected.

3. Metadata (standard format used for the author; name and affiliation; identifier) returned by Names for the selected author is used to search the UKPMC bibliographic database.

4. A list of papers pertaining to the selected author is displayed to the user.

5.8 UKPMC B

5.8.1 Description

A researcher who is in receipt of a grant from a UKPMC funding body (a grantee) wishes to conduct a search on UK PubMed Central (UKPMC) to identify his grants and match them against their associated papers. A funder wishes to access information about their grantees and the papers they have produced as a result of their grants.

1. The grantee/funder enters their name/the name of the grantee into a search box on UKPMC.

2. The UKPMC system utilises its Names Service interface module to request a list of names and corresponding current institutional affiliation which could match the search name value.

a. The names the author requires are available in the list and the appropriate one selected.

b. The names are not in the list. In this scenario the grantee/funder must be able to request the creation of a record for the missing name(s) via the funding body administration.

3. Metadata returned by the Names service for the selected grantee is used to search the UKPMC grants database.

4. A list of grants and the associated research projects relevant to the grantee is displayed.

5. If the grantee's Names identifier has not already been assigned to the grant, the grantee/funder must be able to request its inclusion in the grant record via the UKPMC interface.

6. Metadata (standard format used for the grantee; name and affiliation; identifier) returned by Names for the selected grantee is used to search the UKPMC bibliographic database.

7. A list of papers pertaining to the selected grantee is displayed to the user.

8. The grants and papers are linked within the UKPMC Grant Reporting System.

6. References

[1] *Names Project Plan; v4 Oct 2007, Amanda Hill.*
http://names.mimas.ac.uk/documents/Names_project_plan_v4_Oct07_web.pdf

[2] *Stakeholders' requirements for the Names project prototype; Feb 08, Alan Danskin & Amanda Hill. British Library, Page 11.*
http://names.mimas.ac.uk/documents/Names_Requirements_Report,_26Feb2008.pdf

[3] *A review of the current landscape in relation to a proposed Name Authority Service for UK repositories of research outputs; Feb 08, Alan Danskin, Anne Dixon, Michael Docherty, Amanda Hill, Richard Moore.*
http://names.mimas.ac.uk/documents/Names_Landscape_Report_19Feb2008.pdf

[4] *Stakeholders' requirements for the Names project prototype; Feb 08, Alan Danskin & Amanda Hill. CNI Workshop, Page 9.*

[5] *Stakeholders' requirements for the Names project prototype; Feb 08, Alan Danskin & Amanda Hill. Expert Panel, Page 5.*

[6] *Stakeholders' requirements for the Names project prototype; Feb 08, Alan Danskin & Amanda Hill. Expert Panel, Page 5.*

[7] *Names service: Initial Usage Scenario; Oct 07, Amanda Hill. Researcher submission, Page 1.*

http://names.mimas.ac.uk/documents/Names_project_usage_scenarios_Oct_07.pdf.

[8] *Names service: Initial Usage Scenario; Oct 07, Amanda Hill. Cross-repository search, Page 1.*

[9] *Names service: Initial Usage Scenario; Oct 07, Amanda Hill. Research council reporting, Page 2.*

[10] *Names service: Initial Usage Scenario; Oct 07, Amanda Hill. Comprehensive literature search, Page 2.*

[11] *Names service: Initial Usage Scenario; Oct 07, Amanda Hill. Cataloguing, Page 3.*