Nasjonalbiblioteket
National Library of Norway

Requirement specifications

Audio Visual Management System (AMS)

National Library of Norway (NLN)

Date: 21.12.2021

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1 Background

The National Library of Norway (NLN) is a state-owned agency tasked with collecting, registering, preserving and providing access to published materials from all publication platforms, thus being a major source of information about Norway and Norwegian matters. As a collection and research library, the NLN is a key part of Norway's research infrastructure. The NLN plays a role in cultural policy in terms of the long-term preservation and dissemination of our cultural heritage. The collection is a unique knowledge base for the benefit of present and future generations.

The operations of the NLN are governed by the Legal Deposit Act. All documents in the public domain must be deposited with the NLN, irrespective of which medium they are published in. Electronic publications of documents and electronic master documents are covered by the act. Legal deposit ensures that records of Norwegian culture and society are preserved and made available as source material for present and future research and documentary purposes. The NLN's collection is also continually supplemented with a growing volume of digital and analogue archive material which is not covered by legal deposit.

The NLN employs almost 500 FTEs and is based at Solli plass in Oslo and Mo i Rana, where most of the library's collections are stored.

As a result of the library's digitalisation programme, large parts of the NLN's collection are now digitalised and can be viewed online. This includes all historical book publications in the Norwegian language, more than 60% of all Norwegian newspaper editions and the Norwegian Broadcasting Corporation's (NRK's) historical radio archive. It also covers large quantities of photographs, films, sound recordings and periodicals.

Drawing on its in-house services and experience, the NLN has a particular responsibility for helping to develop and strengthen Norway's libraries as active and relevant civic institutions. The NLN sets bibliographic standards, develops bibliographies and authority files, runs shared repositories and interlibrary lending schemes through the National Repository Library, and oversees the development of a Norwegian digital library.

The NLN's main projects for the period 2018–2022:

- Implementing the new Legal Deposit Act, including realising digital legal deposit for all types of materials.
- Enhancing the NLN's overall communications activities online, at Solli plass in Oslo and through other channels.
- Further developing the library's role as a centre of infrastructure and excellence for Norwegian libraries, archives, arts institutions and researchers.
- Reviewing the NLN's work processes in respect of streamlining and quality development.

Since 2020 the NLN has digitized paper materials, photographs, films and audio recordings from archives, libraries and museums (LAM) across Norway. This process has not only resulted in a significant expansion of the library's capacity; it also represents an extended civic mandate since cultural heritage documents from the entire LAM sector now form part of the NLN's preservation mandate.

1.1 Description of existing management system

Between 1996 and the present day the NLN has been using the Mavis system (Merged AudioVisual Information System) as a tool for managing large parts of its audiovisual material. In addition to audiovisual material, Mavis is also used to manage other materials such as legal deposit newspapers and film documentation. The database is a relational database with a complex structure, and the system comprises a client server application running on Windows and Unix platforms. The Australian firm Feenyx Proprietary Limited is responsible for developing the software and for maintenance and support until the end of 2022.

As well as the large number of systems interacting directly with Mavis (see Chapter 1.4), there are also many other catalogues incorporating audiovisual materials in the library's collection. They include nine different catalogues primarily used for queries in addition to a dedicated reporting system used by our conservators when evaluating objects for lending. The majority of these catalogues belong to historical collections transferred to the NLN due to consolidation, while others are catalogues and management systems primarily covering other functions and materials than Mavis. The most important in the latter category are Exlibris Alma, a catalogue for legal deposit audio recordings, and Hanske, a main catalogue for private archive materials.

The implementation of a new Audiovisual Management System (from now on referred to as AMS) is essential to be able to incorporate as much of the above-mentioned content and functionality as possible in a sustainable and flexible shared solution. This will also make a vital contribution towards establishing an even better functioning and more robust internal system architecture.

1.1.1 Document structure in Mavis

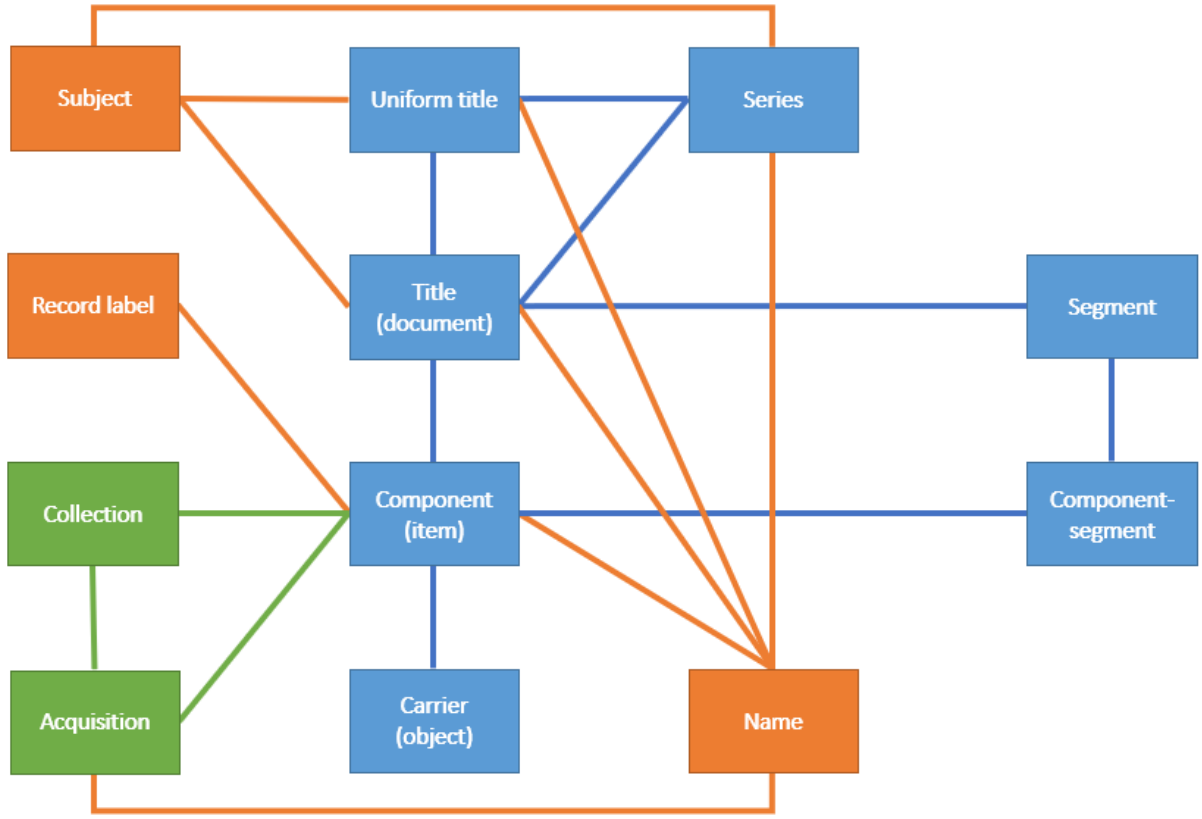

Figure 1: The figure shows the most central parts of the existing management system (Mavis).

Mavis primarily structures the information like this:

- **Title (data object)**
  - This level partly covers the categories “expression” and “manifestation” in IFLA’s LRM model. For certain materials the level constitutes a combination of “work” and “expression”
  - Made up of a unique recording or unique collection of recordings. Some non-conformities with separated titles
  - Contains all fundamental descriptive metadata for the recording or collection, including
    - title
    - name of copyright holder
    - time and location of recording etc.
    - IDs
  - May recursively include part titles in the form of segments, typically tracks on a music album or clips from a newsreel
  - Contains a list of and link to *components*

- **Component**
  - This level partly covers the categories “manifestation” and “item” in the LRM model

    - Forms a hub in the information structure to:
        - act as a link between the intellectual level (*title*) and the physical material (*carrier*)
        - collate one item/version of what the title describes. Some components are not linked to a title but instead act as free-standing components with one or more carriers linked to them.
    - The level contains
        - a description of the physical (or digital) material
        - basic descriptive metadata for publication (where relevant)
        - copying history (where relevant)
        - IDs
    - List of and link to *carriers*
    - Link to *collection* (where relevant)
    - Link to *acquisition*

- **Carrier**
    - Partly covers the “item” category in the LRM model
    - Represents one physical object, alternatively one digital file
    - Contains
        - condition report (where relevant)
        - treatment (where relevant)
        - copying history (where relevant)
        - technical information for digital files
        - rack number
        - IDs

- **Uniform title**
    - Covers the “work” category in the LRM model
    - Used as a uniform title for different versions/editions of the same work May also be used for works of which there is only one version
    - Contains basic descriptive metadata for the work
    - Little used in practice.
    - Linked to *title*, which constitutes an expression of the work

- **Series title**
    - Partly covers the categories “work”, “expression” and “manifestation” in the LRM model
    - Describes the title of a series
    - Contains basic descriptive metadata for the series
    - Linked to *title*, which makes up the individual episodes of the series

- **Acquisition**
    - Describes the acquisition of materials for the collection
    - Contains information about
        - when the material was received
        - who the material was received from

        - why the material has been received (legal deposit, deposited etc.)
        - what has been received: format and estimated number of carriers
    - Linked to *component*

- **Collection**
    - Describes physical and digital material which belongs together. Important level for linking and describing a material
    - Linked to *component*

- **Name**
    - System-level authority register for personal and corporate names in the database
    - Personal name consists of:
        - main name of person, i.e. preferred name
        - any synonyms, i.e. see references
        - alternative names, i.e. other names for the same entity which have also been used, such as pseudonyms and formerly used names
        - relationship with other relevant names, such as membership in a group
    - Corporate names consist of:
        - main name of corporate body
        - synonyms, i.e. see references
        - relationships with other relevant names, such as members of organisation or membership of larger organisation
    - Linked to many different types of records in the management system

1.1.2 Mavis – scope and volume

- Number of users/licences for simultaneous users: 200
- Number of registered titles: 6,500,000
- Number of registered components: 7,500,000
- Number of registered carriers: 66,000,000
- Number of registered personal and corporate names: 130,000 (incl. references)

1.2 The National Library's audiovisual collection in numbers

The National Library holds Norway's largest collection of audiovisual materials. Mavis is currently the main catalogue and prevailing management system for this collection. Yet large quantities of AV materials have not yet been registered in Mavis, and additions of physical and digital material are expected to grow sharply in the next five years. AMS must therefore be an effective tool for preserving materials and metadata already catalogued, and it must enable sustainable and effective management of both extensive backlogs and formidable growth.

Images
The number of physical images in the NLN archives is estimated at more than 15,000,000 units, and growing. More than 1,500,000 of those have already been digitalised.

Images that end up in the NLN's collection come from different sources. The acquisitions are donations, deposits, purchases, legal deposit material or in-house productions. The legal deposit materials described above are posters and postcards. Under legal deposit, submissions are made of photographs not as separate documents but to some extent in connection with other materials such as advertising photos for films. The NLN image collection consists to a large extent of very large historical archive collections of different origins. In the past few years, the collection has been enriched with photo archives from big media companies. These collections contain a large proportion of negatives, and only around 10% of the material has been previously published.

Moving images
The NLN collects, preserves and disseminates Norway's film heritage. The Collections are created through legal deposit (since 1990). The NLN still receives new deposits/donations of physical materials, albeit in smaller quantities than before. The bulk of the historical film collection consists of archive materials transferred to the NLN due to past consolidations. Under legal deposit rules, submissions must be made by all broadcasters and service providers responsible for audiovisual programmes which are broadcast or made available on demand.

Audio recordings
The NLN collects, preserves and disseminates Norway's musical heritage. Collections are created through legal deposit (since 1990) and through acquisition of physical and digital archive recordings and production materials from the Norwegian music industry. The volume of such deposits and donations has increased sharply in the past decade.

The collection also includes complete legal deposit materials from NRK radio broadcasts after 1990, P4 radio broadcasts from 1993 and Radio Norge broadcasts from 2012. Radio broadcasts from before 1990 include the NRK's historical radio archive.

1.3 Expected growth 2021–2025

Digital growth is expected to increase sharply in the period 2021–2025 both as a result of the implementation of digital legal deposit for additional types of materials and because of a general increase in the volumes of born-digital publications and archive material. It is also reasonable to expect stable physical growth, especially in legal deposit of audio recordings in the same period, and for growth in physical audiovisual archive materials to gather considerable pace due both to the NLN's extended digitalisation for the LAM sector and the ongoing archival collaboration with the NRK.

Brief summary of expected growth for AMS in numbers:

Material type	Unregistered existing individual objects	Expected growth 2021–2025 individual objects
Images	13,000,000	1,400,000
Film and video	134,000	60,000
Broadcasting – moving images	150,000 and 1,467 TB[1]	740,000
Broadcasting – audio	8,000 and 1,000,000 hours[2]	700,000
Audio recordings	190,000 and 40 TB[3]	112,000 and 1,000 TB[4]
Total	**13,500,000 and 1,507 TB plus 1,000,000 hours**	**3,000,000 and 1,000 TB**

Mixed collections and archives

In addition to audiovisual material submitted under legal deposit, the NLN receives a growing number of acquisitions of mixed historical collections and archives containing audiovisual material. Such acquisitions may comprise a large number of different types of materials and formats in both physical and digital dede, ranging from older paper manuscripts to memory sticks with music video files. Many of the archives also comprise production materials which form the basis of published and legal deposit recordings. Due to the number of different sources of growth and the use of multiple catalogues and management systems, it is difficult to effectively recreate content and author relationships between different physical and digital objects.

Dealing with this level of complexity in terms of dissemination and research is often resource-intensive, and the implementation of AMS must be able to optimise these processes through both built-in system functionality and good interaction with other systems. The latter encompasses key aspects such as functionality for flexible and standardised data transfer, compatibility with relevant standards, and the option of API integration with local applications.

1.4 Interaction with other systems

AMS must be able to interact and deal with at least seven other existing systems currently forming part of the NLN's digital infrastructure. They include three different inventory management systems, end user interface for metadata and digital objects, platform for processing and delivering digital objects at www.nb.no, national register for geography data and the institution's internal case archive. Two of these systems are operated by external providers and accessed through standardised API solutions.

[1] For practical reasons, the estimate for broadcasts of born-digital moving images is given in terabytes (TB) in the absence of other quantifiable numbers.
[2] For practical reasons, the estimate for born-digital audio broadcasts (radio) is given in broadcast hours in the absence of other quantifiable numbers.
[3] For practical reasons, the estimate for unpublished born-digital audio recordings is given in terabytes (TB) in the absence of other quantifiable numbers.
[4] For practical reasons, the growth estimate for broadcasts of born-digital audio recordings 2021–2025 is given in terabytes (TB) in the absence of other quantifiable numbers.

There are also six internal systems with which AMS will or may have overlapping functionality. They include the library's system for long-term storage of digital objects, proprietary solutions for fast registration of large collections and administration of audiovisual materials from the ALM sector, DAM system for a smaller selection of photographs, a separate system for order processing, and not least several digital production lines adapted for different types of materials. There are also multiple general system concepts currently being set up which AMS needs to deal with. These projects include national name and work registers, authorised shared solution for sharing metadata with other libraries, and the development of a general DAM solution for digital content with focus on internal standardisation of existing systems and production lines.

To achieve optimal interaction between AMS and the NLN's numerous other systems and to help strengthen the institution's digital infrastructure, it is crucial to the success of the implementation that functionality for data transfer between standard interfaces, forms and protocols be introduced along with data flexibility and compatibility with relevant standards.

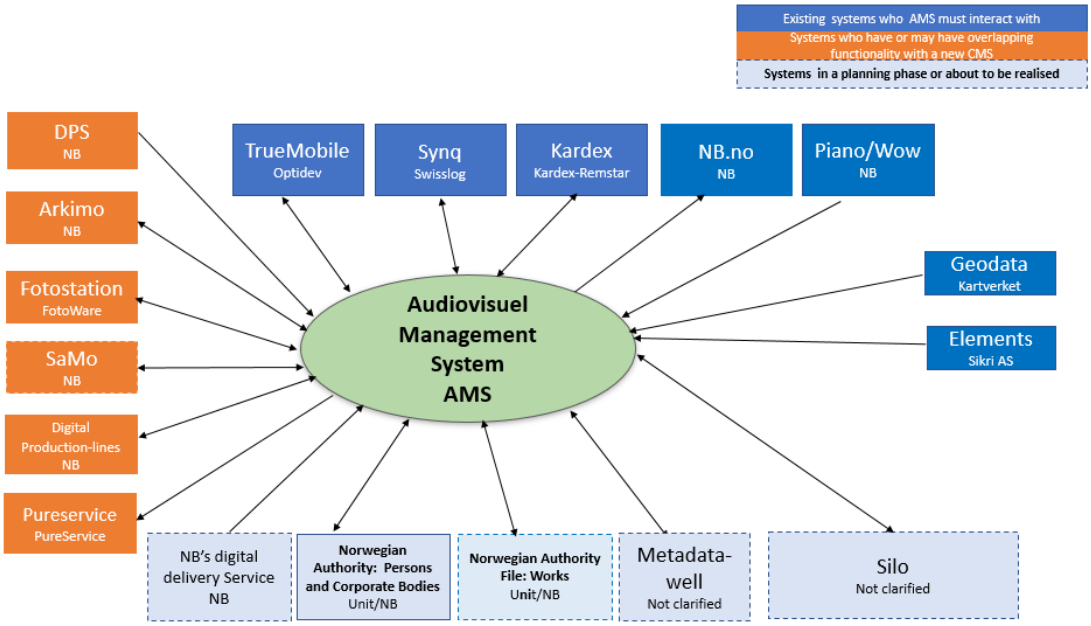

Figure 2: System environment for new management system (AMS)

1.5 Remarks on existing management system

- **Scalability:** The current management system relies on interaction with other systems in order to process fast registration and digitalisation of large collections. The lack of automation and standardisation in these temporary solutions will pose a critical challenge in terms of scaling up to meet expected analogue and digital growth in the coming years.

- **Expertise:** The Australian firm Feenyx Proprietary Limited will be phasing out all support for Mavis from 2022. This will make it difficult to ensure adequate development of software and maintenance after that date.

- **User interface:** Mavis has a complicated and dated graphical user interface comprising a complex window-based display of various functions. This inflexible solution sets a high threshold for performing advanced searches and general cataloguing in respect of the need for system knowledge and expertise. It also generates additional work when training new users.

- **Workflow:** The current management system has a complex and not very user-friendly workflow support and order management system. This has led to the use of simpler external systems for processing orders where a lack of integration with Mavis has resulted in additional work and complicated the documentation of the movement of materials and order history.

- **Outward interface:** Given the age of the management system, there are numerous issues surrounding data transfer through standard interfaces, forms and protocols. This poses a particular challenge when it comes to compatibility with relevant standards and integration with local applications.

- **Playing and displaying files:** The current management system has functionality for displaying/playing digital files associated with metadata records, but this solution has only been partially implemented because of the inadequate outward interface and insufficient interaction with other systems.

- **Internal system searches:** The existing solution enables both internal system-level free text searches and advanced field searches, but the extraction of standard and customised reporting set-ups is unnecessarily time-consuming and not user-friendly.

2. Specifications for new management system

AMS will be used to manage the NLN's collection of moving images, audio recordings and images.

- As a minimum, *moving images* includes video, television and film
- As a minimum, *audio recordings* includes radio, documentary recordings, published and unpublished music
- As a minimum, *images* includes all types of pictorial representations – photographic, painted, drawn, printed etc. – which are typically still images

2.1 Scope of the delivery

The following products must be included in the delivery to the NLN:

- A management system based on off-the-shelf products. The new system must be flexible and be configured according to the needs of the users and the organisation. The management system must meet the NLN's needs in relation to managing the organisation's AV materials. The most important user requirements are described in the document "AMS UserStories"
- In addition to the live system, a test version of the system will also be established for use in training and testing the delivery and for testing and training in connection with future upgrades of the system before they can be released
- System and operating documentation
- Training materials
- The delivery shall also include installation, conversion of data, training and any adaptations

2.2 Mandatory requirements

Mandatory requirements must be answered in a separate document "AMS Requirements Form". All requirements must be met for the offered solution to be eligible for evaluation.

Mandatory requirements for new management system:

1. The solution offered must. be able to manage the NLN's complete collection of analog and digital materials
2. The solution offered must be able to manage both legal deposit, archival and production materials.
3. The solution offered must be able to manage collections with at least 100 million units.
4. The solution offered must have documented and flexible API solutions for exchange of large data sets with other metadata providers. This includes support for CRUD (Create, Read, Update, Delete) operations.

5. The solution offered must support Multi-factor authentication (MFA) to prevent data access by an unauthorized third party.
6. The solution offered must support role-based access to ensure that a user through his assigned roles only has access to perform the tasks that the position requires.
7. The solution offered must run on an infrastructure in active life cycle stage.
8. The solution offered must support 8-bit Unicode Transformation Format. Ref. RFC 3629: https://www.ietf.org/rfc/rfc3629.txt .

2.3 Technical and functional characteristics (50% weighting)

The National Library has described the most important functional characteristics with the new system for six functional categories. Some of the functional categories are divided into subsidiary levels:

Functional category	**Subsidiary level**	**Purpose**
1 Reception and acquisition processing		Functionality for activities associated with the receipt and registration of acquisitions, including information about each acquisition, correspondence and other documentation relating to the acquisition, as well as general descriptions of the materials.
2 Material control and workflow	Material control	Functionality for internal material control in interaction with other inventory management systems, tracking and access to necessary information about physical objects in the AMS, including where the materials are, who is in possession of them, when the materials were loaned from the vaults, why they were loaned out.
	Workflow/ process management	Functionality for planning and executing tasks and workflows associated with objects in the AMS.
3 Metadata and structures	Metadata and structures	Functionality for recording and structuring metadata. Includes all types of metadata that describes contents and objects as well as documentation of relevant activities.
	Rights and rights management	Functionality for managing rights associated with the materials in the collections and management of access to content and/or metadata. Rights include intellectual property rights, ownership rights, contracts, clauses, restrictions, licensing.
4 Searching and reports		Functionality for performing searches and generating reports.
5 User interface	User interface	Functionality for user customisation.
	Playback of digital material	Functionality for playback and access to digital files from the AMS.
6 System requirements	Administration	Functionality for configuring the system, maintenance, quality-assuring content and other administrative functions.

	Outward interface	Functionality for flexible, effective and standardised exchange of data between the AMS and various systems in both real time and in the form of batch jobs processing large volumes of data.
	General requirements	General system requirements for all chapters and areas.
	Security	General requirements.

The individual requirements in the respective categories are described as user stories and can be found in the document “AMS User Stories”. The table is not exhaustive but contains what we believe are the most important requirements in each category. Suppliers should provide an answer as to whether the system being offered contains functionality that meets these requirements in the document “AMS Reply Form”. For each fulfilled requirement, the supplier is asked to provide a brief description of how the requirement will be met.

As part of the negotiation process, NB will prepare a few scenarios for the provider to allow him to demonstrate how the offered system will solve the needs described in selected user stories.

2.4 Delivery criteria (25% weighting)

These criterias will be used to assess the supplier's ability to complete the delivery. Including preparations, production start-up and further follow-up of product and customer during the agreement period.
The following must be described and answered in the “AMS Reply Form”:

1. Describe the qualifications (CV) of the delivery team being offered, up to 4 persons. Of these, one must be the project manager and one must be the technically responsible. The supplier is obliged to use these resources during the delivery. The CVs should contain:
    a. relevant education
    b. relevant experience
    c. a description of relevant assignments in which the person in question has participated, what role the person has played in these, and why these assignments are relevant for the delivery to NLN

2. Describe the implementation timetable with timings for the delivery, i.e. plan for project launch, training, implementation, conversion, testing, documentation and handover of complete solution to the National Library. Please note that only data from Mavis will be converted to the new system as a part of this delivery.

3. Describe how the supplier intends to ensure good communication between everyone involved from the NLN and the supplier in the form of a communications plan.

4. Describe how the supplier will report on progress.

5. Describe how the supplier will practice risk management:
    a. What does the supplier believe constitutes the greatest risks to the implementation of the project/delivery?
    b. Which measures can be taken to minimise the chance of these risks materialising?

6. Describe a plan for handling deviations, both in the preparation phase and in the delivery phase.

7. Describe how the supplier intends to provide training to NLN staff. The description must as a minimum inform about how the training will be carried out. What knowledge/qualifications should the following three groups have acquired upon completing the training?
    a. Training of superusers/administrators. Up to six client employees will take part in this training.
    b. Training of operating personnel. Up to six client employees will take part in this training.
    c. Training of users. Up to 200 client employees will take part in this training. 150 them in Mo i Rana and 50 in Oslo.

8. Describe how the supplier proposes to support the NLN in the first few weeks after commissioning.

9. Describe the supplier’s expectations for NLN participation in the implementation of the delivery. Which activities should the NLN contribute to, and which qualifications are the NLN participants expected to have?

10. Description of further development and follow-up of the system, included:

    a. Document how the product has been developed over the recent years. Describe the roadmap for the product.
    b. Describe how the supplier organises the work to further develop and follow up on the system being offered.
    c. State whether there is a user forum for the product being offered and how user participation is dealt with.

2.5 Service criteria (5% weighting)

These criteria's will be used to evaluate the supplier's offered service agreement and upgrade of the system. Answer is to be supplied in the “AMS Reply Form”:

1. The National Library wishes to enter into a service level agreement for the system. Describe offered service level agreement model. Describe how a service level agreement would work in practice. Support, points of contact, escalation. As a minimum, the National Library expects a service level agreement to be 8/5 NBD.

2. Describe how upgrades of the system is expected to be executed.

2.6 Price (20% weighting)

The price of the requested solution will be calculated based on the sums provided in the submission. Pricing is to be described in the document “AMS Price Form”. The following elements will be taken into account:

1. State all costs including on-site training, installation and testing which will be incurred for the system to be commissioned on an agreed launch date. If the system is module-based and priced per module, please specify the items separately.

   Production and test environment will be installed on NLN infrastructure in Mo i Rana. Training will take place in Mo i Rana (150 employees) and in Oslo (50 employees). Any additional travel costs must be in line with Norwegian government rates.

2. State the annual cost of the 8/5 NBD support agreement. It must include any licensing costs for up to 200 simultaneous named users. The support costs will be calculated for a period of four years.

3. State the hourly consulting rate linked to the conversion of metadata from Mavis to the new system. Estimated usage will be around 1,000 consulting hours and calculated as a one-off cost in the price evaluation based on the price of the consulting resources being offered.

4. State the hourly consulting rate linked to development and maintenance of the NLN’s installation. Estimated usage will be around 500 consulting hours per annum for four years based on the price of the consulting resources being offered.

2.7 Options I

Options with their own pricing are described in the document “AMS Price Form”. These are not included in the price evaluation.

1. The National Library wishes to receive a priced option on a support agreement to cover 24/7/365, 4-hour response time.

2. The National Library is interested in a priced option for the acquisition of an additional instance of the offered solution. This may be relevant for use in other collections / user environments for which the National Library is responsible.

3. The National Library is interested in a priced option to expand the solution for another 50 new concurrent users.

2.8 Options II

Option to be described in the document “AMS Reply Form”. This option is not included in the evaluation or in the price calculation.

1. If the offered system consists of more modules than what is requested in the requirements specification, these can be described briefly with an associated price model. For example, for the management of other types of material such as newspapers, books, magazines etc.