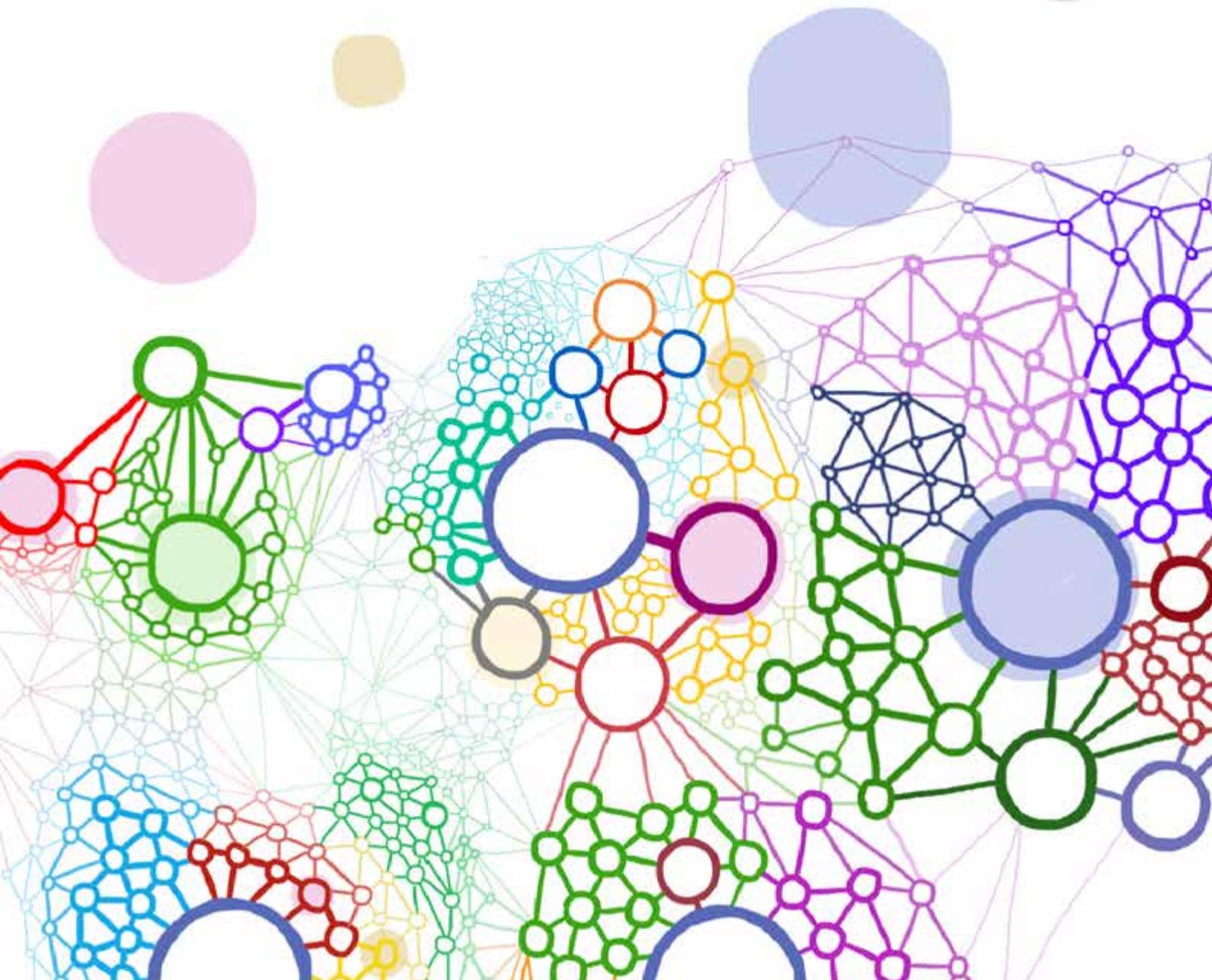




National Digital Heritage Strategy

Digital Heritage Network



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This strategy offers a perspective on developing a national, cross-sector infrastructure of digital heritage facilities. It contains objectives, starting points, and specific work programmes for a joint approach. The strategy was developed within the Digital Heritage Network. Dozens of professionals from the various sectors have contributed to this process by engaging in working groups, attending meetings, and reviewing texts.

Digital Heritage Network

The Digital Heritage Network [*Netwerk Digitaal Erfgoed*] ('NDE') is a partnership that focuses on developing a system of national facilities and services for improving the visibility, usability, and sustainability of digital heritage. The network was established on the initiative of the Ministry of Education, Culture and Science [*Onderwijs, Cultuur en Wetenschap*] ('OCW'). The members of the NDE are large, national institutions that strive to professionally preserve and manage digital data (the National Library [*Koninklijke Bibliotheek*], The Netherlands Institute for Sound and Vision [*Nederlands Instituut voor Beeld en Geluid*], the Netherlands Cultural Heritage Agency [*Rijksdienst voor het Cultureel Erfgoed*], and the Royal Netherlands Academy of Arts and Sciences [*Koninklijke Nederlandse Academie voor Wetenschappen*], and the National Archive), the DEN Foundation [*kenniscentrum DEN*], the INNLE portal, and a growing number of associations and individuals both within and outside the heritage sector.

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More and more collections belonging to archives, libraries, media, museums, and knowledge institutes are being digitised and made available online.

Institutions are developing functional and technological facilities for making these collections available for digital access and use, simultaneously making the maintenance of these collections cost-effective and sustainable. These are often comprehensive programmes unique to the logic, solutions, and dilemmas that are common in that particular sector.

The challenge now is to further develop sector-wide infrastructures and increase their interconnection by formulating shared principles and plan-based frameworks according to which joint projects can be carried out. The heritage sectors want to collaborate more to achieve this goal.

By coordinating their IT strategies, parties can achieve benefits of scale and reuse existing building blocks. Making smart connections between collections will enable users to view, experience, and re-use each object in a much richer context. And therein lies the profit for society.

When it comes to digitisation, the major challenges facing the heritage sector relate to scaling up their facilities to be more effective and efficient and linking the collections together to facilitate use.

Rather than an appeal, strategy, or joint programme, this document is an invitation for cooperation at every level: horizontally between the various sectors, vertically between different levels of scale, and along a cross-section of everyone who sees opportunities to add value by linking or sharing knowledge and facilities.

Management Summary

1. Digital environments offer collection managers, cultural leaders, information users, knowledge institutions, software suppliers, and governments opportunities **to increase the public value** of the collections held by archives, libraries, museums, and other institutions. In this respect, insufficient use is made of the possibilities for linking facilities, cutting costs, sharing knowledge, and increasing impact.
2. This means that more work has to be done on establishing **standardised, cross-sector facilities**. This national strategy will provide the foundation for the nationwide development and improvement of those facilities. The strategy contains objectives, starting points, and specific work programmes for a joint approach, and it should result in more facilities being connected, standardised, and jointly developed and managed in the coming years.
3. In order to increase the visibility, usability, and sustainability of digital heritage, several **network principles** will be determined:
 - use open standards and facilities,
 - reinforce hubs,
 - use ‘the most suitable party for the job’,
 - provide transparency regarding actions and intentions.
4. Because the public value of heritage collections is ultimately determined by their use, **users must be the focus**. In this respect, a distinction can be made between end-users and business-to-business users. Within those groups, there are several target groups (e.g. education, creative enterprises, heritage institutions, research) and types of demand (quick search, rich context, big data).
5. The national facilities infrastructure will be based on a **three-layer model** with a functional division between the management of data collections, facilities for connecting that data, and applications for presentation and use.

6. Several **strategic choices** will be made in order to achieve a future-proof and cost-efficient infrastructure that encompasses the various domains and meets user needs.
 - More stringent focus on policy, compatibility, and openness.
 - Making the use of standards more compulsory, and developing and implementing a reference architecture.
 - Structural reinforcement of the cooperation between heritage sectors and the interaction between heritage institutions, users, and suppliers.
7. A **knowledge agenda** and facilities calendar will be published later in 2015 in order to clarify the future availability of knowledge and facilities. The NDE will also be drafting **position papers** to work towards establishing a joint approach to such issues as aggregation and linked data, copyrights, and institutional information policies.
8. Implementing this strategy will require **efforts at various levels**. Individual institutions will develop an information policy and link their collections, knowledge, and facilities to a larger network. Cooperation within sectors will be reinforced by assigning an active role to five sectoral hubs. The NDE will continue to develop as a cross-sectoral partnership. Cooperation with industry organisations, user groups, governments, and international networks will be bolstered.
9. The partnership will comprise **three 2015-2016 work programmes**:
 - Visible Digital Heritage will increase the visibility of collections, explore user demand, and promote the use and re-use of digital collections.
 - Usable Digital Heritage will improve the possibilities for using collections by making them jointly accessible online, connecting and enriching data using lists of terms and thematic management, and developing targeted services.
 - Sustainable Digital Heritage will work on the cross-sector sharing, utilisation, and scaling up of facilities for sustainable preservation and access, while devoting attention to cost management and the division of duties.

1 Digital Challenges

Information in abundance

The digital display, use, and archiving of cultural heritage has become indispensable to our society. That society is becoming digitised at breakneck speed, and heritage managers and users are part of this process. For the first time in history, users and institutions are sharing the same information space. It is a situation that is rife with opportunities.

Naturally, the use of digital technology in the heritage sector is nothing new. It has been used for decades to register collections, for example, or to duplicate vulnerable content and ensure that it is archived sustainably. A great deal of government money has also been spent over the last ten years to achieve the latter objective, and increasing amounts of ‘born digital’ materials are finding their way into institutional collections.

Still, we are living in the era of a spectacular development: the rapid development of the speed, availability, and use of the Internet. Being online has evolved from an exotic experience to an ‘anyplace, anytime’ reality, and it has done so in less than a generation. This offers previously unheard-of opportunities for researching, linking, and using collections. The emergence of tablets and smartphones is creating new forms of interaction that play out before a potentially worldwide audience. Given this, the use of digital technologies and networks can significantly increase the public value of heritage collections.

The digital use of collections gives rise to new issues in such areas as reliability, intellectual property, selection, privacy, internationalisation, and community-forming. The existing relationships between providers and users of information are changing, and new business models are being created. In the attention economy, keeping an audience interested will no longer be a matter of course for heritage institutions. They will have to earn that attention every day, just like publishers, broadcasters, and bloggers do. This is making the visibility and quality of services in the digital domain increasingly important.

In this changing environment, everyone is formulating their own plans for making the most profit out of digital opportunities. Collection managers are developing information systems, digitisation programmes, and public interfaces. Users are seeking ways to access the information they want as easily and cheaply as possible. Cultural leaders are trying to distribute new products and create value. By enriching their collections, knowledge institutions are making them more visible to researchers. Software suppliers are protecting and upgrading their earning models. Governments are setting conditions and providing incentives.

Challenges for the heritage sector

These are exciting times for archives, libraries, and museums. They are realising that, in the information society, their collections are goldmines. At the same time, the digital environment has made it impossible for them to continue overseeing the entire process of acquiring and managing their collections, and then making them available. For every work process, they are using technology that is developed and managed by someone else.

Institutions that are charged with managing heritage collections and making them accessible are finding themselves in the position of having to redefine their roles. The questions they might ask themselves in this endeavour include:

- How do we reach new user groups? How do we engage them, what services do we offer them?
- How can we carry out our mission while complying with copyright laws?

- What competencies do we need to be successful in a digital context?
- What are the costs and benefits of making collections available to the public?
- What facilities will we manage ourselves, what services will we purchase, and where will we link to other infrastructures?

Information technology offers institutions a great deal of leeway to use innovative and customised solutions in implementing their digital strategy. The downside of this customisation is a lack of coordination and cooperation that keeps institutions, suppliers, and users from benefiting from one another's work. As a result, insufficient use is made of the possibilities for cutting costs, sharing knowledge, and increasing impact.

The customised ICT solutions from which institutions and their clients benefited in the past are now restricting the development of a well-functioning information network. This is why, now, suppliers and institutions are focusing more on standardised, accessible basic facilities that they can use as a basis for developing customised applications more easily and cheaply.

The smooth development of those facilities will require all of the players to be more clear about which standardised facilities they want to develop, use, and manage. This national strategy is intended to better clarify these issues on a national scale and to invite all collection managers (whether large or small) to actively participate in developing these joint facilities. By doing so, they will immediately benefit from: improved online visibility, more digital interaction with professionals and the public, and smarter, cheaper, and more sustainable management of their digital collections.

Basic digitisation, open data, and entrepreneurship

The challenges the sector faces are definitely not limited only to the areas of cooperation, connection, and the linking of technical and functional facilities. Many institutions are only just starting with digitising their analogue collections and drafting descriptions for them. Naturally, enriched data must be digitally available before collections can be digitally linked.

This important aspect of the digitisation objective is not the primary focus of this national strategy, for two reasons. First, cross-domain cooperation is not the key to achieving that objective. Second, many believe that while further basic digitisation may be important, the current key objective is to increase the public value of the digital data and content we already have (and on which a large amount in public funds has already been expended).

This does not diminish the fact that this strategy and the work programmes it includes are expected to yield results that can be used to better estimate the costs, efforts, and public benefits of digitising and enriching analogue content. Examples of this include the work on cost models, the inventorying of collections, and the improvement in the visibility and use of the collections.

Another task for the sector will be dealing with the tension between, on the one hand, wanting to make data openly available and, on the other, needing to take a more entrepreneurial approach. Although this strategy will not eliminate this tension, the facilities for knowledge-sharing, connection, and upscaling it envisages will help decrease costs and increase the impact of affording open access. That impact is something that more and more parties are seeing as offering the potential for improving their position and thus increasing their income.

2 The value of networks

The power of digital networks

Digital information flows and online facilities are inherently network-based. The dispersal, processing, and use of information and tools is becoming less and less dependent on vertical structures. The Internet is a horizontal distributed network (which is not to say that major orchestrating players are a thing of the past).

The network-based nature of the digital environment makes it possible to link information better and more quickly, as well as to share and reuse facilities. This means that institutions and sectors no longer have to do everything themselves. They can save both knowledge and money by using shared services and cloud solutions.

Digital networks can also be used to increase the visibility, usability, and richness of information. This can improve the quality and effectiveness of the ways in which institutions provide information. This means that a distributed network must have a certain degree of organisation. Standardisation and upscaling are indispensable to the effective and efficient use of digital information networks.

The existing digital heritage network was developed differently in each sector. The task now is to work on the upscaling and compatibility of facilities while respecting the existing situation and functional differences.

Relationships, organisations, technology?

The multiple use of the term 'networks' in this strategy sends a clear signal about its underlying intentions and approach. That term can also create uncertainty, however, because it is not always immediately clear if it is referring to technical (physical) links, functional connections, organisational ties, or personal relationships. The text does not always give a precise interpretation of the term. This was done not only to keep the strategy readable, but also because of our conviction that network development is relevant to *all* of these interpretations. The situation involves reciprocity: reinforcing the organizational and personal network is indispensable to improving the functional and technical network, while a better infrastructure will enable the network of organizations, professionals, and users to develop more quickly and effectively.

Network principles

In order to make progress on this, improve the collaboration between sectors, and link the networks, we have established several shared 'network principles':

1. Use open standards and facilities

In order to develop shared ownership and interchangeability at infrastructure level, the technology on which that infrastructure is based must be transparent, reusable, and interchangeable. This will prevent over-dependence on dominant market players and ensure that ownership and responsibility for the technology are shared.

2. Reinforce hubs

Since a house cannot be built using loose gravel, the network must be better organised so that existing infrastructures can be linked and so that those involved can continue developing the network together. This will require parties who are embedded in the various heritage domains and who have the scale to be able to function as a knowledge centre and take responsibility for the development and continuity of the infrastructure.

These organisational hubs can make agreements at national level regarding linking their infrastructures and working together to develop and manage technical facilities.

Their sectoral responsibilities and/or unique competencies enable hubs to link small parties to large ones and represent them in consultations with other hubs. Hubs can operate at various levels (regional, national, international). Letting the parties with the most stamina take responsibility for a linked infrastructure will create a network that can be used more effectively for carrying out temporary, thematic, and crossover initiatives.

At national level, there are five institutions that could act as hubs within the digital infrastructure:

- The National Library [*Koninklijke Bibliotheek*] is legally responsible for the library system (public and academic libraries) and key expertise in the field of publications.
- The Royal Netherlands Academy of Arts and Sciences [*Koninklijke Nederlandse Academie voor Wetenschap*, or KNAW] is a hub for the science sector (in coordination with other parties, including The Netherlands Organisation for Scientific Research [*De Nederlandse Organisatie voor Wetenschappelijk Onderzoek*, or NWO] and the Association of Universities in the Netherlands [*Vereniging van Nederlandse universiteiten*, or VSNU]), plays a leading role in the CLARIAH infrastructure (large-scale data research), and has key expertise in the field of digital research data.
- As the custodian of the national archives, the National Archive [*Nationaal Archief*] is legally responsible for the archiving system and has key expertise in the field of digital archiving.
- Under the Dutch Media Act [*Mediawet*], The Netherlands Institute for Sound and Vision [*Nederlands Instituut voor Beeld en Geluid*] is responsible for media archiving and has key expertise in the field of audio-visual heritage.
- The Netherlands Cultural Heritage Agency [*Rijksdienst voor het Cultureel Erfgoed*] is legally responsible for immovable heritage and the collections in national museums. It has key expertise in the area of collection registration and geodata of cultural or historical significance.

3. Utilise the talents of others: most suitable party for the job

The first priority in the cooperation between the hubs, and in the cooperation between the hubs and other institutions, is that every task is performed by the party best suited to it, so that the best result is achieved at the lowest cost. This is the 'most suitable party for the job' principle.

A hub can perform knowledge, development, and management tasks itself, or it can arrange for third parties to perform them. In the latter case, of course, thorough agreements must be made and enforced regarding quality, costs, and continuity, particularly where crucial components of the infrastructure are involved.

4. Provide transparency about actions and intentions

Seeking the best collectors

Collecting and displaying the content of multiple online databases or websites in a single area (for example, by making indexes of aggregated metadata) is one way to create an overview of the available sources and collections.

This distributed access is currently being organised for various purposes using various techniques, with rich or limited metadata, and by a large number of parties (European, national, regional, sectoral, thematic). This multi-dimensional landscape of often mixed collections does not easily lend itself to generic agreements on which institution would be the one best suited to 'harvest' a certain type of collection. That will have to be determined on a case-by-case basis, with the point being not to claim particular domains, but to avoid duplicated work and to use persistent identifiers to increase the transparency of sources and make them easier to find.

Increasing efficiency and customer friendliness (clear point of contact, adequate referral system) will require making additional agreements on organising distributed access. This process will be managed by the joint hubs (already collaborating within the Digital Collection Project). A separate memorandum on this topic is being drafted.

Often, the choices those institutions make regarding their digital facilities (nature and scope of investments, choice of principles and standards, choice of software packages and suppliers, choice regarding whether to outsource or self-manage) determine the long-term possibilities they have for linking their content and facilities to larger networks. Given this, it is important that, in addition to working with open standards and software, potential partners have a better understanding of one another's activities, choices, and plans. That is the only way that they will be able to identify opportunities for joining forces and taking joint initiatives, without downsizing their own organisations.

It is therefore important that every institute should develop a strategic agenda as part of its information policy. This does not mean everyone has to lay their cards on the table – since this game is a fairly competitive one – but providing one another with a basic understanding can help these institutions develop their own course.

3 Facilities for end-users

Focus on users

Because the public value of heritage collections is ultimately determined by how much they are used – and, therefore, the extent to which their public funding is justified – the primary focus must be on their usability by various user groups. When developing technical and functional facilities to improve usability, it is useful to make a distinction between end-users of information on the one hand, and further developers and intermediaries (business to business) on the other.

Responding to user demand does not require collection managers to develop and manage all user services and interfaces themselves. This is often better left to others who have more specific competencies and knowledge with regard to a certain market. The challenge for the heritage sector is to develop a rich and stable semi-finished product that both third parties and heritage institutions can, in turn, use to develop new products themselves.

Once we shift our perspective to the users of the collections (and the information about those collections), the importance of cross-sector cooperation becomes even clearer. After all, dividing lines between sectors and collections will do nothing to help users looking for cultural content via the Internet. Those users want to be able to find and use *all* sources available from archives, libraries, museums, and other collections, preferably in as few searches as possible and at the lowest possible cost. Right now, users cannot easily locate a coherent overview of relevant sources.

Thinking from the user's perspective also means seeking out the digital platforms and work environments where potential users can already be found. Having a social media presence or being findable through search engines can be more effective methods of reaching the public than simply maintaining a website. The attractiveness of information to a certain user group is not determined only by the nature of the information, but also by the method and location through which that information is offered.



Users and user demand

There is a great deal of variety among users of digital heritage: professional and personal, governments, institutions and businesses, now and in the future. There are also differences in their interests, how much time they have available, and what they need. The interests of a linguist will be far different from those of a primary school teacher. Someone doing genealogy research is looking for information that is nothing like that being sought by a designer or a novelist looking for inspiration and historical references. All of these users need to be offered more customised services.

The heritage sector, fulfilling its public duty as a supplier of ‘fuel’ for culture, society, and the economy, wants to serve at least the following target groups:

1. Citizens seeking information and experience
2. Education
3. Science
4. Creative enterprises and professions
5. The heritage sector
6. Future generations

The wishes and conditions of each target group must be explored in order to make it easier for them to use digital heritage collections. In this respect, the nature of the demand is of the first importance, because it is this – more than its substance – that determines which facilities will be needed to meet that demand.

There are different types of demand:

- The quick, easy demand for full-content information (films, photos, texts, etc.) about a certain topic, person, or place. High-quality, reliable, and freely usable information for such purposes as teaching a class, making a presentation, or applying for a permit. Offering content on familiar platforms (such as Wikipedia), selecting attractive and relevant content, keeping the content up to date, and offering clear user conditions are methods for better meeting this type of demand.
- The demand for information for which the context, origin, and relationships with other sources are relevant. The demand, for example, of scientists, journalists, exhibition designers, or genealogist who are busy writing stories, reconstructing histories, or discovering new – unexpected – connections. This type of demand involves interest not just in the sources themselves, but in the information about those sources: the who, what, where, when of the content, the location where the source was discovered, its prior history, and its prior use. This demand can be better met if sources/collections are enriched and linked to one another.
- Omnivorous demand for as much information as possible (metadata and full content) so that they can use it to perform extensive analyses (with Big Data techniques, for example).

Digital collections

Terminological confusion about digital collections can arise very quickly in the meetings between the sectors. This is caused not just by the differences in nature, scope, and original data carriers, but also by differences in the role and meaning of the collected information. Digital availability of the collection object itself may be the top priority for one party, while the origin and lifecycle of that object may be top priorities for another party, and having an overview of the entire collection may be the top priority for yet another party.

In order to arrive at a mutual understanding, it is in any case useful to make a distinction between two types of digital representations of collections/objects:

- *Digital objects*: the entire content in digital form. This might be born digital sources or digital copies of analogue sources. Examples of these objects are the newspaper pages in Delpher, the films in Open Beelden, or the paintings in Rijksstudio.
- *Descriptions* of and references to objects: information about analogue and digital objects such as process metadata and collection registrations. Other examples are digital references to analogue objects such as the National Monuments Register [*Monumentenregister*] or the inventories of most archives.

Terminological confusion can also arise with regard to the Netherlands Digital Collection. In this document, the phrases ‘digital collection of the Netherlands’ and ‘Netherlands digital collection’ refer to the totality of digital objects and descriptions in the Netherlands, regardless of whether they are publicly funded. The national aggregator of digital collections (digitalecollectie.nl) is referred to as the Digital Collection Project [*project Digitale Collectie*].

The target groups and the demand types are not linked one-on-one. Both categories can be helpful in understanding users and the nature of their demand so that the desired characteristics of the necessary infrastructure can be defined more precisely.

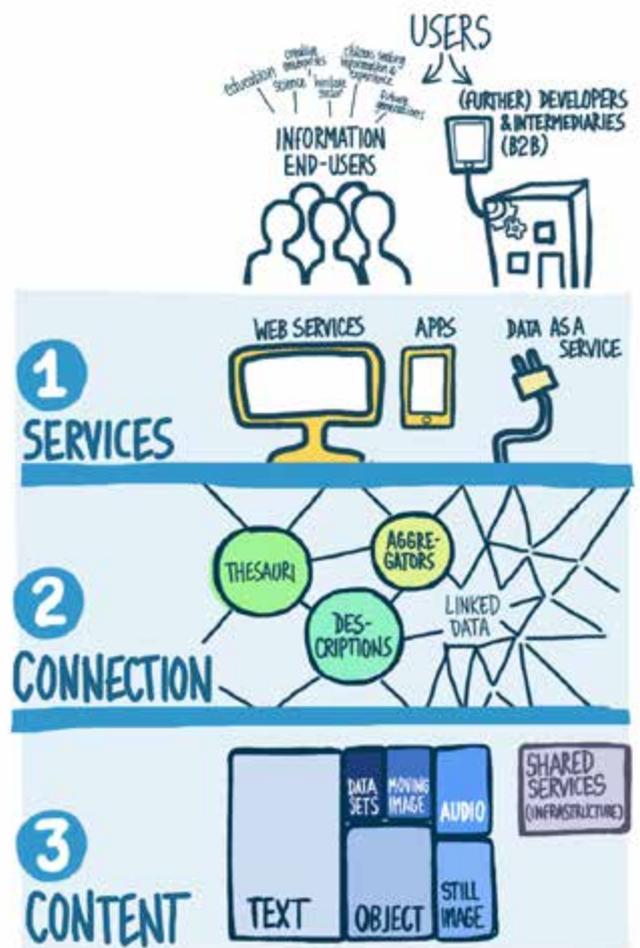
Efficient *and* flexible facilities

Being able to meet wide-ranging and constantly changing demands will depend on having customised digital facilities. However, upscaling and standardisation are needed to lower costs, improve compatibility, and increase sustainability. This is why any facilities developed must be as reusable as possible. Having to develop new facilities for offering and accessing information every time a new demand or application arises would be a waste of both money and efforts.

Ideally, this tension between customisation, benefits of scale, and continuity would be eased by building the infrastructure in such a way that it enables all of the linked collections to be accessed in a meaningful way for new apps, websites, teaching methods, or research. This means that digital collections should not be exclusively linked to a specific application, software supplier, or presentation, but must also be accessible through key words and techniques with a scope that goes beyond that of the collection or collection manager itself.

In order to enable these collections to be used in a rich and effective way, the infrastructure is based on a conceptual model consisting of three layers:

- A data layer contains the digital collections of individual institutions. It is the domain of collection managers to digitise their collections, manage them sustainably, and make them accessible. This layer will consist of using autonomous solutions (such as collection registration) and employing shared services for such elements as sustainable archiving.
- The connection layer contains the facilities that enable users to employ generic means to search for and link the objects/collections in the data layer. This encompasses semantic search techniques, indexes, and terminology lists that can clearly connect the data to 'who', 'what', 'where', and 'when'. This is the domain of cross-sector partnerships and agreements relating to issues such as exchange standards.
- A user layer contains the applications, views, and portals through which the information from and about the digital collections can actually be used. This is the domain of the guides and users of countless applications and services. These include the collection managers themselves, who can develop up-to-date applications to make their own and other collections accessible to their specific audiences.



4 *Towards a national strategy*

Infrastructure, network, and policy

In early 2013, OCW (the Dutch Ministry of Education, Culture and Science) took the initiative to work with the sectors involved to formulate proposals for the gradual development of organisational and technical facilities for digital heritage. The goal is to arrive at a future-proof and cost-efficient infrastructure that will encompass all of the various domains while meeting the needs of heritage users.

The approach focuses on:

1. Developing a coherent and cross-sector infrastructure (technical and functional facilities);
2. managed from a network organisation;
3. flanked by policy.

This document sets out strategic lines and formulates actions (the work programmes) for developing this infrastructure. The network organisation (Digital Heritage Network) is now functioning with active participation from all of the relevant sectors. The objectives regarding the use and preservation of digital heritage are taken into account when policy is developed on such issues as copyrights, open government information, and subsidy conditions.

Change strategy

The shared strategy must result in more facilities being connected, standardised, and jointly developed and managed in the coming years. This will require more cooperation and knowledge-sharing between the various heritage sectors, governments, producers, knowledge institutions, intermediaries, and users. They are working on shared principles, standards, and new methods of knowledge-sharing. Agreements and choices sometimes involve a degree of obligation to benefit interoperability or efficiency. This will ensure the development of an infrastructure that is helpful and stimulating for individuals, as well as for large and small institutions, businesses, and governments.

The strategic partnership will be based on existing sectoral facilities, responsibilities, and funding flows. Working from that foundation, the parties will seek out opportunities for linking and upscaling facilities, as well as for eliminating obstacles. A better understanding of user wishes, the need for a more efficient use of public funds, and the potential of the partnership will reinforce the parties' readiness to change the existing situation.

This national strategy is a means to:

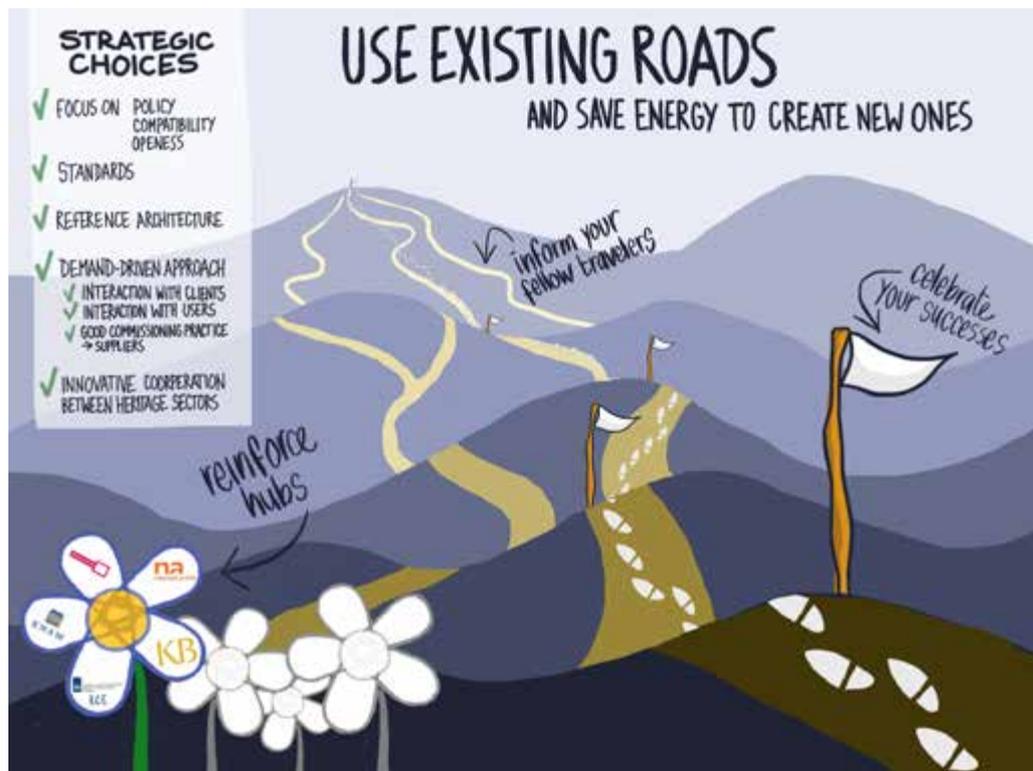
- a. Critically analyse the going concern and investments within sectors and promote the movement towards cross-sector cooperation and facilities.
- b. Jointly programme and implement change projects and innovation projects in order to save money, use knowledge more effectively, and produce results that are suitable for cross-sector application.
- c. Jointly develop technical and functional facilities or structurally link sectoral facilities.

Strategic choices

Against the backdrop of the context and ambitions outlined above, the national strategy will focus on taking the following steps in the coming years:

1. A more stringent focus on policy, compatibility, and openness.
2. Making the use of standards more compulsory.
3. Developing and implementing a reference architecture step-by-step for the cultural sector.
4. Structurally bolstering the interaction between the users, suppliers, and managers of infrastructure facilities.
5. Heritage-wide cooperation to improve the developmental, managerial, and facilitative roles of institutional and governmental collection managers.

The first two points are joint assignments for OCW, the national hubs, and the DEN Foundation. They will undertake this as policymakers, subsidy providers, and collaborative partners, and they will address these issues in their respective internal settings as well. The joint work programmes described in Chapter 6 will be important contributions to accomplishing the goals set out in the latter three points. These work programmes have an innovative bias, not in the sense of experimentation, but in the sense of the achievement of innovations and facilities that will make cross-sector cooperation on the visibility, usability, and sustainability of digital heritage possible.



Knowledge agenda and facilities calendar

Institutions, intermediaries, and users who want to make better use of their digital heritage infrastructure or who want to devote more efforts to their information policy must have a better understanding of the public facilities that are available for their use. This makes it advisable to clarify which technical and functional facilities are already available and which will become available in the coming years. Currently, there is still no clear, up-to-date overview of the status and proposed development of the five different sectors' technical and functional facilities.

Naturally, those parties' development of facilities depends on financial, organisational, technical, and legal prerequisites, not all of which are within their control. Although this will make it difficult at times to furnish explicit guarantees about the facilities that will be available in future, it does not diminish the value of sharing ambitions about proposed facilities and making the most realistic estimates possible regarding how and when these facilities can be developed, scaled up, and managed.

The hubs and other institutions can also better clarify what they already have in terms of information and guidance and how, and in what fields, they intend to develop their knowledge function in the coming years. There are knowledge banks within the various sectors, and the DEN Foundation offers a detailed overview regarding standards (DE BASIS), projects, publications, and events.

The national hubs want to provide more clarification on the points outlined above. To that end, they will coordinate with the DEN Foundation, OCW, and other partners in the Digital Heritage Network in 2015 to develop a knowledge agenda and facilities calendar.

Further strategy development

This memorandum discusses an overall strategy regarding the necessity of, and approach to, developing shared digital heritage facilities. A number of aspects of that strategy have to be worked out in more detail and operationalised. In 2015, based on this document, the Digital Heritage Network will take the initiative to draft several position papers on specific topics, such as:

- aggregation and linked data,
- copyright/intellectual property,
- reference architecture,
- knowledge infrastructure,
- international cooperation and profiling,
- information policy at institutions.

5 *Who does what?*

Efforts at various levels will be required to establish a well-functioning digital heritage infrastructure.

Individual institutions

In order to be able to make effective and efficient use of the infrastructure that is available or will be available in the future, institutions will be working on:

- improving their strategic and tactical handling of information issues, for example by structurally developing and establishing information policy (suitable to the institution's profile and ambitions), organising expertise and control of ICT themes, cooperating actively with other institutions, suppliers, industry organisations, and hubs.
- making their own collections, networks, and facilities suitable for linking to a national infrastructure by using open standards and making their collections available for linking and reuse, devoting the requisite attention to richness, quality, and terms and conditions of use.
- learning to profit from the shared infrastructure by using the information themselves (for example, for research or a presentation) and benefiting from not having to do everything themselves (and thus saving money).
- reformulating their own roles in the network. What roles do the institutions see in the network for their own expertise and those they represent?

Cooperation within sectors

The cooperation between the individual sectors (archives, libraries, media, museums/immovable heritage, science) regarding digital facilities and information exchange can be reinforced by:

- The stimulating, facilitating, and intermediating role of the hubs.
- Active industry associations and trade unions (which could use a clearer digital agenda to that end).
- Individual cooperation between institutions, perhaps at regional or thematic level.

The sectoral role of the hubs will include:

- Improving understanding of the need for, and potential of, digital facilities in the sector by encouraging institutions to articulate their needs and by clarifying the national facilities that are, and will become, available (and under what conditions).
- Stimulating the dialogue about the changing position and function of the individual institutions.
- Supporting the individual institutions with the digital transition.
- Acting as an intermediary with regard to the specifications and conditions of IT facilities between sectoral institutions, the Digital Heritage Network, and IT suppliers.

Cross-sector: the Digital Heritage Network

The Digital Heritage Network [*Netwerk Digitaal Erfgoed*] (NDE) represents a start with cross-sectoral cooperation across the entire spectrum of challenges relating to digital heritage. Existing partial partnerships are already affiliated with the NDE.¹

Through this initiative, the five national hubs, along with the DEN Foundation and OCW, have laid the foundation for a heritage-wide approach. Since the initiative began, NDE worked with a steering group (led by OCW's Directorate-General for Culture and Media), a core group (including the national hubs and the DEN Foundation), and various thematic working groups (with a great deal of expertise and input being contributed from parties outside the core group).

The NDE has an inclusive nature and is gradually being expanded to include other people and entities from within and outside the heritage sector. For example, INNl (portal for heritage and history), Europeana, and the Netherlands Museum Advisors Foundation [*Landelijk Contact van Museumconsulenten*] recently became permanent partners in the network.

The Digital Heritage Network's task is to:

- Identify shared challenges and formulate strategic goals, and to ensure that efforts within the network are focused on achieving these goals.
- Formulate shared standards and best practices and disseminate them among institutions and ICT suppliers.
- Develop shared knowledge infrastructure by organising cooperation between, and in addition to, sectoral facilities.
- Reinforce synergy and linkability in the development of infrastructure in the various sectors.
- Define user groups, assess their need for information facilities, and agree on demand articulation.
- Implement the national strategy in practice and make shared choices.
- Ensure that the shared work programme is carried out.
- Monitor the development and use of the digital heritage infrastructure and adjust strategy and work method as necessary.
- Formulate, foster, and review a policy agenda aimed at the financial and legal context at national and international level.
- Initiate the development, management, and application of a reference architecture for the cultural sector.

As the network is further developed and expanded, the parties will continually seek out effective and inclusive consultation structures aimed at achieving the objectives above. In this respect, a balance must be struck between all relevant active and innovative contributions on the one hand, and coordination, control, and joint progress on the other. This will require the leeway to adjust consultation structures and staffing from time to time to better suit changing tasks, agendas, and partnerships. For the coming phase, consideration is in any case being given to setting up a broader programme council, possibly for each of the individual work programmes.

Continuing to build the network

Many institutions and individual professionals in the various heritage sectors have contributed to the creation of this national strategy. At the same time, the presentation of this strategy reflects the fact that all of the parties involved are intensifying their dialogue and search for cooperation with other players. The relationships that – with regard to this topic – need reinforcement include in any case those with industry organisations in the heritage sector, governments (local, regional, other ministries), digital heritage users (see also Work Programme 1), and the relevant international networks (including the EU, Centres of Competence, Europeana). Partly based on this document, the NDE will take the initiative in developing a more active cooperation with these parties.

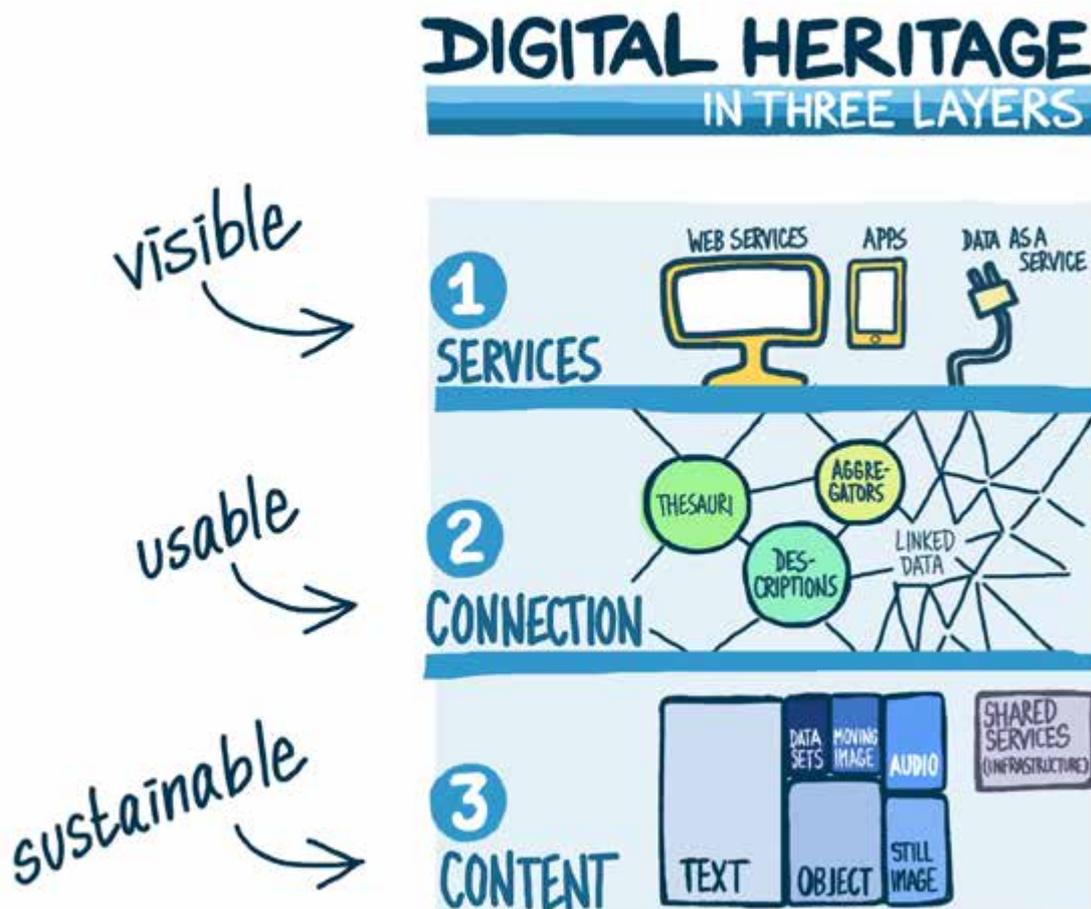
¹ The National Coalition for Digital Sustainability [Nationale Coalitie Digitale Duurzaamheid], the Cultural Coalition for Digital Sustainability [Culturele Coalitie Digitale Duurzaamheid], and the Digital Collection project.

6 Work Programmes for 2015-2016

The strategy, principles, and starting points laid down in this document will serve as the foundation for the work programmes to be run by the Digital Heritage Network. These will be carried out jointly by the hubs, the DEN Foundation, and OCV, and will also involve other experts and relevant institutions in projects. The funds that the ministry will make available for a shared infrastructure will be spent via these work programmes.

Three work programmes have been formulated corresponding to the three layers of the model discussed in Chapter 3:

- Work Programme 1: Visible Digital Heritage
- Work Programme 2: Usable Digital Heritage
- Work Programme 3: Sustainable Digital Heritage



Visible Digital Heritage (Work Programme 1)

VISIBLE DIGITAL HERITAGE

visible
→



Objective:

Increase the public value of digital heritage by improving collection visibility, exploring demand, and simplifying use (and reuse).

The digital collections will be more visible and used by more people:

- By reinforcing demand articulation and improving the dialogue between digital heritage suppliers and users (1.1).
- By making the collections and network visible online (1.2).
- By supporting institutional collection managers with publishing the Netherlands' collection for reuse by third parties (1.3).
- By better utilising the Netherlands' outstanding knowledge infrastructure at international level (1.4).

WP1.1. Demand articulation

In order to get a better understanding of how people want to use digital heritage, we will be meeting with the most important target groups. We will be conducting qualitative and quantitative research to get to know our market better.

Product

- a. Round table discussions with the following user groups:
 - education (educational publishers and teachers)
 - science (CLARIAH and the Centres of Competence)
 - creative enterprises (CLICK, developers, artists, ...)
 - tourism & advertising
 - local history and genealogy associations,
 - amateur developers, hackers, bloggers, artists, etc.

- b. User survey: generation of reliable facts and figures regarding demand, use, and impact of digital heritage. Initially by taking a baseline of the current use of digital cultural heritage (comparable to viewing and listening survey). Permanently by monitoring initiatives such as Enumerate, the impact figures of Open Cultuur Data Nederland, etc.

WP1.2. Online visibility

In order to ensure that people can easily identify the possibilities digital collections have to offer, we will increase their web visibility for end-users and intermediaries.

Products

One or more websites that serve the following purposes:

- a. Informing end-users about the Netherlands' digital collection. Providing a display that helps end-users ascertain the content, scope, and possibilities of the digital collection. Part of this is a proof-of-concept for Linked Data: show the added value linked data can have in opening up heritage information to end-users and institutions. The first source being considered for this is the Historical Canon of the Netherlands [*Historische Canon van Nederland*], and then on people, places, topics, and a timeline (who, where, what, when). Partial sites / views can also be made available for special user groups.
- b. Informing intermediaries / users about reusing the Netherlands' digital collection, for example by means of an overview of available APIs, open data, and open collections. Provide a 'lab' where users can experiment with tools and data.
- c. Informing professionals, international institutions, and user groups about the Digital Heritage Network, progress on the road map, and contact details. Communicating a clear routing and division of duties regarding the services the hubs will provide to institutional collection managers.
- d. A jointly agreed brand or combination of brands in order to indicate the Network's activities.

WP1.3. Competency development and support for institutional collection managers

In order to open the content of digital collections for use on platforms where there is a great deal of demand for heritage content and to support institutional collection managers in this endeavour, we will be organising master classes and strengthening the relationships within the network.

Products

- a. Master classes. A master class for 20 cultural professionals to provide institution employees with the knowledge and competencies they need to open their digital collections for reuse and further distribution by third parties. Ambassadors from various domains (museums, archives, and libraries) will play a role in the master class.
- b. Build a network of cultural professionals and users (and reusers) of the digital collection in order to forge links between institutions and the parties and platforms interested in reuse. Support the ambassadors and bring institutional digital public policy to their attention.
- c. Clear routing and division of duties regarding the services the hubs will provide to institutional collection managers. With the assistance of coordination meetings, guidelines, flowcharts, etc.

WP1.4. International profiling

In order to increase the cultural and economic spin-off of the Dutch digital heritage knowledge infrastructure, we will be investigating whether there is a need for a campaign highlighting Dutch Digital Heritage.

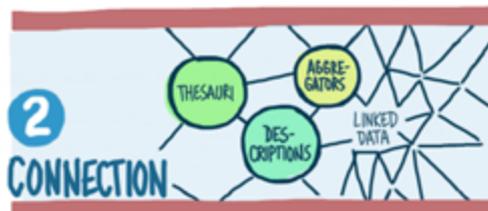
Product

Needs assessment and ownership campaign/brand development.

Usable Digital Heritage (Work Programme 2)

USABLE DIGITAL HERITAGE

usable →



Objective:

To offer collections jointly online, enrich them, and contextualise them. This will increase the usability of these collections for the various target groups.

We will do this by:

- Increasing the accessibility of the Netherlands' collection (2.1).
- Linking data to terminology lists – and make this data available to intermediaries and other uses via services (2.2).
- Promote practice-based research and community-forming (2.3).

WP2.1 Increase accessibility of collections by offering them jointly online (aggregation)

- Improve search results in user environments by offering the entirety of the contextualised collections (Netherlands' collection). [Note: continuation/renewal of the work of the Digital Collection project.]
- Contribute to renewing the aggregation landscape in the Netherlands, taking into account:
 - agreements on publishing and supplying metadata;
 - international developments (e.g. strategy within the Europeana network);
 - linking to infrastructures (such as CLARIAH/CLARIN-Europe/DARIAH-Europe, Edurep);
 - technical possibilities (e.g. storing rich data models). The original records will be kept unchanged.
- Simplify reuse by creative enterprises, for example, by offering a solid technical link that filters for reusability of relevant criteria (quality, copyright status, etc.).

WP2.2. Improve focused searching by linking data through, e.g., terminology lists and thematic management

The activities will focus on clearly linking the relevant terms for who, what, where, and when so that user requests can be served as meaningfully as possible.

a. Setting up the network

Detail the cooperation between the hubs, manage the expansion and implementation of the connection layer, develop services for other institutions (including for linking, adding to, or constructing their thesauri), organise knowledge-sharing (connection principles, teaching materials).

b. Standards and agreements

Working out the details of the connection layer will require making agreements about:

- the method by which clients' who, what, where, or when requests will be translated into access to the connection layer;
- the drafting and development of terminology lists, support, and publication of alignments (links between terminology lists).
- the standards and models for the interchangeability of data and reference sources and their use;
- the degree of freedom in applying the standards and models in terms of scope, context, structure, and vocabularies;
- the method of connecting to other open sources.

c. Developing services

Specific services will have to be developed in order to arrive at visible results. Some of the services will be extensions of the hub activities, while others will relate to the development of new network services. The ultimate form and nature of the services will depend on the structure of the partnerships and network activities, as well as the agreements that must be made in this context. Up to now, the following possible activities have been identified:

- a. Plan-based work on standardising the relevant terminology sources and making them openly available.
- b. Exploring possible and desired services for the various user groups (end-users, professionals, managers).
- c. Making the terminology network available so that it forms a logical, integrated whole for all user groups.
- d. Making the terminology network available in such a way that there is room for different definitions of terms based on different contexts or views.
- e. Developing services for connecting new (local, national, or international) terminology sources and data sets to the terminology network.
- f. Developing services for the distributed construction and management of the terminology network.
- g. Determining technical solutions for offering the terminology network.
- h. Determining technical solutions for managing the various parts of the terminology network.
- i. Exploring new, future-proof systems for thesaurus construction and maintenance.
- j. Setting up one or more production lines for linking and connecting.

The hope is that we will learn from specific cases when refining the requirements and desires regarding these services. This is why we will initially partner with ongoing projects such as LODD2, DIVE, KB Linked Metadata, the Heritage Thesaurus [*Erfgoedthesaurus*] and the Heritage and Location Project [The hope is that we will learn from specific cases when refining the requirements and desires regarding these services. This is why we will initially partner with ongoing projects such as LODD2, DIVE, KB Linked Metadata, the Heritage Thesaurus [*Erfgoedthesaurus*] and the Heritage and Location Project [*project Erfgoed en Locatie*]. In addition, several pilots will be started to clarify specific elements.]. In addition, several pilots will be started to clarify specific elements.

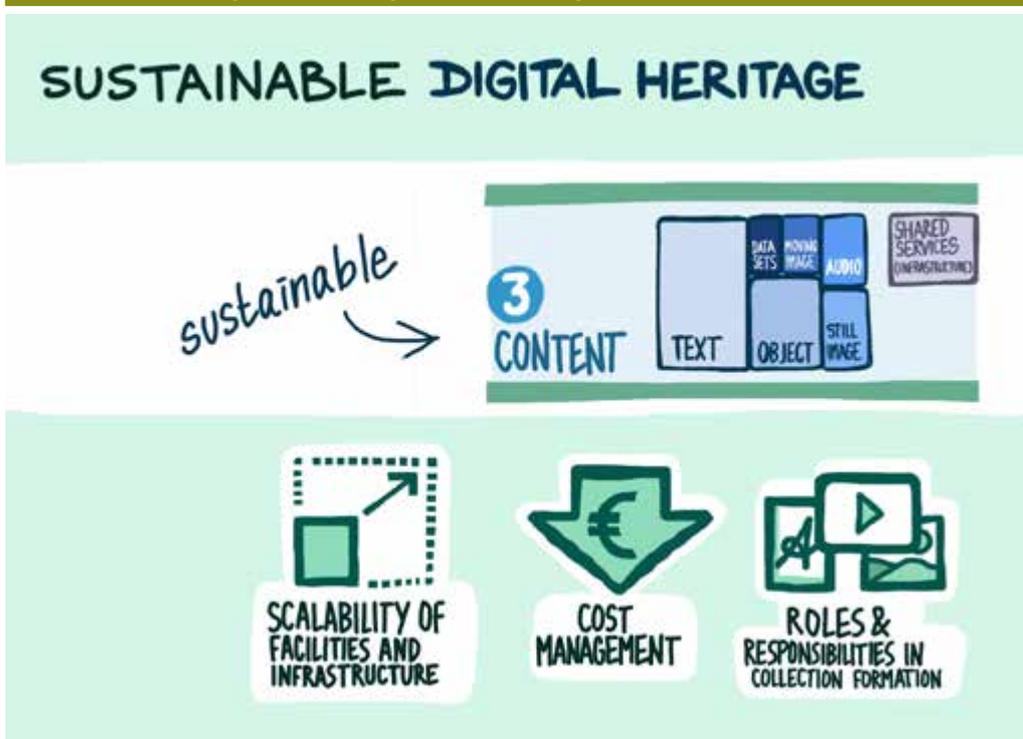
WP2.3 Promote R&D by community-forming and getting the issue on the agenda

Organising the cooperation between the Digital Heritage Network and the broader community of researchers to improve the exchange of knowledge of such topics as software development and access to objects.

Activities:

- Monitor the state of technology and keep the network apprised.
- Present demonstrators and other results from the work programmes to researchers in the relevant bodies.
- Write white papers that outline the specific challenges of the broad Digital Heritage Network (hubs and the parties they represent). Part of this will consist of conducting interviews and identifying wishes based on those interviews.
- Develop a research agenda for NDE and initiating/participating in research projects that further those goals. Financing from NWO, H2020, and other sources. To be drafted in 2015 and updated annually.

Sustainable Digital Heritage (Work Programme 3)

**Objective:**

To create, through cross-domain collaboration, a shared infrastructure that guarantees sustainable access to digital information. The premise for this is that cooperation will lead to an increase in the effectiveness and greater efficiency and cost reductions.

The activities in this work programme have already been started and/or scheduled within the National Coalition for Digital Sustainability [Nationale Coalitie Digitale Duurzaamheid] (NCDD), a partnership between KB, NA, NIBG, DANS and several cultural heritage organisations. The work towards this goal is being done along three lines:

- Better utilisation and upscaling of facilities (3.1).
- Cost management (3.2).
- Clarifying roles and responsibilities (3.3).

WP3.1 Scalability of facilities and infrastructure

The influx of cursory digital information is growing just as spectacularly as the number of forms in which it appears (file formats). In recent years, a great deal of experience has been gained in acquiring, processing, and archiving digital collections, and keeping those collections accessible. To date, however, sustainable digital archiving has not yet become a national practice. Most small and medium-size institutions do not have the requisite funds and specialised knowledge in house, nor do they have reliable and affordable access to external services that furnish sustainable archiving and access.

The following activities must ensure that existing facilities and infrastructure can be better utilised, shared, and scaled up.

- a. Promote and implement a scenario for building a national infrastructure for sustainable access, including a shared archiving strategy.
- b. Develop a programme of requirements and a transition strategy for a national infrastructure for sustainable access.
- c. Draft and implement a road map for certifying Dutch 'e-depots'.

- d. Make technical expertise available to supervise and document the links between various infrastructures, as well as to make those links as uniform as possible.
- e. Develop model agreements for sustainability services.
- f. Define and implement a persistent identifier infrastructure.
- g. Develop sustainability services such as a register for file formats, preservation tools, and preservation actions.
- h. Develop and manage an emulation service.
- i. Participate in developing standards (including file formats and metadata).

WP3.2 Cost management

The costs of sustainable preservation are constantly increasing due to the rapidly increasing volumes of digital information. In order to get a handle on these costs, it will be important to accurately assess the cost structure based on the institutions' recent research and experience. The following activities must ensure that the operating costs for sustainable management and access are transparent, comparable, and predictable.

- a. Collect indicators and develop a predictability model relating to cost management.
- b. Implement cost models and provide explanations for them, including benchmark facilities.
- c. Draft a long-term agenda for major investments in e-depot facilities and infrastructure.
- d. Develop a business model for sustainable access.
- e. Develop a *maturity model* for sustainable access that can be used for, e.g. assessing knowledge level.
- f. Draft guidelines for properly procuring sustainability services.

WP3.3 Roles and responsibilities in collection-building

Currently, the building of digital collections is often still based on clearly domain-linked categories. These rely on types and categories from the analogue world: publications, government documents, and television programmes. The location where digital objects are stored is based on an analogy to a physical storage location. Digital objects, however, increasingly have a multimedia or interactive character, which often makes them difficult to categorise. This has resulted not only in overlaps in collection-building, but also gaps in the digital archiving of new types of digital objects.

The following activities aim to promote more integrated collection-building through cooperation in the areas of selection, management, and access to digital collections.

- a. Formulating scenarios for digital collection-building in the Netherlands.
- b. Organising and implementing the collection and management of enriched publications.
- c. Drafting guidelines for the ingest of file formats and the related quality controls. Setting up a generic quality control process.
- d. Research methods and develop tools for archiving software.
- e. Formulate software sustainability guidelines.
- f. Determine who is responsible for collecting and managing web content and social media.
- g. Develop support tools for drafting preservation policies at heritage institutions.

Manifesto of the Digital Heritage Network

1. We see opportunities to use digital technology to increase the public value of cultural heritage, and we endorse the need to improve cooperation to link to shared technical and functional facilities to achieve that goal.
2. We make our collections visible on the Internet. We ask potential users about their needs regarding quality, context, and terms and conditions for using content, data, and metadata, and we try to meet those needs.
3. We are expanding the possibilities for using digital collections (within and outside an institution's organisation) by making data and/or content available for reuse and persistently identifiable, as well as by enriching it and indexing it using respected terminology lists and actively creating external links.
4. We promote the sustainability of digital collections (full content, metadata, collection registration) through efficient, sustainable archiving and continuous attention to keeping them accessible and searchable.
5. We develop a multi-year information policy and ensure that the visibility, usability, and sustainability of digital information become and remain a priority on management agendas.





Colophon

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