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BHL-Europe

Business plan for long-term sustainability & Implementation of results of BHL-Europe in other projects

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eContentplus

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¹ OJ L 79, 24.3.2005, p. 1.

1 Document History

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1.3 Reviewers

This document requires the following reviews and approvals.

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¹ The CCPA WG members have received the document for revision. A formal feedback/review was never provided by the date of submission.

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3 Introduction

This is the further development on the first overview business plan for a sustainable BHL-Europe service beyond the Best Practice Network of the EC eContentplus programme after 30 April 2012. It gives an overview of the current situation of the BHL-Europe project and a short description of the business model established for the project. This overview is an extract from the Description of Work incorporating the current situation of the project. Starting from this model, we will evaluate the potential business models for the future. This includes a SWOT analysis of five potential strategic directions for BHL-Europe, the environmental scan, an analysis of the value chain for BHL-Europe and results of a survey among the BHL-Europe content providers. This evaluation is followed by an implementation plan of the favoured business models. This is the actual business plan section where the implementation is outlined and itemised for the business models (vision, mission, objectives, value proposition, governance, team, funding, roadmap, risk analysis).

It is also noted that one document that was planned as an additional deliverable for month 36 of the project is considered to be redundant: D1.10 – Implementation of results of BHL-Europe in other projects. The implementation and re-use of key results of the project by other projects, initiatives and organisations is an integrative part of the business plan developed herein. It is therefore not described in a separate document, but is a chapter in this document (5.6).

4 Current BHL-Europe business model

4.1 Project summary, objectives and results

The lack of access to the published biodiversity literature is a major obstacle to efficient research and a broad range of other applications, including education, biodiversity conservation, protected area management, disease control, and maintenance of diverse ecosystems services. This literature also has cultural importance as a resource for the study of the history of science, art and other non-science applications. Currently, a large number of small projects are digitising biodiversity material in numerous institutions across the EU to make access more open, but the corpus will still be seriously fragmented. These projects do not use common standards or interfaces and are not interoperable. In alignment with the EC i2010 initiative, BHL-Europe aims to make the biodiversity knowledge available to everybody who is interested by improving the interoperability of European biodiversity digital libraries.

BHL-Europe will review and test different approaches for such libraries based on the experiences of the partners involved in the project. The consortium will establish a best practice approach and promote the adoption of standards and specifications for the large-scale implementation in a real-life context. BHL-Europe will provide a multilingual access point for search and retrieval of digital content through Europeana. In addition, it will provide a robust multilingual Portal with sophisticated search tools to facilitate the search for taxon-specific biodiversity information. The project will also develop operational strategies and processes for long-term preservation and sustainability of the data produced by national biodiversity digitisation programmes. BHL-Europe will generate activities to raise awareness and to ensure that the project outputs are known and used by the target users and that the



proposed approach directly addresses user needs. BHL-Europe experience and best practice will be shared with the wider digital library community.

The project aims to make Europe's biodiversity information, which is locked in many disparate libraries or scattered in many digital repositories, available for everybody with interest in biodiversity through a global Portal (BHL-Europe) with specific biological functionality (e.g. taxonomic intelligence) and to a wide European cultural audience through Europeana.

More precisely, BHL-Europe aims to:

- (1) review and test approaches for the establishment and management of multilingual biodiversity digital libraries;
- (2) improve the interoperability of European biodiversity digital libraries by the innovative application of proven technologies;
- (3) promote the adoption of best practice, standards and specifications for the large-scale implementation of such repositories;
- (4) facilitate the open access to taxonomic literature for a large number of target users including the general public;
- (5) provide a multilingual access point for the search and retrieval of biodiversity content through at least two Portals (Europeana and BHL-Europe);
- (6) raise awareness and ensure that the project outputs are known and used by the target users and that the proposed approach directly addresses user needs;
- (7) develop operational strategies and processes for long-term preservation and sustainability of the data produced by national biodiversity digitisation programmes;
- (8) facilitate and enable the initiation of scanning initiatives in European countries not yet involved in digitisation programmes and improve the infrastructure for digital libraries in all EU countries;
- (9) negotiate with Rights Holders to enable access to in-copyright content.

The proposed project will produce the following specific and measurable results:

- (1) a robust biodiversity community Portal with open, distributed architecture to provide multi-language access to the digital content;
- (2) >25 million pages of biodiversity literature from a large number of EU Member States for display through the Europeana and BHL-Europe portals;
- (3) tested and validated best practice methods, standards and specifications for technology platforms, digitisation and image storage;
- (4) tested and validated methodology for content enrichment and ingest;
- (5) tested and validated best practice workflow on implementing BHL-Europe architecture;
- (6) sustainable and persistent digital curation of biodiversity heritage literature; preservation and conservation of rare and fragile material;
- (7) the integration of Taxonomic Intelligence tools to facilitate the search for taxon-specific biodiversity information;
- (8) improved efficiency of research in the biology domain; improving access to information to non-museum biologists; building public engagement, awareness and participation;

- (9) permission from publishers to digitise previously published in-copyright content;
- (10) a metadata repository and collection analysis tool for all the leading libraries involved;
- (11) strategies, plans and processes for long-term preservation and sustainability of the data produced by national biodiversity digitisation programmes as part of BHL-Europe.

As the main and most tangible outcomes of the BHL-Europe, we offer to the user five routes to access the digital biodiversity literature – four European and one global (Figure 1):

- 1) BHL-Europe Portal and preservation and archive system
- 2) The Global Reference Index to Biodiversity (GRIB)
- 3) Biodiversity Library Exhibition (BLE)
- 4) Europeana
- 5) Global BHL via Internet Archive – partners include Atlas of Living Australia, Chinese Academy of Science, BHL-US, Bibliotheca Alexandrina, Scientific Electronic Library Online, etc. (see section 7.2).

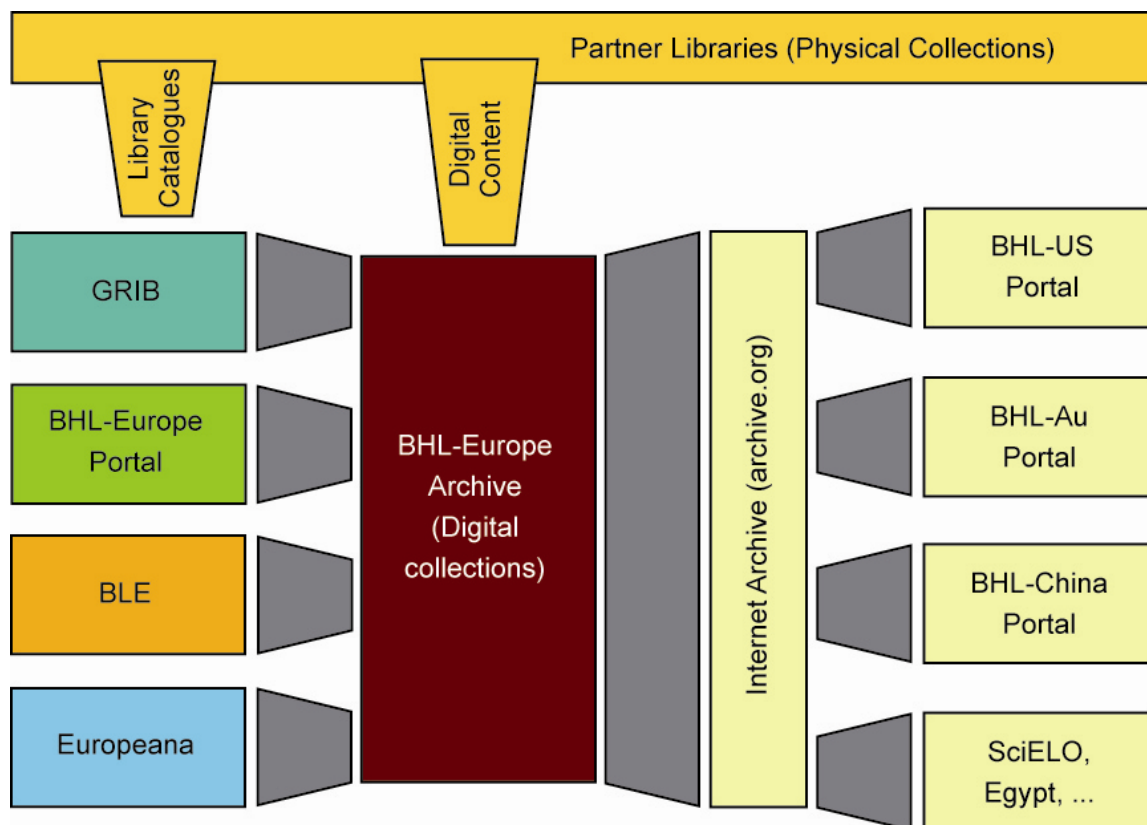


Figure 1. The access routes to the digital biodiversity literature provided by BHL-Europe. Our partner libraries will provide catalogue data and digital content to the GRIB and the BHL-Europe archive. The content in the archive is accessible through the GRIB, the BHL-Europe Portal, Europeana, BLE and any Global BHL Node including the BHL-US Portal via the Internet Archive. The library catalogues are only accessible through the GRIB to facilitate the digitisation management.



All these routes provide access to our digital library, but are self-contained applications working along-side the BHL-Europe preservation and archive system for the European digital literature. The BHL-Europe system and Portal is the core product and outcome of the BHL-Europe project. It is closely linked to BLE to facilitate access to non-scientists and to open the content for education needs. The GRIB is another major outcome of BHL-Europe, developed in collaboration with the EDIT project. Europeana is a major partner of BHL-Europe with its own products and agendas.

4.2 Target users and dissemination channels

Two main user groups have been identified as beneficiaries of the project.

The first group of users are content users – **European citizens** – who will be interested in the content itself. The composition of this group will be eclectic and represent different interests in and uses of the content. Natural scientists may be interested in taxonomic information and the distribution of species through space and time. Social scientists and historians may be interested in the history of science, and background information about famous and significant scientists of the past. Artists may find inspiration in the artistic representations of plants and animals. For hobby scientists, hobby gardeners, and regional conservation organisations the literature is an inexpensive and easily available resource of information about animals, plants, and fossils occurring in their area. Policy makers on various levels (from local to governmental) need the literature as base and background information for their decisions. Students and learners on various levels (from school to university) need the content as a primary source for their studies. Teachers will be able to complement the content of textbooks by downloading historical and original texts of Charles Darwin, for example. These texts may be used as a teaching resource, since many of those historical texts contain important biological concepts and theories still valid today. These classic and scientifically important contributions help to put the results of modern research projects into context. Eventually, every European citizen who is interested in biodiversity, and has access to the Web is a potential user. These target users are manifested by the visitors to the large natural history museums that are now able to get background information on topics and objects present in museum exhibitions.

The second group includes **technology users and content providers**. Technology users are in particular libraries, digitisation centres, digital library networks, and universities/museums. They are interested in the technological outputs from the project, the best practice approach, the quantity and quality of content, but also in unsolved challenges of the project. These institutions may also be content providers for BHL-Europe.

In order to serve these two different markets, BHL-Europe is a multi-faceted platform. Satisfying both customer groups is necessary to make the business model work.

To reach both customer groups and other stakeholders, we have used various mechanisms for dissemination and awareness raising activities:

- dissemination of the project results through consortium members (using already existing networks of European scientific organisations included in the BHL-Europe consortium and within the considerable number of professional and special interest organisations where they are members)
- dissemination through the BHL-Europe Web site and other promotional materials to all target users including the European Commission



- dissemination through the BHL-Europe social media: Blog, Facebook, Twitter
- dissemination through the access points to the digital content: BHL-Europe Portal, GRIB, BLE, Europeana and the portals of the global BHL partners
- dissemination through papers in professional journals, short articles in newspapers, texts in various online encyclopaedias and information services (such as Wikipedia) and the blogosphere
- dissemination through posters, presentations, demonstrations and workshops at conferences and other relevant events.
- dissemination through Europeana communication streams, e.g. EuropeanaPro, Europeana Network, social media, events etc., reaching out to a wider European audience
- dissemination through online discussion groups involving Internet professional groups and hobby science associations

4.3 Key resources, partnerships and activities of the BHL-Europe project

The BHL-Europe partners include most important natural history museums and botanical gardens in Europe and many universities with large biodiversity libraries. All are domain experts, and will be disseminators for BHL-Europe through their extensive participation in related community networks and their contacts with the target user groups. Several of the selected partner institutions combine their domain and library expertise with a strong expertise in biodiversity informatics and related IT issues making them ideal for the technological implementation of the project and the sustainable maintenance and implementation of the project outcomes. The IT expertise of the BHL-Europe consortium is complemented by commercial companies. The Europeana Foundation is also a full partner of the BHL-Europe consortium to ensure close collaboration and outreach to the wider cultural sector. The addition of the Smithsonian Institution and the Missouri Botanical Garden to the BHL-Europe consortium ensures close collaboration with the BHL-US project and the BHL experts around the world.

The list of all consortium partners is provided below:

- Museum für Naturkunde - Leibniz-Institut für Evolutions- und Biodiversitätsforschung an der Humboldt-Universität zu Berlin
- Natural History Museum
- Narodni muzeum
- European Digital Library Foundation
- Angewandte Informationstechnik Forschungsgesellschaft mbH
- ATOS Origin Integration France
- Freie Universität Berlin
- Georg-August-Universität Göttingen Stiftung Öffentlichen Rechts
- Naturhistorisches Museum Wien
- Land Oberösterreich
- Hungarian Natural History Museum
- Museum and Institute of Zoology, Polish Academy of Sciences
- University of Copenhagen
- Stichting Nationaal Natuurhistorisch Museum Naturalis
- National Botanic Garden of Belgium
- Royal Museum for Central Africa
- Royal Belgian Institute of Natural Sciences

- Bibliothèque nationale de France
- Museum national d'histoire naturelle
- Consejo Superior de Investigaciones Cientificas
- Università degli Studi di Firenze
- Royal Botanic Garden Edinburgh
- Species 2000
- John Wiley & Sons limited
- Smithsonian Institution
- Missouri Botanical Garden
- Helsingin yliopisto
- Humboldt-Universität zu Berlin

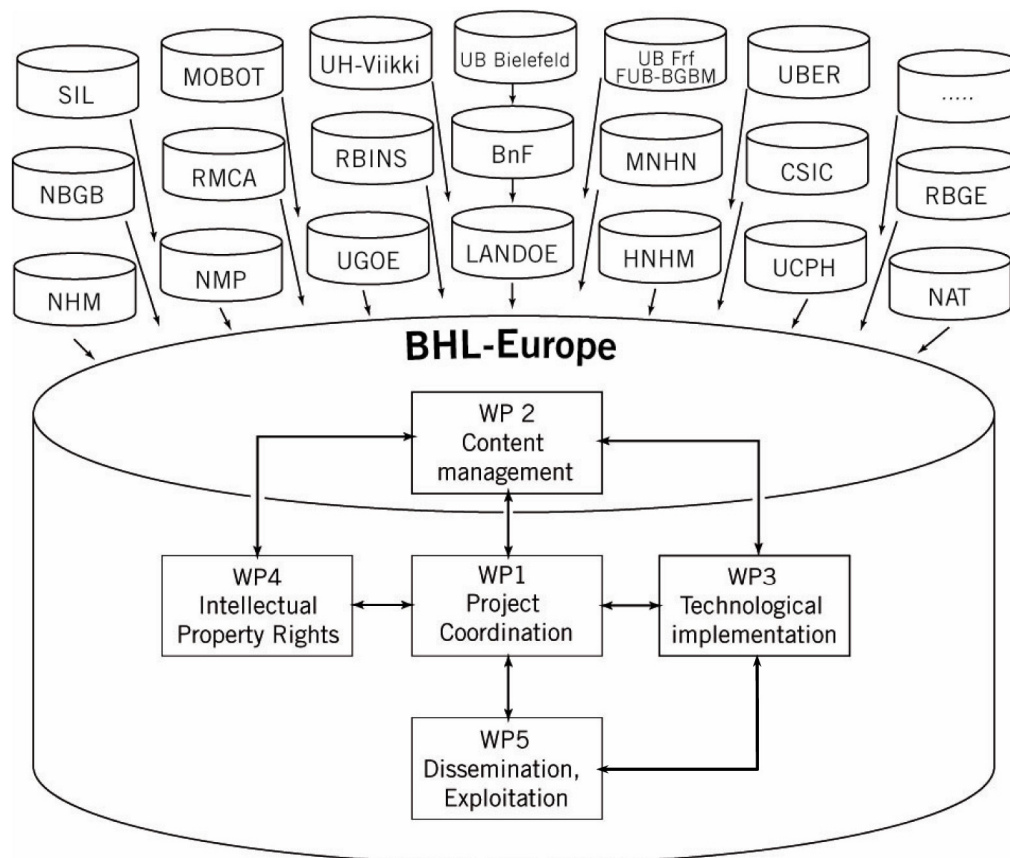


Figure 2. Organisation of the BHL-Europe project with five interacting Work Packages and a growing network of content providers.

A large number of these institutions are content provider for BHL-Europe (see Figure 2). In addition to the content providers that joined the project at the beginning, we identified more European institutions holding digital biodiversity content that we acquired as new content providers for BHL-Europe. These new content providers currently are:

- Universitätsbibliothek Bielefeld
- Universitätsbibliothek Johann Christian Senckenberg, Frankfurt am Main
- Institute of Paleobiology, Polish Academy of Sciences
- Gesellschaft für Biologische Systematik
- Landesbibliothekszenrum Rheinland-Pfalz – dilibri
- Bibliothèque universitaire Sciences & Philosophie, Université de Rennes 1



An important partner for BHL-Europe is the Head Office of the Common Library Network GBV (VZG) in Göttingen (Germany), who is responsible for the development and hosting of the Global References Index to Biodiversity (GRIB), one of the key platforms developed within BHL-Europe. The other and main platform for BHL-Europe is the portal, together with the preservation and archive system and the ingest system running at a dedicated hardware infrastructure at NHM, London.

5 Strategic analysis

5.1 Evaluation of potential future business models

In D1.5 we identified five potential strategic directions for BHL-Europe beyond the end of the project in April 2012:

- 1) **Stop all**: This strategy implies BHL-Europe will not continue any of the services established after the project terminates. This is our least favoured option, and we see no reason to follow this strategy.
- 2) **Maintain**: This strategy aims to keep the content that is already digitised and aggregated online on a long-term basis. This requires the technical maintenance of the systems on NHM servers in London.
- 3) **Incremental growth**: This strategy aims to continue the work with a significant part of the existing content provider network to some extent in order to improve quantity and quality of the content available through BHL-Europe. It is not intended to extend the network of content providers significantly. The improvement of the functionality of the BHL-Europe system is not foreseen. As the BHL-Europe system is based on open source software components and the BHL-Europe community Portal is set up in Drupal, the community itself can help to add new features and improve the functionality of the components. This strategy requires the technical maintenance of the systems on NHM servers in London, the maintenance and adaptation of tools and services for ingest, and the maintenance of the content provider network (incl. ingestion of new content).
- 4) **Keep going and growing**: This strategy aims to further develop important tasks started within the BHL-Europe project beyond the project duration. This may include, for example, the content aggregation, the technology development (e.g. Portal, preservation and archive system), and the dissemination of advice to the digital library community in order to promote best practices. This strategy requires the technical maintenance of the systems on NHM servers in London, the maintenance and extension of the content provider network (incl. ingestion of new content) and the continuation of the technology development and dissemination. In addition to the maintenance of the system and ingest infrastructure, it requires the identification of key new elements for technology development.
- 5) **Scale up**: This strategy aims to extend the scope of the existing BHL-Europe project and collect much more content, invest more time in quality control and also develop technology solutions to cope with these requirements.

5.2 SWOT analysis of strategic directions

Using a SWOT analysis, we have evaluated the Strengths, Weaknesses, Opportunities and Threats of the five potential directions. The results are provided below. We analysed every option against the following main criteria: Content, Services, Funding, Stakeholders, Human resources, Technology. In more detail, these criteria cover Content quality, Content quantity, Service quality, Number of services, Network, Knowledge transfer, Partnership diversity, Funding, Governance, Scope, Staff expertise, Capacity building, Usability, Marketing.

For every option, the results are summarised in a matrix.

Stop all

<p>Strengths</p> <ul style="list-style-type: none"> ○ not worry about funding, content, services, technology, human resources and stakeholders 	<p>Weaknesses</p> <ul style="list-style-type: none"> ○ lose content, services, technology, human resources and stakeholders ○ lose learning from Best Practice Network
<p>Opportunities</p> <ul style="list-style-type: none"> ○ none 	<p>Threats</p> <ul style="list-style-type: none"> ○ dissolution of the network ○ losing the brand positioning ○ repositioning of market existence if we decide to restart

Maintain

<p>Strengths</p> <ul style="list-style-type: none"> ○ content preserved & available ○ established a brand ○ little human resources, low costs 	<p>Weaknesses</p> <ul style="list-style-type: none"> ○ lose control of content development ○ no way of improving quality & quantity of content ○ lose learning from Best Practice Network
<p>Opportunities</p> <ul style="list-style-type: none"> ○ we can restart ○ attractive for other key players in the market to add value to their business 	<p>Threats</p> <ul style="list-style-type: none"> ○ overtaken by other partners or competitors ○ dissolution of the network ○ not flexible to market/technology changes ○ lose partner interest ○ losing the brand positioning ○ incremental decrease in usage

Incremental growth

Strengths

- capability to improve content & services
- maintenance of partnership, network and users
- develop brand visibility following key market needs
- continue to provide data to Europeana

Weaknesses

- tight funding
- slow reaction & inflexibility
- slight content & branding weaknesses
- not be able to keep up with new developments
- no increase in partnership diversity
- difficulty maintaining critical mass

Opportunities

- this is fundable
- we can grow
- continue to exploit new resources & partners
- focus on best practices in technologies provided by the market

Threats

- overtake by other partners & competitors
- eroding partner interest
- marginalisation

Keep going and growing

Strengths

- we know how to do it
- capability to improve content & services
- develop partnership
- develop brand visibility
- continue to provide data to Europeana

Weaknesses

- difficulty to mobilise partner engagement
- conflict of stakeholder interest

Opportunities

- improve content quality & quantity
- improve service quality & quantity
- keep up with technology developments
- extension of partnership incl. diversification of partnership
- funding from other projects
- capacity building & knowledge transfer maintained
- be a significant global partner
- adapt to new user needs

Threats

- requesting a larger amount of funding
- losing financial support
- lose reputation as reliable partner because expectations are not met
- completion of scanning is slow (high dependency on partner progress)

Scale up

Strengths

- capability to be a leading global player
- critical mass will be reached
- complete content ingestion fast
- very sexy
- continue to provide data to Europeana

Weaknesses

- difficulty obtaining a level of funding to do it

Opportunities

- step change in the improvement of content & service quality & quantity
- step change in the improvement of networking & integration
- partner with giants
- integrate European commercial / industrial partners
- adapt to new user needs
- provide additional value to Europeana
- providing best practices to Europeana
- potential to become a leader in technology and market

Threats

- overreach & collapse
- stir up the giants (Google, etc.)
- requesting a very large amount of funding
- losing financial support
- significant loss of reputation as reliable partner because expectations are not met
- completion of scanning is slow (high dependency on partner progress)
- no human resources
- lose core business and identity (to broad, less focussed)
- less service and nurturing (facilitating, engage) for partners

5.3 Environmental Scan

In order to narrow down the strategic directions and to identify and specify the objectives of the alternative strategies, we need to better understand the various aspects of the environment of BHL-Europe. The trends will show us future areas for work and help us to identify options for future projects based on the BHL-Europe project results. We need to consider technology factors, the economic climate and political factors to plan for the future. Potential allies and competitor need to be identified to investigate options for collaboration. We need to review the needs of our customers and understand the uncertainties to minimise the risks to an operational BHL-Europe service.

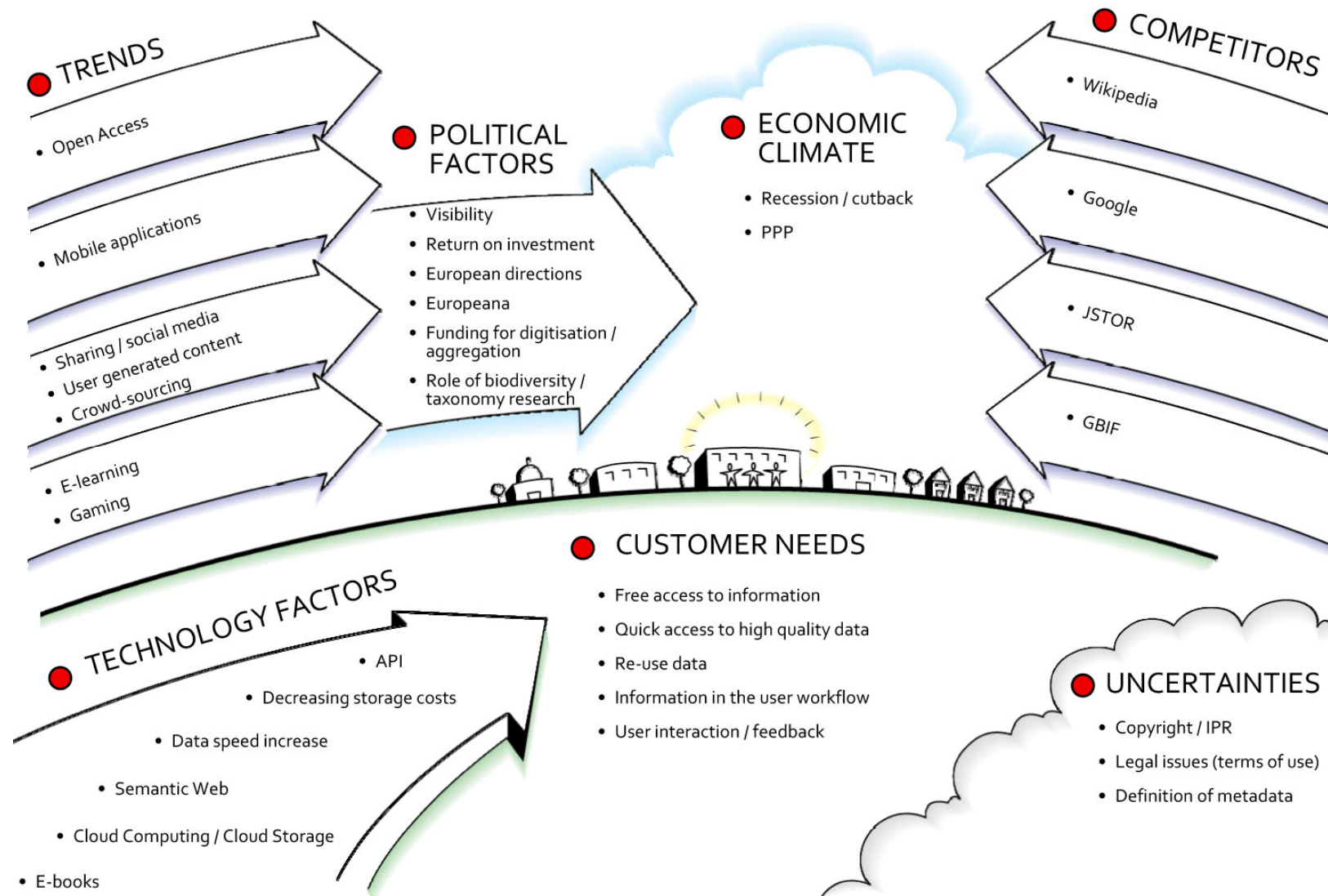
- **Trends:**
Open Access, Mobile applications, Sharing / social media, User generated content / Crowd-sourcing, E-learning, Gaming, Semantic Web, Cloud Computing / Cloud Storage, E-books
- **Technology factors:**
API, Decreasing storage cost, Data speed increase, Semantic Web, Cloud Computing / Cloud Storage
- **Potential allies or competitors:**
Wikipedia, Google, JSTOR, GBIF, National digital libraries
- **Economic climate:**
Recession / cutback, Public Private Partnerships (PPP)
- **Political factors:**
Visibility, Return on investment, European directions (Digital Agenda for Europe^{1,2}), Europeana, Funding for digitisation/aggregation, Role of biodiversity/taxonomy research
- **Customer needs:**
Free access to information, Quick access to high quality data, Re-use data, Information in the user workflow, User interaction / feedback
- **Uncertainties:**
Copyright / IPR, Legal issues (terms of use), Definition of metadata

Figure 3 below is a graphical representation of the environmental scan.

¹ http://ec.europa.eu/information_society/activities/digital_libraries/index_en.htm

²

<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/11/1292&format=HTML&aged=0&language=EN&guiLanguage=en>



5.4 Value chain

Based on the concept from Porter (1986), the value chain can be split into primary and support activities. We adapted this model to the current situation within BHL-Europe to better understand the value chain (Figure 4).

- (1) The first primary activity is the content acquisition and management of the content provider network to ensure a continuous delivery of content. The activities in the acquisition process include the identification of potential content providers hosting relevant digital content according to our collection development policy. It is followed by the signature of the MoU to agree on the quality and quantity delivered to BHL-Europe over a certain timespan.
- (2) The second primary activity is the content processing, i.e. aggregation and enhancement. This activity is split into various activities ranging from metadata and content enhancement by the content providers (e.g. to follow the BHL-Europe file submission guidelines), content upload, metadata mapping, content ingest, data editing, and quality assurance (QA is done after every activity in the process). This activity also covers the various options for data enhancement or semantic mark-up that are not yet implemented by BHL-Europe but envisaged for future projects. Thus, during this primary activity the main value for the users is created, which is high quality content with metadata enhanced according to user requirements.
- (3) The third primary activity is the content dissemination through the access routes we are providing. Based on the functionalities of the sites, the user will have a different experience of the value depending on the task the user is performing.
- (4) The fourth primary activity is the marketing of the products and services through our main dissemination channels.
- (5) The fifth and last primary activity is the service provision through a dedicated feedback system for content users and content providers.

These primary activities are supported by a number of other activities to ensure a continuous and efficient execution of the primary activities (see also Schwolow & Jungfalk 2009).

- (1) The main support activity is the IT infrastructure we have established during the project including the hardware infrastructure and all software components deployed on this system. The automatic processing of data is an indispensable requirement to add value efficiently in terms of time and cost.
- (2) Human resources are another support activity, in particular on a management level and to provide technical support and training.
- (3) A final support activity is knowledge management, which also involves the project Web site, the wiki and the mailing lists to host, manage and distribute knowledge to the appropriate people and communities.

All these activities bring value to BHL-Europe, but also cost money, mostly in form of salaries for content providers, IT and data experts, and management resources (including technical support). In order to decide which strategic direction to follow and which business model to implement for a future and operational BHL-Europe, a value-driven approach is required to fulfil the user needs and to survive as a competitive service in a highly dynamic environment. However, a cost-driven approach is appropriate as a strategy to run the activities as described above but decrease the human investment into the primary activities. Instead of investing in the acquisition of new content providers, only the existing network of content

providers is maintained to a large extent. As the second primary activity is the one with the highest potential to create value, but also the activity with the largest costs, it can not be expected to perform this activity to its full extent with a cost-driven approach. As content aggregation is the basic activity in this context, content and data enhancement activities have to be reduced or even abandoned to reduce costs as much as possible.

The first three business models described above (stop all, maintenance, incremental growth) are considered as cost-driven, whereas the other two models are value-driven. Based on this categorisation and the arguments presented above, the decision process is now clarified significantly. A survey is presented in the next section to reflect the view of the key BHL-Europe partners in the decision-making process.

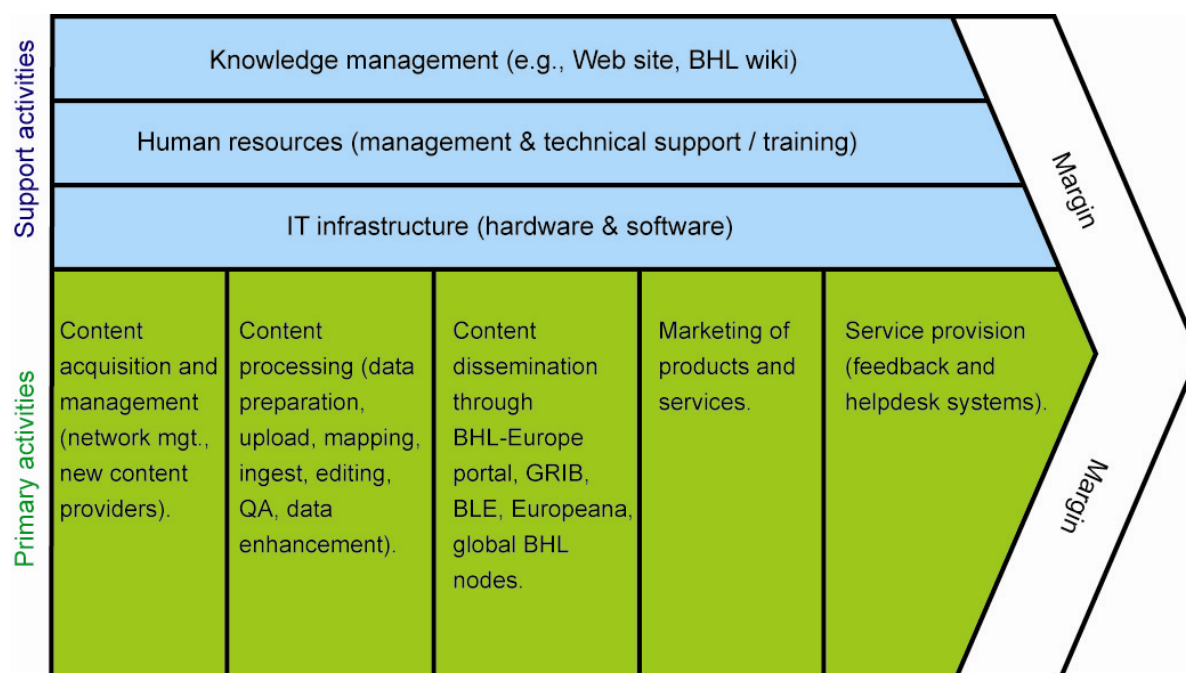


Figure 4. Overview of the BHL-Europe value chain as explained and detailed in the text above.

5.5 Content provider survey and user requirements

The content is the key for the success of BHL-Europe. Without a large volume of high quality content, all Portal features and functionalities have low value. Therefore, continuous digitisation and aggregation is the basic operation to keep BHL-Europe going. It is also the basic for many kinds of data enhancement activities. Thus, the content providers are a key resource and partners to realise a continuous data delivery. This is also the largest group of people in the current project consortium. A survey among all current content providers was performed in summer 2011 to incorporate the view of this important resource for the future planning of BHL-Europe.

Twelve content providers filled the survey questionnaire. Ten of them indicated that they would continue scanning activities beyond the end of the BHL-Europe project. This means we would be able to continue the established aggregation process with the existing network of content providers without any extra efforts in content acquisition. Five content providers are able to support the activities of an ongoing BHL-Europe network with in-kind contributions from their organisations (Figure 5). This would still allow BHL-Europe to grow slowly, but

we would lose a significant number of content providers if we can not provide any additional funding to support the content contribution. This may explain why eleven out of twelve content providers are interested in a follow-up project. Based on the votes of the content providers, the majority is supporting the “Keep going and growing” strategy described above (Figure 6). Thus, the content providers are really interested to add more value to BHL-Europe, which requires additional funding.

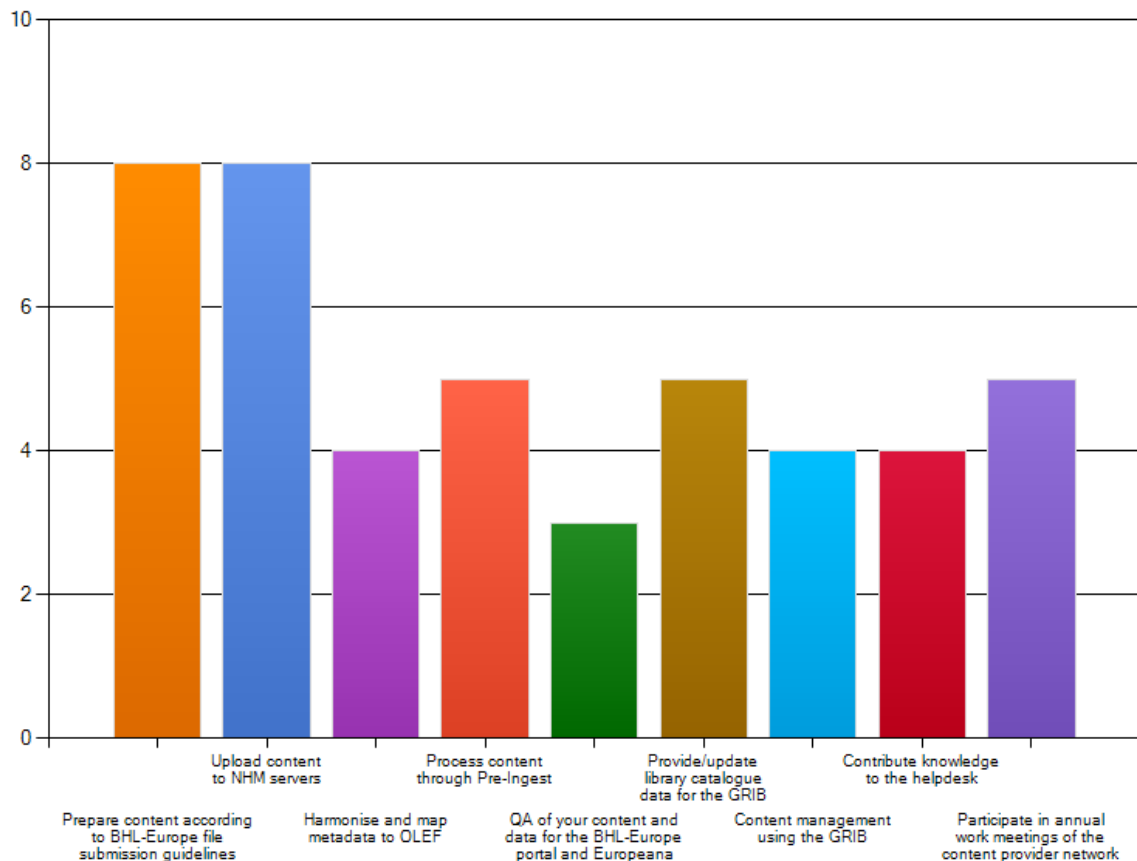


Figure 5. Results of the content provider survey: commitments for in-kind contribution of work after the end of the project.

In spring 2010, BHL-Europe did a user survey to identify the requirements of the users for the BHL-Europe system and Portal¹. We regularly discuss with users their requirements in personal meetings (at conferences, in dedicated workshops). This gives us a clear idea that the users appreciate the achievements of BHL so far. However, more work is still needed to fulfil the requirements of the users, and some of these requirements are beyond the scope of the current BHL-Europe project. One example is the improvement of the search capabilities. This requires more and better data. Enrichment of metadata, semantic mark-up of texts and full-text indexing of OCR are very important to make the BHL-Europe corpus more searchable. In order to enable high quality text mining, high quality OCR of the page images is required, which is a big challenge. The high costs for tools and services and the time to process this large corpus of page images are just two aspects of the challenge. It is not possible to create

¹ <http://www.bhl-europe.eu/de/publikationen/dokumente/first-user-evaluation-report>

this additional value to make BHL-Europe more attractive to various target users without additional funding.

Our experiences with users, and the discussion we had with users over the last few years, have shown that the users are able and willing to support value creation. One example is the PDF generator of BHL-US. Users can create articles out of serial volumes themselves and download the PDF files. Before downloading, users are asked to provide metadata for article they are downloading (author, title of the article, page range). Between January 2010 and April 2011, 60,000 PDFs were generated and 24,000 of them (40%) were ingested into CiteBank as users provided metadata for them. A quantitative analysis of the metadata quality has shown, that many users took the time to create decent metadata to enable subsequent retrieval of articles in CiteBank¹. This shows the motivation and engagement of the scientific community and high potential for crowd-sourcing activities. However, more investment is required to set up infrastructures and services to facilitate crowd-sourcing, e.g. for OCR improvement or semantic mark-up.

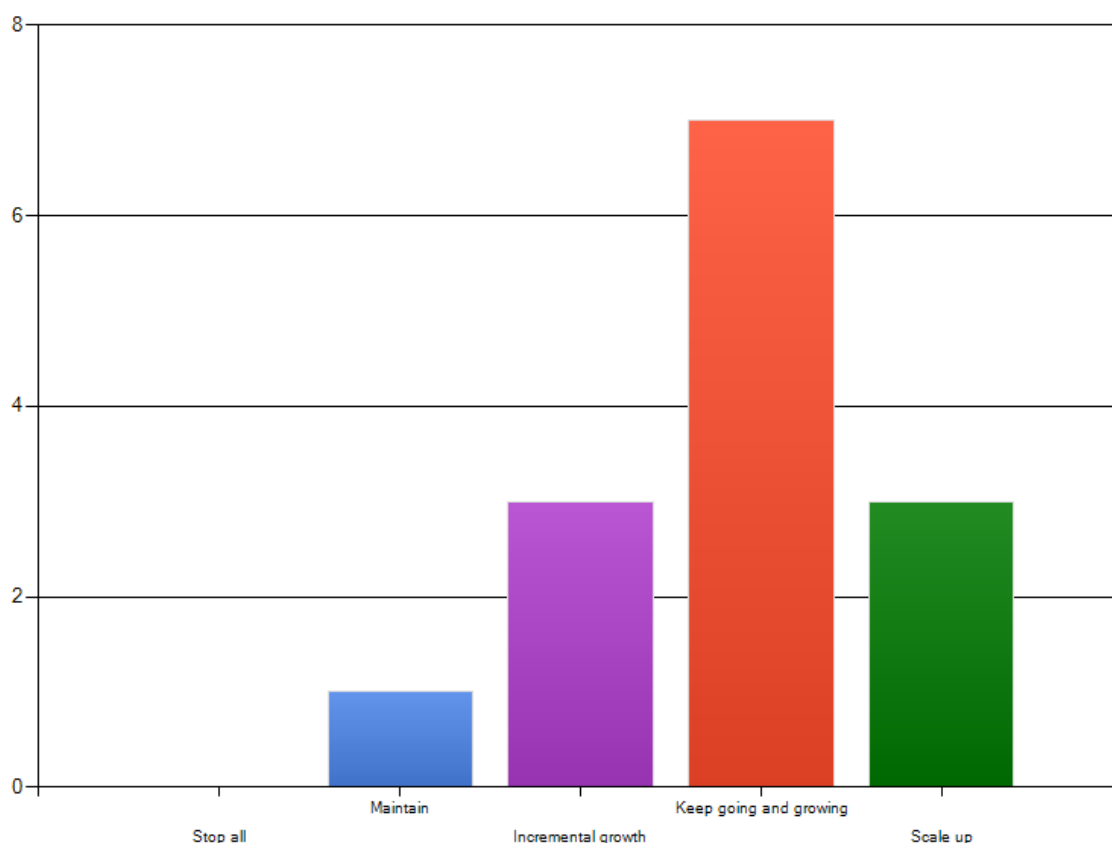


Figure 6. Results of the content provider survey: content provider view on the preferred business model.

On 28 October 2011, key players in bioinformatics and taxonomy gathered in London to celebrate the 150th birthday of Charles Davies Sherborn with a dedicated symposium: *Anchoring Biodiversity Information - From Sherborn to the 21st century and beyond*. It was clear from that day that BHL-Europe is an important player and provider of services in the biodiversity domain.

¹ <http://www.slideshare.net/trosesandler/lita2011-bh-1crowdsrarticles>

From 14-15 November 2011, BHL partners and collaborators from all over the world came together in Chicago for the *Life and Literature* conference. The goal of that conference was to set the goal for the next five years of BHL (see Table 1). One track of the conference focussed on education and the potential of the literature corpus of BHL in this domain. The educational outreach of BHL was identified as highly important. The BHL-Europe's BLE product was well received during the conference and identified as the ideal tool to fulfil these requirements. Thus, BLE clearly needs to be maintained and further developed.

Table 1. Common themes identified by the participants of the breakout session during the Life and Literature conference in Chicago.

<p>Expand</p> <ul style="list-style-type: none"> • Art / Illustrations • Contextualisation (BLE) • Articles • Localisation of serving • Common name searching 	<p>Innovate</p> <ul style="list-style-type: none"> • Mobile • OCR Correction • User engagement with annotations • Gaming • More APIs • Computable data
<p>Maintain</p> <ul style="list-style-type: none"> • More content • Engage users, get feedback 	<p>Avoid</p> <ul style="list-style-type: none"> • Closed access • Charging for content • Growing too big, too fast • Losing brand, value

From the perspective of the BHL-Europe customers (content providers and content users), more value needs to be added to BHL-Europe to make it attractive and competitive. The current system as we are building it in the BHL-Europe project is a good starting point, but continuous substantial investment is required to build on the expertise and experience of the partner network and deliver a high value service for the content users.

5.6 Implementation of results of BHL-Europe in other projects

This chapter was originally planned to be a separate deliverable. As it is important to take these aspects into account when building a business plan, we decided to combine both documents into one. Below we list a number of running projects and potential future projects where BHL-Europe has a role.

After discussion and careful analyses the idea applying for a BHL-Europe successor project was rejected by the consortium partners. Although we can identify features we need in the future in order to fulfil the requirements of our user community, the current ICT PSP work programme is not giving us the flexibility we need to create a fundable proposal. The objectives and targets of the Work Programme are too narrow to meet our users' needs.

Active projects using BHL-Europe outputs:

Project	BHL-Europe results implemented
OpenUp!	<ul style="list-style-type: none"> ▪ Webservices for taxonomic names (CoL, PESI)
Europeana	<ul style="list-style-type: none"> ▪ Metadata of aggregated content ▪ Knowledge (project documents e.g., best practice guide) through EuropeanaPro ▪ Representation in Europeana ThoughtLab (GRIB, Scanlist)
Europeana Libraries	<ul style="list-style-type: none"> ▪ GRIB approach is interesting for this project and may be taken up here
Vibrant	<ul style="list-style-type: none"> ▪ Aggregated content to extract bibliographies ▪ GRIB approach is interesting for this project and may be taken up here
Darwin's Library	<ul style="list-style-type: none"> ▪ Persistence of content for NHM
IMPACT (Centre of Competence)	<ul style="list-style-type: none"> ▪ Ground Truth data produced by IMPACT and BHL-Europe will be available as data in the IMPACT repository
Global BHL	<ul style="list-style-type: none"> ▪ Mirroring (sustainability) of content ▪ Joint use of the GRIB and the Scanlist (digitisation management) ▪ Knowledge share: distribution of BHL-Europe documents (e.g. Best Practice Guide), technology alignment (e.g. open source application, book viewer, GUID minting, ingest procedure)

Potential future projects:

Project	BHL-Europe partners involved	BHL-Europe results implemented
Pro-iBiosphere (in negotiation)	<ul style="list-style-type: none"> ▪ MfN ▪ FUB-BGBM 	<ul style="list-style-type: none"> ▪ Legacy literature to be part of an European Open Biodiversity Knowledge Management System (Pro-iBiosphere should identify current gaps before an Open Biodiversity Knowledge Management System can be build)
Europresa (submitted 17/04/12)	<ul style="list-style-type: none"> ▪ MfN ▪ NHM ▪ NHMW 	<ul style="list-style-type: none"> ▪ Further development and consolidation (sustainability) of BHL-Europe preservation and archive system (alignment of European OAIS repositories)
Europeana4All (submitted 15/05/12)	<ul style="list-style-type: none"> ▪ MfN ▪ NMP ▪ Europeana 	<ul style="list-style-type: none"> ▪ Further development / sustainability and extension of the BLE approach ▪ Content management ▪ Taxonomic Intelligence approach



6 Business plan

Based on the above analysis, it is clear that our two customer groups would clearly like more value added to BHL-Europe. Therefore, BHL-Europe will aim for the implementation of the **keep-going-and-growing** business model after the end of the project on 30 April 2012. However, **keep-going-and-growing** can not be implemented realistically without additional funding by a successor BHL-Europe project with a new focus that goes beyond content aggregation and the increase of the corpus of digital literature. We would need to build on top of this corpus and an improved infrastructure to create additional value for customers. Although some BHL-Europe results are implemented in other projects, and further development will happen in the future, a BHL-Europe successor project is not realistic in the current EU funding round. Therefore, in the following the business plan for BHL-Europe is developed with the **Incremental growth** model as the baseline.

We outline the vision, mission, objectives, value proposition, key resources (including human resources and management), key activities and costs to outline the business model in more detail. We also present a roadmap for the future, and a risk analysis for the chosen approach.

6.1 Vision statement

European biodiversity knowledge freely available globally to everyone.

6.2 Mission statement

Mobilising and preserving digital European biodiversity heritage literature and facilitating the open access to this literature through a multilingual community Portal, the Global Reference Index to Biodiversity, the Biodiversity Library Exhibition and Europeana.

6.3 Objectives

Above we have analysed the strategic directions for an operational BHL-Europe service. These are the objectives for the **Incremental growth** option:

- Provide and maintain a multilingual and open access point for the search and retrieval of biodiversity content through BHL-Europe, GRIB, BLE, global BHL and Europeana.
- Long-term preservation and sustainability of the content and metadata produced by European and national biodiversity digitisation programmes.
- Improve the interoperability of European biodiversity digital libraries by the application of tools and technologies developed with the BHL-Europe Best Practice Network.
- Collaborate with content providers to ingest metadata and content in a standardised way.
- Disseminate best practice guidelines and standards to content providers and the community.
- Raise awareness and ensure that the services are known and used by the target users.



- Raising funds to further develop the BHL-Europe system, to keep pace with technology developments, and to ingest further content.

6.4 Value proposition

BHL-Europe delivers the following values to content providers and content users and helps them to solve the following problems. In summary, the key value proposition for the business model is aggregation.

6.4.1 Value proposition for content providers

- BHL-Europe helps to create OCR text from the scanned page images for further data analysis and metadata enrichment.
- BHL-Europe provides open source tools and technologies to cost-effectively present digital content and manage digitisation projects in the biodiversity domain.
- BHL-Europe establishes a sustainable preservation and archive system to store, curate, manage, and migrate our partners' data. Thus BHL-Europe will have strategies and processes in place for long-term preservation of the data produced by biodiversity digitisation programmes.
- BHL-Europe provides access to an important up-to-date and cost-effective pool of information and network of collaboration to help partners use best practice approaches.
- BHL-Europe provides multilingual access to the content of all partners, thus saving partners the cost of creating a multilingual Portal.
- BHL-Europe increases the visibility of the content of all partners, thus increases the visibility of the partner institutions.
- BHL-Europe is influencing the library strategies for physical collections.
- BHL-Europe is facilitating and changing the interlibrary loan process.
- BHL-Europe will facilitate funding for scanning
- BHL-Europe dissemination activities will reach a large group of target users to increase the use of all data and content. Thus, BHL-Europe gives a cost-effective way to multiply the impact of partners' editorial activities and build a presence with users, the professional community, and other organisations including national governments.
- BHL-Europe makes all its content available through Europeana – a search platform to a collection of European digital libraries. This will increase the visibility of BHL-Europe content, and it will also increase the visibility of BHL-Europe content provider data. A sustainable Europeana will also support the sustainability of BHL-Europe.
- BHL-Europe provides access to the complete content through the Global Biodiversity Heritage Library. The content will be globally mirrored and backed-up for preservation and access.
- BHL-Europe helps content providers to manage their scanning activities through the Global References Index to Biodiversity.
- BHL-Europe facilitates collaboration between partners beyond project goals.

6.4.2 Value proposition for content users

- BHL-Europe is accumulating a trustworthy digital collection of Europe’s biodiversity heritage literature for research, education and many of other applications.
- BHL-Europe provides a sustainable preservation and archive system to store, curate, manage, and migrate our data. This strengthens our position as a long-term trusted source.
- BHL-Europe provides free and direct online access to comprehensive information not currently publicly accessible through different access routes.
- BHL-Europe provides a multilingual community Portal to search or browse the digital archive, read the literature online, download all relevant data (bibliographic information, page images, PDF of the publication or parts of the publication, OCR) and print the literature.
- BHL-Europe provides access to Taxonomic Intelligence services to facilitate the search for taxon specific information, including the search for the scientific name of a species but also the search for vernacular names.
- BHL-Europe makes research in the biodiversity domain more efficient as identification of biological species takes less time, and thus research based on historical taxonomic works is easier and quicker, as time and costs involved in visiting libraries is significantly reduced.
- BHL-Europe improves the quality of research in the biodiversity domain as the accuracy of citations will be improved, and “reinventing the wheel” can be avoided.
- BHL-Europe is repatriating biodiversity knowledge by sharing books with other countries, e.g. biodiversity-rich developing countries.
- BHL-Europe facilitates library management by reducing the handling time for librarians and by reducing the wear and tear of special and rare collections.
- BHL-Europe provides high quality images and artwork of animals and plants.
- BHL-Europe (in particular through BLE) is an extensive resource for teaching material as a complement to textbooks used in schools.
- BHL-Europe provides access to the digital archive through Europeana thus making a major corpus of science material available to every European citizen to help raise the awareness and appreciation of biodiversity heritage. The access through Europeana also facilitates the cross-domain search and retrieval of content for all users.
- BHL-Europe welcomes user feedback and interacts with users.
- BHL-Europe provides information to users about the distribution of heritage material still to be digitised and offers mechanisms to place requests for scanning such material through the Global References Index to Biodiversity.
- In making all the content available through the Global Biodiversity Heritage Library, BHL-Europe is also incorporating content that is made available by the global partners. thus bringing digital copies of European heritage literature that is not available in Europe back to Europe.

6.5 Key Resources, Key Activities and Costs

For the implementation of the business model, we identified eight basic business components, which also translates into key activities (see also Figure 7). The commitments presented below are confirmed at least for the first phase of the operational service after the end of the project.

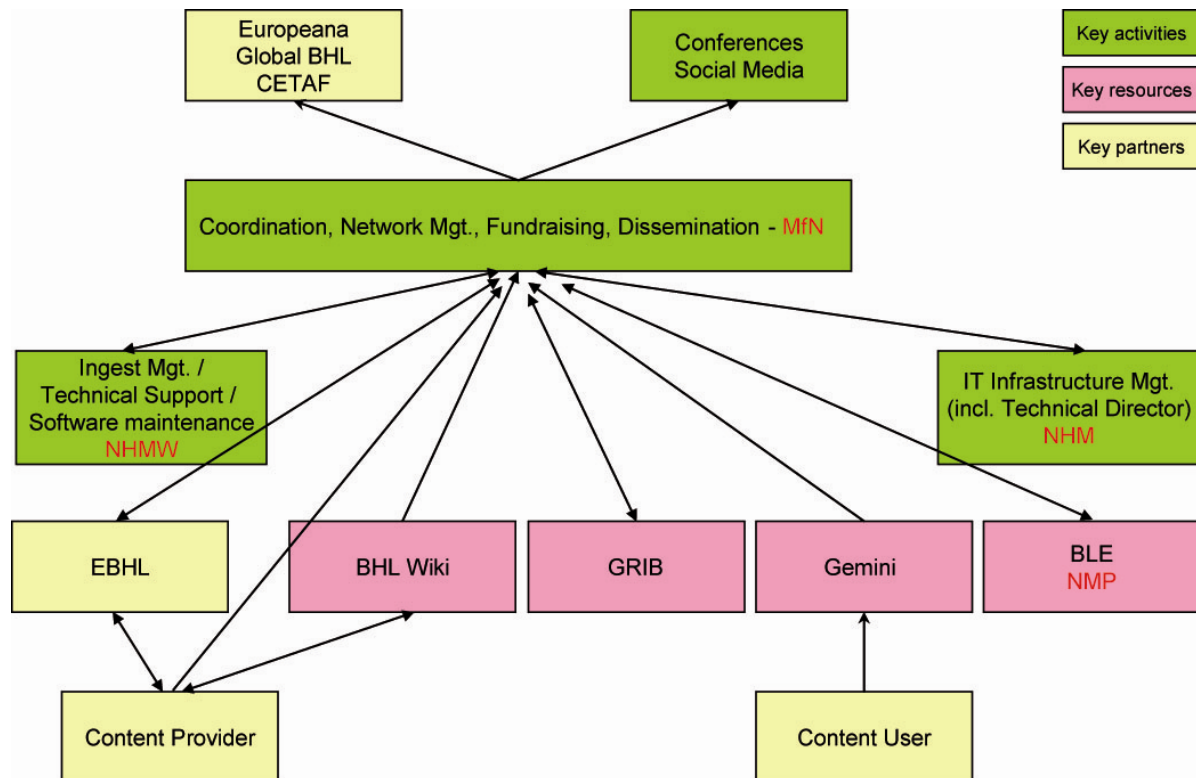


Figure 7. Key resources, activities and partners for the basic operations implementing the IG model. Dependencies and communication routes are shown as well.

- (1) **Long-term sustainability of the content already digitised and aggregated.** To achieve this we need to manage the hardware and software infrastructure established within the BHL-Europe project. As the NHM has already committed to maintain the infrastructure and thus the access to and preservation of the content aggregated during the BHL-Europe project, long-term sustainability of the content already digitised and aggregated is secured. The NHM will employ a *Technical Director* for BHL-Europe.
- (2) **Long-term sustainability of the library catalogues already aggregated via the GRIB.** The GRIB is build by the head office of the common library network GBV¹ (VZG²) for BHL-Europe. The Gemeinsamer Bibliotheksverbund (GBV) is the common library network of the seven German federal states with more than 400 member libraries. Its head office in Göttingen is responsible for the development of new library specific services.

¹ GBV homepage: <http://www.gbv.de/vgm/>

² VZG homepage: <http://www.gbv.de/vgm/info/biblio/01VZG/index?lang=en>

After the end of the BHL-Europe project in April 2012, the VZG will further host and maintain the GRIB at least until February 2020 according to a bilateral agreement. This service includes the import of data from partner libraries as well as free and open access to the data via standard interfaces (www, Z39.50, SRU, internal XML, and OAI). The Museum für Naturkunde Berlin will act as the formal liaison between the BHL-Europe partner libraries providing the data and the VZG through the BHL-Europe Executive Director.

- (3) **Long-term sustainability of the (content provider) network, including Europeana.** Library networks have proven to exist over long time periods and work continuously on a voluntary basis. The European Botanical and Horticultural Libraries (EBHL, <http://www.kew.org/ebhl/home.htm>), for example, exist as a network since 1994 with very little financial support. The activities of EBHL do very well align with the activities anticipated by the BHL-Europe content provider network. In collaborating with EBHL, we would be able to facilitate and support knowledge sharing about the expertise we build in BHL-Europe. As some of the BHL-Europe libraries are already actively involved in EBHL, this collaboration would even reduce duplication of effort. The Museum für Naturkunde, Berlin will act as the liaison for the BHL-Europe content providers through the *BHL-Europe Executive Director*. The director will maintain the communication channels also with the ingest manager and technical support team. The director will also continue to collaborate with Europeana (incl. Europeana Network and ingest team).
- (4) **European participation/leadership in Global BHL.** To achieve this, the BHL-Europe Executive Director and Technical Director needs to align with the other BHL nodes. The BHL-Europe Executive Director will be a member of the Global BHL Coordinating Committee.
- (5) **Easy method for current/future partners to add content to corpus, including IT support.** To achieve this we need to maintain the mapping and ingest management and support structure established in the BHL-Europe project. This also may require minor tweaks and update of the software package for the Portal etc. NHMW, currently managing the ingest process, has committed to maintain the ingest process for the content providers of the existing BHL-Europe project.
- (6) **Maintain and develop the Biodiversity Library Exhibition** in collaboration with Europeana and Global BHL. NMP has built BLE and will continue its engagement with BLE.
- (7) **Helpdesk to manage user feedback on data/content quality.** To achieve this we need one contact point to collect and distribute incoming feedback. This will be the BHL-Europe Executive Director.
- (8) **Lobbying and high level strategic network management:** To achieve this we need to align with CETAF, the Consortium of European Taxonomic Facilities. CETAF has recently established a secretariat office at the Royal Belgian Institute of Natural Sciences in Brussels funded by the major European natural history museums and botanical gardens. Thus, CETAF now has a much more solid foundation to support the lobbying and the high level strategic management of initiatives like BHL-Europe.

Every institution interested in contributing content to BHL-Europe is expected to provide the collaborative work with BHL-Europe as in-kind contribution (e.g. as part of the existing scanning programme / project or library activity). BHL-Europe has already discussed with the consortium partners the option for committing staff time to support BHL-Europe services to



secure a project independent funding of BHL-Europe business components. As indicated in the results of the content provider survey, at least some of the content providers have the capacity to cover the collaborative work necessary to support a continuous content aggregation. In addition, it needs to be investigated and discussed to what extent further contributions can be raised to support the key activities of BHL-Europe on a long-term basis.

A formal structure has been agreed to facilitate the governance of the BHL-Europe operations and make the decision-making process transparent to all parties involved. We plan to implement the BHL-US governance model which has proven to work very well for organisation of this size in this environment. The Europeana Foundation governance model is also very similar.

An Institutional Council (IC) will form the base of the governance structure. All content and data providers that have signed the BHL-Europe MoU will be official members of the IC. Quarterly conference calls will be held and one annual meeting will allow the direct interaction of all members. At the next level, a Steering Committee (SC) will manage the BHL-Europe activities. Monthly conference call will be arranged to discuss progress and issues. The SC will consist of the institutional members with explicit commitments for key activities within BHL-Europe (currently MfN, NHM, NHMW, and NMP). The Executive Committee will consist of elected individuals of the SC member institutions. These persons decide on the BHL-Europe activities, which are then executed by the Executive and Technical Directors of BHL-Europe.

The further specification and implementation of the governance model will be discussed in the second half of the year 2012 to review the experiences we have had with our operational service in the first weeks and months after the end of the project. A new MoU will then be put in place to ensure an ongoing and long-term operational service of BHL-Europe.

6.6 Roadmap

In the first year of operational service (May 2012 to April 2013), we will focus on the following aspects:

- final administration and closure of the formal BHL-Europe project
- testing of the operational service and establish a working environment under the new model organisation, including refined risk analysis and risk management
- discuss and finalise the new governance structure
- identify performance indicators for the future BHL-Europe operations
- investigate options to fund BHL-Europe tasks from grant and other sources
- maintain close alignment with Europeana and Global BHL, including the full mirroring of content between Global BHL and BHL-Europe

For the following years, we will need to establish a plan that identifies what increase of content volume is achievable and what level of contextual enhancement is achievable with the funding we can raise.

6.7 Business Model summary

Key Partners <ul style="list-style-type: none"> • Content providers • Content users • Europeana • Global BHL • VZG • CETAF • EBHL 	Key Activities <ul style="list-style-type: none"> • Coordination • Content / network mgt. • Knowledge maintenance • Ingest mgt. • IT maintenance • Software maintenance • Dissemination & training • Fundraising 	Value Propositions <ul style="list-style-type: none"> • Four access points • Preservation and archive • Data enhancement • Increased visibility • Open source tools • Best practice guides • Knowledge pool • Trustworthy collection • Long-term trusted source • Free online access • OCR • Taxonomic Intelligence • Facilitate library mgt. • High quality artwork • User interaction • Facilitate research • Europeana & gBHL 	Customer Relationships <ul style="list-style-type: none"> • Wiki with FAQ (for CP) • Annual meetings (for CP) • Feedback form (for CU) • Email (direct contact) 	Customer Segments <ul style="list-style-type: none"> • Content Providers (CP) • Content Users (CU)
	Key Resources <ul style="list-style-type: none"> • Content • IT infrastructure + portal • GRIB • BLE • Gemini + Wiki • BHL-Europe Director • Technical Director • Ingest manager • Technical support 		Channels <ul style="list-style-type: none"> • Website • Access points (portal etc.) • Social media • Mailing lists • Publications • Partners & resources • Conferences • Direct contacts 	
Cost Structure <ul style="list-style-type: none"> • Platform Costs (Infrastructure maintenance) • Coordination Costs (Network maintenance, Office) • Salaries: in kind contributions / partner commitments 		Revenue Streams <ul style="list-style-type: none"> • Free access to content • In kind contributions: content & data harmonisation & ingest • In kind contributions: infrastructure maintenance and office host • Membership fees (to be investigated further) 		

Figure 8. Summary of the BHL-Europe business model, based on the schema by Osterwalder & Pigneur (2010).

6.8 Risk analysis

In the following we present a first risk analysis for the BHL-Europe operational service. This needs to be refined and updated during the first year of operations.

Human resources: For the operational service, we currently have a small staff, and that means we are not very flexible and can not easily absorb work peaks or deal with contingencies. In addition, not all staff members we identified for BHL-Europe are permanent staff members of the host institutions. This is bringing uncertainty to the future planning of the BHL-Europe operations. Therefore, one major goal of the main host institutions of BHL-Europe is to increase our efforts to strengthen and extend the partner network, and to raise funding to ensure the long-term persistence of the operational service. We hope that the experiences and lessons learned in establishing the CETAF Office in Brussels will help us to generate the extra funds we need to organically grow over the next years.

Content delivery: The incremental growth option only works if content providers continue to digitise content and are able to invest working time to bring the content into the shape needed for BHL-Europe and required by the File Submission Guidelines. Content need to be digitised in the right format, it needs to have the right metadata, the file structure needs to be correct to allow an accurate ingest, so the content needs to be uploaded and ingested with some level of QA. We need to make sure that we maintain our ingest workflow and infrastructure in a way that facilitates the ingest process for content providers. We also have to maintain our value proposition to make a content delivery to BHL-Europe attractive for content providers.



Technical enhancements: Technology is developing fast and we need to do some development and integration work to update operating systems, software, etc. and fix bugs. We also need to watch the market to identify the technological innovations that we need to consider to remain competitive. The open source nature of the BHL-Europe system components will help us to keep up to date with technology developments. Most of our components (e.g. Drupal, Islandora) have an active community of developers on a global scale. We should be able to benefit from new developments and integrate new modules or components with low effort and which offer new functionalities for our user community.

Brand & reputation: BHL-Europe will benefit from the very good reputation of BHL on a global scale. It is highly unlikely that BHL will lose its reputation. However, we should make sure we align closely with Global BHL in the future to avoid a marginalisation of Europe.

Dependencies: BHL-Europe benefits from Global BHL and Europeana, but is to an extent independent of these big players. If for some reason the two partners are having problems, it is possible that there will be an impact on the operational service of BHL-Europe. Therefore, it is important that we maintain and develop our own infrastructure, network and value proposition to be independent and competitive.

Political: The political landscape in Europe currently supports the digitisation of cultural heritage on a large scale. Therefore, chances for obtaining funding for some parts of the digitisation and preservation lifecycle are good right now, although it is much more difficult to obtain funding for digitisation per se than for technical initiatives. As long as this climate is stable, the organic growth of BHL-Europe is potentially fundable.

7 Europeana and Global BHL

Europeana is a major partner of BHL-Europe with its own products and agendas. Europeana itself has a business plan and a strategic plan that is independent of BHL-Europe. As Europeana is very important for BHL-Europe, a summary of their future strategies is provided below. Although BHL-Europe and Global BHL have some objectives in common, the Global BHL is a separate initiative of which BHL-Europe is a key member.

7.1 Europeana

The Europeana Strategic Plan 2011-2015¹ sets out a clear vision for the future direction of Europeana - Europe's digital library, archive and museum. It focuses on four strategic tracks - aggregate, facilitate, distribute and engage - that will enable Europeana to generate real value for its stakeholders. The plan complements the release of 'The New Renaissance, the Comité des Sages²' report on digital cultural heritage to the Commission, which recommends 'a clear vision and plan for the future development of Europeana.'

The plan sets out to continue to aggregate the material from across Europe and become THE trusted source of cultural heritage. Europeana should also be a facilitator and support the cultural heritage sector through knowledge transfer, innovation and advocacy. To distribute

¹ Europeana Professional website: http://pro.europeana.eu/c/document_library/get_file?uuid=c4f19464-7504-44db-ac1e-3ddb78c922d7&groupId=10602

² European Commission website: http://ec.europa.eu/culture/pdf/report_Comite_des_Sages.pdf



the data and make heritage available to users wherever they are, whenever they want it; through APIs and search widgets, in teaching resources, on blogs, college sites and social networks. Europeana will also explore new ways of actively engaging users in the development of the site and making creative reuse of its content.

Europeana will be one of the access points via which the BHL-Europe material will be made available. Europeana aims to continue its service in the future and reach the goals it has set out in the strategic plan. The Europeana Foundation receives funding from the European Commission, with matching funds supplied by the Member States to carry out its activities. Europeana Foundation competes for project funding from the EU. It has two central projects run entirely by the Europeana Foundation, Europeana v2.0 and Europeana Awareness and it is a partner or subcontractor in 20 other Europeana related projects. Without this matching funding, Europeana cannot participate in the projects and would therefore not have been able to progress beyond the prototype phase of 2008 and leading directly to increased material being available from the countries and establishing improvements of the site for the end user.

Europeana v2.0 is a project under the ICT PSP programme that started 1 October 2011, with the aim to provide the majority of the funding required to ensure the continued running and development of Europeana from October 2011 to February 2014. Activities will include the enhancement of content, increase and facilitate the re-use of content, develop a sustainable finance and provision model, create centralised repositories of linguistic resources, release new versions and maintain the service and its APIs, develop features and functionalities, improve the user experience and coordinate the network of contributing organisations.

Europeana Awareness is a 3 year project that started 1 January 2012, designed to publicise Europeana to users, policy makers, politicians and cultural heritage organisations in every EU Member State so as to encourage the use and contribution of content, raise awareness of cultural heritage as an economic driver and promote knowledge transfer. It will promote its use by a broad public for a variety of purposes including recreation and hobbies, research, learning, genealogy and tourism – engaging users via user generation of content, creation of digital stories and social networking. A wide variety of media and channels, both online and offline, will be used to ensure promotion of appropriate and consistent messages to different stakeholder groups. The approaches to be used have been chosen so as to align closely with the goals of the Europeana Strategic Plan 2011-15 and include both top-down and bottom-up activities.

7.2 Global BHL

The Global Biodiversity Heritage Library (gBHL) is a cooperative network of autonomous decentralised members operating programs and projects to make biodiversity literature available through open access principles. The goals of the gBHL are:

- Digitise and aggregate as much biodiversity literature as funding and copyright law allows through the member programs and projects.
- Maintain repositories for the indexing, storage, preservation, and serving of this digital content.
- Develop services to make this digital content widely and easily available.
- Share data, technologies and knowledge between nodes. Especially important in this regard is the redundant storing of BHL content in multiple, geographically distributed, and independently administered sites. This network approach on content storage will



avoid the “monoculture” problem common to many large digital library projects and set the framework for long-term and sustainable preservation of the digital assets.

The principles of the gBHL are:

- Open access: The digital content served by gBHL members is available without cost and can be reused by other projects and users with appropriate attribution.
- Collaboration: Each gBHL member will actively coordinate its activities with other BHL partners to achieve agreed objectives.
- Decentralisation: Each gBHL is self-governing and funded.
- Interoperability: Each gBHL member will deploy technologies enabling sharing of digital content and services with other gBHL members.
- Transparency: The processes of the gBHL will be transparent and clear to all members and the public.
- Legality: The gBHL members will operate within their legal frameworks.

The current gBHL Partner Projects are:

- BHL
- BHL-Europe
- BHL-China, which includes the Chinese Academy of Science – Institute of Botany, Chinese Academy of Science – Institute of Zoology, Chinese Academy of Science – Institute of Microbiology, and Chinese Academy Science - Institute of Oceanography
- BHL-Australia, which includes the Atlas of Living Australia (ALA), Museum Victoria, and several Australian digitisation projects
- BHL-SciELO Network, established in Brazil envisaging to expand progressively through decentralised nodes in the countries covered by the SciELO (Scientific Electronic Library Online) Network, under the general coordination of the SciELO Program of the São Paulo Research Foundation (FAPESP), the support of the Secretary of Biodiversity and Forests of the Ministry of Environment and the scientific coordination of the Museum of Zoology, University of São Paulo and the technical cooperation of BIREME/PAHO/WHO.
- BHL Arabic node organised by the Bibliotheca Alexandrina, Egypt.

The current gBHL partners are in different stages of project implementation and are establishing a gBHL Coordinating Committee to better align the project's strategies. The hope is that by sharing digitised biodiversity literature content, by mirroring content, and by sharing technologies and best practices in multiple, geographically distributed, independently administered sites, the global partners will reduce the resource burden required by each separate project and will avoid the “monoculture” problem, common to many large digital library projects, while setting the framework for long-term preservation of the digital assets.

8 Appendix and reference documents

8.1 BHL-Europe deliverables and documents

The Business Plan for long-term sustainability (D1.9) in M36 of BHL-Europe will further include as annex the following documents or refer to them:

- D2.9 – Delivery of the final revised best practice guidelines and standards (incl. BHL-Europe in a nutshell, BHL-Europe collection development policy)
- D3.8 – Sustainability policy for continuation of service e.g. hosting, future development, helpdesk provision for service users/content providers etc.
- D4.3 – Deliver IPR framework to support long-term access and sustainability of the digitised material

8.2 Literature

- Osterwalder, A. & Pigneur, Y. 2010. Business Model Generation. - John Wiley & Sons, Inc., 280 pp.
- Porter, M.E. 1986. Changing Patterns of International Competition. - California Management Review 28: 9-40.
- Schwolow, S. & Jungfalk, M. 2010. The Information Value Chain: Strategic Information Management for Competitive Advantage.” Bachelor’s project. Copenhagen Business School, 2009. *Information Value Chain*. 2009. Web. 13 Mar. 2010. <www.informationvaluechain.com/information-value-chain.pdf> [checked 9 October 2011].