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### D6.3.3 - Report on diversity and strengths of existing business plans and discussion of sustainability

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<b>FUB-BGBM</b>	Botanischer Garten und Botanisches Museum	Germany
<b>Pensoft</b>	Pensoft Publishers Ltd	Bulgaria
<b>Sigma</b>	Sigma Orionis	France
<b>RBGK</b>	The Royal Botanic Gardens Kew	United Kingdom
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## TABLE OF ABBREVIATIONS

<b>ADBC</b>	Advancing Digitisation of Biodiversity Collections
<b>API</b>	Application programming interfaces
<b>BHL</b>	Biodiversity Heritage Library
<b>BIOCASE</b>	Biological Collection Access Services
<b>BISE</b>	Biodiversity information system for Europe
<b>COL</b>	Catalogue of Life
<b>CR</b>	Customer relationships
<b>CS</b>	Customer sectors
<b>EDIT</b>	European Distributed Institute of Taxonomy
<b>EMBL</b>	European Molecular Biology Laboratory
<b>EOL</b>	Encyclopaedia of Life
<b>EUNIS</b>	European Nature Information System
<b>FAN</b>	Flora Agaricina Neerlandica
<b>FDB</b>	Fund for Biodiversity
<b>FOG</b>	Flora of the Guianas
<b>FON</b>	Flora of the Netherlands
<b>GBIF</b>	Global Biodiversity Information Facility
<b>GEANT</b>	Pan-European data network for the research and education community
<b>IAS</b>	Invasive Alien Species
<b>ICT</b>	Information and Communication Technologies
<b>IPNI</b>	International Plant Names Index
<b>IUCN</b>	International Union for Conservation of Nature
<b>KA</b>	Key activities
<b>KP</b>	Key partnerships
<b>KR</b>	Key resources
<b>LERU</b>	League of European Research Universities
<b>MOU</b>	Memorandum of Understanding
<b>NCBI</b>	National Center for Biotechnology Information
<b>VP</b>	Value proposition
<b>WP</b>	Work Package

## EXECUTIVE SUMMARY

This document is the final report related to Task 6.3 “Evaluating business models currently in use by partners”. The Task focuses on, the (i) exploitation plans foreseen by each project partner, (ii) business models used by partners, and (iii) market background in the framework of which the project shall develop its activities. The outcomes of T6.3 feed Task 6.4 “Towards Sustainability for Services”.

The activities conducted through Task 6.3 allowed a useful exchange of viewpoints, a good level of agreement on major concepts, a more detailed identification of what could be done together, etc. representing a solid ground on which the project sustainability plan can be prepared.

The following recommendations are made:

- Consortium and non-consortium partners should identify a collaborative activity, time scale, and distribution of tasks in order to capitalise on the strong interest in collaboration with a view to identifying opportunities beyond the project time-frame for partners to define, agree and be ready to launch a real commercial activity.
- The project vision should be adjusted in light of any new priorities arising from the above.
- Consortium partners need to ensure that the Business Model, vision to implement the Open Biodiversity Management System, and Bouchout Declaration are each consistent with one another.

## INTRODUCTION

In the project work plan, within WP6 “Sustainability planning”, Task 6.3 “Evaluating business models currently in use by partners” provides inputs, together with Task 6.1 “Cost of delivering services” and Task 6.2 “Benefits of delivering services”, to Task 6.4 “Sustainability” (see Figure 1).

The aims of Task 6.3 are to:

- Detail the exploitation plans foreseen by each project partner and the consortium as a whole,
- Inventory the business models each partner has been using in its activities,
- Place this information in the light of the “market background” in the framework of which the project shall develop its activities.

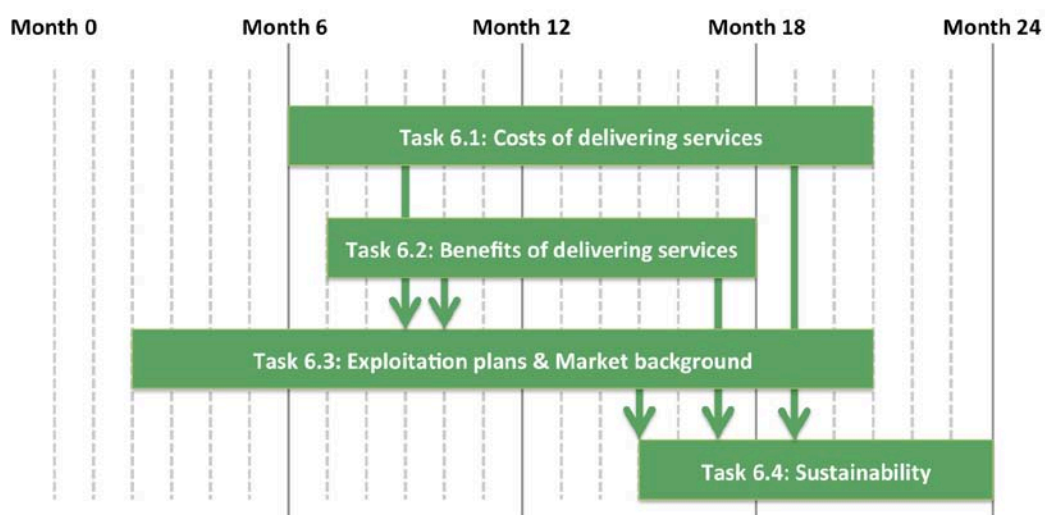


Figure 1. Structure of pro-iBiosphere WP6: Sustainability planning

This document is the final deliverable of Task 6.3 and includes two distinct parts:

- The methodological approach followed through task 6.3 to gather inputs from project partners including (i) the project vision, (ii) exploitation plans at partners’ level, (iii) business models currently in use by project partners, (iv) market background and (v) the workshop to evaluate business models currently in use by partners and relevant non-partners,
- Recommendations after completion of task 6.3 activities.

## TOWARDS PROJECT SUSTAINABILITY: THE PRO-iBIOSPHERE METHODOLOGICAL APPROACH

### PROJECT VISION

Each partner has been requested, at month 6, to answer the following questions:

- Do you agree with the following overall vision of the project: Succeed in interconnecting, through infrastructures, institutions from Europe (and beyond) collecting and processing core biodiversity data, thus leading to the possible implementation of an integrated system allowing each institution and/or all institutions collectively to offer improved or new services to a wide range of users (customers)?
- What are, in your opinion, the main obstacles the pro-iBiosphere partnership will face towards the sustainability of its initiative? What would be the key developments to reach the envisioned integration by the end of the project? Which project activities should necessitate a more particular assessment of their progress?
- How would such an integrated platform be managed? Should this management include all pro-iBiosphere partners, or just some of them, or new partners? What would be the main activities of this management body and which related running costs can be foreseen? Which investments would be necessary?
- Which benefits would such an integrated platform offer when compared to the present situation when institutions collecting and processing core biodiversity data are not, or not so efficiently connected? Which new or improved services could be offered, to which customers at what price, by each institution individually or collectively through the organization managing the platform?

The exercise has been repeated at month 12 (to check if a consensus started emerging). The detailed results reproduced in annex 1, have been discussed during a consortium workshop held at month 14, and can be summarized as follows:

- Overall vision: the proposed vision is agreed on by most partners.
- Obstacles to making it happen: a number of obstacles are identified by project partners (e.g., standards and interoperability issues, lack of institutional support or awareness, difficulty to agree on a common business model), which can only justify that an implementation phase should be developed in continuity with the present project.
- Platform management: several partners indicate that time is needed to fully answer the different facets of these questions: Who would manage it: only project partners / other partners / only an independent organisation? Foreseen investment and running costs: a foundation supported by partners / income through membership and service provision / necessary public funding?
- Benefits and services: a number of envisioned benefits and possible services are listed by project partners and these have been further detailed in the reports on Benefits to Users (D6.2.1) and Benefits to Providers (D6.2.2); they should become more structured once the possible business models corresponding to the market vision are studied in detail.



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## EXPLOITATION PLANS

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Project partners have been requested at month 6 to detail their exploitation plans (at the level of their organisations) and then to update it at month 12 after having discovered the answers of the other partners at month 6. The results obtained at month 12 have been considered as stable and are reproduced in annex 2.

The exploitation plans provided by partners can be summarised as follows:

- Strengthened expertise: partners consider that their involvement in the project (interaction between project partners, developed tools, project workshops) strengthen their expertise in the various topics on which the project is focusing (i.e., eInfrastructures, international cooperation, mark-up strategies and systems, data management, interoperability, taxonomic work, publication workflows, publishing).
- Extended cooperation: partners consider that their involvement in the project extends their cooperation perspectives in Europe at a general level or on specific topics.
- Improved business: partners consider that their involvement in the project, beyond contributing to enhance their corporate image and international reputation, will allow reinforcing their other on-going projects, increasing their productivity and improving their business models. All this, thanks to the knowledge, expertise and tools developed through the project (data management and publication, number and speed of taxonomic publications, increased use of collections, e-tools).

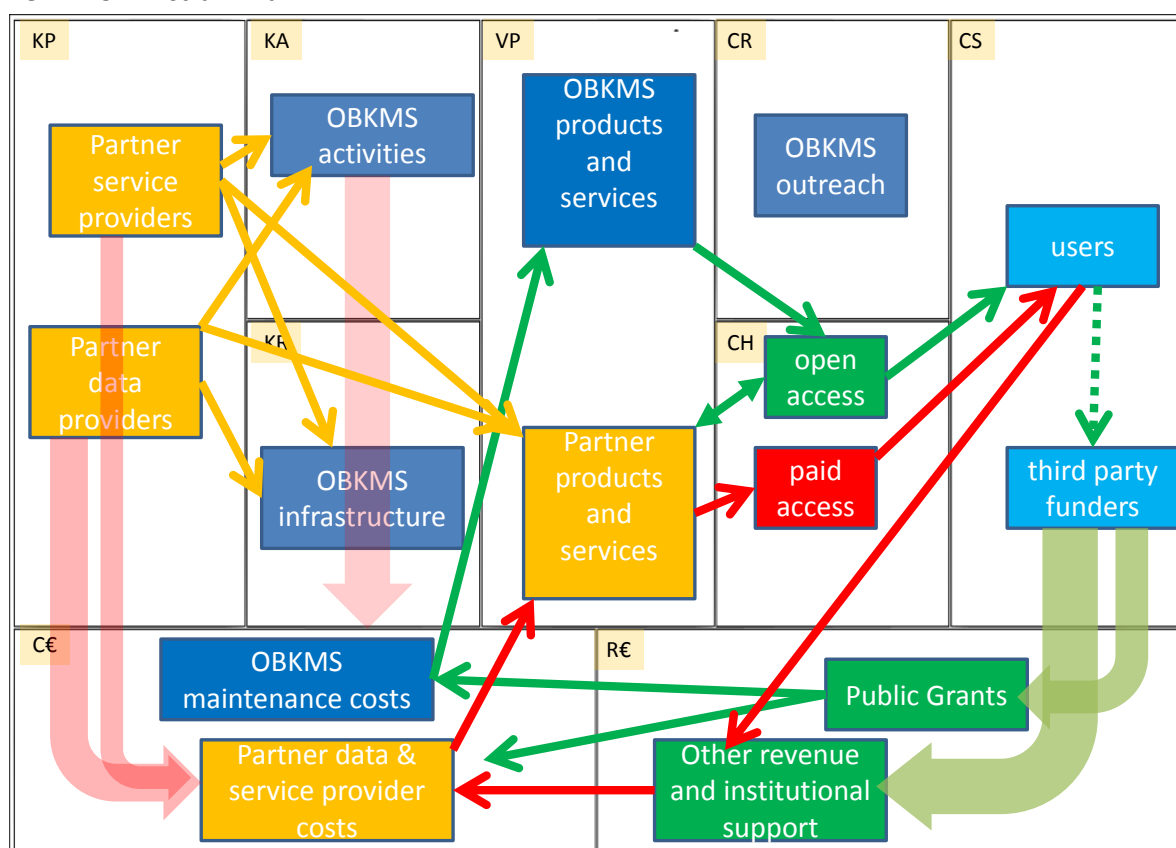
**BUSINESS MODELS CURRENTLY IN USE AT PARTNER'S LEVEL**

Project partners were requested to provide a detailed presentation of the business models currently in use in their organisations. The answers received are documented in Annex 3 (based on the "business model canvas", see [www.businessmodelgeneration.com/canvas](http://www.businessmodelgeneration.com/canvas)).

Based on the information from this exercise and the refinement of the scope of the OBKMS by the consortium, we offer the model below as a "straw man" to further focus discussion for development of the sustainability recommendations in T6.4.

**OBKMS - A straw man**

Canvas design – Businessmodelcanvas.com



**MARKET BACKGROUND**

The market background data elaborated through Task 6.3 aims at analysing the characteristics of existing platforms in order to better position the one envisioned by project partners. This is why one of the main focuses of the market research (performed on the basis of desktop research and of information provided by all partners) has been the detailed analysis of the seven main existing biodiversity mega-science platforms. A matrix synthesizing results is reproduced in annex 4. The characteristics of these platforms and their inter-relation (see Figure 2) are expected to be referred to when fine-tuning project sustainability perspectives in Task 6.4.

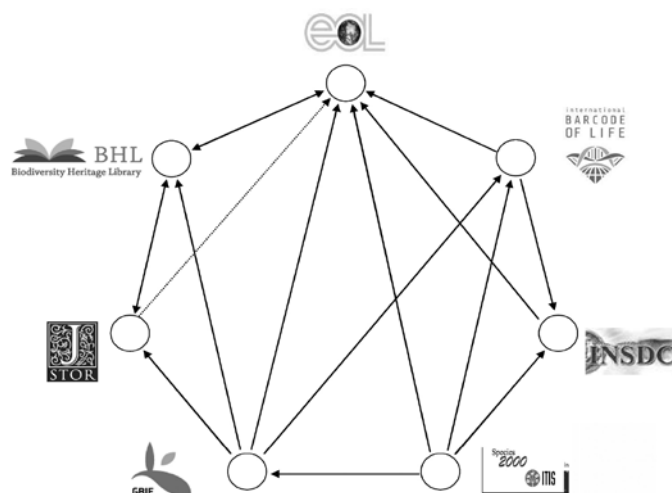


Figure 2. Biodiversity mega science platforms – cross-linkages and data exchange (Triebel et al., 2012)

## CONCLUDING WORKSHOP

A workshop involving all project partners was organized at month 14 to agree on the conclusions of Task 6.3 and ensure a seamless connection with Task 6.4. Taking into consideration the status reached by Task 6.3 at the date when the event took place, it was decided to structure it as follows:

- A first collaborative session was devoted to an analysis of the services developed to date by each partner, and on the opportunities and threats (when considering the present business model of each partner related to a given service) that the perspective of a joint “enterprise” would give birth to. This exercise aiming mainly at identifying the services developed to date by project partners and which would be easily transferable to the enterprise because of the foreseen opportunities.
- A second collaborative session focusing on the activities (or services) which the joint enterprise would develop, consisting in an analysis of the benefits and constraints each partner would see in the development of such (new or existing) activities by the enterprise when considering their present business. This exercise aiming at identifying the activities which project partners will consensually see developing at the enterprise level, the results of the exercise having to be cross-evaluated with those of the previous exercise.

The workshop has been evaluated positively by project partners. The detailed report of the workshop can be found in annex 5.

## KEY FINDINGS TO BE CONSIDERED IN THE SUSTAINABILITY PLAN

- Consortium and non-consortium partners should identify a collaborative activity, time scale, and distribution of tasks in order to capitalise on the strong interest in collaboration with a view to identifying opportunities beyond the project time-frame for partners to define, agree and be ready to launch a real commercial activity.
- The project vision should be adjusted in light of any new priorities arising from the above.
- Consortium partners need to ensure that the Business Model, vision to implement the Open Biodiversity Management System, and Bouchout Declaration are each consistent with one another.

## ANNEXES



ANNEX 1 - SYNTHESIS OF THE VISION OF PRO-iBIOSPHERE PARTNERS ON MARKET DEFINITION

	Do you share the overall proposed vision?	Main obstacles to be faced, key steps to make it happen?	How to manage such an integrated platform (who is in, investment & running costs)?	Which benefits would such a platform offer? Which services to which customers and what price?
<b>BGBM</b>	A second vision to add: digitisation of information + mobilisation of presently underutilized large volumes of biodiversity information	<p>Three major obstacles: lack of standardisation and interoperability between platforms, availability of helpdesk functions (need to quickly create a community-driven helpdesk?), institutional commitment</p> <p><i>Provide stable identifiers for specimen (workshop on 4/5th June 2013 at RBGE; plan to create a collection identifiers implementation review and roadmap during workshop M4.1 in October 2013)</i></p>	Cannot be answered at this point	<p>Benefits: improved re-usability of data, mobilisation of underutilized data, improved data quality, efficient and secure data management, visibility of biodiversity data, streamlines publication process</p> <p>New products: interactive and dynamic biodiversity data interfaces, data access across institutions</p>
<b>MfN</b>	Agree in general but the wording is complex and not easy to understand	Obstacles: lacking of commitment from partners, disagreement on standards and procedures, lack of interest from scientists, conflict partners' - project's goals, insufficient project dissemination (namely in institutions)	<p>Initial partners + new highly engaged partners</p> <p>A S&amp;T Advisory Board (members from each active partner) is necessary</p>	Benefits: increase in scientific output, collaborations, efficient use of taxonomic data / publications, access to a more comprehensive set of data, external services



		Key developments: communication among partners, dissemination, etc.	A self-sufficient foundation supported by project partners?	Services: semantic mark-up of legacy literature, digitising institutions, automated services (free), tools for semantic mark-up, etc.
<b>Naturalis</b> <i>(updates)</i>	FoG agrees with the overall vision (particularly because it allows addressing different needs and updating published data)  FAN: the vision is in line with FAN priorities	FoG obstacle: all data available only in hard copy publication  FoN: Developments needs in line with the LERU report  <i>Major obstacles are 1) bringing partners together and working together on the workflow; 2) lack of institution support and commitment; 3) large science monographic study not properly valued</i>	FoG: the team should include providers of data  FoN: Aspects linked to logical open access  <i>Management can be shared by institutions and fixed budget for tasks can be divided accordingly; Investment by providing training, resources (e.g. IT expertise) and a fully integrated platform.</i>	FoG: increase of the possibilities of mining and reuse, no repeated work across institutions  FoN: a lot (difficult to summarize here)  <i>The platform will enhance data accessibility and allow updatability and up-to-date information. It will also facilitate production, accessibility and availability of new content; Collaboration with wider audiences is</i>



		<p><i>Key steps: 1) making clear goals by staying true to the mission; 2) explicit formulated aims, e.g. on what are current needs on Biodiversity; 3) raise awareness and emphasize of the importance of biodiversity knowledge (e.g. Red list 2020 projects can help to create awareness of the importance of Alpha taxonomy) both to public and institution.</i></p>	<p><i>Institution could decide to host the website (eFlora production) as the investment is low on institution level. The running costs is also low once the website is established as there is no major costs involved.</i></p>	<p><i>also another benefit: scientific paper can be annotated on the user (mainly experts on the subject) side. The platform will also benefit on an institutional level as the workflow of e-publishing in comparison to book publication is much cheaper in the long run. Also, scientists will be able to access sound data of a trusted platform. Customers or users are scientists, interested public (hobbyists, naturalists), professionals (consultancy on environmental mining mitigation who needs specific data and identification tools, educational professionals), land user planners (like conservationists, pharmaceutical industries), policy makers, etc. Open access means no fee unless extra service in tailoring the product is required.</i></p>
<b>NBGB</b>	<p>An additional aspect is improving taxonomic workflows to benefit from elnfastructures.</p>	<p>Taxonomists working in a collaborative and structured manner and gaining recognition for digital work.</p>	<p>An independent management is preferable but considerable incentive is necessary if we want taxonomists and institutions accepting external decision-making process.</p>	<p>Multilingual access, higher visibility for research, reduced costs, a one-stop-shop, closer ties with institutions in Africa.</p>





		Working in a multilingual world <i>Reshaping the incentive structure of taxonomy to encourage sharing of taxonomic treatments</i>	<i>Funding would be raised through various means. For example, through providing services to users, by membership and sponsorship.</i>	The integration of data enabling new science, better monitoring and a reduction to the barriers preventing joined up conservation efforts and sustainable resource management.
<b>Pensoft</b>	<i>Additional aspect is: intensification and increased efficiency of biodiversity research due to improved and automated linkage between legacy data and prospective publishing. Interlinking between previously generated and new knowledge will facilitate new discoveries.</i>	<i>Main obstacles are: (1) the continuing practice to publish in PDF format instead of machine harvestable formats (e.g. XML); (2) financial aspects connected to open access publishing; (3) social aspects connected to open data sharing; (4) lack of efficient coordination of efforts between various biodiversity platforms; (5) lack of universally accepted standards for sharing of different biodiversity informatics elements.</i>	<i>An economically self-supporting membership organisation, financed by (1) membership fees, (2) project funding: (3) services provided to the community</i>	<i>The benefits could be huge and hardly counted in financial terms. The main benefit would be increased efficiency of research due to: (1) open data reuse and big data generation; (2) increased interoperability generates new knowledge; (3) decreasing of effort and costs of obtaining legacy data.</i>
<b>PLAZI</b>	Yes but... can institutions change their isolationist's attitude, can they share the needs for collaboration at social and funding levels?	A convincing (vital) operating system  The feeling to be part of a wider science community  Pilot studies need to be thoroughly assessed	No clear answer yet: need to be a project tasks  Needs to be implemented by "somebody" committed to make it happen	Customization (more specific content, publishing services)
<b>RBGK</b>	Yes but subject to project findings + to be further discussed in a project workshop	A lot has to be clarified during the present project (funding, agreement between partners, engagement of potential users, business models, etc.) and included in particular into 6.4 Del.	Too early to say	Pooling of resources, resource duplication, sharing data, economies of scale, broader use of data, single source of truth (avoidance of competition)



	We should better define “processing core biodiversity data” (floristic and faunistic data?), and “integrated system”	<p>Important to check the coherence of the outcomes of the different WPs</p> <p><i>Reiterate pro-iBiosphere project risks of any delay or failure to deliver outputs from WP2-4 - Important to stay on target with inputs into business modelling and sustainability (T6.3 and T6.4)</i></p>	Too early to say - this will depend on the range of business model(s) available	<p><i>Increased awareness of the capabilities and services offered by partners possibly including some of the following;? Specialisation (e.g. providers of mark-up services, software)</i></p> <p><i>? Outsourcing parts of the infrastructure</i></p> <p><i>? Open source tools</i></p>
<b>Sigma</b>	No comment (we have proposed this vision...)	<p>A test implementation phase of the business model identified in pro-iBiosphere is necessary (= Biosphere funding by the EC)</p> <p>Time is critical: a smooth continuity to be ensured between the two projects</p>	<p>Beyond committed project partners, other EU and non-EU partners to reach a critical mass</p> <p>Governance through a core group</p> <p>A technical partner to run the platform is necessary</p>	No clear at this project stage



ANNEX 2 - PRO-iBIOSPHERE EXPLOITATION MATRIX

Institution	Strengthened expertise	Extended cooperation	Improved business	Reasons for change
<b>BGBM</b>	Mark-up strategies and software systems, mark-up schemas, data standards interoperability and transformation, identifier systems, publication workflows	Cooperation with other institutes of similar background and vision. Potential partners for new projects and project proposals	Data acquisition (standardisation), data management (User-base of the EDIT platform) and data publication (directly from platforms, re-integration of feedback into base data)	
<b>MfN</b>	Thanks to the training of MfN scientists to sophisticated online tools for data extraction, best practice workflows, ways of collaboration	International community building	Project outputs (better access to and facilitated use of taxonomic / legacy information) should increase the number and speed of taxonomic publications  Cooperation with the BHL-Europe and the Fauna European projects are of mutual benefit	
<b>Naturalis</b>	Expertise in tools for capacity building	Cooperation with other institutes of similar background and vision  Potential partners (e.g. for FoG) and funding opportunities	Extended distribution / share of knowledge through ICT (beyond traditional publications)  Increase value, access, use of FAN collections, benefit for the FoG and FM projects, and other projects (e.g. develop the Dutch species catalogue to a national information hub)	



	<p>Assessment of suitable e-tools specifically on taxonomic work and publication workflow to generate effective database backbone in order to create dynamic links to an online publication with interoperability to other initiatives. Exploring e-tools presented by various experts in order to improve Flora production. Evaluating the e-tools through pilot projects using, e.g., GoldenGate mark-up tools, Scratchpads, EDIT, etc. Extended knowledge of current technology trends, such as, Linked Open Data, Stable URIs and many more.</p> <p>Gaining a better understanding on the workflow of eFlora concerning the measurement and constraining the costs.</p>	<p>pro-iBiosphere facilitates meetings and creates opportunities to connect directly to various experts. These meetings are beneficial for Naturalis staff to meet potential partners on many levels of expertise for future collaboration e.g., the joining of grant applications, hosting of the technology that other institutions have developed). The workshops and presentations have been beneficial for researchers to evaluate the available tools and gain new ideas and approaches pertaining to eFlora workflows. pro-iBiosphere also grants opportunity to showcase and promote Flora production within Naturalis.</p>	<p>No planned commercial use (open access) so far</p> <p>Improving Flora production by offering training on e-tools and making the tools available, in a large extend, mature enough to be implemented by maintaining database link; by facilitating information flow through connecting people from different disciplines and focusing on IT expertise by hosting the product and collaborating with potential partners who are developing the technology; and building a structure for data acquisition, curation and update to allow long term commitment to generate authentic and accurate data for users to access.</p> <p>By hosting the website without focusing on development will reduce cost substantially.</p>	<p>Additional data and new selected publication; the changes in opinion and interpretations.</p> <p>[Task 6.1 activities on measurement and constraining of costs] Additional data and new selected publication; the changes in opinion and interpretations.</p>
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<b>NBGB</b>	<p>Taxonomic publishing (staff training through project workshops).</p> <p>Assessing digital publishing options for new works.</p> <p>Discovering methods for the leveraging the investment we have made in digitised taxonomic content.</p>	<p>With the perspective of economies of scale in taxonomic publication and funding.</p> <p>Pro-iBiosphere is helping us develop our publishing model for the Flore d'Afrique Centrale and the Flora of Belgium.</p>	<p>Increase our productivity (publication rate, reduced overheads, faster publication).</p> <p>Promoting digital publication to our scientists.</p>	<p>pro-iBiosphere meetings have helped us network with other similar institutions and provided us with a fresh view of the future of taxonomy and taxonomic publishing.</p>
<b>Pensoft</b>	<p>Extended knowledge in specificity of taxonomic publishing in the different domains (Plants, Fungi, Animals) and the different mark-up techniques</p>	<p>Increased cooperation, especially in the field of botanical publishing; increased opportunities for new infrastructure projects</p>	<p>Automatisation of the registration process of taxon names in global indexers.</p> <p>Mark-up standards and tools</p>	
<b>PLAZI</b>	<p>Deeper insights into science publishing policies</p> <p>Mark-up strategies and software systems, identifier systems, publication workflows</p>	<p>We are building a community of important partners. By sharing the knowledge on mark-up strategies we will build better business cases for mark-up generation and services in the future</p>	<p>Feedback on our operations</p> <p>Contact with potential publishers</p>	
<b>RBGK</b>	<p>Including comparative data across partners</p>	<p>Institutional cooperation and funding opportunities</p>	<p>Improved business models (namely Flora production &amp; dissemination)</p>	
	<p>Beginning to gain a better understanding of partners and users activities.</p>	<p>Brought together expertise across taxonomic domains (e.g. International Union for Conservation of Nature (IUCN) Red Listing).</p>	<p>Improving understanding of user sectors and needs towards more efficient targeting of resources to produce information/services users really want.</p>	<p>Data collected from T2.2 &amp; T6.1 workshops (analysis on-going).</p>



	Beginning to gain a better overview of RBGK processes	Involvement of wider RBGK staff such as the Publications department. e.g. sharing cost information	Potential for integration of delivery channels	T6.3 activities
	Working knowledge of GoldenGate and CharaParser mark-up tools. Now trailing text-mining techniques.	Potential to further cooperation with GG and CP developers. Joint work on "text mining" with Brunel University.	Acquiring information for the streamlining of the mark-up process.	Pilots (mistletoes), GG training in Leiden Jan 2013, T2.1 "tools" workshop Leiden Feb 2013
	Better understanding of transfer formats, names data, architectures, synchronisation of repositories.	Link with CBD GSP target 1 through "World Flora Online."	Potential for efficiencies for pro-iBiosphere and WFO through cooperation - for example at the technical level, funding, pilots	Crossover with "World Flora Online" members attended pro-iBiosphere meeting 3 in Berlin, presentation given.
<b>Sigma</b>	eInfrastructures and dissemination & exploitation	Extend our contact network in the ICT domain	Enhance corporate image & international reputation	





ANNEX 4 - SYNTHESIS OF THE INFORMATION COLLECTED ON BIODIVERSITY MEGA SCIENCE PLATFORMS

(see Deliverable D6.3.1 and D6.3.2 for details on the methodology and results)

	INSDC	CoL	GBIF	JSTOR Plant Science	BHL	iBOL	EOL
<b>Website</b>	<a href="http://www.insdc.org">www.insdc.org</a>	<a href="http://www.catalogueoflife.org">www.catalogueoflife.org</a>	<a href="http://www.gbif.org">www.gbif.org</a>	<a href="http://www.plants.jstor.org">www.plants.jstor.org</a>	<a href="http://www.biodiversitylibrary.org">www.biodiversitylibrary.org</a>	<a href="http://www.ibol.org">www.ibol.org</a>	<a href="http://www.eol.org">www.eol.org</a>
<b>Creation</b>	<b>1992</b>	<b>2001</b>	<b>2001</b>	<b>2003</b>	<b>2005</b>	<b>2007</b>	<b>2007</b>
<b>Vision</b>	To provide and encourage access within the scientific community to the most up-to-date and comprehensive DNA sequence information	Envision becoming a comprehensive catalogue of all known species of organisms on Earth.	Free and open access to the biodiversity data worldwide via the Internet for everyone	To be a comprehensive online research tool for aggregating and exploring the world's botanical resources	Inspiring discovery through free access to biodiversity knowledge.	To democratize access to biodiversity information for all users	Global access to knowledge about life on Earth
<b>EU project</b>		<i>Species2000</i>					
<b>CONTENT - DATA</b>							
<b>Content and scope</b>	Specialised: Nucleic acid sequences	General: Taxonomic checklists	General Occurrences and records	Specialised: Type specimens, multimedia objects for plants	General: Biodiversity literature, multimedia objects	Specialised: DNA barcoding sequences	General: Knowledge data, species fact sheets, multimedia objects





<b>Data source</b>	3 platforms (EMBL Bank; GenBank; DDBJ)	115 taxonomic databases >1 Million known species 50 institutions	420 data publishers	200 content partners and publishers	12 libraries; 60,000 titles and 100,000 volumes 40 Million pages online	BOL data system; 156,461 taxa species and 1,702,485 specimens	>220 partners and >62,000 members; >3.3 million pages 1.8 Million species
<b>Links with other platforms</b>	iBOL; Species 2000; EOL	INSDC; iBOL; LIAS; Species2000; WoRMS; Species Fungorum; FishBase; LifeWatch; ELIXIR; GBIF; CBOL; IUCN; EOL	EDIT; BioCASE; CoL; EOL; JSTOR; BHL; iBOL	BHL; GBIF; EOL	JSTOR; EOL; GBIF	GBIF; EOL; iBOL; INSDC	Catalogue of Life; GBIF; WoRMS; iBOL; BHL; INSDC; JSTOR; iBOL
<b>Data quality management responsibility</b>	Author and/or institution	Peer review	Publishers	JSTOR + feedback mechanisms with providers	BHL consortium	Direct input and curation efforts of scientific community and researchers	Controlled by 300 active EOL curators on a voluntary basis
<b>USER AND SERVICES</b>							
<b>Target user</b>	Biodiversity science community	Research scientists Policy and decision-makers Citizen scientists	Biodiversity science community	Scientific institutions	Scientific institutions Scientists, researchers and students, policy makers	Scientists Biodiversity science community	For everyone: students, teachers, scientists, lifelong learner Primary source for a wide audience
<b>Formats</b>	Online	Online CD-ROM CoL Annual Checklist published	Online	Online	Online	Online	Online



<b>Search display</b>	Results in the different databases Journals/articles; PubMed; Literature citations & abstracts; Books; Nucleotide/protein/genome/structure; Taxonomy	List of names Organised by rank, name status, group and database	List of names Different sections: Scientific names; Common names; Countries; Datasets Filter by Species / Subspecies / Genus / Variety	Results displayed by map and by list of names Filter by title; taxonomy;	Results displayed by Books/Journals; Authors; Subjects; Scientific names in lists Sort by Relevance; Title; Author; Year	Results displayed by Sub-taxa (species); BOLD stats (records); Contributors (Specimens and Sequencing); Imagery; Collection site; Taxon Occurrence (Map)	Results displayed in different sections by Details; Media; Maps; Names; Communities; Resources; Literature; Updates
<b>Functionalities Services</b>	Amount and quality of openly and freely info (oldest platform) Minimal access to the latest information Strict formatting rules enable search software to be written and facilitate reuse of the data.	Carefully controlled dataset Probably the most useful for accessing Life Science Indicators (LSIDs) for higher animal data.	Taxonomic component of the database can be extracted Navigation through the indexes to the huge datasets in centralized locations.	Taxonomic component of the database can be extracted Bioinformatics and biodiversity informatics tools for visualisation.	Range of services and APIs allowing to harvest source data files and reuse content for research purposes.	Massive survey of sequence variation in standardised gene regions across large blocks of life Organisation and analysis of barcode data Repository for barcode records, storing specimen data and images, sequences and trace files.	Large diverse system intended for a range of audiences (public and specialised users) Caching functionality (instant archiving and backup) Creative Commons Species biodiversity knowledge on: taxonomy, geographic distribution, collections, genetics,



							evolutionary, history, morphology, behaviour, ecological relationships, and importance for human well-being
<b>TECHNICAL</b>							
<b>Technical</b>	Abstract Syntax Notation One (ASN.1) BLAST (Basic Local Alignment Search Tool) software	DiGIR and TAPIR	Integrated Publishing Toolkit (IPT)	JSTOR Plant Science SRU	TaxonFinder (developed by uBio.org)	Barcode Submission Tool (BarSTool)	Names-based cyber infrastructure



MANAGEMENT AND FUNDING							
<b>Consortial structure</b>	EMBL ENA, NCBI-GenBank and DDBJ (USA)	Species2000 (UK) and ITIS (US, Canada and Mexico)	Intergovernmental organisation with about 60 nations and 50 international organisations. GBIF secretariat & advisory committee	NGO organisation funded and spearheaded by the Andrew W. Mellon Foundation	Consortium of 12 partners: natural history museum libraries, botanical libraries and research institutions in the US and the UK Global expansion with BHL nodes in China, Australia and Brazil	Central node in Canada, major nodes in China, Europe and US Several regional/national nodes and partner organisations	GBIF, BHL, foundations in the USA and cornerstone institutions in the USA, Australia, China, Egypt and Mexico
<b>Strategy &amp; operational plan</b>		Provides an annual (snapshot of CoL released on a CD) and a dynamic checklist.	Priorities include mobilising biodiversity data, developing protocols and standards to ensure scientific integrity and interoperability, building an informatics architecture to allow the interlinking of diverse data types from disparate sources, promoting capacity building	Identifying and catalysing international partnerships among stakeholders in barcoding Engage biotech instrument developers in efforts to create more portable, faster, cheaper barcoding equipment and processes. Accelerate the growth and	Group strategy: to digitise the published literature of biodiversity held in their respective collections		



			and catalysing development of analytical tools for improved decisions	creation of reference libraries			
<b>Funding source</b>	National funding programmes EBI by the European Molecular Biology Laboratory; the European Commission; Wellcome Trust, at DDBJ by the Ministry of Education, Culture, Sports, Science and Technology of Japan; at the NCBI by the Intramural Research Program of the National Institutes of Health; National Library of Medicine.	Grants and financial supports from Species2000	Voting participants (international organisations) National funding programmes.	- Andrew W. Mellon foundation - Subscription fees.	Grants from several foundations.	- Ontario government - Canadian foundations - Genome Canada Association.	16 institutions and 6 foundations.



	Funding for open access charge: European Molecular Biology Laboratory.						
<b>Creation of content data</b>	Database produced and maintained by the National Institute of Health in the US (NCBI) Receive sequences produced in laboratories throughout the world. Submissions by: - individual labs - large-scale sequencing centers	Volunteers and individual enthusiasts	Interlinking of diverse data types from disparate sources (central data catching system)	Backed by financial support - paid for digitalisation effort	BHL-US: Backed by financial support	Backed by financial support	Volunteers and individual enthusiasts

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ANNEX 5 - REPORT ON THE MEETING HELD AT MONTH 14 TO EVALUATE BUSINESS MODELS CURRENTLY IN USE BY PARTNERS AND RELEVANT NON-PARTNERS

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Project Acronym: **pro-iBiosphere**

Project Full Title: **Coordination & policy development in preparation for a European Open Biodiversity Knowledge Management System, addressing Acquisition, Curation, Synthesis, Interoperability & Dissemination**

Grant Agreement: **312848**

Project Duration: **24 months (Sep. 2012 - Aug. 2014)**

### **MS22 - Meeting to evaluate business models currently in use by partners and relevant non-partners**

Deliverable Status: **Final**

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Dissemination Level: **Public**

Task Leader: **Camille Torrenti (Sigma Orionis)**

Authors: **Camille Torrenti, Stephanie Morales, Alan Paton, Don Kirkup, Lyubomir Penev, Richard Chung, Soraya Sierra**



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Consisting of:

<b>APM</b>	Agentschap Plantentuin Meise (formerly NBGB)	Belgium
<b>Naturalis</b>	Naturalis Biodiversity Center	Netherlands
<b>FUB-BGBM</b>	Freie Universität Berlin	Germany
<b>Pensoft</b>	Pensoft Publishers Ltd	Bulgaria
<b>Sigma</b>	Sigma Orionis	France
<b>RBGK</b>	The Royal Botanic Gardens Kew	United Kingdom
<b>Plazi</b>	Plazi	Switzerland
<b>Museum für Naturkunde Berlin</b>	Museum für Naturkunde Berlin	Germany

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## Revision Control

Version	Author	Date	Status
1.0	Stephanie Morales	21.11.2013	First Draft
1.1	Camille Torrenti	29.11.2013	Final report reviewed
1.2	Alan Paton	27.01.2014	Update
1.3	Don Kirkup	20.02.2014	Update
1.4	Lyubomir Penev	25.02.2014	Corrections and comments to the final draft
1.5	Alan Paton, Richard Chung and Soraya Sierra	27.02.2014	Corrections and comments to the final draft
1.6	Donat Agosti	28.02.2014	Update on business model
1.7	Camille Torrenti	28.02.2014	Final version

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## Introduction

This workshop, held on October 10, 2013 in Berlin, Germany, aimed at discussing the business models currently in use at each partner's level and the expected impact of project developments on these existing business models and on business models envisioned at project level.

The present document is a report on this event.

## Event objectives, methodological approach, and structure

This workshop, taking place one year after the project start, involved an audience of 30 participants composed of all pro-iBiosphere project partners with some external experts.

During the first part of the meeting, an overview of the work done so far on “Exploitation plans” and on “Business models” at each partner’s level, together with the “Overall vision of the business model at consortium’s level” (in the perspective of an integrated platform), were reviewed.

Then the workshop continued through two working groups:

- The first group focusing on business models at partner’s level:
  - What are the services that partners are offering today?
  - What are the business models for each of these services?
  - What are the opportunities/threats related to these services/business models when considering the perspective of a “iBiosphere enterprise”?
- The second group focusing on business model(s) at project’s level:
  - What are the activities that the iBiosphere enterprise would develop?
  - What are the business models for each of these activities and what is the business model of the iBiosphere enterprise?
  - What would be the benefits/constraints for project partners of these activities?

For this first working group session, the starting point was a draft list of services (Figure 1) prepared by RGBK and Sigma Orionis on the occasion of an “Office meeting” held on July 4, 2013.

SERVICES
<b>Research</b>
<b>Web services (M to M, API)</b>
<b>Identification</b>
<b>Software tools:</b> <ul style="list-style-type: none"> <li>• Applications, smartphones</li> <li>• Data hosting</li> <li>• Marking-up data</li> <li>• Linking/connecting data (joining up, integrating, serving)</li> </ul>
<b>Consultancy:</b> <ul style="list-style-type: none"> <li>• Training</li> <li>• Expertise</li> <li>• Interpretation</li> </ul>
<b>Books</b> <b>Web portals</b>
<b>Free services:</b> <ul style="list-style-type: none"> <li>• Access to collections</li> <li>• Public museums</li> </ul>

Figure 1- Draft list of services offered by natural history institutions and botanic gardens

For the second working group session, the starting point was a draft list of activities (Figure 2) also prepared by RBGK and Sigma Orionis during the “Office meeting” of July 4, 2013.

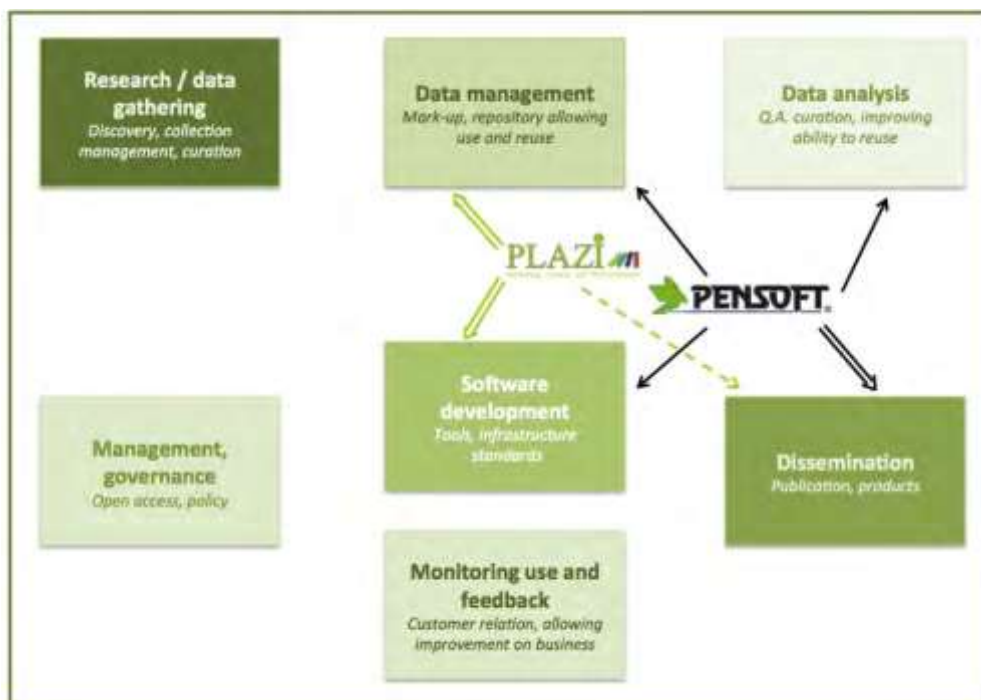


Figure 2. Draft mapping of the possible activities at enterprise’s level

---

The outputs of the working groups were discussed during a closing session, which (along with the outputs of task 6.1 'Costs' and 6.2 'User benefits') paved the way towards a more precise description of those business model(s) at project level that would be likely to ensure the sustainability of the pro-iBiosphere initiative (focus of project Task 6.4 « Towards sustainability for services »).



## Workshop agenda and participants

### Workshop agenda

<b>08:30 - 08:45</b>	<b>Welcome of participants</b>
<b>08:45 - 09:00</b>	<b>Welcome session: Setting the scene</b> <i>Introductory presentation by Bob Allkin - RBGK</i>
<b>09:00 - 09:15</b>	<b>Task 6.3: Concepts and Methodology</b> <i>Presentation by Roger Torrenti - Sigma Orionis</i>
<b>09:15 - 09:45</b>	<b>Exploitation Plans at partner's level and Market Background</b> <i>Presentation by Camille Torrenti - Sigma Orionis</i>
<b>09:45 - 10:00</b>	<b>Meeting objectives &amp; methodological approach</b> <i>Presentation by Roger Torrenti - Sigma Orionis</i>
<i>10:00 - 10:15</i>	<i>Coffee break</i>
<b>10:15 - 10:30</b>	<b>Business Models at partner's level</b> <i>Introduction by Don Kirkup - RBGK</i>
<b>10:30 - 12:45</b>	<b>Parallel working group: opportunities &amp; threats analysis (partners' services)</b> <i>Chaired by Don Kirkup - RBGK</i> <i>Group moderators: Bob Allkin &amp; Roger Torrenti</i>
<i>12:45 - 13:30</i>	<i>Lunch break</i>
<b>13:30 - 13:45</b>	<b>Business Models at project's level</b> <i>Introduction by Alan Paton - RBGK</i>
<b>13:45 - 16:00</b>	<b>Parallel working group: benefits &amp; constraints analysis (activities at project's level)</b> <i>Chaired by Alan Paton - RBGK</i> <i>Group moderators: Bob Allkin &amp; Roger Torrenti</i>
<i>16:00 - 16:15</i>	<i>Coffee break</i>
<b>16:15 - 17:15</b>	<b>Wrap-up session: Wrap-up and review</b> <i>Working groups conclusions by Don Kirkup &amp; Alan Paton - 20 min</i> <i>Discussion and review by Bob Allkin &amp; Roger Torrenti - 10 min</i> <i>Open discussion (Q&amp;A) - 30 min</i>
<b>17:15 - 17:30</b>	<b>Closing session: concluding words &amp; roadmap towards sustainability</b> <i>Concluding words by Bob Allkin - RBGK</i>

## Workshop participants

The consortium had decided to restrict the number external experts at this workshop as the main expected event output was to reach a consensual vision among partners of the project sustainability perspectives. Wider consultation of external experts would be more effective at a later stage on the basis of a more elaborated version pro-iBiosphere business model.

Partner/External participant	Structure	Name
<b>Partners</b>	Plazi	Donat Agosti
	RBGK	Bob Allkin
		Don Kirkup
		Alan Paton
	FUB-BGBM	Sabrina Eckert
		Anton Güntsch
		Susy Fuentes
	NBGB	Quentin Groom
	Naturalis	Eva Kralt
		Jan van Tol
		Soraya Sierra
	MfN	Daniel Mietchen
	Sigma Orionis	Roger Torrenti
		Camille Torrenti
Stephanie Morales		
Pensoft	Lyubomir Penev	
<b>External experts</b>	Forest Research Institute Malaysia (FRIM)	Richard Chung
	Leeds University School of Geography	Alan Grainger
	Centre for Ecology & Hydrology	Robert Kenward
	IUCN	Craig Hilton Taylor

## Working group session 1: Business models at the partner's level

The draft list of services prepared as a starting point for this working group session was first discussed in open session and a consensus appeared on reducing the collective analysis of these services to four of them considered as the most important ones for project partners (i.e. Research, Web services, Software tools, Environmental assessment and Monitoring consultancy). There were analysed by four thematic groups working in parallel.

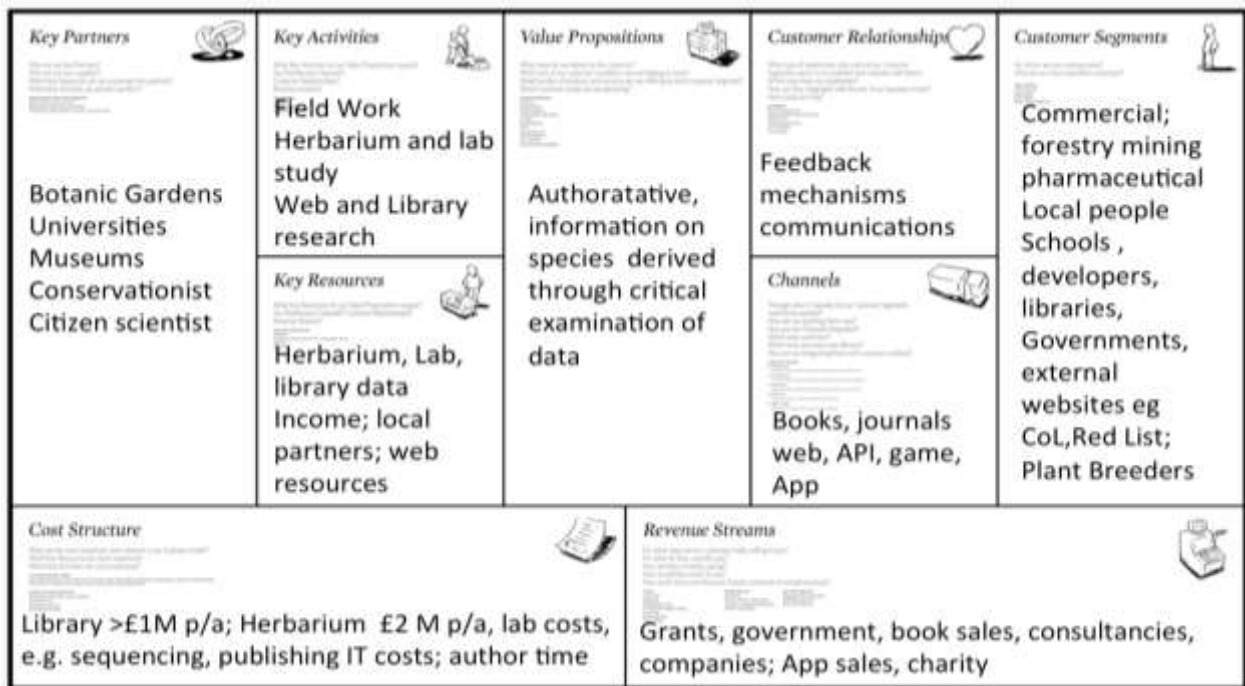
### Group 1 - Research

#### *Analysis of current services*

Sub- Service	Aspect of subservice	Provider	User
<b>Taxonomy</b>	Identification	Expert (taxonomists, field workers); Amateur; super user (inventory, park manager)	Horticulture; other experts- e.g. working in aspects of biodiversity, conservation or health; public; government
	Species accounts	Taxonomist	Other scientists (ecology, modellers); taxonomists; public seed companies, horticulture
	Checklist production including distribution	Taxonomists; land managers (e.g. national parks); citizen scientists	As above
	Fundamental science	Institutions; companies	Government; broad society
	DNA barcoding	Labs Institutions and companies	Industry; conservation agencies; customs
	Education	University, schools	Government, public, other scientists
<b>Support to Legislation</b>	Support to legislation implementation	Experts; scientific authority for Convention- e.g. CITES	Trade Customs; Government Conservation policy
	Advice on legislation	Scientific authority e.g. CITES; regulators e.g. pharmacovigilance	As above
<b>Conservation</b>	Gene banking	Genebanks, seed companies; botanic gardens; biodiversity research institutions	Conservation agencies; NGO's; plant breeders
	Red Lists	Red List assessors (taxonomists and conservation researchers)	Conservation agencies
	Habitat management; restoration; ecological research	Institutions environmental agencies (commercial and NGO)	Land managers; conservation agencies

#### *Business model canvas analysis*

The Business model analysis was, for time constraints reasons, limited to the Taxonomy sub-service, considered as the most important one by the Research group.



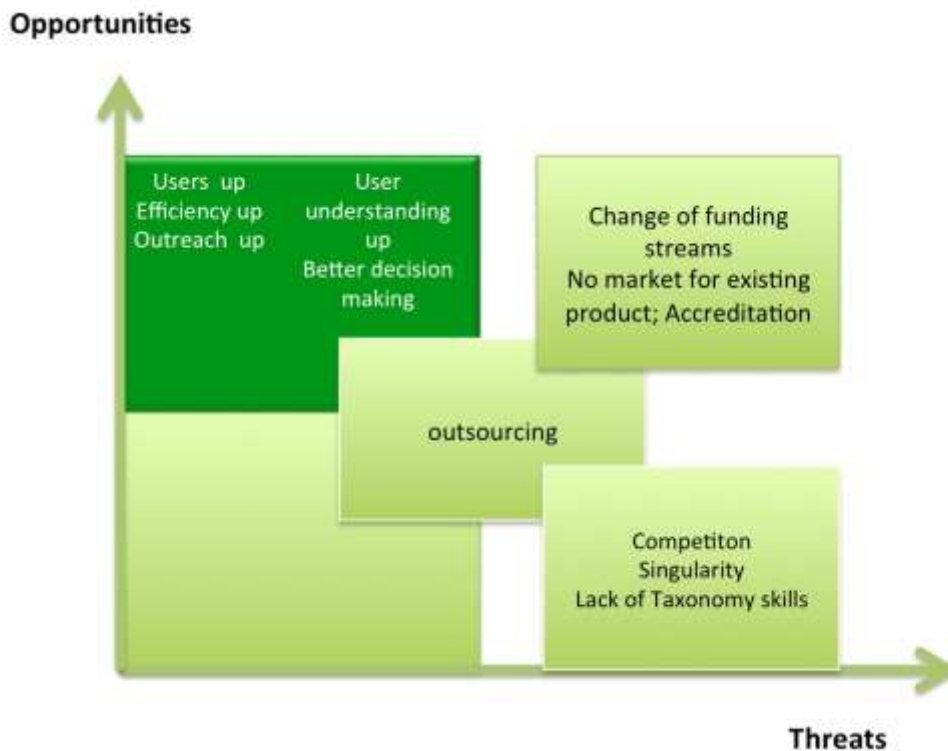
**Figure 3 - Business model canvas - Research**

**Threats and Opportunities analysis**

Taking into consideration the above business model analysis, the group identified three major threats and five main opportunities (related to the perspective of an “enterprise”):

- Threats: lack of taxonomic skills, no market for existing products and loss of independence and relevance,
- Opportunities: new areas and new audiences, improved discoverability, increased efficiency, increased outreach, and better-evidence decision-making.

The matrix on next page was then prepared to complete the analysis undertaken by the group.



**Figure 4 - Threats and opportunities matrix - Research**

The research opportunities presented to the partners of an iBiosphere enterprise include an increase in the use of data held by that partner aided by easier access to that data. The iBiosphere process would help the partners gain a better understanding of the user audience enabling packaging of the data in ways to facilitate better decision making by the end users of that data. There were some concerns expressed by partners concerning the possibility of the joint iBiosphere enterprise altering the ways in which partners could raise funds, produce products to audiences that the partner did not currently deal with, and worries about losing individual accreditation for their products. However, generally the partners felt that the potential benefits of an iBiosphere enterprise outweighed the risks in these areas, and the joint enterprise could act in ways to mitigate these risks to individual partners. There are some general features of iBiosphere which caused the partners concern such loss of independence and institutional presence: each partner relies on different funders and in their broader activities different institutions may have different audiences. iBiosphere will need to concentrate on an agreed scope of activities so that partners can still act as individuals in other spheres of activity where appropriate. It was also recognized that there is a lack of taxonomic skills and that the partners see this skill shortage as a major threat in the long term to the enterprise, and to each partner. The iBiosphere enterprise may allow a partner to outsource some activities, and echoing the concerns mentioned above, this was seen as advantageous in some areas, but a threat to independence in others.

## Group 2 - Web services

### Analysis of current services

Rank	Product or service	Provider	Users
3	Pensoft Journal Systems 1	Pensoft	Authors, reviewers, editors, scientists, SpeciesID, Zoobank, EOL, PLAZI
1	PJS 2 Biodiversity Data Journal	Pensoft	Authors, reviewers, editors, scientists, GBIF, EOL, PLAZI
2	Pensoft Writing Tool	Pensoft	Biodiversity scientists
5	Pensoft Taxon Profile (PTP)	Pensoft	Biodiversity scientists
4	Re-finder and Refbank	Pensoft	Scientists
Rank	Product or service	Provider	Users
3	eFlora Zambesiaca	RBGK	Taxonomists, conservationists, ecologists, public
2	E-monocots	RBGK	Taxonomists, conservationists, ecologists, public
1	IPNI	RBGK (consortium)	Taxonomists (conservationists, ecologists)
4	Interactive Key to Malesian Plants	RBGK, Naturalis	Taxonomists, conservationists, ecologists, public
5	Gateway to African Plants (scratchpad)	RBGK, SANBI	Taxonomists, conservationists, ecologists, public
Rank	Product or service	Provider	Users
2	Anatrac.com	Anatrac	Animal habitat mappers (niche market)
1	Naturalliance.eu	Anatrac, Tero, GWCT, IUCN	Biodiversity beneficiaries (100,000000)
Rank	Product or service	Provider	Users
	The European Library	Consortium of European libraries	Researchers, students
	Europeana.eu	Europeana	Everyone

**Business Model canvas analysis**

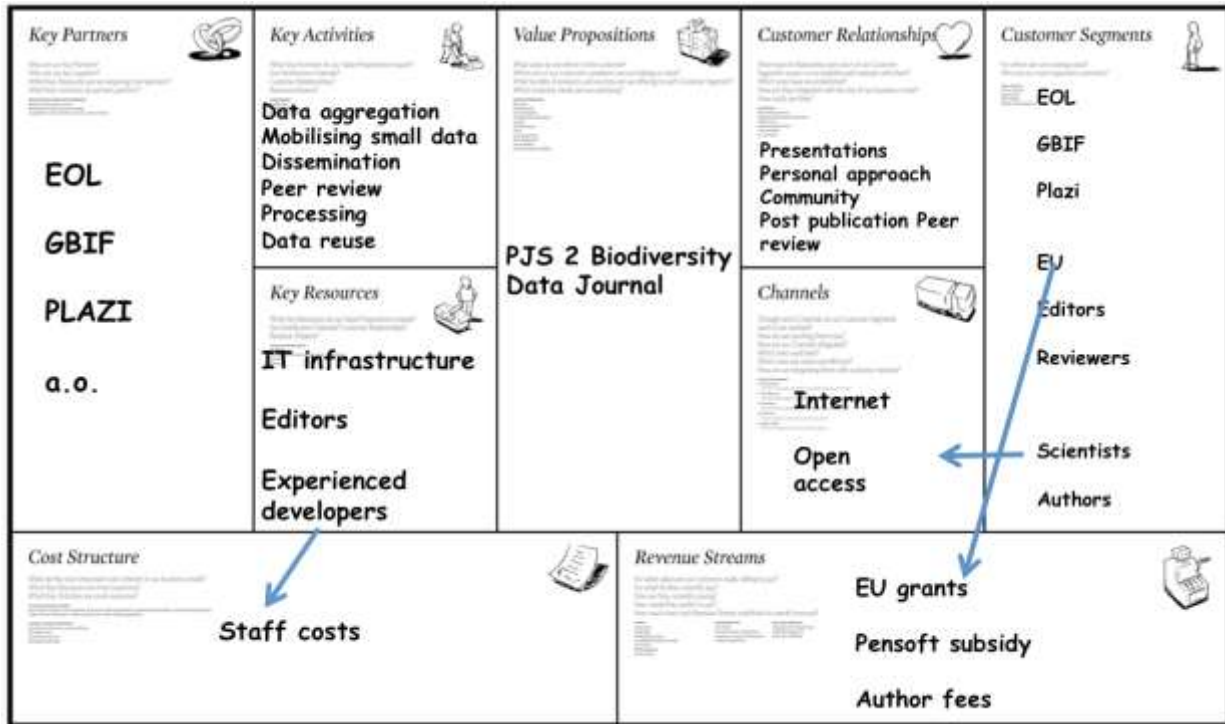


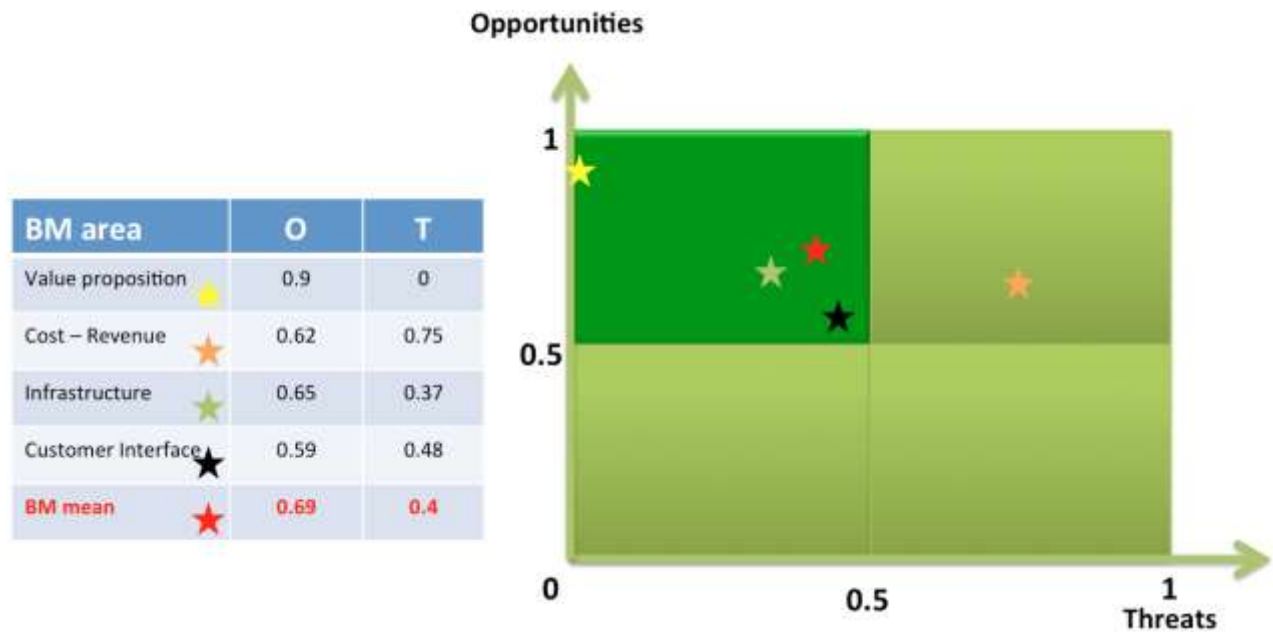
Figure 5 - Business model canvas - Web services

**Threats and Opportunities analysis**

Taking into consideration the above business model analysis, the group identified a set of threats and opportunities concerning web services (related to the perspective of an “enterprise”):

- Threats: Cost/Revenue (disappearance of the revenue streams from the EU in the future), Infrastructure (partners more likely to collaborate with competitors), and Customer interface (risk of intensification of the competition in our market).
- Opportunities: Value proposition (recurring revenues generation by converting products into services / a better integration of the products or services and the creation of jobs/services on behalf of customers), Cost/Revenue (the replacement of one-time transaction revenues with recurring revenues / costs reduction), Infrastructure (an intellectual property of value to others / a greater collaboration with partners that would help focus on the core business / partner channels that would help better reach customers / boosted efficiency thanks to Information Technologies) and Customer Interface (a growing market/ the possibility to serve new customer segments).

The below matrix was then prepared to complete the analysis undertaken by the group. In the matrix, BM refers to Business Model and the other headings to the most important areas in the business model canvas.



**Figure 6 Threats and opportunities matrix - Web services**

The environmental analysis of the Web services Business Model, considering the perspective of an iBiosphere, shows in figure 6 that the activity will be affected in a positive way as opportunities are stronger than threats (0.69 vs. 0.4). The project will have a positive effect at partner’s Business Model on this specific activity, especially when we have a closer look to the Value proposition area (0.9 vs. 0). However, it is important to note that partner’s should be careful regarding Cost/Revenue. This area might be threatened by the project. In this situation, partners may benefit by having contingency plans to address the threats if they should occur.



## Group 3 - Software tools

### *Analysis of current services*

Rank	Supplier	Product or service	Users
1	Plazi	Repository (Treatments)	EOL, GBIF, domain specific web sites, Zoobank, Publishers
3	Plazi	GoldenGATE	Scientists, Plazi GmbH
2	Plazi	Schemas	Publishers
4	Plazi	Identifiers	Publishers
5	Plazi	Re-finder and Refbank	Scientists
Rank	Supplier	Product or service	Users
2	Anatrac	Anatrac.com	Animal habitat mappers (niche market)
1	Anatrac, Tero, GWCT, IUCN	Naturalliance.eu	Biodiversity beneficiaries (100,000000)
Rank	Supplier	Product or service	Users
Rank	Supplier	Product or service	users
	Consortium of European libraries	The European Library	Researchers, students
	Europeana	Europeana.eu	Everyone

**Business Model canvas analysis**

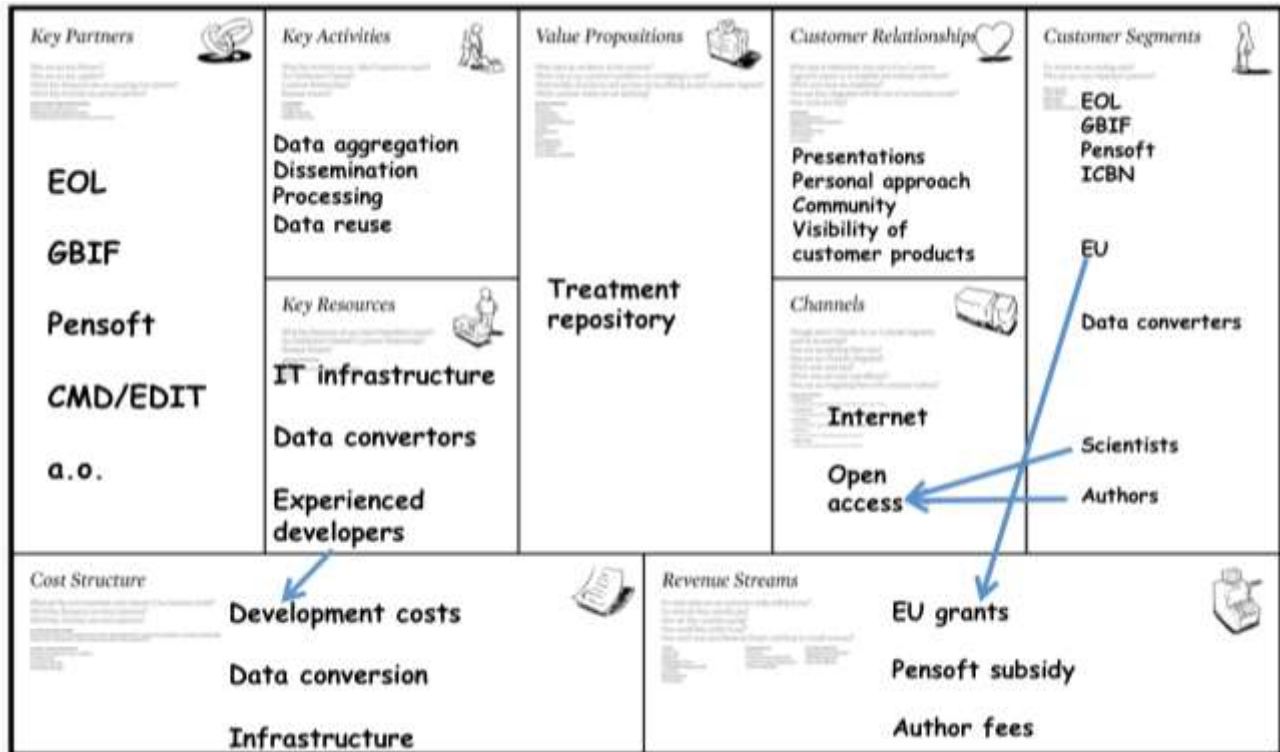


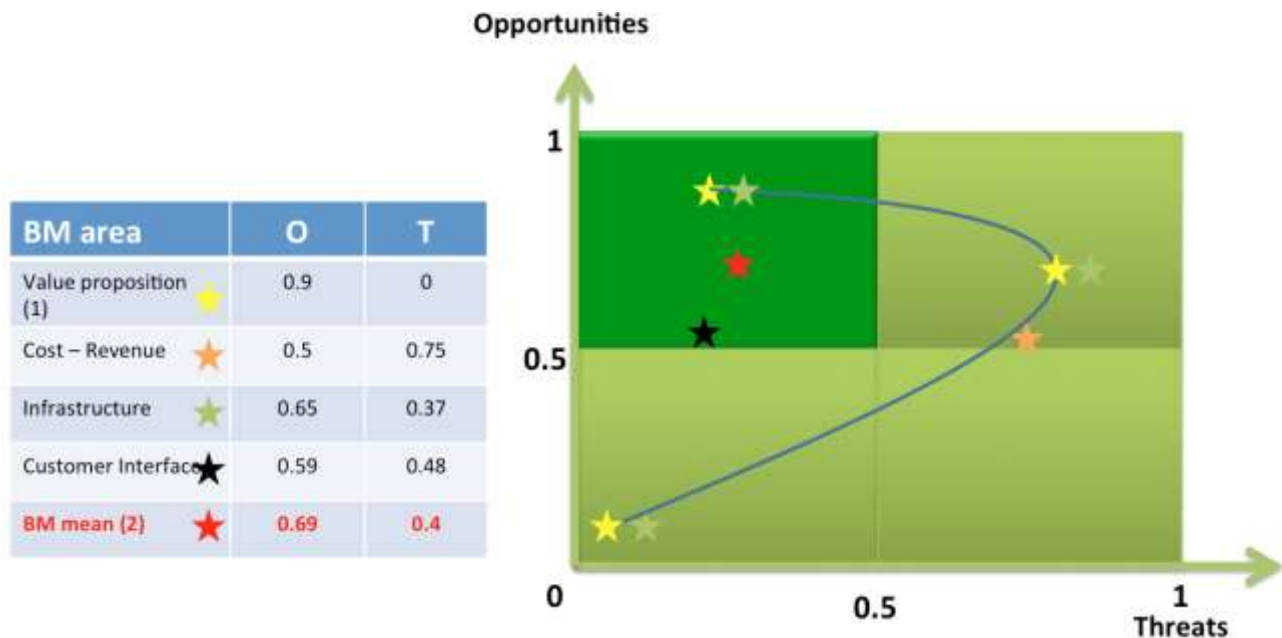
Figure 7 - Business model canvas - Software tools

**Threats and Opportunities analysis**

Taking into consideration the above business model analysis, the group then identified a set of threats and opportunities concerning software tools (related to the perspective of an “enterprise”):

- Threats: Cost/Revenue (disappearance of EU revenue streams), Infrastructure (partners more likely to collaborate with competitors), and Customer Interface (risk of intensification of the competition in the market).
- Opportunities: Value Proposition (recurring revenues generation by converting products into services / a better integration of the products or services), Cost/Revenue (increased prices), Infrastructure (an intellectual property of value to other/ the possibility to standardize some key activities through mark-up processes), Customer Interface (a better integration of the channels/ a better mean to tighten relationships with customers).

The matrix on Figure 8 was then prepared to complete the analysis undertaken by the group. In the matrix, BM refers to Business Model and the other headings to the most important areas in the business model canvas.



**Figure 8 Threats and opportunities matrix - Software tools**

The environmental analysis of the Software tools Business Model, considering the perspective of an OBKMS enterprise, shows in the short term (project with a low volume of content), that Value proposition area faces a low volume of threats and opportunities. In the mid term, with building up more content towards long term, there are more opportunities, but greater threats. However, the long term (project with high content volume) is reversing the trends, with low risk and many opportunities. Regarding the Business Model as a whole, in the long term, there are a lot more opportunities than risks to implement the project (0.69 vs. 0.4).

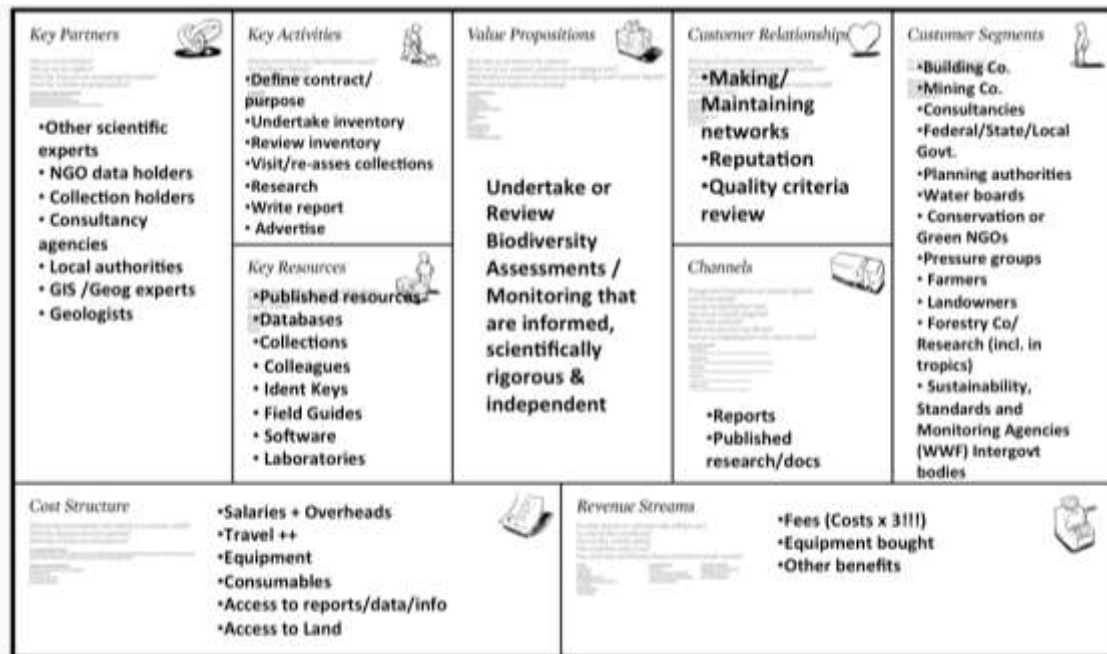
## Group 4 - Environmental assessment and monitoring consultancy

### *Analysis of current services*

Consultancy Sub- Service	Aspect of subservice	What are they?/
<b>Capacity building</b>	Training	<ul style="list-style-type: none"> <li>Identification courses</li> <li>Systematics and courses in Universities</li> <li>Training in a wide variety of expert skills</li> <li>How to undertake environmental assessment and monitoring</li> <li>How to use names</li> <li>How to use keys/identify</li> </ul>
	Knowledge transfer	<ul style="list-style-type: none"> <li>Consultancies explaining:</li> <li>How to find, use, interpret biodiversity information</li> <li>Available/ reliability of biodiversity information resources</li> <li>Design of workflows, systems using or managing biodiversity information</li> <li>Data standards</li> </ul>
<b>Innovation and support for industrial R&amp;D</b>		<ul style="list-style-type: none"> <li>Support for R&amp;D within industry</li> <li>Run trials and lab analyses for industrial partners</li> <li>Undertake R&amp;D for industrial partners</li> <li>Chemical or molecular analysis, profiling</li> <li>Agro food genetic engineering</li> <li>Support for researching literature</li> </ul>
<b>Identification</b>		<ul style="list-style-type: none"> <li>Human health (e.g. DNA id) Necessary support for DNA barcoding</li> <li>Identification for environmental assessment</li> <li>Authentication of biological materials through morphological, chemical and molecular profiling</li> </ul>
<b>Data modelling for policy</b>		<ul style="list-style-type: none"> <li>Niche modelling</li> <li>Global changes (climate/land use) modelling</li> </ul>

<b>Environmental Assessment and Monitoring</b>	Building controls Surveys: industrial, government, NGOs, private land owners Protected species licensing and monitoring Environmental Impact Assessments: mining, building, construction, companies Water quality control/monitoring EU change network Ecological monitoring
--	--

**Business Model canvas analysis**

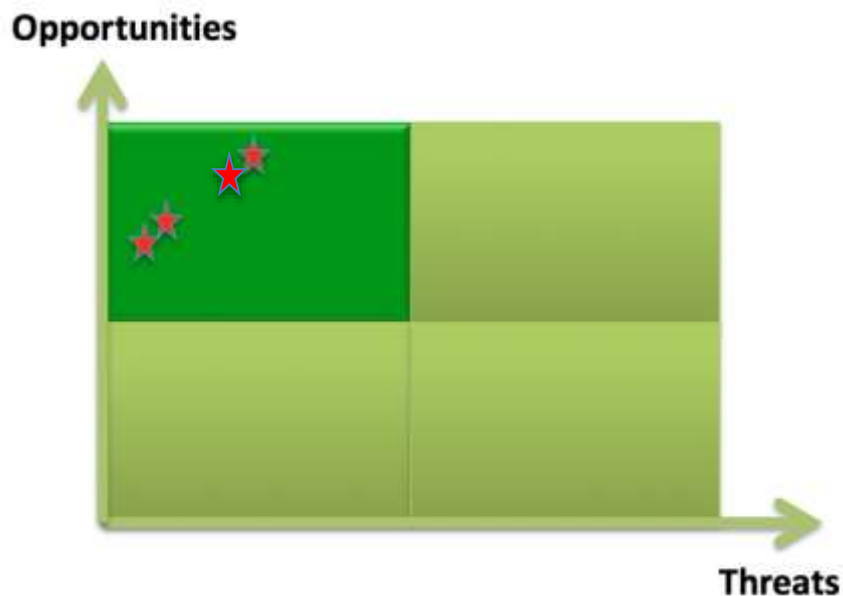


**Figure 9 Business model canvas - Environmental assessment & monitoring consultancy**

### ***Threats and Opportunities analysis***

Taking into consideration the above business model analysis, the group then identified a set of threats and opportunities (related to the perspective of an “enterprise”):








- Threats: Increased competition from partner institutions, Increasing competition as data get free (some other threats from outside the Consortium have been identified with limited severity, such as, a lower priority to the environmental agenda or an increasingly restrictive legislation).
- Opportunities: It would be it easier and/or cheaper to access data and easier to find knowledge (other opportunities from outside the Consortium have been identified, such as the possibility to create new identification methods - molecular-, an increasingly strict legislation creating more demand, and additional institutional benefits).









***Figure 10 Threats and opportunities matrix - Environmental assessment & monitoring consultancy  
(Work not fully completed during the workshop)***

## Working group session 2: Business model at project level

The draft list of 16 activities prepared as a starting point for this working group session was first openly discussed and reduced to the following activities considered as the most important ones:

-  Dissemination
-  Data management
-  Software development
-  Monitoring use and feedback
-  Management, governance
-  Research/data gathering
-  Data analysis

Then it was decided to add to this list some missing activities not included into the draft list:

-  Management/design of customer relationships
-  Business development (fund raising)
-  User engagement to define requirements (user interface?)
-  Specify user interface?
-  Income generation
-  Collaboration/compliance

It was finally decided to reduce the collective analysis of these activities during the workshop to 4 of them considered as the most critical ones (Dissemination, Customer interface - including Relationships & Users, Software and Business development, User engagement & Define requirements + Data Management) These were analysed by 4 thematic groups working in parallel.

## Group 1 - Dissemination

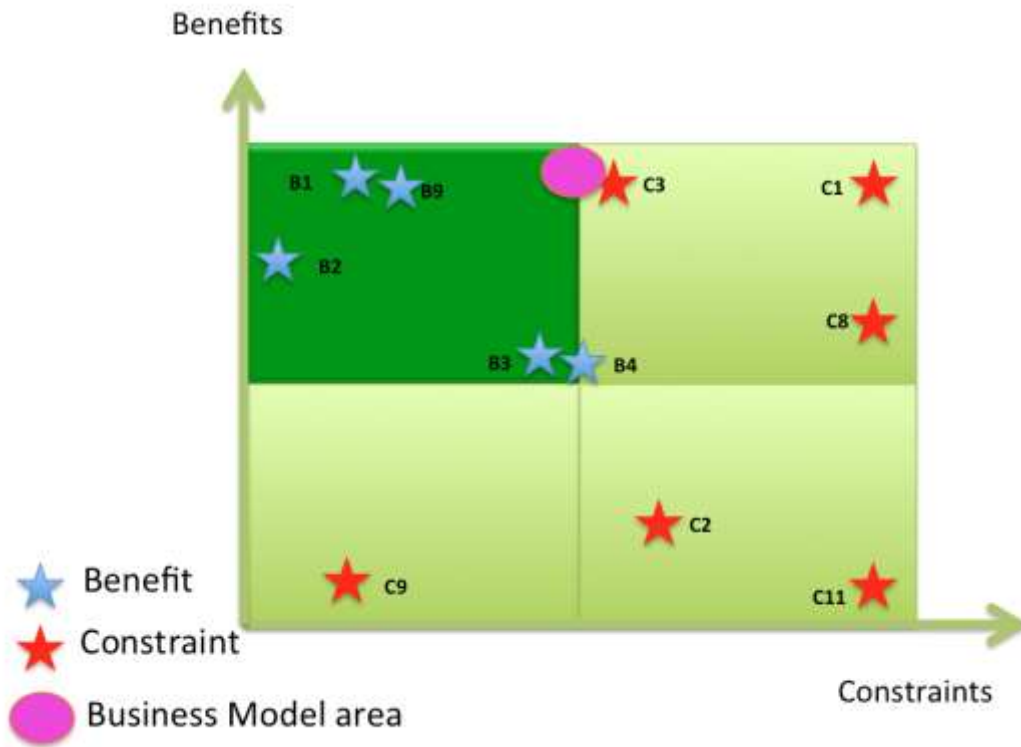
### *Benefits and Constraints*

Benefits	Constrains
1. New users, collaborations and uses	1. Licensing (lack of open)/ Copyright
2. Increased public awareness	2. Lack of awareness
3. Functionality (same cost)	3. Machine readability
4. New funding possibilities	4. Lack of web services
5. Multiple entry	5. Lack of implementation of open standards
6. Incentives/Opportunity for technological development & innovation	6. Pay walls
7. Education opportunities	7. Lack of awareness (alerting mechanisms)
8. Role model for other domains	8. Language
9. Fill gaps	9. Censorship
10. Quality control	10. Complexity to make things accessible
11. New opportunities in combining content with hardware & software	11. Costs
12. Business opportunities	12. Business models
	13. Lack of centralization of content
	14. Lack of metadata standards & application
	15. Lack of targeting approach
	16. Lack of promotion/marketing & public relations



**Benefits and Constraints Matrix**

Figure 11 depicts the matrix of Benefits versus Constraints. The pink spot is the overall position of the business model. Those benefits (blue star) and constraints (red star) thought most significant by the group are plotted individually.



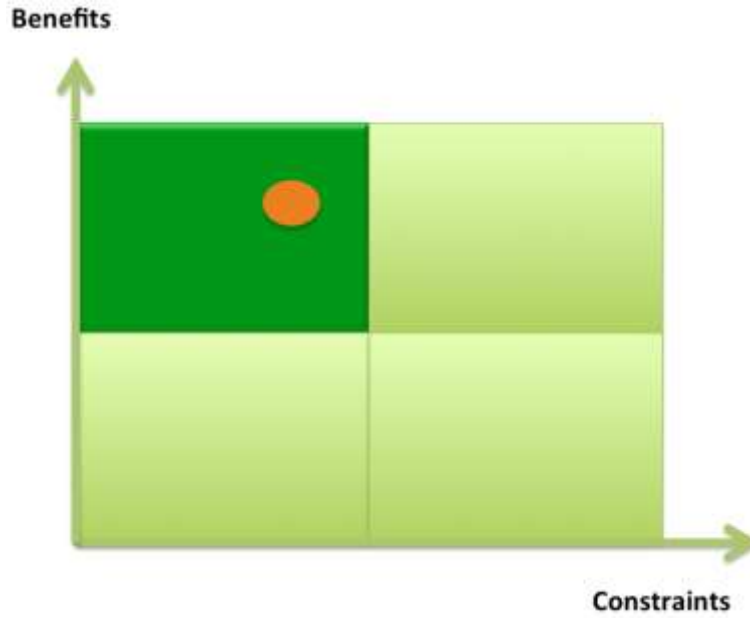
**Figure 11 Benefits and Constraints matrix - Dissemination**

## Group 2 - Customer interface (including relationships and user)

### *Benefits and Constraints*

Benefits	Constrains
<p>A wider client base</p> <ul style="list-style-type: none"> <li>• Increased diversity of clients,</li> <li>• Use of shared networks</li> <li>• Increased geographical area</li> <li>• From more domains</li> </ul>	<p>Multi-national/ Multi-cultural</p> <ul style="list-style-type: none"> <li>• Multi languages project cost money</li> <li>• Managing multi-currencies</li> <li>• Issue of <i>evolving exchange rates</i></li> <li>• <i>Variable (conflicting?) National regulations</i> in existence</li> <li>• <i>Distance between supplier and customer support.</i></li> </ul>
<p>Opportunities for shared market intelligence</p> <ul style="list-style-type: none"> <li>• Share knowledge of customers.</li> <li>• Significant value attached to /from deriving metadata customers which might serve as product/service in own right</li> </ul>	<p>Defining common procedures and protocols</p>
<p>Shared Costs</p> <ul style="list-style-type: none"> <li>• All manner of costs can be shared</li> <li>• Economies of scale.</li> </ul>	<p>Risks of customer data being shared, - considered to be a limited risk</p>
<p>Higher visibility/Corporate image</p> <ul style="list-style-type: none"> <li>• Corporate image was more attractive [especially within the EU?]</li> <li>• Greater visibility will present a significant advantage.</li> </ul>	<p>Volume of transactions and clients - NOT marked as a major constraint</p>
<p>Broader set of Skills/Domains/Experience</p> <ul style="list-style-type: none"> <li>• Greater diversity of domain experience</li> <li>• Broader choice of skill sets that partners can tap into</li> </ul>	
<p>Shared IT systems</p> <ul style="list-style-type: none"> <li>• Reduced development effort</li> <li>• Learning lessons</li> <li>• Consistent quality</li> <li>• Improved quality</li> </ul>	

**Benefits and Constraints Matrix**



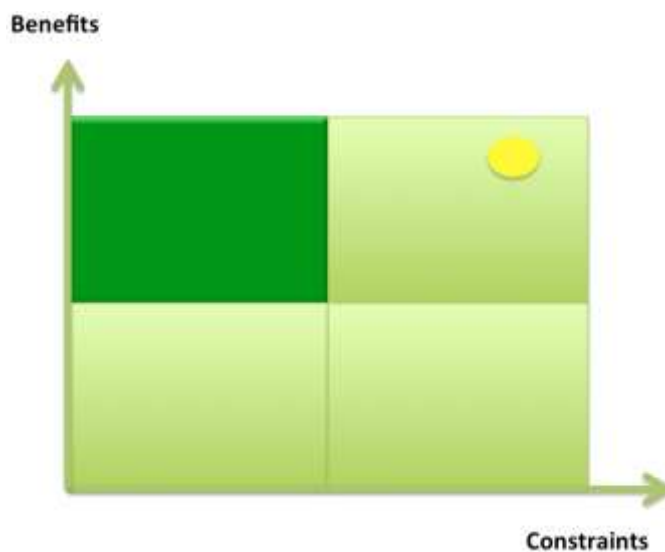
**Figure 12 - Benefits and Constraints matrix - Customer interface**

### Group 3 - Software development and business development

#### *Benefits and Constraints: Software development*

Benefits	Constrains
Consistent space of data & services, reliable and interoperable	Licensing schemes
Better visibility	Lack of funding for maintenance
Improved efficiency of analyses, data management, data mobilisation/ test mining/ extraction/ semantic enrichment	Getting suitable staff
Improved reactivity	Choice of base technology
Repurposing of data	Small market
Improved visualization	Wrong understanding of the user needs

#### *Benefits and Constraints Matrix*

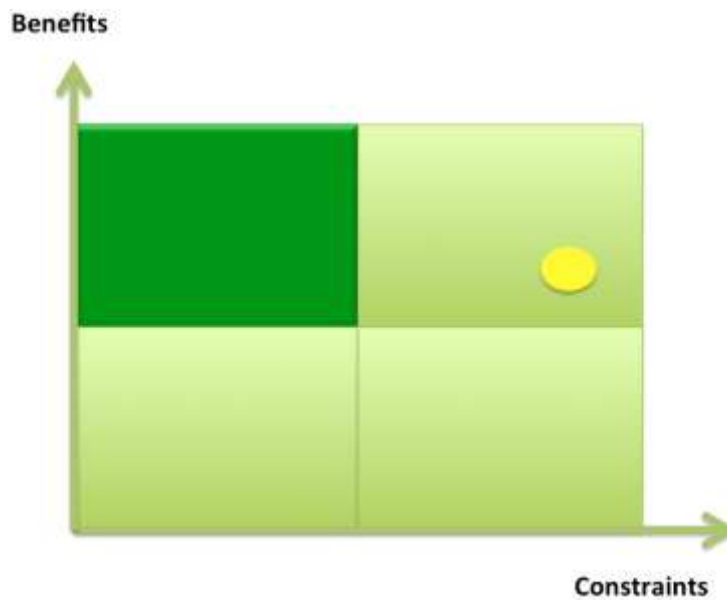


**Figure 13 - Benefits and Constraints matrix - Software development**

**Benefits and Constraints: Business development**

Benefits	Constrains
New income streams	Alienating data providers (countries)
Wider user base	Side tracking from core business
More investment in the system	Misunderstanding the market
More stakeholders (higher visibility)	Licensing
Broader expertise	Partners not interest in Business development
Innovation	Alienating data providers (countries)
New income streams	

**Benefits and Constraints Matrix**



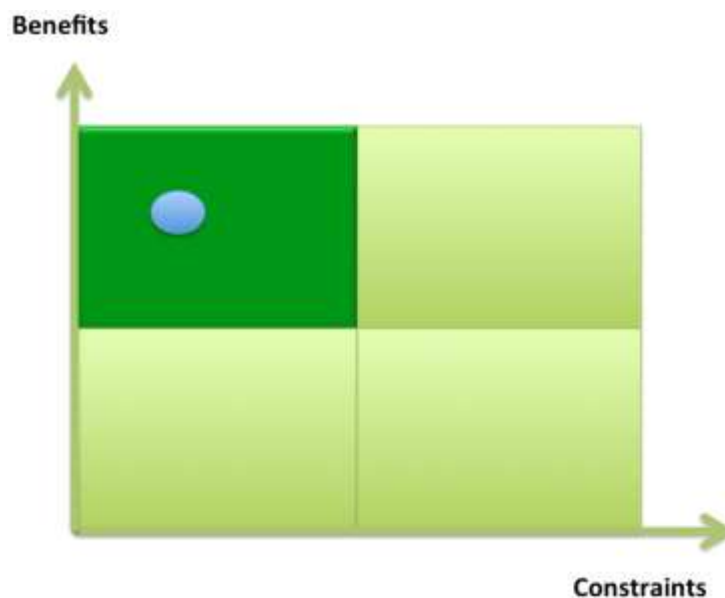
**Figure 14 - Benefits and Constraints matrix - Business development**

## Group 4 - User engagement and define requirements + Data management

### *Benefits and Constraints: User engagement & Define requirements*

Benefits	Constrains
Data supplied in way to suit user	Users do not engage
System meets user needs with respect to data and format	Failure to identify and connect with user sector
Information up to date	Unable to express value of iBiosphere to user
Data used more widely	Users find data difficult to access
Funding opportunities easier to identify as part of a larger initiative	Developing with user's expectations over time
User friendly interface	Costs to the users
Time to get data reduced	Concern over being too expensive
Increase in research outputs	Limited access for user
Value for money	Server capacity
Identify users with capacity to pay	Bad/old data

### *Benefits and Constraints Matrix*

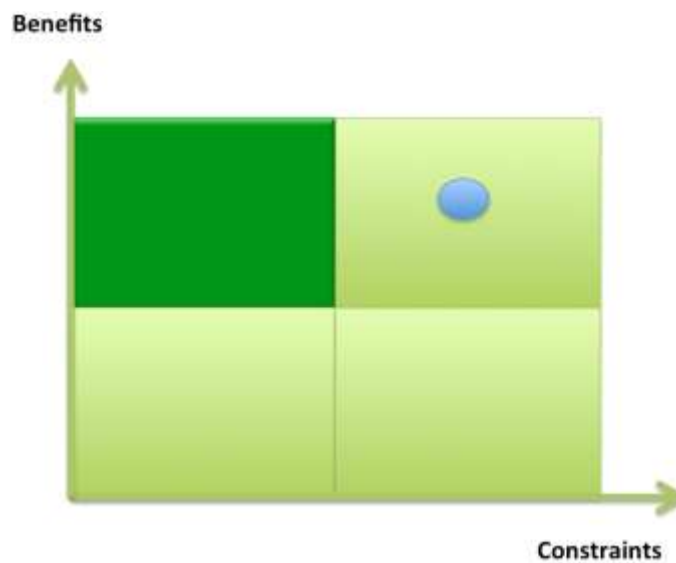


**Figure 15 - Benefits and Constraints matrix - User engagement and Define requirements**

**Benefits and Constraints: Data Management**

Benefits	Constrains
Framework to develop standards	Lack of standards
Standard methodologies	Standards ambiguous
Increased Collaboration	Partners do not all contribute
Increase capacity	Multiple platforms
Partners actively contribute	Insufficient tools
Data quality improves	New skills/ expertise required
Integration of data across institutions	Conflicting data
Value added by others	Lack of staff involvement
Data easier to find	Business change
Efficient tools to manipulate and analyse data	

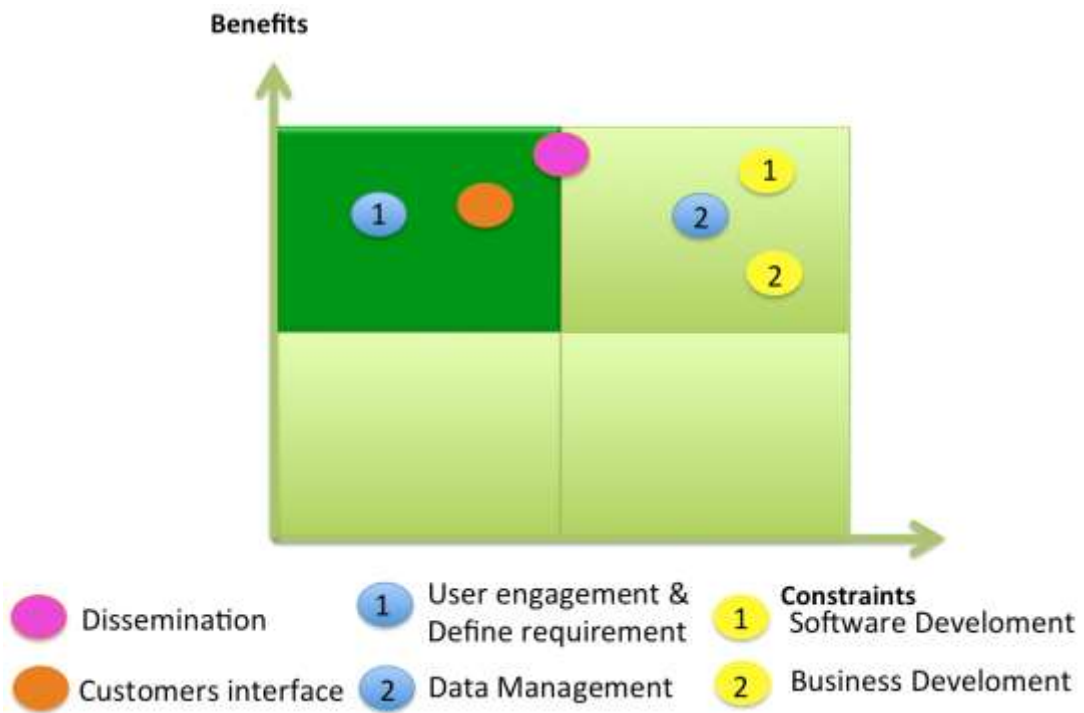
**Benefits and Constraints Matrix**



**Figure 16 - Benefits and Constraints matrix - Data Management**

**Consolidated matrix**

At the end of this working group session, the present consolidated matrix was prepared



**Figure 17 - Benefits and Constraints: consolidated matrix**



## Conclusions and next steps

All participants actively contributed to the collective exercises proposed during the workshop and expressed their satisfaction at the end of the event since the event has reached its main objective: providing a very good opportunity to all partners to exchange information and visions, and progress together towards a consensual vision of what should and should not be done at the consortium level, taking advantage of the pro-iBiosphere developments.

Plans for the next 4 months have been drafted at the end of the workshop.

- Each partner is invited to
  - Contribute to finalizing the list of services and sub-services (at partner level) and the list of activities (at enterprise level) uploaded on the project wiki,
  - Prepare as many business model descriptions as possible (using the Business model canvas in reference) related to services and sub-services they develop,
  - Map these services into the opportunity and threats matrix.
- Sigma Orionis will prepare the draft version of D6.3.3 under the form of an executive summary of the outputs from the various analyses undertaken in Task 6.3.
- RBGK will use these inputs (and the conclusions of Task 6.1 and Task 6.2) to prepare the next workshop planned in Berlin in February 2014, which will be devoted to project sustainability and should therefore usefully continue the exercise initiated at the present workshop on activities at project level (and the related Benefits / Constraints analysis).

Before closing the workshop, partners have been asked to share their vision about the “enterprise” in 2 minutes and to suggest “How to make it happen”. These inputs will obviously be taken into consideration in the drafting of D6.3.3 and in the preparation of the February workshop on “alternative business models” (MS23).

The “enterprise” should be:

- 🌱 A “**unique model**” of information space and data that will make us different. Offering better ways of serving our data to users in an appropriate form
- 🌱 A “**global reference system**”, leader in information provision on biodiversity and relevant to the people who need to access the data. A system that would actually increase the visibility of the activities
- 🌱 An “**open access system**” available to all kind of users (not only for taxonomists, but for other areas), at inexpensive fees, especially regarding developing countries (in order to access all data currently uneasy to find)
- 🌱 A “**one-stop shop**”, where all data information is visible and available for different uses (to avoid paper-made models to keep up with the important changes in information availability), reducing the number of platforms in order to gain information and time, gathering all information needed in a single place with no need to use all types of technology
- 🌱 An “**easy-to-use system**” where all levels of users can enter, exchange and gain information through high quality updated data and an appropriate format

- 🌱 An **"intelligent system"** where everything is linked (names, concepts, images, movies, sounds...). A system that can actually identify concrete things, having all identification tools at hand, getting a name, get all the distribution data out, so that everybody in the developing world or here can actually do proper surveys and be enabled to conduct biodiversity assessments
- 🌱 A **"social network system"** that would provide with the opportunity to contact other users in order to facilitate the sharing of knowledge and to provide with the possibility to work together, and thus, to reach a new level of investigation.
- 🌱 A **"practical system"** that gives the tools and the possibilities to make the data reusable, including, for example, the possibility to download it
- 🌱 A **"resourceful system"** gathering all relevant information and data in order to have effective, accountable solutions to the management of biodiversity and to deploy solutions to global issues such as climate change, food production and sustainable development. It should be a system that will make biodiversity applicable to human welfare in general

How to make it happen:

- 🌱 To seek for complementary funding (at the national and EU levels), in the short term for the implementation phase, as the project is not yet mature
- 🌱 To define a small portfolio of services meeting particular needs for a defined set of users
- 🌱 To engage with the users, to understand and get insights into what they actually need
- 🌱 To implement robust services providing the data to the applications. When this is achieved, that would open up a complete new space or range of interesting applications serving all different users (society, scientists, students...)
- 🌱 To elaborate an information system based on extended knowledge, gathering the collections of data as well with the literature in order then to establish a programme on how to make progress and innovate in the future.
- 🌱 To connect with other sectors to share our discussions and concerns
- 🌱 To develop user scenarios and strategically on some end-users
- 🌱 To demonstrate the use and interest of our system (helping people in their work), the impact of it to gain on sustainability. It would be much easier to have an ended-product in mind to demonstrate value
- 🌱 To offer flexibility to enable the system/infrastructure to be used by different kind of audiences

## Annex 1: Detailed outputs of the “Threats and opportunities” analysis

### Group 1 – Research

Threats	Severity 1 low 5 high
Institution outcompeted as data become more readily available	3
Lack of taxonomic skills	5
No market for existing products	5
Fear of outsourcing skills/ development	2
Singularity (loss of independence and relevance)	4
Loss of accreditation	5

Opportunities	Severity 1 low 5 high
New areas and new audiences	5
Improved discoverability	5
Increased efficiency	5
Increased outreach	5
Better evidenced decision making	5
Larger audience	4
Increased support to users	3
Ability to outsource aspects of dissemination	2

**Group 2 – Web Services**

Threats			
BM area	Question	text	score
<b>Value Proposition</b>	Are substitute products and services available?		0
	Are competitors giving better value?		0
<b>Cost/Revenue</b>	Are margins threatened by competitors/technology?		0
	do we depend excessively on one revenue stream?		3
	which revenue streams are likely to disappear in the future?	EU	5
	which costs threaten to become unpredictable?	maintenance	3,5
	which costs threaten to grow more quickly than revenue they support?	editorial cost	3,5
<b>Infrastructure</b>	could we face disruption in the supply of certain resources?		2
	is the quality of resources threatened in any way?		1
	what key activities might be disrupted?	peer review	2,5
	is the quality of our activities threatened in any way?	peer review	2
	are we in danger of losing partners?		1
	might our partners collaborate with competitors?		4
	are we too dependent on certain partners?		0,5
<b>Customer Interface</b>	could our market be saturated soon?		0
	are competitors threatening our market share?		0
	how likely are customers to defect?		1
	how quickly will competition in our market intensify?		5
	do competitors threaten our channels		1,5
	are our channels in danger of becoming irrelevant to our customers?		2
	are any of our customer relationships in danger of deteriorating?		0

Opportunities			
BM area	Question	Text	Score
<b>Value Proposition</b>	Could we generate recurring revenues by converting products into services?	Yes	5
	Could we better integrate our products or services?	Yes	5
	Which additional customer needs could we satisfy?	Unspecified	3,5
	What complements to, or extensions of our VP are possible?		0
	What other jobs/services could we do on behalf of customers?	Unspecified	4,5
<b>Cost/Revenue</b>	Can we replace one-time transaction revenues with recurring revenues?		5
	What other elements would customers be willing to pay for? (putting mark-up, )	Putting mark up	2,5
	Do we have cross-selling opportunities internally or with partners?		2
	What other revenue streams could we add or create? 2-3	Unspecified	2,5
	Can we increase prices? 2-3	Can we increase prices? 2-3	2,5
	Where can we reduce costs? 4	Unspecified	4
<b>Infrastructure</b>	Could we use less costly resources to achieve the same result? 0-1		0,5
	Which key resources could be better sourced from partners? Editorship 2	Editorship	2
	Which key resources are under-exploited? 2-3	Unspecified	2,5
	Do we have unused intellectual property of value to others? 5	Unspecified	5
	Could we standardise some key activities? 3-4		3,5
	How could we improve efficiency in general? 3-4		3,5
	Would IT support boost efficiency? 4		4
	Are there outsourcing opportunities? 2		2
	Could greater collaboration with partners help focus on our core business? 4-5		4,5

	Are there cross-selling opportunities with partners?		0
	Could partner channels help us better reach customers? 5		5
	Could partners complement our VP? 3-4		3,5
<b>Customer Interface</b>	How can we benefit from a growing market? 5		5
	Could we serve new customer segments? 4-5		4,5
	Could we better serve our customers through finer segmentation? 3-4		3,5
	How could we improve channel efficiency or effectiveness? 3		3
	Could we integrate our channels better?3		3
	Could we find new complementary partner channels? 2-3		2,5
	Could we increase margins by directly serving customers? 3		3
	Could we better align channels with CSs? 3-4		3,5
	Is there potential to improve customer follow-up? 2-3		2,5
	How could we tighten our relationships with customers? 3		3
	Could we improve personalisation? 2		2
	How could we increase switching costs? 2		2
	Have we identified and fired unprofitable customers, if not why not? 1		1
	Do we need to automate some relationships? 2-3		2,5

**Group 3 – Software Tools**

Threats			
BM area	Question	text	score
<b>Value Proposition</b>	Are substitute products and services available?		0
	Are competitors giving better value?		0
<b>Cost/Revenue</b>	Are margins threatened by competitors/technology?		0
	Do we depend excessively on one revenue stream?		3
	Which revenue streams are likely to disappear in the future?	EU	5
	Which costs threaten to become unpredictable?	Maintenance	3,5
	Can we remain interesting enough to attract freelance contributions?		2
	Which costs threaten to grow more quickly than revenue they support?	Data conversion	3,5
<b>Infrastructure</b>	Could we face disruption in the supply of certain resources?		2
	Is the quality of resources threatened in any way?		1
	Is the quality of our activities threatened in any way?	QC changes	2
	Are we in danger of losing partners?		1
	Might our partners collaborate with competitors?		4
	Are we too dependent on certain partners?		0,5
	Can we find a partner to integrate our infrastructure?		3
<b>Customer Interface</b>	Could our market be saturated soon?		0
	Are competitors threatening our market share?		2
	How likely are customers to defect?		1
	How quickly will competition in our market intensify?		5
	Do competitors threaten our channels		1,5
	Are our channels in danger of becoming irrelevant to our customers?		2
	Are any of our customer relationships in danger of deteriorating?		0
	Can we build up enough momentum to open this market?		2

**Opportunities**

BM area	Question	text	score
<b>Value Proposition</b>	Could we generate recurring revenues by converting products into services?	Yes	5
	Could we better integrate our products or services?	Yes	5
	Which additional customer needs could we satisfy?	Unspecified	3,5
	What complements to, or extensions of our VP are possible?		0
	What other jobs/services could we do on behalf of customers?	Linking	3
<b>Cost/Revenue</b>	Can we replace one-time transaction revenues with recurring revenues?	Subscription model	3
	What other elements would customers be willing to pay for?	Text capturing, mark-up	2,5
	Do we have cross-selling opportunities internally or with partners?		2
	What other revenue streams could we add or create?	Unspecified	2,5
	Can we increase prices?		5
	Where can we reduce costs?	In the long term	3
<b>Infrastructure</b>	Could we use less costly resources to achieve the same result?		1
	Which key resources could be better sourced from partners?	Mark-up	2
	Which key resources are under-exploited?	Data input into repository	2,5
	Do we have unused intellectual property of value to others?		5
	Could we standardise some key activities?	Mark-up processes	4
	How could we improve efficiency in general?	Dedicated stag	2
	Would IT support boost efficiency?		1
	Are there outsourcing opportunities?		2
	Could greater collaboration with partners help focus on our core business?		3
	Are there cross-selling opportunities with partners?		0
	Could partner channels help us better reach customers?		2
	Could partners complement our VP?		2
<b>Customer Interface</b>	How can we benefit from a growing market?		2
	Could we serve new customer segments?		2
	Could we better serve our customers through finer segmentation?		1
	Could we integrate our channels better?		3
	Could we find new complementary partner channels?		2



	Could we increase margins by directly serving customers?		2
	Is there potential to improve customer follow-up?		2
	How could we tighten our relationships with customers?		3
	Could we improve personalisation?		2
	How could we increase switching costs?		2
	Have we identified and fired unprofitable customers, if not why not?		1
	Do we need to automate some relationships?	Data export	2

**Group 4 – Consultancy**

Threats	Severity 1 low 5 high
Increased competition from partner institutions	4
Data being free can be used by anyone and competition increases	4
Amateurs able to undertake work not previously possible	2
<b>Other threats not from the pro-iBiosphere Consortium</b>	2
Economy	
Lower priorities to Environmental agenda	
Increasingly restrictive legislation	

Opportunities	Severity 1 low 5 high
Sharing information	
Easier/cheaper to access data	4
Sharing expertise	3
Easier to find knowledge	4
Easier to find partners	3
Become more competitive	3
Increase chances to build capacity	3
More/New identification tools/ apps	2
Reach new customers through greater visibility	2
Improved IT support	3
<b>Other opportunities not from the pro-iBiosphere Consortium</b>	4
New identification methods (molecular)	
Increasingly strict legislation creates more demand	
Additional institutional benefits	

## Annex 2: Presentations made during the workshop

1. Task 6.3: Concepts and Methodology, Presentation by Roger Torrenti - [Ref. 10](#)
2. Exploitation Plans at partner's level and Market Background, Presentation by Camille Torrenti - [Ref. 11](#)
3. Meeting objectives & methodological approach, Presentation by Roger Torrenti - [Ref. 12](#)
4. Business Models at partner's level, Introduction by Don Kirkup - [Ref. 7](#)
5. Business Models at project's level : Working groups conclusions by Alan Paton - [Ref. 9](#)
6. Workshop outputs, Presentation by Camille Torrenti - [Ref. 2](#)

### Annex 3 : Pictures taken during the event



## Annex 4 : Transcription of partners' concluding visions

**Note: iBiosphere was the name used for the OBKMS at M14.**

**Don Kirkup:** I'd like a system where data would be mobilized for a variety of uses and users in an appropriate format so if you would need to treat data as atomized then you would be able to get a hold of that. If you want to interact with keys to identify things you could do that. I'd like to see a system that really made use of making links between the different components of an iBiosphere with different parts of the biosphere linking different organisms from different kingdoms.

**Roger Torrenti:** The idea, as we said this morning, would be to quickly reach a solid view of the different possible businesses: futures that the group can envision. The group has many possible cards to play, many possible options to investigate, and this will take more time than just the pro-iBiosphere project period to progress, decide, and act. Therefore what is important in my mind is to keep the present consortium alive (why not creating quickly an EEIG or an association or...), through following projects funded by the EC or not, in order keep the momentum and advance our enterprise project.

**Soraya Sierra:** Roger, do you think that we would like to apply for funding for another CSA project where we should continue discussing things or do you think that in the second year of activities we could just think ok how can we be more focused towards our goal?

**Roger Torrenti:** I have not yet analysed into details the call 1 and call 2 on e-Infrastructures but in my opinion call 1 is about making progress on platforms, mark-ups, etc. It's not about discussing but preparing. You have infrastructures but you need to agree on standards etc. and to make another step in terms of integration and knowledge sharing. So I think this would be for me the next one.

**Soraya Sierra:** The vision that I have with i-Biosphere is that this kind of data that we have becomes available for others, not only for taxonomists but for other areas, other participants. I would like to increase the visibility of our activities, of our data information and at the same time I think that I would like to have like updated data that's high quality and that it is there for people to use. It is not so difficult the whole process that we are now facing like it goes by one database to a second one to a third one, to a fifth one, etc. and then we have this aggregating possibilities or aggregators. I would like to have like a system that allows having a door to this data that opens different possibilities without using all technologies.

**Bob Allkin:** I applaud and feel comfortable with the brave ambition of sharing data and open access and meeting all sorts of different goals. But I fear that this ambition actually is a break on us moving forward. So my vision is that we try and define a service that meets a very particular need for a particular clearly defined set of users, and we engage with these users and we deliver that service. My idea would be that the service involved information from the most number of institutes involved as possible and will involve software built by the most number of partners possible. But probably the first product that we produce won't involve all partners but we may actually start beginning to think of a little portfolio of services that meet particular needs. But only by defining those services and being clear about who to engage with will we actually end-up with some users that can tell us how to do it.

**Jan van der Tol:** We've build up huge collections, lots of publications and a lot of knowledge but it is all one-dimensional and it is very difficult for even us, but also for the other users to find all this information. The vision is: lets see how we can make this information available to other users as mentioned before but then in a way that we start from the beginning, we start from the collections, we start from the literature in such a way that we can really make progress and innovate the progress in taxonomy but also to make biodiversity applicable to human welfare in general. There is a lot of knowledge available about medicine, this information is sometimes very hidden, we want to make it available and so if we can make an information system based on extend knowledge so that we know what's there, so that we can define the programme on how to make progress.

**Quentin Groom:** My vision of pro-iBiosphere comes from the fact that museums and botanical gardens need to keep up with the big changes in information availability. I don't think we've really grasped all of the changes that have occurred due to the Internet. I still think we're creating floras and faunas on a paper-based model even though some of them are maybe on the Internet. It's really about making sure we're leaders in information provision on biodiversity. There is a danger, especially with the big genomics thing

that is going on that we won't be and we'll be side-tracked and we need to keep ahead with that sort of stuff and remain relevant to the people who need that data and not going to go elsewhere for it.

**Lyubomir Penev:** If we talk about open access to data not just publication but the content in general, we have two levels of open access: green and gold. Green means with some delays people get the content and gold means that on the publications, it becomes available for access. But I think that we are already at the verge of the platinum open access which means that you do not only publish the data, you publish the data in the way that it can be downloaded, collated to other data or the computers collect the data. This is completely a new level of usage so now, publishing data in PDF, in open access seems already anachronistic in the terms of use. My vision for iBiosphere is not just to open the data, not just make data discoverable, it gives the tools and the possibilities to make the data reusable.

**Donat Agosti:** I would like to have open-linked data so always part of that, I'd like to see that our synthesis treatments are linked to names, to concepts so we can actually have a platform where everything is linked. I would like to be a child who can actually merge myself in biodiversity. I want to have a question, a real story and go dive into science, into DNA and go somewhere else from there into the broad things, into which makes a colour flower, the pollinators attracted by this flower and have a similar system. I would like to see it all attached to all the fantastic resources we have, all the images, movies, sounds. I would like to go back to my dream in '92 where we thought we are scientists, we want to have a value on biodiversity, to measure it and we need to be scientists in a very competitive science world. For that we have to be able to measure what is out there and especially measure what is changing but the problem we encountered is that you can't go out because we can't measure things we can't give names to. At that time there was no DNA or specimens, plants, and so on. What I imagine is a system that can actually go out and identify your stuff, having all that indications tools at hand, getting a name, get all the distribution data out or it can get all the information linked to that out. So that anybody in the developing world or here can actually do proper surveys and we'll be common power in biodiversity assessments. Not like now we have black lists and we're kind of fed-out and disappearing in this world for conservation.

**Richard Chung:** My hope is that this open access of biodiversity information would be available to all users, especially the developing countries, in these countries we have difficulties to access to all these classical specimens as well as the classical literature so with all this biodiversity information available that would help us in accelerating our vision of access and in our work. Especially when you come up with this iBiosphere enterprise, what I wish is not to impose too expensive fees, that developed countries would like to pay for it. Try to consider developing countries, especially in Southeast Asia, make it available to all users and that would double benefit a lot of people.

**Daniel Mietchen:** My concern in planning such a whole system is the reusability; I would really underscore the open access of the linked open data that Donat was referring to. Another thought that crossed my mind is that I had a dream when I was in school we had a homework once that was to design a new city, I was growing up in Eastern Germany so of course we were supposed to construct a city in Siberia and I like this idea of rethinking things like if I were to construct science communications now it would be radically different from the way we actually have, so I would really like to have us sit back from time to time to look at the way we are acquiring, maintaining and disseminating biodiversity information and then to rethink how would we do that if we were to install or even write and design a system right now. What I like about this project is that it brings up such thoughts very regularly and I have not yet figured it out how we can actually put this into a form that is useful, reusable and that can be the basis of some future call and actual future project or product.

**Anton Güntsch:** I should start with the statement of one of our former Prime Minister Helmut Schmidt who said if you have a vision you should immediately go to a doctor, it could be dangerous. I think we've seen over the last years that many international projects have layers and layers and layers on top of a ground but which is actually very shaky and that's our data in the form in which it is presently exposed to applications. It is partly of low quality, fragmented, it has low degree of mobilization and after the discussions over the last two days, I think there could really be a niche for us in which we wouldn't compete with initiatives such as Lifewatch, Biovel and so forth and we would really have our own scope which could be this creation of a sound, consistent, capable information space of linked data, that is what the other initiatives don't have, they rely on the existence of this and we can provide this existence. This is not only about the data, we would also need to provide the robust services which provide the data to the applications so it is the lowest level we can work on and if we achieve to do this, that would probably open up a completely new space or range of interesting applications which serve society and scientists and school children and everybody but all thoughts should be really to build up that fundament and I would be convinced of this concept actually.

**Alan Paton:** Several people said I want to increase the uses of data, talking about things like linking it, allowing the use but I think that critically we need to demonstrate the impact of our data which means better ways of serving our data to users in an appropriate form to demonstrate how that data helps other people do what they want to do as well as what we may want to do. I worry about sustainability, whatever we build, particularly in this kind of economic climate we do need to think about how we are going to continue, but being able to demonstrate impact of what we do is one way and maybe we should think about, as well as creating this logical depository of data which is of high quality, picking one or two questions to demonstrate how our impact actually works so you see the whole thing that only the provision side of the data. The other thing is that we need to connect with other sectors so in those questions that we seek to ask I think we might need to think about, where, of all the users possible use scenarios, where can we that biggest impact so we focus a little bit strategically on some end-users.

**Soraya Sierra:** *You mention that we should try to demonstrate the impact of our data, do you think that could be like a main output of this project?*

**Alan Paton:** I think the pilots begin to grow in that direction but for example if you want to increase the impact of data, it is not enough to just have the data which is all just logical and linkable and if it really can be used you have to demonstrate why the world is a better place as a result. For example if you pick up one of the biodiversity targets and say here is our iBiosphere, which allows you to reach this target. We are actually now on our ambition in some ways because we said what we want to do is we are not going to do it only for all partners, we are going to do it for additional partners and provide users with what they want and that develops where our priorities are.

**Bob Allkin:** And by engaging with those users you get insights into what they actually need. And they may expect from you new things that you may have not thought of or they may require that you provide them with a certain form or certain order and with understanding of their world. Their terminology is great and that takes time.

**Alan Paton:** Another aspect of that is that it doesn't necessarily mean that what you've been producing can be used by the audience because the infrastructure you've created to serve data to one audience could be used to serve another set of data to another one so it is just about having flexibility, but if you do not have an end-product in mind, it is very difficult to demonstrate value.

**Craig Hilton Taylor:** Speaking as a user, I'm looking for a one-stop shop, where I can find all this information I need from faunas and floras and collections so I can easily find that data, access it, download it and reuse it in various high-technology products with all the right attributions, acknowledging where it is coming from and then we can then use it to value and conserve nature, to have effective, accountable solutions to governance of nature use and also for deploying solutions to problems like the climate change, food production and sustainable development.

**Sabrina Eckert:** I would see from the user perspective as a biologist and obviously because I am working on the project, that I would like that pro-iBiosphere to be a place where I can enter information and also gain information for one species and I would also see what I hear from other users. I would like to see a reduced number of platforms and things that I have to access to gain information because it is driving me crazy as I could use this and I could use this, then I use this for a while and then they go on to another thing that they use and then they don't use it again because there is always new platforms, new catalogues that they can use, it is just a thing of finding them. iBiosphere should help users to actually not have to do that and what we were talking about earlier about this "wall of things" in comparison to a deep jungle of things, a wall where you can see where the links are, where the data is coming from.

**Susy Fuentes:** Following the same line as a user, scientist, I would like that this iBiosphere provides me with access to every kind of data, of something that I want to search but also the opportunity to have contacts with persons especially in other fields and also persons who work for locals, for regions and also that these persons live in developed countries have the opportunity to have contacts with specialists, which is all the time the question when I go to Republic Dominican or the Caribbean: how we can get contact with specialists and I would like that this iBiosphere became a really big network not only in information but also among persons working together to go to a new level of investigation.

## Annex 5 : References

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