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Task Leader:	Camille Torrenti, Sigma
Authors:	C. Torrenti, S. Morales, D. Agosti, S.Eckert, A. Güntsch, G.Hagedorn, D. Kirkup, E.Kralt, D.Mietchen, A. Paton; L. Penev, S. Sierra

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Pensoft	Pensoft Publishers Ltd	Bulgaria
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TABLE OF ABBREVIATIONS

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

EXECUTIVE SUMMARY

The present report on “Diversity and strengths of existing business models and discussion of sustainability”, is a deliverable of the pro-iBiosphere project, funded by the European Commission’s Communications Networks, Content and Technology (DG CONNECT), under its 7th EU Framework Programme for Research and Technological Development (FP7).

Within Task 6.3, a series of reports are being presented on a 6-month basis. D6.3.1 is the first one of the series and has been submitted in February 2013.

The present report, D6.3.2, consists of three sections:

- Part 1 presents the envisioned exploitation plans at each partner’s level.
- Part 2 presents the business models at each partner’s level with a consolidated matrix presenting all inputs received from the partners, together with a first analysis.
- Part 3 is devoted to the market context, presenting the project partners’ vision, obstacles, costs and benefits of managing the foreseen integrated platform, and the interim results of a desktop research conducted by Sigma in the first six months.

Two potential business models at project level have been identified along with the corresponding potential activities and services. The models consider an integrated platform which will impact on business models at the level of each partner on one hand, and the integrated ‘i-Biosphere enterprise’ will have a business model of its own. The central value proposition of these business models is to offer products and services which deliver comprehensive, authoritative, validated, biodiversity knowledge, but the precise forms for these has not yet been specified. The stated aim is to help the user find out information about species. The main business drivers given are statutory responsibilities, mission, reputation and sustainability. Information on the costs and benefits of the activities will be one of the foci of the next workshop meeting “Evaluation of business models currently in use by partners and relevant non-partners” on October 10, 2013. The most important customers are conservationists, taxonomists, ecologists, students and publishers. The exploitation plans of the partners are based around strengthened expertise, extended cooperation and improved business activities




The pro-iBiosphere October meeting will bring together all project partners and identified organisations with an interest in the project goals and results. Analyses of opportunities, benefits and threat will be undertaken. This along with the outputs of task 6.1 (Costs) and 6.2 (user benefits) will provide the basis for the sustainability plans of task 6.4.

INTRODUCTION

The purpose of Task 6.3 “Evaluating business models currently in use by partners” is, to (i) detail the exploitation plans foreseen to date by each project partner (at its own level or at the level of one member of the consortium) and the business models that each partner has been currently referring to in its activities; (ii) place this information in the light of a “market context” or “market background” in the framework of which the project shall develop its envisaged activities (i.e., implementation of an Open Biodiversity Knowledge Management System during a second project: “i-Biosphere”).

Successive versions of this deliverable, with updated inputs from all consortium partners, will be produced in months 6 (Feb. 2013), 12 (August 2013), 18 (Feb. 2014) and 21 (May 2014). In addition, a plenary meeting to “evaluate business models currently in use by partners and relevant non-partners” will be organised in month 14 (October 2013) which will be a significant step towards the provision of sustainability plans.

In order to gather inputs from project partners, a questionnaire was designed by RBGK and Sigma Orionis. The questionnaire includes three parts, addressing, the:

-  Exploitation plans at the level of each organisation
-  Business models currently in use by organisation
-  Market context and sustainability perspectives

The questionnaire was sent to all pro-iBiosphere consortium partners in January 2013 and July 2013 (for updates). The inputs received have been consolidated, analysed and complemented with a desktop research, and are here presented.

1. - METHODOLOGY

1.1 - A first step

The present deliverable should be considered as a first step of Task 6.3 activities. It is based on inputs from partners and a desktop research performed by Sigma Orionis. The project has been running for 12 months, and, hence, at the present stage of project development only limited outputs can be used from the other WPs (namely WP2 - WP4) to feed into WP6 analyses (see Fig. 1).

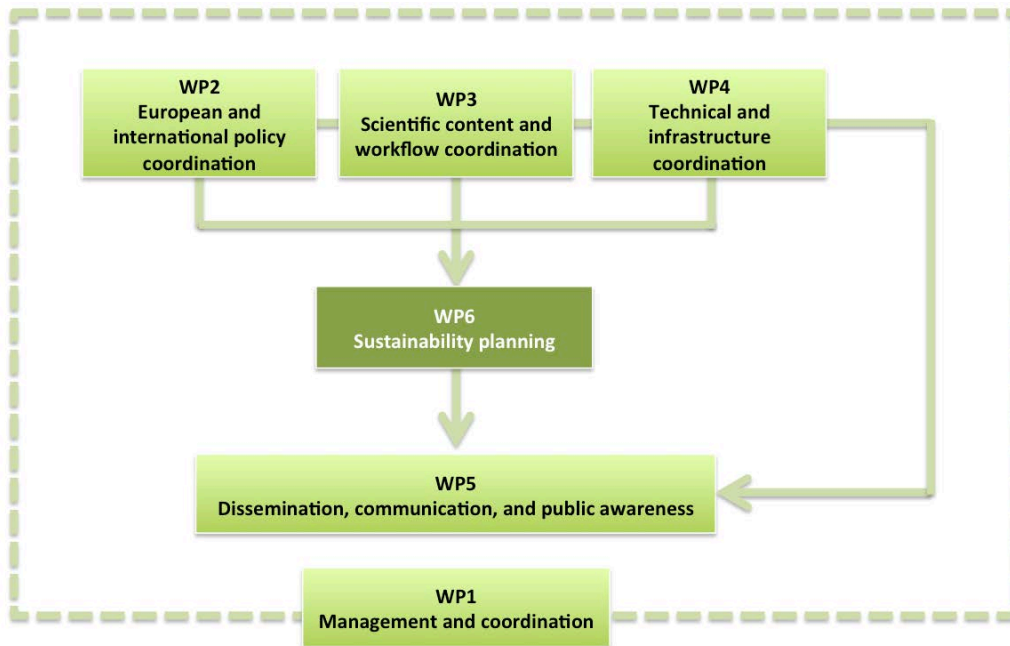


Figure 1. Work plan to feed into WP6 analyses

Furthermore, Tasks 6.1 (dealing with Cost of Services) and 6.2 (dealing with Benefits of Services) are expected to feed into Task 6.3 analyses once the analysis stage for these tasks has been completed (see Fig. 2).

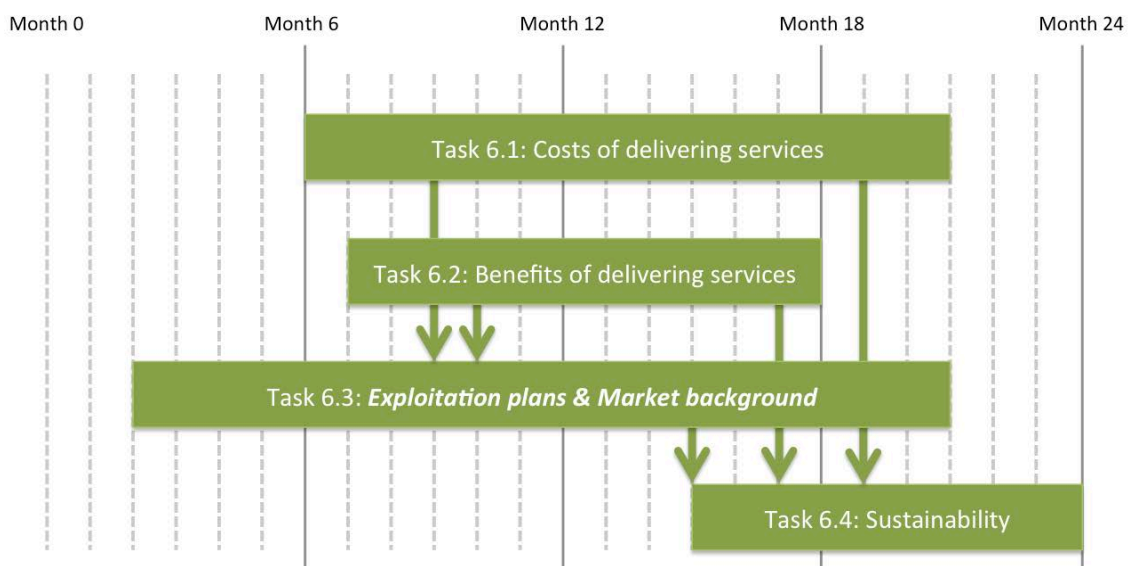


Figure 2. Timeline of WP6 Tasks

1.2 - Task 6.3 methodology

The methodology developed for Task 6.3 is detailed below.

In month 10, consortium partners were asked to update their answers to three key questions dealing with “exploitation plan, business models, market context and project sustainability)” addressed in the pro-iBiosphere questionnaire (the questionnaire is available on the wiki: http://wiki.pro-ibiosphere.eu/w/media/8/88/Pro-iBiosphere_WP6_SIG_ESPQ_V3.0_20122012.pdf). In addition to this, an office meeting was organised between SIGMA and RBGK with the purpose of revising the methodology.

In month 14, the plenary “Meeting to evaluate business models currently in use by partners and relevant non-partners” (project milestone MS22) will be held to outline business models at project level and sustainability plans (see Fig. 3).

In month 16, partners will be requested to update their answers. The task leader is responsible for the update of the questionnaires on the basis of the inputs from WP2-4; Tasks 6.1 & 6.2; and further analyses based on desktop research. It is expected, that the focus of the “business models” part of the questionnaire will switch from a current perspective (business models currently in use) to a future one (business models concerning the integrated platform), thus providing a smooth transition towards Task 6.4 analyses.

In month 18, the results of this process will be presented in Deliverable 6.3: Report on diversity and strengths of existing business plans and discussion of sustainability (4).

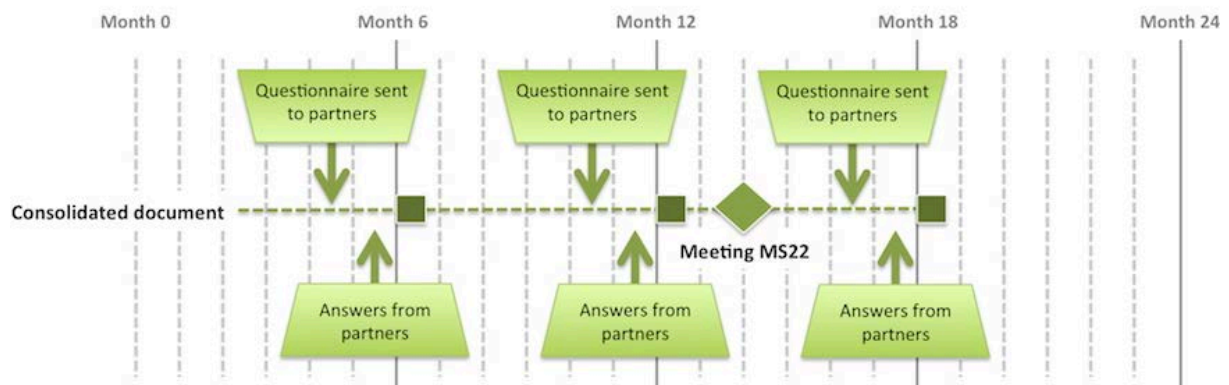


Figure 3. Timeline of partners' contributions to D6.3

Revised Task 6.3 methodology: (based on updates made in month 10)

As a result of the office meeting between RBGK and Sigma Orionis in M10, the T6.3 methodology was revised (for original methodology see Annex 8). At present, the timeline for activities is as follows:

Exploitation Plan

- ✔ M6 = First inputs provided by the consortium
- ✔ M10 = Updated inputs provided by the consortium
- ✔ M12 = Synthesis of exploitation plan inputs
- ✔ M14 = The status of the exploitation plan to date will be presented during the pro-iBiosphere workshop on “Meeting to evaluate business models currently in use by partners and relevant non-partners” that will take place in October 2013, in Berlin (http://wiki.pro-ibiosphere.eu/wiki/Workshops_Berlin_October_2013)

Market Background

- ✔ M6 = First inputs provided by the consortium
- ✔ M10 = Updated inputs provided by the consortium
- ✔ M11 = Desktop research on other biodiversity platforms and market study on the mega science platforms
- ✔ M12 = Synthesis of the project's vision to date

Business Models

- ✔ M6 = A first set of business models at each partner's level was prepared by each consortium partner (following the business model canvas included into the questionnaire)
- ✔ M12 = RBGK identified a draft final set of business models for each service identified at partner's level
- ✔ M13a = RBGK will map partners depending on the different activities/models they are involved in, before the pro-iBiosphere workshop that will take place in October 2013, in Berlin
- ✔ M13b = RBGK will share the documents on the business models with the partners
- ✔ M13c = A consensus analysis of the business models at project and partner's levels will be conducted
- ✔ M14 = The event report will be produced

Deliverables

- ✔ M6 = D6.3.1 Report on diversity and strengths of existing business plans & discussion of sustainability (1)
- ✔ M12 = D6.3.2 Report on diversity and strengths of existing business plans and discussion of sustainability (2)
- ✔ M18 = D6.3.3 Report on diversity and strengths of existing business plans and discussion of sustainability (3)
- ✔ M21 = D6.3.4 Report on diversity and strengths of existing business plans and discussion of sustainability (4)

1.3 - Key concepts

In order to facilitate understanding by the pro-iBiosphere consortium on the concepts of “exploitation”, “business model” and “business plan”, a set of definitions and figures was shared with them in M6 (see document entitled “Methodology about Exploitation Plans and Business Models”, also available on the wiki (http://wiki.pro-ibiosphere.eu/w/media/d/d7/Pro-ibiosphere_WP6_Task63_Sigma_V01_09112012-2.pdf)).

Figure 4 represents the steps from EU-funded research to innovation and jobs. It includes the following steps: funding, exploitable results, exploitation plans, business plans and innovation job.

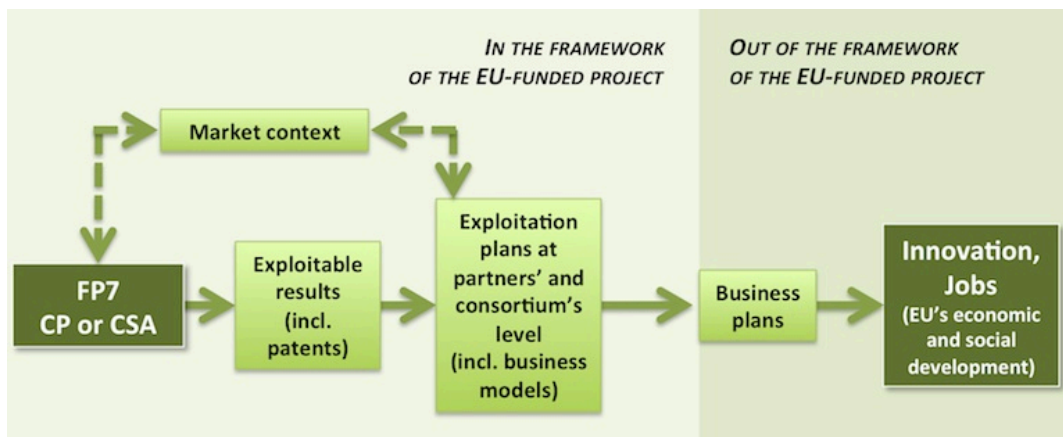


Figure 4. Steps from EU-Funded research to Innovation and jobs (© Sigma Orionis 2012)

Exploitation plan. An “exploitation plan” details how each project partner and the consortium as a whole intend to make use of research results produced by the project. Funding bodies/agencies/institutions pay great attention to the fact that the results of research projects funded through taxpayers’ money, are “disseminated” (i.e. communicated to a wide audience, not limited to the audience of project partners) and “exploited” (i.e. useful after project completion).

WP6 will develop a plan outlining how to exploit the results obtained in the pro-iBiosphere pilots. A “market background document” will be useful to fine tune exploitation plans at partners’ or consortium’s level and will be part of the deliverables produced within Task 6.3.

An exploitation perspective may be better understood by the partners after considering the market environment. Some partners might foresee an increase of their expertise or level of publications, others might envision precise exploitation perspectives based on more or less formalized business models.

Sustainability. Funding bodies, agencies/ and institutions also pay great attention to the fact that the funding of a research project in some cases is only a first step in the development of a more ambitious project by the consortium partners (or at least a sub-group of them).

In some cases, the results of projects can lead to a (pre)-commercial phase during which no EU funding will be necessary any longer, because the consortium partners find a way (typically through suited business models) to fully exploit the project results. This ensures the continuity of their efforts and the sustainability of the overall project they had envisioned.

Since consortium partners are co-investing in the research project, they are expected to have a similar determination to exploit project results and ensure the sustainability of their overall project. A convincing sustainability plan is one of the key expected outputs of the project.

Business model. A business model describes the precise way a stakeholder plans to seize a commercial (business) opportunity. The “Business Model Canvas” (http://en.wikipedia.org/wiki/Business_Model_Canvas) based on Osterwalder’s work is often considered as a good reference framework to describe the various constituents of a business model: value proposition, customer relationship, channels, etc. In the pro-iBiosphere project, a detailed business model for i-Biosphere (the envisioned Open Knowledge Biodiversity System) will be fine-tuned by the end of the project, when all project activities exploring the context and conditions necessary to ensure a transition from pro-iBiosphere to i-Biosphere will have provided main outputs.

However, project partners are in a position, at the start of the project, to describe the “business models currently in use in their organisations”, i.e., which services (e.g., publications, access to data, expertise) are they exploiting today?, or could they exploit?; and under which cost-benefits model?.

These current business models are important to consider. In particular because the envisaged project “i-Biosphere”, offers the possibility to deliver improvements of services that already exist, and a broader range of new services.

Business plan. A business plan precedes a business model. It is prepared by an organisation targeting a business opportunity (made concrete through a business model) and precisely describes how the business will develop (e.g. addressing strategy, marketing, operations, human resources, legal aspects.). It is primarily intended to obtain a green light from the management of companies, banks or investors. Therefore, a business plan is typically out of the scope of a EU-funded project.

2. - EXPLOITATION PLANS

2.1 - Methodology

In month 5, all project partners were requested to detail the way they planned to exploit pro-iBiosphere in their organisation or at their own personal level (i.e., why they would consider, by the end of the project, their involvement has been useful, for instance, by taking advantage of the activities that have been developed, making use of project results, etc.).

The questionnaire sent to project partners included the following guideline:

For this exercise, partners may only foresee an increase of their expertise, of the level of their publications, of their contact network, etc. They may also envision more commercial exploitation perspectives, based on more or less formalized business models, which they could describe there. This question is not about business models related to the envisioned iBiosphere integrated system but at partners' own level.

The answers received in M6 are available in Annex 2. A new column was added to the matrix in month 11 – “Reasons for change”, this, in order for partners to indicate why they had updated their exploitation perspectives. The updated answers are presented below.

2.2 - Synthesis of exploitation plans to date

All pro-iBiosphere partners envisage exploitation perspectives at their own level and *beyond the consortium level* (i.e., the perspective of an i-Biosphere integrated system allowing each institution and/or all institutions collectively to offer improved or new services to a wide range of users. These perspectives are based on three main exploitation channels: strengthened expertise, extended cooperation, and improved business (see Table 1). A summary of the answers received by partners is presented below.

- ✔ **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., infrastructures, international cooperation, markup 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 the framework of ***EU-funded programmes*** and at a general level or on specific topics ***with project partners or other partners contacted through the project.***
- ✔ **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 ongoing 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).

In M11, most project partners updated their exploitation perspectives (see Table 1). This, as a result of the experience gained through their involvement in project activities, participation in project meetings, and interaction with other project partners.

Table 1. pro-iBiosphere Exploitation Matrix at M12
(month 5 inputs are indicated in black, month 11 inputs are indicated in green and italics)

Institution	Strengthened expertise	Extended cooperation	Improved business	Reasons for change
BGBM	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)	
MfN	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	
Naturalis	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) No planned commercial use (open access) so far	



Institution	Strengthened expertise	Extended cooperation	Improved business	Reasons for change
	<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).</p> <p>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>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]</p> <p>Additional data and new selected publication; the changes in opinion and interpretations.</p>
NBGB	<p>Taxonomic publishing (staff training through project workshops).</p> <p>Assessing digital publishing options for new works. 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>
Pensoft	<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>	



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

3. - BUSINESS MODELS

3.1 - Business models currently in use by partners

A preliminary summary of responses is presented on Figure 5. In the next few months of the "research and understanding" phase, Figure 5 will be further developed and refined. This refinement is achieved, by (i) collaboratively resolving any ambiguities that the respondents may have found in the phrasing of the questions, and (ii) researching the areas where detail is currently lacking. New responses will also be solicited. A set of business models for each partner will then be developed from this Table and from further input from workshops, at a sufficient level of detail to ensure that links between the components of the models are explicit (e.g. between a value proposition and a user).

The layout of the figure follows Osterwalder & Pigneur (2009) where the value proposition (VP) is central to the model. The customer segments (CS), customer relationships (CR) and the delivery channels (CH) form the upper-right portion of the figure. The key activities (KA), key resources (KR) and key partnerships (KP) form the upper left part. The cost structure (C\$) and revenue streams (R\$) are at the bottom of the figure. This presentation tends to place the expenditure components to the left of the diagram and the revenue generating ones to the right.

The text from each set of replies was processed using the R-cran software (Natural Language Processing task view) to generate 'commonality' plots i.e. words most commonly used in replies placed centrally with larger font). These are overlaid on the model canvas. The following summary gives an overview of the commonalities between partners, and can be used to identify areas for work:

- The central VP is richly described and appears quite complex, though it lacks precise detail, it is to offer products and services, which deliver comprehensive, authoritative, validated, biodiversity knowledge, but the precise form is not specified. The stated aim is to help the user find out information about species. The main business drivers given are statutory responsibilities, mission, reputation and sustainability. Cost reduction does not figure greatly here (which is perhaps surprising).
- As above, at the level of abstraction of a combined analysis, the Customer Segments (CS) are broadly defined: value is created for a wide range of scientists, data aggregators, students, citizens. The most important customers are conservationists, taxonomists, ecologists, students and publishers but the relationship between the individual Customer Segments (CS) and specific VP is not immediately apparent. The current channels of delivery (CH) are mostly hardcopy, with some web portals, software, application programming interfaces (APIs), apps and the like. Personal contacts, education and training and exhibitions also play an important role. The main established CR include self-service, semi-automated or automated types, and consultancy.
- The KA are either taxonomic (curation, research, editorial) or software development (coding, documentation), a distinction that is not so pronounced in the VP, but require the KR scientific collections, literature, scientific staff, editors on one side and IT staff hardware, software, consultants, and administrators on the other. The delivery channels (CH) require publishers, designers, consultants, specialists funding of exhibits, infrastructure developers.

-
- The KP are with governmental and non-governmental organisations, such as, universities, editors, taxonomists, referees, (software) developers. These partnerships provide (taxonomic) accounts, editorial, peer review and software.
 - Very little information was gathered regarding financial aspects. Revenue from the sale of hard copy publications is common theme but otherwise the details of the revenue streams (R\$) and cost structures (C\$) are unknown.

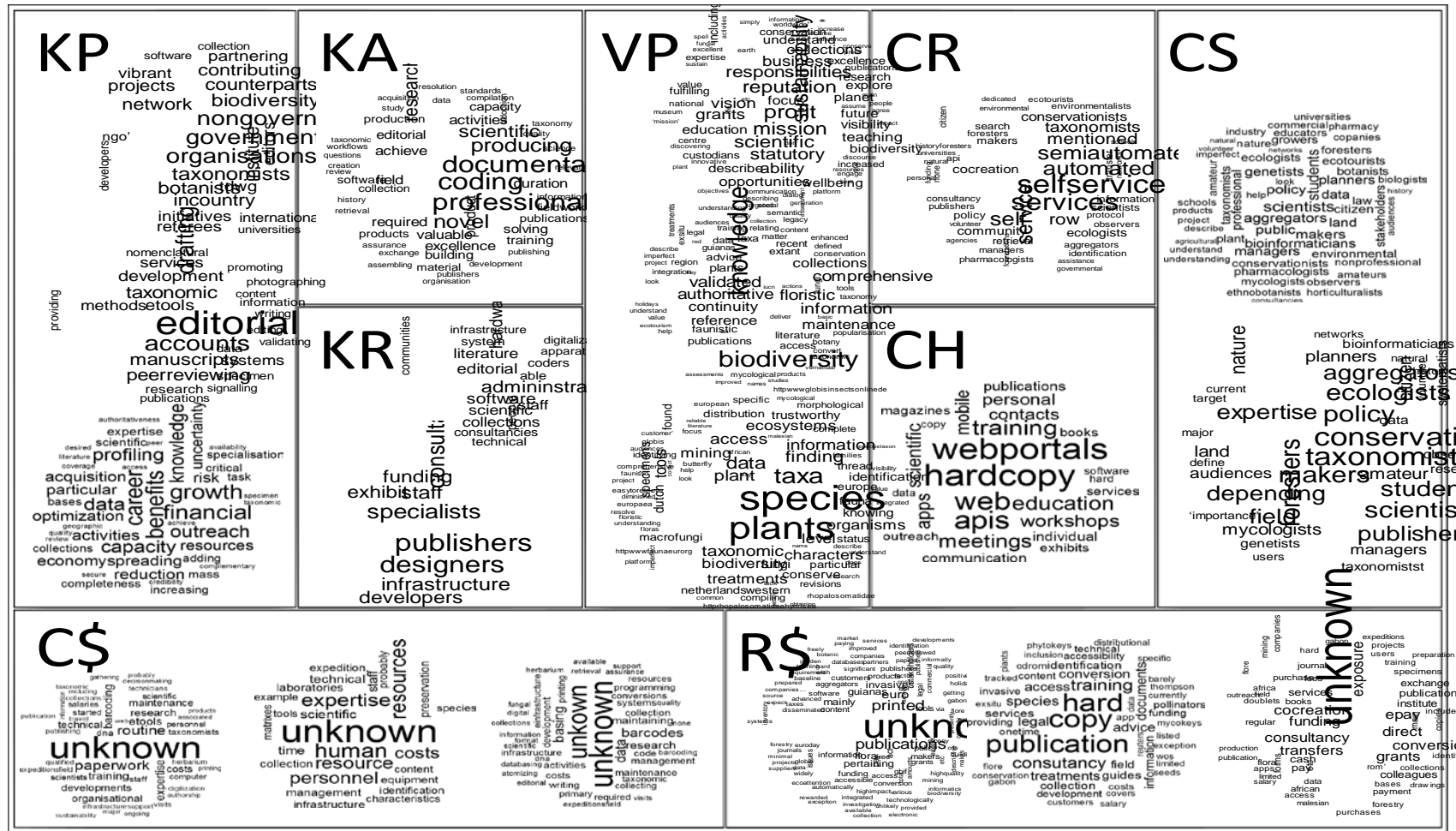


Figure 5. Business models currently in use by pro-iBiosphere partners (based on the answers received in M5)

As a result of the RBGK-SIGMA office meeting held in July 2013, further work on business models has been undertaken (see Annexes 5 & 6). Following this meeting and thanks to the amount of information already available, both partners identified possible business models at project level (see Fig. 6).

So far, two aspects of business models have been identified:

- The perspective of an integrated platform will have an impact of the business models at each partners' level;
- The "i-Biosphere enterprise" will have a business model of its own.

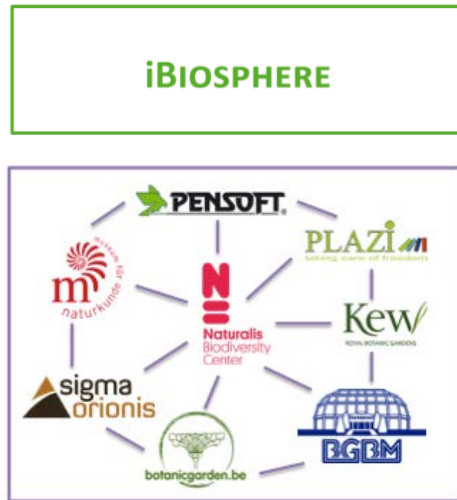


Figure 6. Possible business models at project level

The aim of drafting envisioned business models at project level is to find out a model suitable for all partners. For example, in the case of the e-Infrastructure project GEANT¹, its achievement is that the benefit for the whole research and education community is actually benefiting all project partners as well, while GEANT has a business model of its own. Hence, partners should be looking at what they would like to achieve (and related benefits) and how they can make this happen (this comprises the costs and platform management features).

¹ e-Infrastructure project that developed a pan-European research and education network interconnecting the national research and education networks (NRENs) more information on www.geant.net

The identified costs and benefits of these envisioned business models are:

1. At consortium level (the sum of all partners' business models)

COSTS	
- Personnel and technical costs	- Intellectual property / use of data
	- Accessing data

2. At organisation level (one single entity)

COSTS	
- Personnel and technical costs	- Intellectual property / use of data

This specific part has a direct link with Task 6.1 on "Measuring and Constraining the cost of delivering services". Task 6.1 will provide Task 6.3 with inputs, based on, the: (i) data collected during the "Measuring and Constraining Costs" workshop that took place on the 22nd of May 2013 in Berlin; and, (ii) the first "Report on cost delivery, efficiency and cost reduction through effective practices" (D6.1.1) to be released in M15. See Table 2 "Inputs from Work Packages and Tasks" detailing information on Task 6.1.



Table 2. Inputs from Work Packages and Tasks at M12

Task	Outputs
WP2 - European & international policy coordination lead: NBGB	
<p>2.1 - Coordination and routes for cooperation across organization, projects and e-infrastructure lead: PLAZI</p>	<p><i>The prepared documents and the workshop towards routes for cooperation identified that institutions and organisation can work better together than they presently do. There is significant cost saving involved, so the business plan for the future is to make the core funding of the existing memory institutions go further by sharing activities, making better use of existing IT technologies. Several hurdles to do this have to be overcome and it is highly desirable to have significant catalytic funding, which is carefully designed as to change existing processes that prevent improved collaboration.</i></p>
<p>2.2 - Stakeholder requirements lead: RBGK</p>	<p><i>To date, the main activity for T2.2 was the running of a workshop on the "Uses and users of [Biotas]" Berlin, May 2013. The compilation and analysis of the results is in progress, Preliminary findings suggest that out of the range of invited participants which included Ecologists, Conservationists, Taxonomists, Earth Systems Scientists, the strongest response was received from what might be regarded as the "traditional" user-base of conservation [Red Listing], taxonomy and ecology [identification] - the latter were under-represented at the workshop owing to availability. Although about 150 scientists were invited who working on what might broadly be referred to as trait analysis, vegetation and climate modelling projects (and are using flora derived trait data in their work), the response to the invitation was very poor (2 ecological traits databases and one vegetation analyst). The reason for this is not clear but the first general invite for the meeting may not have effectively targeted this group (subsequent direct contacts with individuals would tend to confirm). Anonymous feedbacks from workshop participants suggest that more "real" users should be heard (for example amateurs as opposed to professionals). Very preliminary assessment suggests that the types of information that users most wanted were species names and geographical location, and services or tools for species identification, and most would prefer to have data available in a finely atomised format. There is a follow-up meeting planned in the UK with CEH staff to target ecological uses.</i></p>
<p>2.3 - e-Taxonomy tools lead: NBGB</p>	<p><i>Digital tools for taxonomy have been available for many years and are increasing in number and sophistication. Their use has many advantages for collaboration, verification, publication and reuse of data; however uptake from the taxonomic community has been slow and patchy. The reasons for this are numerous but include lack of training and lacks of incentive. There are several factors that lead to the lack of incentives. Paper publications generate revenue whereas digital publications do not. Journal impacts factors are used assess the performance of taxonomists, so there is no incentive to publish outside traditional taxonomic journals. Research is valued by the number of citations received. However, the majority of the users of taxonomy don't cite the source of their identifications. If the aim is to have a comprehensive, open and authoritative taxonomic system it would require a change in the way we assess and reward taxonomic publication.</i></p>



<p>2.4 - Legal issues of data acquisition, curation and dissemination lead: PLAZI</p>	<p>A short paragraph summarizing the major findings</p>
<p>WP3 - Scientific content and workflow coordination lead: FUB-BGBM</p>	
<p>3.1 - Data acquisition & curation lead: NATURALIS</p>	<p>Data acquisition & curation address two parts. Part I reviews and analyses the existing methods for data acquisition and curation. When deciding what e-platform is most suitable for an institution; the IT capacities (or capabilities) of the institution; and the requirements of the projects that will use the platforms. These decisions need to be taken into account. Part II presents a set of Best Practices on editorial policies for entering new data and collaboratively writing taxonomic treatments in order to advocate open access and free re-use of data publicly-funded and produced by NHIs (including publications). Despite the technological developments, most content of Biotas (e.g., Floras, Faunas, Mycotas, as of biodiversity information in general) is still being published in "closed", non-machine-readable formats, such as paper and PDF. Those closed formats are in most cases available through a pay-wall. Scientists continue to gather high quality, well-structured data, which are then being "closed" into non-machine-readable publication formats, which lead on its turn on doubling the effort to get back the published data into databases. A standard that is widely available and specifies a minimum of fundamental biodiversity data, e.g., references/citation, taxon treatments, collection specimen numbers, names, material citations, descriptions illustrations (line art to multimedia), etc., needs to be formulated. A best practice should specify that publishers of biodiversity data should export these data, irrespective of the form of publication, and allow its wide dissemination.</p>
<p>3.2 - Semantic mark-up generation, data quality and user participation infrastructure lead: PLAZI</p>	<p>A concept paper for involvement of individual experts, commercial vendors, and citizen scientists has been handed in to the EU at the end of May to define the current status, technical issues and propose a strategy to involve stakeholders in the conversion process.</p>
<p>3.3 - Semantic integration of biodiversity literature lead: MFN</p>	<p>The task is presently being prepared by the MfN and the work is not yet due.</p>
<p>WP4 - Technical & infrastructure coordination lead: Pensoft</p>	
<p>4.1 - Improve technical cooperation and</p>	<p>A major and important outcome will be a decision towards use of stable http identifiers for bioinformatics elements, such as specimen data, taxon</p>



<p><i>interoperability at the e-infrastructure level</i> lead: FUB-BGBM</p>	<p><i>treatments, genomic data etc. Stable http identifiers have the advantage of being more efficient in semantic web than DOIs is LSIDs. In addition, http identifiers are coming at low costs, incomparable with DOIs for example, which may need huge investments at the scale of all biodiversity domains.</i></p>
<p><i>4.2 - Promote and monitor the development and adoption of common mark-up standards and interoperability between schemas</i> lead: PLAZI</p>	<p><i>The interoperability gaps between several XML schemas used for mark-up services (e.g., TaxPub, TaxonX, ABCD, DarwinCore, TCS, BisbyCore, AudibonCore) are explored with the aim to make the mark-up and harvesting process cost efficient. One of the possible ways to make schemas interoperable is the RDF environment. Increased interoperability between schemas will lay the ground for a business model of mark-up services for legacy literature and data and collate these with prospectively published information.</i></p>
<p>WP6 - Sustainability planning lead: RGBK</p>	
<p><i>6.1 - Measuring and constraining the costs of delivering services</i> lead: NATURALIS</p>	<p><i>At this stage we are in the process of collecting data based on the "Measuring and Constraining Costs" workshop that took place on the 22nd of May 2013 in Berlin. Templates on capturing the costs were sent to the three groups of the workshop. The deadline for receiving contributions is the end of June 2013. After the information has been received an analysis of the data will be done, all this will be done in close collaboration with RBGK. The report is due in November 2013.</i></p>
<p><i>6.2 - Identifying and measuring the benefits of delivering services</i> lead: RBGK</p>	<p><i>A short paragraph summarizing the major findings</i></p>

3.1.1 - Map of partners' activities

Figure 7 on “activities”, maps the different activities for the business model at enterprise level (based on RBGK business model and activities). Most of the other partners share the same kind of activities except Plazi and Pensoft who have a narrower scope of activities. The graph shows the positioning of Plazi and Pensoft in these activities, depending on the different activities/models they are involved in (Plazi e.g., more software development and data management; Pensoft is closer to dissemination). The business models of RBGK, NBGB, BGBM, Naturalis should be quite similar, only with some differences (e.g., all receive public funding but data management may differ).

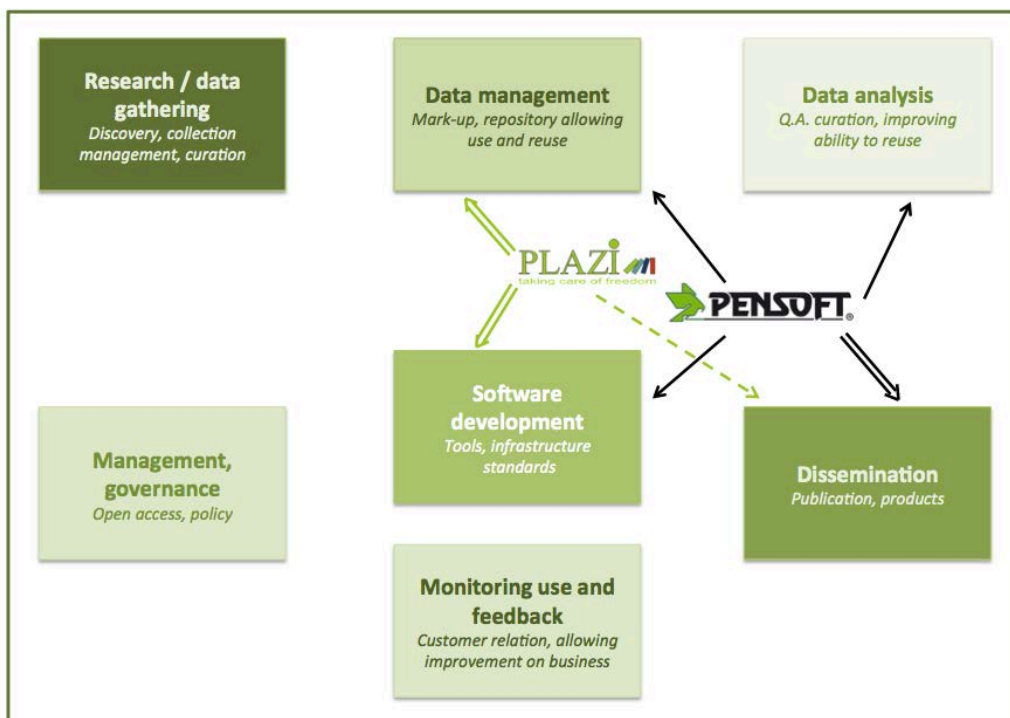


Figure 7. Map of activities for the business models at enterprise level

In Annex 14 we provide a set of partners' current business models which have been mapped to the above schema, This is in preparation for the pro-iBiosphere meeting #4 in Berlin (http://wiki.pro-ibiosphere.eu/wiki/Workshop_Berlin_4:_Evaluation_of_business_models_currently_in_use_by_partners_and_relevant_non-partners) and partners are encouraged give their feedback on these models in the run up to the meeting (during M13) and they will be updated on the pro-iBiosphere wiki (http://wiki.pro-ibiosphere.eu/wiki/Exploitation_Plans_and_Business_Models_-_Task_6.3). An analysis at ‘single enterprise’ level, depicting benefits versus constraints of each potential activity will be undertaken as a group exercise during meeting 4 in Berlin.

3.1.2 - Identification of potential services

In order to find reference business models, services identified from discussion and previous questionnaires related to Task 6.3 were used as a starting point (see Figure 8). These services are offered by the natural history institutions and botanic gardens involved in the project.

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

Figure 8. Services offered by natural history institutions and botanic gardens

The impact of a collaborative integration on the services or activities will be assessed. In the assessment, one element will be the analysis of the ways that these services or the project in general may modify the partners' activities. Another element will be mapping the threats and opportunities for each of these services. This analysis will be the aim of the second exercise of meeting #4.

4. - MARKET BACKGROUND

4.1 - Methodology

The first step in any efforts to support a project development through market research is to precisely define the market that the project targets.

In order to focus market research efforts, it has been considered important since the initial stage of the project to precisely agree among partners on, the: (i) overall vision of the project, (ii) foreseen steps to make it happen, (iii) anticipated management issues related to an integrated platform, (iv) and services the platform will deliver.




The answers to this questionnaire (see Annex 10) are presented below (updated inputs are indicated in green).

4.2 - Synthesis of the market vision to date

It is clear that all project partners have made real efforts to provide substantial inputs on market related aspects and on needed paths towards sustainability.

An updated synthesis of the market vision is here presented:

Overall vision: *the proposed vision is agreed by many partners. Succeed 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).*

-  **Obstacles to make 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 can 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 is managing 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; they ***should become more structured once the business models*** corresponding to the market vision are ***studied in detail.***

The “market vision to date” will be further discussed in October 2013 and should eventually lead to a wider agreement of some aspects of it. The following exercises will be conducted:

- 🌱 An analysis of the opportunities and threats, for the business models currently in use at each partner’s level, when considering the market vision to date,
- 🌱 An analysis of the constraints and benefits of the activities developed (at platform’s level) in line with the market vision to date.

Table 3. pro-iBiosphere market vision in month 12

	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?
BGBM	A second vision to add: digitisation of information + mobilisation of presently underutilized large volumes of biodiversity information	Three major obstacles: lack of standardisation and interoperability between platforms, availability of helpdesk functions (need to quickly create a community-driven helpdesk?), institutional commitment <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>	Cannot be answered at this point	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 New products: interactive and dynamic biodiversity data interfaces, data access across institutions
MfN	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) Key developments: communication among partners, dissemination, etc.	Initial partners + new highly engaged partners A S&T Advisory Board (members from each active partner) is necessary A self-sufficient foundation supported by project partners?	Benefits: increase in scientific output, collaborations, efficient use of taxonomic data / publications, access to a more comprehensive set of data, external services Services: semantic mark-up of legacy literature, digitising institutions, automated services (free), tools for semantic mark-up, etc.
Naturalis (updates)	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	FoG: the team should include providers of data FoN: Aspects linked to logical open access	FoG: increase of the possibilities of mining and reuse, no repeated work across institutions FoN: a lot (difficult to summarize here)

	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?
		<p>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</p> <p>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.</p>	<p>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. 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.</p>	<p>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 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.</p>
NBGB	An additional aspect is improving taxonomic workflows to benefit from einfrastructures.	<p>Taxonomists working in a collaborative and structured manner and gaining recognition for digital work.</p> <p>Working in a multilingual world <i>Reshaping the incentive structure of taxonomy to encourage sharing of taxonomic treatments</i></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><i>Funding would be raised through various means. For example, through providing services to users, by membership and sponsorship.</i></p>	<p>Multilingual access, higher visibility for research, reduced costs, a one-stop-shop, closer ties with institutions in Africa.</p> <p>The integration of data enabling new science, better monitoring and a reduction to the barriers preventing joined up conservation efforts and sustainable resource management.</p>

	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?
Pensoft	<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>
PLAZI	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)
RBGK (update)	Yes but subject to project findings + to be further discussed in a project workshop We should better define "processing core biodiversity data" (floristic and faunistic data?), and "integrated system"	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. Important to check the coherence of the outcomes of the different WPs <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>	Too early to say Too early to say - this will depend on the range of business model(s) available	Pooling of resources, resource duplication, sharing data, economies of scale, broader use of data, single source of truth (avoidance of competition) <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) ? Outsourcing parts of the infrastructure ? Open source tools</i>
Sigma	No comment (we have proposed this vision...)	A test implementation phase of the business model identified in pro-iBiosphere is necessary (= Biosphere funding by the EC) Time is critical: a smooth continuity to be ensured between the two projects	Beyond committed project partners, other EU and non-EU partners to reach a critical mass Governance through a core group	No clear at this project stage

	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?
			A technical partner to run the platform is necessary	

4.3 - Market research

The “market definition” exercise will lead, in the next months, to:

- A clearer vision of the project positioning,
- The identification of needed technological developments,
- The identification of services targeting a set of identified customers through given organisational & operational modes,
- The identification of business models and sustainability plans the services would refer to.

In parallel a focused market research will then be possible, to collect and analyse information from similar initiatives in the field of biodiversity or in other fields, in order to fine tune the pro-iBiosphere approach on all its mentioned aspects.

So far, the market definition exercise has not yet reached a sufficient level in order to implement a focused market research.

The Task leader has started, with the support of all project partners identifying the main similar initiatives the research could focus on (see Table 4). Figure 9 displays the 7 major biodiversity mega-science platform while picturing their linkages.



Table 4. Synthesis of the information collected on “mega science platforms”

	INSDC	CoL	GBIF	JSTOR Plant Science	BHL	iBOL	EOL
Website	www.insdc.org	www.catalogueoflife.org	www.gbif.org	www.plants.jstor.org	www.biodiversitylibrary.org	www.ibol.org	www.eol.org
Creation	1992	2001	2001	2003	2005	2007	2007
Vision	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
EU project		<i>Species2000</i>					
CONTENT - DATA							
Content and scope	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
Data source	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
Links with other platforms	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



	INSDC	CoL	GBIF	JSTOR Plant Science	BHL	iBOL	EOL
Data quality management responsibility	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
USER AND SERVICES							
Target user	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
Formats	Online	Online CD-ROM CoL Annual Checklist published	Online	Online	Online	Online	Online
Search display	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
Functionalities Services	Amount and quality of openly and freely info (oldest platform) Minimal access to the latest information	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	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	Large diverse system intended for a range of audiences (public and specialised users) Caching functionality (instant archiving)



	INSDC	CoL	GBIF	JSTOR Plant Science	BHL	iBOL	EOL
	Strict formatting rules enable search software to be written and facilitate reuse of the data.		centralized locations.			Repository for barcode records, storing specimen data and images, sequences and trace files.	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
TECHNICAL							
Technical	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 cyberinfrastructure
MANAGEMENT AND FUNDING							
Consortial structure	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



	INSDC	CoL	GBIF	JSTOR Plant Science	BHL	iBOL	EOL
Strategy & operational plan		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 and catalysing development of analytical tools for improved decisions	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 creation of reference libraries	Group strategy: to digitise the published literature of biodiversity held in their respective collections		
Funding source	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	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.



	INSDC	CoL	GBIF	JSTOR Plant Science	BHL	iBOL	EOL
	by the Intramural Research Program of the National Institutes of Health; National Library of Medicine. Funding for open access charge: European Molecular Biology Laboratory.						
Creation of content data	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

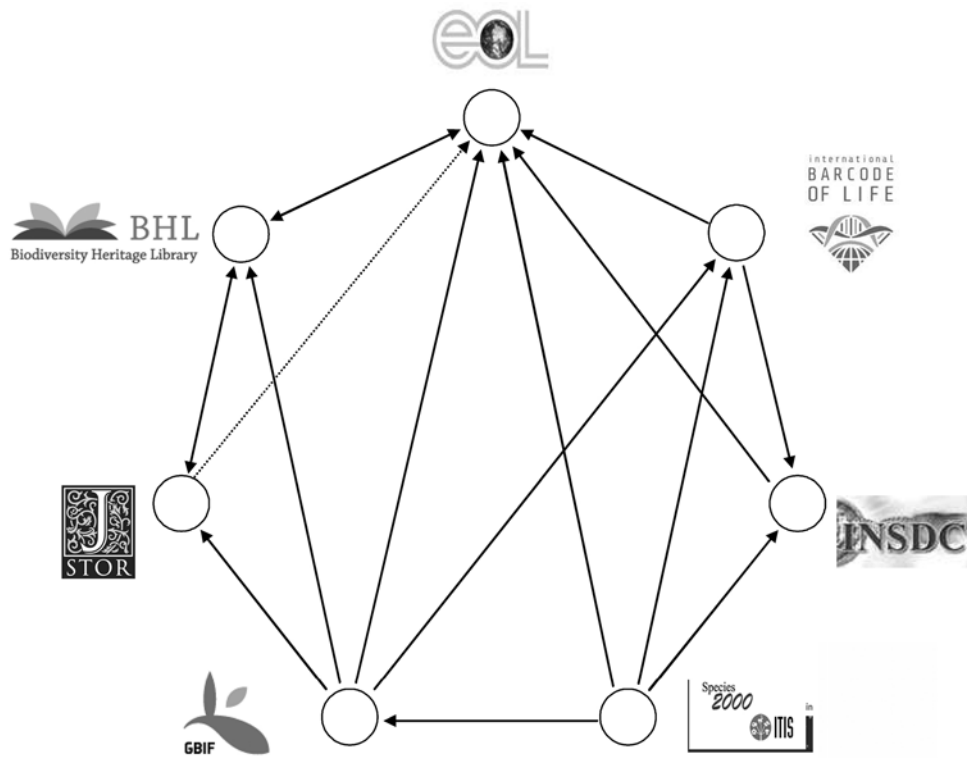


Figure 9. Biodiversity megascience platforms – cross-linkages and data exchange (Triebel et al., 2012)






5. - MEETING TO EVALUATE BUSINESS MODELS CURRENTLY IN USE BY PARTNERS AND RELEVANT NON-PARTNERS (MS22)

5.1 - Event concept and objectives





pro-iBiosphere meeting 4 aims at bringing all partners together to discuss the business models that partners could envision and how to realize this. Envisaged outcome is that all partners agree on a draft business model at the project level.

In order to ensure a focused and fruitful meeting with concrete results, all prepared documents (envisioned business models, activities and services) will be shared in advance with partners to enable their understanding as to where the project is heading and how to gather their feedbacks prior to the meeting.

Questions that will be addressed during the meeting include:

-  What activities are we doing?
-  What benefit/constraint would there be for each activity?
-  What services are we producing?
-  Which support services would be needed?
-  What would be the cost/revenue model of the envisioned business models (leading to Task 6.4)

Topics that will be addressed include:

-  Introduction of D6.3 with a draft final version of Exploitation Plans
-  A presentation of the draft final presentation of business models at each partner's level
-  Two exercises in parallel groups (costs / benefits analysis and opportunities / threats analysis)
-  A final discussion to draft the business model at consortium level (towards the sustainability of the initiative) and agree on a roadmap to fine tune it before the end of the project

For more information, see annex 8 and 9 and on the wiki (http://wiki.pro-ibiosphere.eu/wiki/Workshop_Berlin_4:_Evaluation_of_business_models_currently_in_use_by_partners_and_relevant_non-partners)

Two criteria will be addressed for the exercises and discussion on the two envisioned business models:

- **Constraints versus Benefits** (Activities at enterprise level)
- **Opportunities versus Threats** (Services at partners' level)

Participants will further analyse the activities and services to evaluate what different partners should do for the project in general. Task leaders will be asked to share their inputs and be informed on the kind of inputs they are supposed to provide for the meeting.

5.2 - Participants

RBGK recommended not involving so many experts as the project is still in an early phase of defining the business model at project level, at this stage, it is preferable to stay focused on a common view and to enable partners to reach an agreement and not to confront it in the views and feedbacks of other experts.

There is a risk of inviting external experts as they might try to sell their organisation or product, which will not ultimately help reaching the project aims in the agreement on a business model at project level. At this stage, project partners must identify and agree first on a business model for the project and then they could confront it with other business models (other initiatives). External experts would be consulted at a later stage while receiving pro-iBiosphere business model for review after the workshop so as to share their best practices, success stories and failures with the project.

Rather than inviting external experts, RBGK identified potential partners that could join the consortium and be invited to the meeting. The following list of external participants has been drafted:

Table 5. List of potential participants for MS22

Name	Position	Project or Department	Organisation
Tom Brooks	Head – Science & Knowledge	Global Policy and Programme Group	International Union for Conservation of Nature (IUCN)
Leng Guan Saw	Director	Forest Biodiversity Division	Forest Research Institute Malaysia (FRIM)
Marianne Le Roux	eFlora Coordinator	National Herbarium in Pretoria	South African National Biodiversity Institute (SANBI)
Dora Canhos	Associate Director		Reference Center on Environmental Information (CRIIA)
Laurence Bénichou	Head assistant	Scientific publications	Muséum national d'histoire naturelle (MNHN)

CONCLUSION

Two potential business models at project level have been identified along with the corresponding potential activities and services. The models consider an integrated platform which will impact on business models at the level of each partner on one hand, and the integrated 'i-Biosphere enterprise' will have a business model of its own. The central value proposition of these business models is to offer products and services which deliver comprehensive, authoritative, validated, biodiversity knowledge, but the precise forms for these has not yet been specified. The stated aim is to help the user find out information about species. The main business drivers given are statutory responsibilities, mission, reputation and sustainability. Information on the costs and benefits of the activities will be one of the foci of the next workshop meeting in October. The most important customers are conservationists, taxonomists, ecologists, students and publishers.

The exploitation plans of the partners are based around:

- ✔ **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., infrastructures, international cooperation, markup 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 the framework of *EU-funded programmes* and at a general level or on specific topics *with project partners or other partners contacted through the project*.
- ✔ **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 ongoing 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).

The next steps towards the analysis of the project exploitation potential have been agreed.

The pro-iBiosphere meeting on "evaluating business models currently in use by partners and relevant non-partners" that will be organised on October 10, 2013 will bring together all project partners and identified organisations with an interest in the project goals and results. Analyses opportunities of, and threats to the activities and services undertaken by the partners; and of the potential benefits of and constraints to these will be undertaken. This along with the outputs of task 6.1 (Costs) and 6.2 (user benefits) will provide the basis for the sustainability plans of task 6.4. The outputs of this meeting will be reported in a consensual document detailing the project exploitation potential, which will ultimately feed-in Task 6.4 "Towards sustainability for services".

ANNEXES

Annex 1: Report prepared following the RBGK-Sigma Meeting of Dec. 7, 2012 (including the questionnaire sent to partners)

PRO-IBIOSPHERE EXPLOITATION AND SUSTAINABILITY PLANS

1. Questions to each project partner

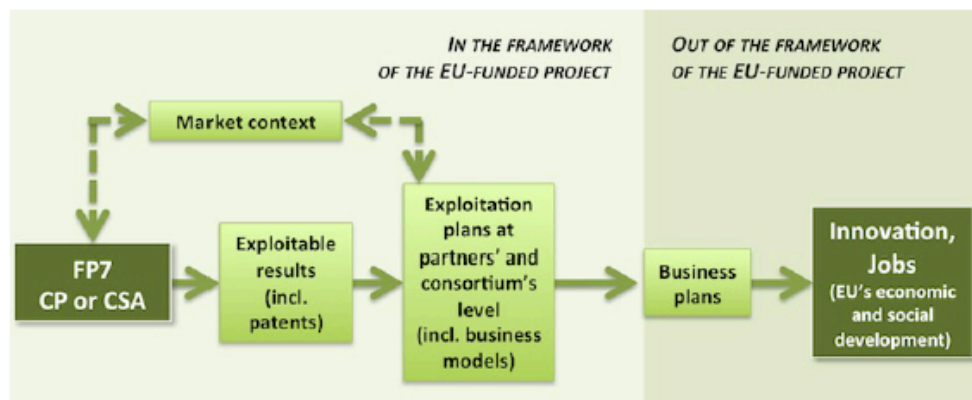
**To be filled in and sent back by email not later than January 15, 2013 to
Don Kirkup (D.Kirkup@kew.org) and Camille Torrenti (camille.torrenti@sigma-orionis.com)**

This questionnaire has to be filled in every 6 months (until project month 18). From the next 6-month period on, you will only be asked to revise and update the questions you will have given 6 months earlier. Should you consider that several representatives from your organization may usefully fill in this questionnaire in order to provide the consortium with a better understanding of the way your organization foresees the exploitation and sustainability of the pro-iBiosphere project, their contributions are welcomed. You may also want to provide a consolidated view through answers provided collaboratively by different representatives of your organization.

Please indicate in the below table the name(s) of the representative(s) of your organization having provided answers to this questionnaire.

	Contributor 1	Contributor 2	Contributor 3
Full name			
Organization			
Position			
Email address			
Skype ID (<i>to be provided only if you would kindly accept to be contacted should some of provided answers necessitate clarification from our part</i>)			

2. Introduction: some definitions of terms and concepts referred to in this document



Steps from EU-funded research to Innovation and jobs - © Sigma Orionis 2012

EXPLOITATION PLANS

The European Commission pays a great attention to the fact that the results of research projects (or coordinated and support actions), funded through taxpayers' money, are "disseminated" (i.e. communicated to a wide audience, not limited to the audience of project partners) and "exploited" (i.e. useful after project completion).

An "exploitation plan" is quite systematically requested from EU-funded projects, detailing how each project partner and the consortium as a whole intends to make use of research results, to take advantage of its activities in the project. Some partners will only foresee an increase of their expertise or level of publications while others may envision precise exploitation perspectives, based on more or less formalized business models. **Part 1 of the present questionnaire** focuses on exploitation plans at each partner's level.

A "market background document" may be useful to fine tune exploitation plans at partners' or consortium's level since an exploitation perspective may be inspired, identified, better formalized when considering the market environment: such a document will be made available at month 11 (i.e. August 2013).

SUSTAINABILITY

The European Commission also pays a great attention to the fact that the funding of a research project is only a step in the development of a more ambitious project by the consortium partners (or at least a sub-group of them), that research results can lead to a pre-commercial or even commercial phase during which no EU funding will be necessary any longer, the consortium partners having found a way (typically through suited business models likely to fully exploit project results) to ensure the continuity of their efforts, to ensure the sustainability of the overall project they had envisioned.

Obviously, since consortium partners are co-investing in the research project, they are expected to have a similar determination to exploit project results and ensure the sustainability of their overall project. **A convincing sustainability plan is one of the key expected outputs of the project.**

BUSINESS MODEL

A business model describes the precise way a stakeholder plans to seize a commercial (business) opportunity. The "Business Model Canvas" (http://en.wikipedia.org/wiki/Business_Model_Canvas) based on Osterwalder's work is often considered as a good reference framework to describe the various constituents of a business model: value proposition, customer relationship, channels, etc. In the pro-iBiosphere project, a detailed business model for iBiosphere (the envisioned integrated system) will logically be fine tuned only by the end of the project, when all project activities exploring the context and conditions necessary to ensure a transition from pro-iBiosphere to iBiosphere will have provided main outputs.

However, project partners are in a position, at the start of the project, to describe the "business models currently in use in their organizations" (**Part 2 of the present questionnaire**), i.e. "which services (publications, access to data, expertise, etc.), for which users/customers, are they exploiting today (or could they exploit), and this under which cost-benefits model?"

These current business models are important to consider the possible iBiosphere business models since iBiosphere, when compared to the present not (or less) integrated situation, offers in particular the possibility to deliver improved services that already exist.

BUSINESS PLAN

A business plan comes after a business model. It is prepared by an organization targeting a business opportunity (made concrete through a business model) and precisely describes how the business will develop (addressing strategy, marketing, operations, human resources, legal aspects, etc.).

It is primarily intended to get a green light from the management of a company, banks or investors. Therefore, a business plan is typically out of the scope of a EU-funded project.

PART 1: “EXPLOITATION PLANS AT THE LEVEL OF YOUR ORGANIZATION”

Could you describe (in ½ to 1 page if possible) the way you plan to, or may exploit pro-iBiosphere in your organization or even at your own level, i.e. why you will consider by the end of the project that your involvement in it has been useful (taking advantage of the activities you will have developed, making use of project results, etc.)?

You may only foresee an increase of your expertise, of the level of your publications, of your contact network, etc. You may also envision more commercial exploitation perspectives, based on more or less formalized business models, which you could describe here. Please note that this question is not about business models related to the envisioned iBiosphere integrated system but at your own level.

PART 2: “BUSINESS MODELS CURRENTLY IN USE IN YOUR ORGANIZATION”

In order to gather information on the costs and benefits of producing and disseminating faunistic and floristic data, information and knowledge, WP6 “Sustainability Planning” has designed a questionnaire.

The answers to this questionnaire will allow WP6 to establish baseline information such as:

- (i) What workflows related to the production/use/dissemination of Floras/Faunas are being used by partners
- (ii) How can current workflows be improved (e.g. more efficient, less resource consuming, etc.); and,
- (iii) How to maximise benefits to support sustainability of workflows.

This baseline information will be compared with new models and & workflows.

I. Documenting business models currently in use by partners (T6.3)

SOME GUIDANCE

The **Unit of Analysis** for this exercise is at the level of the individual partner organisation, **not the consortium**. If the workflows within a partner organisation are diverse, then analysis will be at the level of an individual project and a separate questionnaire will be required for each (for example, at RBGK one unit of analysis might be "African Flora production" since the workflows for the Flora of Tropical East Africa and Flora Zambesiaca are similar enough to be treated together).

The **conceptual focus** of the analysis is multi-faceted as we are interested in activities, delivery channels, value exchanges and customers. Hence the broad range of the questionnaire.

The basic elements that are needed to describe any business model are centred on the product, service, information (or combination of) that is offered to the customer. In Business Modelling jargon this is often referred to as the **Value Proposition** and we have adopted this nomenclature below.

In our particular context we might think of the Value Proposition a being the output from any particular workflow.

As partners operating both inside and outside of pro-iBiosphere a common component of the Value Proposition might be stated as something along the lines of " **provision of floristic and or faunistic data, information, knowledge and services**" but the detail would differ between each partner. Following the critical first task of defining what the Value Proposition is, there are five other basic business model elements that ask further questions about the Value Proposition:

1. What is the value proposition?	Value proposition, product, service, information or combination
2. To whom is the value proposition offered?	Customer segment or type
3. What is received in return?	Value in return such as rent, commission, sales revenue, advertising space, and future contracts. Within our particular sphere would also include publications, specimens.
4. How is the value proposition offered?	Channel of value transmission
5. How is the value proposition created?	Value adding processes and related activities, resources, capabilities, strategies and organisation structure
6. What other entities contribute to creating and delivering the value proposition to the customer?	Financiers, suppliers, allies and regulatory bodies

The questionnaire that follows is based on the "Business Model Canvas" of Osterwalder & Pigneur (2009). The questions are grouped under the five headings given in the table above, which is taken from Lambert (2012), as are the guidance notes (in blue) in the table below.

Many of the questions are quite easy to have a stab at. We've started entering some example answers (work in progress in red), which are loosely based on Kew's African Floras. We also found that it was helpful to construct a diagram of the workflow (appended).

For some questions it may only be possible to give a general answer or indicate "unknown" - the intention is that more detail can be added in future iterations.

II. What is the Value Proposition?

VALUE PROPOSITION

The object(s) of value offered to the customer. It can take the form of products, services, information or a combination of each. The channel through which it is offered can be an important part of the value proposition, e.g. there should be at least one value proposition per partner, based on their **current** provision of floristic/faunistic data, information, knowledge, services, tools.

VALUE PROPOSITIONS	Characteristics include: newness, performance, customization, "getting the job done", design, brand/status, price, cost reduction, risk reduction, accessibility, convenience/usability
<i>What are the business drivers for our institutes?</i>	Mission, statutory responsibilities, profit, sustainability
<i>What value do we deliver to the customer?</i>	Comprehensive and authoritative floristic information
<i>Which one of our customer's problems are we helping to solve?</i>	Finding information about species of African plants
<i>What bundles of products and services are we offering to each customer segment?</i>	Printed floras, printed field guides, web-based
<i>Which customer needs are we satisfying?</i>	Identification of specimens, nomenclatural problems, describing plant distribution, describing plant characteristics

III. To whom is the value proposition offered?

CUSTOMER

The entity (entities) targeted with the value proposition. It can be a group of consumers or other businesses. Where differences exist in terms of demand or servicing requirements, a new customer group needs to be recognised.

CUSTOMER SEGMENTS	These might include Mass Market, Niche Market, Segmented, Diversified, Multi-sided Platform
<i>For whom are we creating value?</i>	Taxonomists, Conservationists, Ecologists, Environmental Scientists, Policy Makers
<i>Who are our most important customers?</i>	Policy Makers? Conservationists
CUSTOMER RELATIONSHIPS	These might include Personal assistance, Dedicated Personal Assistance, Self-Service, Automated Services, Communities, Co-creation
<i>What type of relationship does each of our customer segments expect us to establish and maintain with them?</i>	Taxonomists (self service, automated services, community, co-creation) Conservationists & ecologists (self service, automated services)
<i>Which ones have we established?</i>	Taxonomists (self service, community, co-creation) Conservationists & ecologists (self service)
<i>How are they integrated with the rest of our business model?</i>	Taxonomists (close: community and co-creation relationships are part of the workflow)
<i>How costly are they?</i>	?

IV. What is received in return?

VALUE IN RETURN

This is what the entity receives in return for the value proposition. It can be money (e.g. in the form of rent, sales revenue, commission) or other non-monetary elements of value (e.g. advertising space or future contracts). The Value in Return can be realised at different points of time.

REVENUE STREAMS	
<i>For what value are our customers really willing to pay?</i>	Unknown
<i>For what do they currently pay?</i>	Hard copy publication
<i>How are they currently paying?</i>	Would include exchange of publications and specimens which is one of the main forms of payment by African flora users in Africa
<i>How would they prefer to pay?</i>	Unknown
<i>How much does each revenue stream contribute to overall revenues?</i>	Unknown
COST STRUCTURE	
<i>What are the most important costs inherent in our business model?</i>	Unknown
<i>Which key resources are most expensive?</i>	Unknown
<i>Which key activities are most expensive?</i>	Unknown
<i>What controls/drives cost structures</i>	Unknown

V. How is the value proposition offered?

CHANNEL

The channel describes how the value exchanges take place. It transmits one, or more, of the value propositions and the value in return. More than one channel can be used to effect a transaction.

CHANNELS	<p>Channel phases:</p> <ol style="list-style-type: none"> 1. Awareness - How do we raise awareness about our company's products and services? 2. Evaluation - How do we help customers evaluate our organization's Value Proposition? 3. Purchase - How do we allow customers to purchase specific products and services? 4. Delivery - How do we deliver a Value Proposition to customers? 5. After sales - How do we provide post-purchase customer support?
<i>Through which channels do our customer segments want to be reached?</i>	Hard copy, web-portals, web services, mobile apps?
<i>How are we reaching them now?</i>	Hard-copy, web-portals,
<i>How are our channels integrated?</i>	Loosely
<i>Which ones work best?</i>	Unknown
<i>Which ones are most cost-efficient?</i>	Unknown
<i>How do we best compliment & support customer workflows?</i>	Currently unknown - likely through interoperability standards
<i>How do we provide customer support?</i>	Further collaborative work and partnerships, ad hoc response

VI. How is the value proposition created?

VALUE ADDING PROCESS

This element ties together the resources, activities, and capabilities of the entity to create the value proposition and/or the channel. It can be a manufacturing process, a retailing operation, or a service process. It describes how the value proposition is provided. At the most detailed level the value adding processes can be defined precisely (a process model can be constructed). However, at the external user and management levels, all that will be depicted, are the inputs and outputs of the value adding processes.

KEY RESOURCES	Resources: Include information technology hardware and software, intellectual property, financial, physical and human resources and may be provided by suppliers or generated internally. Include Capabilities: the expertise required by the entity to perform the activities. They are provided by resources (both human and other). Capabilities can be provided by an ally.
<i>What key resources do our value propositions require?</i>	Scientific and editorial staff, collections, literature, software, hardware
<i>What key resources do our distribution channels require?</i>	IT staff, IT infrastructure, designers, publishers
<i>What key resources do our customer relationships require?</i>	Market research
<i>What key resources do our revenue streams require?</i>	Fund raisers, financial backers
KEY ACTIVITIES	Activities: Are actions undertaken to convert resources into Value Propositions, or to operationalize a channel of transmission using the capabilities of the entity and its allies. Categories include production, problem-solving and platform/network
<i>What key activities do our value propositions require?</i>	Problem solving (field work, curation, research, editorial), activities required to know we have a valuable product i.e., achieve scientific excellence
<i>What key activities do our distribution channels require?</i>	Production (publication), platform/network (dissemination)
<i>What key activities do our customer relationships require?</i>	?
<i>What key activities do our revenue streams require?</i>	?

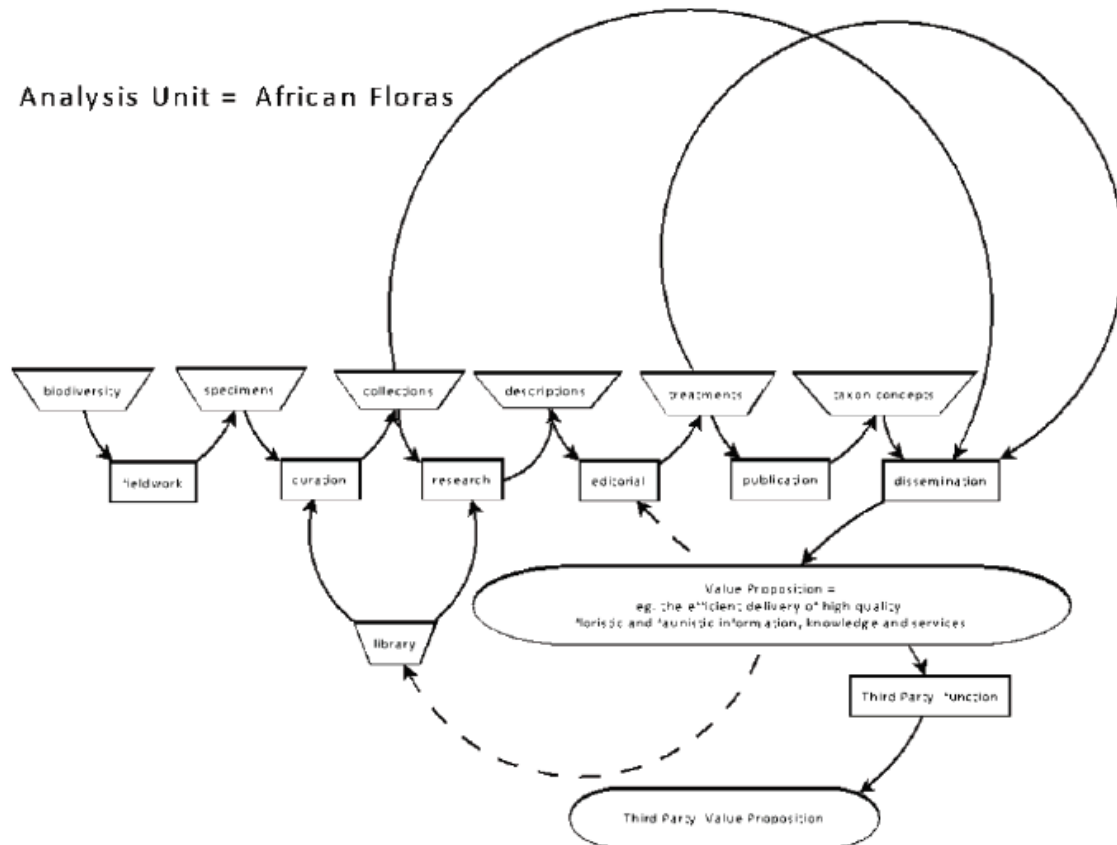
VII. What other entities contribute to creating and delivering the value proposition to the customer?

OTHER ENTITY

Other entities represent third parties that assist the enterprise to create or provide the value proposition to the customer, have some influence on how the enterprise creates or provides the value proposition, or they are involved with determining or providing the value in return. Common examples of other entities include suppliers of inventories, machinery and consumables and regulatory bodies that have some form of control over the operations of the enterprise. Other allies assist the entity in providing the value proposition to the customer, by providing the channel or becoming an outsourcing partner for various parts of the value adding process (Weill & Vitale 2001).

KEY PARTNERS	
<i>Who are our key partners</i>	Contributing taxonomists, editors, biodiversity institute network, in-country counterparts
<i>Who are our key suppliers</i>	?
<i>Which key resources are we acquiring from partners</i>	Specimen exchange and loan, expertise, knowledge, artwork
<i>Which key activities do partners perform</i>	Drafting accounts, editorial work
<i>What are the motivations for having partnerships</i>	Optimization and economy-spreading the work, reduction of risk and uncertainty, acquisition of particular resources and activities

Analysis Unit = African Floras



Assets (things of value)

- Biodiversity** - Animals, Fungi, Plants
- Specimens** - Samples of biodiversity with accompanying field notes
- Collections** - Curated repository of specimens
- Descriptions** - Characterisations of taxa
- Treatments** - Standardised descriptions (including nomenclature, distribution etc.), marked up legacy literature
- Taxon Concepts** - Authoritative taxon concept (reference)

Functions (activities with associated costs but which add value)

- Fieldwork** - collecting specimens, field observations, generalist, geographical or taxon focused, or project based.
- Curation** - access, digitisation, preservation, naming, systematic organisation, finding specimen related information.
- Research** - description, delimitation etc.
- Editorial** - scope definition, error checking, standards, mark-up of legacy literature.
- Publication** - making a citable reference
- Dissemination** - hard copy, web, mobile etc.

PART 3: “TOWARDS THE SUSTAINABILITY OF OUR JOINT INITIATIVE”

I. The vision

Would you agree that the overall vision of the project is to succeed 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)?

Please indicate below any questions, comments, remarks, disagreements you may have on this assessment (no text limitation).

III. The steps to make it happen

What are in your mind 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? (No text limitation)

Annex 2: Exploitation plans inputs from partners at M6

NATURALIS

Biodiversity information is considered core business for Naturalis. Our scientists are working in getting information based on the immense collection of more than 35 million specimens. The results of these studies are mainly distributed to the user community through scientific publications, such as articles in journals, books and Flora and fauna series.

We now consider these publications a necessary, but not always the only step towards the distribution of our knowledge. Modern information technology provides ample options to use the information in such publications in many different ways. It is Naturalis vision that this information shall be shared with other researchers, but also with other users. The technology as promoted by pro-iBiosphere is such a mechanism in which our knowledge can be used more efficiently, and more effectively.

One of the more attractive aspects of this project is that also much attention is paid to our heritage, viz., and the publications that appeared during the last centuries, also in our institute. We foresee to increase our output with so much information immediately available. Another attractive aspect is the cooperation with other institutes with similar background and vision.

Based on our vision of open access, we do not anticipate significant commercial use of our information, but this is one of the topics we will monitor during this project.

Additional inputs

From the Flora Agaricina Neerlandica (FAN):

- *Generate a digital database of the collections featured in FAN*
- *Increased value of FAN collections*
- *Facilitate increased use of FAN collections, e.g. in systematic, ecological or phylogeographic works*
- *Facilitate access to literature, data and figures through open access data portal (e.g., FUB-BGBM), when allowed by copyright issues*
- *Develop e-tools and biodiversity information systems to provide tailor made, customer driven information to stakeholders, such as the Dutch Mycological Society (NMV)*
- *Develop expertise in e-tools for capacity building*

From the Flora of the Guianas project (FoG):

The Flora of the Guianas project might profit from the activities of Pro-iBiosphere in the following issues:

- *Online publication: currently, the volumes of the FoG, which can include the taxonomic treatment of one or more families, are published only as hard copy. The FoG board wishes to have these taxonomic treatments, as well as upcoming ones, available online and with open accessibility. By participating in e-taxonomy workshops and other activities offered by pro-iBiosphere, I expect to be better informed about the different possibilities and costs of online publication, and to find partners/funding to implement it. Publication online will increase the reach of the Flora and attract new contributors.*

- *Updating taxonomic information: As editor and coordinator of the Flora, I aim to implement a system of periodical update of the taxonomic data produced within the FoG project, based on the experience and information acquired with the pro-iBiosphere mark-up pilot and the e-taxonomy workshops offered.*
- *I do not envision commercial exploitation perspectives within the FoG project.*

From the Flora Malesiana project:

- *Make optimal use of the physical collections*
- *Built optimally (monographically) validated and continuously updated information on Malaysian plant diversity*
- *Develop e-tools and biodiversity information systems to provide tailor made, customer driven information to stakeholders*
- *To include all available information on uses, conservation status based on the label data*
- *Develop expertise for capacity building*

Regarding Dutch species

For the next two years we have the following activities planned that might benefit by the results from pro-iBiosphere:

- *Connecting biodiversity literature to the taxonomic thesaurus of plants, animals and mushrooms of The Netherlands. The result of pilot 1 and 2 might increase our knowledge, or perhaps offer tools that we can use.*
- *Develop the Dutch Species Catalogue (www.nederlandsesoorten.nl) to a national information hub with species information.*
- *Developing identification tools, mostly multi-entry keys. Non-professionals are filling matrixes with species and their characteristics, which is very time consuming.*
- *Overall: we are disseminating knowledge via (digitised) books & magazines, web-platforms and apps. We use a cross medial approach. Users can access information in several ways, including all kinds of web services and api's.*

NGBG

We will use this project to develop our competencies in taxonomic publishing by developing the skills and experience of members of our institution. Many of our taxonomists want to use digital publishing, but have no experience and are unaware of current developments. The workshops of pro-iBiosphere will train several people to use these tools.

Pro-iBiosphere will help developing communication and relationships between European institutions also interested in streamlining taxonomic publication. As a medium-sized institution it is important for us to collaborate with other institutions to benefit from economies of scale. We hope that pro-iBiosphere will help us build links with other consortium institutions and other institutions that contribute to the project in workshops, seminars, etc.

These institutional ties will be developed to seek additional funding for digital taxonomic tools, management and infrastructure.

The scientific, educational and opinion publications of the Botanic Garden are some of our primary products and are necessary for us to fulfil our missions of providing authoritative information on biodiversity. If we can find ways to increase our publication rate, reduce the overheads per publication and bring work to publication faster we will directly increase our productivity.

FUB-BGBM

The Botanic Garden and Botanical Museum Berlin-Dahlem (BGBM) based at Freie Universität Berlin (FUB) provides a combination of international collaborative efforts and scientific production in both systematic research and biodiversity informatics. Research activities are focused on six thematic areas addressed by the BGBM research groups Asterales, Caryophyllales, Diatoms, Cuba & Caribbean, Euro+Med, and Biodiversity Informatics.

Apart from conducting hypothesis-driven specific scientific studies, the BGBM research groups are responsible for or contribute to a number of long term initiatives compiling, managing, and publishing floristic information about specific taxonomic groups or geographic regions. This includes, for example, Euro+Med Plantbase, Med-Checklist, Flora of Cuba, Flora Hellenica, Flora of Cyprus, Dendroflora of El Salvador, AlgaTerra, and the International Cichorieae Network. BGBM is also a signatory to the MoU establishing the institutional partnership to create a World Flora Online, thus fulfilling target 1 of the Global Strategy for Plant Conservation, which was adopted by the Conference of the Parties of the United Nations Convention on Biological Diversity.

In all initiatives the issue of streamlining the processes of data acquisition, information management, and data publication in web portals and in printed form is crucial as taxonomic expertise is an (increasingly) rare and precious good and should be unburdened from tasks that can potentially be handled by methods provided by computer science and biodiversity informatics. Pro-iBiosphere supports this approach and we expect to benefit from project results in particular in three areas:

- **Data acquisition:** presently, in almost all of our projects, the acquisition of greater amounts of data stemming from unstructured or semi-structured resources (e.g. printed Floras, web-pages, MS-Word lists and tables) is handled by data import mechanisms lacking standardisation. Practically this means that data imports often have to be implemented on an individual basis which therefore makes them time consuming and expensive. We hope that pro-iBiosphere activities in WP3 and WP4 will help us to optimize this process by offering i) standard software components for semantic mark-up of semi-structured source documents, ii) agreeing on standard target XML schemas produced by mark-up activities, and iii) providing data import-software components implementing the agreed standards.
- **Data management:** the biodiversity informatics community has provided several software platforms which can be used for data management, two of them being the Scratchpad-system coordinated by the NHM and the EDIT Platform for Cybertaxonomy coordinated by the BGBM. In pro-iBiosphere, we expect to broaden the User-base of the EDIT platform supported by cooperation and outreach activities in WP2 and WP5. In particular, we hope to be able to train a group of “power-users” in our institutions which will then be in the position to train and support external users beyond the funded pro-iBiosphere phase.
- **Data publication:** creating publications directly from data management platforms is a vision shared by almost all biodiversity information platforms. With pro-iBiosphere’s activities for improving interoperability between infrastructures such as PLAZI, Pensoft, and the EDIT Platform for Cybertaxonomy, we hope to be able to offer functionalities helping taxonomists to create research papers directly from their data management platform. Also we hope to be able to improve data feedback mechanisms allowing data managers to re-integrate results from a publication review process in their scientific base data.

PENSOFT

The exploitation of project results by Pensoft is directed towards:

- Automatisation of the registration process of new taxon names in Global indexers. Currently Pensoft is using semi-automated process of registration of new taxon names in electronic registers for species information (International Plant Names Index (IPNI), Index Fungorum, MycoBank, ZooBank). Within pro-iBiosphere, Pensoft will develop a common XML-query model for automated registration of nomenclatural acts between publishers and the electronic registers for higher plants (IPNI), fungi (Index Fungorum, MycoBank) and animals (ZooBank). Pensoft will utilise the new model and develop a fully automated module for registration of nomenclature acts published in the journals Zookeys, PhytoKeys and Mycokeys.
- Pensoft will also benefit from the outcomes of Task 4.1 aiming to develop workflow linking the legacy and prospective biodiversity literature and data through mark-up standards and tools.

SIGMA

Sigma Orionis specialises in services supporting collaborative research and global innovation in ICT. Therefore, the company does not envision to and will not directly exploit project results.

However our involvement in an important and very visible project such as pro-iBiosphere, and our position as leader of the WP5 addressing dissemination and leader of the Task 6.3 on exploitation plans and business models will significantly enhance our experience in infrastructures developments, our expertise in dissemination and exploitation activities, and our corporate image and international reputation. It will also extend our network of international contacts in the ICT domain.

For these reasons, our involvement in the pro-iBiosphere project will logically and notably increase the potential of the company as far as its four services are concerned: technology and market research, promotion and exploitation of research projects, organisation of cooperation and business events, support to the involvement in EU-funded programmes.

RBGK

- Obtain information on the costs and benefits of Flora production including comparative data across partners
- Better understanding of audiences of Floras and their requirements for information
- Increased ability to target products to audiences and to increase their use
- Better understanding of the costs of production and maintenance
- Better understanding of different business models and approaches for sustaining Flora production and dissemination
- Identify opportunities for further funding (commercial and non-commercial)
- Identify opportunities for institutional collaboration in building, managing and disseminating Floras and related tools and systems
- Ability to pool together information from Floras and faunas and analyse data

PLAZI

Plazi is promoting open access to scientific content. Its activities are centred on the legal aspects, access to content hidden in legacy publications, and ways forwards. Plazi also funded a SME to provide services to convert legacy publications into semantically enhanced documents, to build and maintain a treatment repository, to provide consultancy for publishers interested in converting from traditional journal production workflows into an XML based workflow. Plazi is also interested to develop legal language that will facilitate easier access to the scientific content.

This project allows getting feedback for our operations, to talk to potential publishers, which might lead to business, and we gain a deeper insight into science publishing policies and how it is handled by the different partners in this project and those with whom we will cooperate to write the proposed reports.

MfN

In general, pro-iBiosphere will provide better access to and facilitate the use of taxonomic (legacy) information for scientists working at the Museum für Naturkunde. The proposed products and tools of pro-iBiosphere have the potential to increase the number and speed of taxonomic publications. Furthermore, they will facilitate (international) community building and may increase the use of the museum's collections by facilitating the location of specimens of our collection. In addition, the taxonomic output of the institution will be disseminated in a more efficient way.

At the MfN scientists still follow the more traditional workflow in producing faunas. Raising awareness that there are sophisticated online tools for data extraction, best practice workflows and yet unknown ways of collaboration will help to improve the efficiency in producing these faunas at MfN. The training of individual scientists in the use of these tools will not only increase the output and quality of work, but also change and modernise scientific workflows at MfN. Respectively, this will enable scientists to undertake more challenging (large-scale) taxonomic projects in a reasonable time. Furthermore, new ways of scientific collaboration can be introduced to the scientists at MfN, which may extend the (international) collaboration network of the museum.

Pro-iBiosphere will enable sophisticated extraction and dissemination of taxonomic information from digitised legacy literature, which is a strong argument for pushing the digitisation of faunas and Floras and similar legacy literature at European institutions. Therefore, the BHL-Europe project, formerly coordinated by MfN, will benefit from pro-iBiosphere activities by a potential increase of digital content produced throughout Europe. The close collaboration of BHL-Europe with the pro-iBiosphere project will help to disseminate BHL-Europe workflows, standards, and best practises. Potentially, the collaboration of BHL-Europe and pro-iBiosphere will kick-off new development or improvements of the BHL-Europe technical architecture, which will allow a better integration and connectivity of services, developed by pro-iBiosphere. Consequently, the BHL-Europe portal users will gain better access to taxonomic information contained in legacy literature presented by BHL-Europe through the semantic mark-up tools provided by pro-iBiosphere.

As of late MfN is hosting the web platform of the Fauna Europaea. A business model and future perspectives for Fauna Europaea will be developed over the course of the next years at MfN. At the moment the integration of Fauna Europaea with the EDIT Platform is underway. Therefore, a close alignment of Fauna Europaea and pro-iBiosphere activities will be beneficial for both initiatives/ projects.



Annex 3: Business models - consolidated answers from partners

	Q	BGBM	MfN	NaturalisDF	NaturalisFAN	NaturalisFGu	NaturalisNAT	NaturalisFM	NaturalisFGa	NaturalisVT	NBGB	Pensoft	Plazi	RBGK
V P1	What are the business drivers for our institutes?	Mission, statutory responsibilities (including higher education), sustainability, scientific excellence	Our mission (“Discovering and describing life and earth – with people, through dialog”) and vision (“As an excellent research museum and innovative communication platform, we want to engage with and influence the scientific and social discourse about the future of our planet – worldwide”)	Mission, statutory responsibilities, profit, sustainability, focus of collections, teaching opportunities, visibility, national expertise centre	Mission, statutory responsibilities, profit, sustainability, increased use and value of collections, teaching and research opportunities	Mission, statutory responsibilities, profit, sustainability, focus of collections, teaching opportunities, visibility	Mission, statutory responsibilities, profit, sustainability	Mission, statutory responsibilities, profit, sustainability, focus of collections, teaching opportunities, visibility	Mission, statutory responsibilities, profit, sustainability, focus of collections, teaching opportunities, visibility, scientific publications	To describe, understand and explore biodiversity for the well-being of man and the future of our planet.	Fulfilling our mission in custodians of scientific collections, scientific research, conservation, and education.	Sustainability, reputation, mission, profit	Mission, Vision, business, ability to get grants,	Mission, statutory responsibilities, profit, sustainability MJ - do not agree with ‘profit’ above! I assume here we should spell out the main objectives of Kew rather than simply refer to ‘mission’ etc. e.g. a) better understand and conserve plant and fungal biodiversity b) increase use and impact of our information resources c) sustain our activities through increased generation of income



V P2	<i>What value do we deliver to the customer?</i>	Comprehensive and authoritative floristic information	Comprehensive and authoritative faunistic information (Recent and extant taxa)	Comprehensive and authoritative floristic information, validated reference collections	Comprehensive information, better access to literature, validated reference collections	Comprehensive and authoritative floristic information in the Guianas region, validated reference collections	Validated information, maintenance, continuity	Comprehensive and authoritative floristic information, validated reference collections	Comprehensive and authoritative floristic information, validated reference collections, IUCN Red Data list assessments, basic data on uses, vernacular names, key literature, improved quality of ecotourism holidays, high quality collection data to be used in biodiversity assessment and other studies or conservation actions	Knowledge on biodiversity	Authoritative information on all matter relating to plants and fungi. Training in Botany. Ex-situ conservation of plants.	Comprehensive and authoritative faunistic, floristic and mycological information; popularisation of taxonomy, integration of taxonomic data and information	Well defined content (treatments); tools to convert legacy publications in semantic enhanced publications; advice; legal advice	Comprehensive and authoritative floristic information NB: We have an imperfect understanding of how our products are used and how well targeted, and look to this project to help us better understand and describe our audiences and the value we deliver to them.
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V P3	<i>Which one of our customer's problems are we helping to solve?</i>	Finding information about particular species (e.g. distribution, thread status, specimens).	Access to comprehensive (and easy-to-retrieve) information about the European fauna (Fauna Europaea, http://www.faunaeuropa.org/), butterfly families (GloBIS, http://www.globis.insects-online.de/), Rhopalosomatidae (http://rhopalosomatidae.hymis.eu/) and others	Finding specific information about plant taxa; identifying plant specimens; compiling taxonomic and morphological information for complete taxa revisions;	Finding information about species of macrofungi found in the Netherlands and in Western Europe	Finding specific information about species of plants in our focus area; compiling taxonomic and morphological information for complete taxa revisions	Finding trustworthy information about Dutch species. Identification of species	Finding specific information about plant taxa; identifying plant specimens; compiling taxonomic and morphological information for complete taxa revisions;	Finding specific information about species of Malaysian plants; identifying plant specimens; compiling taxonomic and morphological information for complete taxa revisions; finding key literature; obtaining reliable biodiversity information; getting the correct name for a species/taxon	Information on biodiversity at the level of organisms, ecosystems and characters	Finding information about plants and fungi, such as knowing which plants to conserve.	Finding faunistic, floristic and mycological information, diminished value of taxonomic research, poor visibility of taxonomic data, lack of common platform for integrated taxonomic data	Access to treatments of taxa, data mining tools	Finding information about species of African plants NB: We have an imperfect understanding of our customer's problems and how Floras are used and could be used to resolve them, and look to this project to help us better understand and describe our audiences and their problems.
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V P4	<i>What bundles of products and services are we offering to each customer segment?</i>	Printed Floras and checklists, web-based information systems, web services, data management software, university courses (currently suspended)	web portals for online search, (printed faunas, printed field guides)	Printed Floras, web-based information systems and identification tools; species checklists for specific areas	Printed Floras, web-based information systems and identification tools	Printed Flora; species checklist (in development)	Books, magazines, digital species register, identification tools, identification services	Printed Floras, web-based information systems and identification tools; species checklists for specific areas	Printed Floras, web-based information systems and identification tools; species checklists for specific areas; high quality and georeferenced specimen database; identification expertise; simple guides for ecotourists;	Revisions, identification keys, analysis of distribution patterns and dynamics of distribution, character analysis, expert advice	Floral works; improved accessibility to plant and fungi information; new knowledge on plants and fungi; training to students; ex-situ conservation of living plants and plant seeds.	Electronic and printed information on systematics, phylogeny, biogeography, ecology and biodiversity of animals, plants and fungi	Access to treatments and subsections (ie cited observations); tools, legal advice	Printed Floras, printed field guides, web-based NB: We have an imperfect understanding of who uses our products and how well targeted are the different products and services we offer, and look to this project to help us better understand and describe our audiences and their needs.
V P5	<i>Which customer needs are we satisfying?</i>	Identification of specimens, nomenclatural problems, describing plant distribution, describing plant characteristics, organising and maintaining scientific data	Access to information on species/ taxa, e.g. text description, geographic distribution, nomenclatural variants (synonyms), common names, taxonomic status, type information (locality, material), hierarchical position, associated multimedia objects (species images, labels), experts contacts, associated references (including species protologues)	Identification of specimens, correct nomenclature, describing plant distribution, describing plant characteristics, indication of related taxa, indication of uses and conservation status, validation of observations	Identification of specimens, correct and updated nomenclature, systematic context (related taxa)	Identification of specimens, correct nomenclature, describing plant distribution, describing plant characteristics, indication of related taxa, indication of uses	Identification of specimens, nomenclatural problems, describing distribution, describing characteristics, describing biology of species	Identification of specimens, correct nomenclature, describing plant distribution, describing plant characteristics, indication of related taxa, indication of uses and conservation status	Identification of specimens, correct nomenclature, describing plant distribution, describing plant characteristics, indication of related taxa, indication of uses, rareness and conservation status	All questions related to biodiversity (we are a brooker of information for those fields for which we do not have expertise ourselves)	Their need to get fast and reliable information on plant and fungal diversity; safeguarding plant diversity for future generations	Publication of all types of taxonomic information and data, dissemination of taxonomic content, popularisation of taxonomic outcomes, integration of taxonomic information and data	Aggregators (EOL, GBIF); webmasters, taxonomists,	Identification of specimens, nomenclatural problems, describing plant distribution, describing plant characteristics NB: We have an imperfect understanding of our customer needs and how far these are being satisfied and look to this project to help us better understand this.



CS 1	<i>For whom are we creating value?</i>	Taxonomists, Students, Conservationists, Ecologists, Environmental Scientists, Policy Makers	Taxonomists, Conservationists, Ecologists, Environmental Scientists, Policy Makers, Citizen Scientists, Stakeholders	Taxonomists, Conservationists, Ecologists, Environmental Scientists, Policy Makers, Pharmacologists, Botanists, Foresters, Land use planners, Law makers, Plant growers, Ecotourists, students, volunteer networks (natural history), Citizen Scientists, Agricultural scientists, Consultancies	Taxonomists, Conservationists, Ecologists, Environmental Scientists, Policy Makers, Land use planners, amateur mycologists, general public	Taxonomists, Students, Conservationists, Ecologists, Environmental Scientists, Policy Makers, Pharmacologists, Botanists, Foresters, Land use planners, Law makers, Plant growers, Ecotourists	Taxonomists (professional and non-professional), Nature Observers, Policy Makers, Conservationists, Educators, Ecologists, Environmental Scientists	Taxonomists, Conservationists, Ecologists, Environmental Scientists, Policy Makers, Pharmacologists, Botanists, Foresters, Land use planners, Law makers, Plant growers, Ecotourists, students	Taxonomists, Conservationists, Ecologists, Environmental Scientists, Policy Makers, Pharmacologists, Foresters, Land use planners, Law makers, Plant growers, Ecotourists, students	Taxonomists, Conservationists, Ecologists, Environmental Scientists, Other biologists, Policy Makers, general public, Professional amateurs, Commercial companies	Taxonomists, Conservationists, Ecologists, Environmental Scientists, Policy Makers, Schools & Universities, ethnobotanists, horticulturalists, the pharmacy industry, the general public.	Taxonomists, Ecologists, Environmental scientists, Conservationists, Bioinformaticians, Data managers, Genetists	Taxonomists, Conservationists, Ecologists, Environmental Scientists, Policy Makers, Aggregators	Taxonomists, Conservationists, Ecologists, Environmental Scientists, Policy Makers NB: We have an imperfect understanding of who uses our products, and look to this project to help us better understand and describe our audiences and their needs.
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CS 2	<i>Who are our most important customers?</i>	Taxonomists, Students, Conservationists	Taxonomists, Citizen Scientists, Policy Makers	Policy Makers? Conservationists, Ecologists, Taxonomists, students, citizen scientists, volunteer networks (natural history)	Taxonomists, Land use planners, amateur mycologists	Taxonomists, Ecologists, Foresters	Taxonomist, nature observers, policy makers, managers of nature reserves	Policy Makers? Conservationists, Ecologists, Foresters, Taxonomists	Policy Makers? Conservationists, Ecologists, Foresters, Taxonomists	Depending on field of expertise	Policy Makers, Conservationists	Taxonomists, systematists, bioinformaticians, data managers, ecologists, genetists, conservationists	Aggregators, publishers, scientists	Policy Makers? Conservationists MJ - we ought to define 'importance' - are these the audiences we most want to target, or the audiences we think are the major current users?
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C R 1	<p><i>What type of relationship does each of our Customer Segment expect us to establish and maintain with them?</i></p>	<p>Taxonomists (self-service, automated services, community, co-creation) Conservationists (self-service, automated services)</p>	<p>Citizen Scientists, Taxonomists – provider/ user relationship (provision of automated services for search and information retrieval, maintenance of community platforms); collaborator relationship (options for co-creation of content) Conservationists, Ecologists, Environmental Scientists – provider/ user relationship (provision of automated services for search and information retrieval, maintenance of community platforms) Policy Makers, Stakeholders – consulter, advisor, and partner relationship (provision of reliable information, information summaries, numbers, and statistics)</p>	<p>Taxonomists (self-service, automated services, community, co-creation) Policy makers, Citizen scientists, volunteer networks (natural history) Foresters, Environmentalists, Conservationists & ecologists (self-service, automated services, instant tailor made information on request)</p>	<p>self-service, automated services, tailor made information on request</p>	<p>Taxonomists: self-service, individual cooperation or in a network Others (from row 1): self-service, automated services, specific information on request</p>	<p>Taxonomists & observers (self-service, automated services, community, co-creation) Policy makers & managers (self-service, automated services)</p>	<p>Taxonomists (self-service, automated services, community, co-creation) Policy makers, Foresters, Environmentalists, Conservationists & ecologists (self-service, automated services, instant tailor made information on request)</p>	<p>Taxonomists (self-service, automated services, community, co-creation) Policy makers, Foresters, Environmentalists, Conservationists & ecologists (self-service, automated services, instant tailor made information on request) Ecotourists: simple local guides to wildflowers</p>	<p>Taxonomists (self-service, automated services, community, co-creation) Conservationists & ecologists (self-service, automated services)</p>	<p>Taxonomists (self-service, automated services, community, co-creation) Conservationists & ecologists (self-service, automated services, personal assistance) Schools & Universities (Automated Services, Dedicated Personal Assistance, Self-Service). Funding agencies, governmental, foundations (self-service, automated services, community, co-creation)</p>	<p>All types of customers expect from us self-service and automated services</p>	<p>Taxonomists (self-service, automated services, community, co-creation) Aggregators (API) Publishers (markup service and access provider for them) General users (self-service, automated services)</p>	<p>Taxonomists (self-service, automated services, community, co-creation) Conservationists & ecologists (self-service, automated services) NB: We have an imperfect understanding of what our customers want from us, and look to this project to help us better understand this.</p>
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C R 2	<i>Which ones have we established?</i>	Taxonomists (self-service, community, co-creation) Conservationists (self-service)	(Citizen Scientists), Taxonomists - automated services for search and information retrieval, community, co-creation Conservationists, Ecologists, Environmental Scientists - automated services for search and information retrieval	Taxonomists (self-service, community, co-creation) Policy makers, Citizen scientists, volunteer networks (natural history)Foresters, Pharmacologists, Environmentalists, Conservationists & ecologists (self-service, identification services)	self-service, automated services,	Taxonomists: all mentioned above Others (from row 1): only self-service	Taxonomists & observers (self-service, community, co-creation) Policy makers & managers (self-service)	Taxonomists (self-service, community, co-creation) Policy makers, Foresters, Pharmacologists, Environmentalists, Conservationists & ecologists (self-service, identification services)	Taxonomists (self-service, community, co-creation) Policy makers, Foresters, Pharmacologists, Environmentalists, Conservationists & ecologists (self-service, identification services) Ecotourists: none?	Taxonomists (self-service, community, co-creation) Conservationists & ecologists (self-service)	Taxonomists (self-service, community, co-creation) Conservationists & ecologists (self-service) Schools & Universities (dedicated Personal Assistance, Self-Service) Funding agencies, governmental, foundations (self-service, automated services, community, co-creation)	Self-service and semi-automated services	Taxonomists (self-service, community, co-creation) Aggregators (API, transfer protocol) Publishers (consultancy)	Taxonomists (self-service, community, co-creation) Conservationists & ecologists (self-service)
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C R 3	<i>How are they integrated with the rest of our business model?</i>	Taxonomists (close: community and co-creation relationships are part of the workflow)	Unknown	unknown Others may provide data and collections as a corollary of their own work	Taxonomists (close: community and co-creation relationships are part of the workflow)	Taxonomists: close (part of the workflow) Others: not formally integrated, occasional may provide data and collections as a corollary of their own work	Taxonomists & observers (close: community and co-creation relationships are part of the workflow) Policy makers & managers (average: acting as stakeholders and funders)	Taxonomists (close: community and co-creation relationships are part of the workflow) Others may provide data and collections as a corollary of their own work	Taxonomists (close: community and co-creation relationships are part of the workflow) Others may provide data and collections as a corollary of their own work	Taxonomists (close: community and co-creation relationships are part of the workflow)	Taxonomists (haphazardly) Conservationists & ecologists (haphazardly) Schools & Universities (part of our mission)	Not fully integrated	Taxonomists / Publishers provide content to make accessible to aggregators	Taxonomists (close: community and co-creation relationships are part of the workflow) MJ - not sure what this question really means!
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C R 4	<i>How costly are they?</i>	We usually do not have clearly delimited and defined capacities dedicated to “customer relations”. An exception is the BioCASE-helpdesk at the BGBM which which is a half-time tenured position dedicated to support both users and providers of specimen and observational data.	Unknown	unknown	Unknown	? The customer relationships? Or the products we offer? I did not get	There are more profits than costs. Taxonomists are volunteering to add. Observers use our tools and information	? The customer relationships? Or the products we offer? I did not get	? The customer relationships? Or the products we offer? I did not get	Unknown	Unknown	Unknown	We do not have an idea of how much the services are worthwhile since payment comes from grants (eg pro-iBiosphere)	? We do not have this information to hand and will need to consider how to assemble it.
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RS 1	<i>For what value are our customers really willing to pay?</i>	Unknown. With the exception of printed products, CDs, etc., presently most electronic information systems and services provided by biodiversity informatics are freely available which makes it hard to place products which are not free. However, there are several software products (e.g. collection software, descriptive data tools) which are not free and found their market. Still, most of the software developments are open source products.	Printed publications	< 100,000 Euro / year (mainly pertaining to invasives)	Unknown	Unknown	Policy makers act as stakeholders and are funding parts of our tools and information	< 100,000 Euro / year Flora of the Guianas: unknown	< 100,000 Euro / year Flora of the Guianas: unknown Flora du Gabon: training and capacity building; getting positive eco-attention (Total...); improved quality of holidays; expert identification; baseline inventory work (mining companies etc.)	Commercial partners pay about 1000 euro/day for advice; most customers, however, do not wish to pay significant amounts of money (except via taxes)	This needs investigation. Most customers expect information for free, or at a minimal cost. It is unlikely that many will pay if that was a requirement. Some of these customers also act as suppliers to the Botanic Garden so informally they are rewarded by free services. Some customers, however, are prepared to pay: mining companies, forestry companies, ... Policy makers are paying through funding projects.	High quality papers published in a High-impact Factor technology advanced peer-reviewed journals that are widely disseminated and integrated automatically in various global databases	Publishers: make their content accessible, conversion Aggregators: access to content (eg GBIF, EOL) Legal issues: Grants (eg EU)	Unknown.
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RS 2	<i>For what do they currently pay?</i>	Hard copy publication.	Hard copy publication	Hard copy publication, field guides, CD-ROM, App Identification services, collection information, training	Hard copy publication	Hard copy publication, training	One-time funding for technical development and accessibility to species content (pollinators, invasive species)	Hard copy publication, field guides Identification services, collection information, training	Hard copy publication, field guides Identification services, collection information, training Flore du Gabon: also very limited salary costs	Hard copy publication, consultancy	Hard copy publication, though this barely covers publication costs; providing specific distributional data; ex-situ conservation of seeds or plants.	We are currently providing these services to our customers; exception – PhytoKeys and MycoKeys are tracked for inclusion in WOS by Thompson Reuters, but are not yet listed	Access to treatments, conversion of documents, legal advice	Hard copy publication.
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RS 3	<i>How are they currently paying?</i>	Journal fees. Regular purchase of books, etc., exchange of publications.	Unknown	Identification services Doublets of collections Access to data bases Training grants Hard copies, CD-ROM's, Apps	Unknown	Unknown	Co-creation, funding, exposure	Would include exchange of publications and specimens which is one of the main forms of payment by Malesian Flora users Identification services Doublets of collections Access to data bases Training grants Flore du Gabon: field expeditions, (limited) salary, preparation of drawings, production of outreach publication	Would include exchange of publications and specimens which is one of the main forms of payment by Malesian Flora users Identification services Doublets of collections Access to data bases Training grants Flore du Gabon: field expeditions, (limited) salary, preparation of drawings, production of outreach publication	Cash; some colleagues pay through services to the institute	In general by exchange of publications and specimens which is one of the main forms of payment by African Flora; in the case of mining and forestry companies by funding projects.	e-pay or by direct transfers	Grants, consultancy, conversion	Purchases of publications. Would include exchange of publications and specimens which is one of the main forms of payment by African Flora users in Africa
RS 4	<i>How would they prefer to pay?</i>	Unknown	Unknown	So far, in connection to legal obligations	Unknown	Unknown	Unknown	So far, in connection to legal obligations	So far, in connection to legal obligations,? on project basis	Unknown	n/a	Pay Pall, Card transfer, cheques, bank to bank transfer	For a product (x amount of conversion of documents and x treatments accessible; policies	Unknown



RS 5	<i>How much does each revenue stream contribute to overall revenues?</i>	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown. Publication pricing is generally set to cover the costs of printing and publication, excluding authorship costs (MJ - is this true?)
CO 1	<i>What are the most important costs inherent in our business model?</i>	Personnel costs for scientific staff (taxonomists, computer scientists)	Unknown	Research, Expertise, training, e-tools, barcoding	Expertise, training, e-tools, DNA barcoding	Research, Expertise, training, e-tools, barcoding (not yet started)	Organisational and technical developments and maintenance	Research, Expertise, training, e-tools, barcoding	Research (so, salaries!), Expertise, training, e-tools, digitisation of collections, DNA barcoding, expeditions/field work, herbarium visits	Unknown	Salaries of taxonomists and qualified technicians. Publishing costs. IT support and infrastructure. Travel costs.	Unknown	Routine work, paperwork	Unknown. Major costs are probably associated with the gathering of information, authorship (including taxonomic research and decision-making); printing and publication; ongoing sustainability of web products.	
CO 2	<i>Which key resources are most expensive?</i>	Personnel costs	Scientific and technical staff time	Human resource and expertise	Human resources and expertise	Human resource and expertise	Content, for example matrixes with species characteristics for identification tools	Human resource and expertise	Human resources and expertise	Personnel, collection management and preservation, laboratories	Probably IT infrastructure and scientific equipment, expedition costs.	Unknown	Human resources	Unknown	



C O 3	<i>Which key activities are most expensive?</i>	Unknown	Support of infrastructure, (scientific) information retrieval, quality assurance of data	Data basing, Bar-codes	Databasing (at present, none of the fungal collections are available in digital format), DNA barcoding	Unknown	Research and development, maintenance of systems	Data basing, Bar-codes	Atomising data, expeditions/field work, Data basing, DNA Barcoding, herbarium visits, editorial work	Research activities, collection management	Primary taxonomic research and the collecting of resources required for this.	Programming and maintaining of the e-infrastructure; printing costs	Conversions, writing code, maintaining infrastructure	Unknown
C O 4	<i>What controls/drives cost structures</i>	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Governmental control and the demands of funding agencies.	Unknown	Negotiations without any comparative values	Unknown
C H 1	<i>Through which channels do our Customer Segments want to be reached?</i>	Data: Hard copy publications, web portals, workshops, individual communication, helpdesk Software: web portals, workshops, and individual communication, helpdesk	Hard copy, web portals, web services, mobile apps	Hard copy, web portals, web services, mobile apps? Training	Hard copy, web portals, web services, mobile apps, meetings / workshops	Hard copy, web portals, web services, mobile apps, training opportunities, scientific meetings	Books, magazines, web portals, web services, apps, exhibits	Hard copy, web portals, web services, mobile apps? Training	Hard copy, web portals, web services, mobile apps?! Training	Hard copy, web portals, web services, mobile apps, personal advice.	Hard copy, email, web portals, web services, mobile apps.	Hard copy, web portals, web services	Web, APIs	Hard copy, web portals, web services, mobile apps? NB: We have an imperfect understanding of who uses our products and how, and look to this project to help us better understand and describe our audiences and their needs.



CH2	<i>How are we reaching them now?</i>	Data: Hard copy publications, web portals, workshops, individual communication Software: workshops, and individual communication	Hard copy, web portals, mobile apps	Hard copy, web portals, Training and education	Hard copy, web portals, meetings / workshops	Hard copy, training, scientific meetings	Books, magazines, web portals, web services, apps, exhibits	Hard copy, web portals, Training and education	Hard copy, web portals, Training and education, scientific and outreach publications	Hard copy, web portals, personal contacts	Hard copy, web portals.	Hard copy, web portals	Web, APIs	Hard copy, web portals,
CH3	<i>How are our channels integrated?</i>	Loosely	Currently no integration	Loosely	Loosely	Loosely	Loosely, f.e. taxonomic and biological content in books is placed on web portals as well. Identification of certain species groups is published in magazines, on web portals and apps, and will be accessible in exhibits	Loosely	Loosely	Loosely	Loosely.	Well integrated	tightly	Loosely and ad hoc if at all
CH4	<i>Which ones work best?</i>	Unknown	Unknown	Unknown	Unknown	Unknown	Not one, but cross medial	Unknown	hard copy; verbally transmitted assessments of expertise	Personal contacts	Probably self-service web portals and services.	Pensoft's Online publishing system	Unknown	Unknown



CH5	<i>Which ones are most cost efficient?</i>	Unknown	Unknown	A mixture; Flora of the Guianas: hard copy publication,	Unknown	Unknown	Unknown. Investments in old media and new media are both expensive	A mixture; Flora of the Guianas: hard copy publication,	A mixture; Flora of the Guianas: hard copy publication, Flore du Gabon, idem, as long as external researchers/honorary staff is offering manuscripts!	Unknown	We suspect internet based services are cheaper than printed literature, but this needs investigation, particularly in Africa.	Pensoft's Online publishing system	Once established all are cost efficient	Unknown
CH6	<i>How do we best compliment & support customer workflows?</i>	Unknown	Thorough assessment of customer's needs and workflows Interoperability of exchange standards	Currently unknown - likely through interoperability standards	Currently unknown - likely through interoperability standards	Currently unknown - likely through interoperability standards	Interoperability and usability	Currently unknown - likely through interoperability standards	Currently unknown - likely through interoperability standards	Currently unknown - likely through interoperability standards	By providing information in a standard format. By insuring the information we provide is widely dispersed, accessible and reusable, for example by not restricting use by copyright.	Currently unknown - likely through interoperability standards	API	Currently unknown. Interoperability standards will probably be important for integration into customer workflows.



CH7	<i>How do we provide customer support?</i>	Ad hoc response, helpdesk if sufficient resources are available (example: BioCASE).	Direct contact and communication (contact forms) Further collaborative work and partnerships	Further collaborative work and partnerships, ad hoc response, Training opportunities at all levels	Further collaborative work and partnerships, ad hoc response	unknown	Further collaborative work and partnerships, ad hoc response	Further collaborative work and partnerships, ad hoc response, Training opportunities at all levels	Further collaborative work and partnerships, ad hoc response, Training opportunities at all levels	Further collaborative work and partnerships, ad hoc response	Informally, usually through direct contact and email.	Further collaborative work and partnerships, ad hoc response	Email, face to face meetings, skype, google hangout	Further collaborative work and partnerships, ad hoc response
KR1	<i>What key resources do our value propositions require?</i>	Scientific and editorial staff, collections, literature, software, hardware	Scientific and editorial staff, collections, literature, software, hardware	Scientific and editorial staff, collections, literature, software, hardware	Scientific and editorial staff, staff for digitalisation of the collections, literature, software, hardware	Scientific and technical staff, collections, literature, software, hardware	Scientific and editorial staff, communities, collections, literature, software, hardware	Scientific and editorial staff, collections, literature, software, hardware	Scientific and editorial staff, collections, literature, software, hardware	Scientific and editorial staff, collections, literature, software, hardware	Scientific and editorial staff, collections, literature, IT infrastructure, scientific apparatus.	Scientific and editorial staff, software, hardware	Coders, system administrators; administrators, people being able to do consultancies	Scientific and editorial staff, collections, literature
KR2	<i>What key resources do our distribution channels require?</i>	IT staff, IT infrastructure, designers, publishers	IT staff, IT infrastructure, designers, publishers	IT staff, IT infrastructure, designers, publishers	IT staff, IT infrastructure, designers, publishers	IT staff, IT infrastructure, publishers	Funding, IT staff, IT infrastructure, designers, publishers, exhibit developers	IT staff, IT infrastructure, designers, publishers	IT staff, IT infrastructure, designers, publishers	IT staff, IT infrastructure, designers, publishers	IT staff, IT infrastructure, designers, publishers.	IT staff, IT infrastructure, designers, publishers	IT staff, IT infrastructure, designers, consultant specialists	IT staff, IT infrastructure, designers, publishers



K R 3	<i>What key resources do our customer relationships require?</i>	staff for user training and helpdesk	Scientific staff, consultants	Market research, promotion of new services	Market research, promotion of new services	Unknown	Market research, communication, accessibility, feedback opportunities, participation, thinking along	Market research, promotion of new services	Market research, promotion of new services	Market research	Good physical access to collections. High quality curation.	Market research	Market research, personal contacts	Market research, MJ - if this question is about how we are now, then I would suggest that our customer relationships are vestigial but basically include science staff, publications sales support, IT support, etc.
K R 4	<i>What key resources do our revenue streams require?</i>	Fund raisers	Unknown	Fund raisers, financial backers, lobbyists, students	Fund raisers, financial backers, lobbyists, students, amateurs	Structured and steady publication, easy access and more flexibility in the delivery channels	Fund raisers, financial backers,	Fund raisers, financial backers, lobbyists, students	Fund raisers, financial backers, lobbyists, students	Fund raisers, financial backers	Biodiversity data and specimens (in case of exchange programs), money (in case of funded projects)	?	Fund raisers, financial backers	Fund raisers, financial backers MJ - I do not agree with the above as they are not about collecting revenue. I would say sales, finance MJ - I do not think we respond to this section very well at present, and it is another area which we will need to develop a better understanding of and think further about.



K A 1	<i>What key activities do our value propositions require?</i>	Problem solving (field work, curation, research, editorial) Production (scientific publications, software products)	Research in taxonomy, science history Study of collection material and retrieval of new collection material Adoption and further development of exchange standards and workflows Compilation of information and publishing (by publishers) Quality assurance of data	Problem solving (field work, curation, research, editorial), activities required to know we have a valuable product i.e., achieve scientific excellence, training and capacity building	Problem solving (fieldwork, research, editorial), activities required to know we have a valuable product i.e., achieve scientific excellence	Problem solving (field work, curation, research, editorial), activities required to achieve scientific excellence; training and capacity building	Problem solving (field work, curation, research, editorial), activities required to know we have a valuable product i.e., achieve scientific excellence	Problem solving (field work, curation, research, editorial), activities required to know we have a valuable product i.e., achieve scientific excellence, training and capacity building	Problem solving (field work, curation, research, editorial), activities required to know we have a valuable product i.e., achieve scientific excellence, training and capacity building	Problem solving (field work, curation, research, editorial), activities required to know we have a valuable product i.e., achieve scientific excellence	Producing novel scientific research.	Problem solving (field work, curation, research, editorial), activities required to know we have a valuable product i.e., achieve scientific excellence	Professional coding and documentation	Problem solving (field work, curation, research, editorial), activities required to know we have a valuable product i.e., achieve scientific excellence Production (acquisition and assembling of relevant information; creation of products; organisation of review) Problem solving (resolution of taxonomic questions)
K A 2	<i>What key activities do our distribution channels require?</i>	Production (publication, software), platform/network (dissemination)	Production (publication), platform/network (dissemination),	Production (publication), platform/network (dissemination)	Production (publication), platform/network (dissemination)	Production (publication), platform/network (dissemination)	Participation, design, production, testing, tuning, innovation	Production (publication), platform/network (dissemination)	Production (publication), platform/network (dissemination)	Production (publication), platform/network (dissemination)	Publishing, Peer review, Digitisation	Production (publication), platform/network (dissemination)	Human machine interfaces, publications	Production (publication), platform/network (dissemination)



K A 3	<i>What key activities do our customer relationships require?</i>	?	collaboration, counselling, support	PR, convincing examples	PR, convincing examples	unknown	Participation, rewarding	PR, convincing examples	PR, convincing examples	Business development	Attending conferences, email communication, welcoming visiting researchers. Providing support for scientists in the developing world.	?	Good teaching capabilities, good abilities to understand the other side	?
K A 4	<i>What key activities do our revenue streams require?</i>	platform/network (stakeholder involvement, consortium building)	unknown	Prove of clear accuracy and added value	Proof of utility and added value	unknown	Communication, well developed proposals	Prove of clear accuracy and added value	Prove of clear accuracy and added value	Effective time management, good contacts with customers to have good knowledge of their demands	Lobbying; Writing grant proposals.	?	?	?
KP 1	<i>Who are our key partners</i>	Contributing taxonomists, editors, biodiversity institute network, in-country counterparts, and software developers in international universities and collection facilities/institutions.	Contributing taxonomists, editors, biodiversity institute network	Contributing taxonomists and other botanists s.l., editors, biodiversity institute network, in-country counterparts	Contributing taxonomists, editors, biodiversity institute network, in-country counterparts	Contributing taxonomists and other botanists s.l., editors, biodiversity institute network, in-country counterparts	Taxonomists, non-governmental organisations, government	Contributing taxonomists and other botanists s.l., editors, biodiversity institute network, in-country counterparts	Contributing taxonomists and other botanists s.l., editors, biodiversity institute network, in-country counterparts, GO's and NGO's	Contributing taxonomists, editors, biodiversity institute network, in-country counterparts	Contributing taxonomists, editors, biodiversity institute network, in-country counterparts and international biodiversity projects.	Editors, referees, partnering projects (e.g., ViBRANT), initiatives (TDWG)	Contributing taxonomists, editors, biodiversity institute network, in-country counterparts	Contributing taxonomists, editors, biodiversity institute network, in-country counterparts



KP 2	<i>Who are our key suppliers</i>	?	na	ICT specialists with affinity for our work	IT specialists,	unknown	Taxonomists, non-governmental organisations	ICT specialists with affinity for our work	ICT specialists with affinity for our work; taxonomists	Unknown	Academics in Africa, other Botanical Gardens.	Editors, referees	?	? MJ - international herbaria (specimens) and libraries (literature)? Publishers?
KP 3	<i>Which key resources are we acquiring from partners</i>	Specimen exchange and loan, expertise, knowledge, access to web services	Expertise/knowledge, specimen exchange and loan	Specimen exchange and loan, expertise, knowledge, artwork, ICT products	Specimen exchange and loan, expertise, knowledge, artwork	Specimen exchange and loan, expertise	Knowledge, images, literature, specimen descriptions	Specimen exchange and loan, expertise, knowledge, artwork, ICT products	Specimen exchange and loan, expertise, knowledge, artwork, ICT products; taxonomic treatments	Specimen exchange and loan, expertise, knowledge, artwork	Specimen exchange and loan, access to data expertise, knowledge.	Expertise, knowledge	Specimen exchange and loan, expertise, knowledge, artwork	Specimen exchange and loan, expertise, knowledge, artwork
KP 4	<i>Which key activities do partners perform</i>	Nomenclatural services, specimen information services, research data publications	editorial work	Drafting accounts, editorial work, development of e-tools, methods and systems	Drafting accounts, editorial work, development of e-tools	Drafting accounts, editorial work, development of e-tools, methods and systems	Research, validating, writing, editing, photographing, providing content, promoting, signalling	Drafting accounts, editorial work, development of e-tools, methods and systems	Drafting taxonomic accounts, editorial work, development of e-tools, methods and systems	Drafting accounts, editorial work	Taxonomic accounts, editorial work.	Peer-reviewing manuscripts, editorial work	Drafting accounts, editorial work	Drafting accounts, editorial work



KP 5	<i>What are the motivations for having partners hips</i>	Optimization and economy-spreading the work, reduction of risk and uncertainty, acquisition of particular resources, expertise, and activities, specialisation	Optimization and economy-spreading the work, reduction of risk and uncertainty, acquisition of particular resources and activities	Optimization and economy-spreading the work, reduction of risk and uncertainty, acquisition of particular expertise, resources and activities, collections, data bases; increasing completeness of the task; adding critical mass	Optimization and economy-spreading the work, reduction of risk and uncertainty, acquisition of particular resources and data	Optimization and economy-spreading the work, reduction of risk and uncertainty, acquisition of particular expertise, resources and activities, collections, data bases; increasing completeness of the task; adding critical mass	Knowledge, capacity, data, profiling, outreach	Optimization and economy-spreading the work, reduction of risk and uncertainty, acquisition of particular expertise, resources and activities, collections, data bases; increasing completeness of the task; adding critical mass	Optimization and economy-spreading the work, reduction of risk and uncertainty, acquisition of particular expertise, resources and activities, collections, data bases; increasing completeness of the task; adding critical mass	Optimization and economy-spreading the work, reduction of risk and uncertainty, acquisition of particular resources and activities	Optimization and economy-spreading the work, reduction of risk and uncertainty, acquisition of particular resources and activities.	Financial benefits, career growth	Optimization and economy-spreading the work, reduction of risk and uncertainty, acquisition of particular resources and activities	(Idem) Access to complementary scientific expertise and literature and specimen resources necessary to achieve desired geographic and taxonomic coverage; availability of peer review to secure scientific quality; scientific credibility and authoritativeness.
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Annex 4: SIGMA-RBGK Skype meeting minutes at M10

- SKYPE MEETING MINUTES -

MEETING ON TASK 6.3 - EVALUATING BUSINESS MODELS CURRENTLY IN USE BY PARTNERS

June 10, 2013

PARTICIPANTS

Alan Paton - RBGK
Bob Alkins - RBGK
Don Kirkup - RBGK
Camille Torrenti - Sigma Orionis
Roger Torrenti - Sigma Orionis
Stephanie Morales - Sigma Orionis

MINUTES

The meeting discussion focused on two main upcoming activities of task 6.3 and, in particular, on two documents shared by Sigma Orionis prior to the meeting:

- ✔ **Work Plan** for the forthcoming deliverable D6.3.2 - Report on diversity and strengths on existing business plans and discussion on sustainability
- ✔ **Agenda** for the office meeting between Sigma Orionis and RBGK to be held in Sophia Antipolis on July 4, 2013

I. Discussion of Work Plan

1) Matrixes updates

The (i) exploitation plans matrix, (ii) overall vision matrix and (iii) mega-science platforms have been placed on Google Docs and will be shared with partners through the project wiki. The actual work plan document drafted by Sigma Orionis will be updated with complementary guidelines on how to update these matrixes. The work plan will be sent to all partners to gather their inputs before June 28th 2013. → **Action**

2) Inputs from other WPs

The business plans matrix, will not be shared with partners for further updates, mainly because it would be challenging for them to update all questions. Furthermore, they might miss or not provide new information (staying focused on the same ideas).

In order to gather inputs on the results of their tasks and work package, it has hence been decided that a new template will be circulated among WP2 – 4 leaders and Task 6.1, 6.2 leaders. Sigma Orionis will propose a template to gather WPs inputs to RBGK before June 14th. → **Action**



3) Timeline

Partners' inputs to D6.3.2 will be gathered and consolidated before the office meeting between RBGK and Sigma Orionis on July 4th. This will enable both partners to discuss on the report updates and derive business models at the project level. Findings will be included in the final report. Before submitting the report to the EC (in M12), a quality check will be performed among partners. Sigma Orionis will then update the Work Plan and send it to all partners asking for their inputs on June 17th so that partners will have at least two weeks to provide their inputs. → **Action**

II. Review of office meeting agenda

1) Meeting #4 in Berlin

The "Meeting to evaluate business models currently in use by partners and relevant non-partners" (MS22), taking place on the 9th to 10th of October 2013 in Berlin (on the occasion of pro-iBiosphere Meeting #4), will be further discussed during the office meeting that will take place on July 4 2013 in Sophia, Antipolis. Main topics that will be discussed are: (i) the event concept and objectives, (ii) tentative agenda and speakers to be invited, (iii) logistics and organisation and, (iv) roles and responsibilities (see Annex 1. Office Meeting Agenda).

Sigma Orionis suggested preparing working documents to be discussed during the office meeting such as: (i) event concept and objectives, (ii) event agenda, (iii) list of potential speakers to be invited. Sigma Orionis will share the draft version of these documents with RBGK on the occasion of the office meeting of July 4th. → **Action**

RBGK stressed out the importance of inviting other initiatives such as ViBRANT, LifeWatch, BHL to the pro-iBiosphere October meeting to share their experience, success stories and best practices. RBGK also suggested SIGMA to look for other e-infrastructure projects/initiatives (not necessarily related to biodiversity) that have developed, maintained and fed (data aggregation and inputs) a platform. A list of invited participants will be made available after the office meeting.

III Action Plan

Both partners jointly agreed on the course of actions to be undertaken during the next weeks and months:

- ✔ Sigma Orionis will update D6.3.2 work plan by adding guidelines before June 14th 2013.
- ✔ Sigma Orionis will add a table to gather WPs inputs on Google Calendar before June 14th 2013.
- ✔ Sigma Orionis will send the work plan to partners and ask for their inputs before June 28th 2013 (i.e., before the office meeting).
- ✔ Sigma Orionis will propose a draft version of the meeting #4 documents (agenda, list of speakers and concept and objectives) to RBGK on the occasion of the office meeting on July 4th 2013 in Sophia, Antipolis.
- ✔ RBGK and Sigma Orionis will discuss partners' inputs received for D6.3.1 and D6.3.2 during the office meeting
- ✔ Sigma Orionis will consolidate all inputs and will share D6.3.2 with partners for improvements on July 26th 2013 and quality check on August 29th 2013.
- ✔ Sigma Orionis will submit D6.3.2 before August 30th 2013.

The next meeting between RBGK and Sigma Orionis will be held in Sophia Antipolis on July 4, 2013.



Annex 5: Office meeting agenda

- OFFICE MEETING ON TASK 6.3 -

BUSINESS MODELS AT CONSORTIUM LEVEL, D6.3.2 & MS22

Sigma Orionis - Buropolis 1, 1240 route des Dolines - 06560 Sophia Antipolis, France

PARTICIPANTS

Royal Botanical Gardens Kew	Sigma Orionis
Bob Allkin	Camille Torrenti
Alan Paton	Roger Torrenti
Don Kirkup	Stéphanie Morales

AGENDA

July 4, 2013

Morning: D6.3.2: Report on diversity and strengths of existing business plans and discussion of sustainability

09:00 - Welcome

09:30 - D6.3.2 Methodology

10:00 - Partners' inputs consolidation

11:00 - COFFEE BREAK

11:15 - Analysis and first draft of Business Models at project level

12:30 - LUNCH BREAK

Afternoon: MS22: Meeting to evaluate business models currently in use by partners and relevant non-partners

14:00 - Meeting concept and objectives

14:30 - Identification of speakers

15:00 - COFFEE BREAK

15:15 - Role and responsibilities

15:45 - Next steps and work plan

16:30 - End of Meeting



Annex 6: Sigma Orionis powerpoint presentations

a. Task 6.3 - General Overview

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Task 6.3 Evaluating business models currently in use by partners

2nd Office Meeting between RBGK & Sigma Orionis
Sophia Antipolis - July 4, 2013

Task 6.3 - General Overview

Supported by the European Commission through its FP7 research funding programme

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Introduction

- **Objective**
 - The purpose of Task 6.3 “Evaluating business models currently in use by partners” is to detail the exploitation plans foreseen to date by each project partner (at its own level or at the one of the consortium) and the business models each partner has been currently referring to in its activities, and to put this information in the light of a “market context” or “market background” in the framework of which the project shall develop its activities.
- **Reporting**
 - A series of D6.3 Deliverables to report on Task 6.3 achievements on a 6-month basis (M6/M12/M18/M22)

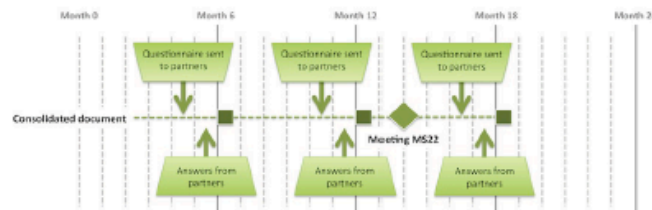
- **First deliverable: D6.3.1**
 - A questionnaire has been sent to all pro-iBiosphere consortium partners at month 5. It included three parts, addressing respectively:
 - Exploitation plans at the level of each organization,
 - Business models currently in use by organization,
 - Market context and sustainability perspectives.
 - These inputs have been consolidated, analysed (by KEW and SIGMA) and complemented with a desktop research by Sigma Orionis.
- **Work Plan**
 - Successive versions of this deliverable with updated inputs from all consortium partners will be produced at months 12, 18 and 21.
 - In addition, a plenary meeting: "Meeting to evaluate business models currently in use by partners and relevant non-partners" will be organised at month 14 and should allow making a significant step towards sustainability plans, which the consolidated document produced at month 18 should confirm



1. **Exploitation Plans**
 - Partner's level
2. **Business Models (Business Model Canvas)**
 - Currently in use by partners
 - At consortium's level
3. **Market Background**
 - Vision
 - Obstacles / steps to make it happen
 - Platform Management
 - Benefits
4. **Market Research**
 - Main biodiversity projects/initiatives
 - Biodiversity platforms
 - Mega-science platforms



- Updates D6.3.2/D6.3.3/D6.3.4
 - In months 10 and 16, partners will be asked to update their answers to the three key sections addressed in the pro-iBiosphere questionnaire (i.e. on exploitation plan, business models, market context and project sustainability).
 - At the present stage (M12) of project development, first project outputs can be used from the other WPs (namely WP2, WP3, and WP4) to be completed with a desktop research
 - It is expected that the focus of the “business models” part will switch from a present (business models currently in use) to a future perspective (business models concerning the integrated platform), thus providing a smooth transition towards Task 6.4 analyses.



- All partners have submitted their inputs to Sigma on time
 - **Food for thought**

Organisation	Exploitation Plans	Inputs from WP2	Inputs from WP3	Inputs from WP4	Inputs from WP6	Overall vision	Megascience platforms	Date
BGBM	X		X	X		X		24/06/2013
Naturalis	X		X		X			20/06/2013
MfN			X					25/06/2013
NBGB	X	X				X		25/06/2013
Pensoft	X			X		X		21/06/2013
Plazi	X	X	X	X				28/06/2013
RBGK	X	X				X		26/06/2013
Sigma Orionis							X	3/7/2013
TOTAL								



Morning: D6.3.2: Report on diversity and strengths of existing business plans and discussion of sustainability

09:00 - Welcome of participants

09:30 - Task 6.3/D6.3.2: Methodology and Work Plan (15')

09:15 - Exploitation plans (60')

10:15 - Business Models (60')

11:15 - COFFEE BREAK

-> Derive a first set of business models at project's level

11:30- Market Background (45')

Afternoon: MS22: Meeting to evaluate business models currently in use by partners and relevant non-partners

14:00 - Meeting concept and objectives (30')

14:30 - Logistics and organisation (15')

14:45 - List of main stakeholders and participants to be invited (15')

15:00 - COFFEE BREAK

15:15 - Agenda and expected outputs (30')

-> Make substantial progress in the preparation of Meeting 4

15:45 - Role and responsibilities (15')

16:00 - Next steps and Work Plan (30')



b. D6.3.1 & D6.3.2

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Task 6.3 Evaluating business models currently in use by partners

2nd Office Meeting between RBGK & Sigma Orionis
Sophia Antipolis – July 4, 2013

D6.3.1 & D6.3.2
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Exploitation Plan - Conclusions M6

All project partners provided substantial inputs addressing various possible exploitation perspectives. An overview of these inputs has been presented under the form of a matrix. The matrix is based on three major exploitation outputs that are quite consistent and convincingly stated by project partners:

- **Expertise:** an increased expertise coming from the interaction between project partners, developed tools, project workshops, etc.
- **Cooperation:** extended cooperation perspectives thanks to potential partners, funding opportunities, institutional cooperation, international community building, etc.
- **Business:** improved business models, widened field of operations, impact on existing projects, etc.

To be noted: some cells are empty because some partners did not have a clear answer to some of the questions, or not previously considered these issues. The second iteration on exploitation plans planned at month 11-12 will probably lead most project partners to update the matrix accordingly
-> Obtain a complete matrix at M12? End of exercise? only minor updates until the project's end?

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PRO-iBIOSPHERE WWW.PRO-iBIOSPHERE.EU		Exploitation Plan - Updates M12		
	Strengthened expertise	Extended cooperation	Improved business	Reasons for change
BGBM	Mark up strategies and software systems, mark up schemas, data standards interoperability and transferability, identifier systems, publication workflows	Cooperation with other institutes of similar background and vision. Potential partners for new projects and project proposals.	(thanks to the progress the project would allow) Data acquisition (standardisation), data management (User-base of the EDIT platform) and data publication (directly from platforms, re-integration of feedback into base data)	
MfN	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 Europaea projects are of mutual benefit	
Pensoft	Extended knowledge in specificity of taxonomic publishing in the different domains (Plants, Fungi, Animals) and the different markup techniques	Increased cooperation, especially in the field of botanical publishing; increased opportunities for new infrastructure projects	(thanks to project outputs) Automation of the registration process of taxon names in global indexes. Mark-up standards and tools	
NBGB	Taxonomic publishing (staff training through project workshops). Assessing digital publishing options for new works. Discovering methods for the leveraging the investment we've made in digitised taxonomic content.	With the perspective of economies of scale in taxonomic publication and funding. Pro-Biosphere is helping us develop our publishing model for the Flora d'Alsace Centrale and the Flora of Belgium.	Increase our productivity (publication rate, reduced overheads, faster publication). Promoting digital publication to our scientists.	pro-Biosphere meetings have helped us network with other similar institutions and provided us with a fresh view of the future of taxonomy and taxonomic publishing.
Naturalis <i>(7 inputs) info from previous report. NOT UPDATED</i>	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) No planned commercial use (open access) so far	

Naturalis (update from Soraya)	Naturalis wishes to play a key role in structuring species information, including the Catalogue of Life, probably including part of the technical infrastructure of a supermentorator including all names of plants and animals. By assuming the responsibility for the Species 2000 secretariat (to be realized April-August 2013). Herewith, Naturalis positions itself as an organization where knowledge of taxonomy is maintained.	Seeking strategic collaboration with partners active in areas of interest to us and where we can play a unique role. A combination of the technical infrastructure as developed for the Catalogue of Life is a logical step, and can be developed in Naturalis. The organization of the contents may differ significantly. Co-operation with, for instance, the Commissions for Nomenclature and new systems for electronic registration of new taxa (MycoBank, ZooBank) should be sought. Naturalis has taken an initiative, with the Natural History Museum (London), to organize accommodating this infrastructure among the larger natural history museums. Naturalis is prepared to play a key role in the development of the technical infrastructure.	Based on the SAB report it is not clear what is going to be the improved business.	Info has been updated based on the latest Scientific Advisory Board report produced by the management team.
Naturalis (update)	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 markup tools, Scratchpads, EDIT, etc. Extended knowledge of current technology trends, such as Linked Open Data, Stable URIs and many more.	pro-Biosphere 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-Biosphere also grants opportunity to showcase and promote Flora production within Naturalis.	Improving Flora production by offering training on e-tools and making the tools available, in a large extent, 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.	Data collected from Editor Flora of Guyana, coordinator of eFlora Malesiana, Fungi specialists and Tricacua Secretary Flora Malesiana (coordinator of Flora Malesiana project) of Naturalis.
Naturalis (update)	Gaining a better understanding on the workflow of eFlora concerning the measurement and constraining the costs.		By hosting the website without focusing on development will reduce cost substantially.	[Task 6.1] activities on measurement and constraining of costs) Data collected from Editor Flora of Guyana, coordinator of eFlora Malesiana, Fungi specialists and Treasure Secretary Flora Malesiana (coordinator of Flora Malesiana project) of Naturalis.

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PLAZI	Deeper insights into science publishing policies, mark up strategies and software systems, identifier systems, publication workflows	We are building a community of important partners. By sharing the knowledge on markup strategies we will build better business cases for markup generation and services in the future.	Feedback on our operations Contact with potential publishers	
RBGK	Including comparative data across partners	Institutional cooperation and funding opportunities	Improved business models (namely flora production & dissemination)	
RBGK (update)	Beginning to gain a better understanding of partners and users activities	Brought together expertise across taxonomic domains (eg IUCN Red Listing)	Improving understanding of user sectors and needs towards more efficient targeting of resources to produce information/services users really want.	Data collected from T2.2 & T6.1 workshops (analysis ongoing)
RBGK (update)	Beginning to gain a better overview of RBGK processes	Involvement of wider RBGK staff such as the Publications department, eg sharing cost information	Potential for integration of delivery channels	T6.3 activities
RBGK (update)	Working knowledge of GoldenGate and CharaParser mark-up tools. Now trialing 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
RBGK (update)	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 p-IB and WFO through cooperation - for example at the technical level, funding, pilots.	Cross-over with "World Flora Online" members attended p-IB meeting 3 in Berlin, presentation given
Sigma	Infrastructures and dissemination & exploitation	Extend our contact network in the ICT domain	Enhance corporate image & international reputation	

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Project main achievements - Conclusions M6

- At the present stage (M6) of project development, only limited outputs can be used from the other WPs (namely WP2, WP3, and WP4).

-> Include main project achievements at M12. How those inputs could be used/analysed and feed the identification of business models?

PRO-iBIOSPHERE WWW.PRO-iBIOSPHERE.EU		Project main achievements - M12
Task	Output	
WP7 - European & international policy coordination lead: NBSG		
2.1 - Coordination and routes for cooperation across organization, projects and e-infrastructure lead: PLAZI	The prepared documents and the workshop towards routes for cooperation identified that institutions and organization can work better together than they presently do. There is significant cost saving involved, so the business plan for the future is to make the core funding of the existing memory institutions go further by sharing activities, making better use of existing IT technology. Several hurdles to do this have to be overcome and it is highly desirable to have significant catalytic funding, which is carefully designed as to change existing processes that prevent improved collaboration.	
2.2 - Stakeholder requirements lead: RBGK	To date, the main activity for T2.2 was the running of a workshop on the "Uses and users of [Biotaxa]" Berlin, May 2013. The compilation and analysis of the results is in progress. Preliminary findings suggest that out of the range of invited participants which included Ecologists, Conservationists, Taxonomists, Earth Systems Scientists, the strongest response was received from what might be regarded as the "traditional" user-base of conservation (field listing, taxonomy and ecology identification) - the latter were under-represented at the workshop owing to availability. Although about 150 scientists were invited who working on what might broadly be referred to as trait analysis, vegetation and climate modelling projects (and are using flora derived trait data in their work), the response to the invitation was very poor (2 ecological traits databases and one vegetation analyst). The reason for this is not clear but the first general note for the meeting may not have effectively targeted this group (subsequent direct contacts with individuals would tend to confirm). Anonymous feedback from workshop participants suggest that more "real" users should be heard (for example amateurs as opposed to professionals). Very preliminary assessment suggests that the types of information that users most wanted were species names and geographical location, and services or tools for species identification, and most would prefer have data available in a finely atomised format. This is a follow-up meeting planned in the UK with CEH staff to target ecological uses.	
2.3 - e-Taxonomy tools lead: NBSG	Digital tools for taxonomy have been available for many years and are increasing in number and sophistication. Their use has many advantages for collaboration, verification, publication and reuse of data; however uptake from the taxonomic community has been slow and patchy. The reasons for this are numerous but include lack of training and lack of incentive. There are several factors that lead to the lack of incentives. Paper publications generate revenue whereas digital publications do not. Journal impact factors are used assess the performance of taxonomists, so there is no incentive to publish outside traditional taxonomic journals. Research is valued by the number of citations received. However, the majority of the users of taxonomy don't cite the source of their identifications. If the aim is to have a comprehensive, open and authoritative taxonomic system it would require a change in the way we assess and reward taxonomic publication.	
2.4 - Legal issues of data acquisition, curation and dissemination lead: RBGK	A short paragraph summarizing the major findings	

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WP1 - Scientific content and workflow coordination	lead: FUB-RGBM	
3.1 - Data acquisition & curation lead: NATURALIS	Data acquisition & curation address two parts. Part I reviews and analyses the existing methods for data acquisition and curation. When deciding what e-platform is most suitable for an institution; the IT capacities (or capabilities) of the institution; and the requirements of the projects that will use the platforms. These decisions need to be taken into account. Part II presents a set of Best Practices on editorial policies for entering new data and collaboratively writing taxonomic treatments in order to advocate open access and free re-use of data publicly-funded and produced by NHIs (including publications). Despite the technological developments, most content of Biotaxa (e.g., Flora, Fauna, Mycota, as of biodiversity information in general) is still being published in "closed", non-machine readable formats, such as paper and PDF. These closed formats are in most cases available through a pay-wall. Scientists continue to gather high quality, well-structured data, which are then being "closed" into non-machine readable publication formats, which lead in its turn on doubling the effort to get back the published data into databases. A standard that is widely available and specifies a minimum of fundamental biodiversity data, e.g., references/citation, taxon treatments, collection specimens numbers, names, material citations, descriptions (illustrations (line art to multimedia), etc., needs to be formulated. A best practice should specify that publishers of biodiversity data should export these data, irrespective of the form of publication, and allow its wide dissemination.	
3.2 - Semantic mark-up generation, data quality and user participation infrastructure lead: PLAZI	A concept paper for involvement of individual experts, commercial vendors, and citizen scientists has been handed in to the EU at the end of May to define the current status, technical issues and propose a strategy to involve stakeholders in the conversion process.	
3.3 - Semantic integration of biodiversity literature lead: MPN	The task is presently being prepared by the MPN and the work is not yet due.	
WP4 - Technical & infrastructure coordination lead: PENsoft		
4.1 - Improve technical cooperation and interoperability at the e-infrastructure level lead: FUB-RGBM	A major and important outcome will be a decision towards use of stable http identifiers for bioinformatics elements, such as specimen data, taxon treatments, genomic data etc. Stable http identifiers have the advantage of being more efficient in semantic web than DOIs or URNs. In addition, http identifiers are coming at low costs, comparable with DOIs for example which may need huge investments at the scale of all biodiversity domain.	
4.2 - Promote and monitor the development and adoption of common mark-up standards and interoperability between schemas lead: PLAZI	The interoperability gaps between several XML schemas used for markup services (e.g., TinPubs, TaxonX, ABC2, DarwinCore, TCS, BiotyCore, AuditionCore) are explored with the aim to make the markup and harvesting process cost efficient. One of the possible ways to make schemas interoperable in the RDF environment. Increased interoperability between schemas will lay the ground for a business model of markup services for legacy literature and data and collate these with prospectively published information.	
WP6 - Sustainability planning lead: RGBK		
6.1 - Measuring and constraining the costs of delivering services lead: NATURALIS	At this stage we are in the process of collecting data based on the "Measuring and Constraining Costs" workshop that took place on the 22nd of May 2013 in Berlin. Templates on capturing the costs were sent to the three groups of the workshop. The deadline for receiving contributions is the end of June 2013. After the information has been received an analysis of the data will be done, all this will be done in close collaboration with RBGK. The report is due in November 2013.	
6.2 - Identifying and measuring the benefits of delivering services lead: RBGK	A short paragraph summarizing the major findings	

Market Background - Conclusions M6

- The consortium does not yet share a common vision, which is quite logical at such an early stage of the project when project partners have not yet got time enough to fully interact, and when key project outputs that will help clarifying this vision are not yet available,
- There are not many definite answers in the columns of the matrix but at least a lot of interesting questions or relevant information that constitute valuable “food for thought” for the coming months.
- It is expected that the next iteration at month 11-12 will allow reaching a more substantial shared vision across each of the four columns.

-> Time for sharing a common vision? (consolidated views)

-> How to better analyse these inputs? Can we already extract some business models?



Market Background - Updates M12

		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?	Reasons for change
BGBM	A second vision to add: digitization of information + mobilization of presently underutilized large volumes of biodiversity information	Three major obstacles: lack of standardization and interoperability between platforms, availability of help-desk functions (need to quickly create a community-driven help-desk?), institutional commitment Provide stable identifiers for specimen (workshop on 4/9th June 2013 at RBGZ; plan to create a collection identifiers implementation review and roadmap during workshop M4.1 in October 2013)	Cannot be answered at this point	Benefits: improved re-usability of data, mobilization of underutilized data, improved data quality, efficient and secure data management, visibility of biodiversity data, streamlines publication process New products: interactive and dynamic biodiversity data interfaces, data access across institutions	
MIN	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) Key developments: communication among partners, dissemination, etc.	Initial partners + new highly engaged partners A S&T Advisory Board (members from each active partner) is necessary A self-sufficient foundation supported by project partners?	Benefits: increase in scientific output, collaborations, efficient use of taxonomic data / publications, access to a more comprehensive set of data, external services Services: semantic mark-up of legacy literature, digitizing institutions, automated services (free), tools for semantic mark-up, etc.	
Pensoft	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.	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.	An economically self-supporting membership organisation, financed by (1) membership fees, (2) project funding; (3) services provided to the community	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 re-use and big data generation; (2) increased interoperability generates new knowledge; (3) decreasing of effort and costs of obtaining legacy data.	
MBG8	An additional aspect is improving taxonomic workflow to benefit from e-Infrastructures	Taxonomists working in a collaborative and structured manner and gaining recognition for digital work Working in a multilingual world reshaping the service structure of taxonomy to encourage sharing of taxonomic treatments	An independent management is preferable but considerable incentive is necessary if we want taxonomists and institutions accepting external decision making process Funding would be raised through various means. For example, through providing services to users, by membership and sponsorship.	Multilingual access, higher visibility for research, reduced costs, a one-stop-shop, closer ties with institutions in Africa The integration of data enabling new science, better monitoring and a reduction to the barriers preventing joined up conservation efforts and sustainable resource management.	

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Naturalis	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 FOG: Developments needs in line with the LERU report Major obstacles are: 1) bringing partners together and working together on the workflow; 2) lack of institution support and commitment; 3) large science monograph study not properly valued	FOG: the team should include providers of data FOG: Aspect linked to logical open access 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. Institution could decide to host the website (before 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.	FOG: increase of the possibilities of mining and reuse, no repeated work across institutions FOG: a lot (difficult to summarize here) The platform will enhance data accessibility and allow up-to-date and up-to-date information. It will also facilitate production, accessibility and availability of new content. Collaboration with wider audiences is also another benefit: scientific paper can be associated on the user (mainly experts on the subject) side. The platform will also benefit as an institutional level as the workflow of 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 (consultance 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 is before the product is required.	Additional data collected from authors, editors and coordinators of Naturalis
Naturalis (update)		Key steps: 1) making clear goals by staying true to the mission; 2) explicit formulated aims, e.g. on what is current on Biodiversity Diversity; 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)			

 PRO-iBIOSPHERE WWW.PRO-iBIOSPHERE.EU					
RBGK	Yes but subject to project findings + to be further discussed in a project workshop We should better define "processing core biodiversity data" (floristic and faunistic data), and "integrated system"	A list 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. Important to check the coherence of the outcomes of the different WPs	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)	
RBGK update:		Reiterate p-10 project risks of any delay or failure to deliver outputs from WP3-4 - Important to stay on target with inputs into business modelling and sustainability (T6.3 and T6.4)	Too early to say - this will depend on the range of business models available	Increased awareness of the capabilities and services offered by partners possibly including some of the following: 2 specialisation (eg. providers of mark-up services, software) 3 outsourcing parts of the infrastructure 4 open source tools	
Sigma	No comment (we've proposed this vision...)	A test implementation phase of the business model identified in pro-iBiosphere is necessary in Biosphere funding by the EC Time is critical: a smooth continuity to be ensured between the 2 projects	Beyond committed project partners, other EU and non-EU partners to reach a critical mass Governance through a core group A technical partner to run the platform is necessary	No clear at this project stage	

Market Research - Status as of today

Market Research

- Main biodiversity projects/initiatives -> updated in real-time
- Biodiversity platforms -> updated in real-time
- Mega-science platforms -> to be updated at M12 (**new platforms identified - desktop research needed**)



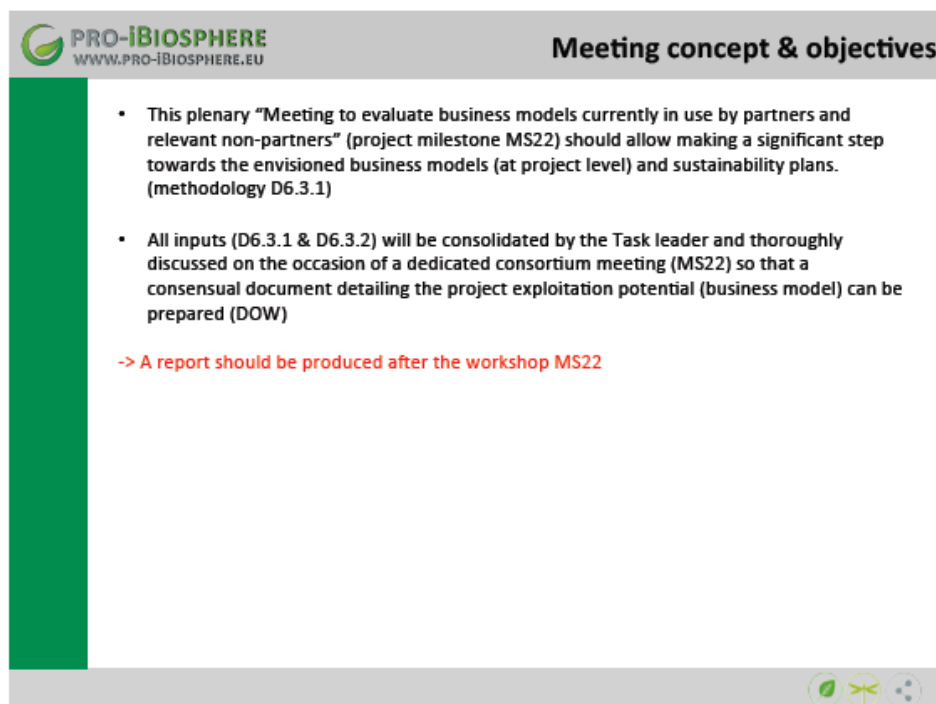
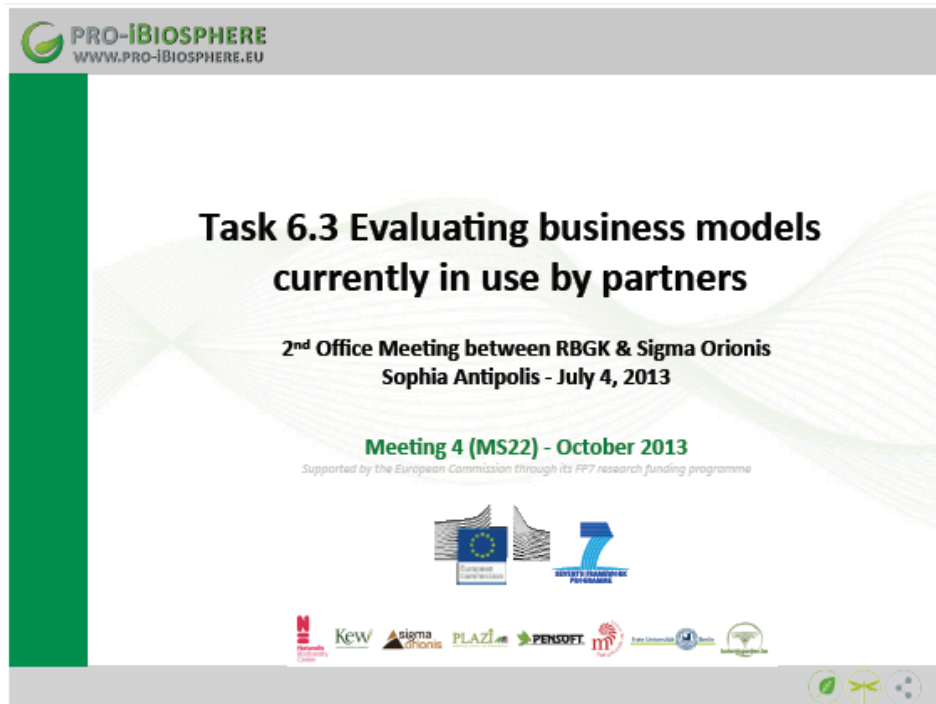
Mega Science Platforms - Updates M12

- **3 platforms added**
 - *Atlas of Living Australia (ALA)* → not mega-science (scope is reduced)
 - *Wikispecies* → 369,899 articles
 - *Australian Faunal Directory (AFN)* → same as ALA
 - *Global Names Architecture (GNA)* → 2.2 million species
- **Complementary background research will be undertaken for the update**
 - ViBRANT to be added ? (enough info and feedbacks?)
- **Q°: Consider smaller platforms? Regional? Species oriented?**

	ALBA	AFN	CBP	ITIS	IBD	IBCN	IBD	ALA	GlobalNames	ViBRANT	ALA	Notes for change
Website	www.ala.org	www.austlii.edu.au/other/dfat/pubs/afn/	www.cbp.org	www.itis.gov	www.biodiversitylibrary.org	www.ibcn.org	www.ibd.org	http://www.ala.org	http://species.wikimedia.org	http://www.vibrant.org	http://www.gna.org	You forget to add these important platforms in your previous report. They are aggregated/linked now under the GNA, ALA, etc.



c. Meeting 4 (MS22) - October 2013



Meeting concept & objectives

- This plenary "Meeting to evaluate business models currently in use by partners and relevant non-partners" (project milestone MS22) should allow making a significant step towards the envisioned business models (at project level) and sustainability plans. (methodology D6.3.1)
- All inputs (D6.3.1 & D6.3.2) will be consolidated by the Task leader and thoroughly discussed on the occasion of a dedicated consortium meeting (MS22) so that a consensual document detailing the project exploitation potential (business model) can be prepared (DOW)

-> A report should be produced after the workshop MS22

Meeting user engagement and benefits (RBGK) M6.2.2 & Meeting to evaluate business models currently in use by partners (SIGMA) M6.3.2 - (DOW)

Duration: 2 days (1 day each)

Date: October 9 & 10, 2013

Place: Berlin

Number of participants: 30 (each)

Total budget (FUB-BGBM): 4 800€ (2 x 30 x 80€)

- 14 non-project participants (inside the EU) - budget: hotel 100€ + travel 400€ each
- 4 non-project participants (outside the EU) - budget: hotel 100€ + travel 1300€ each

Nota bene: Budget constraints shared by Soraya -> financial commitment to the Biodiversity Informatics Horizons 2013 meeting requested by our PO (around 10 000€)

-> Save budget if possible!



- **Target audience (DOW):**
 - Flora/Fauna data User & Potential user/stakeholder group
 - Flora and Fauna data Provider, Potential Provider & Provider/user stakeholder group
- **List potential participants (DOW):**

<ol style="list-style-type: none"> 1. Biowikifam- Andreas Plank 2. EOL - Cynthia Parr 3. ETI - Peter Schalk 4. FUB-BGBM - Andreas Müller 5. FUB-BGBM - Andreas Kohlbecker 6. FUB-BGBM - Walter Berendsohn** 7. FUB-BGBM - Anton Guentsch* 8. 4DLife and i4Life - Alistair Culham 9. GBIF - Markus Döring 10. GN - David Patterson 11. Index Fungorum - Paul Kirk 12. JCNS-KNAW Fungal - Arthur W.A.M. de Cock 13. KIT - Guido Sautter* 14. MFN - Henning Scholz* 15. Mycobank - one representative 16. Naturalis - Marc Sosef 17. Naturalis - Marco Roos 18. Naturalis - Peter Hovenkamp 19. Naturalis - Thomas Hamann* 20. NBGB - Quentin Groom* 	<ol style="list-style-type: none"> 21. Pensoft - Lyubomir Penev** 22. Plazi - Donat Agosti* 23. Plazi - Guido Sautter* 24. Plazi - Terry Capatano* 25. Plazi - Gregor Hagedorn* 26. RBGK - Don Kirkup** 27. RBGK - Alan Paton* 28. Species2000 - Yuri Roskov 29. ViBRANT - Simon Rycroft 30. ZooBank - Richard Pyle
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- **List of additional participants:**
- **Other initiatives**
 - Vince Smith, ViBRANT Project Coordinator, NHM
 - Tjess Hernandez, Coordinator, LifeWatch
 - Magda Sitko, Coordinator, i4Life
 - David Patterson, Coordinator, Global Names Project (GN)
 - Speaker, Biodiversity Heritage Library (BHL)
 - Speaker, Encyclopedia of Life (EoL)
 - Speaker, JSTOR Plants (subscription fees)
- **Experts in business and biodiversity**
 - EU Business @ Biodiversity Platform*
 - Shulamit Alony, Regional Business and Biodiversity Officer, European Union Representative Office
 - Global Partnership for Business and Biodiversity*
 - Strahil Christov, Policy Officer, Economics of Ecosystems and Biodiversity
 - Other experts*
 - Richard Lane, Director of science, Natural History Museum in London (NHM)
 - Robert Darnton, Professor and University Librarian, Carl H. Pforzheimer University
 - Sjef Gussenhoven, Senior Advisor, International Union for Conservation of Nature (IUCN)
 - Henk Simons, Senior Advisor, International Union for Conservation of Nature (IUCN)
 - Joost Bakker, Project Manager, Global Nature Fund (GNF)



- 09:00 Session 1**
- Inputs from piB - Overview Task 6.3 (D6.3.1 & D6.3.2 main findings)
 - Business models at project's level
- 10:30 Coffee break**
- 11:00 Session 2**
- Inputs from other initiatives - online biodiversity platforms
 - Business models currently in use by non-partners (**sharing a questionnaire to get their inputs before the workshop?**)
- 12:30 Lunch**
- 13:30 Session 3**
- Small working groups - Post-it session (Part I)
 - Identification of Business models: evaluating various scenarios such as licensing, joint ventures, while leading to a consensual document detailing the project exploitation potential
- 15:00 Coffee break**
- 15:30 Session 4**
- Small working groups - Post-it session (Part II)
- 17:00 Closing**
- Presentation of the main findings (draft consensual document)



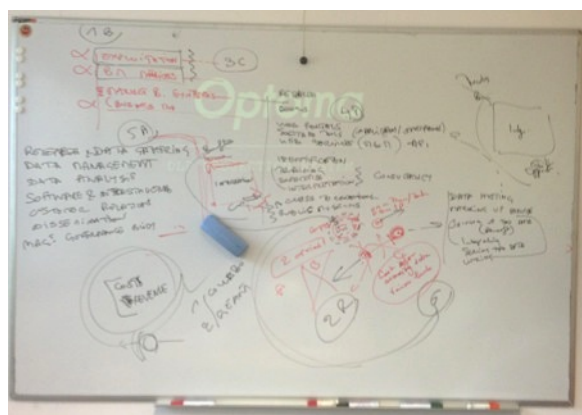


KEW/SIGMA could work collaboratively on the below mentioned activities (in the coming weeks):

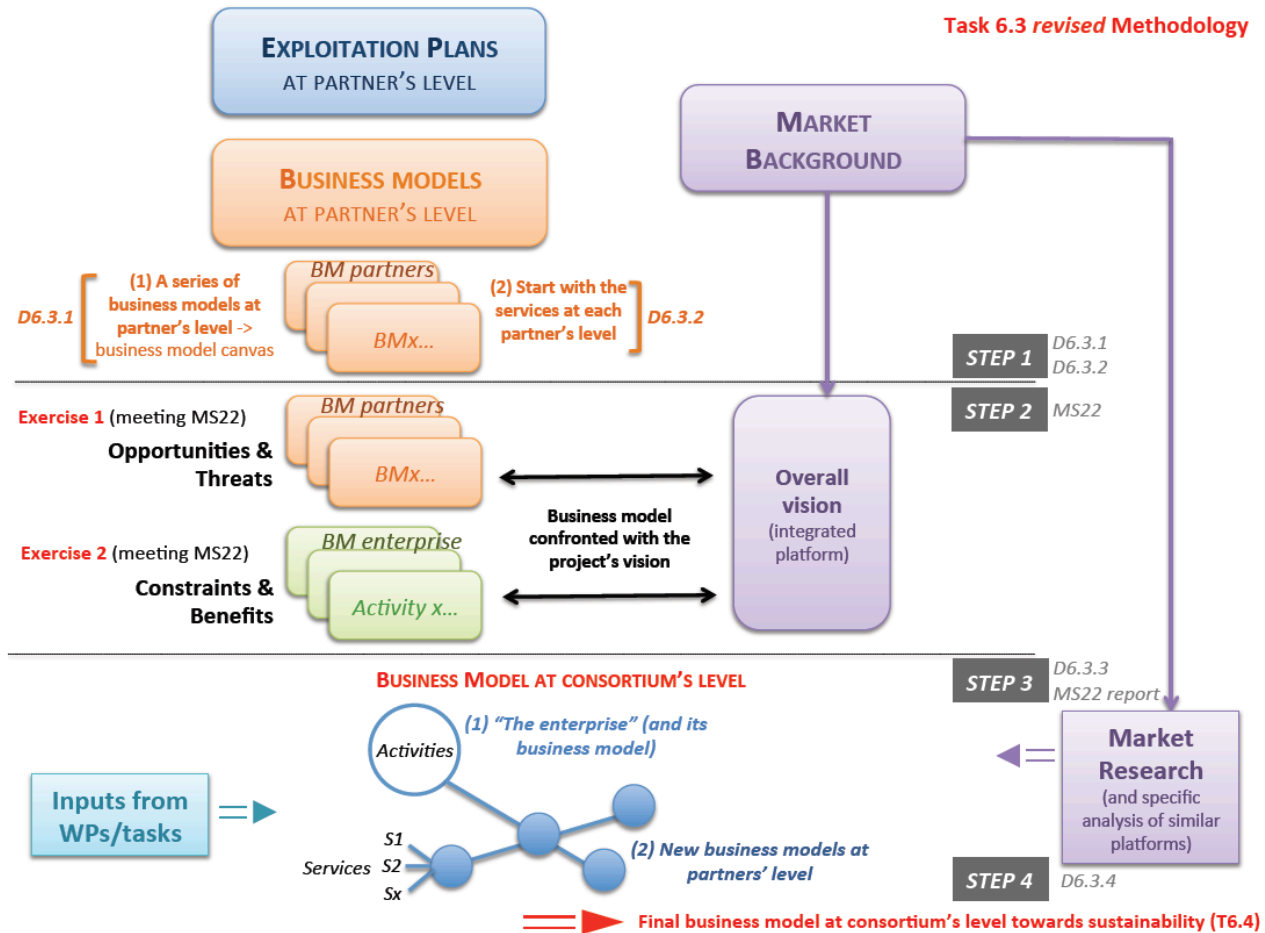
1. Event concept & objectives (incl. poster)
2. Event agenda
3. Liaise with FUB-BGBM for budget allocation/logistics (who takes care of the logistics? Eva? Sabrina? & budget handling)
4. Invite speakers/participants
5. Skype meeting organized on July 19 (Friday) to share results with the rest of the partners (especially FUB-BGMB)
6. Onsite management: KEW & SIGMA could co-manage the workshop
7. Proceedings – SIGMA/KEW will prepare a consensual report



Annex 7: office meeting pictures selection



Annex 8: Task 6.3 revised methodology





Annex 9: Meeting 4 (MS22) draft concept, participants and agenda



Meeting to evaluate business models currently in use by partners and relevant non-partners (Meeting #4)

T6.3 EXPLOITATION PLANS & BUSINESS MODELS

Berlin - October 10, 2013

CONCEPT AND OBJECTIVES

This fourth pro-iBiosphere meeting aiming at “evaluating business models currently in use by partners and relevant non-partners” takes place one year after the project start and will involve an audience of 30 participants composed of all pro-iBiosphere project partners and of external experts from other biodiversity initiatives.

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

The workshop will be refined collectively, through two exercises taking place in parallel working groups (WG):

- WG1: “Opportunities / Threats analysis” linked to the envisioned integrated platform, from a “partner’s business model” viewpoint,
- WG2: “Costs / Benefits analysis” linked to the envisioned integrated platform as well, but from a “portfolio of activities” viewpoint.

The outputs of the working groups will be discussed during a closing session, which should allow paving the way towards a more precise description of the business model at consortium level, likely to ensure the sustainability of the pro-iBiosphere initiative. This path will include the detailed methodology to be used to refine the present business model: inputs from other WPs and Tasks, specific market research focused on similar initiatives, etc.

ATTENDEES

pro-iBiosphere institutions

- Naturalis Biodiversity Center
- National Botanic Garden of Belgium
- Royal Botanic Gardens, Kew
- Botanischer Garten und Botanisches Museum Berlin, Freie Universität Berlin
- Museum für Naturkunde
- Pensoft
- Sigma Orionis
- Plazi

Other institutions, initiatives

- South African National Biodiversity Institute (SANBI) - Marianne LEROUX
- Reference Center on Environmental Information (CRIIA) - Dora CANHOS
- Muséum national d’histoire naturelle (MNHN) - Laurence BENICHOU
- Forest Research Institute Malaysia (FRIM) - Leng GUAN SAW
- Atlas of Living Australia (ALA) ; RIFKEW ; CONABIO ?

Experts in business and biodiversity

- International Union for Conservation of Nature (IUCN) - Tom Brooks

AGENDA

08:30 - Welcome of participants

08:45 - Welcome session: Setting the scene
Introductory presentation by Bob Allkin - RBGK

09:00 - Meeting objectives & methodological approach
Presentation by Roger Torrenti - Sigma Orionis

09:30 - Exploitation Plan at partner's level
Presentation by Camille Torrenti - Sigma Orionis

10:00 - COFFEE BREAK

10:15 - Business Models at partner's level
Presentation by Don Kirkup - RBGK

10:45 - Parallel working group: opportunities & threats analysis
Chaired by Don Kirkup - RBGK
Group moderators: Bob Allkin & Roger Torrenti

12:45 - LUNCH BREAK

13:30 - Parallel working group: costs & benefits analysis
Chaired by Alan Paton - RBGK
Group moderators: Bob Allkin & Roger Torrenti

15:30 - COFFEE BREAK

15:45 - Wrap-up session: Wrap-up and review

1. Working groups conclusions by Don Kirkup & Alan Paton - 20 min
2. Discussion and review by Bob Allkin & Roger Torrenti - 10 min
3. Open discussion (Q&A) - 30 min

16:45 - Closing session: concluding words & roadmap towards sustainability
Concluding words by Bob Allkin - RBGK

17:00 - End of meeting

Annex 10: Market background Inputs from partners at M6

The overall vision

Partners have been asked if they agreed with the following overall vision of the project proposed by the Task leader:

Succeed 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).

NATURALIS

Taxonomy is crucial to understand biodiversity, because taxonomic revisions are the primary source of validated biodiversity information. They comprise expert opinion, identification tools and information on morphology, distribution, ecology, uses and conservation. Current challenges in taxonomy are: (a) speeding up the generation and sharing of taxonomic information, (b) keeping the taxonomic information up-to-date; (c) facilitating and enhancing the application of taxonomic information by providing flexible information services for scientific and societal purposes; d) setting worldwide standards for sharing and deploying taxonomic content. In order to meet these challenges, we need to create a virtual taxonomic working environment for taxonomists, researchers in general, citizen scientists and users.

The virtual environment need to build upon an electronic taxonomy platform, i.e. a coordinated, open knowledge management system and information backbone for biodiversity. What is needed is the disclosure of high quality taxonomic, biological and geographical data and metadata of species. Such a virtual environment ensures a new and modern approach to taxonomy by facilitating information updates (from new classifications to missing data); allowing instant and specified output in many formats (from hard copy to electronic); enclosing all steps of the research work flow, including distant cooperation among researchers; accommodating various types of illustrations; allowing production of specific checklists or distribution maps directly based on specimen information; etc. Furthermore, we need to work towards a link between species and specimen information in the collections, GIS and DNA sequence databases (from other external sources), further increasing the usefulness and applicability of the data.

Beyond taxonomy, the e-platform also ensures breakthroughs in other research fields, simply by providing large volumes of well curated taxonomic data for the first time structured in a database format that allows data mining for a variety of disciplines, such as paleontology and macro-evolution, phylogeography, macroecology, species distribution modelling, ethnobotany, nature conservation, etc. The increased possibilities of data mining, and the disclosure and reuse of primary biodiversity data in combination with other biological databases will promote the originality and innovative nature of the research programs.

Additional inputs:

From the Flora Agaricina Neerlandica

- *The multi-volume Flora Agaricina Neerlandica provides identification keys, extensive descriptions, and illustrations of all agarics and boleti occurring in the Netherlands, with data on their ecology and distribution, based on vouchered specimens deposited at Naturalis. Many fungal genera are species rich and are taxonomically challenging. The overall*

goal is to provide a reliable, flexible systematic framework macrofungi of Western Europe that can be constantly updated as more knowledge is being accumulated, e.g. via DNA barcoding, molecular phylogenetic and systematic studies etc.

- This constantly improved taxonomic database needs to be readily available to the scientific community as well as to the general public, including amateur mycologists etc. for data mining and resulting applications.
- The proposed digitalisation and barcoding of the FAN will enhance ecological and taxonomic studies globally, thus resulting in a greater recognition of the NHN collections abroad. Generating sequences for types and other well-documented collections will create a reliable backbone for systematic studies.

From the Flora of the Guianas

- Yes, I agree with the overall vision. The Flora of the Guianas publishes family treatments of plant and fungi species occurring in the Guianas - French Guiana, Surinam and Guyana. Fascicles of the Flora may contain one or more families and are published as hard copy only. The participants of the Flora of the Guianas project share the overall vision of 1) generating accurate taxonomic data; 2) making it available for users in different formats, to address different needs; 3) keeping up with the dynamic nature of taxonomy through updates of the published data; and 4) promoting training and education. Items 2 and 3 cannot be achieved due to the structure of our current workflow.

NBGB

I think an additional aspect is one of improving taxonomic workflows to benefit from the efficiencies of the IT infrastructure.

FUB-BGBM

Agreed. We would add as a second vision the digitisation of information not yet available in electronic form and the mobilisation of presently underutilized large volumes of biodiversity information held in semi-structured formats (websites, documents, tables) to exploit their full potential in biodiversity information networks.

PENSOFT

Yes, we agree with such a statement.

SIGMA

We fully share this vision

RBGK

- Almost certainly, but subject to the findings of the project with regard to appropriate business models and approaches to sustainability, and the points below.
- We should define "processing core biodiversity data". Our assumption is we are concentrating on Floristic and faunistic data in this project.
- There may be merit in defining this more precisely through workshop discussion.
- The nature of the integrated system also requires investigation and better definition.

PLAZI

Yes, I agree. But that is not the point. The important thing is how to initiate this transition and finally get our institutions to make a commitment and change their predominantly isolationist's attitude, that is historically understandable (a specimen or book cannot be shared but is part of the collection or library respectively), but is increasingly challenged by adding an additional layer of shared objects, such as a catalogue of the bibliographies to digital books and publications, images of specimen, etc., that can easily be shared. But shared objects need a home in which comes with costs that somebody has to take care of. Sharing needs a new form of collaboration that has to be established at social but also funding level.

MFN

In general I agree with this statement. However the wording is pretty complex and not easy to understand.

The steps to make it happen

Partners have been asked the following question:

What are in your mind 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?

NATURALIS

The quality of the customer services lays on (respect for) the expertise of the staff, recognized in the scientific community and leadership in taxonomic projects. The increased possibilities of data mining, and the disclosure and reuse of primary biodiversity data in combination with other biological databases will promote the originality and innovative nature of the research programs.

The report "Challenges for Biodiversity Research in Europe", from the League of European Research Universities (LERU) (http://www.leru.org/files/publications/Biodiversity_final.pdf), indicates that it is necessary to invest in a European infrastructure for biodiversity data and research. According to the document, it is "disconcerting to see that taxonomy and the establishment of primary databases or collections are largely ignored in research agendas". The LERU report also suggests investments in modern web-based biodiversity informatics to ensure that information is as widely available as possible. A large amount of data currently only achievable in hard copy publications needs to become available as open access and in a database format for the scientific community and society. Europe, as custodians of large biodiversity data sets with a global coverage, can assume an internationally leading position in this. The intended facility would provide a strong core for national Lifewatch activities. Furthermore, regarding hotspots of biodiversity, the threats of land use and climate change must be rapidly addressed. Timely elaboration and dissemination of information on plant diversity in these areas is crucial to identify, understand, use and natural resources

It is essential to unfold a new strategy for primary biodiversity data, i.e. the reuse of taxonomic data from other databases and the incorporation of scattered information resulting from other types of research or from citizen science. These are critical aspects in

the light of the ever-decreasing pool of specialists concentrating on taxonomic revisions. This new strategy will also require the development of a set of protocols on how to update and curate the data within the online facility.

Additional inputs:

Flora Agaricina Neerlandica: in order to achieve the above goals, it is necessary to:

- *Have the taxonomic information present in all published volumes of the FAN in a searchable electronic format (markup and import into the database of volumes 1-6);*
- *Digitise corresponding collections at Naturalis so they can be mined, searched or browsed and located easily;*
- *Link the corresponding information to species list and distribution information as displayed at the NMV mapping websites, e.g. verspreidingsatlas.nl*
- *Provide links to molecular databases, such as NCBI, in addition to the automated connections to MycoBank, GBIF, EOL, etc.*

From Flora of the Guianas

The main obstacle for the Flora of the Guianas is the fact that all data is available only in the hard copy publication. The pdf's might become available in near future (editorial office has got in touch with Kew publisher about that possibility, waiting for an answer).

Main steps needed:

- *Markup of published volumes*
- *Implementation of a database system that allows curation and update of content (taxonomic data)*
- *Link with collections database (Brahms)*

Currently, there is no secure funding/ staff for these activities.

From Flora of the Netherlands

The Flora of the Netherlands is hampered by the presence of only a part time position, and the threat of losing technical support. The contributions of citizen science (e.g. 'waarneming.nl' [observado]) is valuable, but needs extra scrutinizing, because it is in most cases not vouchered and therefore not verifiable and difficult to validate.

The main obstacles for Flora Malesiana

- *Taxonomy is generally regarded as mainly the activity to map and describe new taxa. This is a step back to the 19th century when everybody was describing new species, whereas the strength of the 20th century was the monographic/revision approach, critically evaluating and testing species hypotheses in the context of the whole group (and cleaning up all chaos). The monographic approach needs to be re-installed in science policies and valued as such. This includes recognition of the fact that producing data is one thing, systematically validating them is another thing, much more time consuming and not a corollary of other activities. Funding will follow from that, as most and for all more research capacity is needed. It is rather a shame that the present scientific culture discourages young botanists to start a career in taxonomic Flora research.*

- *We need a platform of our own with fully committed ICT people, to be independent of others for whom we do not have appropriate incentives.*
- *We face the problem of a multinational Flora and the difficulties of commitment of counterparts, due to national funding, priorities and restrictions (permission to look beyond borders). Counterparts should share the responsibilities and eventually take these over.*

NGBG

- To get taxonomists to work in a collaborative and structured manner.
- To ensure taxonomists can gain credit for their work and acknowledgement of their contribution, while at the same time aggregating knowledge. Taxonomists gain recognition from journal publications, and do not get additional recognition for digital publication nor for the licence they publish under. Digital publication needs to become part of institutional policy.
- To work in a polylingual world.
- To cater for the often conflicting requirements of the producers & consumers of knowledge. For example, the producers of knowledge might be interested in the minutiae of morphology, but the consumers just want to know which morphological characters distinguish two species.

FUB-BGBM

We see three major obstacles:

- A lack of standardisation hinders efficient data mobilisation as well as interoperability between platforms. The success of the various pilot implementations can be used to the monitor progress of standardisation efforts in the project.
- Availability of helpdesk functions. Resources for a dedicated pro-iBiosphere helpdesk have not been planned for the funded project itself and would be crucial for the sustainability beyond the project. Pro-iBiosphere should take measures to build user-expert groups, which can act as a community-driven helpdesk as long as a formal helpdesk is not available.
- Institutional commitment: the aims have to be incorporated into the institutional priorities and policies, so that a dependable partnership is created, including long term commitments of partners to fulfil certain specialised functions for the partnership and for the community at large.

PENSOFT

All products of pro-iBiosphere need to be tailored according to the specific exploitation needs of each partner organisation, especially to SMEs that will be primarily responsible for the valorisation and sustainable use of the product.

SIGMA

The pro-iBiosphere project aims to prepare (=pro) the ground for an integrative system (=sphere) for intelligent (=i) management of biodiversity (=bio) knowledge. It is expected that a relevant business model can be identified by the end of the project.

However, a “test implementation phase” (of this business model) will be necessary to fine tune the model and ensure the true sustainability of a “European Open Biodiversity Knowledge Management System”. The core funding of this test phase can only come from the European Commission (even if other sources of funding will be investigated).

Time being critical (the duration of the pro-iBiosphere is only 24 months), it is thus important that the consortium can quickly finalize its first analysis on the feasibility and constraints of such system, in order to start building the new project.

The idea would be at the end to insure a smooth continuity of both projects without creating any discrepancy either losing the momentum.

RBGK

A - The purpose of the project is to clarify the nature of future integration desired to provide a range of services. Potential barriers to build and sustain this integration include:

- Lack of funding post-project
- Lack of clarity and agreement over project and post-project goals
- Lack of agreement between partners on priorities
- Lack of effective engagement with and understanding of actual and potential users of the integrated system
- Poor definition of supplier and user requirements
- Failure to establish viable business model(s)
- Divergent requirements
- Failure to establish convincing picture of actual and potential user demand
- Failure to integrate with complementary biodiversity information initiatives and resources

B.

- The deliverables related to sustainability (6.4)
- Mutual agreement on steps required to foster continued integration
- A plan with resourcing for post-project integration activities
- A means of continuing communication, discussion and collaborations beyond this project

If we are to develop an integrated system, then the specifications of that system need to be clearly defined, either in this project (not currently a deliverable) or in the initial stages of a future project.

C. Too early to say for individual work packages, but

- A concern over how the outcomes of different Work Packages relate and are brought together into a coherent plan during this project and post-project
- Agreement between partners on preferred routes to integration and sustainability
- Pilots may give some insights as they develop
- Need to check up on end user engagement

PLAZI

Not enough convincing operating system that can be used to make a “fait accompli”, that is to be in a stage where the institutions will consider the system to be so vital that it will have to support it. The other part is to be part of a wider science community as

opposed to be even a successful isolated domain. Floras especially are targeted towards applied sciences, conservation, forestry: If those fields would have an access so that the use of the data from Floras and faunas are a daily routine, and we have a system to create and maintain the content that increasingly is linked to the assets of a botanical garden or natural history museum, then there might be chance. Ultimately, it is a mixture of good science and salesmanship, ie selling the new to those protecting or committed to continue the old traditions.

Probably within the pro-iBiosphere that assessment of the pilot studies needs particular assessment: Do they deliver? Do they really provide something new that will become mainstream because it adds to the tools of a working taxonomists or publisher?

MFN

Obstacles:

- Lacking commitment of contributing partners, especially after the end of the project
- Disagreement on supported standards and procedures
- Scientists may not be using the produced products, services or platforms (lack of need or interest)
- Individual partner's interests is in conflict with project goals (change of focus)
- Insufficient dissemination of project goals and outcomes, especially in the participating institutions

Key developments:

- Good communication of project partners
- Dissemination project goals and outcomes
- Easy-to-use and well integrated products for the target users
- Functional integrated system (including testing) and services
- Integration of produced systems and services in existing (external) services (spreading use)

Particular assessment:

- Unknown at the time of writing (needs further involvement in the project)

Platform management

Partners have been asked the following question

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?

NATURALIS

- It should at least include the owners of the information, editors of the information and the developers of the platform/systems.

- The platform should include the providers of data (taxonomists, editors and curators) and a team responsible for the IT issues (?).

Updating is a laborious work, depending on specialists and editors.

The virtual system is free software and all products generated by the investment will become immediately open access, thus the reach to the proposed facility is worldwide. Arrangements concerning property rights between the institute and the publishers of the Floras need to guarantee its free online publication. Access to the data will be as free as possible (e.g., for conservation purposes, some data may necessitate shielding). Adding or changing data will be a more restricted, two step procedure, to maintain the high quality of the database. Researchers can apply for writing permission and their data will always be screened by editors before added to the main body of the database. Ongoing research may be temporarily shielded from viewing, as species concepts will not be stable yet. Authors of future taxonomic treatments to be incorporated will have to adhere to common terms of agreement, but most of them are already well aware of the open access conditions, including data sharing and citations

NGBG

From the perspective of wishing to achieve goals as efficiently as possible a strong independent management would be preferable. However, it seems unlikely that taxonomists and institutions would devolve decision making to a central body without considerable incentive.

FUB-BGBM

Cannot be answered at this point. Pro-iBiosphere would need a clearer vision or plan for this platform first.

PENSOFT

The integrated platform should be managed by economically self-supporting organisation, not depending on state budget or irregular project funding.

SIGMA

The pro-iBiosphere project involves major European biodiversity organisations, including natural history museums, botanic gardens, and specialists in markup, dissemination and publishing.

It appears logical, that this integrated system involves the current pro-iBiosphere partners (depending on their interest and commitment), but also other EU and non-EU partners to reach a critical mass and ensure a suited positioning in the international landscape.

A core group should ensure the governance of the platform.

Concerning the platform itself, a technical partner that could host, run and sustain this system, will probably be necessary.

RBGK

Too early to say - we do not want to preempt analysis of business models and cost benefit analysis

PLAZI

No clear answer to this yet – I think this need to be a task of the project itself.

Generally, I think the platform needs to be a vision statement of this project that follows analysis and needs of at least the institutions and scientists in this group, as well as the input from our various workshops. It then needs to move to “Somebody” that implements it with support from the “crowd”. Somebody being a person / institution that has the commitment to make it happen, the crowd would be the management body.

At the moment, running costs would have to be established within this project. We might be able to provide figures for parts such as a treatment repository of running RefBank.

The investments can only be guessed if we have a vision on how this platform should look like, and what content it has to include.

MfN

The management of the envisaged platform can be a shared duty of the initial partners of the project, but could also be extended to new highly engaged partners. There has to be an (scientific and technical) advisory board, which is able to make decisions about future plans and development, but also deals with upcoming risks and issues. Each active partner should commit to the contribution in this board (personnel). However, it will be a major challenge to convince involved partners to agree on this for a long term.

Another possibility is the creation of a foundation, which should be self-sufficient but supported by the project partners (personnel or finances) or otherwise created income (see below). This foundation would then be responsible to open up new resources and funding, e.g. new grants, profits generated by specific services and products developed in the project.

The benefits the integrated system will offer

Partners have been asked the following question:

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 organisation managing the platform?

NATURALIS

With user-friendly, reliable, and up-to-date taxonomic e-platforms, accurate information on species identification, distribution, ecology etc. can be readily and widely disseminated to a wide range of user groups, such as taxonomists, amateur mycologists, conservation professionals, ecologists, environmental scientists, policy makers, and the general public. Such wide accessibility of

validated information increase the societal impact and relevance of biodiversity, hopefully resulting in increased weight in policy making processes.

The efficient connection of data from different sources will add value to taxonomic research by increasing the possibilities of mining and reutilisation of data. Institutes/ individual researchers do not have to do repeated work, they can optimize by sharing tasks.

During the last decade state-of-the-art computer tools have been developed to facilitate acquisition and update of taxonomic data. A growing demand for electronic and online taxonomic data has led to a proliferation of e-taxonomy projects. Such projects easily exceed the capacities and skills in a single institute or country, hence the development of biodiversity infrastructures needs to be addressed in European context as collaborative efforts. Moreover, now the infrastructures are there, it is of great importance to populate them with quality data, and to deploy them in an engaged community of experts and stakeholders: a true research facility, which facilitates access to the existing and the production of the new content. Interoperability of systems and data is still limited, needing further technical and semantic interoperability. Implementation of this platform will not only facilitate production of new information and updates of existing information, but will also increase publication possibilities (hard copy on demand, internet, smartphone). Moreover, it will also enable to add data scattered throughout existing literature (and consequently difficult to trace and retrieve), and to adopt new standard best practice for taxonomic work flows.

The main results achieved as a result of the investment – innovation in the work flow of taxonomic research, remote collaboration among specialists (notably also those from developing countries) and the release of an enormous volume of primary biodiversity data - will serve as an unprecedented facility to support the local as well as global scientific community, conservationists, consultancy firms, policy makers, etc., to suit a wide range of tasks, among which biodiversity prospecting, species distribution modelling, impact of land use change on biodiversity. Also, since the greater part of the data proposed to be uncovered through this investment relate to tropical countries with a colonial past, Europe will play its role in the repatriation of primary biodiversity data to these countries as well as provide scientific training to the appropriate national and regional institutes. The fact that data will be generated and stored already in a database format, guarantees continuous update and provide possibilities for innovative (and tailor made) data mining, especially when it is linked to other databases, such as our specimen database and DNA barcode database. The new structure will allow the following technological innovations in the field:

- Online publication and open access of legacy data and information.
- Remote collaboration between specialists in different institutes, speeding up publication.
- Extraction of taxonomic data/checklists/Floras/Faunas.
- Update and revision of (new) species, taxonomic treatments, identification keys, nomenclature, maps, images, ecological data.
- Disclosure of large amounts of high quality taxonomic data to biodiversity initiatives and/or other related databases such as TRY database (www.try-db.org), GBIF (www.gbif.org), JSTOR (www.jstor.org), Europeana (www.europeana.eu), BHL-Europe (www.bhl-europe.eu), TEEB (www.teebweb.org), etc.
- Data mining and tailor made queries for other scientific fields (e.g. studies on global climate change or resilience of ecosystem services).

The fact that the data concerned will be available as an open access source will promote social change. A larger audience, including the general public, will have direct access to otherwise hidden aspects of the biological diversity on our planet as well as allow

amateur botanists to identify plants (in the future also other organisms) they encounter all over the world. This will lead to a different attitude towards biodiversity in general and an exciting new way of experiencing nature. Imagine someone walking on the island of Java, and through the use of a smart phone being able to identify a plant that caught the attention, thus obtaining its scientific and local names, its ecology, its rarity and threat, uses, etc. What a potential, also for the development of ecotourism in such regions.

NBGB

- Multilingual access for all
- Higher visibility for research
- Reduced costs
- A one-stop-shop for biodiversity information
- Better-coordinated environmental policy
- Closer ties with institutions in Africa

FUB-BGBM

Benefits include: improved re-usability of data, mobilisation of presently underutilized data, improved data quality, more efficient and secure data management, improved visibility of biodiversity data, streamlined publication processes.

Examples for new products: Interactive and dynamic biodiversity data interfaces (web-pages, mobile applications, etc.), services providing data access across institutions.

PENSOFT

Unknown

SIGMA

RBGK

- Pooling of resources
- Reduce duplication
- Sharing data
- Reducing institutional costs (economies of scale)
- Broader use of data
- Single source of truth / avoidance of competition

It is too early to properly understand what new services could be offered, but potentially these might involve improved access channels for human and machines; tailoring of content; products benefiting from broader geographical range; better connectivity

with complementary biodiversity data; more dynamically updated products; improved interactivity; on demand and tailored print products; improved customer support.

PLAZI

Sharing digital data means de -duplication of efforts. But it comes with an additional cost since the system is not yet part of a standard budget.

A typical service could be anything that means customization, creating more specific content, or offering a publishing service (for example for publishing Floras off the platform) or conversion of existing Floras into a digitally harvestable form.

MFN

Benefits:

- Increase in scientific output, output speed
- Fostering across institution collaborations
- Visibility and efficient reuse of taxonomic data/ publications
- Access to a more comprehensive set of data
- Use of collected data also by third parties, external services

Improved services:

- Semantic markup of legacy literature, digitising institutions, for free (automated services)
- Tools for creating semantic markup of new taxonomic publications, author, page charge

Annex 11: Main biodiversity projects and initiatives (*update in M12*)

EU- FUNDED PROJECTS ON BIODIVERSITY

Project	Website	Description
4D4Life	www.4d4life.eu	Distributed Dynamic Diversity Databases for Life
agINFRA	www.aginfra.eu	A data infrastructure to support agricultural scientific communities promoting data sharing and development of trust in agricultural sciences
ANAEE	www.anaee.com	Structuring Infrastructures for the ANALysis and Experimentation on Ecosystem
Biodiversa2	www.biodiversa.org	Cooperation and shared strategies for biodiversity research programmes in Europe
BiodiversityKnowledge	www.biodiversityknowledge.eu	BiodiversityKnowledge is an initiative by researchers & practitioners to help all societal actors in the field of biodiversity & ecosystem services to make better informed decisions
BIOFRESH	www.freshwaterbiodiversity.eu	To build a global information platform for scientists and ecosystem managers with databases of global freshwater biodiversity
BioVeL	www.biovel.eu	Virtual e-laboratory that supports research on biodiversity issues using large amounts of data from cross-disciplinary sources
CReATIVE-B	creative-b.eu	Coordination of Research infrastructures Activities Toward an International Virtual Environment for Biodiversity
EBONE	www.ebone.wur.nl	The project has developed a system or data collection that can be used for international comparable assessments.
EDIT	www.e-taxonomy.eu	Network of excellence gathering 28 major institutions devoted to knowing the living world better with the support of the EC
EMBRC	www.embrc.eu	European Marine Biological Resource Centre
EUBrazilOpenBio	www.eubrazilopenbio.eu	EU-Brazil Open Data and Cloud Computing e-Infrastructure for Biodiversity
EUBON	http://www.eubon.eu/	Assessing global biological resources: the European contribution to the Global Earth Observation Biodiversity Observation Network (GEO BON)
EXPEER	www.expeeronline.eu	Distributed Infrastructure for EXPERimentation in Ecosystem Research
FishBase	www.fishbase.org	A global encyclopaedia of fishes
i4Life	www.i4life.eu	Establishing of a virtual research community interlinking and harmonizing the taxonomic catalogues to create an enhanced list of the entire set of organisms
iMarine	www.i-marine.eu	Hybrid Data Infrastructure service & Virtual Research Environments
INCREASE	www.increase-infrastructure.eu	An Integrated Network on Climate Change Research Activities on Shrubland Ecosystems
INTERACT	www.eu-interact.org	International Network for Terrestrial Research and Monitoring in the Arctic
JERICO	www.jerico-fp7.eu	Towards a Joint European Research Infrastructure Network For Coastal Observatories
KNEU	www.biodiversityknowledge.eu	Developing an open networking approach to boost the knowledge flow between biodiversity knowledge holders and users in Europe
LifeWatch	www.lifewatch.eu	E-Science European Infrastructure for Biodiversity and Ecosystem Research
MARBEF	www.marbef.org	Marine Biodiversity and Ecosystem Functioning EU Network of Excellence
PESI	www.eu-nomen.eu/pesi	A Pan-European Species directories Infrastructure
SYNTHESYS	www.synthesys.info	Produce an integrated European resource for research users in the natural sciences.
TESS	www.tess-project.eu	Design of a transactional environmental decision support system, linking central policy planning to local livelihoods
VIBRANT	www.vbrant.eu	To set up the means, tools and infrastructure to produce a more rational and a more effective framework for European biodiversity research

OTHER BIODIVERSITY PROJECTS AND INITIATIVES

Project	Website	Description
Barcode of Life (BOL)	www.barcodeoflife.org	Identifying Species with DNA Barcoding
Belgian Biodiversity Platform	www.biodiversity.be	The Belgian Biodiversity Platform is a science-policy interface offering a privileged access to primary biodiversity data and research information
Biodiversity Heritage Library	www.biodiversitylibrary.org	Consortium of natural history and botanical libraries that cooperate to digitise and make accessible the legacy literature of biodiversity
Biodiversity-CHM	http://en.biodiversiteit.n	The Netherlands Biodiversity Portal aims to provide access to a maximum of biodiversity information related to the Netherlands
Biodiversity International	www.biodiversityinternational.org	Research-for-development organisation working with partners worldwide to use and conserve agricultural and forest biodiversity for improved livelihoods, nutrition, sustainability and productive and resilient ecosystems
Biodiversity in Good Company	www.business-and-biodiversity.de	To create space for innovation and investment in order to pave the way for ecologically sound technologies, products and services to be successfully introduced into the marketplace
BHL-Europe	www.bhl-europe.eu	Brings together existing EU digital collections of biodiversity literature and will provide access by a multilingual web portal
BioNET	www.bionet-intl.org	International initiative dedicated to promoting the science & use of taxonomy
BioStor	www.biostor.org	BioStor provides tools for extracting, annotating, and visualising literature from the Biodiversity Heritage Library
Biodiversity Information System for Europe (BISE)	www.biodiversity.europa.eu	Biodiversity Information System for Europe is a partnership between the EC & the EEA. It is a single entry point for data & information on biodiversity in the EU
CBD	www.cbd.int	The conservation, the sustainable use of the components of biological diversity, the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources
CETAF	www.cetaf.org	Networked consortium formed to promote training, research and understanding of systematic biology and palaeobiology
DIVERSITAS	www.diversitas-international.org	International research programme aiming at integrating biodiversity science for human well-being
Dryad	www.datadryad.org	International repository of data, governed by a consortium of journals, underlying peer-reviewed articles in the basic and applied biosciences
ELIXIR	www.elixir-europe.org	Pan-European research infrastructure for biological information managing and safeguarding the massive amounts of data being generated every day by publicly funded research.
Endowment Fund for Biodiversity (FDB)	www.fdbiodiversity.org/en	The FDB is intended for businesses & the general public to develop actions for the preservation of animal & plant species, and actions to inform & education
eMonocot	www.e-monocot.org	eMonocot aims to create a global online resource for monocot plants.
Encyclopedia of Life (EoL)	www.eol.org	To increase awareness & understanding of living nature in an Encyclopedia of Life that gathers, generates & shares knowledge in a digital resource
ERMS	www.marbef.org	European Register of Marine Species
European Info° System for Alien Species	-	To facilitate enhanced knowledge gathering and sharing and providing support to a European Invasive Alien Species (IAS) information system
Flora of North America	www.floranorthamerica.org	Information on the names, taxonomic relationships, continent-wide distributions, and morphological characteristics of all plants found in North America north of Mexico
GBIF	www.gbif.org	GBIF promotes and facilitates the mobilisation, free and open access, discovery and use of biodiversity information via the Internet.
GBRCN	www.gbrcn.org	Global Biological Resource Centre Network
GEOSS	www.earthobservations.org	Global Earth Observation System of Systems

Project	Website	Description
	ons.org/geoss.shtml	
Global Names US Project	-	
IAPT	www.iapt-taxon.org	To promote all aspects of botanical systematics and its significance to the understanding and value of biodiversity
iDigBio	www.idigbio.org	Integrated Digitised Biocollections, the National Resource for Advancing Digitisation of Biodiversity Collections (ADBC) funded by the US National Science Foundation
Index Fungorum	www.indexfungorum.org	International project to index all formal names in the Fungi Kingdom
IPBES	www.ipbes.net	IPBES is an interface between the scientific community and policy makers that aims to build capacity for and strengthen the use of science in policy making
IPNI	www.ipni.org	Database of the names and associated basic bibliographical details of seed plants, ferns and lycophytes
Joint Nature Conservation Committee (JNCC)	www.jncc.defra.gov.uk	JNCC is the public body that advises the UK Government and devolved administrations on UK-wide and international nature conservation.
KeyToNature	www.keytonature.eu	Range of new, much easier and paper-free identification tools, for use within schools and universities across Europe
LIAS	www.lias.net	A Global Information System for Lichenized and Non-Lichenized Ascomycetes
Marine Genomics	www.marinegenomics.org	Web-based interface for public transcriptomic and genomic data and analysis tools
MycoBank	www.mycobank.org	Online database aimed as a service to the mycological and scientific society by documenting mycological nomenclatural novelties and associated data
Nordic LifeWatch	-	Aiming at creating the e-science infrastructure for Biodiversity and Ecosystem Research. Funded by NordForsk
Pl@ntNet	www.plantnet-project.org	Plant Computational Identification & Collaborative Information System
Plants2020 (GSPC)	www.plants2020.net	A toolkit to support national and regional implementation of the Global Strategy for Plant Conservation
Species 2000	www.sp2000.org	Federation of database organisations working closely with users, taxonomists and sponsoring agencies to create a validated checklist of all the world's species
SynBioSys	www.synbiosys.alterra.nl	An information system for the evaluation and management of biodiversity among plant species, vegetation types and landscapes

Annex 12: Biodiversity research portals (*update in M12*)

Sequence databases		
Barcode of Life	http://www.barcodinglife.com	All public barcode data
International Barcode of Life (iBOL)	ibol.org	Extending the geographic and taxonomic coverage of the barcode reference library
International Nucleotide Sequence Databases (INSDC)	www.insdc.org	Composed of the three databases: DDBJ, ENA, and GenBank
International Transcriber Spacer 2 (ITS2)	http://its2.bioapps.biozentrum.uni-wuerzburg.de	Ribosomal RNA Database
Global biodiversity databases		
Bibliography of Life (BoL)	http://refbank.org	Database for storing and handling of literature, references mostly from biodiversity sciences (200,000 references)
Biodiversity Heritage Library	http://www.biodiversitylibrary.org	Natural history and botanical libraries that digitise and make accessible the legacy literature of biodiversity
Biowikifarm.net	http://biowikifarm.net/meta/	Shared media repository, enabling synergies in re-using media content
CrossRef	http://crossref.org	4300 societies and publishers facilitating the links between distributed content hosted and other sites
DataONE - ONEMercury	https://cn.dataone.org/onemercury/	Three primary cyberinfrastructure elements for multi-scale, multi-discipline, and multinational science data
D4Science.org Hybrid Data Infrastructure service	http://portal.d4science.research-infrastructures.eu/web/guest/welcome	Scientific community in the large
EDIT platform (European Distributed Institute of Taxonomy)	http://wp5.e-taxonomy.eu/	Cybertaxonomy
Encyclopedia of Life (EoL)	http://eol.org/	1 112 217 pages
ETI BioInformatics	http://www.eti.uva.nl/	World Biodiversity Database, World Taxonomist Database) and Linnaeus II
European Bioinformatics Institute (EMBL-EBI)	http://www.ebi.ac.uk	Building, maintaining and providing biological databases
GEO Portal	http://www.geoportal.org/	1 057 results for Biodiversity
GBIF Data Portal (Global Biodiversity Information Facility)	http://data.gbif.org/welcome.htm	377 177 914 data records
Global Names Initiative	http://www.globalnames.org	System of databases, programs & web services to index, organise & interconnect online information about organisms /names.
Linnaeus II research tool	http://www.eti.uva.nl/products/linnaeus.php	Multifunctional research tool for systematists and biodiversity researchers
Mapping Life	http://www.mappinglife.org	Knowledge-base and platform for species distribution map development
Morphbank	http://www.morphbank.net	Growing database of biological images that scientists use for international collaboration, research and education
Plazi Taxon Search Portal	http://plazi.org:8080/GgSRS/search	20 223 treatments (1 476 documents)
Scratchpads	http://search.scratchpads.eu/	Manage, share and publish taxonomic data online
Species 2000 Checklist / Catalogue of Life	http://www.catalogueoflife.org/annual-checklist/	Validated checklist of all the world's species (plants, animals, fungi & microbes)
Species Base	http://www.speciesbase.org/	73 100 species
Species-ID	http://species-id.net/wiki/Main_Page	Dynamic and authoritative open access resource for biodiversity information
uBio TaxonFinder web service	http://www.ubio.org/	11,106,374 Biological Names

Wikispecies	http://species.wikimedia.org/wiki/Main_Page	Species directory covering Animalia, Plantae, Fungi, Bacteria, Archaea, Protista and all other forms of life - 370,518 articles
World Biodiversity Database (WBD)	http://wbd.etbioinformatics.nl/bis/index.php	25 493 unique taxa
Xper2 platform	http://lis-upmc.snv.jussieu.fr/xper2/infosXper2Bases/en/index.php	Dedicated to taxonomic descriptions & computer-aided-identification
Regional databases		
African Plant Database	http://www.ville-ge.ch/musinfo/bd/cjb/africa/index.php	A checklist of the vascular plants of Africa
Atlas of Living Australia	http://www.ala.org.au	Biodiversity data covering Australian species
Australian Faunal Directory	http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/home	Online catalogue of taxonomic & biological information on all animal species within Australia - 117 670 species/subspecies
BioCASE (The Biological Collection Access Service for Europe)	http://search.biocase.org/europe/	Transnational network of biological collections of all kinds
Biodiversity data centre (BDC)	http://www.eea.europa.eu/themes/biodiversity/dc	Data and information on species, habitat types and sites of interest in Europe
DNA Data Bank of Japan	http://www.ddbj.nig.ac.jp	
Dryades	http://www.dryades.eu	Identification tool devoted to plants, fungi and animals and to important databases on the biodiversity Italy
EUBrazilOpenBio	www.eubrazilopenbio.eu	e-Infrastructure of open access resources (data, tools and services)
EU BON	TBA	European gateway for biodiversity information, integrating a wide range of biodiversity data
European Nature Information System (EUNIS) database	http://eunis.eea.europa.eu/	The species part contains information about more than 278 000 taxa
Flore d'Afrique Centrale	www.br.fgov.be/RESEARCH/DATABASES/FOCA/index.php	The digitised Flora of the Democratic Republic of Congo, Rwanda and Burundi
Flore d'Afrique Centrale (Checklist)	http://floreafriquecentrale.org/	A checklist of the higher plants of the Democratic Republic of Congo, Rwanda and Burundi
Indian Biodiversity Information System (IBIS)	http://www.indianbiodiversity.org	Common platform of modular and searchable biodiversity portals on Indian Flora and fauna
Integrated Digitised Biocollections (iDigBio)	www.idigbio.org	Data and images for millions of biological specimens are being made available in electronic format
LifeWatch	http://www.lifewatch.eu/fr	E-Science European Infrastructure for Biodiversity and Ecosystem Research
PESI portal (Pan-European Species directories Infrastructure)	http://www.eu-nomen.eu/portal	European species
SinBiota	http://sinbiota.biota.org.br/	Disseminating information about São Paulo State's biodiversity
SoortenBank	http://www.soortenbank.nl	Fauna, Flora and Fungi from the Netherlands
SynBioSys species checklist	http://www.synbiosys.alterra.nl/synbiosys.eu/speciesviewframe.htm	This checklist is a compilation of the most important Turboveg species lists of European countries
SYNTHESYS portal	http://www.synthesys.info/II_access.htm	337,204,000 specimens
Species databases		
AlgaeBase	http://www.algaebase.org	Database of information on algae that includes terrestrial, marine and freshwater organisms
AmphibiaWeb	http://amphibiaweb.org	Online system that provides access to information on amphibian
Animal Diversity Web	http://animaldiversity.ummz.umich.edu	Online database of animal natural history, distribution, classification, and conservation biology

Anthos	http://www.anthos.es	Program developed to display information about the biodiversity of plants in Spain online
Biodiversity of Freshwater Ecosystems (BIOFRESH)	www.freshwaterbiodiversity.eu	To build a global information platform with databases of global freshwater biodiversity
Biodiversity Monitoring & Assessment Tool (BioMat)	http://eumon.ckff.si/biomat/1.2.php	Monitoring schemes available: 633 / Species: 456 / Habitats: 177
BioSystematic Database of World Diptera (BDWD)	http://www.sel.barc.usda.gov:8080/diptera/names/searchre.htm	Information about the World's flies
CATE-Araceae	http://www.cate-araceae.org/taxon.html	Taxonomy, biology, ecology and evolution of the Araceae
Cichorieae Portal	http://wp6-cichorieae.e-taxonomy.eu/portal/	90 genera comprising approximately 1400 species
Cybertruffle	http://www.cybertruffle.org.uk/eng/index.htm	Cybertruffle databases (Cyberliber, Cybernome, Robigalia and Valhalla)
eMonocot	www.e-monocot.org	Global online resource for monocot plants
Euro+Med Plantbase	http://ww2.bgbm.org/EuroPlusMed/	Euro-Mediterranean plant diversity
European Marine Biological Resource Centre (EMBRC)	www.embrc.eu	Access to marine biodiversity, its associated metadata and extractable products
European Marine Observation and Data Network (EMODnet)	http://bio.emodnet.eu/portal/index.php	Access to the marine biological data portal and metadata catalogue
Fauna Europaea	www.faunaeur.org/	All European land & freshwater animals brought together in one database
Freshwater Animal Diversity Assessment (FADA)	http://fada.biodiversity.be	FADA database is an information system dedicated to freshwater animal species diversity and distribution
Global invasive species database	http://www.issg.org/	One Hundred of the World's Worst Invasive Alien Species
Global Lepidoptera Names Index	http://www.nhm.ac.uk/research-curation/research/projects/lepindex/search/	Now includes all Lepidoptera superfamilies (290,099 names in total)
Global plants initiative	http://gpi.myspecies.info	To support the digitisation of herbarium specimens
GrassBase - The Online World Grass Flora	http://www.kew.org/data/grasses-db.html	Good florastyle descriptions for all grass species
Index Fungorum	http://www.indexfungorum.org/names/names.asp	473 871 records online
International Plant Names Index (IPNI) Database	http://www.ipni.org:80/ipni/plantnamesearchpage.do	Names & bibliographical details of seed plants, ferns & lycophytes
iPlant Collaborative	http://www.iplantcollaborative.org/	Community to enrich plant sciences through the dvpt of cyberinfrastructure
JSTOR Plant Science Collection	http://plants.jstor.org/	1 250 000 digital objects
LIAS names and LIAS light	http://liasnames.lias.net	A Database with Names of Lichens, Lichenicolous Fungi and Non-Lichenized Ascomycetes
MarBEF Data System	http://www.marbef.org/data/index.php	ERMS taxonomic list of species occurring in the European marine environment
Marine Genomics	www.marinegenomics.org	Web-based interface for public transcriptomic and genomic data and analysis tools
MycoBank online database	http://www.mycobank.org/	Total number of records: 463 700; total number of species: 160 362
Mycology Net	http://www.mycology.net	Internet Portal for Scientists presenting Information about Diversity of Fungi
Neogene Mammal Mapping Portal (NeoMap)	http://www.ucmp.berkeley.edu/neomap/	Distributed database system for paleomammalogy, designed to link databases by a common access portal
Palmweb	http://www.palmweb.org/	Data compiled by palm diversity experts for all 2 400 palm species
Royal Botanic Gardens Kew	http://www.kew.org/science-research-	Kew's collection databases, plant name resources, world

(RBGK)	data/databases-publications/index.htm	checklists and other Kew publications.
Saccharomyces Genome Database (SGD)	http://www.yeastgenome.org	Budding yeast <i>Saccharomyces cerevisiae</i> with search and analysis tools
SeaLifeBase + FishBase	http://www.sealifebase.org/ http://fishbase.sinica.edu.tw/search.php	114 700 Species
Species Fungorum	http://www.speciesfungorum.org	
TRY database	http://www.try-db.org/	Quantifying and scaling global plant trait diversity
Taxonomic Literature II	http://www.sil.si.edu/DigitalCollections/TL-2/search.cfm	Botanical publications and collections from IAPT
VertNet	www.vertnet.org	Four distributed database networks (MaNIS, HerpNET, ORNIS and FishNet) - vertebrates species
World Register of Marine Species (WoRMS)	http://www.marinespecies.org	Authoritative & comprehensive list of names of marine organisms, including information on synonymy
ZooBank official registry of Zoological Nomenclature	http://zoobank.org/	79 676 Nomenclatural Acts

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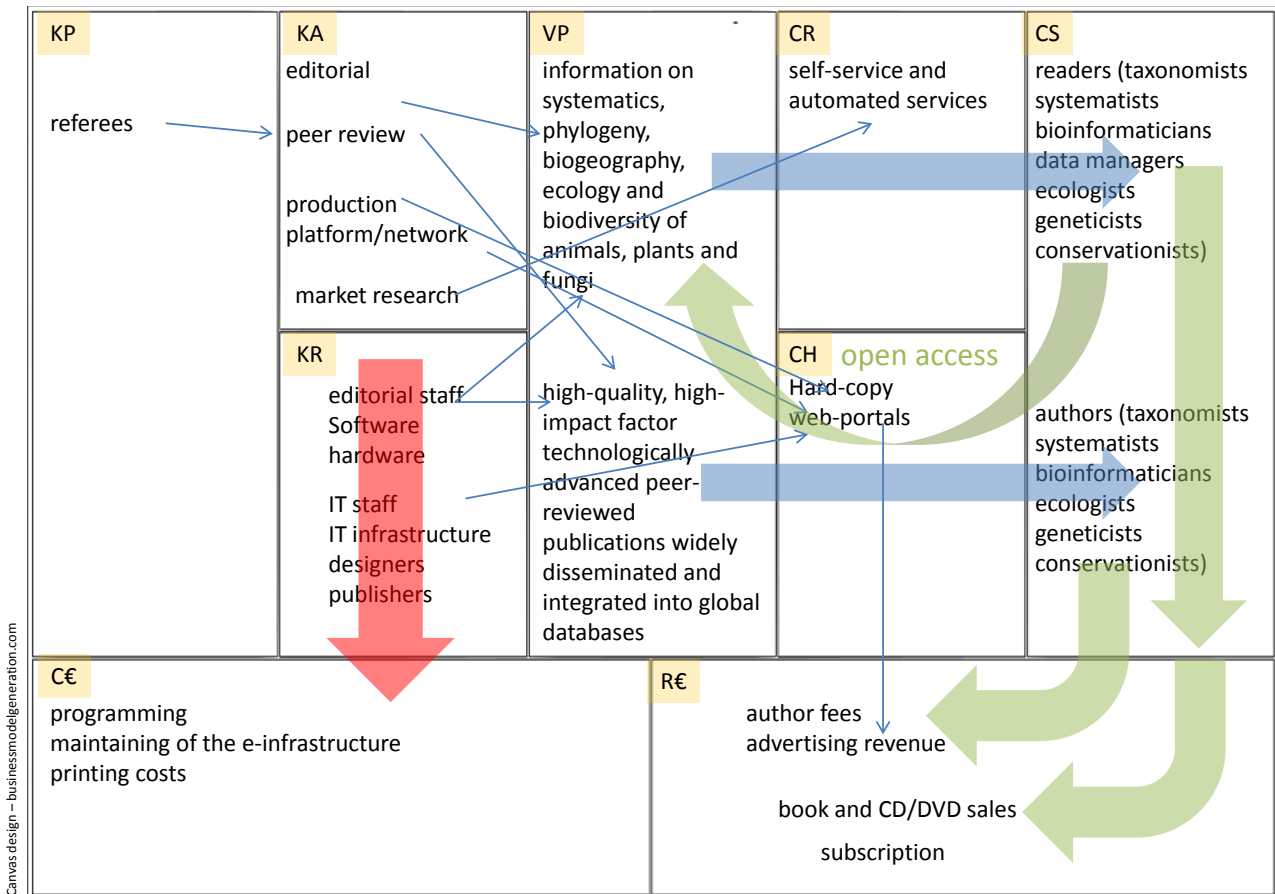
Annex 14: Partners' current Business Models in M12

The following diagrams show the partners' current business models mapped to the main activity classification shown in figure 5. Updated versions following participants' feedback will be available via the project wiki.

- VP - Value Proposition
- CS - Customer Segment
- CR - Customer Relationship
- CH - Delivery Channels
- KP - Key Partners
- KA - Key Activities
- KR - Key Resources
- C€ - Cost Structure
- R€ - Revenue Structure

Blue arrows indicate relationship, green arrows revenue flow and red costs. Curved green arrows represent open source/access.

Partners' current Business Models - Dissemination (publication)



Partners' current Business Models - Software development (web services and software tools)

