



Project no. 018340

Project acronym: EDIT

Project title: Toward the European Distributed Institute of Taxonomy

Instrument: Network of Excellence

Thematic Priority: Sub-Priority 1.1.6.3: “Global Change and Ecosystems”

D21 – Version 3 of the EDIT Platform for Cybertaxonomy

Due date of deliverable: Month 54
Actual submission date: Month 54

Start date of project: 01/03/2006

Duration: 5 years

Organisation name of lead contractor for this deliverable: 9 FUB-BGBM

Revision: Final

Project co-funded by the European Commission within the Sixth Framework Programme (2002-2006)		
Dissemination Level (“X” in the relevant box)		
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1 Introduction

This deliverable presents a summary of the developments and results achieved with regard to the development of the „Internet Platform for Cybertaxonomy“, a computing platform with modular design assisting the taxonomic workflow, e.g. for taxonomic revisions, checklists, inventories, etc. and making the results of the work accessible to others. The basic design was described in Deliverable 7 (month 18, September 2007), the first results of the implementation were presented in Deliverable 11 (D11, month 32, November 2008). The first functional version of the Platform for Cybertaxonomy was provided with Deliverable 20 (D 20, month 42)

The document shows an overview over the developments and features of platform release 3, technical details are to be found within the component documents (underlined text). The complexity of the endeavour and the amount of resources directly related to D21 once more justifies a deliverable document of some length.

Section 2 of the D11 document outlined the phases that led to Platform Version 1 (with months 0-11 occupied by preparation and definition activities; m12-17 providing the basic technical design, and m15-32 the first phase of the implementation). It stated that the “main purpose of Platform Version 1 [was] to demonstrate capabilities, not full usage”. Platform Version 2 represented the outcome of the first round of development activities, with key applications and developments reaching production state. Platform version 3 focuses on usability of the platform modules as well as integration of requirements and data of further exemplar groups.

2 Software components and development

The software products and developments are presented here under headings representing the major components developed in WP5. Sections are related, but not restricted, to actual activities as defined in the WP5 workplan. Within the sections, a brief introduction (often with reference to more in-depth explanations given in earlier deliverables) is followed by a description of developments and decision making processes since D20, a description of the current state, highlighting existing and/or imminent products, and a concluding outlook .

The software modules of the Platform for Cybertaxonomy are designed to support the taxonomic workflow, which summarily consists of data acquisition, data integration in the taxonomic investigation and editing process, publishing of data, and sustainable data storage and exchange. The Platform can be used to execute these functions by individuals as well as by teams within or across institution.

2.1 Platform access: the EDIT Cybergate and the CDM Bundles

The Cybergate continues to provide a regularly updated visual interface to the Platform's software products, showing the components and their interactions and providing access to the software, user documentation, and developer information¹. In the beginning of 2010 a “CDM setups site” was installed to facilitate the installation of the EDIT software. The site includes installation instructions and offers the download of software bundles including all necessary items for setting up an individual CDM site, an institutional site, or an inter-institutional collaboration site with EDIT software ([C5.144 Downloadable ready-to-install product bundles](#)).

2.2 Core architecture: CDM and Java Library

The **EDIT Common Data Model (CDM)** now fully covers the data that are used for systematic treatments resulting from the taxonomic work process. This includes the full complexity of nomenclatural information (botany and zoology), the entire range of taxonomic

¹ <http://dev.e-taxonomy.eu/platform/>

relationships (including multiple taxonomic hierarchies, synonymies, concept relationships etc.), structured and unstructured descriptive data, geographic information, literature, and specimen data. The CDM is based on existing information models as well as the standardisation efforts of the organisation for Biodiversity Information Standards (TDWG). The CDM forms the base for the programming code implemented and made available as the **CDM Programming Library**. The application programming interface or the web services based on the CDM library can be used by programmers to create software applications for taxonomists (Fig. 1). New functionality created in that process becomes part of the CDM Library after in-depth testing.

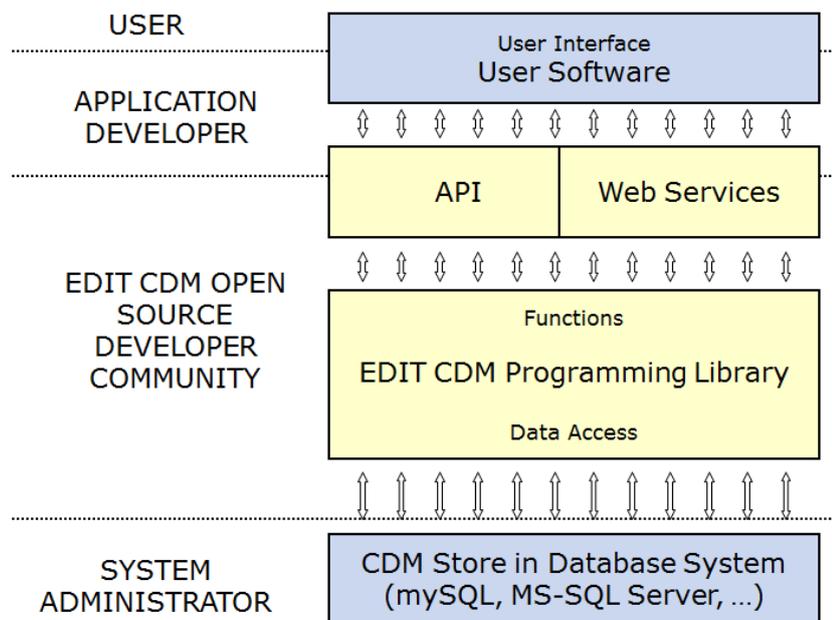


Fig. 1: Architectural layers and actors' roles in the Platform for Cybertaxonomy

An overview of the **documentation** available for both users and software developers is given in component [C5.099 Community store documentation for Platform release 3](#).

Because most parts of the CDM had already been tested prior to the release of version 2, both the number of **model changes** and the number of changes in the derived database schema decreased significantly during the past year. This represents an important step towards stable applications with well-defined migration paths from older to newer versions. However, the CDM is still evolving due to additional requirements from new user communities. Some of these requirements induced model changes which are implemented in CDM version 3 and which have been described for milestone [M5.35 CDM refinement concluded and documented for Platform release 3](#) and in component [C5.101 Framework Implementation available for Platform release 3](#). Changes were induced mainly by further development of the EDIT Taxonomic Editor and the EDIT Data Portals according to user demands, further development of the CATE Data Portals and Web Editor, refinement of the import procedures for descriptive data via SDD, and the import of additional data from WP6 exemplar groups and the eFlora initiatives.

Testing of the Taxonomic Editor (C5.131, see section 2.11 below) has shown that users want to be able to directly integrate external data into their treatment, e.g. from IPNI and GBIF. Integration of such **external services** has now been implemented in the CDM Library ([C5.141 Integration with central services](#)), with the result that such services can be used not only for direct user interaction via GUIs but also for internal data processing. For example, external services have already been integrated into data import routines for on-the-fly data consistency

checks and conflict resolution improvement. The following external services have been integrated so far: IPNI (International Plant Name Index: name service, author service, publications service), BCI (Biodiversity Collection Index), GRIB (see section 2.7 below), GBIF (Global Biodiversity Information Facility) and EDIT Specimen and Observation Explorer for Taxonomists (see also section 2.8 below).

2.3 Output: Data Portal and print publication services

The **CDM Data Portal** is the central web output mechanism provided as a Platform component used to publish the data in the Community Data Store. It is a website based on the open-source content management system Drupal and thus highly configurable as to displayed content and design. The EDIT CDM Data Portal has been further developed following user requirements from the EDIT exemplar groups ([C5.129 Data portal update for Platform version 3](#)). Improvements to the Data Portal software include:

- a multitude of new data categories, e.g. common names
- improved administrative options to give users more freedom in portal management
- a caching mechanism for increased performance
- extended support for multiple concurrent classifications
- implementation of CDM entities as Drupal nodes enables use of the comment function and other built-in Drupal features
- improved display of synonymy including types, lectotypes, homonyms, etc.
- display of all media metadata of images as well as of the copyright information
- geographic regions can now be arranged in hierarchical order
- distribution maps can now display a legend
- a generic footnote system to display annotations and references for individual data items
- display of structured and semi-structured descriptive data
- links to external services ([C5.163 Integration of additional functionality into web portals](#))
- a print option allowing the viewing of a fully formatted representation of the current taxon.

The following CDM data portals exist: Palmweb (RBG Kew), Cichorieae (BGBM Berlin), Diptera (NHM London), Campanulaceae (BGBM), Flora Malesiana (NHN Leiden). Several more are under development, mainly in the context of the e-flora initiative, e.g. for the Flora of Central Africa and the Flora of Cyprus.

With respect to professional recognition, **printed publications** in hardcopy or as fully formatted documents in e-journals are the most important result of the work of a taxonomist. Streamlined print output from the CDM is therefore an essential feature of the Platform. Two options have been developed: output for further formatting in a word processor, and output via pre-defined stylesheets to “camera-ready copy” (i.e. PDFs ready for publishing).

Technically, the CDM Printservice is first configured to define what will be contained in the output (currently, selection of taxa, inclusion/exclusion of descriptions and images is possible). The Printservice then harvests the data through the CDM’s REST webservice and outputs the data. The output for the first option is in ODF (Open Document Format), which is also XML based, so that the generated XML can easily be transformed using eXtensible Stylesheet Language Transformations (XSLT). For the second option, the Printservice generates an unaltered XML document, which allows further processing with custom-tailored XSL applications. ([C5.127 Prototype of Service to generate printed publication from the CDM](#) and [M5.41 Service to generate pre-processed text from the CDM available](#).)

The first option (word processor) is technically less demanding and thus will appeal to individual authors or more traditionally minded publication departments. The ODF document contains all the taxonomic data in a well-structured form and can be edited in modern word processors like OpenOffice or Microsoft Word. This has the advantage that familiar tools can be used for the

layout. The clear disadvantage is that corrections in final proofreading have to be applied to both, the document and the CDM Datastore, if the word-processor formatting is not fully automated.

Creating stylesheets for pre-formatted output requires in-depth knowledge of XSL and of the CDM webservice output. Out of the (EDIT) box there will be ready made stylesheets for a botanical monograph, a zoological monograph, botanical and zoological checklist, and for the publication of new names in specific journals. Institutional developers will be able to modify these to create custom stylesheets conforming to the editorial rules of their in-house publications.

The component [C5.128 User documentation for CDM print publication service](#) refers to the respective on-line documentation with step-by-step instructions.

2.4 Input: The EDIT Taxonomic Editor

The EDIT Taxonomic Editor (EDITor) is an innovative tool for data input and editing for the taxonomic data held in CDM data stores. Conceptual details are described in section 3.4 of D11.

The EDITor combines a full text user interface (i.e. allowing text entry in place of filling in a form) with the possibility to edit every detail of the database content. The project database can be configured, e.g. by determining which kind of factual data is going to be available for data input. Apart from the taxon-centric standard interface, a “power user interface” presents the data in spreadsheet-like fashion and allows bulk editing and data cleaning. Import and export functionality with several pre-defined formats and standards has been implemented ([C5.115 CDM power user interface fully functional](#)). Users can install the EDITor locally on their computer for individual work or to access to an institutional Community Data Store, or use it remotely.

EDIT exemplar groups as well as several other initiatives have now started to use the CDM EDITor as their primary software tool for data capture and maintenance of their community information stores. Such usage, as well as the reliability and usability testing (see 2.11 below) led to demands for new features and refinements of existing functionalities. The feature requests were thoroughly analysed and led to significant changes in design and implementation ([C5.114 Refined CDM taxonomic editor available for Platform release 3](#)), including the following new functions:

- completely overhauled property editing (Details View)
- complete CDM data support (Supplemental Data View)
- descriptive Data Editor
- access to print Publishing Module
- image Management.

2.5 Tools: The Geo-Platform

The EDIT Geo-Platform consists of two main components: The **EDIT MapViewer** is an online toolbox for taxonomists, offering data visualisation and analysis. The **EDIT MapViewer REST services** make a selection of the mapViewer functionalities accessible as a web service for machine-to-machine communications

The **MapViewer Tool** is used for geographic information mapping, commonly to map species and their habitat locations, and to compare data provided by the user with ecological and GIS data coming from external resources (GBIF, Google Maps). It also allows the production and documentation of distribution maps for ecological analysis that can be used in paper publication ([C5.111 MapViewer version 3: The EDIT MapViewer with enhanced functionality available](#)). The **spatial analysis functions** of the EDIT mapViewer allow performing basic spatial investigations such as survey effort or species distribution and biodiversity measure in relation to spatial units. This information facilitates assessment of occurrence distribution and inventory completeness ([C5.110 Design document for a prototype software for data completeness assessment \(gap](#)

analysis) for selected test data (e.g. ATBI and other datasets). The tool is largely interactive and so it can require a large amount of server processing resources. This can cause problems when increasing numbers of users are accessing the service, as anticipated. A procedure to install **mirrors of the MapViewer Server** was put into place so that other institutions can host it on their own servers. This will spread the load and make the Tool stronger and more reliable. ([C5.154 Testing report on installation of a MapViewer Tool mirror](#))

The **EDIT Map REST Service** is a visualization tool for automated publication of the collated taxonomic data. The Service is operational, and yet undergoing a constant development in order to advance its capabilities and stability. The REST Service is extensively used in many EDIT Platform sites and is currently tested for the new exemplar groups for the African e-Flora project. The goal is to use the Platform for Cybertaxonomy, including the Map REST Services to produce volumes of the African flora. The following functions were refined ([C5.112 MapREST Refined and Integrated into the EDIT Platform](#)):

- Generating maps customized to specific needs. This includes points and areas symbolization, specifying map extent, features labelling or creating map legends.
- Multiple data sources (vector, raster, distribution, occurrences) can be combined in one map.
- Display one or several external WMS layers as background in the ‘Areas’ and ‘Point’ services.
- Output image can be directly embedded into database driven websites.
- Performance enhancement by porting on a new server at RMCA
- Improved stability and reliability.

E-conferences helped to coordinate the distributed developer team. In the e-conference with developers and contributors to the Geo-Platform development ([C5.153](#)) and its follow up, the state of the developments, the situation of mirroring and future developments were discussed. A further e-conference on future-proofing of the Geo-Platform components ([C5.155](#)) treated the selection of features for MapViewer Version 3, the Map REST Services Version 3 and specific technical issues and bugs.

2.6 Tools: Descriptive components

Structured descriptive data consist of the atomised content of taxon descriptions and identification keys (see section 3.6 of D11 for more details). Within the EDIT project, the aim was set to be able to (i) accommodate this type of data in the CDM, (ii) provide import and export routines using the Structured Descriptive Data format (SDD) standard, (iii) provide the functionality to provide and display the textual concatenated output generated from the data, and (iv) include the functions to create dichotomous keys in the library. Data entry as well as the generation of interactive determination keys was excluded, not only for budgetary reasons but also because existing tool sufficiently cover the needs of taxonomist, and they are able to import and export SDD data, so that a migration pathway is open.

The *Cichorieae* exemplar group used the DeltaAccess software to build a large descriptive dataset. This was used to test the developed tools ([C5.123 Selection of a representative taxonomic group](#)). The set aims have been achieved for Platform v. 3:

- SDD-CDM import/export functions in the software library interface the CDM with existing tools for the management of descriptive data (such as Xper², Linnaeus or DeltaAccess) ([C5.124 Report on technical integration of descriptive tools into the platform](#)).
- Structured descriptive data can also be output as concatenated descriptive text, e.g. for display in CDM Data Portals (see [C5.124](#)).
- The CDM library offers the functionality to automatically generate identification keys from structured descriptive data ([C5.132 Output of structured descriptive content](#)).

2.7 Tools: Bibliography (ViTaL)

The EDIT Virtual Taxonomic Library (ViTaL) is to provide seamless access from within the EDIT Platform components to library catalogue and digital literature services. A secondary aim is to provide access to reference data taxonomists enter into CDM Data Stores. In contrast to data from library catalogues these records are often on the level of individual articles rather than entire journal or book volumes. Making this data available to digital taxonomic literature services like BHL (Biodiversity Heritage Library) will greatly improve their search capabilities.

As detailed in D20, the ViTaL activity was completely reorganised after a thorough review, taking advantage of new techniques in the library domain and complementary activities in the BHL (Biodiversity Heritage Library)-Europe project. For the library and digital catalogue services, it was decided to jointly develop the Global References Index to Biodiversity (GRIB, <http://bhleurope.gbv.de/>) in cooperation with the Head office of the Common Library Network GBV-VZG. The GRIB incorporates the reference metadata from EDIT and BHL-Europe library catalogues, offers a simple de-duplication mechanism, displays licence information of e-journals for the titles displayed, and links to full texts where available. This covers the aims originally set for ViTaL: Query for references restricted to a set of catalogues with (mostly) taxonomic literature and display of access information for digital full text resources (and, where possible, direct access to the digitised content).

A demonstrator was set up (C5.143 Pilot implementation of integration with library catalogues and digital literature services) and catalogues from FUB-BGBM, MFN, NNM Naturalis and NHML were imported and de-duplicated in the GRIB. (C5.145 Import of test sets of selected libraries). The GRIB has been enhanced by adding the bibliographic records from the Biodiversity Heritage Library (BHL), including hyperlinks to the digitised items (C5.146 Import of freely available bibliographic metadata).

For data access, the GRIB offers a Search/Retrieval via URL interface (SRU) which allows CDM based EDIT platform components to find data in the GRIB and retrieve those in several standard formats. On the other hand the GRIB can now harvest and import data from the CDM store via the Open Archives Initiative Protocol for Metadata Harvesting (C5.106 Implementation of an import and export data interface to and from CDM).

The GRIB was further enhanced by a Digitisation Management Tool, serving scientists and librarians. Scientists can search the GRIB and nominate titles for digitisation. Librarians can use the tool to indicate the digitisation status of a title, within their libraries digitisation workflow, thus helping to avoid duplication of effort (C5.147 Implementation of mechanism to nominate literature items for digitisation).

With these developments a revised ViTaL component is available for Platform release 3 (M5.36).

2.8 Tools: Specimen access

The specimen access portal has been operational since D11. Further development for Platform version 3 included the incorporation of direct access to the search results via the taxonomic editor and the incorporation of additional taxon catalogues for query expansion.

2.9 Technology: Security and Single Sign-on (SSO)

This activity covers the design of a security infrastructure for the platform and the introduction of a secure Community Single Sign-On (CSSO) for the Platform. The CSSO enables the various EDIT service providers to protect their services and resources defining individual access control policies, while users can access different services using only one identity. The security infrastructure is based on the international standard SAML v2 protocol family and provides a federation concept to realise the community aspect.

Within the 5th project year the software was updated and extended. The Single Logout (SLO) functionality was newly integrated with the Platform. Regarding CSSO user experience, an important enhancement was changing the Certification Authority (CA) issuing certificates for CSSO infrastructure components like the Identity Provider to the CA of the Freie Universität Berlin (FUB), which is a subordinated CA of the Deutsche Forschungsnetzwerk (DFN). Now, CSSO users are not any more required to install specific certificate hierarchies within their web browsers. In particular, the necessary RootCA certificate is already included in most modern web browsers (C5.162 Final release of CSSO security infrastructure and concept development for its post EDIT operability).

The EDIT federation was extended to further EDIT institutions. The first application addressed for becoming an EDIT Service Provider were the ATBI-Sites developed at the Museum für Naturkunde Berlin (MfN) and the service provider for the ATBI-Site had to be changed. The CSSO will be installed after the ATBI sites moved to a new server of the MfN. Another installation scheduled is to connect the web application International Taxonomic Courses index in cooperation with RMCA Tervuren (EDIT WP8). Due to the outdated operating system installed on the server running this service, this is also waiting for an upgrade of the server.

The GRIB (Global reference index to Biodiversity) application, developed by EDIT's activity 5.3. (bibliographic tools) in close cooperation with the EU funded BHL-Europe project will be connected to the EDIT CSSO by the end of November 2010.

Finally, the EDITExpertNet application developed by EDIT WP2 in Copenhagen is connected as a Service Provider to EDIT CSSO. The taxonomic experts registered to EDITExpertNet were imported and, when valid, registered to the EDIT CSSO (M5.40 Prototype Shibboleth federation built up with further EDIT institutions).

2.10 The Expert database

The EDITExpertNet Database (www.editexpertnet.org) was set up to help interested people to find contact information of experts, to help experts to create networks, and administrators to facilitate their experts. It was not initially devised as a Platform component, but recent developments are included in this deliverable.

EditExpertNet currently enables filtering and search facilities to find taxonomic experts based on any combination of the several categories covering scientific methods, taxonomic activities and geographical distribution. These categories have now been critically revised (C2.1.16 Refining the classification of approaches to taxonomic research).

EDIT has chosen Denmark and Norway as the countries for testing the possibilities of having the taxonomic expertise of single countries register in EditExpertNet. The results as summarised in C2.1.5 (Test data from test country/ies entered in information service) were not at all encouraging; it proved very difficult to have the specialists registering in the database.

The EDITExpertNet was integrated in CSSO as a service provider (see above). A registered expert could access all EDIT CSSO service providers with one single sign on. However, the quality of the data in the database has blocked to application of access. However, it turned out that the goals of the two applications were inconsistent. While the aim of EDITExpertNet was to attract as many taxonomic experts as possible on a more or less open and free basis, the reliability of the EDIT federation depends on the trustworthiness of information delivered about registered users. The latter requires a certain level of data review before being approved. For this reason the CSSO Identity Provider component was not integrated as drafted in C5.84 (Integrate the CSSO Identity Provider component with the Experts-DB)

2.11 Usability testing

User input for software development was obtained throughout the project, either indirectly, by analysing the specifications of existing tools, or directly, by means of input received from

exemplar groups, in demonstration sessions, or in workshops with users. However, a systematic approach was needed and finally became possible when RBGE joined the EDIT project as a partner.

Usability testing is the systematic observation of testers under controlled conditions to determine how well a product meets the needs of its intended users. Features to be measured include intuitiveness, ease of use, speed, availability of help if needed and the quality of error messages.

Usability testing is a vital part of the testing process that helps identifying design flaws or undesirable features of the software as well as its strengths.

Usability testing centred on the Taxonomic Editor (EDITor), using the version published with Platform v. 2. A manual for the Taxonomic Editor was delivered and is available via the CDM setups site. In a next step a Documented plan for usability testing with partners was produced (C5.165), setting out the schedule and method of the usability testing to be carried out. A Tester Profile Questionnaire, Instructions for Usability Co-ordinators, Test Case Scenario Recording Sheets for Testing Co-ordinators, Instructions for Testers, and a Post-Test Feedback document was discussed and provided for the testing workflow. The plan followed the ISO standard on guidance for usability, which names three elements to measuring usability: effectiveness, efficiency and satisfaction. In a summary report on reliability and usability testing (C5.131) the results of the testing are presented. The structured testing was carried out on last year's version of the Taxonomic Editor (to maintain compatibility with the documentation), so many issues encountered have already been addressed in subsequent versions. 19 Testers from 8 EDIT institutions (UKBH, RMCA, RBG-K, NHN, NBGB, IBSAS, HNHM, BGBM) took part in the testing. All testers currently use Microsoft Word for either the production or publication of their taxonomic revisions, or both. Ten out of 16 felt that using the Taxonomic Editor would make the revision process more efficient. The requirements for testing are taken into account for further software developments.

3 Integration and sustainability

The software components of the Platform for Cybertaxonomy are used now in an increasing number of working groups, which was named as the decisive prerequisite for institutional take-up by the EDIT BoD and the ISTC. The exemplar groups coordinated in WP6 (Cichorieae, Palmae, Diptera) made the start, followed by the application in the PESI project (see below), and recently a Campanula Data Portal (BGBM Berlin) was added. Several further projects are in the pipeline. With respect to institutional collaboration, the most important development is in the context of the “e-Floras Initiative”. Here exemplar groups have been started with a focus on central African floras (Checklist Flore d’Afrique Central, Ericaceae, Ferns, Mistletoes) and Flora Malesiana (Sapindaceae and further families). Both are large-scale on-going projects, Flora Malesiana for example having published more than 11,000 pages of treatments up to now. Core partners are NBGB Meise, RBG Kew, NHN Leiden and BGBM Berlin. A workshop in Leiden in January 2010 (32 participants from 12 European institutions) represented the kick-off, followed by a e-flora meeting in Berlin in March 2010. The aims are to establish the collaboration between makers of floras and the Platform for Cybertaxonomy including a feedback mechanism in order to evolve the Platform and the taxonomic work in exemplar groups and in parallel helping authors to produce new treatments and give them a voice in shaping their future working environment. Existing print-publications are being digitised, marked up with techniques developed at RGB Kew and imported into the Platform. Several project applications are under way to turn this into an even broader partnership of European Flora initiatives.

The EDIT BoD posited that establishing the Platform among taxonomists would need further third-party financed projects. Platform development and use is part of the work plan of the following funded initiatives:

- PESI (until April 2011, led by UvA Amsterdam) – use of the Platform as the working environment for updates to the European terrestrial organism lists Fauna Europaea and Euro+Med PlantBase ([C5.140 CDM-PESI integration accomplished and tested](#)).
- VIBRANT (led by NHM London; 3-year project starting 1 December 2010) – Integration of the Platform with the Scratchpad environment.
- I4Life (3 year project led by U Reading, starting December 2010) – Integration of EDIT Services as the taxonomic component of the proposed LifeWatch infrastructure with the Catalogue of Life environment.
- e-monocots (RBG Kew, NHM, U of Oxford) with the CATE software which is a fully EDIT-Platform based application supporting the taxonomic editorial workflow.
- SYNTHESYS 2 project (led by NHM London) includes a networking activity which will

The ISTC will continue to play an important role in efforts to coordinate activities. With the upcoming 5th ISTC meeting for the first time members from EDIT and CETAF institutions are invited to include the largely overlapping membership. Several of the IT departments represented in the ISTC stated that they will support the Platform.

The following platform components will be maintained by EDIT institutions:

Bibliographic tools: MfN Berlin will maintain the Virtual Taxonomic Library (ViTaL) through BHL-Europe in corporation with the common library network GBV (Gemeinsamer Bibliotheksverbund, Göttingen). At the core is the GRIB index, which is part of the BHL-Europe technological infrastructure.

Descriptive tools: The LIS (Laboratoire Informatique et Systématique), Paris, will maintain and improve their software Xper2. Xper2 2.0 is now free software of the university Paris 6 with a Creative Commons License. The work on Xper2 is independent of EDIT, but it contributes to the Platform. This software will continue to be freely accessible and downloadable from the LIS server. The import/export SDD/CDM software developed in the context of the Platform, same as the output routines for “natural language” descriptions, form part of the CDM library and are thus in the public domain.

Geo-tools: RMCA Tervuren is willing to maintain geospatial components beyond the EDIT project, committing to host the principal site for the services (with other institutions having agreed to install mirrors for load-balancing), tend to bugs, and provide documentation and training as much as possible ([C5.156 Geoplatform Continuity Sustainability beyond EDIT](#)).

Editor and CDM Data Portal: The BGBM will commit resources for the maintenance of these Platform components apart from upcoming projects.

A discussion of sustainability options for the Internet Platform for Cybertaxonomy was provided in the context of D17 (Designs for EDIT as a sustained supranational entity), with its Component [C5.119 \(Report on sustainability of the Internet Platform for Cybertaxonomy software\)](#). The basic requirements outlined there remain pertinent, so the (slightly out-dated) component was also included with this deliverable.