

The slide features a background with abstract red and blue shapes. On the left, there is a logo for EKT (Εθνικό Κέντρο Τεκμηρίωσης) with the text 'ΕΘΝΙΚΟ ΚΕΝΤΡΟ ΤΕΚΜΗΡΙΩΣΗΣ' and 'NATIONAL DOCUMENTATION CENTRE'. In the top right corner, the 'openABEKT' logo is displayed. The main content is enclosed in a white box with a drop shadow. The title 'From desktop to Software as a Service:' is in a large, bold, black font, followed by a subtitle in a smaller font: 'transforming Greece's most widespread library software "ABEKT" into a brand-new cloud service "openABEKT"'. Below this, two names are listed: 'Eleni Angelidi | Head of ABEKT Services Unit' and 'George Stavrou | Head of ABEKT Development Unit', with their respective departments below them. At the bottom of the slide, the text '2017 ELAG Conference' and the website 'openabekt.gr' are visible.

From desktop to Software as a Service:
transforming Greece's most widespread library software "ABEKT" into a brand-new cloud service "openABEKT"

Eleni Angelidi |
Head of ABEKT Services Unit
Science & Culture Digital Library Department

George Stavrou |
Head of ABEKT Development Unit
Information Systems Department

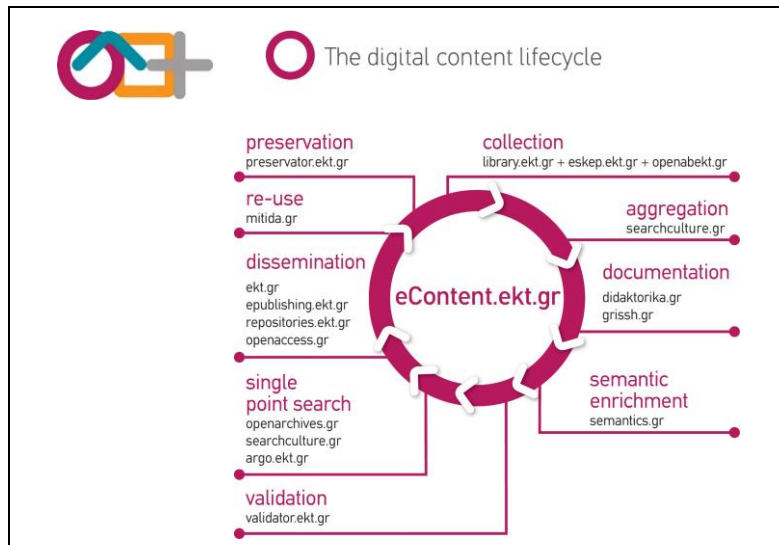
2017 ELAG Conference openabekt.gr

Good afternoon. I am Eleni Angelidi and with George Stavrou we represent the National Documentation Centre's project team who transformed the most widespread library software ABEKT, into a brand new cloud service.



At National Documentation Centre or EKT, our **mission** is to **collect, document, manage, disseminate and preserve quality, digital** content and **data** produced by the Greek scientific, research and cultural **communities**.

With the aim of **supporting** research and technology, **we provide infrastructures and services** for the use and dissemination of Greek scientific and cultural digital **content**, placing **emphasis on open availability and the reuse of content**.



We support **digital content in all its lifecycle**, from **collection and aggregation** to **documentation and semantic enrichment**, to content **validation**, to single point search **gateways** and wide dissemination to re-use for education, research, creativity, innovation and finally for **preservation**.



EKT and libraries

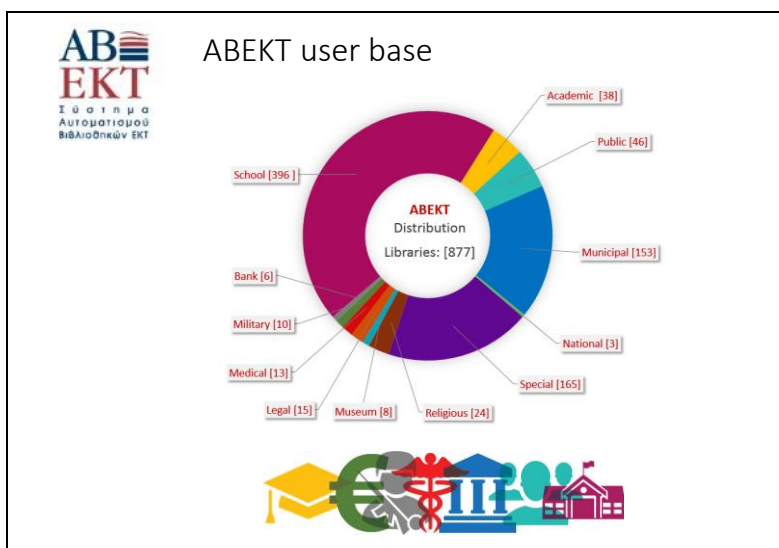
Part of our longstanding role is to:

- Develop ABEKT, EKT's library automation system, for the past 30 years.
- Connect libraries with each other and with international library networks and databases
- Support the national Network of Research and Technology Libraries
- Develop the National Union Catalogue of Science Magazines
- Develop aggregators and union catalogues for digital content

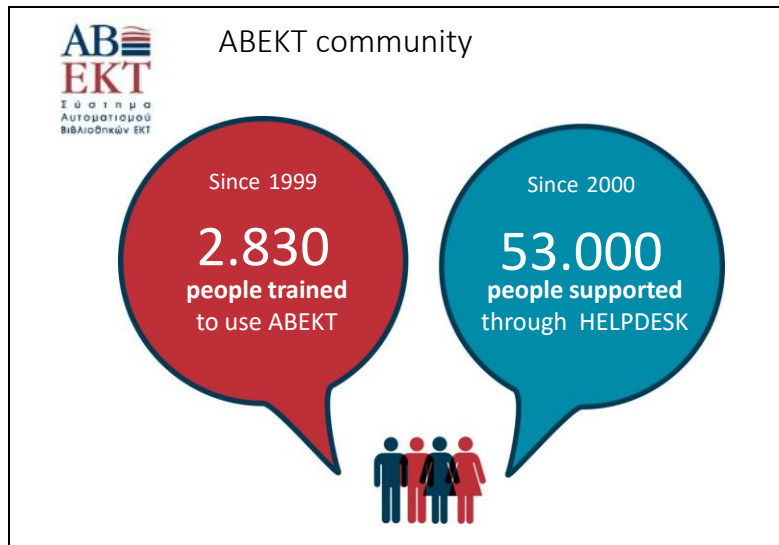


Being one of the leading organizations in the **documentation** and **disseminating** of science and cultural **content** in Greece, we contribute in the development of awareness and technical know-how in regards to digital content. Part of our longstanding role is to:

- We **develop ABEKT**, EKT's library automation system, for the past 30 years.
- We **connect libraries** with each other and with international library networks and databases
- We support the **national Network of Research and Technology Libraries**
- We develop the **National Union Catalogue of Science Magazines**
- We **develop aggregators and union catalogues for digital content** (ARGO.ekg.gr, SearchCulture.gr, etc.)



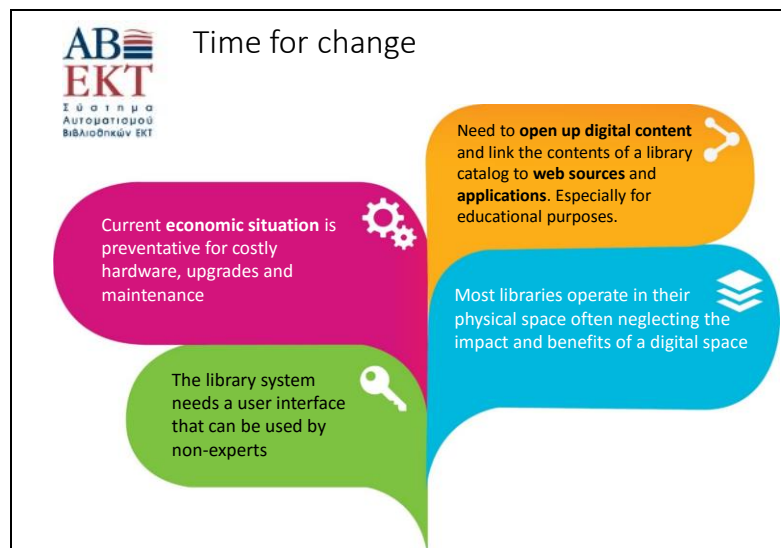
We hold a **prominent place** in the library public services and automation sector. Since 1986 we develop ABEKT, the EKT's Integrated Library System for libraries' automation, with a goal to support Greek libraries and Greek content. Through constant e-learning and support services we maximize the benefits of ABEKT's operations so that our users take full advantage of our services since 1999. ABEKT was offered for free (for the basic edition), with a minimum annual support subscription: 1) To all the **non-profit libraries** in Greece, Cyprus and the Hellenic diaspora and 2) To all the **public and school libraries**, in collaboration with the Ministry of Education. Beyond that, many libraries from **private sector** also use ABEKT for more than 25 years. You can see here our user base for the previous edition of ABEKT (the desktop one) which extend to 877 libraries of all types: from academic, to public & municipal, to National Libraries in Cyprus & Albania, to special & school libraries.



Through **ABEKT training and support**, we have been in touch with librarians and their needs for 30 years. We trained **2830** people in using the system since 1999. **1850 of them via physical seminars** and the rest of them via elearning. We supported 53.000 people, through our helpdesk service.


For ABEKT's workflows analysis we took on board the **existing practices and needs of the Greek libraries**, while we developed the system based on **international principles and good practices**, aiming to **facilitate inter-library cooperation in terms of content and services**.

We are very proud that through our seminars, we contributed to the expansion of information literacy, of automation and familiarity with computer use for Greek libraries staff.



However, times change and situation changes. We became very aware of a few key factors:

- The current **economic situation** is preventative for costly hardware, upgrades and maintenance
- That there is a bigger need to **open up digital content** and **link the contents of a library catalog to web sources** and other **non-library applications**. Especially for educational purposes.
- That most libraries in Greece operate in their **physical space** often neglecting the impact and benefits of a **digital space**
- That a library system needs a user interface that can be used **by non-experts**, as they hire staff that may not be cataloguers or could be volunteers and other paraprofessionals



Time for a new cloud-based service

- Demand of making full use of national infrastructures and economies of scale
- Flexible and immediate updates of metadata formats
- Digital content management
- Improved staff & end user interfaces
- Library workflows
- New content discovery options and services
- Linked data....

Recognizing the needs of the libraries nationwide and the framework, which demands making full use **of national infrastructures and economies of scale**, we designed and developed ABEKT's new and upgraded version, openABEKT, which comes as a complete cloud service.

EKT's goal is to offer solutions that correspond to the principal requirements of **library automation**. In particular : **flexible and immediate updates of metadata formats, digital content management, improved staff and end user interfaces, library workflows, extended discovery procedures, linked data** etc..

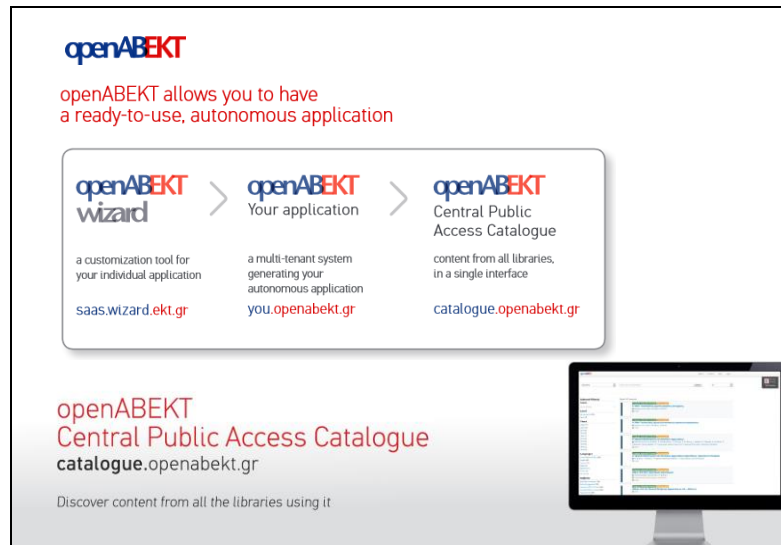


So openABEKT is a cloud based platform for library's catalogue and functions. It is **being offered as a Software as a Service (SaaS)**.

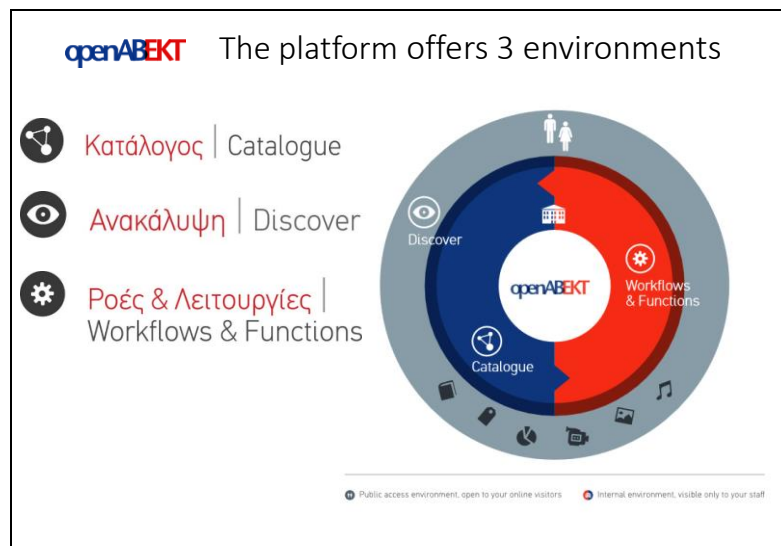
It is **hosted, maintained and secured by EKT's Cloud Infrastructure**.

All a library needs is a **reliable internet connection and a current browser**, as the service runs **online**, saving the libraries a considerable cost for maintenance, hardware and software licensing.

It ensures that library's **metadata is of good quality, digital files are fully managed and that both experienced and novice cataloguers use it effectively**. openABEKT is perfect not only for libraries but also **for other content-rich organizations with complex needs for managing content, users, members and multiple workflows**.



The openABEKT platform is a **multi-tenant system**, which means that it **generates autonomous web applications for each library**. Each library **initially** uses an **online wizard** to customize its individual application. Then the tenant is being created. Each tenant application **feeds into the central openABEKT Catalogue**, a **public access discovery environment which collects and offers for search** all content from all libraries **using openABEKT, in a single interface**.

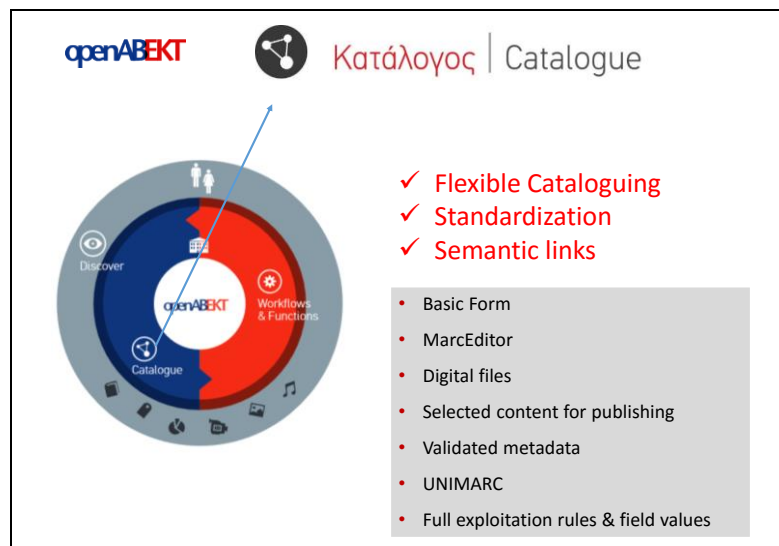


The platform offers 3 environments:

Catalogue: an internal environment, accessible to verified users, where the library catalogues and manages content

Discover: the public access environment where collections are open for discovery through browse, search functions

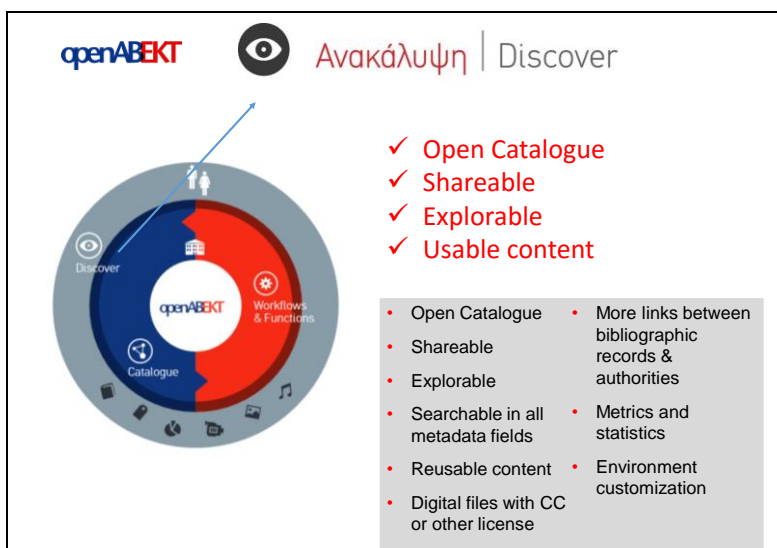
Workflows and Functions: an internal environment where holdings, patrons, circulation services, reports and statistics are managed



The Catalogue environment **offers standards based cataloguing** and a **user-friendly interface for content management**. Cataloguing is made easy with openABEKT, even for novice cataloguers, with the **Basic Form**. The expert cataloguers can use **MarcEditor**, a state of the art, dynamic tool for experienced users. Both the Basic Form & the MarcEditor have been developed in-house. OpenABEKT allows for management of **digital files** of various formats, and offers safeguards to avoid duplication, errors and information loss.

Last edition of **UNIMARC** is fully incorporated into openABEKT while the platform allows dynamic updates. We paid a lot of attention on the ontological representation and management of UNIMARC so that we can ensure that:

- openABEKT schema instantly gets updated for all libraries to incorporate all UNIMARC updates
- We can **make full use of UNIMARC rules & field values** in **validated development** and **management of bibliographic and authority records**.

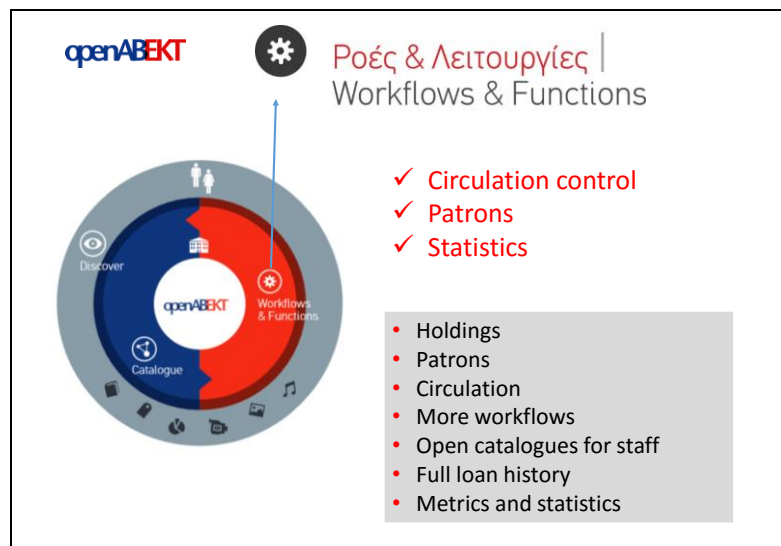


Discover is the **open, public access web environment**. It has state of the art browse and search functions, **in all metadata fields**. The Discovery environment offers a dynamic experience of searching and using an open, public access library catalogue. The Library's catalogue is **open and visible**, **navigation is intuitive**, browsing and searching are done **flexibly**, in all records and metadata fields, faceted search offers a dynamic discovery experience to library's users. **All or selected records and digital files can be presented to the public** accompanied by the **appropriate Creative Common or other license** that the library will apply to its content. Semantic links between bibliographic records and authorities **are being showed in a new upgraded context**. **Metrics and statistics** offer a whole **new picture of library's content at a glance**.

The environment can be **customized and updated from the library** so that it can incorporate the library's brand and communication needs.

The various elements that can be customized are:

- The URL, i.e. library.openabekt.gr
- The Logo
- The Name of catalogue
- The About & Communication sections

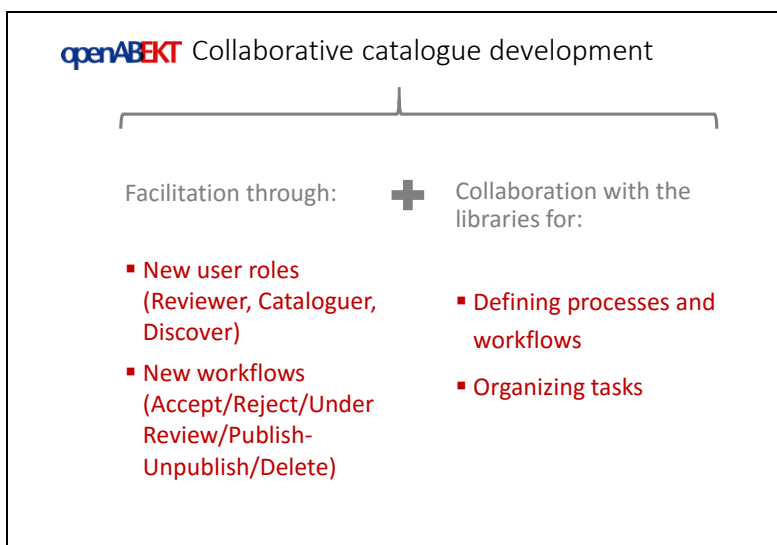


The workflows and functions environment allows the library to manage **holdings, patrons, circulation** and other **functions effectively**.

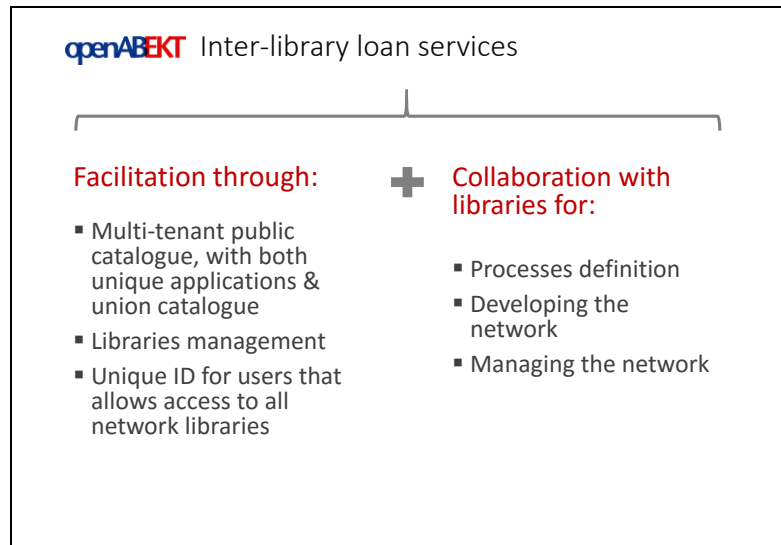
Circulation control takes place quickly and flexibly.

New functions for library's authorized personnel like patrons, circulation and holdings **open catalogues** with a **full loan history** make the library's daily **routine streamlined and more productive**.

Clear **metrics and statistics** for patrons, circulation and content give a user-friendly and at-a-glance view of the work the library accomplishes.



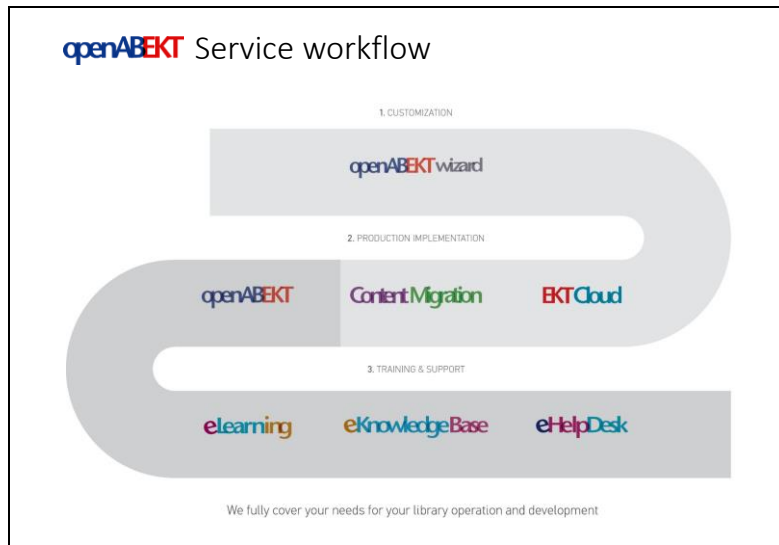
OpenABEKT **facilitates collaboration between libraries**, for example, in developing collaborative catalogues. This is made possible through making use of openABEKT functionalities. Those functionalities are **additional user roles**, such as: **Reviewer**: The **curator** of the catalogue, responsible for accepting and publishing records. **Cataloguer**: the person who does the **cataloguing, responsible** for creating records, bibliographic and authorities. **Discover**: the user of the library who **can access all the records and digital files**, even to **those not accessible by online users**. In addition to this, openABEKT incorporates **new workflows for cataloguing**. Now it is possible for a bibliographic record to be Accept, Reject and Under Review, Publish and Unpublish and Delete. Through our **ongoing collaboration with the libraries we are planning** to follow up with **defining specific processes, workflows and task distribution**.



Also, openABEKT facilitates collaboration **for developing inter-library loan services.**

This happens through:


- The **multi-tenant architecture** that allows for both a **unique application** for each library and a **union catalogue for the network**
- **Libraries** management
- A **unique ID** for users that allows **them access to all the libraries belonging to the same network**
- At the same time, we plan **for more engagement** with the libraries **to define processes** and develop and manage the **network of participants**





The openABEKT service comprises of a full suite of online components:

1. **openABEKT Wizard**, where users **initially define** certain aspects of the application (URL, logo, user management etc.).
2. **EKT Cloud**, which ensures **required storage space, system resources**, high service **availability** and regular **back ups**.
3. The **Content Migration** service, with data metrics & statistics analysis, data validation and enrichment.
4. **openABEKT** customized web platform, which consists of 4 environments Catalogue, Discover, Workflows & Functions, Platform Administration.
5. **eLearning**, which offers 24/7 full training on the use of the openABEKT web platform.
6. **eKnowledgeBase**, which offers 24/7 useful material to support of the service.
7. **eHelpdesk**, which offers e-support for users of the service.

We put most emphasis on the fully **online service**, **avoiding the need for meetings, training or pre-launch support**.

 An integrated cloud service provided as Software as a Service (SaaS)

Service components	What's covered	Basic	Advanced	Gold
Hosting	Hosting on EKTCloud and maintenance	✓	✓	✓
Storage	Till 5 times more storage for backup copies	100 GB	500 GB	1000 GB
Backups	Backups of your data hosted in our datacenter	3 months inhouse	6 months inhouse	9 months outsourced
Maximum downtime	Annual total of periods when expected performance is low or there are short downtime intervals	10 days/year	6 days/year	4 days/year

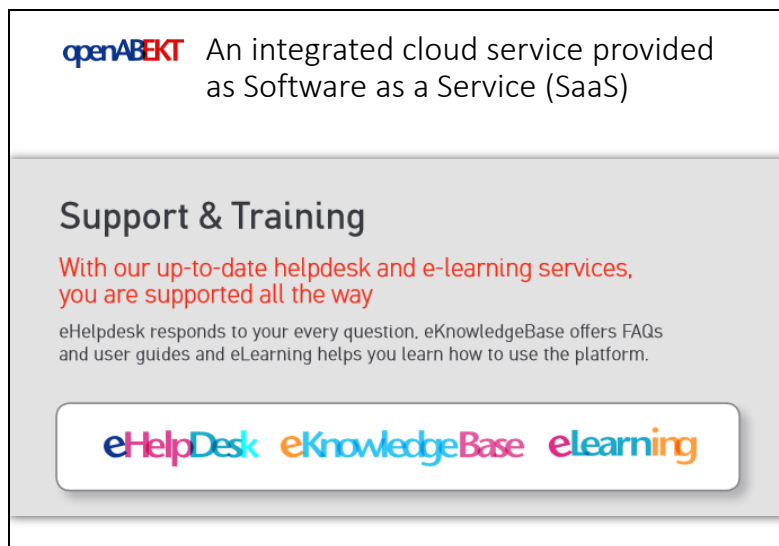
+  & 

openABEKT service is offered over the web, using Software as a Service (SaaS) delivery model.

This means that it is hosted in **our Cloud Infrastructure**, so it has minimal impact on the **library's IT resources** and **no hardware additional costs**: the library doesn't **need to install a software in their PCs, maintain it or back it up**.

We **host the application and the content** and we offer a **suite of online support services, as well as real-time online access to the content and services to the public**. Additional services include **cloud storage space, regular backups, preservation of data**, hosted in our high speed cloud infrastructure **and disaster recovery**. Disaster Recovery is optional, as an **add-on**. Disaster Recovery ensures that the **library's application and its content are safe in case of emergencies, such as: natural disasters and system failures**.

EKTCloud covers the needs of **Greek libraries** and contains: **hosting, storage, backups** and a **guarantee for downtime control**, based on the subscription level. There is also the option to create a **totally custom package** to suit a library's individual needs.



openABEKT An integrated cloud service provided as Software as a Service (SaaS)

Support & Training

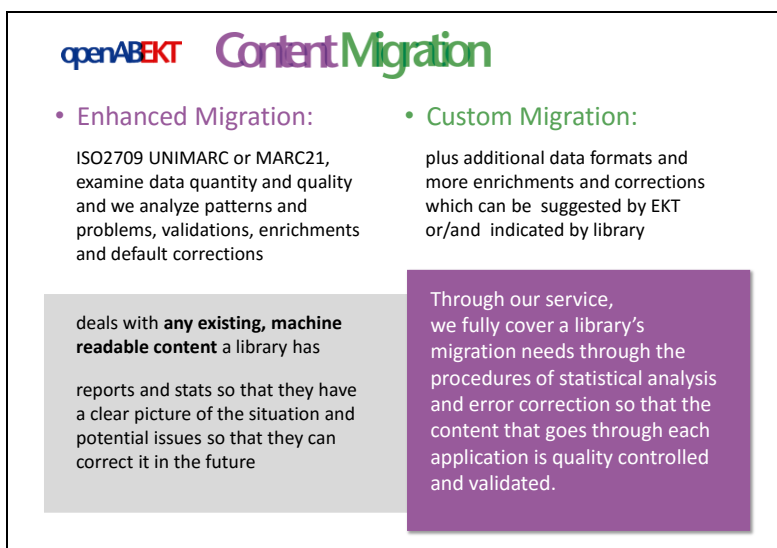
With our up-to-date helpdesk and e-learning services, you are supported all the way

eHelpdesk responds to your every question, eKnowledgeBase offers FAQs and user guides and eLearning helps you learn how to use the platform.

eHelpDesk eKnowledgeBase eLearning

With our up-to-date eHelpdesk, eLearning & eKnowledgeBase services **libraries are supported all the way.**

eLearning & eKnowledgeBase are provided **24/7** and contain: FAQ's, user guides, how to's, etc.



The slide is titled "openABEKT Content Migration". It features two main bullet points: "Enhanced Migration:" and "Custom Migration:". The "Enhanced Migration:" section describes a process involving ISO2709 UNIMARC or MARC21, examining data quantity and quality, analyzing patterns and problems, and performing validations, enrichments, and default corrections. It also mentions that the service deals with any existing, machine-readable content a library has and provides reports and stats to help libraries correct issues in the future. The "Custom Migration:" section describes a process that includes all the work done in the Enhanced Migration service, plus additional data formats and more enrichments and corrections suggested by EKT or indicated by the library. A purple box at the bottom right states that through the service, the library's migration needs are fully covered through statistical analysis and error correction, ensuring quality control and validation.

openABEKT Content Migration

- **Enhanced Migration:**
ISO2709 UNIMARC or MARC21, examine data quantity and quality and we analyze patterns and problems, validations, enrichments and default corrections
- **Custom Migration:**
plus additional data formats and more enrichments and corrections which can be suggested by EKT or/and indicated by library

deals with **any existing, machine readable content** a library has

reports and stats so that they have a clear picture of the situation and potential issues so that they can correct it in the future

Through our service, we fully cover a library's migration needs through the procedures of statistical analysis and error correction so that the content that goes through each application is quality controlled and validated.

Our Content Migration service deals with **any existing content** a library needs to manage via its new openABEKT tenant application. The service comes in **2 tiers**: **Enhanced Migration**: is about bibliographic and authority data with or without digital files from ISO2709 UNIMARC or MARC21. We examine **data quantity and quality** and we **analyze patterns and problems**. We then proceed doing **validations, enrichments** and default **corrections**.

Custom Migration: includes all the work done in the Enhanced Migration service, **plus additional data formats** and more **enrichments** and **corrections** which can be **suggested** by EKT or **indicated** by the library.

In both tiers, we give the libraries **detailed reports and stats** so that they have a **clear picture** of the situation and potential issues in order **to correct them in the future**.

With our service, **we fully cover a library's migration needs**. Through the procedures of **statistical analysis and error correction** the content that goes through each application is **quality controlled and validated**.

Most times, we face **challenges**, for example when we have content to migrate from **outdated and proprietary systems**.

openABEKT **Content Migration**

Metadata quality & interoperability

- UNIMARC structure and characteristic, UNIMARC schema depiction on openABEKT allows it
- Record label and coded values (country, language, operation, spaces, fill characters etc.
- Error in ISBN/ISSN
- Missing fields
- Records without 7xx or \$4
- Records without 6xx
- Mixed characters, i.e. Greek words with English characters etc..
- Cataloguing rules
- Other points as specified by the library

No data import for now

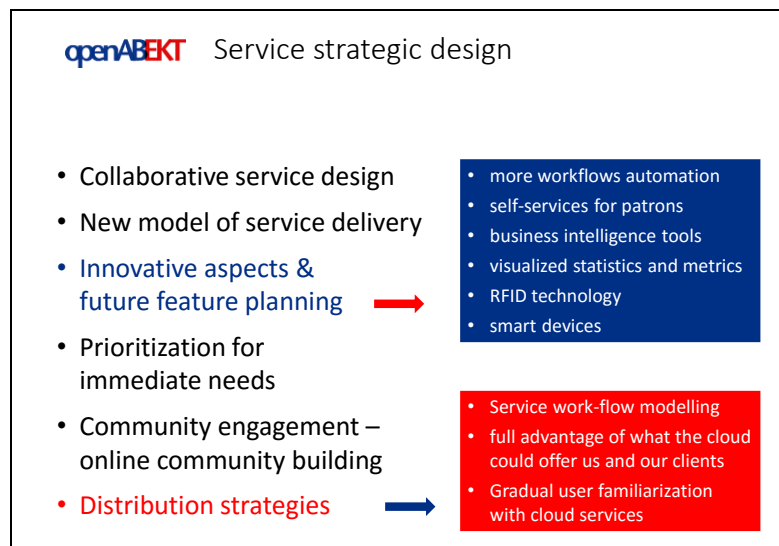
Libraries send us records

we validate, perform some automatic corrections & we migrate them ourselves


develop a Migration tool


We have put a lot of **emphasis on the quality and interoperability of the metadata so, for time present we don't offer data import**. For the moment, libraries send us records they want to **migrate** and after we **validate** them and **perform some automatic corrections, we migrate them ourselves**. We will eventually develop a **Migration tool** which **will link to the Catalogue in order to further enrich metadata**. You can see **here some of the automated checks we perform** today!

- UNIMARC structure and characteristic, UNIMARC schema depiction on openABEKT allows it
- Record label and coded values (country, language, etc.
- Error in ISBN/ISSN
- Missing mandatory fields
- Records without responsibility or specific role i.e... 7xx or \$4
- Records without subjects i.e. 6xx
- Mixed characters, i.e. Greek words with English characters etc.
- Cataloguing rules
- Other points as specified by the library




- Overall, when designing the service, we took a **strategic** approach, making some choices and evaluating each step with the **community of users**.
- We **followed general collaborative service design principles**, in order to **introduce a new model of delivery of service to libraries**. In fact, the community engagement that happened all throughout the **design** process enabled us to **identify innovative aspects** of the service and platform, prioritize some for **immediate implementation**, while leaving some for future development. As resources were **thin**, therefore we had to make some **hard choices**.
- The community **engagement** definitely helped us with this, since we were made aware of what the **immediate needs** are and what can be put in the **pipeline**, such as: additional **workflows automation and self-services for patrons**, **business intelligence tools** through the integration of visualized statistics and metrics, the **strategic adoption of RFID technology** and **smart devices**- to name a few.
- We spent **considerable time** thinking about the modelling of the **service work-flow**, in order to make **full advantage** of what the **cloud could offer us and our clients**, and avoid unnecessary bureaucracy that is resource-intensive.
- We also focused a lot in building **an online** community of users with a goal to ensure the **optimum** adoption rate for the new service.
- **Cloud services are often seen with skepticism** in this country, as people are **not as familiar with them**, so the gradual **rolling out of the service and familiarization** of our client base with this new delivery model was **paramount**.
- One thing that was of great importance to **us** was **disseminating to the libraries what the cloud offers and what libraries can do with the opportunities presented to them**.

 The technical side

 Κατάλογος | Catalogue

- MongoDB
- ElasticSearch
- Redis
- Z39.50 Zebra
- Ruby on Rails Framework
- Puma
- Bootstrap
- Sidekiq
- Capistrano

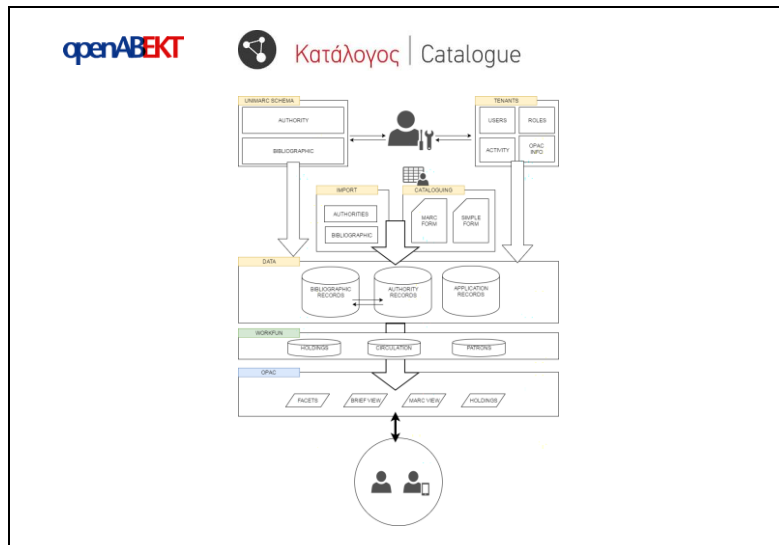
 Ροές & Λειτουργίες | Workflows & Functions

- PHP
- MySQL
- Nginx
- Bootstrap

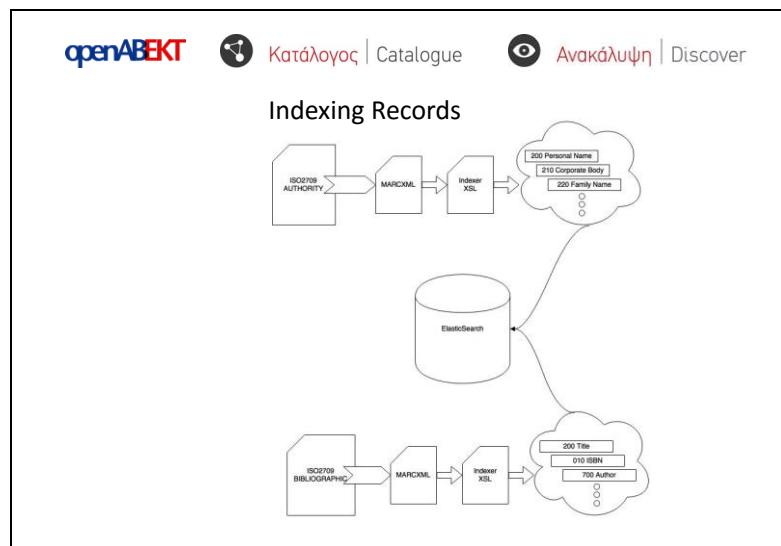
openABEKT Server Software 2013
Operating System: Linux | Web Server: Nginx | Caching Server: Varnish

Now, when it comes to the technical side:

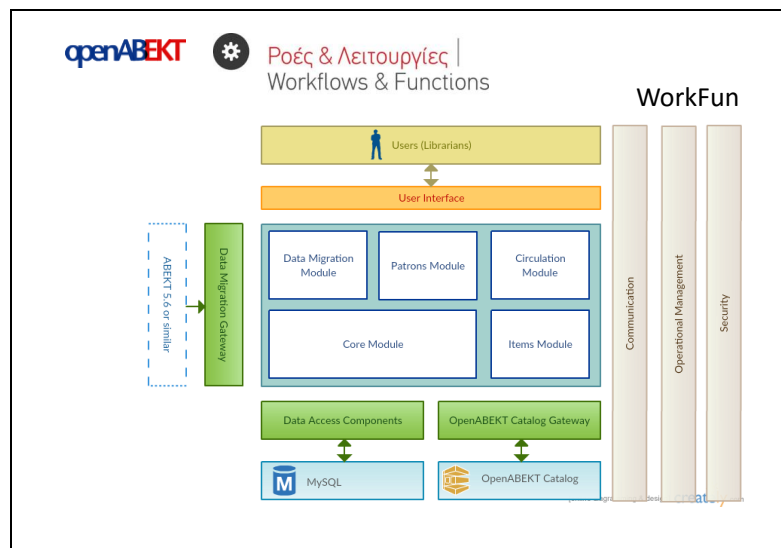
We used a variety of **open source** operating systems, tools, programming languages and servers, in the development of openABEKT in EKT's infrastructure



- The key building blocks of the openABEKT catalogue are the schema and the tenants
- Metadata are either imported or created with the use of two-tier forms, for novice and expert users
- Metadata are preserved on the data layer
- The data layer collects data from Workfun too
- Then the data are distributed through opac to the library's personnel and its users
- Both catalogue and discover are responsive environments, available for an array of interfaces, mobile and desktop



While **Indexing** the bibliographic and authorities, data are transformed into **MARCXML**, through the **indexer xsl** which incorporates **ISBD rules**. Finally, bibliographic and authority **entities** are transferred and **indexed to ElasticSearch**. ElasticSearch is a core part of openABEKT, **since that is where the indexing and OPAC services are based**.



In the Workfun environment, the architecture is based on the **storage/persistence** and data exchange mechanisms, MySQL and the Catalogue.

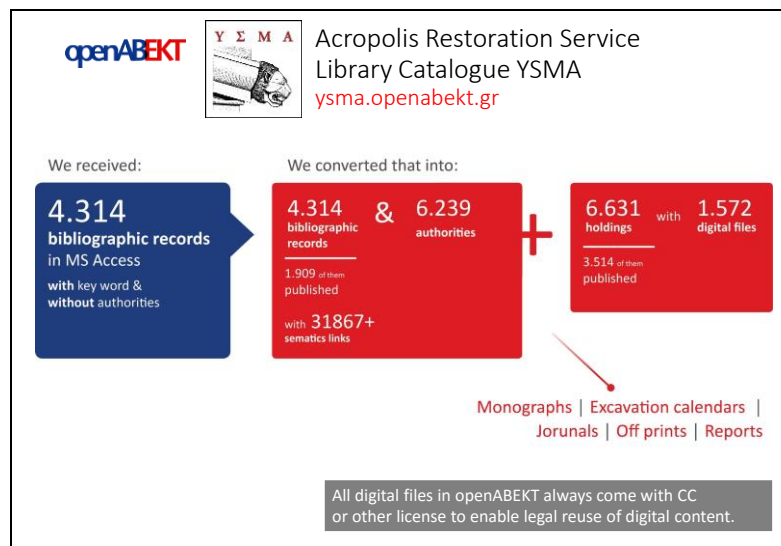
The workflow can also start with a data migration through a dedicated gateway, from ABEKT 5.6 or similar infrastructure. The **data falls** into the **system core**, which comprises of 5 modules, core, data migration, patrons, circulation and items modules. **The visible layer** is the user interface for staff. All throughout **the various layers of the system**, Communication, Management and Security operations **run horizontally, only after authentication**.

openABEKT Some of our users

- The Acropolis Restoration Service Library Catalogue
- The European Public Law Organization Library
- The Library of the Greek Biotope/Wetland Centre (EKBY)
- The Catalogue of the Library of General Hospital Asklepieio
- The Public Library of Konitsa
- The Public Library of Levadia
- The Public Library of Serres
- The Public Library of Mytilene
- The Library of Holy Trinity's Sacred Patriarchal and Stavropegic Monastery of Jagaroli



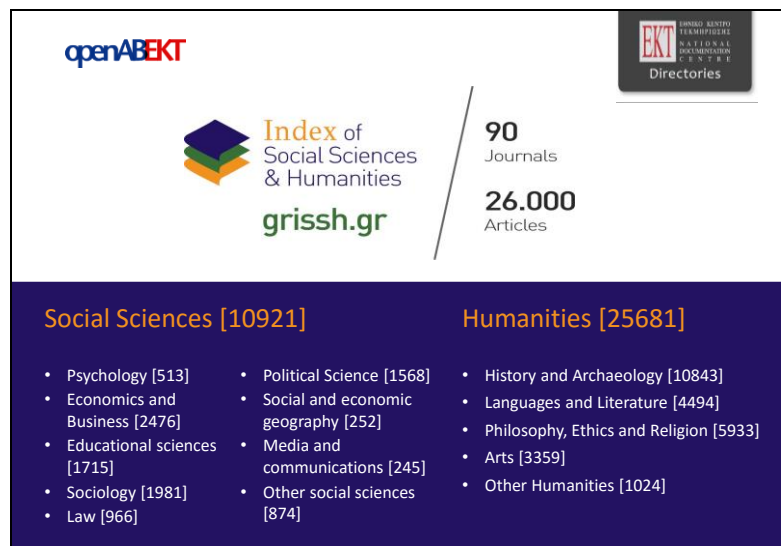
In regards to our **current users**, amongst the **first organizations to receive the service** was the Acropolis Restoration Service. Another **client with international audiences is the European Public Law Organization**. There also special, public libraries, hospital libraries even monasteries.



Some facts about the Acropolis Restoration Service Library Catalogue migration:
We received 4314 bibliographic records in MS Access with keywords and without authorities. Those are for Monographs, Excavation calendars, Journals, Off prints, Reports

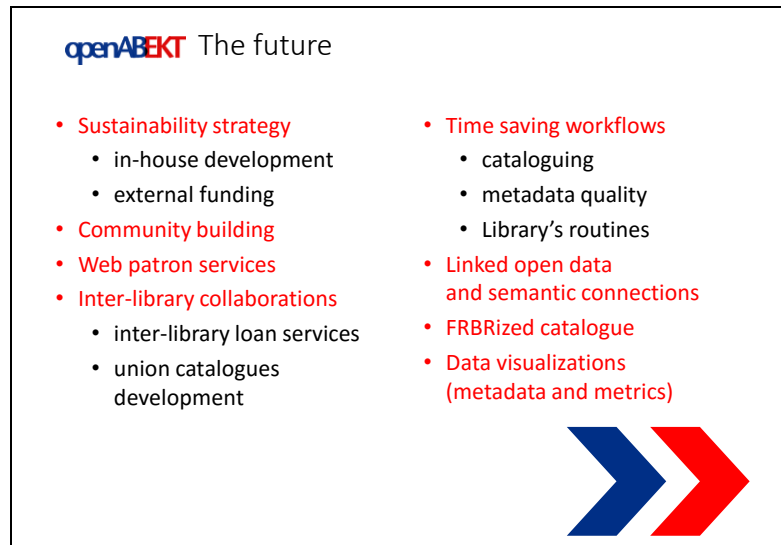
We converted that into:

- 4314 bibliographic records (1909 of them published) & 6239 authorities with more than 31867 semantics links
- 6631 holdings with 1572 digital files (3514 published). All digital files in openABEKT **always come with a CC or other license in order to enable legal reuse of digital content.**



We also used openABEKT to develop our Greek **Social Sciences and Humanities Index**, which collects, documents and preserves the **authoritative Greek scientific publications of Social Sciences and Humanities (SSH)**. **More than 90 journals and 26.000 articles** can now be searched, browsed and used. GRISSH's content was developed **collaboratively with the community of publishers** whose journals are indexed here.


Its purpose is **to serve the needs of the scientific community** and contribute **to the development of a collaborative network among research institutes and publishers in the country**.



Now, in regards to the future, one basic factor is **sustainability**. Since we develop **openABEKT in-house**, it is a resource-intensive work, so we do have to rely on **external funding**, which we try to find through projects.

Therefore, we do have to be flexible about **our development agenda**, as it relies on external factors. For the future we plan:

- to focus more on our web **community building**
- to widen the **web services** offered to patrons
- to strengthen the **inter-library collaborations**, such as inter-library loan services and union catalogues development
- to add more **workflows** that help save time in **cataloguing** for our users and add value to their **metadata quality**
- to offer **linked open data** and semantic connections between other strands of content
- to offer an **FRBRized catalogue**
- to do more data **visualizations**, which are inclusive and user-friendly. This includes both **metadata**, i.e. timelines, interactive maps etc. and **metrics for library use**.

 The project team

- **George Stavrou,**
Head of ABEKT Development
- **Eleni Angelidi,**
Head of ABEKT Services
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Director of the National Documentation Centre

*
Permanent staff
Full time Contractors

This is our project team, which may seem large, but in fact, it is not. The only full time staff who work for openABEKT **exclusively** are in bold. The rest help amongst other responsibilities. Special thanks to Elena Lagoudi & Vasilis Doumanis who also helped a great deal with this presentation. Dr Evi Sachini, directs and supports ABEKT development and the work we have been doing with libraries since 1998.

openABEKT The funding



The project is co-financed by Greece and the European Union

openABEKT was developed within the project
"A Platform for the Deposit, Management and Delivery of Open Metadata and Digital Content"
implemented by the National Documentation Centre within the Operational Programme "Digital Convergence" (NSFR), which is co-funded by Greece and the European Union-European Regional Development Fund.

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