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Widening open access: EKT as a case-study for an innovative content distribution model

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Abstract:

Objective: The National Documentation Centre (EKT) plays a pivotal role in the collection and dissemination of scientific and cultural content in Greece and beyond. The paper focuses on the innovative distribution model which funnels structural funds (from national and European projects) into a robust infrastructure comprising of developmental initiatives and cloud-native digital services, with a scope to collect, curate and publish a growing volume of open access digital content.

Background: Traditionally, research centers are not content-agnostic, opting to focus on either cultural or science content. Our innovation is based on an integrated methodological approach and a common work-flow oriented towards a blended dissemination model. We collect both primary material and various scientific resources and output and circulate them with the widest possible CC licenses and open access principles for education, re-use, life-long learning and research. This open licensed content

amassed by EKT enables the deployment of a multitude of activities, work flows and synergies which enhance learning, inspiration and citizen participation in the scientific process and cultural sharing. In addition, the added value applications and services provided to end users form a digital research environment that facilitates open and citizen science in the broader sense.

Methods: Describes the networked distribution model supported by the organizational strategy, present the full spectrum of digital services (EKT's aggregators, SearchCulture.gr & OpenArchives.gr, the repositories service, openABEKT, ePublishing services, indexes and other research aids etc) offered to the communities of GLAMs, research and academia, the educational community, other libraries and the public. The paper will present the integrated workflow which aggregates, validates and publishes open access digital content generated by diverse communities of practice and the semantic enrichment which adds value and conceptual integrity to curated digital content.

Conclusion: This innovative operational framework is further leveraged by participating in European consortiums and EU-funded projects, enabling EKT to act as a facilitator of inclusive and open circulation of knowledge in and for society at local and European level.

Keywords: open access, digital content, aggregation

Introduction

The European Union vision is for scientific and cultural digital content to circulate freely through cloud services with a goal to help leverage the economy and provide solutions to key societal challenges. Digital content is now recognized as a crucial factor for development and as a valuable resource giving opportunity to large scale online research using vast amounts of data.

The National Documentation Centre (EKT) plays a pivotal role in the collection and dissemination of scientific and cultural content in Greece and beyond. Aligned with the above EU priorities and national policies, EKT developed a robust e-infrastructure and a range of high value public services, made possible through national and European funding. These services support content through its lifecycle and are offered to research, science, culture and memory organizations. This innovative operational framework is further leveraged by EKT's participation in European consortia, networks and EU-funded projects, enabling EKT to act as a facilitator of inclusive and open circulation of knowledge in and for society at local and European level. EKT's strategic goals promote openness in all levels: open access, open standards, technologies, data and licenses. Through participation in various working groups, EU funded multi-partner Open Access projects, technical know-how sharing and collaboration with open access stakeholders in Greece and abroad, EKT leverages its strategy with action-focused, targeted networking and lobbying.

Traditionally, libraries and aggregators are not content-agnostic, opting to focus on either cultural or science content. EKT's innovation is based on an integrated methodological approach and a common work-flow oriented towards a blended dissemination model. EKT collects primary material, digitized heritage assets and scientific resources and output and circulates them with the widest possible CC licenses and open access principles for education, re-use, life-long learning and research. This open licensed content amassed by EKT enables the deployment of a multitude of spin-off activities, work flows and synergies which enhance learning, inspiration and citizen participation in the scientific process and facilitate cultural sharing. In addition, the added value applications and services provided to

end users contribute to the incubation of a digital research environment that facilitates open and citizen science in the broader sense.

The paper focuses on the innovative distribution model which funnels structural funds (from national and European projects) into a robust infrastructure comprising of developmental initiatives and cloud-native digital services, with a scope to collect, curate and publish a growing volume of open access digital content. It will also present the suite of digital content services which support this model.

Business and Distribution Model

Based on its strategy, EKT developed a networked distribution model for a full spectrum of digital services (EKT's aggregators, SearchCulture.gr & OpenArchives.gr, the Repositories service, openABEKT, ePublishing services, indexes and other research aids etc) offered to the communities of GLAMs, research and academia, the educational community, other libraries and the public. Given the non-homogeneous nature of the content collected, focus was given to invest in an integrated workflow which aggregates, validates and publishes open access digital content generated by diverse communities of practice. This workflow is content agnostic and adds value to diverse data through a common semantic enrichment process. The semantic curation enhances the conceptual integrity of digital content which emerges from this workflow cleaner and enriched.

The business model decisions that were made and the choice of particular technologies, such as the cloud and the SaaS (Software as a Service) delivery model, were geared towards guaranteeing economies of scale. The choice was sensible and compelling because of the many cloud benefits, apart from the most obvious- the cost effectiveness: it provided flexibility in implementation, scalability to meet demand, high availability and robustness in application, dependability and application of the "connect & go" principle.

The above decisions were taken in order to address a series of issues have emerged during previous public funding digitization projects. Amongst other issues, the key ones the above strategy tried to address had to do with increasing the dynamics of the generated/digitized content, safeguarding the value of the public investment made and augmenting the previously limited potential for wide and open reuse. At a functional level, these problems generated from the disintegration of the systems used for publishing digitized content, the inability of these systems to effectively integrate with international repositories and/or search engines and the lack of mechanisms that would ensure the long-term preservation, availability and security of said content.

Therefore, it was necessary to establish a framework that would ensure compliance of the open digital content publishing systems with proper specifications, combined with the necessary interoperability checkpoints, in order to avoid failures during the implementation of projects. The framework and the corresponding specifications were an integral part of the project "A Platform for the Deposit, Management and Delivery of Open Metadata and Digital Content" (Digital Convergence, 2011-2015). The aim of the project was to create an open environment, integrated within the advanced e-infrastructure of EKT, for the provision of Cloud Services for open digital content, which was supplied as a complete software service - SaaS (Software as a Service). Horizontal interventions on a wide scale were made through the project which ensured interoperability with platforms of central Cloud storing, support for established content and metadata organisation standards as well as the immediate integration

of emerging standards and advanced functions for the preservation of hosted data. The specifications were first published in 2009, then re-iterated in 3 more editions and were based on EKT's long national and international experience and implementation of the e-infrastructure "National Information System of Research and Technology". They follow international practices within European Countries (UK, Netherlands, France, Sweden, etc.) and EU (e-content programs, ICT PSP, e-infrastructure, etc.), successful case studies of large-scale individual international repositories and digital content systems (Open Library of Internet Archive, Google Books and Art Project, etc.) as well as developments, opportunities and capabilities provided by the SaaS infrastructure for digital content. The current edition "Interoperability and content quality specifications for publishing on-line digital cultural content" was published in 2019. It has up-to-date guidelines that can help beneficiaries of digitization projects to produce and publish interoperable, qualitative and re-usable digital cultural content.

In regards to the work-flow, starting with either the organizations' own systems or EKT provided services (repositories, ePublishing services or openABEKT), content passes through a pipeline of validations, preservation mechanisms, semantic enrichment and aggregation.

Services

EKT's Repository Service is intended for a wide range of organisations providing ready-made repository infrastructure for immediate, easy organisation, documentation and showcasing of their content using international standards and advanced cloud technologies. The repositories manage multiple content types and offer enhanced functions in terms of content and user experience. Thus, not only is the content reused but the validity and impact of the organisation is strengthened, while costs for technological infrastructure and technical support are reduced. Users can create highly configurable open access repositories at a granular level, through an online Wizard tool, where they specify in detail the documentation and communication features of their repository.

ePublishing is a suite of services for publishers wishing to transfer their content to an electronic environment or create a new electronic open access publication online. It is an EKT initiative for the enhancement of academic communication and the dissemination of scientific content. It comprises of 3 services:

eJournals

eJournals is an integrated management infrastructure for open access electronic journals, aimed at meeting the needs of the country's scientific community and the international promotion of academic publishing and Greek journals, mainly in Social Sciences and Humanities.

eBooks

eBooks is a new EKT service for the country's research and academic communities. It enables the publishing of electronic monographs of high scientific and technical quality using open access.

eProceedings

eProceedings is an innovative service for the electronic publishing of conference proceedings, and availability of authoritative open access content, highlighting the activities of scientific bodies and the work of Greek researchers.

openABEKT is an integrated cloud service for the management of catalogues and library functions, using cutting-edge technology, developed following the SaaS model and available online through EKT's cloud infrastructure. The service is mainly designed for libraries, museums, archives and educational institutions with complex needs for managing content, users, members and multiple workflows, such as development of standard performance, management of digital and non-digital, membership management, loans, statistics, references etc.

EKT's Validation-Preservation-Aggregation Services are a suite of services for quality control, interoperability and sustainability.

EKT's Data Protection Service (**Preservator**) maintains backup files and preserves digital resources. The safe preservation of content is achieved through the EKT cloud and Disaster Recovery.

The service is supported by an online platform through which procedures for mass collections, storage of digital resources (metadata of multiple types, digital files) and recovery are performed by authorised EKT personnel. Maintaining such data in safe conditions and downloading remote database backup is performed by mechanisms implemented by the EKT system and networks unit.

The safekeeping of digital content is a prerequisite for its long-term preservation. Digital content can be protected from human and computer error, ensuring future access to it. Safekeeping of content is achieved through the EKT Cloud Infrastructure Disaster Recovery Service

The **Validator Service** checks for compliance with wide-spread international data and system standards. In essence, it assesses institutional maturity when it comes to digital governance. Apart from that, it also tests for data interoperability capacity with major third party national and international aggregation services like Europeana and runs performance tests to check the level of openness related to an organization's data. The metadata and digital file validation service is provided through an online tool accessible by authorized users which checks for content compliance with internationally recognized standards and specifications, resulting in content quality certification. It generates reports and offers the capability to integrate more controls and extend it to other metadata formats.

The **Aggregator Service**- offered through SearchCulture.gr and OpenArchives.gr- offer a single point for searching and retrieving cultural and scientific (respectively) digital content that has been produced through public funding. **SearchCulture.gr** is the portal that provides free and open access to varied, useful cultural content for education, recreation and life-long learning. It aims at enhancing findability and re-usability of good quality documented and public funded cultural content. Through SearchCulture.gr EKT is the National Greek Aggregator for Europeana. **OpenArchives.gr** has been in operation since 2006 and has quickly become the largest online search portal for quality digital Greek scientific content. At openarchives.gr, users can search a wide range of scientific journals, research publications, doctoral theses, dissertations, maps, grey literature etc from a single access point. New collections are constantly added and existing collections are updated regularly with the most recent events and changes. Recently, EKT has launched two new ways of publishing data: a Web API, which allows third-party applications to search for and display data aggregated and as Linked Data, which is a publishing approach that allows data integration and use. This high value services are a driver for communities of innovation and

re-use, such as developers, to come up with inventive new products and services, completing the digital content life-cycle.

Semantics.gr is a pilot system for creating, establishing and publishing semantic vocabularies. It provides a public online portal (www.Semantics.gr) which disseminates vocabularies as Linked Open Data. It supports vocabularies, thesauri, taxonomies and other authority files and is compatible with RDF and Semantic Web technologies. It has a user-friendly configuration tool for shaping vocabularies and a tool for semantic enrichment which can be used by aggregators and repositories to enrich and homogenize their metadata using vocabulary terms.

Other tools and services offered by EKT include the Social Sciences and Humanities Index, an up-to-date index of quality Greek scientific publications from the Social Sciences and Humanities. The Index collects, documents, maintains and provides access to reputable Greek scientific publications in the Social Sciences and Humanities. There is also ESKEP, the National Union Catalogue of Scientific Journals of Greek scientific and technological libraries, a service developed, maintained and distributed by EKT as part of its institutional remit. It presents bibliographic data for printed and electronic scientific journals available in the collections of Greek libraries, and for every journal title details of the library's holdings are given. Finally, it is worth mentioning the openABEKT union catalogue, where all content aggregated and documented in each individual catalogue of a library using openABEKT is fed into and where users can perform searches amongst many libraries records.

Results

Quantitatively, the results in numbers are impressive:

- 488.235 records from 59 content providers have resulted from the aforementioned workflow and aggregated into SearchCulture.gr.
- Of these, 175.000 records from 26 content providers have been ingested into Europeana.
- 452.767 records in SearchCulture.gr have been homogenized and enriched through Semantics.gr.
- 750.227 records from 59 content providers have been aggregated into OpenArchives.gr.
- 707.489 records in OpenArchives.gr have been homogenized and enriched through Semantics.gr.
- 26 repositories were developed through EKT's Repository Service, amassing around 110.000 records.
- 37 eJournals, 4 eProceedings series and 9 eBooks have been published through EKT's ePublishing services, with 14.000 records in total.
- 156 Libraries use the openABEKT service contributing 2.144.527 records to the openABEKT central public Catalogue
- 40.317 SSH articles are indexed in Grissh.gr

Apart from the measurable results however, the cultural shift that EKT's work has contributed to, had to do with policy-makers recognizing that more transparency and sustainability are required from publicly funded digital content projects. Partnering with the Digital Convergence managing body during the previous Operational Programme was a step in this direction.

Moreover, EKT achieved a distribution of technical and documentation know-how to a much wider user base and contributed to awareness-raising about the importance of networks, exchanges of experience, pilot research projects and the implementation of effective business methods and sustainable models in the digital content management life-cycle and the knowledge circulation ecosystem in Greece.

One of the most intangible results we have been witnesses to though was a paradigm shift emerging amongst the communities of practice: content producers are navigating a connected and continuously expanding information ecosystem, which calls for a shift in mentality- from thinking just about content and software to thinking about widening access and linking to other data and online services for their communities of users. Cloud and distributed technologies can provide attainable answers to these challenges for content producers and curators, such as universities, museums, libraries and archives. By materializing the above principles through business models and following open access principles, EKT has contributed significantly to the development of a Digital Public Space in Greece. Such a Public Space is vital for a country in order to achieve not only a public dialogue about how it manages its cultural and scientific heritage but also to guarantee the most effective circulation of public funded digital content. Of course, all this is possible if it involves the engagement of community networks that participate in this value chain.

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