



Europeana DSI 2– Access to Digital Resources of European Heritage

DELIVERABLE

D3.1: FEASIBILITY REPORT ON EUROPEANA MARKETPLACE

Revision	final
Date of submission	10.08.2017
Author(s)	Dimitris Gavrilis (AthenaRC)
Dissemination Level	Public



Co-financed by the European Union
Connecting Europe Facility

REVISION HISTORY AND STATEMENT OF ORIGINALITY

Revision History

Revision No.	Date	Author	Organisation	Description
1	16.6.2017	Dimitris Gavrilis	AthenaRC	Draft
2	19.6.2017	Milena Popova	EF	Review and remarks
3	5.7.2017	Dimitris Gavrilis	AthenaRC	Revision
4	20.07.2017	Saso Zagoranski	Semantica	Review and remarks
5	10.08.2017	Dimitris Gavrilis	AthenaRC	Final version

Statement of originality:

This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

The sole responsibility of this publication lies with the author. The European Union is not responsible for any use that may be made of the information contained therein.

Table of Contents

- Table of Contents 3**
- 1. Overview..... 4**
- 2. Methodology 4**
- 3. Research on existing marketplaces..... 5**
- 4. Technical architectures..... 8**
- 5. Delivering products vs services..... 10**
- 6. Building Trust 12**
- 7. A Marketplace for cultural heritage: A Case Study..... 13**
- 8. Proposed technical architecture 15**
- 9. Setup and Operation Requirements..... 17**
- References 19**
- Annex I. Existing marketplaces 20**
- Annex II. Europeana Labs 25**
- Annex III. AHP Results 28**

1. Overview

There is a huge rise of marketplaces worldwide, so big that affects the global economy and future of ecommerce. These marketplaces are not of course limited to selling services and applications but include companies such as Uber and Airbnb (where they sell transportation and hospitality services).

The main reason for this change has to do with the fact that horizontal marketplaces such as eBay are too vast so that they cannot provide quality services to specific domain. So, domain specific marketplaces emerged and had a disrupting impact.

The amount of services marketplaces available globally is also huge and more are added every month. For example, fiverr, a marketplace that sells services by professionals (<http://www.fiverr.com/>) had over 25 million transactions between 2010-2015 [1].

FAST FACTS: TOP MARKETPLACES	
Alibaba 8,5MM sellers (Q2 2014)	Etsy 1.4MM active sellers (Q1 2015)
eBay 25MM sellers (2014)	Uber 1MM driver partners, +6x Y/Y
Airbnb Nearly 25MM total guests in 2014	Amazon 2MM+ third-party sellers (Q1 2015)
<i>Source: "Internet Trends 2015" by Mary Meeker</i>	

Figure 1. Top marketplaces facts [3]

This document presents a study of services marketplaces that exist in the global market. The aim of the report is:

- to map the ecosystem of services marketplaces
- to identify functionalities, architectures and business models
- to propose a technical implementation plan for a Europeana marketplace
- to estimate implementation costs for a Europeana marketplace

Whereas a marketplace sounds more like a shelf in which a client buys a set of services, in reality, services marketplaces are usually complicated, state of the art infrastructures that offer a wide range of functionalities that act as a glue for the services they provide.

2. Methodology

The huge amount of service marketplaces that exist alongside the significant research work that is being carried out that supports/studies these technologies, consists a vast and diverse set of information. In order to compile this document, and take into account as much of this information as possible, the following steps were taken:

- a) bibliographic research was conducted (see References section),
- b) online search/discovery of existing marketplaces and analysis of their different aspects,

- c) field-testing of the provided functionalities and user experience of different marketplaces where available
- d) a survey and analytical hierarchy process analysis [2] from selected experts.

3. Research on existing marketplaces

This section presents the various aspects and highlights of existing marketplaces. The work was based on research with a large number of existing marketplaces (a selection of these is listed in Annex I) and through bibliographic research [3], [4].

Types of marketplaces

There are two main different ways of classifying marketplaces:

- a) by participant type (e.g. B2B, B2C, C2C, etc.)
- b) thematically (e.g. products, services, content, etc.)

Examples of marketplaces by participant type:

Business to Business (B2B)	Business to Customer (B2C)	Customer to Customer (C2C)
Alibaba	Amazon	Etsy
Amazon	iStockPhoto	
iStockPhoto	YouTube	

Examples of marketplaces by thematic category:

Products	Services	Content	Investment & fundraising
eBay	Airbnb	YouTube	Kickstarter
Amazon	Booking	Spotify	CircleUp
Etsy	Fiverr	iStockPhoto	Indiegogo
Google Play	Upwork		
Apple store	Freelancer		

In both cases, there are some functionalities that are common, such as: statistics monitoring, version control, user and technical support. These functionalities aim at ensuring service quality.

Common Functionalities

This section presents a list of common functionalities offered by the different marketplaces.

Search	Search for available services
Browse	Service browsing based on categories and tags
Billing	Billing when buying a service
Recommendations	Recommendation service for personalized user experience (e.g. suggestions based on purchase history etc.)
Statistics	Usage/download statistics
Reviews	User reviews and ratings
Compatibility	Compatibility based on the client's hardware / software

Security	Security through authentication / encryption
Error reporting	Crash / error reporting
Documentation	Help guides, user guides
Support	Support through tickets, FAQ, knowledge base, etc.

A more technical anatomy of a marketplace

If one was to construct a simple marketplace, they would require a small amount of services/components. These can be seen in the figure below.

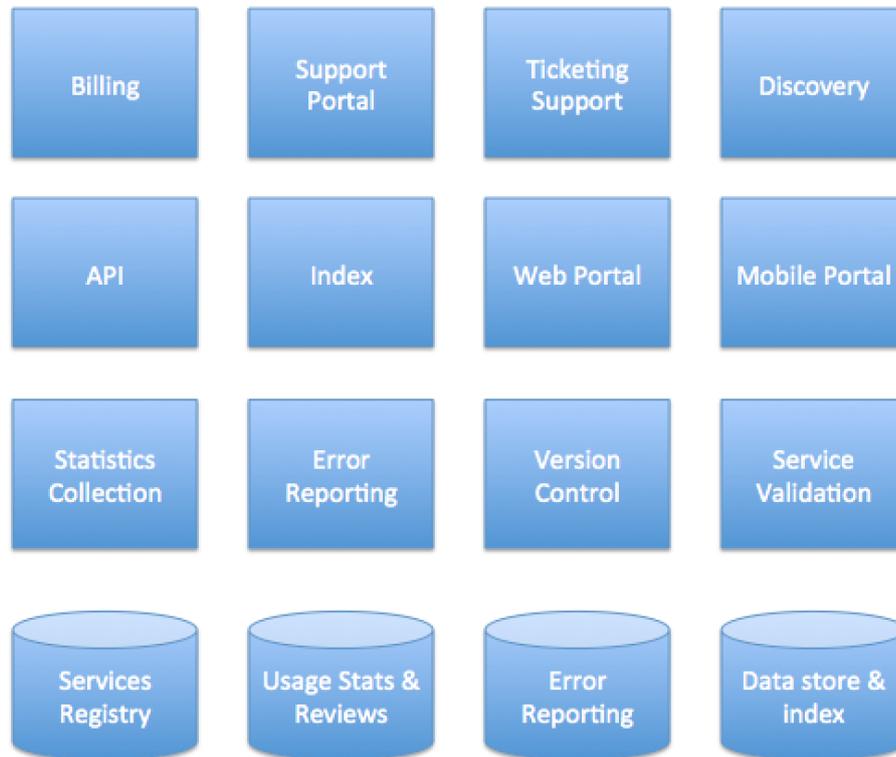


Figure 2. A list of components for a basic marketplace

The required components include data stores, services, APIs and access clients.

Data stores:

A service registry where all the metadata about the services are stored. A usage statistics and reviews data store is responsible for gathering usage stats, reviews from users and other feedback. An error reporting data store, maintains crash logs and other related data. Finally, a data store for the services themselves alongside an index.

Services / APIs:

A statistics collection service (with an API), an error reporting service (with an API), a version control service that handles different versions of the services alongside their dependencies, a validation service that ensures the integrity of each offered service, a discovery service, ticketing and support, a billing service. Furthermore, a central API for accessing the marketplace alongside an indexing mechanism.

Access Clients:

The marketplace requires a series of access endpoints so that end users can access it. These are usually a web and a mobile portal.

Business models

This section presents a list of common business models found in various marketplace implementations. There are two things to consider when planning for a marketplace: a) launch strategy, and b) pricing strategy.

Before going into depth, one must understand “the chicken and egg problem” [3] [5], a common challenge found when talking about marketplace business models. This problem has to do with supply and demand by producers and consumers and how to mutually build this without falling into a deadlock.

The overall lifecycle in marketplace building consists of three steps:

Seeding	Select a strategy (see below), and start by building an inventory, convince consumers to use the marketplace and producers to contribute their services. Finally, bring consumers and producer together.
Growing	Growing an established marketplace involves mainly identifying the areas of high demand and expanding on them.
Scaling	Scaling a marketplace happens when a marketplace is successful. The primary things to consider have to do with building trust and safety among the communities addressed.

There are three main ways of launching a marketplace in terms of strategy:

1. **Producer first:** producers start adding content in the platform first and waiting for consumers to start using it.
2. **Consumer first:** is based on an existing platform with already registered consumers. The producers add content gradually until a critical mass is formed.
3. **Parallel:** a combination of the above.

In a producer first model, the following are to be considered:

- Producer seeding: the consumers are adding content and services into the marketplace even when no demand/users exist.
- Making consumers promote content by introducing services such as loyalty programmes that enable consumers to promote the services and attract more consumers.
- Provide services that consumers can use outside the marketplace content (e.g. YouTube allows users to upload their video so that they can edit it and embed it on their website).

In a consumer first model, the following are to be considered:

- Create traction through free offering of services to producers (e.g. through a free game, an embedded search engine, etc.).
- Provide incentives to consumers such as points and premium services so that to attract more premium consumers.

In regards to the pricing strategy, the following options have been identified:

Flat fee
This is one of the most common options. The services are charged and the clients buy each service based on a fixed fee.
Example: Google Play store

Subscription based
This is one of the most common options. The services are charged based on a subscription fee.
Example: Apple Store

Pay per use
This model involves paying based on the use of the service. Typically, usage per month or per storage consist common scenarios.
Example: Amazon Web Services (AWS)

In-app payments
In this model, the services are offered for free. These free services offer a limited or no real functionality and require that the user buys more add-ons from within the service.
Example: Apple Store

Credit-based
In this model, the user buys credits offered in batches and through different prices per batch. These credits appear in the user's account and are used to buy services / products from the marketplace.
Example: iStock

Developer subscriptions
In this model, the developers are required to pay a small fee (usually on a yearly basis) in order to be able to publish and sell their services on the marketplace.
Example: Apple Store

4. Technical architectures

In terms of their overall technical architecture, service marketplaces have to address specific challenges such as a) scalability, b) complexity, c) agility and d) resilience.

Scalability

When thinking in terms of scalability, overall architectures fall into two major categories: a) centralized and b) distributed.

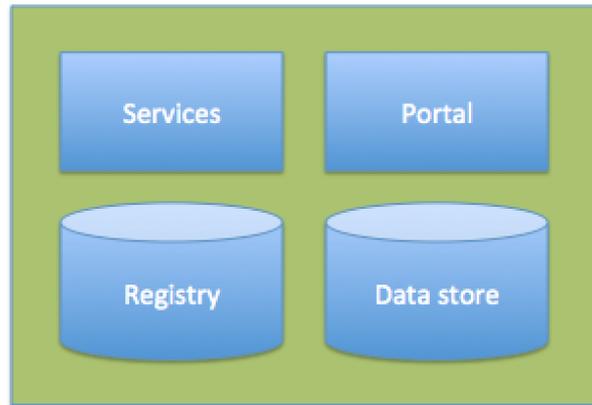


Figure 3. A simple centralized marketplace architecture

The former (Figure 3) usually refers to simpler/small scale marketplaces, whereas the latter case presents scalable larger scale solutions. Whereas the latter (Figure 4) usually involves large scale infrastructures with: a) either millions of users and hundreds of thousands of applications, or b) hundreds/thousands of applications that interact with each other. When scaling up an infrastructure like this, the data storage systems that hold the services are the ones that are scaled in priority.

In the cases of large scale marketplaces, users download content from all around the globe. This presents the need for hosting the data in various geographical places, e.g. having at least one data centre in every continent. Apart from the very big players who own many datacentres globally, this is achieved through the use of Content Delivery Networks (CDNs).

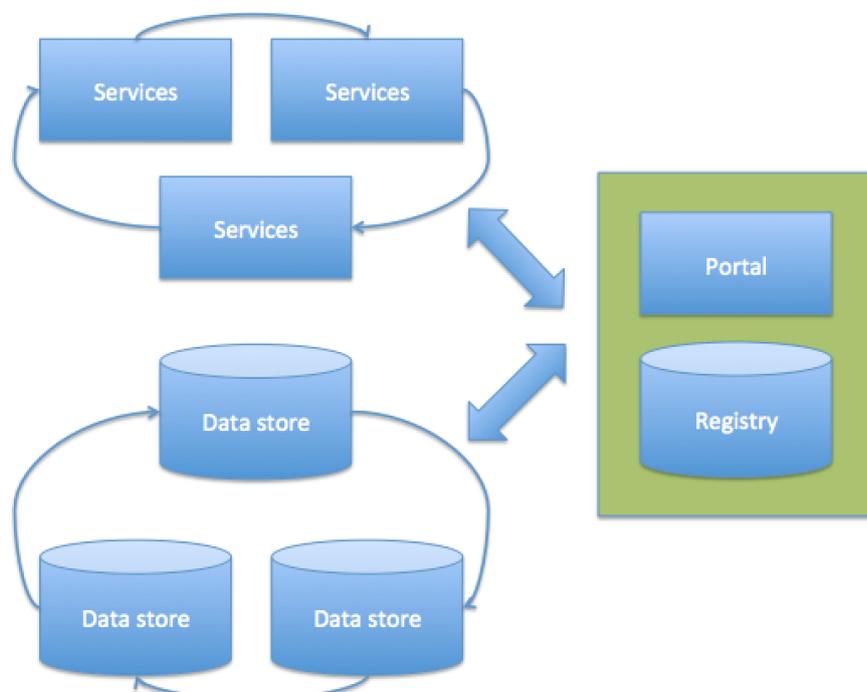


Figure 4. A simple distributed marketplace architecture

It is common to start with a monolithic system and shift to a more scalable architecture when the need arises. For example, in the case of Upwork [6] which has been around for almost 11 years, the initial system was a monolithic one which was upgraded when the need aroused.

Deciding on the overall architecture is also associated with the type of content delivered through the marketplace. For example, Netflix cannot afford to start with a non-scalable system simply because it deals with delivering huge streaming content to a large number of customers. Bearing in mind that a domain specific services marketplace does not deal with content of this size, the details of such scale-out architectures will not be thoroughly explored nor suggested.

Complexity & agility

A common and popular design choice when complexity and agility have to be addressed is micro-services. A micro-service oriented architecture involves de-composing the application into autonomic services that are launched and maintained separately.

This approach requires more effort during the early development stages but it is scale-ready and pays off when things become more complex. A micro-service oriented architecture can be expanded also in UX design where micro-frontends [7] can be employed to the user interface design.

A major advantage of a micro-service oriented architecture has to do with the capability of designing, developing and deploying services independently without affecting the overall status of the system.

Resilience

When dealing with a complex services ecosystem (especially, a micro-services one), handling faults is a major issue to consider. Resilient architectures employ the use of technologies such as ZooKeeper [8] to monitor the services health status, destroy crashed ones and spawn new ones in order to maintain the overall system health.

A major advantage of a properly designed micro-service oriented architecture is that services can fail independently, thus allowing the overall system to work.

5. Delivering products vs services

When thinking about a marketplace, the majority of people think about apps (e.g. Google Play, Apple Store) but there are plenty of marketplaces that target professionals and do not necessarily sell apps.

Popular cases include marketplaces such as iStock or Fivver, that sell media content (e.g. images, videos in the case of iStock) or services such designers' or actors' time.

In the case of selling content, the various formats and resolutions usually stand out in the product's page and are made explicit during the purchase. The product is made available to the customer through a download link that either appears or is emailed to the customer. This download link usually expires after some time (the workflow is shown in Figure 5 below).

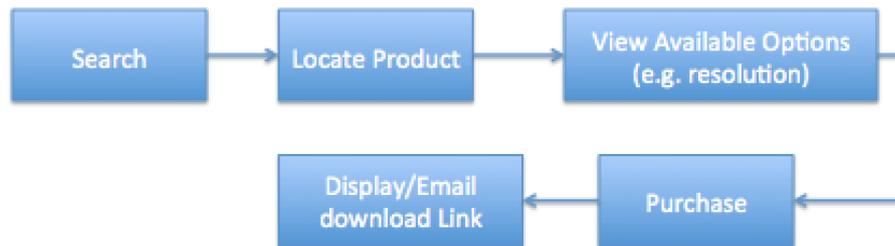


Figure 5. Overall workflow when selling content

Selling specific expertise (services) through a marketplace is usually the most complex and difficult case as it involves managing a professional's time through a number of iterations and rating the outcome. This workflow is shown on Figure 6. The main characteristics found is, that when dealing with services that correspond to time spent and charged, various options have to stand out. These options could include:

- number of hours spent
- number of iterations that can be implemented (an iteration is an exchange between the customer and the professional)
- quality / level of the service provided (e.g. size or resolution of the product being created).



Figure 6. Overall workflow when selling services

Another important characteristic that is found when dealing with services is reputation and reviewing. This is another characteristic that stands out and this is because of the subjective nature of the services. Thus, it is common to review both the customer and the professional (mostly the latter) so as to improve the overall experience and quality of the marketplace.

6. Building Trust

When launching and growing a marketplace, building trust among both the customers and producers is essential. This section presents and explores specific aspects related to building trust with the customers and producers.

Reputation building

Building reputation is a slow process that involves:

- Making sure all services are available (no broken links, downtime, etc.)
- Identifying and promoting services of high demand/importance
- Consistently presenting services, for example require a minimum amount of information (description, screenshots, etc.) per service.

Reviewing services

Reviewing services allow consumers to review and rate a consumer's services. Reviewing is probably the one thing all marketplaces have in common. Since any person can register as a producer and advertise/sell a product, it is difficult to control quality through some moderation process. Furthermore, trending services constantly change and it is best to leave it to the demand (the consumers) to "decide" on the popularity and quality of each service.

Operation and Support Services: Certifications

When a complex service is offered through a marketplace, it is common that specialized personnel are required to configure and operate this service. For that reason, most vendors of such services provide training and certification programmes. These specialized - certified professionals often offer their services through marketplaces (e.g. Upwork). The marketplace can list/verify the available certifications and skills and match them against the services provided.

Disputes

In all cases (both apps and services) the owner/creator of the app/service is responsible and liable. The marketplace deals only with facilitating the search/charging between the customer and the professional.

However, in cases where services are offered (e.g. when a professional charges for time or delivers a project), it is common for the customer to dispute the hours or the quality of the project charged. In both cases, since the marketplace is involved (in match making the producer and the consumer), the marketplace owner bears some responsibility. It is common for marketplaces to try to minimize these incidents using specific services:

- In cases of projects, usually, the customer pays and the professional get a bad review.
- In cases of charged hours, there are cases of marketplaces that utilize some tele-work monitoring software (e.g. Upwork) in order to be able to ascertain whether the hours charged were real and corresponding to the service agreed.

7. A Marketplace for cultural heritage: A Case Study

This section puts all the characteristics found in marketplace design and sets up a use case for cultural heritage domain.

Audience

The targeted audience (customers and consumers) include:

Audience	Needs
Large-Medium heritage organizations	Large-medium organizations usually require more specialized services and tools to address specific, not "every day" problems. <u>Examples include:</u> ministries, large museums.
Small heritage organizations	Small heritage organizations usually require access to out of the box applications and specialists (e.g. schema design, cataloguing). <u>Examples include:</u> museums, personal collections
Creative industries	Although creative industries usually require content (in the case of Europeana this is provided already), they could also benefit from specific curation services. <u>Examples include:</u> gaming industry, tourism
ICT companies	ICT companies are usually acting as producers
Individuals	Individuals usually require access to out of the box applications or specialized tools for their research. When acting as producers, individuals contribute services or provide specialized expertise. <u>Examples include:</u> researcher, private owner of content

In order to reduce complexity, costs and risks, three phases of deployment are proposed:

Phase 1: Basic	The basic setup consists of the following services: <ul style="list-style-type: none"> • <u>Submission</u> for apps and services • <u>Moderation</u> (quality control on the submission workflows) • <u>Retrieval</u> (search/browse for apps and services) • <u>Presentation</u> (view the apps/services through the web app) • <u>Reviewing</u> the provided services by the consumers • <u>Analytics</u> (for viewing/downloading apps and services) • <u>Licensing</u> (covering licensing schemes for apps/services) • <u>Versioning</u> (for handling app updates/bug fixes)
Phase 2: Advanced	The advanced setup builds on top of the basic and provides the following extra services: <ul style="list-style-type: none"> • <u>Billing</u> for apps/services where the platform will handle billing and invoicing. This will enable Europeana to make profit. • <u>Work monitoring</u> desktop application for monitoring work charged per hour (telework).

	<ul style="list-style-type: none"> • <u>Dispute</u> service for handling disputes. • <u>Dependency management</u> service that will enable managing dependencies among apps and data schemas.
Phase 3: Integrated	<p>The integrated (final) phase will built on top the advanced phase and will extend it with the following services:</p> <ul style="list-style-type: none"> • <u>Cloud</u> service that will enable developers to deploy apps and services as Docker (possibly) containers on a hosted virtualized environment. • <u>Sandbox</u> service that will enable developers to experiment with their services before deployment. • <u>Usage analytics</u> service that will enable tracking the real use of each cloud hosted app and charge per use.

Types of services

The types of services that can be offered include:

1. Micro-services and tools (e.g. a RESTful service or an algorithm)
2. Off-the-shelf services (e.g. a repository platform or a platform that curates (meta-)data)
3. Curation services (offered by professionals and target specific domains/models)
4. Mapping services (offered by professionals and target specific domains/models)
5. Operation services (offered by professionals and target specific products -- possibly require certifications).
6. Training / educational services

Specific marketplace functionalities

The marketplace will provide services that target two groups: a) consumers, b) producers. Consumers are looking to buy/use some product or service, and producers are looking to sell products or services (including expertise). The differences from the current Europeana Labs model are discussed in the next section.

A. To consumers

1. Search/Browse. Provide services for specific heritage domains / data models
2. Ratings and reviews
3. Preview/demo
4. Rights clearance. Specific and clear use/re-use rights.

B. To producers (businesses or professionals)

5. Billing. The marketplace handles billing for the professional.
6. Legal guidance. Specific legal /consulting
7. Usage analytics. Track use of services / enable charge per use model.
8. Versioning. Support versioning and compatibility among services or among services and data models.
9. Community access. Ability to train on humanities data models and requirements, access to new potential clients.

The role of Europeana Labs

Within the Europeana ecosystem, Labs is the closest thing to a Marketplace. Europeana Labs consists of 4 sections (APIs, Apps, Data, Incubation), out of which only the Apps section can be re-used in an online marketplace. The API section refers to the APIs offered by the Europeana, data refers to data offered by Europeana and incubation provides services to support viable ideas from concept to market-ready stage.

A more thorough presentation of Europeana Labs can be found in Annex II below.

Although the Europeana Labs platform (Apps section) provides a good categorization and presentation of the 168 tools and showcase items, the following main functionalities are missing:

- Reviews
- Usage statistics
- Licensing information
- User recommendations
- Owner information

Moreover, Labs is more like a CMS/Wiki rather than a platform required to deploy and market these services. For that, a new platform must be built in order to support seeding, growing and scaling the cultural heritage marketplace.

Added Value for Europeana

Setting up a marketplace around Europeana Labs provides added value for Europeana as professionals can take advantage of ready to use guides, samples and training material for EDM. This will most likely lead to: a) EDM-ready services and b) professionals with data quality awareness.

8. Proposed technical architecture

This section presents the proposed technical architecture of the marketplace for the first and second phase.

During the first phase (Figure 7), a web application and a set of back-end components will be developed. The web application is the primary means of exposing the marketplace to clients. All the retrieval and presentation processes are part of the Web app. A back-end framework consists of a series of components that carry out specific tasks such as: submissions management, reviewing and moderation, analytics, licensing management and CMS.

Each component enables the managers to monitor and moderate submissions and reviews. Certain components offer functionalities both for clients and managers. Such components include the CMS, Submissions, Reviews and others.

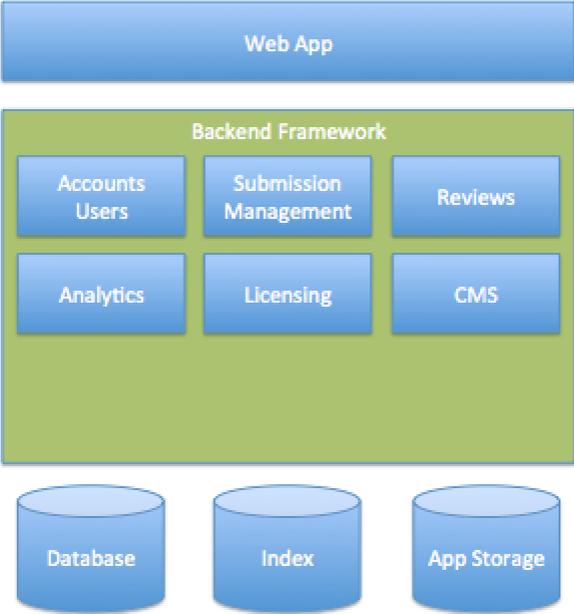


Figure 7. Phase 1: Technical components

A relational database is proposed to be used for storing the primary information alongside an index (due to the limited amount of content, the index could be merged with the database). An App storage component will hold the uploaded applications.

During the second phase (Figure 8), the extra modules for billing, dispute management, tele-work and dependency management will be added.

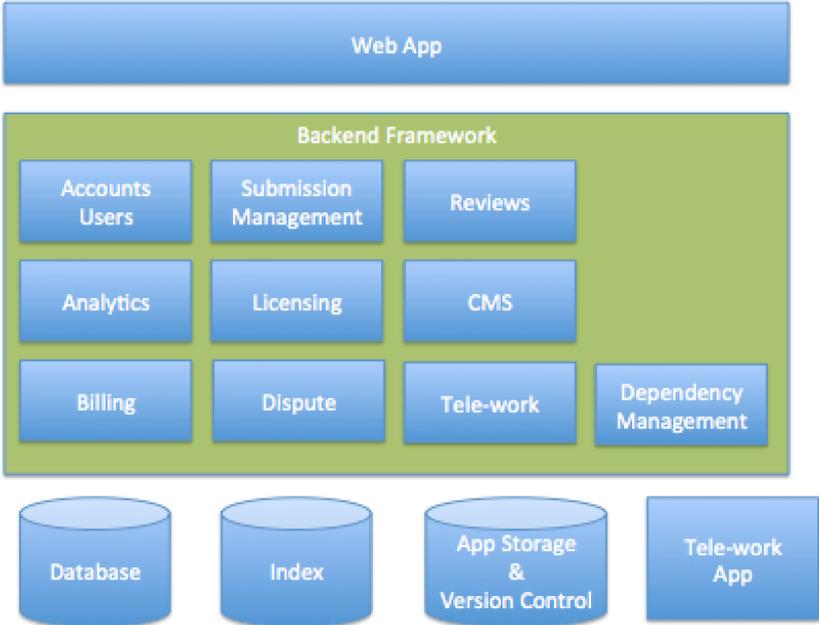


Figure 8. Phase 2: Technical components

The tele-work management component will also include a desktop app. The billing management will also require integration with a credit-processing API (such as Stripe.com). The App storage could be augmented with version control capabilities.

9. Setup and Operation Requirements

The setup and operation requirements of the Marketplace are estimated as follows (only phase 1 and phase 2 costs are estimated):

Phase 1:

Construction costs:

Category	PMs
Technical management	1
Storage setup	0.5
Database design	0.5
Framework development	2
Workflows design	1
User management	1
Content Management System (CMS)	2
Submissions	2
Reviews	2
Licensing	4
Analytics	2
Testing and refinement	2
Documentation and Support material	2
Total:	22

The operation costs require approximately (annual fees, on top of the development costs shown above):

- 0.5 PMs for system administration
- 1 PM for maintenance
- 1 PM for monitoring / moderation (for light-medium traffic)
-

Hardware costs include:

- 1 development server
- 1 production server

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Requirements specifications	■	■	■									
Technical design plan		■	■	■								
Infrastructure setup			■	■	■	■						
Framework development			■	■	■	■	■	■				
Submissions module						■	■	■	■	■		
Reviewing module						■	■	■				
Licensing module						■	■	■				
Analytics module						■	■	■				

D3.1: Feasibility report on Europeana marketplace

Integration, testing & refinement													
Documentation and support													

Phase 2:

Construction costs:

Category	PMs
Billing	4
Dispute management	4
Work monitoring	6
Dependency management	3
Total:	17

The operation costs require approximately (annual fees, on top of the development costs shown above):

- 2 extra PM for maintenance

Hardware costs include:

- 1 extra development server
- 1 extra production server

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12
Requirements specifications												
Technical design plan												
Billing service												
Dispute management												
Tele-work monitoring app & service												
Dependency management service												
Integration with existing system												
Documentation and support												

References

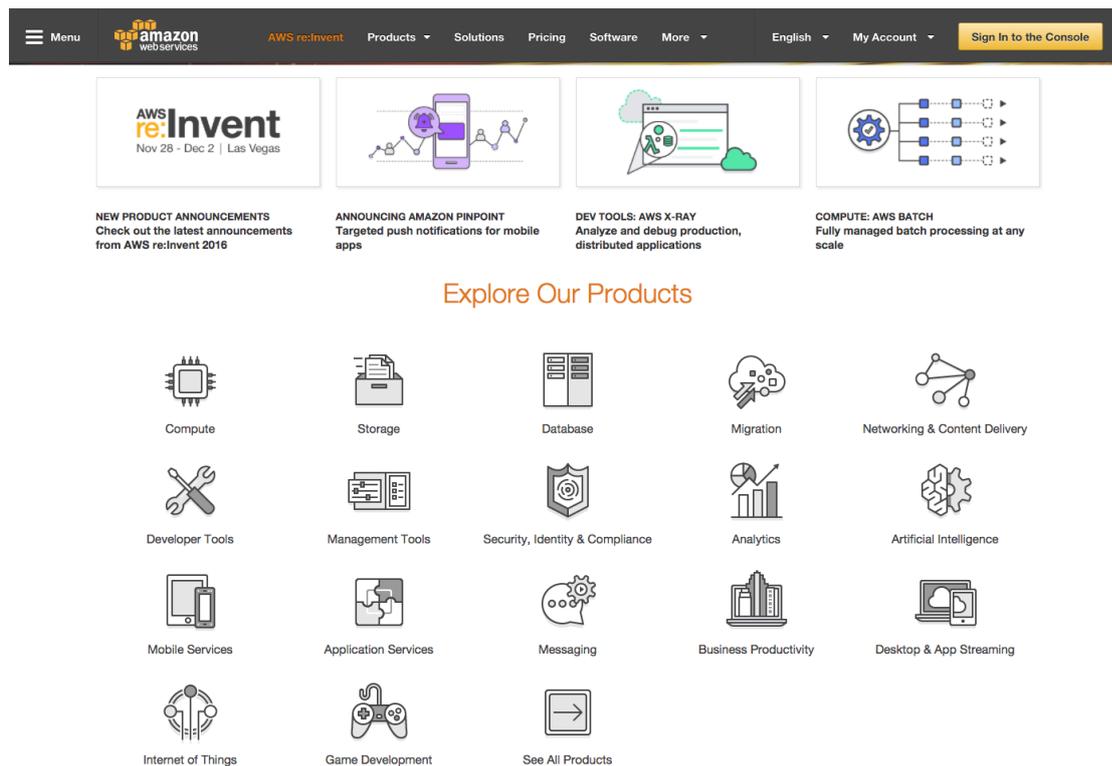
1. Platform strategy, available at <https://www.fiverr.com/yearinreview/>
2. Analytic Hierarchy Process, available at https://en.wikipedia.org/wiki/Analytic_hierarchy_process
3. A Guide to Marketplaces – Version One Ventures, available at <http://versionone.vc/wp-content/uploads/2015/11/Marketplace-Handbook-11-08-2015.pdf>
4. Types of marketplaces – Marketplace Wiki, available at <http://wiki.rademade.com/4-typology-of-marketplaces>
5. <http://platformed.info>
6. Upwork Modernization: An Overview, available at <https://www.upwork.com/blog/2017/01/upwork-modernization/>
7. Modernizing Upwork Micro Frontends, available at <https://www.upwork.com/blog/2017/05/modernizing-upwork-micro-frontends/>
8. Apache ZooKeeper, <https://zookeeper.apache.org/>
9. The Future of the Electronic marketplace, available at <https://goo.gl/kR69oT>
10. Electronic marketplaces: A literature review and a call for supply chain management research, available at <https://goo.gl/5pnknQ>
11. Universities in the Marketplace: The Commercialization of Higher Education, available at <https://goo.gl/bmTM7c>.
12. Online marketplaces: niche sites on the internet, available at <http://wiki.rademade.com/what-is-marketplace>.
13. An overview of online marketplace and its challenges, available at <https://www.enginethemes.com/online-marketplace-overview/>.
14. How to Succeed with a Services Marketplace: Choose the model that fits you right!, available at <http://nextjuggernaut.com/blog/how-to-succeed-with-a-services-marketplace-choose-the-model-that-fits-you-right/>.

Annex I. Existing marketplaces

This section presents a selected list of existing solutions/technologies that provide a services marketplace. These marketplaces fall into two major categories: a) the ones offering generic services to the public, and b) marketplaces that specialize in some domain (e.g. IoT).

Amazon Web Services

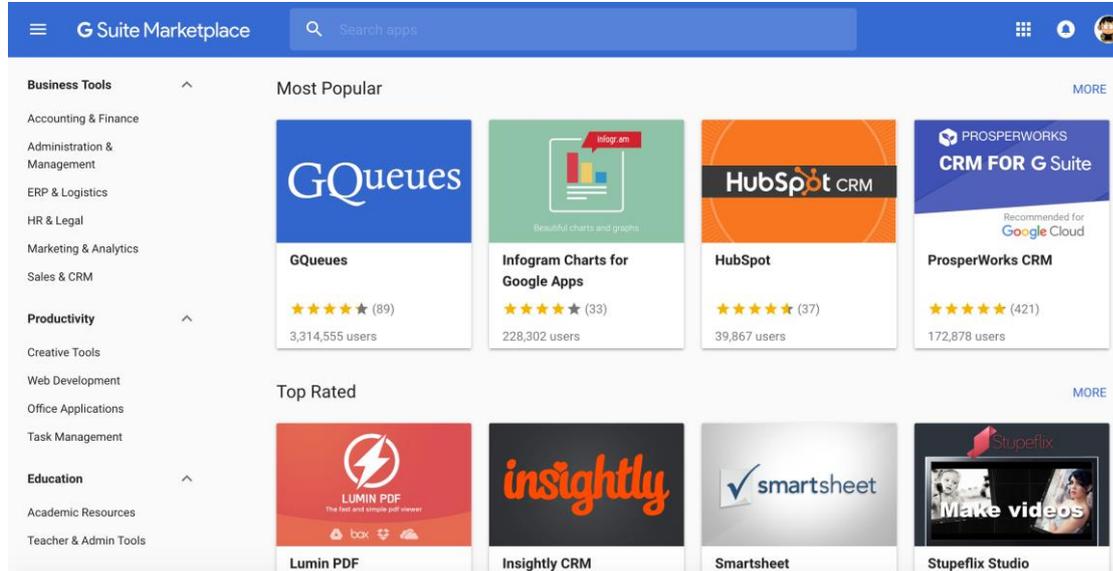
<https://aws.amazon.com>



The Amazon Web Services (AWS) were launched officially in 2006 offering IT infrastructure services to businesses and individuals in the form of web services.

Google G Suite Marketplace

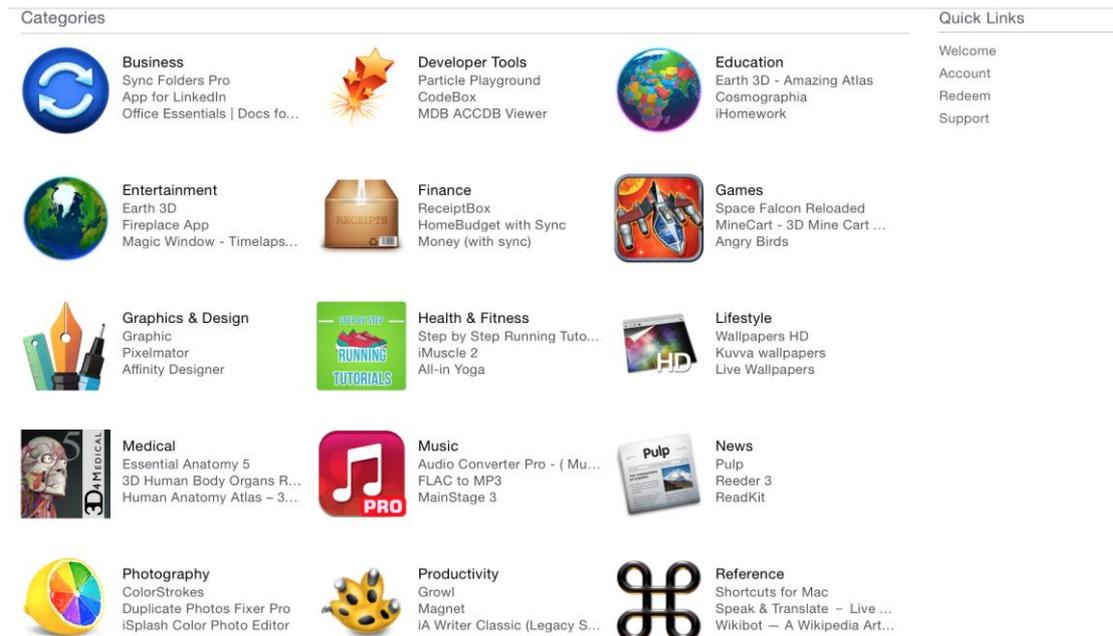
<https://apps.google.com/marketplace>



Google's G Suite marketplace offers apps for the G Suite (ex-business apps) of Google. Each app is reviewed and is made available for specific parts of the G platform.

Apple Store

<https://itunes.apple.com/>

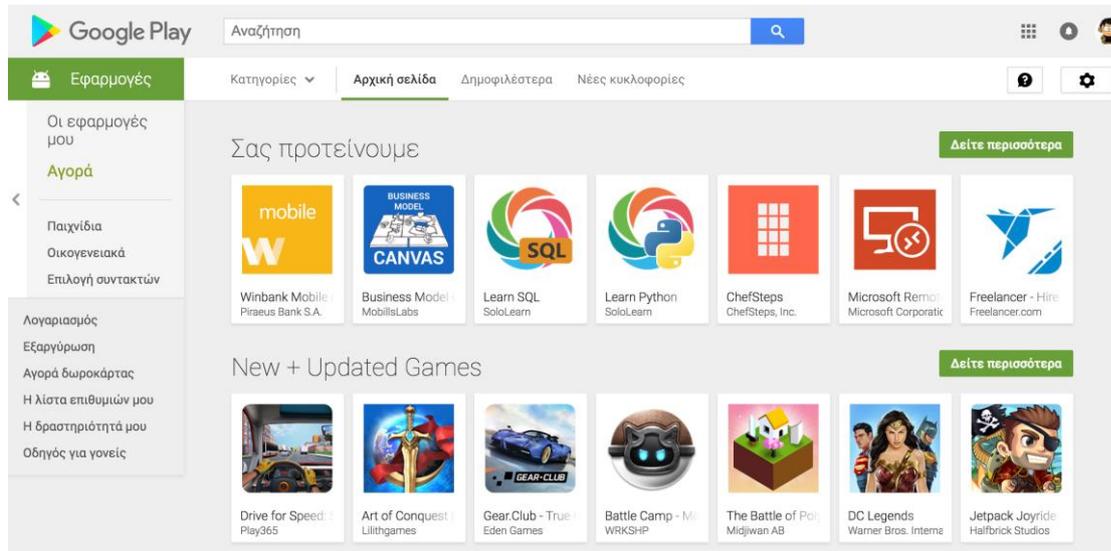


The Apple store platform offers customers to search and buy apps, music and games for Apple products such as MacOS, iOS and iTunes. The apps and content are thematically organized and there are different marketplaces for MacOS, iOS and iTunes (there are actually 3 different

marketplaces here). Each app is reviewed and there is a strict moderation process for advertising something.

Google Play

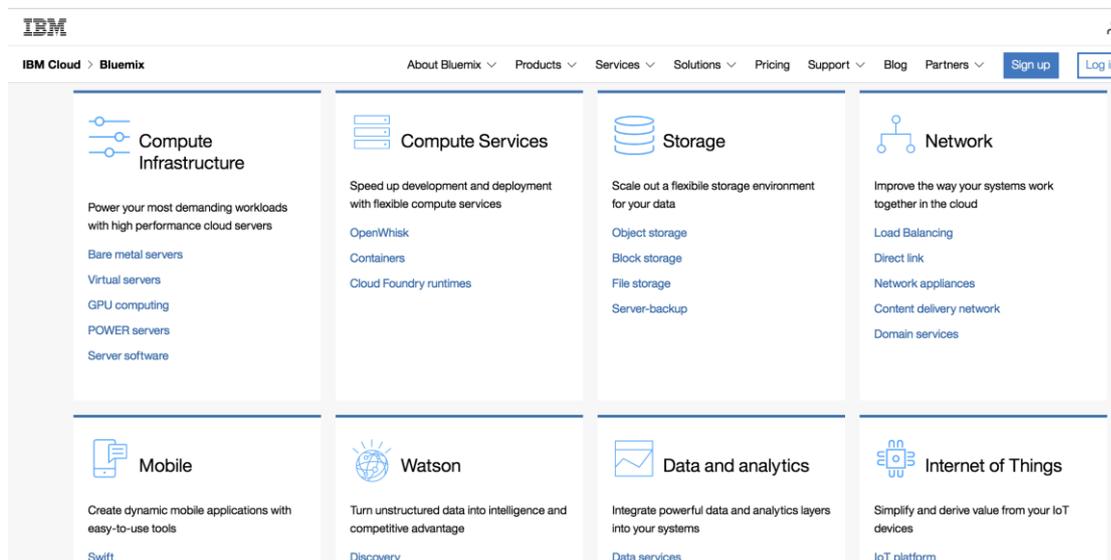
<https://play.google.com>



The Google play platform offers customers to search and buy apps and games for Google products such as Android, Chrome, etc. The apps are thematically organized and there are different marketplaces for Chrome and for Android. Each app is reviewed and there is a moderation process for putting something on the marketplace.

IBM Bluemix

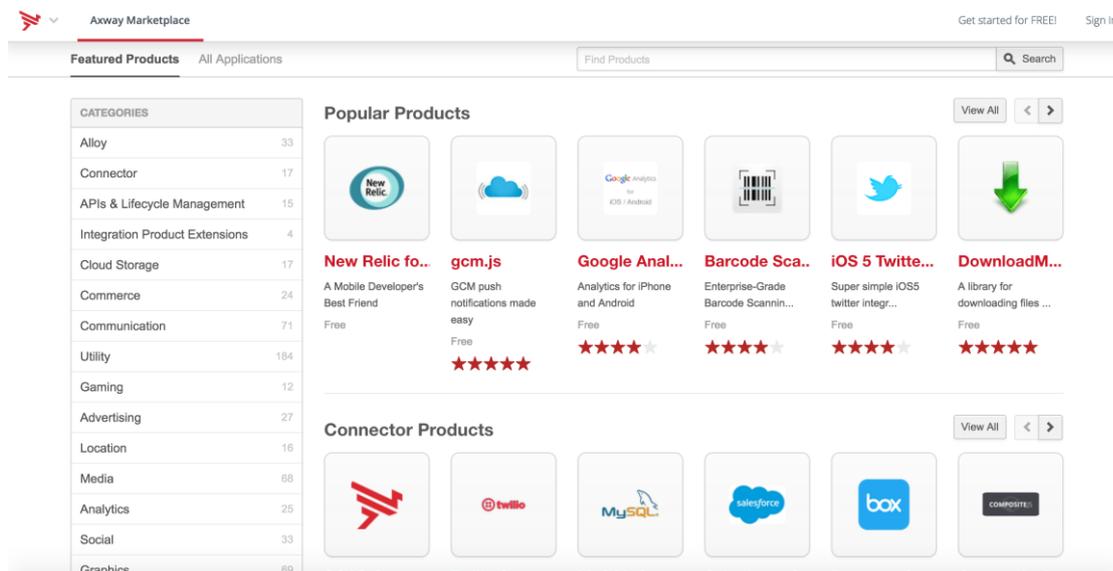
<https://www.ibm.com/cloud-computing/bluemix/>



The IBM Bluemix is a platform similar to the AWS. It offers services that can be plugged and streamlined together in order to form more complex applications.

Appcelerator

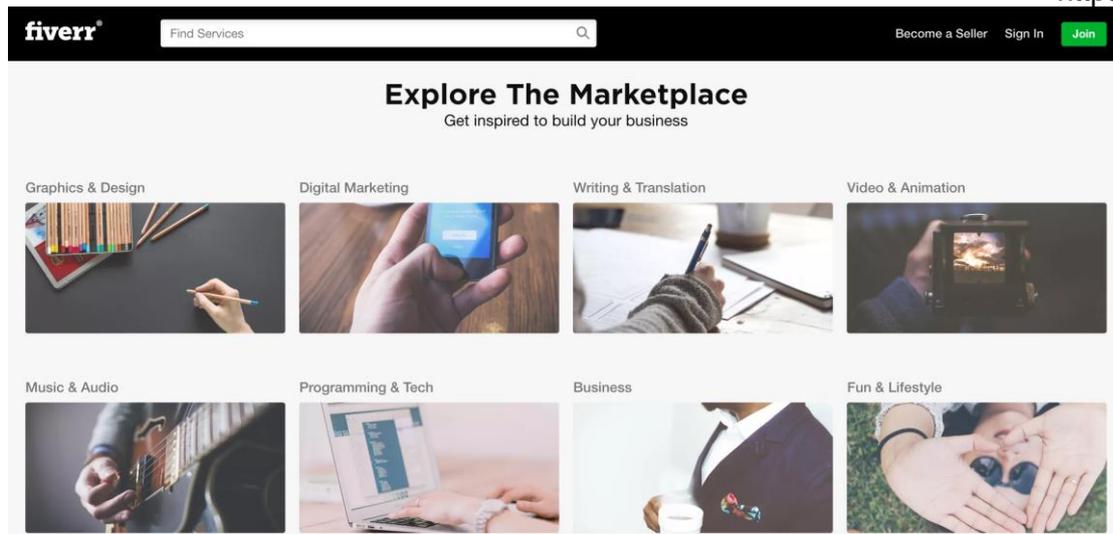
<http://marketplace.appcelerator.com/>



Appcelerator is a JavaScript based cross-platform integrated development environment. It also started a marketplace allowing developers to sell their modules / services that are based on the appcelerator platform.

fiverr

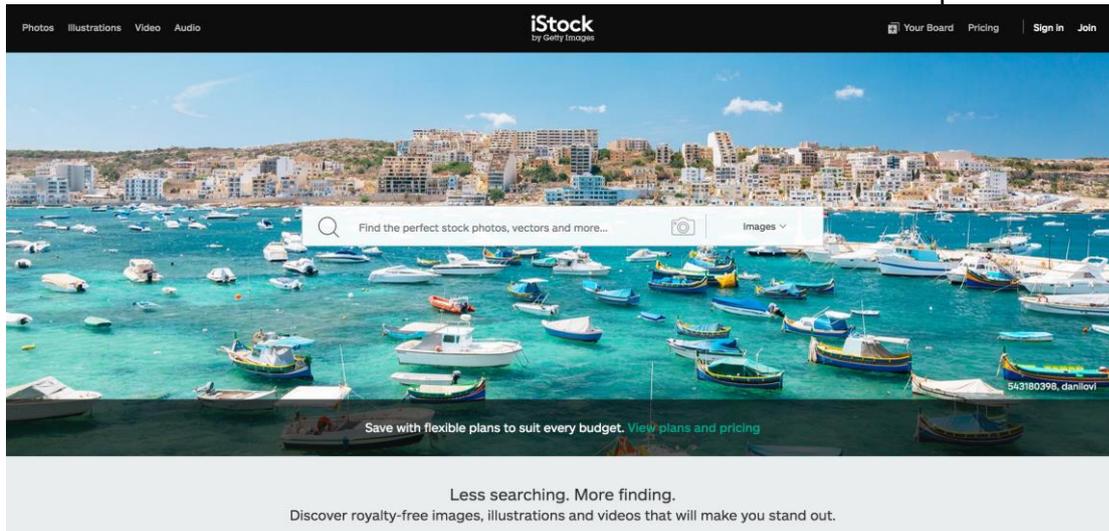
<https://kontena.io>



fiverr is marketplace where freelancers offer services in creative design, marketing & SEO, translation, video and animation etc. The professionals offer services per item or per hour. There are samples and reviews and a flexible process of buying services.

iStock

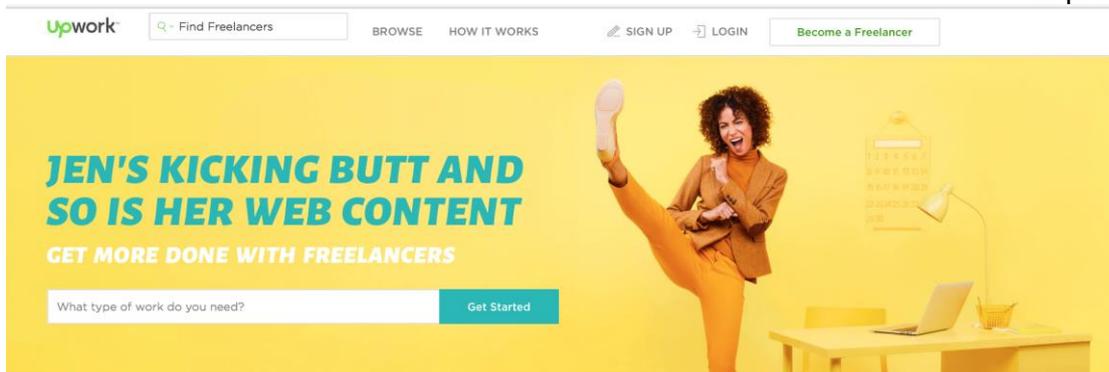
<https://www.istockphoto.com>



iStock is a platform that allows freelancers to sell images and video. It has a credit based billing process and makes it easy to locate the content and download it based on different resolutions.

Upwork

<https://upwork.com>



Work with someone perfect for your team

 WEB DEVELOPERS	 MOBILE DEVELOPERS	 DESIGNERS & CREATIVES	 WRITERS
 VIRTUAL ASSISTANTS	 CUSTOMER SERVICE AGENTS	 SALES & MARKETING EXPERTS	 ACCOUNTANTS & CONSULTANTS

Upwork allows freelancers to offer their services. It provides reviews and tools to assess whether they are really working on the agreed project (through screen capturing). Started for software developments but there are many non IT professionals offering services (e.g. design, Q&A, legal, etc.).

Annex II. Europeana Labs

Europeana Labs currently provides 4 different types of content: 1) APIs, 2) Apps, 3) Data and 4) Incubation.

The **APIs** section contains information regarding the different APIs that are provided by Europeana. This includes documentation, guides, and examples on the Europeana REST API, Annotations API, OAI-PMH API and on Linked Open Data (SPARQL) API.

API	Usage
REST API	Standard REST calls over HTTP. Responses returned in JSON.
Annotations API	Annotations REST API. Responses returned in JSON-LD.
OAI-PMH	Harvest data via the OAI-PMH protocol.
Linked Open Data	Query and retrieve data in SPARQL 1.1.

The **Apps** section contains two different types of apps: a) tools and b) showcase projects

There are 17 tools that mostly focus on the Europeana search api.

- Europeana OAI-PMH harvester
- Europeana API php client
- Europeana BlackLight
- Europeana Colada PHP client library
- Europeana Ruby client library
- Europeana Node.js client library
- Wandora Europeana Extractor
- Python Rest Easy
- europeana-search-0.2.1 (Python)
- Europeana PHP library
- REPOX
- Django Europeana 0.1.5
- Pundit
- MICO-DB Aggregator Backoffice
- europeana4j client library
- Europeana Search Python

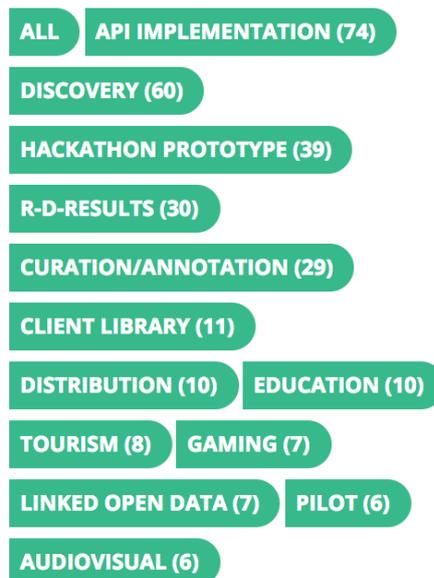
There are 151 showcase projects that fall under different categories.

The apps are also categorized by type. There are 13 different types as it can be seen from the picture on the right.

They focus on a diverse set of categories such as:

- focus on providing a thematic collection or a set of stories.
- provide access to bibliographic resources
- games that make use of Europeana content
- storytelling
- bibliographic and citations
- smartphone enabled personalized services

FILTER BY:

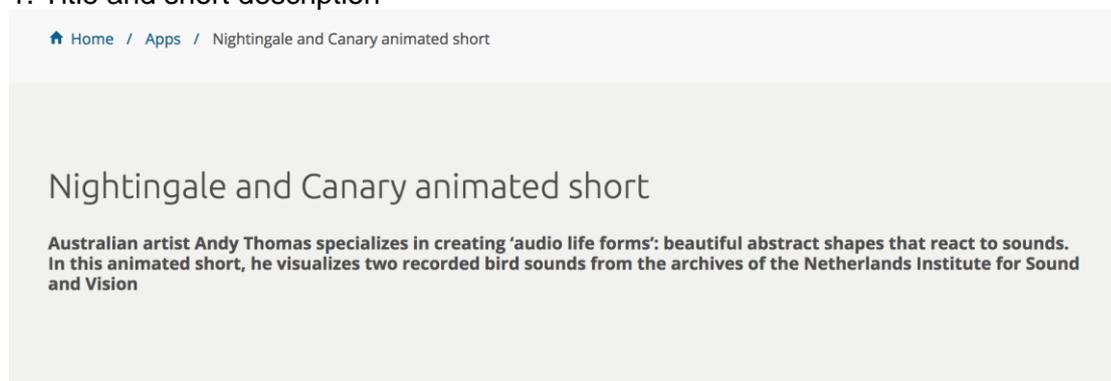


The **Data** section presents the various sets of curated data set that are provided by Europeana.

The **incubation** section facilitates the incubation process for various projects.

All four sections hold content through CMS like functionalities. In essence, this content appears to have the same structure that includes the following main sections:

1. Title and short description



2. Description

As part of the Europeana Creative project, Sound and Vision commissioned Australian artist Andy Thomas to create an inspirational digital sound sculpture re-using two bird sounds from its archive. The result is a visually mesmerizing artwork that has been widely circulated and admired.

The Nightingale & Canary video was commissioned to inspire creative industries to submit their own ideas to a Europe wide competition, organised by the Europeana Creative project.



3. Comments & discussion

0 Comments Europeana Labs [Login](#)

[Recommend](#) [Share](#) Sort by Newest

Be the first to comment.

ALSO ON EUROPEANA LABS

Open source tools - what's available, what are you using?
1 comment • 3 years ago*

Micah Stubbs — d3js + angularjs for interactive graphics on the web

CultureCam
1 comment • 2 years ago*

Enric Senabre — From Platoniq we just did some playing and UX testing of the tool with a group of designers in Barcelona, we had great feedback from them as an inspirational tool (for their ...

The history of the circus from 1880 to now
1 comment • 2 years ago*

Zed Lawrence — Love these old circus posters

Mirador
1 comment • 3 years ago*

EuropeanaEU — Quality of the documentation: The quality of the documentation for developers is excellent. Everything you need can be found here: <https://github.com/IIIF/mir...> There is no ...

[Subscribe](#) [Add Disqus to your site](#) [Privacy](#) **DISQUS**

4. Related

NEXT STEPS:

Sounds of daily life and birds from Netherlands Institute of Sound and Vision

A collection of about 2,500 sounds of daily life, birds, city sounds, airplanes etc.

Sound Connections

Explore sounds from across Europe and help enrich them with contextual information and audio-visual media.

Karlsruhe Virtual Catalog

The Karlsruhe Virtual Catalog (KVK) is a search engine that gives access to millions of books, magazines and other media from library and book trade catalogs worldwide.

Annex III. AHP Results

The table below presents the priority vectors of an analytic hierarchy process analysis that was carried out using 5 experts (3 computer scientists, 1 information scientist and 1 CH professional) both in the humanities and other domains.

From these 5 experts, there was only 1 outlier (#2). The rest 4 were in line with each other.

These experts provided insight on the functionalities priorities.

Taking into account all opinions (including the outlier) the following outcomes can be seen:

Conclusion #1

The IT services-tools are considered slightly more important than the professional services in 4/5 cases.

Conclusion #2

The billing, analytics and reviewing services are given priority over other services.

	#1	#2	#3	#4	#5
IT SERVICES-TOOLS	21%	15%	14%	7%	14%
PROF. SERVICES	16%	3%	11%	7%	17%
REVIEWING	5%	1%	8%	6%	8%
MODERATION	7%	3%	5%	9%	3%
LICENSING	16%	3%	4%	1%	3%
ANALYTICS	6%	9%	3%	9%	11%
DOMAIN GUIDES	5%	3%	5%	9%	5%
SANDBOX	3%	21%	6%	11%	9%
SERVICES CLOUD	2%	22%	4%	2%	11%
DEPEND. MANAGEMENT	2%	3%	7%	5%	5%
BILLING	14%	8%	11%	5%	8%
TELE-WORK	1%	6%	12%	14%	4%
DISPUTE MANAGEMENT	2%	4%	9%	14%	2%