

Πληροφοριακά συστήματα για Οργανισμούς Πληροφόρησης - Ανάγκες και Λύσεις

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Τμήμα Αρχειονομίας, Βιβλιοθηκονομίας και Συστημάτων Πληροφόρησης

Σχολή Διοικητικών, Οικονομικών & Κοινωνικών Επιστημών

Ημερίδα «Νέες τεχνολογίες και Προοπτικές για Οργανισμούς Διαχείρισης της Πληροφορίας»

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Πανεπιστήμιο Δυτικής Αττικής
Τμήμα Αρχειονομίας,
Βιβλιοθηκονομίας και
Συστημάτων Πληροφόρησης

Information Management Research Lab

Συστήματα Πληροφορικής σε BAM

Συστήματα Διαχείρισης Βιβλιοθηκών (ILS, LSP, LMS κ.λπ.)

Ψηφιακές Βιβλιοθήκες – Αποθετήρια

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Συστήματα μαθησιακή αναλυτική (learning analytics)

Θέματα

- **Από το ILS στο LSP**
- **Συστήματα Διαχείρισης Ερευνητικής Δραστηριότητας (Απήχηση-Ερευνητικά δεδομένα) – Βιβλιομετρικά δεδομένα**
- **Από τα Κέντρα Πληροφόρησης στα Κέντρα Μάθησης**

Definitions – Categories – ILS vs LPS

- An **integrated library system (ILS)** is a computer-based information system consisting of a set of interrelated components or entities and subcomponents that are designed to interact together to perform specific tasks, functions, and operations and achieve a purpose

Definitions – Categories – ILS vs LPS

- **Library Services Platforms - LSPs** are next generation ILSs that are “based on service-oriented architecture with web-based interfaces designed for deployment through SaaS” (another term is **Library Management Systems - LMSs**)
 - ILSs were **developed around print collections**
 - **Digital** collections have **increased** in many libraries, notably academic and research ones
 - **Older ILSs** could **not** be **reconfigured** to effectively and efficiently manage both print and digital collections
 - **Older ILSs** do **not take advantage** of the latest technologies and architecture such as **cloud computing**

Definitions – Categories – Proprietary vs Open source

- **Proprietary or turnkey or off-the-shelf** because ILS software is supplied by a commercial vendor or company
- **The company is responsible for maintaining, updating, providing technical support, and training**
- **The software is stored** on one of **library's servers** and is managed by the library
- **ILS companies** restrict access to the software source code
- **A number of companies** have moved toward the **open system concept** to allow **libraries to customize their ILSs**, harvest data, and share metadata, among other things, through application **programming interface (API)**

Definitions – Categories – Proprietary vs Open source

- **Open source ILS** software **provides** access to the **program source code** (the actual computer program the developer has created) for **modification** and free **distribution**
- To qualify as **open source**, the software must meet **certain criteria**:
 - the program must **include** the **source code**;
 - **modification** and **customization** of the **source code** must be allowed;
 - the **modified source** code can be **redistributed**;
 - the **license** must **not require the exclusion** of **other software** or must not interfere with the operation of other software

Definitions – Categories – Software architecture

On-site software hosting

- Traditionally, libraries have hosted **their ILS** software **on-site** (on premises)
- In this setting, a **staff member with IT skills** takes responsibility of **installing** the **software** and **managing** the operation of the network
- **Library personnel store, update, and manage records** and **patron data** in the ILS
- The ILS is made accessible to staff and patrons over the web

Definitions – Categories – Software architecture

On-site software hosting

- On-site hosting **gives library staff control** over the hosted software, troubleshooting, and data security, among other things (+)
- On-site hosting **incurs cost** for hiring personnel **with IT skills** to maintain and manage the network where the ILS is stored (-)
- In addition, **servers and other hardware required** in support of the ILS software will be needed, thus, bringing upon additional expenses (-)
- Software updates may be not as frequent as they are for a cloud-hosted application(-)

Definitions – Categories – Software architecture

Cloud software hosting

- Many libraries are **migrating** from **on-site hosting** to **cloud-based hosting** solutions of the ILS
- **Cloud software hosting** is built on a cloud computing platform -
“Cloud computing is a **model** for **enabling ubiquitous, convenient, on-demand network access** to a **shared pool of configurable computing resources** (e.g., networks, servers, storage, applications, and services) that can be **rapidly provisioned** and **released** with **minimal management** effort or service provider interaction”

Definitions – Categories – Software architecture

Software-as-a-Service (SaaS)

- **SaaS model** provides the **capability** to **run ILSs** and other applications **on a cloud infrastructure maintained** by a designated **service provider**
- The **provider** manages or **controls** this underlying **infrastructure** (e.g., network, servers, operating systems, storage) though there **may be limited application** configuration settings that the **library** needs to do up front to customize and gain **access** to the **ILS (-)**
- **Libraries** can **save** on the **cost** of **IT resources, software updates, and hardware infrastructure such as servers, technical personnel salary, and software maintenance contracts**, and also other computing resources needed to operate the ILS **(+)**

Definitions – Categories – Software architecture

Multitenant Software Hosting

- A **multitenant** model is **built on an architecture** where a **single instance of the ILS** or application is **shared by multiple tenants** or **libraries** where **each library organization** is considered a **tenant**.
- **Each tenant** or library is provided with a **limited ability to customize** or **configure the software** but they **cannot customize the application's source code (-)**

Definitions – Categories – Software architecture

Multitenant Software Hosting

- In this model, any **updates** that the provider makes to the software are **propagated** to all its users at **once (+)**
- This is because **only one set of ILS application** program gains access to a centralized, robust, knowledge base that is **shared** among the **tenants** or libraries **(+)**
- This approach results in **quicker updates** and **upgrades** to the **software**, faster **delivery of services** to users, and **lower cost (+)**
- In addition, the ability to **share global knowledge bases** is an advantage of this hosting model **(+)**

Definitions – Categories – Software architecture

Multitenant Software Hosting

- This hosting solution **requires advance hardware infrastructure** for the hosted ILS and a **high-speed Internet** connection for efficient access through a **web browser**, thus incurring some cost (-)

Definitions – Categories – Software architecture

Single-tenant Software Hosting

- A **single-tenant software** hosting is an **architecture** where **each tenant** or library has its **software application hosted individually** rather than shared with other libraries
- A library **may be given access** to the application's **code**

Definitions – Categories – Software architecture

Single-tenant Software Hosting

- Each tenant or library **has its own instance** of the software stored by the service provider, thus **preventing data migration** from other tenants or libraries (+)
- The **provider stores** an instance of the ILS software for each **tenant** or **library individually**
- The provider performs software updates and upgrades to each tenant or library individually, thus incurring more overhead that translates to higher cost for each tenant or library (-)
- A tenant or library may experience delay in software updates or upgrades (-)

Definitions – Categories – Software architecture

Generations	Licenses	Hosting	Software Architecture
ILS	Proprietary	Local	Stand-alone
LSP	Open source	Cloud	Single-tenant
			Multitenant

Modularity

- A **modular ILS** consists of components or modules that are designed using **specific application** software to perform **specific** functions
- **Components** or **modules** can be **decomposed** based on the **tasks** they are designed to perform
- Example: **decomposition** of the **circulation** module, for example, will result in several sub functions, including—but not limited to—**check-in, checkout, fines, inventory, holds, account management, and management reports**
- **Modularity** and **decomposition** are important for **understanding** the individual **ILS components** and the tasks that each module is designed to perform

Basic LSP modules

- **Online Public Access Catalog** Module
- **Cataloging** Module
- **Circulation** Module
- **Acquisitions** Module
- **Serials** Module
- **Interlibrary Loan** Module
- **Authority** Control Module
- **Media Management** Module
- **Electronic Resource Management** Module
- **Digital Asset** Module
- **Textbook (e-book) Management** Module

Online Public Access Catalog – OPAC vs Discovery Interface

- Every **ILS** has a **traditional public access** or **online catalog** module
- **Patrons use the online catalog** to find **items** (books, names of journals, specific media, etc.) held by the library

Online Public Access Catalog – OPAC vs Discovery Interface

- A **discovery interface** is **independent** of the **traditional ILS** and can be supplied by the **same ILS vendor** or a **third-party vendor**
- A **discovery interface** consists of “a layer of **software** that **sits on top** of any existing **database** or **integrated library system (ILS)** . . . **ingesting records** in **many formats**, including **MARC** and **XML**, and providing a **best-of-breed, web-based search interface** for users”
- A **discovery interface** **retrieves multiple** library **resources** including **print, digital, and journal articles** from a library’s subscription databases - “With this approach, information is **brought out of silos**, and users need only use a **single interface** to access **disparate resources**”

Online Public Access Catalog – OPAC vs Discovery Interface

- As a next-generation online catalog, this discovery interface is based on Web 2.0 features, meaning that it provides:
 - a **spell-check**,
 - **relevance ranking** of retrieved search results,
 - **recommender services/features** (e.g., More Like This, Similar Sites), and
 - **faceted searching** or **guided navigation** (allows users to refine or navigate search results using multiple facets of a subject term and create their own custom navigation)

Online Public Access Catalog – OPAC vs Discovery Interface

- The discovery interface **allows patrons to generate** their **own content** for materials including **reviews, summaries, and tags**.
- **User tagging** of items can be used by technical services staff to create **folksonomies** (subject categories or headings organized on the basis of tagged content created by patrons) to **augment keywords** and **subject headings**, and **subsequently**, enhance the user's discovery experience
- A discovery interface supports many features, including searching by author, title, phrase, and keywords combined with Boolean operators (AND, OR, NOT)
- A user can limit a search to a **specific time period, publication date, and type of materials**, among others. Search results can be **saved, e-mailed, exported**, and formatted according to a specific **bibliographic style available to users**

Discovery Interfaces paradigms

- Ex Libris's **Primo** (<https://www.exlibrisgroup.com/products/primo-library-discovery/>)
- Innovative Interfaces Inc.'s **Encore** (<https://www.iii.com/products/sierra-ils/encore-discovery/>)
- Online Computer Library Center's (OCLC's) **WorldCat Local**
- SirsiDynix **Social Library** (<http://www.sirsidynix.com>)
and (open source)
- **Vufind** <https://vufind.org/vufind/>
- **Blacklight** - <http://projectblacklight.org>

Discovery Service

- A **discovery service** is a cloud-based next-generation discovery interface that goes **beyond federated searching** to enrich the user's information discovery experience
- This service is based on the open platform framework and **harvests** data from **aggregated scholarly e-resources** including **eBooks, journal articles, newspaper articles, and digital repositories**
- A discovery service **integrates** with a **library's collections** to provide access to a **library's print and digital contents** in a **single interface**.
- A user can **search for materials using one single search box** and the service retrieves materials in all formats including **journal articles (citations and/or full text)** that are **ranked** by relevancy and based on the library's subscription to online databases and services

Discovery Service

- Design of the interface is based on one **single search box** to facilitate searching across different types of materials
- **Journal articles** are retrieved in **search results along** with other types of materials in various formats (print and digital) similar to what Google retrieves for a user's search
- **Retrieved search** results to a user's search are **ranked by relevancy**
- Access to **both local content** and **remotely hosted content** saves the user time in finding information

Discovery Service

- A **search often yields** results that are **inconsistent** with those retrieved from a library's traditional online catalog interface
- The **amount of information** retrieved may be **overwhelming** to users
- **Users** may **not be able to distinguish** between **various types** of **materials** retrieved
- **Research** and **academic** libraries are the **target** audience for discovery services

Cataloging Module

- **Cataloging** library **materials** and **storing the metadata** for cataloged items are accomplished in the cataloging module
- The **cataloging module** has many additional features, including **searching, editing, saving, deleting, indexing, and exporting** records
- When a **MARC record** is saved in the **cataloging database** and **indexed** (keywords are assigned from various fields), a **user will be able to find** it through the online catalog or **discovery interface** or **service**.
- An **item** or **holdings statement** is attached to the **MARC record** during the cataloging process to make it available for circulation

Cataloging Module

- The **latest development** in the area of cataloging has been the **Resource Description and Access (RDA)**
- RDA “**is the new standard for resource description and access designed for the digital world**”
- Built on the foundations established by AACR2R, **RDA provides a comprehensive set of guidelines and instructions on resource description and access covering all types of content and media**” (<https://beta.rdatoolkit.org/RDA.Web/>)

Cataloging Module

- One of the main benefits of **RDA** lies in the **conceptual models of functional requirements for bibliographic data (FRBR)** and **functional requirements for authority data (FRAD)** that will be applied to cataloging
- FRBR “is a conceptual model that defines four different entities in an attempt to alter the ways in which catalogers catalog items so that they can be more uniform, more trimmed down, and more accessible by users”
- “**FRBR is not a data format** like MARC 21 or a rule set like AACR2, or a mark-up language like Extensible Markup Language (XML); rather, **it is a set of structured ideas about what bibliographic records** must contain to **meet user needs**”
- For more information, visit LISwiki website:
[http://liswiki.org/wiki/FRBR#What is FRBR.3F](http://liswiki.org/wiki/FRBR#What_is_FRBR.3F)

Circulation Module

- This module covers **tasks** and **processes** for managing the **circulation** function
- This includes item **check-in, checkout, inventory, fines, overdue notices, holds, account** management, and **reports management**
- Circulation **deals** with both **patron records** and **item records** created during the cataloging process
- **Patron records** include patron **information** such as the **name, identification number, address, phone number**, and so forth
- This **module** also **contains** circulation **policies, calendar of due dates** and **holidays, tables that hold current circulation transactions, tables with item records, and patron privileges**, among other things

Acquisitions Module

- Materials ordering and management is covered in this module
- This includes **ordering, receiving, invoicing, claiming, fund allocation and encumbrance, vendor performance tracking, and reporting**
- Materials may be **onetime** orders, **standing** orders, on **approval**, or **subscriptions**
- **Orders** can be **transmitted electronically** to a vendor using the **Electronic Data Interchange (EDI)** manager that is based on the EDI protocol
- **When materials are received** in the library, they are **checked** against the **orders to ensure accuracy, and encumbered funds are released** to the vendor

Acquisitions Module

- In an ILS with an **acquisitions module**, **status** and **availability** of **ordered materials** are reflected
- When an **item** is placed on **order**, it is **reflected** in the **discovery interface** or **service**
- When the **item** is **received** and a **MARC record** is **generated** for it or **imported** in the **cataloging module**, the user will be able to identify its availability if the circulation module is integrated with cataloging

Serial Module

- Ordering and processing annuals, periodicals, newspapers, and like materials are accomplished in this module
- Additional functions include **cancellation** of **subscriptions**, **claiming late issues** of journals or magazines, **routing** of **journals** (passing issues to interested users), **allocating** and **encumbering funds**, **tracking vendor performance**, **binding**, and management **reports**
- This module allows for **searching** and **browsing serials records** using **different options** (e.g., title, ISSN, publisher), **editing**, **deleting**, and **merging** serials records

Serial Module

- In an ILS with an **integrated serials module**, the **status and availability** of a magazine or journal, for **example**, will appear in the **discovery interface** (on order, claimed, at the bindery)
- As the status of the **magazine or journal changes** from **claimed** to **received**, the serial record for that item is updated and reflected in the discovery interface

Interlibrary Loan Module

- **Borrowing** and **lending** materials are achieved in this module
- When an **item** is **not owned** by a **library**, a **registered patron** can **place** and **track** a request for the item **electronically** via the **library website**.
- ILL is a form of resource sharing among libraries; it is based on the **International Organization for Standardization (ISO) ILL Protocol**, which is an international standard that allows “**libraries to exchange interlibrary loan requests and responses electronically, even when using different systems**”

Interlibrary Loan Module

- The **standard provides a unified structure for all ILL requests**, thus facilitating the **tracking and management** of requests (**ISO ILL 10160** - Open Systems Interconnection, and Interlibrary Loan Application Service Definition, **ISO ILL 10161** is Open Systems Interconnection, and Interlibrary Loan Application Protocol Specification)
- **Borrowing and lending** is based on a **reciprocal agreement** among **participating** libraries
- **Not all types of materials** can be **requested through ILL** (e.g. a library may not allow the borrowing of **textbooks** or **reference** materials that is not circulated)
- In many **situations, ILL is managed through software independent** from the existing ILS (Greek example SMILLE - <https://iris.seab.gr/infos.php> , EKT - <http://www.ekt.gr/el/library/edetb>)

Authority Control Module

- The **creation and management of headings** (**author** names, **titles**, **series**, and **subjects**) of MARC 21 bibliographic records created in the Cataloging module are performed in this module
- It **links authority-controlled headings** with their respective **authority records** through use of a list of **standardized headings**
- **Variant forms** of a heading (e.g., **author name**) existing in **bibliographic records** are **brought together** under one **authority-controlled** heading and **cross references** (See and See Also) associated with the heading are generated for use in the online catalog or discovery interface

Authority Control Module

- Authority control **allows** for **maintaining consistency** in the **heading formats** of **bibliographic** records, leading users to the headings used in catalog in one single place
- This **module** is an **add-on** to the **ILS** and can be purchased from the ILS vendor or a **third-party vendor**

Electronic Resource Management Module

- Management of electronic resources (e.g., eBooks, eJournals) is performed in this module
- Tasks supported are **license methods, access, distribution channels, record creation, usage statistics, and report management**
- Increased use of **eBooks** in libraries in the past few years **makes this module** an essential **add-on** to the ILS or as a **separate stand-alone module**

Media Management Module

- **Reserving multimedia** materials and **booking equipment** are provided through this module, which is also an add-on to an ILS
- Through this **module**, one can **schedule, book, search, and track** these resources
- **Videos**, audio **CDs, DVDs, Blu-ray Disks**, and the like materials are the types of media managed in this module; also included are **study rooms, conference rooms, and labs**
- This module also allows for a **better management** of multimedia resources, such as use by type and the generation of various kinds of management reports

Digital Asset Module

- The **purpose** of this **module** is to **organize, manage, and maintain digital collections** such as special collections, repositories, images, digitized texts, and other materials in digital format
- Large **academic libraries** and other libraries with large digital collections are the target audience for this module
- Library **patrons** can use this **module** to **search** for and **retrieve** all **types of digital assets** using one single search in the ILS discovery interface

Criteria to choose LSP/ILS

- The **percentage of features available** in each **module**, **strengths**, and level of meeting **users' needs** (patrons, staff, administrators, etc.), as well as the **needs** and **priorities** of the overall **mission** of the **library**, goals, and **strategic** plan of its parent institution
- The **availability** of an **add-on discovery interface** or **discovery service** and its **features** and **requirements**, as well as the cost - If **federated search tools** are desirable, features provided in these tools should be assessed
- The **overall software capabilities**, **customization** through **application programming interface (API)**, and **scalability**

Criteria to choose LSP/ILS

- **Compliance** with the **latest** bibliographic **standards** including (indicative):
 - MARC 21,
 - Fundamental Requirements for Bibliographic Records (FBRR),
 - Resource Description Access (RDA)
 - OpenURL – Link resolving
 - 3M Standard Interchange Protocol, which is currently a National Information Standards Organization (NISO) standard and used for circulation functions
 - Electronic Data Interchange (EDI) standard
- The **type** of **cloud-based** hosting of the **software**, support provided, and **cost**
- The **cost of the basic ILS software**, each **desired** add-on **module** (integrated or stand-alone), and **frequency** of software **updates**

Criteria to choose LSP/ILS

- The **quality of service** provided by the **vendor** (e.g., technical support, turnaround time for assistance, diagnostics and troubleshooting), and **service availability**
- The **ILS vendor's plan for implementing cutting-edge** applications in the **next couple of years**
- The **online and hard copy documentation** of the **software**, indexing quality, and organization
- The **type** and cost of **training provided**
- The **cost of annual software technical** support and **maintenance** for on-site or cloud-based hosting

Criteria to choose LSP/ILS (Open Source)

- **Source code dimension**—**inspect** the source **code**, **robustness** of the coding, level of code reuse, and level of code documentation
- **Design and schema**—**inspect** the **database**, data **design**, and the degree of **flexibility** it provides
- **Open-source development community**—**plan** for the source code enhancement processes and the degree of participation in its development
- **Reputation** of the **software performance** and **reliability**
- **Ongoing effort** in the development of the **software**, **number** of **versions** released, and the **bugs** or **errors** that have been fixed
- **Open standards and interoperability** with other software

Criteria to choose LSP/ILS (Open Source)

- **Active support community** to answer questions and help with problems through blogs, listservs, and other media
- **Commercial support** from firms that offer **third-party assistance**
- **Documentation available** from users that have developed it
- **Skill set needed** to work with the **software**
- **Project development model** describing the **development process, contributors, and contribution criteria**
- **License and conditions** for use and contribution to the ongoing development of the software
- **Case studies of libraries** that have **selected OSS**

Criteria to choose LSP/ILS (Open Source)

- **Licensing and distribution**—should be based on the **GNU GPL** because it will ensure freedom in the way that the software is shared and modified
- **Infrastructure components**—should be **mature** and **reliable**. These components include the **server operating system** (e.g., Linux); **web server** (e.g., Apache Web); **database engines** (e.g., MySQL, PostgreSQL for data functions)
- **Programming language** (e.g., Perl) and **staff client support** (e.g., Java Swing)
- **Standards supported** (e.g., Unicode, Z39.50 for server and client, MARC 21, Dublin Core, etc.)
- **Scope**—support for **local content**, **electronic record management**, discovery interface, **OpenURL link resolver**, support for **consortia** and **union catalogs**
- **Support**—**commercial** support firms to support the software

Criteria to choose LSP/ILS (Open Source)

- In a **2011 study, Müller** evaluated all ILS OSS and open license software using **40** criteria and **analyzed 800 functions** and features to identify which ILS are most suited to the needs of libraries
- He also identified the strengths, weaknesses, and differences or similar features of each ILS
- He found that of the **20 ILSs that** qualified for analysis as **open-source ILSs**, only **Evergreen, Koha, and PMB** met the criteria, functions, and features

Migrate to a new ILS

- The **existing ILS** is **traditional** in its interface design and features, and the library is moving toward **enhancing the user's experience** and **information discovery** while **providing staff with robust modules** that are customizable and responsive to their needs and requirements
- The **existing ILS** is **old, inefficient**, and the **vendor no longer supports** the software
- The **recurring cost** of the **existing ILS** is **high**, especially when compared to the features and functionalities it supports; the return on investment (ROI) can no longer be justified
- The **ILS's vendor** performance is unsatisfactory
- The **library is joining a regional or state-wide consortium** and will migrate to the system decided upon by the library consortium group.

1st step – Data cleanup

- **Take an inventory** of your library's collection to ensure that collection titles on the shelf are in the cataloging database (i.e., MARC 21 bibliographic records) and vice versa
- **Remove bibliographic records** for which you have **no holdings**
- **Decide on what to do with records for missing or lost items** from the collection
- If you **want to keep them, negotiate** with the **ILS replacement company** how the **export of these items** will be handled in terms of status (i.e., codes used) such as lost, withdrawn, or missing

1st step – Data cleanup

- **Weed your collection** and **remove bibliographic records for withdrawn items** from the cataloging database
- **Identify bibliographic** records that have **data field problems and correct them**
- These fields may include, but are not limited to
 - access points (main entry, title, added entries, subject headings, and content notes);
 - call numbers and call number prefixes;
 - MARC tags, indicators, and subfield codes;
 - Misspellings and abbreviations
- If **these corrections are not possible** at the time you are **migrating, flag these records** to correct at a later time

1st step – Data cleanup

- **Evaluate the circulation database** (transactions, fines, overdue notices, and other patron information)
- **Purge records of patrons who are no longer affiliated with the host institution**
- Make sure that **all patron records with overdue items and fines are cleared**
- **If not, discuss this matter** with the replacement company representative to determine how to **handle these records**.

2st step – Data extraction

- **Install a test version of the new ILS** (or a demo site) after ensuring that the compatible hardware is in place and has been configured
- This **version may be supplied by the ILS replacement company/firm**; it can also be developed in-house for an OSS ILS
- **Develop your own scripts** (e.g., XML, SQL, and Javascript) **and extract data from each module in the existing ILS for testing, including data with normal and problematic elements or features** (e.g., records with long fields in the MARC 21 records; patron records with fines, overdues, and prohibited access to certain collection items)
- You **may extract data that works well with .xls or .csv** file extensions
- If **writing such scripts is not possible and the library does not have the technical expertise** to do so, consider hiring a **consultant or outsourcing some parts** of the migration process to a company that specializes in data migration

2st step – Data extraction

- **Run tests on extracted data sets, review results, and keep test logs**
- **Tests should include data with long and short fields, fields with special symbols, characters, and/or codes, and content notes, among others**
- **Examine whether records are formatted based on the MARC 21 standard and that they are correctly formatted**
- **Check whether data are described based on the Anglo-American Cataloging Rules (AACR2R) or Resource Description and Access (RDA), and that all data are in the appropriate fields**

2st step – Data extraction

- When tests are run on MARC 21 records, examine the accuracy of the following:
 - Full MARC records with fields such as 520 and 505
 - Brief MARC records
 - MARC records for multivolume items and multiple copy items
 - MARC records with long call numbers

2st step – Data extraction

- When tests are run on circulation records, examine the accuracy of the following:
 - New and existing patron IDs or numbers to input
 - Patron status, address, and other information
 - Items with fines and overdues, as applicable
 - Item checkouts (to examine whether the status appears in bibliographic records) and item check-ins (to ensure that the status appears in bibliographic records and that no coded field is missing or incomplete)

2st step – Data extraction

- **Run tests using the ILS and hardware peripherals** (e.g., scanner, printer, and self-checkout device) to ensure proper workability
- **Identify problems and relay them to technical staff** (as applicable) or the outsourcing company
- **Run new tests after problems are fixed and before going “live”** to ensure proper transformation or mapping of data from the current to the new ILS
- **Ensure that extracted data transform or map well in the test version or demo site for each data entity, field, and across the overall database** (macro-data)
- **This is part of understanding data schemas in the current and new ILS**

2st step – Data extraction

- **Allow sufficient time for data testing and problem solving** of data that do not load or map well in the ILS test version of the software
- **It may take more than four weeks to perform data testing**, and therefore, you should factor the expected time for completing data loading, testing, and correction of errors in the migration project timeline.

If data migration is outsourced check the followings

- **The previous level of experience with successful data migration** for all types of records (MARC 21, circulation, etc.) of the company or firm
- **The performance record of the company or firm in exporting and importing ILS data**
- **The accuracy level of data migration provided** by the company or firm to libraries like **your own in the past years**
- **The reliability record of the migration projects or activities** of the company or firm
- **The number of data tests** the company or firm is willing to handle
- **The level of support the company or firm is willing to provide during and after the migration process**

Library Systems Landscape – Open Future

- **Academic librarians are concerned** about the **decreasing number of competitors** in the integrated library system (ILS) and library services platform (LSP) market, and many are dissatisfied with their current ILS or LSP
- **Almost 90% of respondents** said their library uses a **proprietary ILS or LSP**, while only **6.7% said they were currently using an open source** or community-sourced system such as **Koha, Evergreen, oruali OLE**
- **More than 43%** of respondents described themselves as **somewhat dissatisfied (33.5%) or completely dissatisfied (9.7%)** with their current ILS or LSP
- **However, 36.2% of those respondents** using a proprietary ILS said that their library **had considered switching to an open source** or community-sourced system, and 14.9% said that they weren't sure whether such a move had been considered

* <https://www.libraryjournal.com/?detailStory=wanting-more-survey-library-systems-landscape-2017>

Library Systems Landscape – Open Future

UNDER CONSIDERATION

Almost **90%** of academic library respondents are currently using a proprietary ILS or LSP. Of those respondents, more than one-third said their library had considered switching to open source.



“our director is mistrustful of open source options that lack robust support and may require more advanced programming skills from our librarians”

Library Systems Landscape – Open Future

- More than **three-quarters (76.9%)** of respondents said their ILS or LSP included **reporting/analytics tools** and **course reserves features**
- Only **57.5%** currently have a **discovery layer** or **integrated search module**
- Only **44.8%** described their system as currently **having a user-friendly interface**
- Only **43.3%** **felt** that their system **was customizable** or offered the ability to adjust vendor settings
- **44% of respondents** said their systems **currently offer single sign on (SSO)** support,
- Only **43.3%** **said** that they offer **mobile features** or **apps for students** and faculty
- Only **30.6%** said that the their ILS currently includes **mobile features or apps** for **library staff**

Library Systems Landscape – Open Future

- **Enhanced reporting features:** collection analysis tools, APIs (application programming interfaces) to access data for library-created or third-party analytics systems, institutional comparative analytics features, integrated statistics from vendor databases
- **Connectivity and integration: interoperability** with other **institutional systems**, such as accounting, student registration, and learning management systems, **ILL tools, course reserves, full-text online resources, social media pages, external data repositories, and vendors involved with acquisitions, linked data capabilities, SSO functionality, a built-in citation generator, highlighted keywords** in discovery records, **SMS alerts** for patrons

ALMA (ExLibris & ProQuest)

- Ex Libris reported that the number of **ALMA installations** had risen to 550
- A total of **825 institutions** were signed to contracts at year-end 2016 in 25 countries.
- Integration between **Summon and Alma**
- **Online Acquisitions and Selection Information System (OASIS)** - ProQuest ebook services - was integrated with Alma
 - Using an Alma API, all electronic and print book orders placed through OASIS are now automatically updated in Alma in real time rather than requiring manual updates or daily file transfers
- **Ulrich's periodical data** from ProQuest was also incorporated into the **Ex Libris Primo discovery solution** and **SFX link resolver**

ALMA (ExLibris & ProQuest)

- **Alma Mobile**, a new standard component of the Alma platform that enables librarians and staff to work with the **Alma service via iOS and Android** devices
- As network of Alma libraries grows, customers also benefit from features such as **Alma's Community Zone shared repository**, which includes library-submitted **authority records, bibliographic metadata**, and an **electronic materials knowledge base**. Also more than **1.5 million ProQuest records** were loaded into the repository
- **Alma as an open platform** that can easily integrate with solutions created by libraries and third-party developers and currently offers more than **140 APIs** that are free to use for Alma customers.

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Innovative Interfaces (Sierra)

- In May 2016, the company announced that the **Sierra Services Platform Release 2.2** would feature the delivery of all circulation functions in a web application, enabling staff to access Sierra without installing the system's Java-based desktop application
- A significant development for Sierra, this will also enable automatic updating for new releases and won't require local IT support for Sierra installations on individual workstations
- Innovative continued opening up the Sierra platform, with new set of APIs
 - allow placing holds of any kind, enabling libraries to use alternative hold options when integrating external services
 - new API endpoint for creating patron records for key fields including names, addresses, emails, phones, and PINs

OCLC's WorldShare Management Services (WMS)

- Tipasa, the organization's own cloud-based interlibrary loan (ILL) management system
- D2D (Discovery to Delivery) consortial borrowing solution

SirsiDynix

- **BLUEcloud Circulation:** a **solution** designed to be simple and intuitive but also flexible enough for libraries to **customize** and **apply** almost any library policy by associating **loan periods**, **fee structures**, and **holds policies** with **user type**, **item type**, and more
- **BLUEcloud Acquisitions:** include a **price comparison tool** within the LSP, **consortial buying**, **hierarchical fund categories**, **vendor templates** for **autopopulating fields**, **built-in simple query** searching **across vendor records** or **titles** in a **selection list**, and more
- **BLUEcloud Mobile:** app for iOS and Android devices, integrating and leveraging the capabilities of other BLUEcloud modules including eResource Central, Buy It Now, and BLUEcloud Search, Commerce, and Lists
- **BLUEcloud Insights:** is an analytics and report-generating tool

Koha

- An **integration** with **Koha** and the **EBSCO Discovery Service** (EDS) and, with funding and technical assistance from EBSCO, helped upgrade Koha's search engine to Elasticsearch (ByWater)
- Capabilities of **linked data** using **RDF** and **Elasticsearch** to **create** “the **next generation** of **library catalogs**,” enabling patrons to discover Koha library collections on the open web (ByWater)
- **Bibliovation™ (LibLime)** uses relational databases storing all data types including bibliographic, patron, transaction, acquisitions as well as digital objects - support for the **EDS API**, for **open access databases** and **independent commercial databases**, simplified access to ebooks from **OverDrive** and the **bibliotheca cloudLibrary**, digital object import with **full-text search**, **community-based tags** and reviews, and integration with social media including **Pinterest, Twitter, Facebook, and LinkedIn**

FOLIO - Future Of Libraries Is Open

- FOLIO is essentially a total reboot of the Kuali OLE platform
- EBSCO, Index Data, several academic libraries - <https://www.folio.org>

The ILSAS Case

TABLE 2 HEAL-Link info.

**Full members /
Co-operating members**

Full members: **36** University Libraries, Academy of Athens, National Library of Greece / Co-operating members: **10** Research Institutes Libraries

**Academic Community /
Students**

more than **15,000** Professors and Researchers / **~ 400,000** undergraduate and postgraduate students

**Bibliographic Records /
Online content**

4,000,000 bibliographic records, access to more than **14,000** scientific journals, **30,000** eBooks, various digital databases etc.

The ILSAS Case

TABLE 3 LMS Vendor and bibliographic records status before MITOS project.

LMS Vendor	# of installations	# bib records
<i>ABEKT (Greek ILS)</i>	4	71,438
<i>Ex-Libris Aleph</i>	3	146,700
<i>GEAC Advance</i>	10	396,596
<i>SirsiDynix Symphony</i>	1	9,217
<i>SirsiDynix Horizon</i>	7	811,345
<i>VTLS</i>	1	44,072
Total	26	1,479,368

The ILSAS Case

TABLE 4 (a) Number of LMS installations and records per MARC framework, and (b) End-users per patron category.

MARC framework	# of installations	# bib records
(a)		
<i>UNIMARC</i>	24	1,445,095
<i>MARC-21</i>	2	34,273
Patron category	# end-users	
(b)		
<i>Undergraduates</i>	329,946	
<i>Post-graduates</i>	54,780	
<i>Academic-staff</i>	8,719	
Total	393,445	

The ILSAS Case

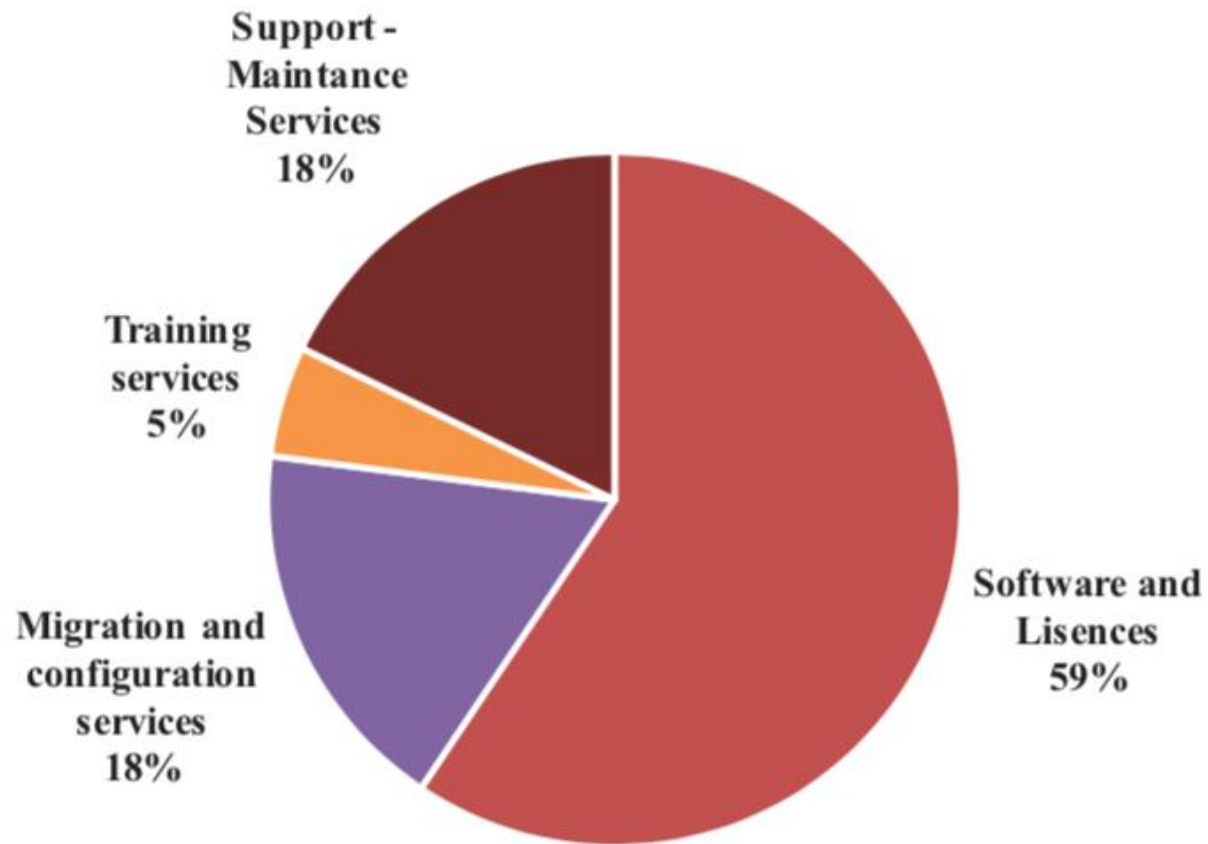


FIGURE 1 Cost distribution per category (Innovative offer).

The ILSAS Case

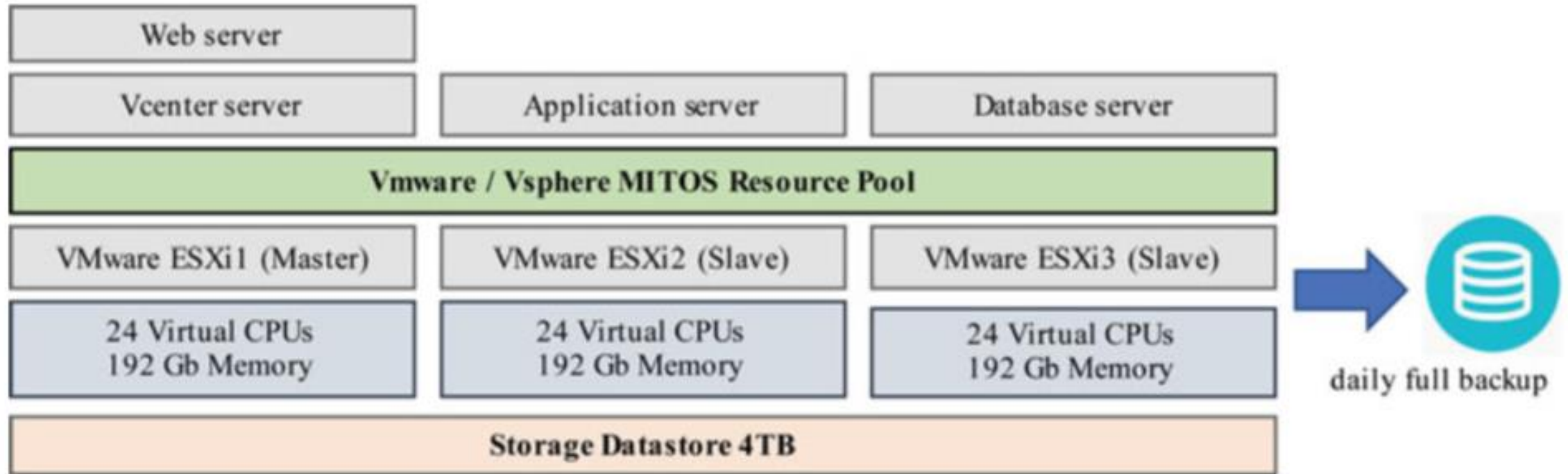


FIGURE 2 Hardware/Software setup/architecture for MITOS service.

The ILSAS Case

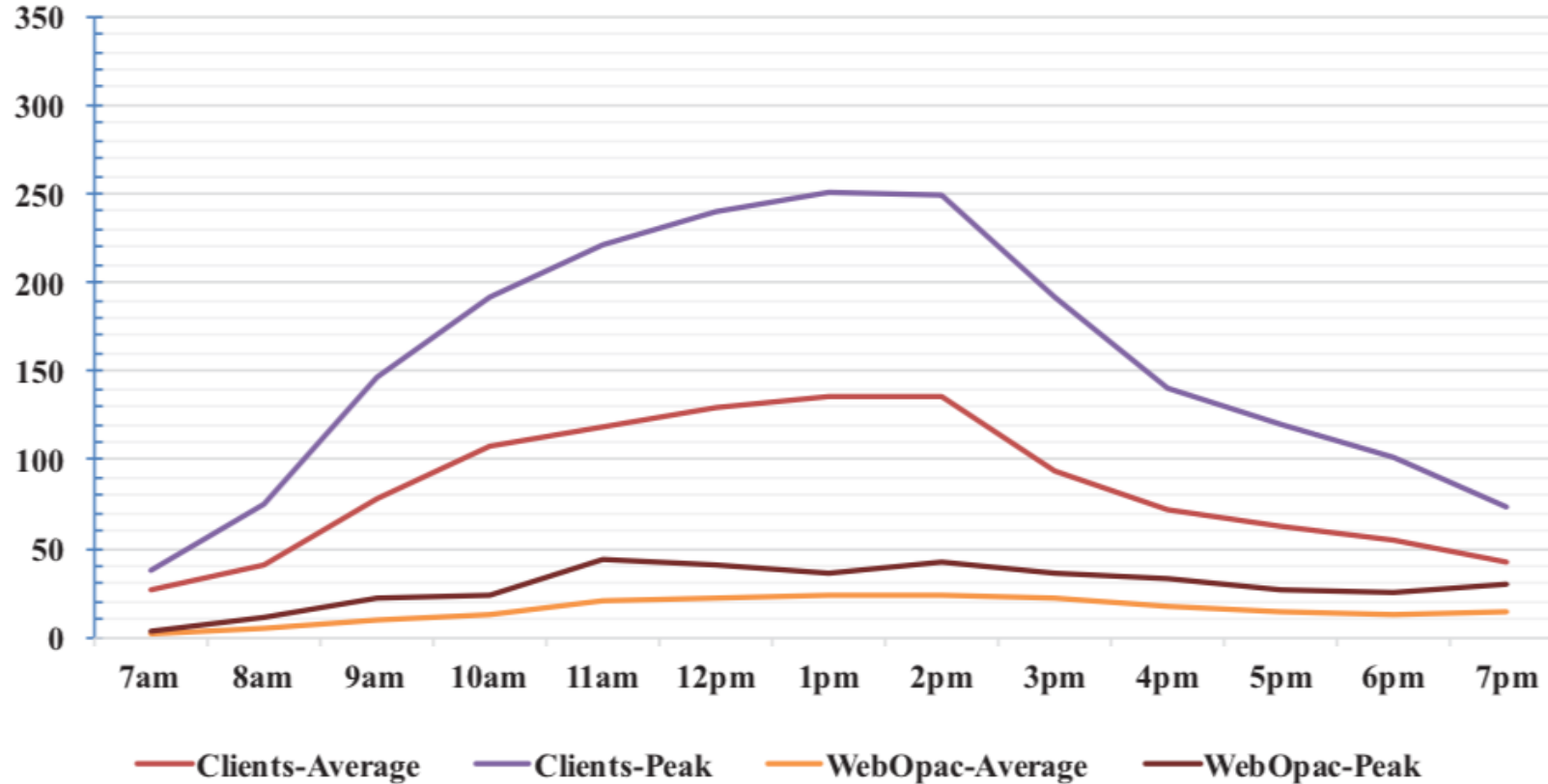


FIGURE 3 Average/peak clients' licenses and WebOpac sessions during a typical week day.

The ILSAS Case

TABLE 5 MITOS and stand-alone cases information.

	MITOS	Case 1	Case 2	Case 3	Case 4	Case 5
# num of records	56,916*	15,000	80,000	311,000	700,000	93,000
# num of staff licenses	13*	3	20	20	non-applicable	non-applicable
Vendor	Innovative Sierra LMS	Innovative Sierra LMS	Innovative Sierra LMS	Innovative Sierra LMS	KOHA	KOHA

*average per library

The ILSAS Case

TABLE 6 Comparative data for cost categories (a), (c), (d) and (e).

	A. Software and licenses				C. Migration / Configuration services			
	MITOS	Case 1	Case 2	Case 3	MITOS	Case 1	Case 2	Case 3
Per library	1.0	6.1	3.1	5.9	1.0	2.4	4.2	4.2
	D. Training services				E. Support / Maintenance services			
	MITOS	Case 1	Case 2	Case 3	MITOS	Case 1	Case 2	Case 3
Per library	1.0	3.0	6.4	7.1	1.0	5.2	no data	7.5

Bibliometric Analysis and Measures

Bibliometric analysis

The European Commission on Research and Innovation has defined bibliometrics as “a statistical or mathematical method for counting the number of academic publications, citations and authorship” and notes that it is frequently used as a measure of academic - output (Directorate-General for Research, *Assessing Europe’s University-Based Research*, 2010)

Bibliometric analysis is one important tool among an array of potential processes and related tools used to understand the aspects of research output

Bibliometric measures (most common) (1/5)

- **Publication Counts**

- It refers to the total number of publications attributed to a researcher or an entity like department, lab, university etc.
- Usually it includes all type of documents (journal papers, letters, conference papers, books, book chapters etc.).
- Various methodologies have been proposed for publication count (based on the total number of authors, the name sequence etc.)
- Although publication count is important normalization is needed if more accurate results are required (eg. Normalization based on the discipline average publication count).

Bibliometric measures (most common) (2/5)

- **Citation Counts**

- It refers to the total number that a specific document is cited by other documents.
- Many citation count based metrics exist (total citation, excluding self-citations, excluding self-citations from all authors, proportion of documents cited, average number of citations etc.).
- Again, normalization, is necessary across disciplines.
- Negative citation
- Citation in time and discipline

Bibliometric measures (most common) (3/5)

- **h-index**

- Refers to the number of papers (h) that have received at least (h) citations. H-index combines both the *publication and citation count*.
- Other measures related to H-index are the **g-index** [*a g-index of 20 means that an academic has published at least 20 articles that **combined** have received at least 400 citations*], **i10-index** [*number of publications with at least 10 or more citations*], **m-index** [*divide h-index by the years that the researcher is active*] etc.
- Inherits all the limitations for both publication and citations count

Bibliometric measures (most common) (4/5)

- **Journal Impact**

- Journal Impact Factor (**JIF**) from Thompson Reuters [The Impact Factor of journal J in the calendar year X is the number of citations received by J in X to any item published in J in (X-1) or (X-2), divided by the number of source items published in J in (X-1) or (X-2).].
- SCImago Journal Rank (**SJR**) from Elsevier [The SJR of journal J in year X is the number of weighted citations received by J in X to any item published in J in (X-1), (X-2) or (X-3), divided by the total number of articles and reviews published in (X-1), (X-2) or (X-3).
- Every publication (consequently researcher) should be judged on its own merit.
- JI is discipline-sensitive and should be also used comparatively

Bibliometric measures (most common) (5/5)

- **Top percentiles**

- They refer to the measure of the most cited documents or citations in a subject area, document type, and year (for example 1% or 10%).
 - The number of publications that published in the 1% of most important Journals
 - The number of publications that belong to the 10% of the most cited publications.

Non Bibliometric measures

Other research output measures:

- Intellectual property (patents, licences, etc.)
- Research or grant awards
- Altmetrics (Comments, Scholarly activity, Social activity etc.)
- Publication acceptance rates

Publication and Citation-tracking Databases

How to evaluate a P & C-T Database (1/2)

- **Collection/Discipline coverage:** refers to how comprehensive is the database in dimensions like time and discipline.
 - Databases cover disciplines at a different level.
 - Databases don't cover grey literature, web etc.
 - Bibliometric results from a single database should be treated with a certain level of arbitrariness.
 - *Examples (focusing on disciplines)*
 - Conference proceedings for Computer related sciences.
 - In Arts and humanities books, and book chapters are the main publishing method (including exhibitions).
 - Researchers involved with regional topics are likely to receive low scores during research assessment procedures through the use of bibliometric indicators

How to evaluate a P & C-T Database (2/2)

- **Bibliometric measures variations:** refers to definitions or methods for calculating the same or completely different bibliometric indicators.
- **Data accuracy:** refers to the quality of the indexed data as well as the algorithms for identifying bibliometric parameters (including authorship). Even a single typographical error can result in duplications, citation count errors, or wrong authorship attribution

P & C-T Database Comparison (1/2)

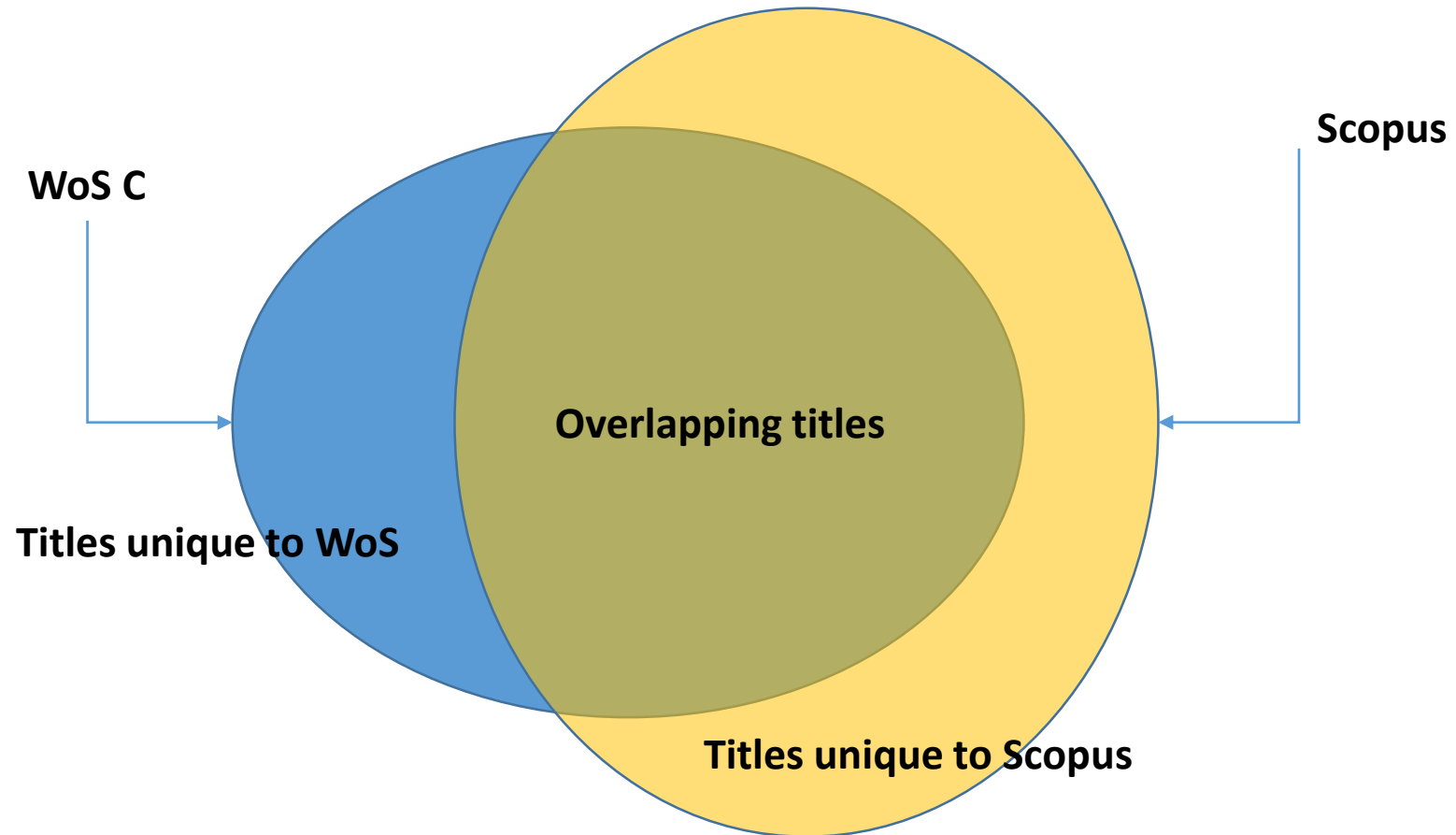
	Web of Science (WoS Core / WoS All) *	Scopus / Elsevier **	Google Scholar ***
Sources	>18,000 Journals, books & conferences series etc. (WoS All >33.000)	> 24,000 Journals, books & conferences series etc.	Unknown – Grey literature, web sites
Time	From 1900	From 1966 (although recently added 5 million items pre-1966)	Unknown
Records	>65 / 138 million records (journals, books, and proceedings) – 54 million of patents	>80 million records (journals, books, and proceedings)- >28 million patents	99 millions
Citations	> 1 billion (1900 to present), A. Einstein (>38k citations)	Unknown	Unknown
Indicators	citation tracking, citation counts, and author h-index calculations, “Hot” and “Highly Cited” articles (top performing by citation comparison), JIF	citation tracking, citation counts, and author h-index calculations, number of citations per year etc.	Unknown
Other		Public API	

* <http://clarivate.libguides.com/webofscienceplatform/coverage>

** <https://www.elsevier.com/solutions/scopus/content>

*** DOI 10.1007/s11192-015-1614-6

P & C-T Database Comparison



Our BibApp - The need and the selected indicators

Our BibApp– The need

- Every three years HQAA requests from HEI/departments and academic staff to execute both internal and external evaluation procedures.
 - Among other, the research output performance bibliometric indicators are an essential part of the evaluation report.
- Also, the university's governing council requests from the Quality Assurance Unit (internal unit) to prepare an extensive set of indicators (including those sent to HQAA), in a yearly base.
- The project doesn't get any funding.

Our BibApp– The indicators (1/10)

Indicators per academic staff

- Publications count [in relation to type of document, certain time period of publication]
 - Total publications count [all years / for the last 5 years]
 - Journals publications count [all years / for the last 5 years]

Our BibApp– The indicators (2/10)

Indicators per academic staff

- Citations count [certain time period where a document is cited by other documents, excluding self citations]
 - Total citations count [all years / for the last 5 years]
 - Total citations – self citations [all years / for the last 5 years]
 - Citations for Journal from Journals only [all years / for the last 5 years]

Our BibApp– The indicators (3/10)

Indicators per academic staff

- H-index [in relation to certain time period]
 - H-index (all years)
 - H-index (for the last 5 years)

Our BibApp– The indicators (4/10)

Indicators per department [deduplication of common publications and citation]

- Publications count from all department's staff [in relation to document type, certain time period of publication, per academic ranking]
 - Total publications count [all years / for the last 5 years / and per year for the last 5 years, per academic ranking]
 - Journals publications count [all years / for the last 5 years / and per year for the last 5 years, per academic ranking]

Our BibApp– The indicators (5/10)

Indicators per department [deduplication of common publications and citation]

- Citations count from all department's staff [certain time period where a document is cited by other documents, excluding self citations]
 - Total citations count [all years / for the last 5 years / and per year for the last 5 years, per academic ranking]
 - Total citations – self citations [all years / for the last 5 years / and per year for the last 5 years, per academic ranking]
 - Citations for Journal from Journals only [all years / for the last 5 years]

Our BibApp– The indicators (6/10)

Indicators per department [deduplication of common publications and citation]

- H-index for the department [in relation to time]
 - H-index (all years)
 - H-index (for the last 5 years)
- Average values for most of the indicators are given

Our BibApp– The indicators (7/10)

Indicators for the University [deduplication of common publications and citations]

- Publications count from all staff [in relation to type of document, certain time period of publication]
 - Total publications count [all years / for the last 5 years / and per year for the last 5 years]
 - Journals publications count [all years / for the last 5 years / and per year for the last 5 years]

Our BibApp– The indicators (8/10)

Indicators for the University [deduplication of common publications and citations]

- Citations count from all staff [certain time period where a document is cited by other documents, excluding self citations]
 - Total citations count [all years / for the last 5 years / and per year for the last 5 years]
 - Total citations – self citations [all years / for the last 5 years / and per year for the last 5 years]
 - Citations for Journal from Journals only [all years / for the last 5 years]

Our BibApp– The indicators (9/10)

Indicators for the University [deduplication of common publications and citations]

- H-index for the University [in relation to time]
 - H-index (all years)
 - H-index (for the last 5 years)

Our BibApp– The indicators (10/10)

Other data

- All data on the publications
- All data on the citations

Our BibApp – Database selection,
data model

The P & C-t Database

We selected Scopus / Elsevier

- Free API
 - Scopus ID
 - XML based information retrieval
 - API key renews every 20.000 queries
 - Many API queries available ... [we used only by author, by document]
- No funding for this project - excludes WoS
- Google Scholar has no API - Scraper only

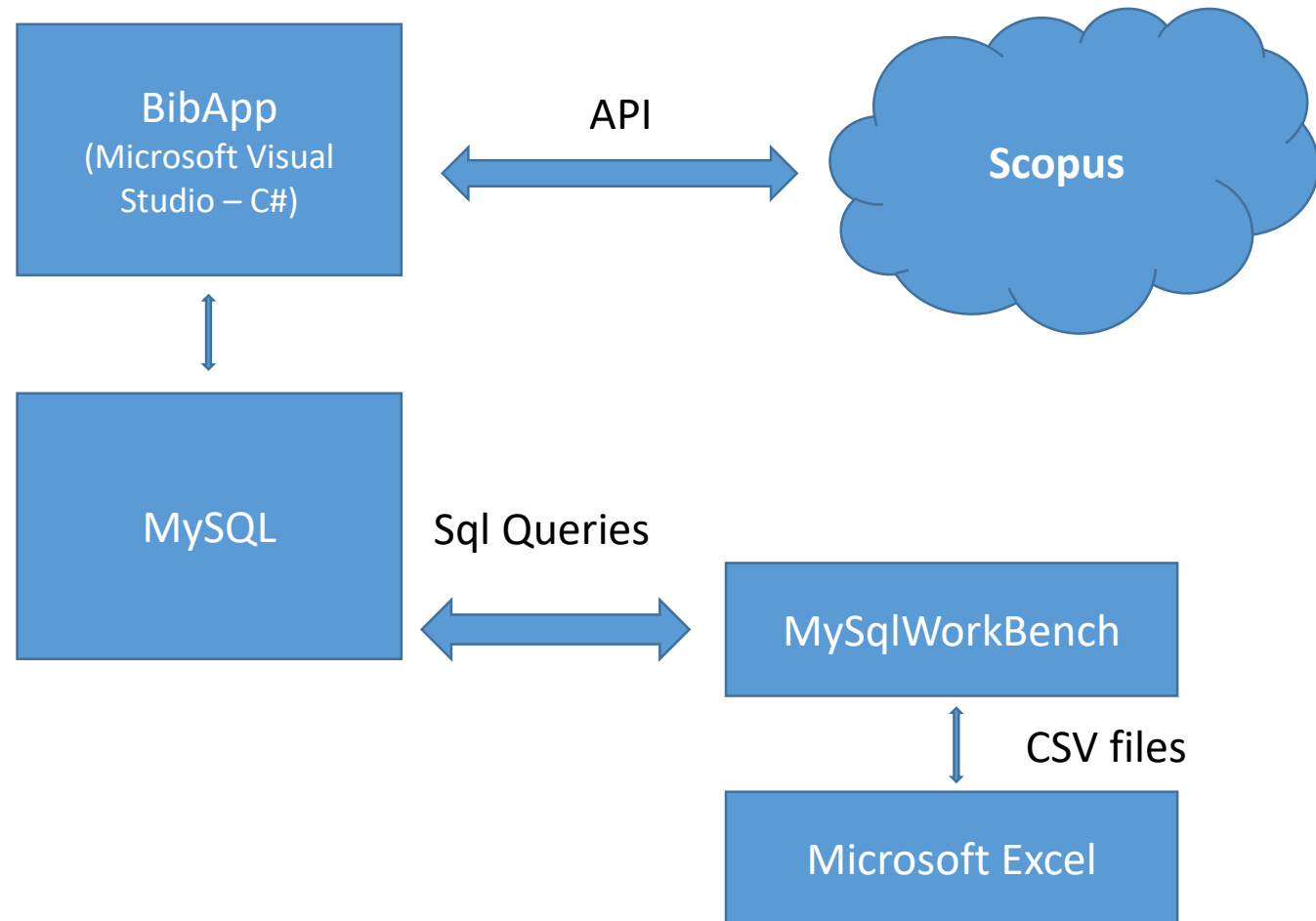
Data model analysis

- **Authors:** researchers data [**scopus id**, name, affiliation, active/non active etc.]
- **Documents:** documents related to authors [**scopus id**, title, various PIDs, citation number, type of publication etc.]
- **Citation:** documents citing documents related to authors [**scopus id**, year of publication, self or non-self citation, type of publication etc.]

Data model challenges

- **Authors:** multiple scopus ids per author
- **Documents:** duplicate records - different scopus ids, single count on department level / institute level
- **Citation:** self citation on author level / department level / institute level, single count on department level / institute level

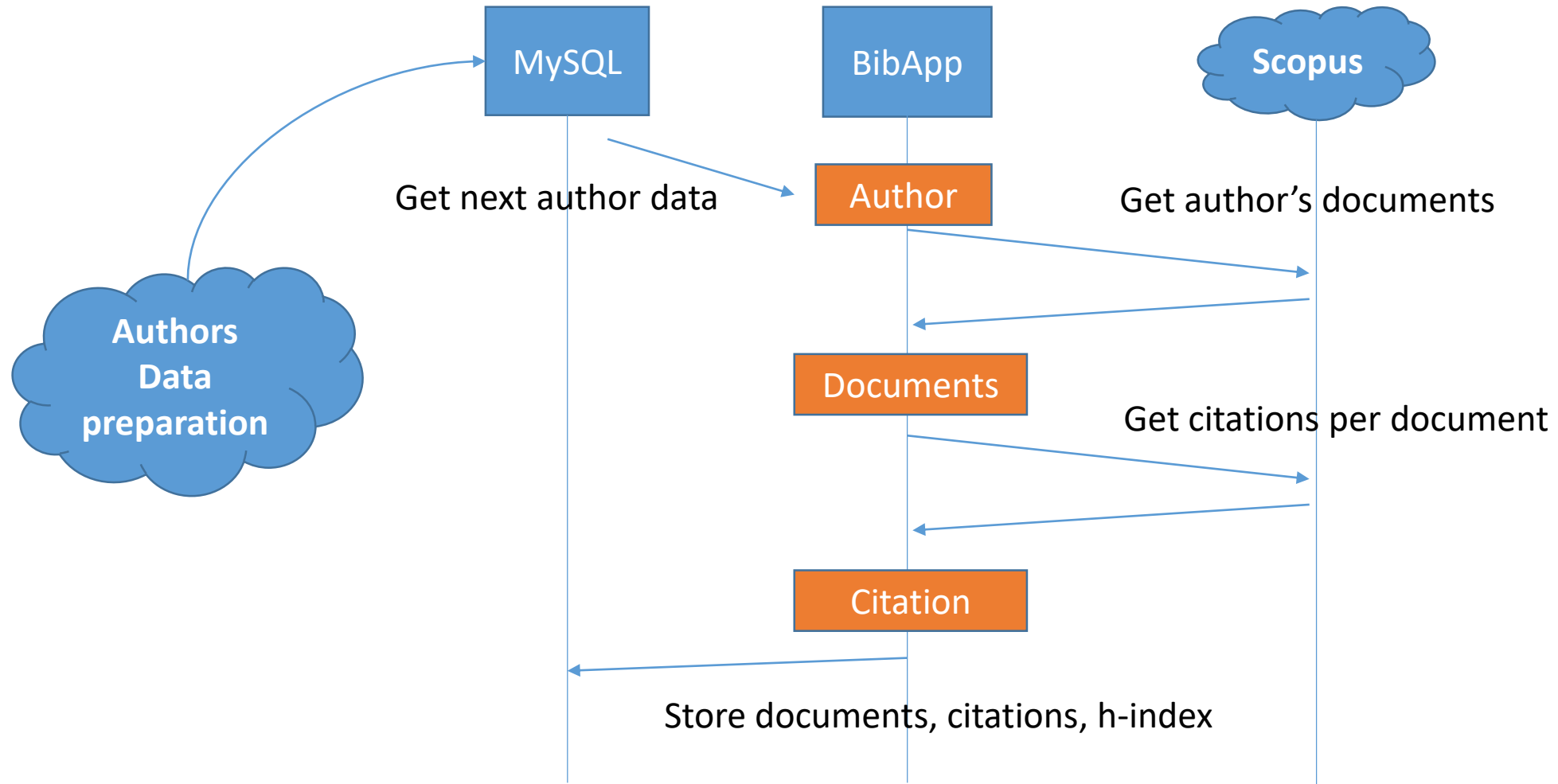
BibApp environment Architecture



Database schema



BibApp data flow



Main disadvantages (1/2)

- The bibliometric measures reflect the Scopus data coverage
 - Disciplines with low coverage in Scopus database should not be considered as representative.
 - No regional scientific research activities are included (eg. sources published in the Greek language).
- No affiliation management
 - All publications, attributed to an author are included during department / institute indicators calculation.
 - This situation affects the results, but not in a high degree, due to the Greek Higher Education unique characteristics

Main disadvantages (2/2)

- The results are narrowed only to active members of the Institute
 - It should be noted the scope of the BibApp is used only for active academic staff. It doesn't include already retired staff or other categories of personnel with affiliation relation to the Institute (researchers, PhD students etc.)
- BibApp is semi automated
 - Many steps during the workflow require human intervention and rather tiring repetitive actions.
- The Scopus API
 - It has restrictions. It can not be used for massive data retrieval. A subscription is needed.

Future development (1/3)

- Total User Management
 - Affiliation management
 - Promotion management
 - Retirement management
 - ORCID integration
- Full record (publications / citations) data retrieval (including thematic classification).
 - Authors number, authors order, authors affiliations, JIF information, keywords, Scopus subject classification, etc.

Future development (2/3)

- Integration with other P & C-t Databases
 - Google Scholar
 - ResearchGate (Altmetrics)
- More advance bibliometric indicators / algorithms
 - Research development patterns identification
 - Second level of citations (how important is the citing publications;)
 - Relation between researchers / departments / institutes
- Fully automated BibApp environment - Integrations
 - UI to librarians and admins
 - Access user profile through web
 - Integration with Institutional Repository

Future development (3/3)

- Explore Scopus API capabilities
 - Search and retrieve by affiliation
 - Search and retrieve by subject

Βιβλιομετρική ανάλυση

- **Ομότιμη αξιολόγηση (peer-review) vs Βιβλιομετρική ανάλυση vs Τεκμηριωμένη (Informed) Ομότιμη αξιολόγηση**
- Η βιβλιομετρική ανάλυση είναι γρήγορη και με χαμηλό κόστος μέθοδος αποτίμησης της απήχησης του ερευνητικού έργου
- Η βιβλιομετρική ανάλυση περιορίζεται στο ερευνητικό έργο που είναι δημοσιευμένο σε μορφή άρθρων σε περιοδικά, ανακοινώσεων σε συνέδρια κ.λπ.
- Η βιβλιομετρική ανάλυση επηρεάζεται από την «κάλυψη» που προσφέρουν οι βάσεις αναφορών (citation databases – Scopus, Web of Science, Google Scholar)

Αποτελέσματα - ΣΔΟΚΕ

Τμήμα	Αριθμός δημοσιεύσεων (συνολικός)	Αριθμός δημοσιεύσεων σε περιοδικά - Journal (συνολικός)	Αριθμός δημοσιεύσεων (2014-2018)	Αριθμός δημοσιεύσεων σε περιοδικά - Journal (2014-2018)	Μέσος όρος # δημοσιεύσεων ανά Καθηγητή (συνολικά)	Μέσος όρος # δημοσιεύσεων σε περιοδικά ανά Καθηγητή (συνολικά)	Μέσος όρος # δημοσιεύσεων ανά Καθηγητή (2014-2018)	Μέσος όρος # δημοσιεύσεων σε περιοδικά ανά Καθηγητή (2014-2018)
Αρχειονομίας, Βιβλιοθηκονομίας & Συστημάτων Πληροφόρησης	171	95	78	40	14,25	7,92	6,5	3,33
Κοινωνικής Εργασίας	35	28	14	13	4,375	3,5	1,75	1,625
Τουρισμού	91	63	57	34	10,11	7	6,33	3,78
Διοίκηση Επιχειρήσεων	342	189	154	80	13,15	7,27	5,92	3,08
Λογιστικής και Χρηματοοικονομικής	75	51	37	19	9,38	6,38	4,63	2,38
Αγωγής και Φροντίδας στην Πρώιμη Παιδική Ηλικία	17	13	3	3	8,5	6,5	1,5	1,5

Αποτελέσματα - ΣΔΟΚΕ

Τμήμα	Αναφορές - Citation (συνολικός)	Αναφορές πλην αυτό-αναφορών (συνολικά)	Αναφορές - Citation (2014-2018)	Αναφορές πλην αυτό-αναφορών (2014-2018)	Μέσος όρος # αναφορών ανά δημοσίευση (συνολικά)	Μέσος όρος # αναφορών ανά δημοσίευση πλην αυτοαναφορών (συνολικά)	Μέσος όρος # αναφορών ανά δημοσίευση (2014- 2018)	Μέσος όρος # αναφορών ανά δημοσίευση πλην αυτοαναφορών (2014-2018)
Αρχειονομίας, Βιβλιοθηκονομίας & Συστημάτων Πληροφόρησης	1149	1056	678	624	6,72	6,18	3,96	3,65
Κοινωνικής Εργασίας	166	135	53	51	4,74	3,86	1,51	1,46
Τουρισμού	420	358	299	269	4,62	3,93	3,29	2,96
Διοίκηση Επιχειρήσεων	1460	1333	816	740	4,27	3,90	2,39	2,16
Λογιστικής και Χρηματοοικονομικής	392	332	227	201	5,23	4,43	3,03	2,68
Αγωγής και Φροντίδας στην Πρώιμη Παιδική Ηλικία	154	124	49	47	9,06	7,29	2,88	2,76

Αποτελέσματα - ΣΔΟΚΕ

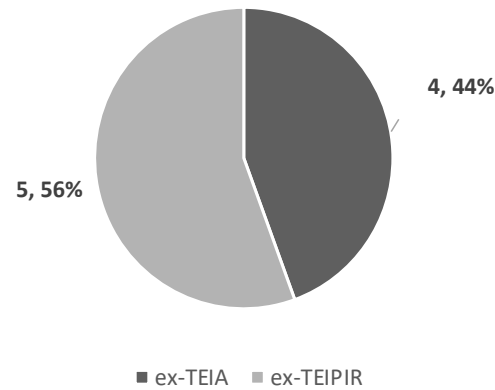
Τμήμα	Αριθμός δημοσιεύσεων (συνολικός)	Αριθμός δημοσιεύσεων σε περιοδικά - Journal (συνολικός)	Αριθμός δημοσιεύσεων (2014-2018)	Αριθμός δημοσιεύσεων σε περιοδικά - Journal (2014-2018)	Μέσος όρος # δημοσιεύσεων ανά Καθηγητή (συνολικά)	Μέσος όρος # δημοσιεύσεων σε περιοδικά ανά Καθηγητή (συνολικά)	Μέσος όρος # δημοσιεύσεων ανά Καθηγητή (2014-2018)	Μέσος όρος # δημοσιεύσεων σε περιοδικά ανά Καθηγητή (2014-2018)
Τουρισμού	91	1056	57	34	10,1	7,0	6,3	3,8
ΤΕΙ Αθήνας	18	135	15	11	4,5	3,3	3,8	2,8
ΤΕΙ Πειραιά	73	358	42	23	14,6	10,0	8,4	4,6
Διοίκηση Επιχειρήσεων	342	189	154	80	13,2	7,3	5,9	3,1
ΤΕΙ Αθήνας	235	139	101	64	13,8	8,2	5,9	3,8
ΤΕΙ Πειραιά	107	50	53	16	11,9	5,6	5,9	1,8

Αποτελέσματα - ΣΔΟΚΕ

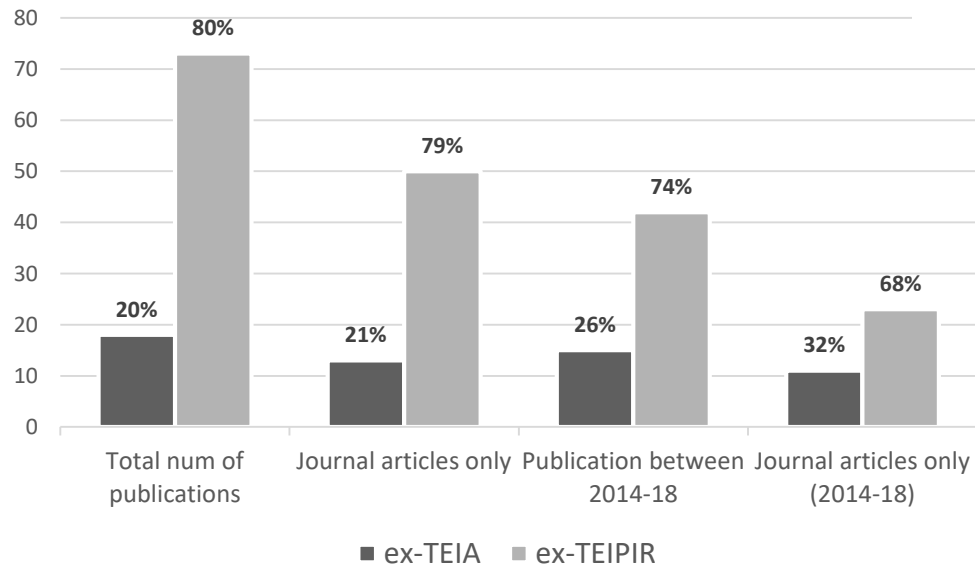
Τμήμα	Αναφορές - Citation (συνολικός)	Αναφορές πλην αυτό-αναφορών (συνολικά)	Αναφορές - Citation (2014-2018)	Αναφορές πλην αυτό-αναφορών (2014-2018)	Μέσος όρος # αναφορών ανά δημοσίευση (συνολικά)	Μέσος όρος # αναφορών ανά δημοσίευση πλην αυτοαναφορών (συνολικά)	Μέσος όρος # αναφορών ανά δημοσίευση (2014- 2018)	Μέσος όρος # αναφορών ανά δημοσίευση πλην αυτοαναφορών (2014-2018)
Τουρισμού	420	358	299	269	4,6	3,9	3,3	3,0
ΤΕΙ Αθήνας	74	70	61	58	4,1	3,9	3,4	3,2
ΤΕΙ Πειραιά	346	288	238	211	4,7	3,9	3,3	2,9
Διοίκηση Επιχειρήσεων	1460	1333	816	740	4,3	3,9	2,4	2,2
ΤΕΙ Αθήνας	1056	968	590	536	4,5	4,1	2,5	2,3
ΤΕΙ Πειραιά	404	365	226	204	3,8	3,4	2,1	1,9

Αποτελέσματα - ΣΔΟΚΕ

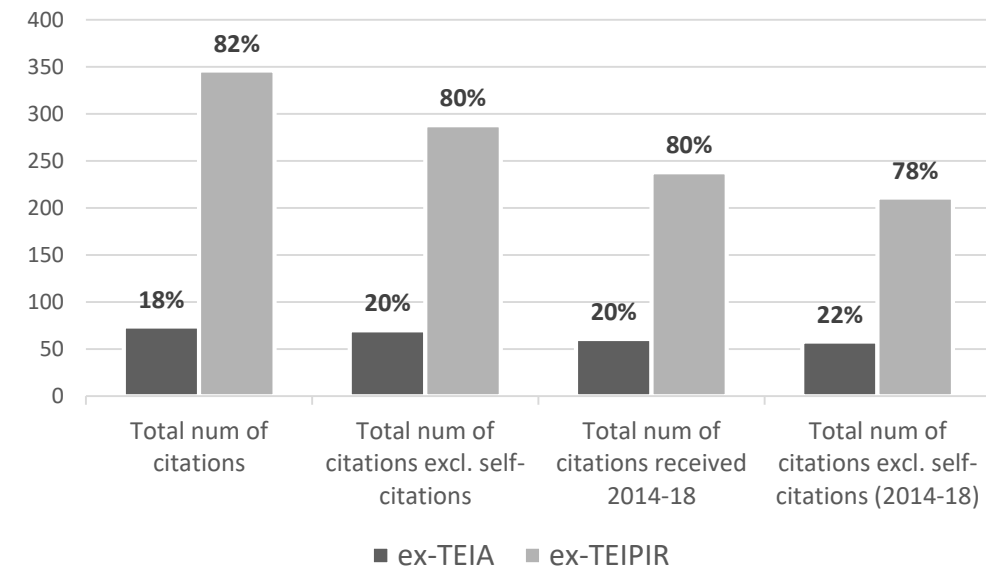
Tourism department academic staff



Tourism department publication statistics

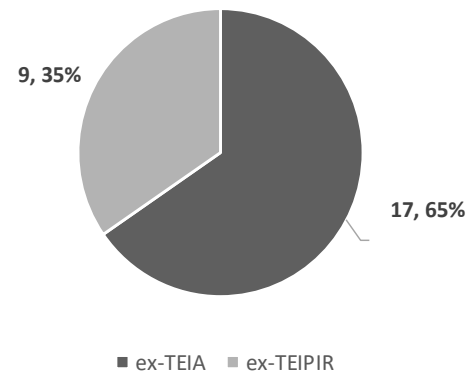


Tourism department citation statistics

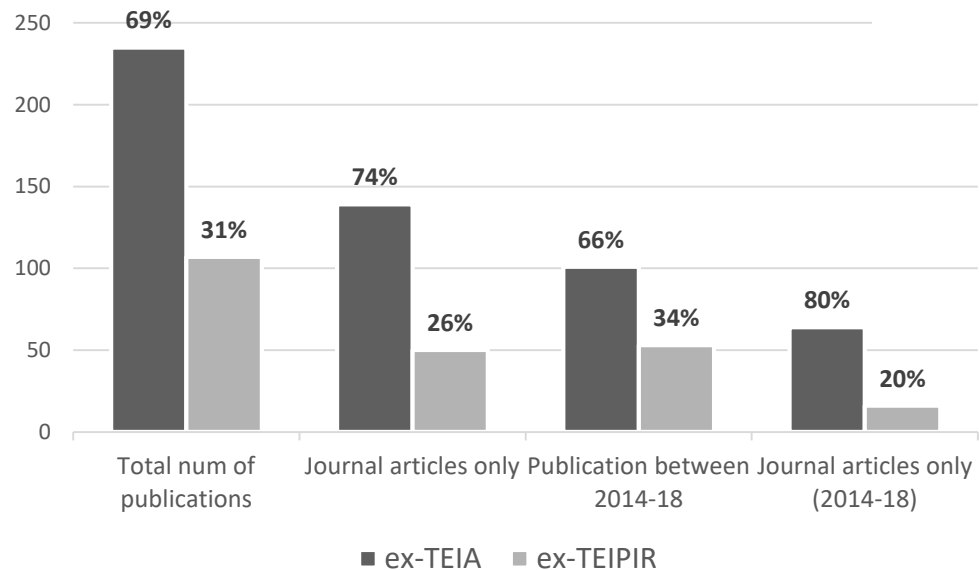


Αποτελέσματα - ΣΔΟΚΕ

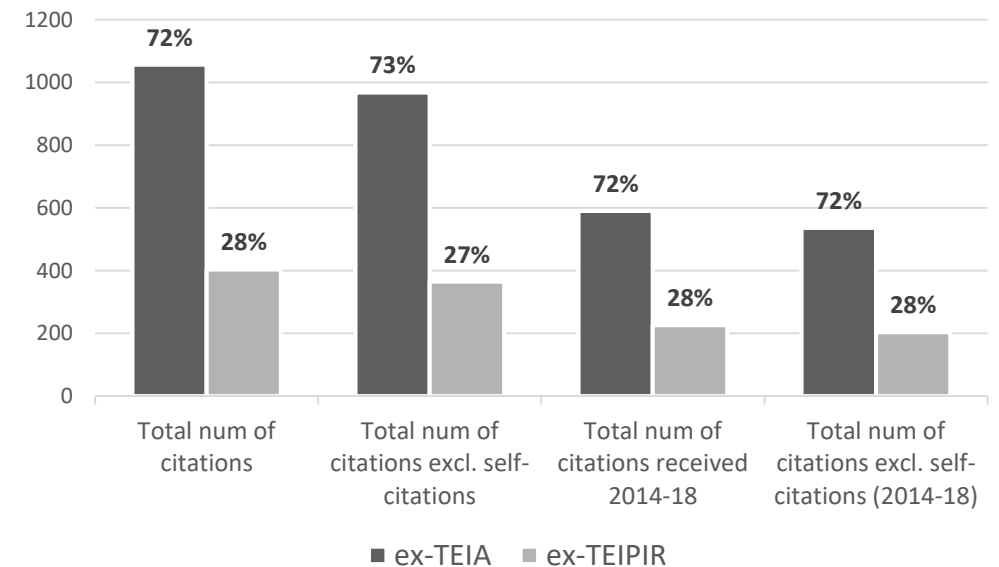
Business department academic staff



Business department publication statistics



Bussiness department citation statistics



Αποτελέσματα - ΠΑΔΑ

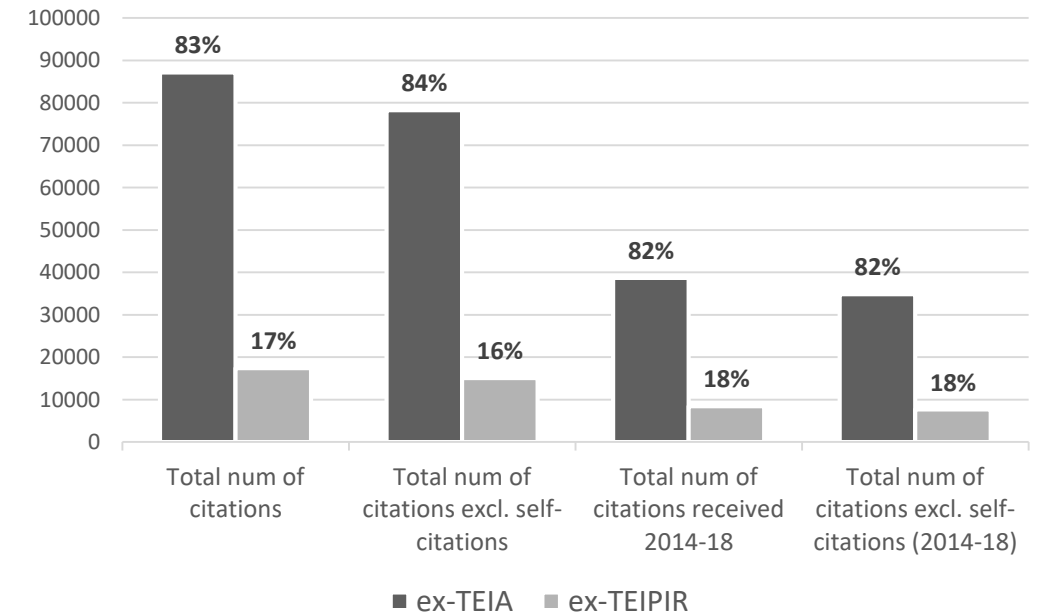
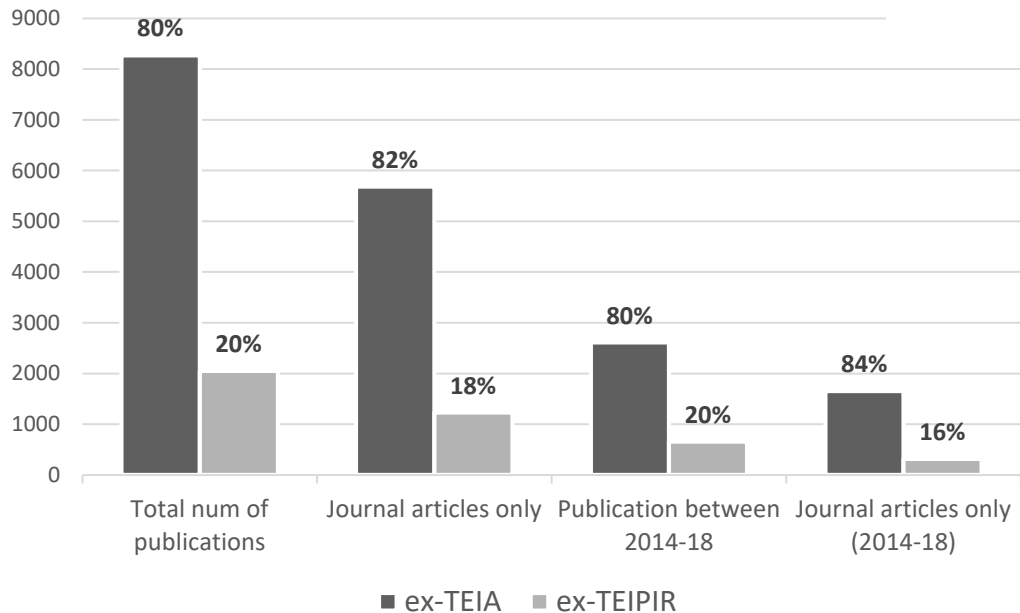
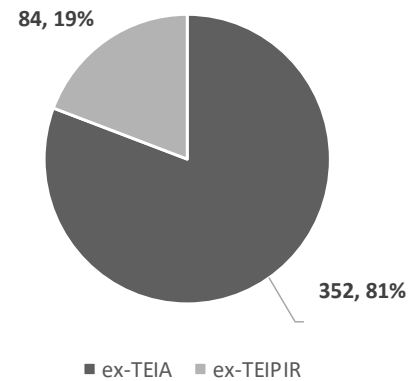
Τμήμα	Αριθμός δημοσιεύσεων (συνολικός)	Αριθμός δημοσιεύσεων σε περιοδικά - Journal (συνολικός)	Αριθμός δημοσιεύσεων (2014-2018)	Αριθμός δημοσιεύσεων σε περιοδικά - Journal (2014-2018)	Μέσος όρος # δημοσιεύσεων ανά Καθηγητή (συνολικά)	Μέσος όρος # δημοσιεύσεων σε περιοδικά ανά Καθηγητή (συνολικά)	Μέσος όρος # δημοσιεύσεων ανά Καθηγητή (2014-2018)	Μέσος όρος # δημοσιεύσεων σε περιοδικά ανά Καθηγητή (2014-2018)
ΠΑΔΑ	10320	6910	3263	1969	23,7	15,8	7,5	4,5
ΤΕΙ Αθήνας	8270	5682	2609	1654	23,5	16,1	7,4	4,7
ΤΕΙ Πειραιά	2050	1228	654	315	24,4	14,6	7,8	3,8
Μηχανικοί	6960	3989	2104	1034	34,0	19,5	10,3	5,0
Επιστημών Υγείας και Πρόνοιας	1945	1867	615	572	17,8	17,1	5,6	5,2
ΣΔΟΚΕ	731	439	343	189	11,2	6,8	5,3	2,9
Επιστημών Τροφίμων	410	385	104	95	15,2	14,3	3,9	3,5
Εφαρμοσμένων Τεχνών και Πολιτισμού	129	89	41	26	6,8	4,7	2,2	1,4
Δημόσιας Υγείας	145	141	56	53	13,2	12,8	5,1	4,8

Αποτελέσματα - ΠΑΔΑ

Τμήμα	Αναφορές - Citation (συνολικός)	Αναφορές πλην αυτό-αναφορών (συνολικά)	Αναφορές - Citation (2014-2018)	Αναφορές πλην αυτό-αναφορών (2014-2018)	Μέσος όρος # αναφορών ανά δημοσίευση (συνολικά)	Μέσος όρος # αναφορών ανά δημοσίευση πλην αυτοαναφορών (συνολικά)	Μέσος όρος # αναφορών ανά δημοσίευση (2014- 2018)	Μέσος όρος # αναφορών ανά δημοσίευση πλην αυτοαναφορών (2014-2018)
ΠΑΔΑ	104537	93309	47111	42542	10,1	9,0	4,6	4,1
ΤΕΙ Αθήνας	87118	78199	38663	34870	10,5	9,5	4,7	4,2
ΤΕΙ Πειραιά	17419	15110	8448	7672	8,5	7,4	4,1	3,7
Μηχανικοί	67569	58623	30723	27173	9,7	8,4	4,4	3,9
Επιστημών Υγείας και Πρόνοιας	19296	18009	8037	7415	9,9	9,3	4,1	3,8
ΣΔΟΚΕ	3741	3338	2122	1932	5,1	4,6	2,9	2,6
Επιστημών Τροφίμων	10788	10365	4854	4730	26,3	25,3	11,8	11,5
Εφαρμοσμένων Τεχνών και Πολιτισμού	710	615	402	361	5,5	4,8	3,1	2,8
Δημόσιας Υγείας	2433	2359	973	931	16,8	16,3	6,7	6,4

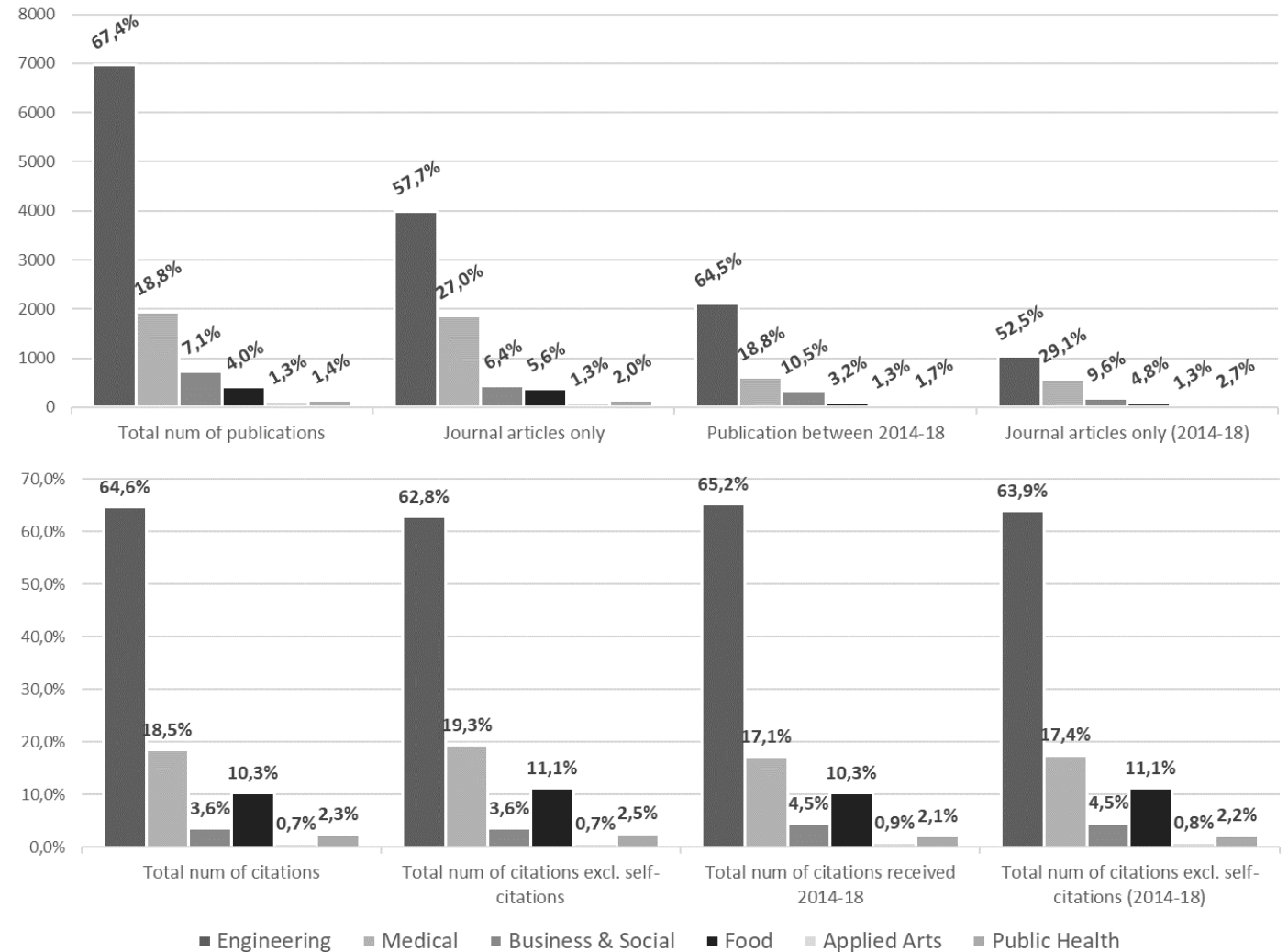
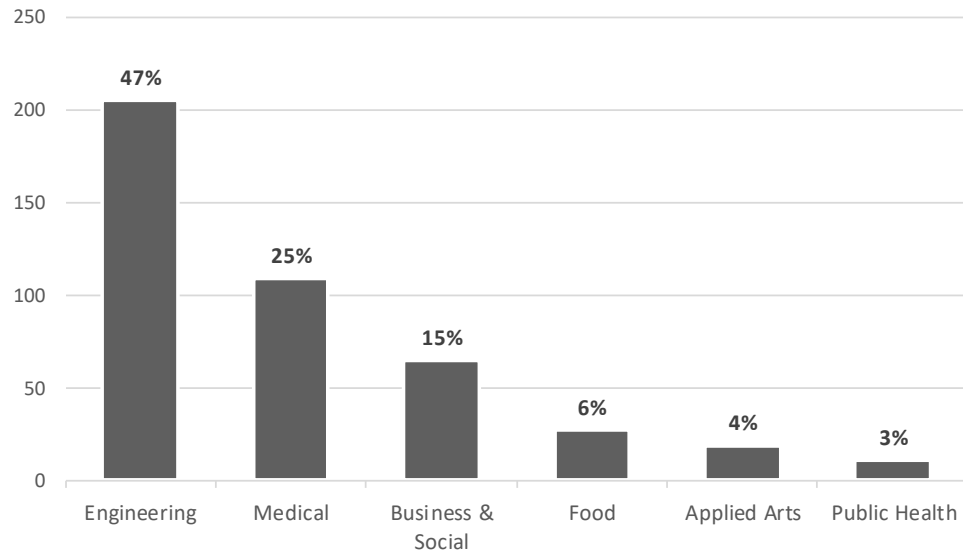
Αποτελέσματα - ΠΑΔΑ

Academic staff per merging TEI

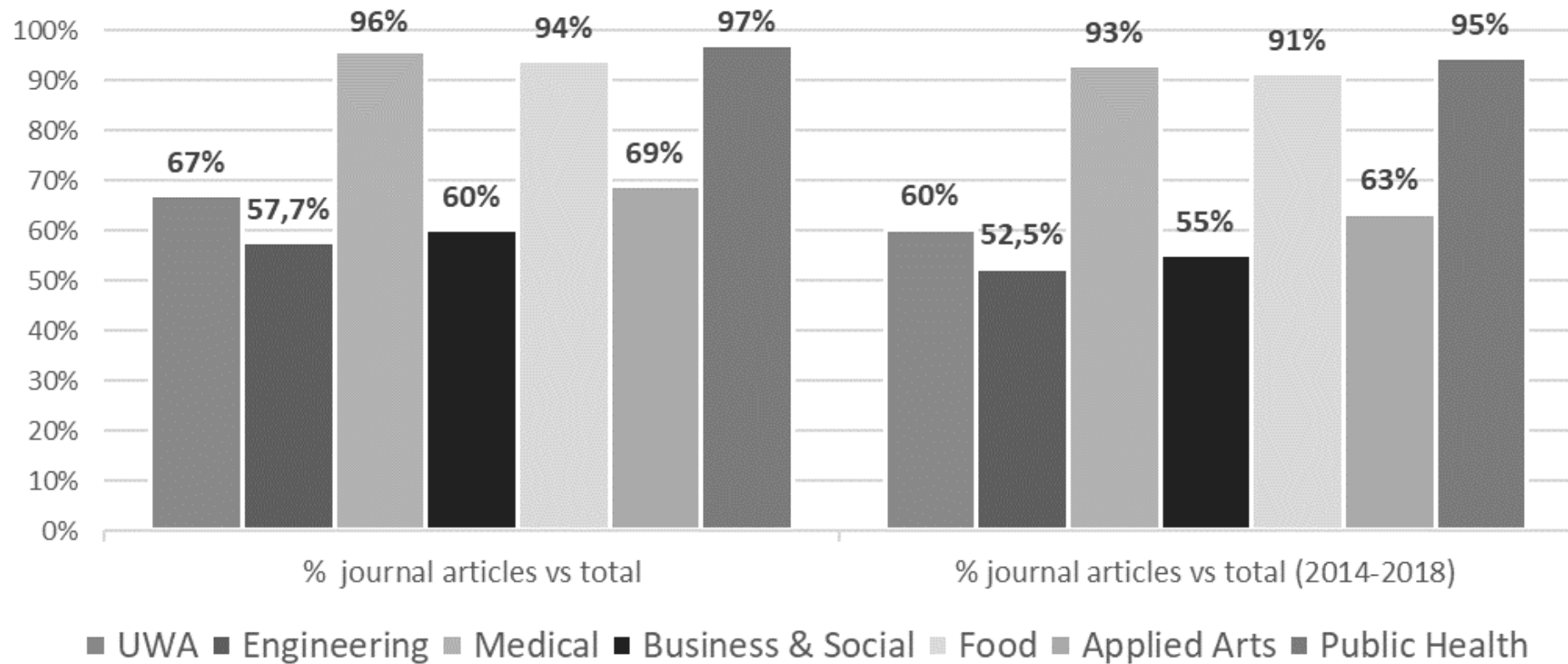


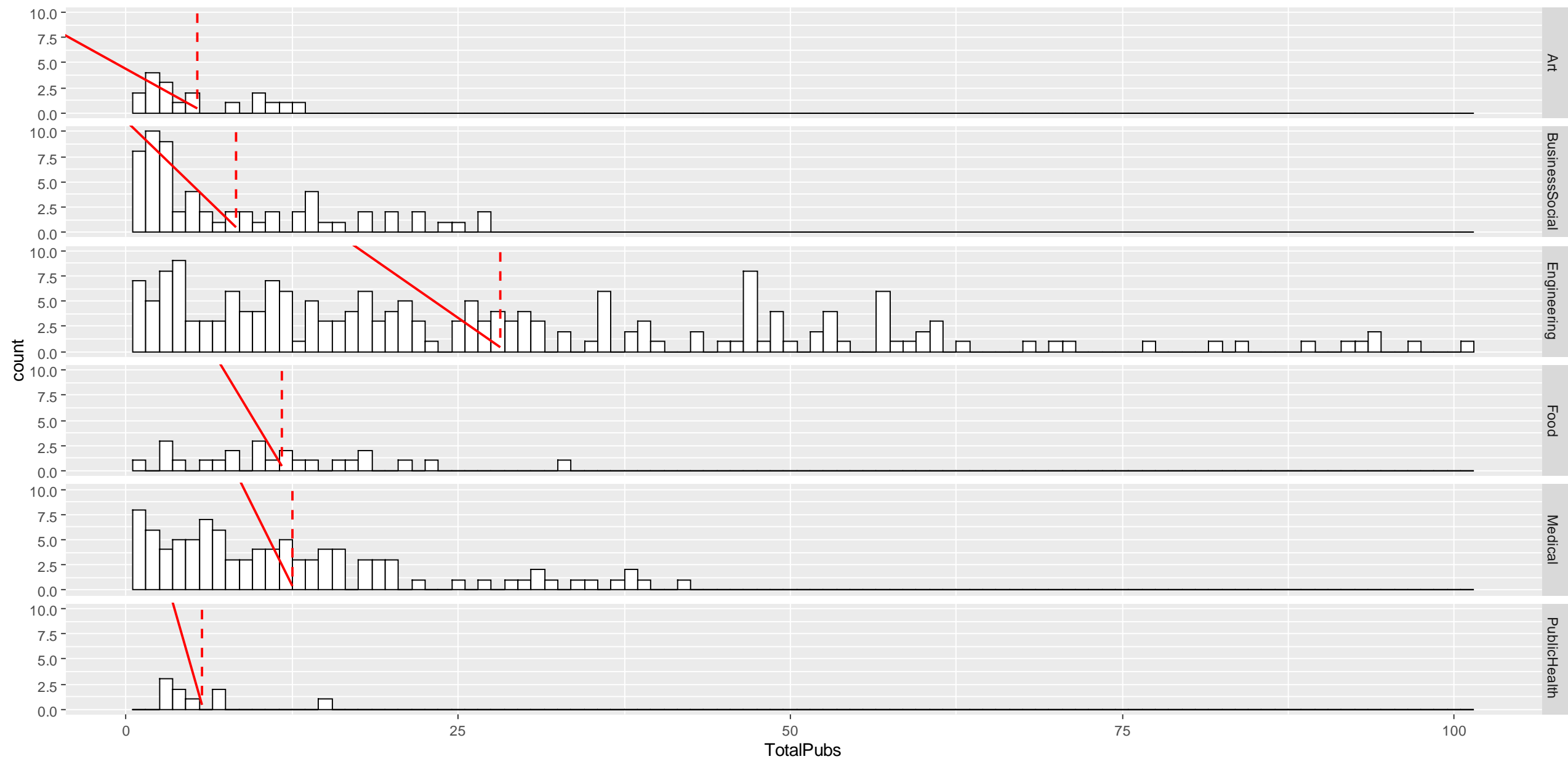
Αποτελέσματα - ΠΑΔΑ

Academic staff per school



Αποτελέσματα - ΠΑΔΑ

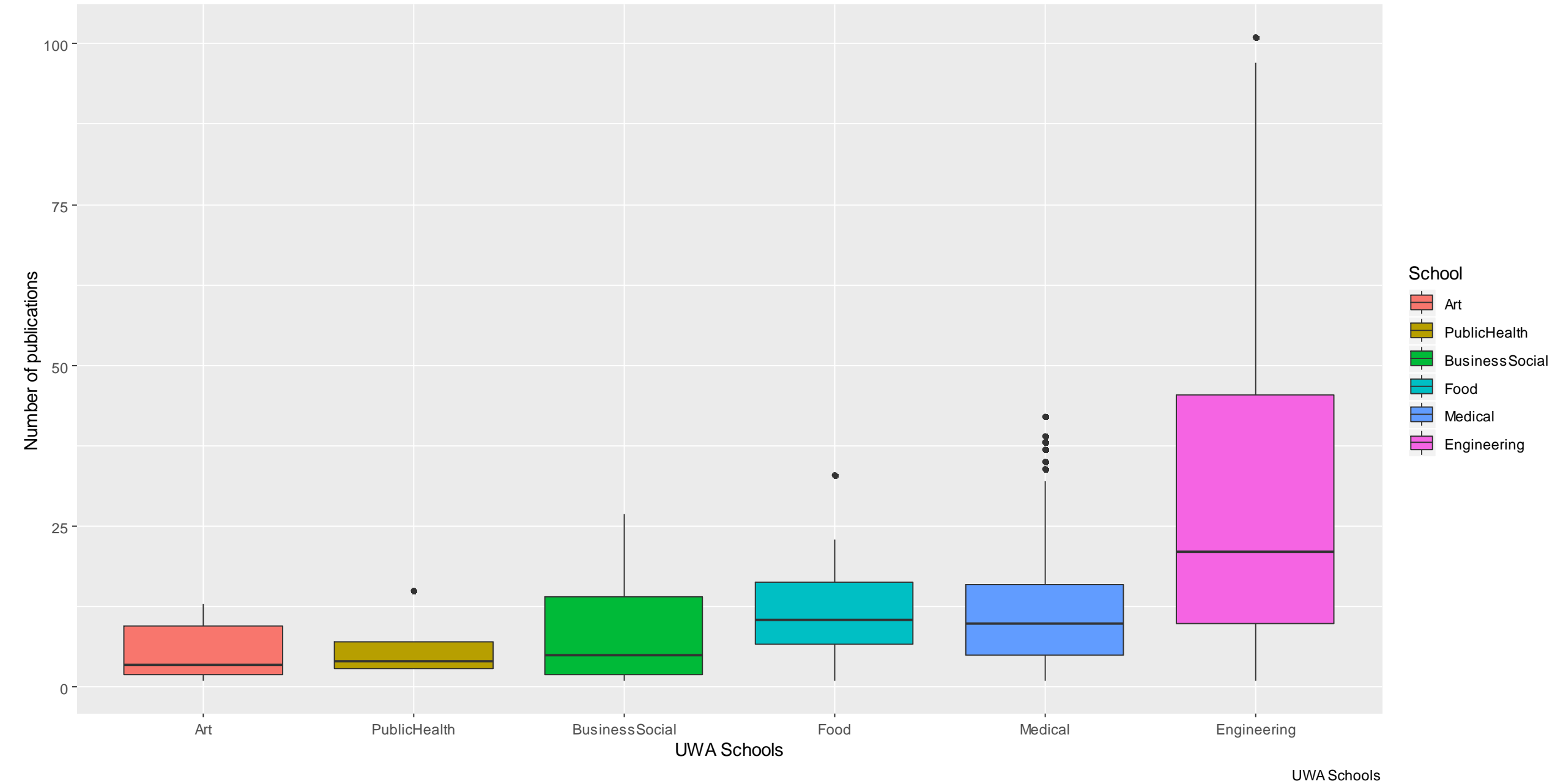




A

Total number of publications per School - UWA

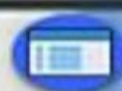
Boxplot diagram



Σύγχρονες τάσεις στην διασύνδεση των
δεδομένων χρήσης της ακαδημαϊκής
βιβλιοθήκης με την εκπαιδευτική διαδικασία

1. My QR & Library Snaps
2. Το πορτοφόλιο μου
3. Kanvas 2.0
4. Εγγραφές/Κρατήσεις
5. Scan a QR
6. Τοπ λίστες
7. Προτάσεις
8. Social Hub





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Προτάσεις

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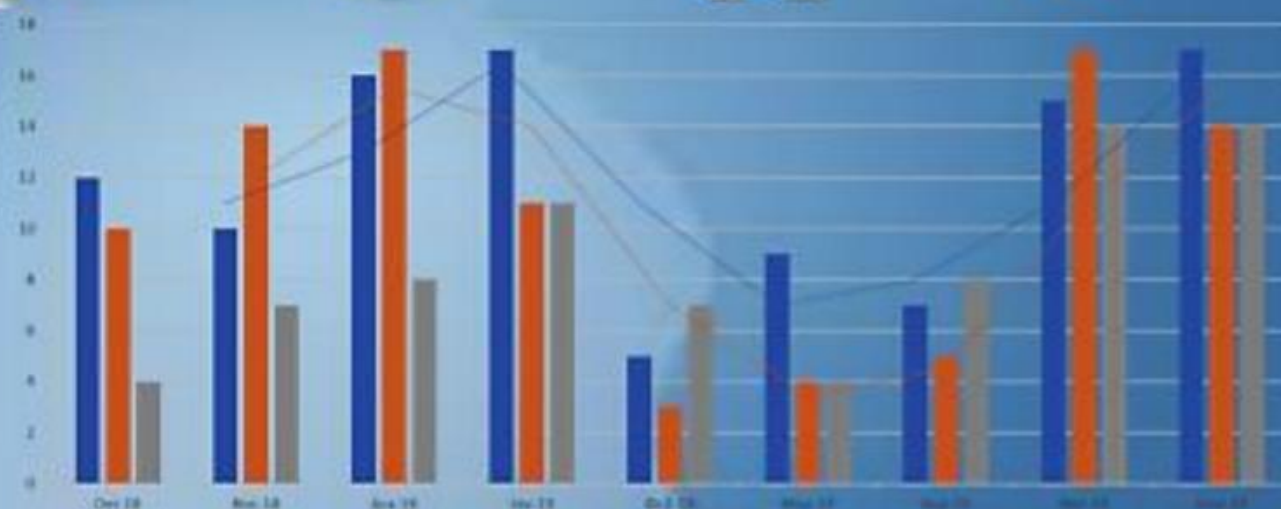
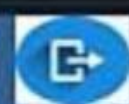
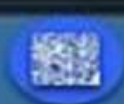
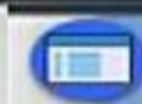


Το υλικό μου

Η δραστηριότητά μου

Η επίδοσή μου





■ Course Average

■ Program Average

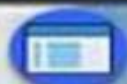
■ My Value

— 2 περίοδοι κυλιόμενου μέσου όρου (Course Average)

— 2 περίοδοι κυλιόμενου μέσου όρου (Program Average)

Next

Πίσω στις
επιδόσεις



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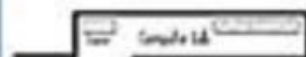
Εγγραφές/
Κρατήσεις

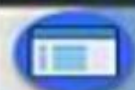
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Social Hub





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Κρατήσεις

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2



εκπαίδευση

σεμινάριο

εκδήλωση

εργαστήριο

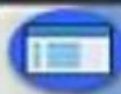
πολυμέσα

Language lab

makerspace

αίθουσα
μελέτης





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Snaps

My portfolio

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Εγγραφές/
Κρατήσεις

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Τοπ Λίστες

Προτάσεις

Social Hub

Τοπ αξιολόγηση

Τοπ χρήση

Τοπ χρήστες

Τοπ
influencers

Κατά πρόγραμμα

όνομα

όνομα

όνομα

Κατά τύπο
δραστηριότητας

όνομα

όνομα

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