EDUCATION AND TRAINING FOR DIGITAL REPOSITORY MANAGER

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Abstract:

The need of an active and continuous partnership between the informational profile organizations, scientific community and general public must be ensured to the extent that it includes the user-guiding paradigm and researcher's support as well. There are several important questions the future digital management is asking concerning the professional profile of those who will work in different specialized structures that are mandated to preserve cultural and scientific heritage: Which are the core competencies going to be and based on which set of skills will they be built? How will these institutions look like? How will the frame look like and especially will there be a common area of knowledge exchange for those who manage considerable sized informational bodies? Which are the policies dedicated to informational management and knowledge requirements?
This research article will try to solve these questions by the objectives below:
- Study concerning the state-of-art of the universities digital repositories;
- Analysis of quality management in digital repositories procedures and development. Procedures of uploading, conservation, preservation and copyright legality implemented for digital deposits;
- Analysis of staff competencies involved in digital repository management, manners of professional training for such personnel, existing Life Long Learning training offer.
- Transilvania University proposal and students' reaction about this new educational offer.

Key words: *institutional repository, marketing research, institutional repository manager, quality management.*

1. Study concerning the state-of-art of the universities digital repositories

1.1 General aspects of the institutional repository (*Institutional Repository* – IR)

  The digital institutional repository represents an open database, namely internet accessible, where the entire scientific production of the university is archived: bachelor degrees, master degrees, PhD theses of the university's members, teaching material, scientific papers, conferences proceedings organized by the university, research projects and other materials which the university considers valuable and can be made available for the members of the university or of other universities. The digital institutional repository represents the entire value of the university and increases visibility, and national and international appreciation. It can be constituted and maintained by each faculty separately, or by the informatics department, or by a group of specialists in information technology from each faculty, or by the library.

  The digital institutional repositories (IR) are digital collections which stock and preserve the academic community's intellectual production. They are the main component in the reform of academic communication by stimulating innovation in a disaggregated publishing structure and are intangible indicators of the quality of institutions by increasing visibility, prestige and public value.

  The digital repositories present the following characteristics: they offer a critical component in the reformation of the academic communication system – a component which extends the access to research, reiterates academic control, increases competition and reduces the monopoly of journals. They bring an economic ease and are relevant for the institutions and libraries which maintain them; they have the potential of serving as intangible indicators for the quality of the university and demonstrate the scientific, social and economic relevance for each research activity.

A digital institutional repository represents:
- Organization and management of digital materials;
- Web-based archive – open;
- A service offered to the community members by the university;
- Material created by the institution and its members;
- Academic content;
- It includes long-term saving.

The reasons for publishing in an institutional repository are:
- The institution research will be valid in a single Internet database accessible to anyone from anywhere;
- The increase of visibility and the impact of the institution research.

1.2 Research projects developed to create instruments and services for the open access to scientific information

  SHERPA-Securing a Hybrid Environment for Research Preservation and Access. The major objective of the project was opening the access to research in England, creating a digital open access environment for the scientific research of the greatest universities in the United Kingdom. By this project, the absolutely necessary services and instruments for the creation of the open access digital environment had been made available to the academic community respecting the copyright and relationships between universities, authors and publishers (Sherpa, 2011).

  The management of the project was ensured by the team of the digital repositories local managers of the institutions involved in the project. The services developed by the project are:

- [RoMEO](#) - Publisher's copyright & archiving policies
- [JULIET](#) - Research founders archiving mandates and guidelines
- [OpenDOAR](#) worldwide Directory of Open Access Repositories
- [SHERPA Search](#) - simple full-text search of U.K. repositories

The most useful and used services offered by this project are henceforth presented.

1.3 The *Open*DOAR Project - The Directory of Open Access

*Open*DOAR is the database with open access academic repositories. Each repository was analyzed by the ones authorized by the project to check the documents enrolled there. A list of the repositories which observe the standards of academic quality was made up.

Besides the simple list of repositories, OpenDOAR equally allows the access to the repositories content. Additionally, instruments and support are offered for sharing experience and good practices in order to improve the quality of the repositories infrastructure. All the continents have developed institutional repositories. In Europe institutional repositories have developed in 36 countries.

OpenDOAR offers a graph service with reference to the world situation regarding digital repositories, the selection being able to generate data concerning many identification elements: continent, country, institution, language of documents, and type of documents.

Most of the institutions that have developed digital repositories are in Europe 46.5%, namely 737 institutions of a total of 1952. North America is registered by this service with 324 institutions representing 20.4% from the total. Then there is Asia with 300 institutions – 18.9%, Australia with 54 institutions – 3.4%, South America with 109 institutions – 6.9%, Africa with 43 institutions – 2.7%.

Although Europe is represented by most institutions, the country with the most digital repositories is the United States with 395 repositories out of the total of 1952 digital repositories from the whole world, representing 20.2% from the total.

The United Kingdom has 190 digital repositories representing 9.7%, followed by Germany with 145 digital repositories – 7.4% from the total. Then, there is Japan with 133 digital repositories, representing 6.8%, Australia with 64 – 3.3%, the Netherlands with 49 - 3%, Italy with 59 - 3%, Canada with 53 – 2.7%.

In the United States 269 institutions develop digital repositories representing 17% from the total of 1585 institutions. 37.6% of the digital repositories, namely 734 use Dspace. 17% use Eprints followed by: Digital Commons – 4.3%, OPUS – 2.8%. 82.2% of the digital repositories are cross-disciplinary, 11.3% disciplinary, 4.1% aggregator which selects data from other repositories, 2.3% governmental.

The highest percent of archived documents in digital repositories is represented by scientific articles, 1277 articles representing 62% from the total number of documents **(OpenDOAR, 2011).**

1.4 The DOAJ Project - Directory of Open Access Journal

The **DOAJ** repertoire is a database with open access journals. This service enrolls free of charge 'full text' qualitatively checked academic journals. The database contains 42079 journals, out of which 2864 are 'full text' articles. There are 568183 articles included **(DOAJ, 2011).**

1.5 The ROAR Project - Registry of Open Access Repository

This service is offered to community. All the 2270 repositories can be visualized.

The service contains 2270 digital repositories loaded January 1990 – May 2011 (ROAR, 2011).

1.6 The DRIVER Project: Networking European Scientific Repositories.

The DRIVER project Networking European Scientific Repositories represents a network of European digital repositories. The DRIVER project is considered the most important initiative for the development of a digital repository. DRIVER I accumulated a range of efforts in the development of digital repositories and it was intended to offer a European infrastructure providing services for researchers, administrators and public. Thus, a network of field experts and digital repositories was achieved. DRIVER II consolidated the previous achievements and developed the initial platform in a confederation of repositories. The GEANT network was created within the European project FP7 with the purpose of stocking knowledge, of adding value to primary researches, to data and information and creating much more effective, profitable for industry secondary research, of consolidating the link between research and education. Thus a portal of the European information for open access publications was created having more than 2.5 million documents, from 33 European countries, 248 repositories in 25 languages (DRIVER, 2011).

1.7 Existing informational technologies for digital repository constitution
The universities and research centers worldwide are very active in planning and implementing digital repositories. A help guide has been published for the organizations which plan to implement IR, offering a presentation and a selection of the software systems that best satisfy the needs of the respective institutions.

All the presented systems satisfy three criteria:

〉 They are available free of charge by an Open Source license, that is they are available for free and can be modified, updated and redistributed.

〉 They are compatible with Open Archives Initiative-OAI and by any implementation participation to the global network of the institutional inter-operable repositories is possible.

〉 They have recently been made and are available to the public.

The presented systems are Archimede, ARNO, CDSware, Dspace, Eprints, Fedora, i-Tor, MyCoRe and OPUS.

We have at our disposal a lot of models of digital repositories, handbooks, open sources in order to build digital repositories. The field is being in full development. There must be established what management of quality in digital repositories means.

2. Analysis of quality management in digital repositories procedures and development. Procedures of uploading, conservation, preservation and copyright legality implemented for digital repositories

A very important instrument of assessment in the economy of a digital repository is DRAMBORA-Digital Repository Audit Method Based On Risk Assessment (DRAMBORA, 2011) which was developed under the cooperation DCC – Digital Curation Centre and DPE – Digital Preservation Europe, being the result of an audit period of a pilot repository carried out between 2006 and 2007. The result became concrete in a methodology of self-assessment, encouraging organizations to be fully aware of objectives, activities and resources before identifying, assessing and managing the risks within the organization.

In DRAMBORA case, the digital processing is characterized as an activity of assessing the risk and the role of data curator is that of rationalizing uncertainties and dangers which prevent operations of maintaining authenticity and intelligibility and turn them into risks which can be managed. Within the process there are described six stages. The initial stages need, if we speak about auditors, the

development of an organizational profile in which there are described and documented the repository mandate, objectives, activities and resources. Subsequently, the risks are derived on their basis and assessed in terms of potential impact and probabilities. At last, auditors are encouraged to conceive answers in accordance with the risks management that were identified. The process allows an efficient allocation of resources, thus permitting the managers to identify and categorize the areas where the shortcomings are most obvious or where they have a great potential of being disruptive. The process itself is an iterative one.

The goal of the set of DRAMBORA instruments is to ease the auditor's work in:
- defining the area of repository functions and mandate
- identifying the repository activities and resources
- identifying the risks and vulnerability associated to mandate, activities and resources
- assessing and calculating the risks
- defining the measures of risk managing
- reporting in the case of self-auditing

OAIS is "an archive consisting in persons and systems that have accepted to take the responsibility of preserving information and of making it available to a Designed Community" (ISO 14721, 2003). What presents interest is the descriptive attribution "trustworthy" which actually implies a level of auditing. Strictly speaking, the purpose of this document is that of presenting an instrument which covers strategic planning with everything it implies for a digital repository. The document content is mainly based on the processes through which an organization initializing a digital repository has in view in order to manage the contained objects. The described processes are concentrated around a group of Strategic Objective Plans (SOP) through which a repository specifies its objectives, goals and key indicators of performance (Kosson, 2011).

NARA- National Archive and Records Administration of United States (NARA,2010) has recently hosted a meeting of the Working Group which elaborates ISO standards (International Organization for Standardization) in order to use them in certifying trustworthy digital repositories. The two proposed standards are **ISO/DIS 16363 – *Audit and certification of trustworthy digital repositories*** and **ISO/DIS 16919 – *Requirements for the persons who offer auditing and certifying the candidate trustful digital repositories.*** ISO/DIS 16363 is mainly based on *Criteria and Checklist for Audit and Certification of Trustworthy Repositories*, shortly TRAC (Trustworthy Repositories Audit & Certification: Criteria and Checklist). On the whole, the TRAC document was elaborated in accord with the requirements of **ISO 14721** – Open system of information archiving – Reference model. NARA has actively involved in developing both of them. Why is such a standard, as ISO 16363, necessary?

The substantiation of standard proposal based on the following grounds: Long time ago before it had become an approved standard in 2002, many sides of the cultural heritage community adopted OAIS as a model in order to better understand what is asked from the digital preservation systems. The institutions started to self-declare "in accordance with OAIS" just to underline the trust degree of the digital repositories. Anyway, there was no agreed understanding regarding what "in accordance with OAIS" meant beyond the possibility of applying terminology in order to describe the own archives despite the fact that there was a segment targeted to conformity in OAIS, which specified the requirements necessary to support the information model and the

responsibilities that were compulsorily achieved. Declaring the attribute of trustworthiness is made easily but it is more difficult to try it on and to justify it objectively. Setting up some clearer criteria to detail what is and what is not a trustworthy repository has become essential. While ISO/DIS 16363 mentions the criteria which should be fulfilled for a trustworthy repository, ISO/DIS16919 offers the requirements necessary to the persons who will do audits and certifications of digital repositories (Kosson, 2011).

According with international standard: Space data and information transfer systems — Audit and certification of trustworthy digital repositories, DRAFT INTERNATIONAL STANDARD ISO/DIS 16363, we are trying to define trustworthy digital repositories (ISO, 2011).
"The main purpose of this document is to define a CCSDS Recommended Practice on which to base an audit and certification process for assessing the trustworthiness of digital repositories. The scope of application of this document is the entire range of digital repositories. At the very basic level, the definition of a trustworthy digital repository must start with 'a mission to provide reliable, long-term access to managed digital resources to its Designated Community, now and into the future" (RLG-OCLC, 2002).

Table 1: Components of a trustworthy digital repository

Component of a trustworthy digital repository	Procedures that:
A mission statement	"reflects a commitment to the preservation of, long term retention of, management of, and access to digital information" (ISO, 2011)
Preservation Strategic Plan	"defines the approach the repository will take in the long-term support of its mission, collection, policy or other document that specifies the type of information it will preserve, retain, manage and provide access to" (ISO, 2011)
Organization of structure and staff	"identified and established the duties that it needs to perform and shall have appointed staff with adequate skills and experience to fulfill these duties, the appropriate number of staff to support all functions and services, in place an active professional development program that provides staff with skills and expertise development opportunities" (ISO, 2011)
Procedural accountability & preservation policy framework	"identified and established the duties that it needs to perform and shall have appointed staff with adequate skills and experience to fulfill these duties, the appropriate number of staff to support all functions and services, in place an active professional development program that provides staff with skills and expertise development opportunities" (ISO, 2011)
Contracts, licenses, & liabilities	"mechanisms for review, update, and ongoing development of its Preservation Policies as the repository grows and as technology and community practice evolve, a documented history of the changes to its operations, procedures, software, and hardware, commit to transparency and accountability in all actions supporting the operation and management of the repository that affect the preservation of digital content over time, define, collect, track, and appropriately provide its information integrity measurements., commit to a regular schedule of self-assessment and external certification., have short- and long-term business planning processes in place to sustain the repository over time, have financial practices and procedures which are transparent, compliant with relevant accounting standards and practices, and audited by third parties in accordance with territorial legal requirements, have an ongoing commitment to analyze and report on risk, benefit, investment, and expenditure (including assets, licenses, and liabilities)" (ISO, 2011)
Digital object management, acquisition of content	"maintain appropriate contracts or deposit agreements for digital materials that it manages, preserves, and/or to which it provides access" (ISO, 2011)
Infrastructure and security risk management, technical infrastructure risk management	"identify the Content Information and the Information Properties that the repository will preserve" (ISO, 2011)

There are a lot of handbooks, sources in order to build digital repositories, to ensure conservation, preservation, development, there are standards of accreditation and audit of trustworthy digital repositories. The documentation is at hand for everybody who is interested in the issue. Who will be the specialists working in these repositories and will they achieve all the presented desiderates? Will they be specialists in science of information, IT staff, technical staff? Who will be attracted to getting specialized and running a career in this field? Will they need a special training? Who will be their trainers?

3. **Analysis of staff competencies involved in digital repository management, manners of professional training for such personnel, existing Life Long Learning training offer.**

3.1 Situation in international context

The synchronization of educational offer with the present necessities for aggregation, dissemination and preservation of digital information represents the concern of many universities (Zuccala, 2008).

The programs which offer an answer to these necessities have led to the transformation of the domains that traditionally deal with informational management such as science of libraries, science of archives and science of museums. Thus, under the concept of sciences of information, there have been initiated, by higher education institutions of tradition from Europe and the United States of America, the so-called iSchools – Schools of Information, which reunite, under the same curricula, elements specific to LAM (Libraries-Archives-Museums). The most visible examples are:

- master degree program of Illinois University with data processing specialization: The Data Curation Education Program (DCEP);

- master degree program of Syracuse University - The Master of Science in Information Management with Data Management Specialization program of thorough studies which is offered by WISE consortium – Web-based Library science Education

- Leif Kajberg, Leif Lørring (2005). *European curriculum reflections on Library and Library science education.* Copenhagen: Royal School of Librarianship and Library science. available at http://www.library.utt.ro/LIS_Bologna.pdf

- SCONUL Task Force on Information Skills (1999). *Information Skills in Higher Education.* London: Society of College, National and University Libraries. available at http://www.sconul.ac.uk/groups/information_literacy/papers/Seven_pillars.html

-Kings Royal College, London (Jacobs) (Cockburn) (Jones) (2011) *Digital Asset Management,* available at:

http://www.kcl.ac.uk/prospectus/graduate/details/name/digital_asset_management/alpha/d/header_search/

Analysing the educational offer and taking into account the Romanian specific, especially the situation of Transilvania University of Brasov, there has been proposed a program of specialization in the field which is developed within the Faculty of Mechanic Engineering, Mechatronics specialization.

3.2 Description of the program proposed by Transilvania University of Brasov

Mission: The complementary master program **ADVANCED SYSTEMS FOR LIBRARIES, ARCHIVES AND MUSEUMS, ASLAM,** aims at developing some formative programs and research

programs in order to obtain in-depth information in the trans-disciplinary subfields of Mechatronics engineering in accord with the modern tendencies of technique and ensuring a synergetic combination between mechanics of precision, electronic systems of command and control, and computer science, which serves to projecting, achieving, putting into function and exploring intelligent automated systems.

The disciplines proposed in the education plan for **ASLAM** specialization have in view completing the fundamental knowledge the students gain during their undergraduate studies (specializations *Mechatronics, Sciences of Libraries and Information, Sciences of Archives and Museums, Computer Science, Marketing* and so on) (Table 2).

Table 2: Objectives and competences for master degree students

Specific objectives of training	Specific competences	Disciplines
For didactic activities Studying thoroughly and completing the knowledge previously gained, necessary to obtaining a higher level of training, so that the graduates will be able to act in decisional jobs as well; Building skills and abilities which should allow the graduates to apply their knowledge and to achieve professional activities in fields and subfields specific to Mechatronics engineering with applications in LAM; Building a systematic thinking on functioning and behavior in exploiting some other types of systems assimilable to mechatronic systems with applications in LAM.	· Studying thoroughly the latest methodologies and technologies used in Mechatronics engineering or which have clear perspectives to be used in the near future. · Capacity of applying theory in specific situations of economic and institutional environment. · Using methods of experimental analysis in Mechatronics engineering. · Competences regarding measurements, automated data gathering, results analysis. · Competences regarding the principles that are at the basis of quality management of production, projection and research. · Competences regarding conception and improvement of the machines and equipments specific to the field. · Using various settings of programming in order to solve the issues of Mechatronics engineering with applications in LAM. ·	Factors of information support degrading
		Apparatus used in publications repositories
		Apparatus and security systems used in LAM
		Archives management
		Conservation through digitization
		Informatics technologies for managing documents in LAM
		Processing contemporary documents
		Informatics technologies applied in documentary structures
		Databases used in managing LAM
		Treatments of conservation
		Management of info-documentary structures for preserving publications
		Systems and technologies applied in LAM automation
		Calibration and maintenance of the apparatus destined to publications conservation
		Patrimony values from archives, libraries and museums
		Achieving web pages
		Management of the projects in LAM
		Systems of cultural animation used in LAM
		Multimedia equipments used in LAM
		Optic systems of documents recognition
		Marketing research with applications in LAM
		Software products of archiving and conserving information
		Copyright in informational society
		Management of digital repositories

It is to be done by approaching some complementary themes that aim to domains of science with high performances in the implementation of new technologies, usage of technologies of traditional and digital conservation, usage of RFID technology in the systems of patrimony security and inventory, in the management of documents and vending machines for checking and borrowing, usage of the software products for archiving, stocking and management of documents and displayed objects. The graduates should finally be able to organize, access and disseminate databases, to organize digital repositories, to archive collections of traditional documents observing the legislation, to make marketing research surveys in order to identify the users and clients' needs, to organize cultural events, to promote institution, to preserve the traditional and electronic documents. They should also be able to develop their theoretical knowledge in the field and to develop their competences regarding the usage of apparatus that are destined to measure the variables of factors that are noxious to documents conservation under good circumstances, to maintain these apparatus, to calibrate them and to measure variables, to maintain variables, conditions, treatments applied to damaged documents, to archive documents and ensure optimal conditions for the preservation of traditional and electronic documents.

3.3 Qualitative marketing research survey on the options of engineering and library sciences graduates, class 2011, regarding the educational offer

The survey was carried out in March-April 2011 and addressed to the graduates class 2011 from specialization Sciences of Libraries and Information, day and distance learning courses, as well as to the graduates of Mechanics engineering, day courses, Mechatronics specialization.

The research promotion was made on the email addresses of students groups, by sending them the following message: "We are kindly asking you to answer the following questions of the online questionnaire in the above link. Your contribution is important in the university decision of starting to make the steps for establishing this new specialization: MASTER DEGREE OF SPECIALIZATION IN ADVANCED SYSTEMS FOR LIBRARIES, ARCHIVES and MUSEUMS – LAM, at http://www.surveymonkey.com/s/3PMSGVJ".

Hypothesis of research:

⟩ Any company, institution, library, museum has a digital archive (documents that are stocked and archived electronically)

⟩ There must be trained specialists for forming, conserving and preserving digital archives or digital repositories.

⟩ There must be trained specialists for traditional conservation of the documents in repositories using technical apparatus of measuring and maintaining constant temperature, admitted luminosity, relative humidity of the environment etc.

⟩ There must be trained specialists for projecting, launching and functioning of equipments and software products specific to digitization, securing, RFID, vending machines of documents transport.

⟩ MANAGER OF DIGITAL REPOSITORY should be introduced in jobs classification book and there should be observed the standards stipulations regarding the audit and quality of digital repositories.

The questionnaire had 10 questions, out of which one represented the respondents' characterization. The graduates who answered were 40 out of 75 from engineering, therefore 51% and 42 out of 69 from the science of libraries, therefore 61%. The research is validated from the point of the number of respondents and gender issues.

Results of research:

We are presenting the questions and graphics of answers for the students from engineering – ENG and of those from Library Science- LIB, excepting the questions of characterization.

1. Have you ever accessed digital libraries in your personal activity or for studying necessities?

☐ 1. Only digital libraries

☐ 2. Traditional and digital libraries
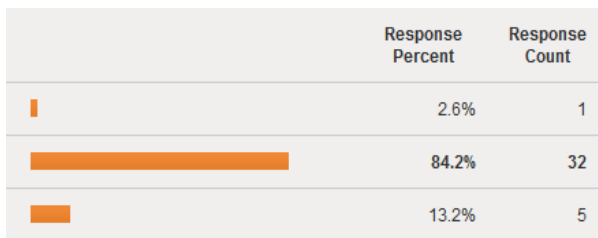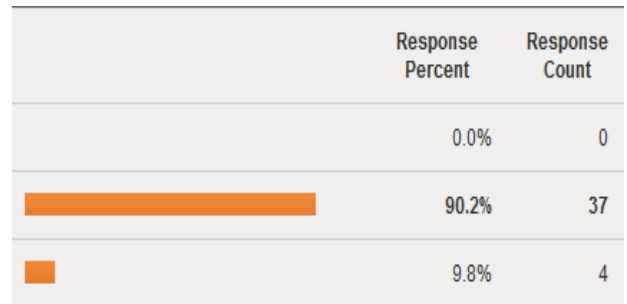
☐ 3. I have never accessed them

	Response Percent	Response Count
▪	2.6%	1
▬▬▬	84.2%	32
▬	13.2%	5

Figure 1: ENG opinion to question 1

	Response Percent	Response Count
	0.0%	0
▬▬▬	90.2%	37
▪	9.8%	4

Figure 2: LIB opinion to question 1

Concerning the libraries accessing for study necessities, 84.2 % of students from engineering and 90.2% of students from science of information accessed these libraries which were both traditional and digital (Fig.1, Fig.2).

2. Do you think that the profession of manager of digital platforms represents a future profession and may it be frequent on labor market in the future?

☐ 1. Yes

☐ 2. No

☐ 3. I do not know

☐ 4. It is no need to specialize in this job

	Response Percent	Response Count
▬▬▬	78.9%	30
	0.0%	0
▬	21.1%	8
	0.0%	0
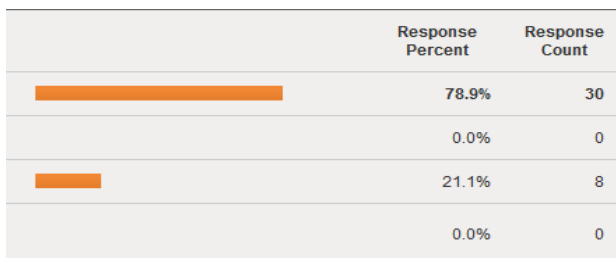
Figure 3: ENG opinion to question 2

	Response Percent	Response Count
▬▬▬	90.2%	37
	0.0%	0
▪	9.8%	4
	0.0%	0
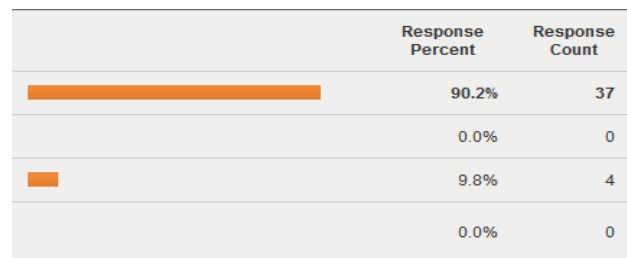
Figure 4: LIB opinion to question 2

78% of students from engineering and 90.2% of students from science of information think that the Manager of digital repository represents a job for the future (Fig.3, Fig.4).

3.   In which of the subjects proposed for this master degree are you interested to study?
1- Great interest, 2- Medium interest, 3- I am not interested

	1	2	3
Factors of degrading the information support	☐	☐	☐
Apparatus used in publications repositories	☐	☐	☐
Security apparatus and systems used in LAM	☐	☐	☐
Archives management	☐	☐	☐
Conservation through digitization	☐	☐	☐
Computer technologies for managing the documents in LAM	☐	☐	☐
Processing contemporary documents	☐	☐	☐
Computer technologies applied in documentary structures	☐	☐	☐
Databases used in managing LAM	☐	☐	☐
Conservation treatments	☐	☐	☐
Management of info-documentary structures for preserving publications	☐	☐	☐
Systems and technologies applied in LAM automation	☐	☐	☐
Standardization and maintaining the apparatus destined to conserving publications	☐	☐	☐
Patrimony values from archives, libraries and museums	☐	☐	☐
Achieving web pages	☐	☐	☐
Projects management in LAM	☐	☐	☐
Systems of cultural animation used in LAM	☐	☐	☐
Multimedia equipments used in LAM	☐	☐	☐
Optical systems of documents recognition	☐	☐	☐
Marketing research surveys with applications in LAM	☐	☐	☐
Software products of archiving and conserving information	☐	☐	☐
Copyright in informational society	☐	☐	☐
Management of digital repositories	☐	☐	☐

Figure 5: Electronic questioner, question 3

The students' interest in the disciplines proposed for the future curricula, resulted from research, is the following:

Table 3: Students' opinions regarding disciplines to be studied to master degree

The disciplines that represent the highest interest for the students from **engineering** are:
− **Optic systems of recognizing characters – 71.1%**
− Conservation by digitization - 68.4%
− Software products of archiving and conserving information – 65.8%
− Patrimony values in LAM – 51.4%
− Achieving web pages – 51.4%
− Management of digital repositories – 50%.
The disciplines that represent the highest interest for the students from **library science** are:
− **Archiving software products – 75%**
− Management of digital repositories – 73.7%
− Conservation by digitization– 69%
− Achieving web pages– 66%
− Projects management in LAM – 65.7%

4.   What other subjects would be of interest to you?

The students from engineering proposed the following disciplines as well:
− **Techniques of security against electronic theft.**
− Architectural and managerial design of modern libraries
− Appreciation and promotion of publications
− A course about the ways of archiving, stocking and maintaining records, photos, processed or non-processed films (other sources of information than books).
The students from library science proposed the following disciplines as well:
− Informatics technologies applied in documentary structures, Achieving web pages, Software products of archiving and conserving information
− Factors of information support degradation
− **Methods of press monitoring, Legislation on culture**
− Marketing, Writing appearance (discoveries)
− Restitution of patrimony values

	A course on the old book
	Modern methods of readers' drawing towards library; Digital repositories- easy access
	Practicing on the elaboration of projects for financing libraries and museums. School psychology
	Research methods and methodologies in sciences of communication
	Open access to information through digital repositories
	Disciplines connected to archives.

5. The teaching staff who will teach these subjects will belong to the following fields: Letters - LT, Sociology - SO, Engineering - ENG, Law - L, Computer Science - CS. Allocate 100 points to these fields in accord with the weight of the disciplines that you think are more useful in this specialization

Response Average	Response Total	Response Count
21.37	748	35
14.57	510	35
21.86	765	35
12.71	445	35
28.86	1,010	35

Figure 6: ENG opinion to question 5

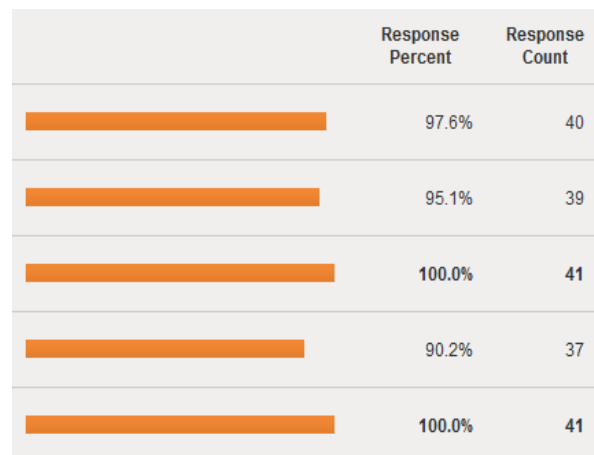|	Response Percent	Response Count
	97.6%	40
	95.1%	39
	100.0%	41
	90.2%	37
	100.0%	41

Figure 7: LIB opinion to question 5

Regarding the weight of disciplines field from the proposed curricula, the students from engineering want that the disciplines in the computer science field should have a weight of 28.06%, the ones in the engineering field 21.86%, the ones in the field of letters 21.37%, those in the field of sociology 14.57% and those in the field of law 12.1%. The students from sciences of information answered completely inexactly as they did not succeed in distributing 100 points in four fields (Fig.6, Fig.7).

6. Do you think that Transilvania University has expertise and facilities in the field and do you trust that it will be a specialization with a high level of teaching and learning?
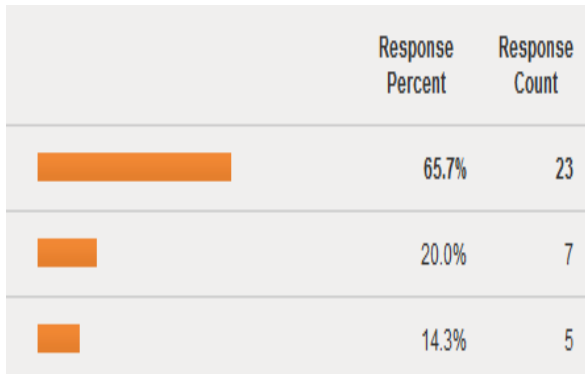**1- No, 2- Poor, 3- Medium, 4- Good, 5- High**

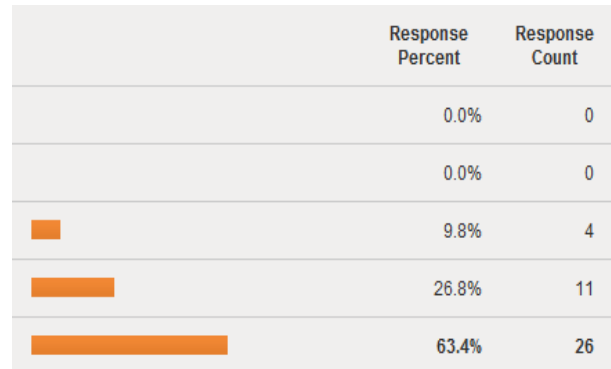
Figure 8: ENG opinion to question 5

Figure 9: LIB opinion to question 5

Concerning university expertise, 58% of the students from engineering and 63.4% of the students from sciences of information think that there will be held courses of quality and at the wanted level of technology (Fig.8, Fig.9).

7. If these courses can be carried out online and seminars can be web-seminars through direct online interaction with the teaching staff, then would the specialization become more attractive?

☐ Yes
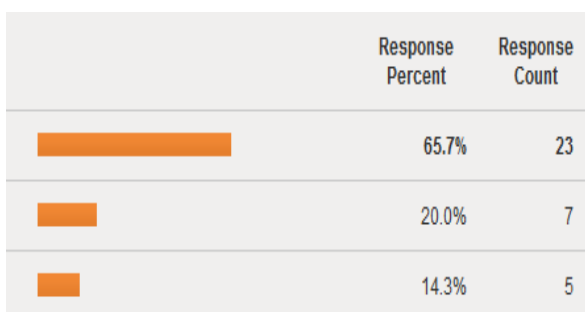
☐ No

☐ I do not know

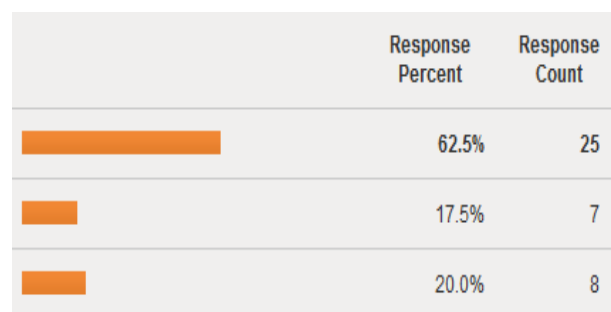Figure 10: ENG opinion to question 6

Figure 11: LIB opinion to question 6

65.7% of the students from engineering and 62.5% of the students from sciences of information think that this specialization could become more attractive if there were held web seminars and online courses (Fig.10, Fig.11).

8. Would you like to attend this specialization?
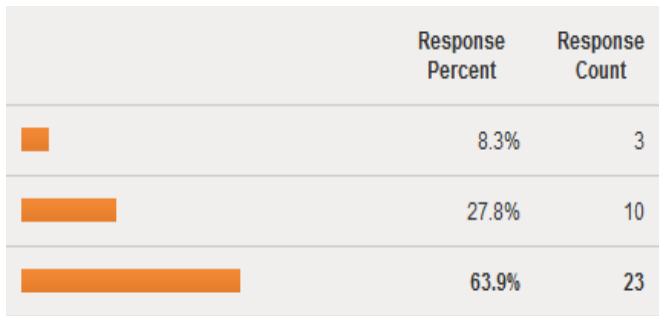
☐ Yes

☐ No

☐ I do not know

	Response Percent	Response Count
▬	8.3%	3
▬▬	27.8%	10
▬▬▬▬	63.9%	23

Figure 12: ENG opinion to question 7

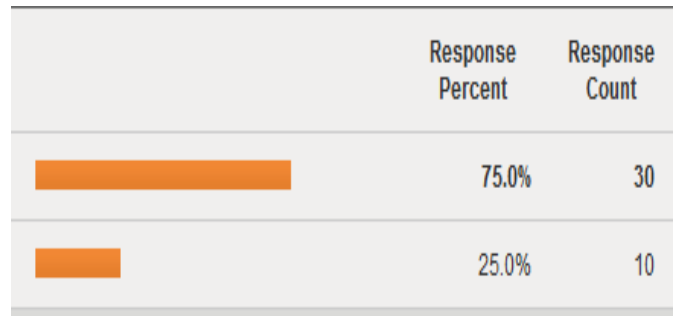|	Response Percent	Response Count
▬▬▬▬	75.0%	30
▬▬	25.0%	10

Figure 13: LIB opinion to question 7

Only 8.3% of the students from engineering will attend this specialization, while 75% of the ones from sciences of information are interested in becoming master degree students (Fig.12, Fig.13).

9. If you did not choose this specialization, what would be the reasons?

☐ I want to attend another specialization

☐ I do not have financial resources

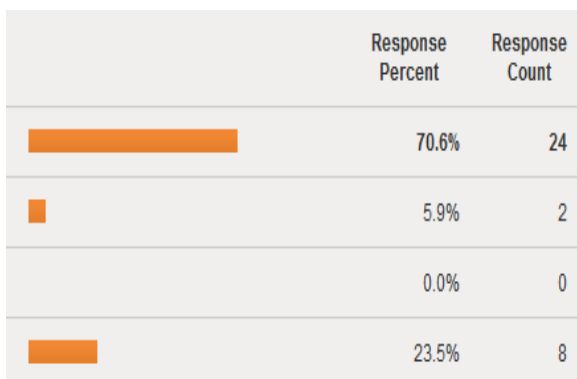☐ I do not like the oferred structure

☐ Other

	Response Percent	Response Count
▬▬▬▬	70.6%	24
▪	5.9%	2
	0.0%	0
▬▬	23.5%	8

Figure 14: ENG opinion to question 8

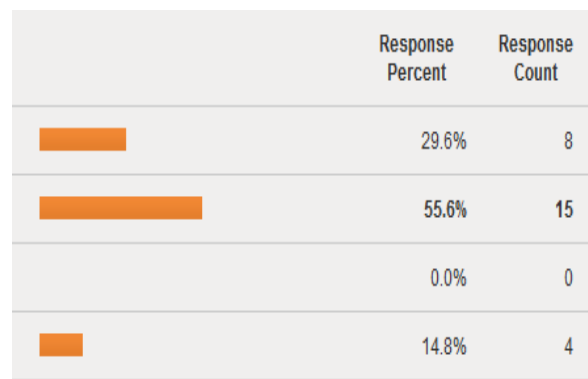|	Response Percent	Response Count
▬▬	29.6%	8
▬▬▬	55.6%	15
	0.0%	0
▬▬	14.8%	4

Figure 15: LIB opinion to question 8

Out of the ones who do not want to attend this specialization 70% of the students from engineering wish another specialization and 55% of the ones from sciences of information do not have financial resources (Fig.14, Fig.15).

Conclusions

The majority of students accesses traditional and digital libraries for their study necessities and think that the profession of manager of digital repositories represents a job of the future. Both ENG and LIB students are interested in the following courses: *Conservation by digitization* and *Achieving web pages*. The students from ENG are interested in *Techniques of security against electronic theft*, while the LIB students are interested in *Methods of press monitoring, Legislation on culture.*
Most of them prefer the master degree should carry out through web seminars and online courses. The LIB students want to attend this specialization while very few ENG students are interested in this specialization because they want to attend another specialization. All the students agree at and like the offered structure.
From my didactic experience, teaching at both Library Science specialization and Engineering, Mechatronics specialization, I can state that the graduates of Library Science are not prepared for such a responsibility and do not possess IT competences in order to master the problems. The Engineering graduates are capable to develop these repositories, to further train and to build trustworthy repositories but they do not have abilities regarding information organization, indexation elements, thesaurus, bibliographic description, and they are not attracted by this domain. What is to be done?

- Involving all the decisional factors to make educational decisions for training the basic specialty staff in informational society;
- Offering post-university courses, i-courses, to which all the graduates can have access whatever the profile they attended but who are involved in developing digital repositories;
- Offering training courses for the persons who have already been working in the field;
- Involving professional associations in promoting and carrying out these courses;
- Making all responsible factors aware of the future of this profession.

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