OPTIMIZATION PROPOSAL FOR BIBLIOGRAPHIC RESOURCES MANAGEMENT OF DOCTORAL SCIENTIFIC RESEARCH PROJECTS

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Abstract:

General skills of computer usage and specific knowledge of applying some software are very important for a PhD student's time management. To be effective in our research we need efficient management of all bibliographical sources that we work with throughout the project. There are many proposals on how to index and analyse resources.

We have built a useful strategy that it doesn't depends by one software only, it is free and we think that it is very effective in the management of information with which we operated until now to achieve doctoral thesis. In this paper we describe how we integrated efficiently into our strategy functions of software for Android platform (Adobe Reader, Google Translate) and software for Windows 7 (Adobe Reader, Capture2Text, Microsoft Excel).

We believe that the method used by us increases the efficiency of the management of bibliographic sources and the process of editing the necessary materials for research. Also, the use of software on Android platform provides a viable working solution when we do not have a computer with us.

Key words: research, optimization, project, management, references.

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INTRODUCTION

General skills of computer usage and specific knowledge of applying some software are very important for a PhD student's time management. A sufficient amount of IT knowledge along with an appropriate planning of interdependencies that are created between specialized and technical requirements it is mandatory in order to achieve scientific product in a short amount of time.

Bibliographic information for a research project is practically limitless considering today's technology. Storage in both computer and library shelves will fill quickly. However, the biggest problem it is not the storage space. The biggest problem is the multiple bonds of interdependence existing between all sources of information and the need to access accurately, if necessary, any part from any source you found it.

We all know that resources will not be accessed only once in the process of research. During the development process of our work we need to go back several times to some bibliographic sources and sometimes we have to find the page that contains the sentence we quoted to reconsider all the information preceding a paragraph. Writing only the title and author of the reference is not enough to help us find that source after several weeks or months (Literature searching for dissertations in Management and Business, 2011).

To be effective in our research we need efficient management of all bibliographical sources that we work with throughout the project. There are many proposals on how to index and analyse resources. Virtually, every researcher has a preferred strategy. Whichever we use, it should help us to organize our resources in order to process and retrieve information efficiently and with a time record.

Multiple databases give us the possibility to search by keywords and export the results in a variety of ways (Bridle, 2014). Software for this kind of management occurs periodically (Data

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management tools, 2014), such as, for example OpenRefine (an open-source program that helps us manage the information) and SQLShare (a site that helps us organize data in a ".csv" file to use them with Microsoft Excel).

Microsoft Word helps us manage bibliographic sources through the "Manage Sources" function. This function is very useful for entering text references and for automatic bibliography (Bridle, 2014).

There are, also, programs that propose complete solutions. Through the interface of such software we can even search directly into online databases. Some software is capable to index sources downloaded and to build a database even with sources from our PC. There is even software free of charge, such as Mendelay and Zoter (Bridle, 2014). Some programs have to be purchased with money, such as RefWorks and EndNote (Bridle, 2014).

When you choose a complete solution, especially if you have to pay for it, you must inform as well as possible about the features they offer. Complex software comes with integration solutions in Microsoft Word or Microsoft Excel. We need to explore these functions to find out if they are useful for us. We have to find if the software that we want supports citation styles that we use routinely. Also, it is important to discover any limitation this kind of software has (Bridle, 2014).

For example, EndNote program has many advantages. We can search the database to save our resources, introduce text citations and references in a variety of forms, we are able to attach personal files and some other facilities (Thomson Reuters, 2014). We must be aware that even the most advanced software can give us surprises when they interact with other programs. For example, EndNote had problems integrating with Microsoft Word at every new Microsoft Office update, as some users explain on some forums (The Art of Organizing Your Literature, 2014).

DISCUSSIONS

We have built a useful strategy that it doesn't depends by one software only, it is free and we think that it is very effective in the management of information with which we operated until now to achieve doctoral thesis. We'll present this in detail hoping that what was useful for us can help other researchers in their efforts.

Bibliographic data collection can begin on the Internet, at the central library or even personal library. No matter where we begin to gather information is very important that for each source found to assign a unique identification code. For example, all our books are coded like CA001, CA002, CA003, etc. The letters "CA" come from Romanian carte (book). All our items are coded like AR001, AR002, AR003, etc. It is not mandatory to apply more subcategories of codes. We can apply something COD001, COD002, COD003, etc. regardless of the type of source references. It is mandatory that each source needs to have unique identification code.

In the following images we present our coding structure. Images were captured with "FreeScreenCapturer" software (Extensoft Inc., 2014).

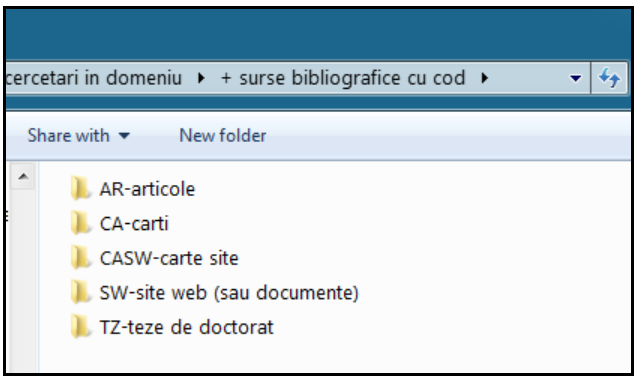


Fig. 1 - Coding structure of bibliographical sources, mainline

For quick access to any source without having to search the entire structure we recommend using a card-index file. This file we've built with the Microsoft Excel (Microsoft Corporation, 2014). The file has multiple pages that are actually equivalent for branches in our coding structure (see Fig. 3).

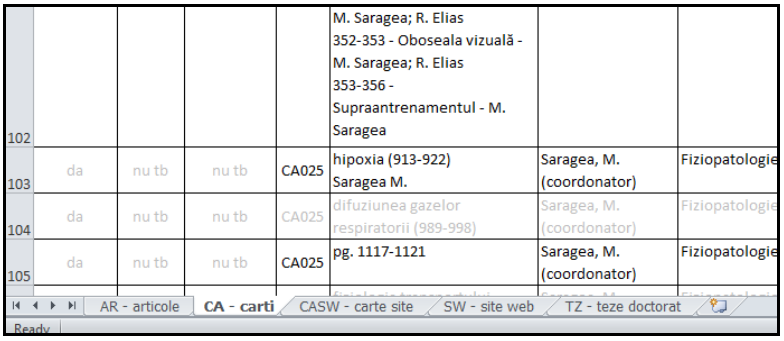


Fig. 3 - The structure for our card-index file

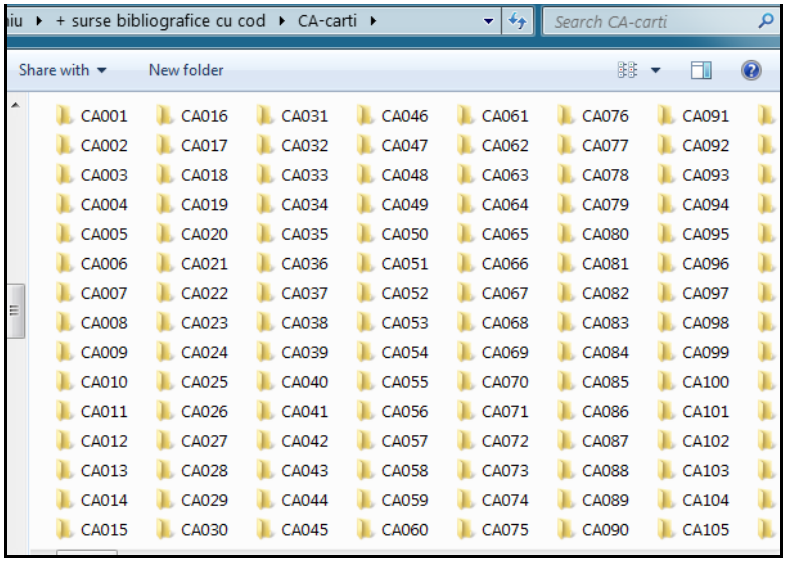
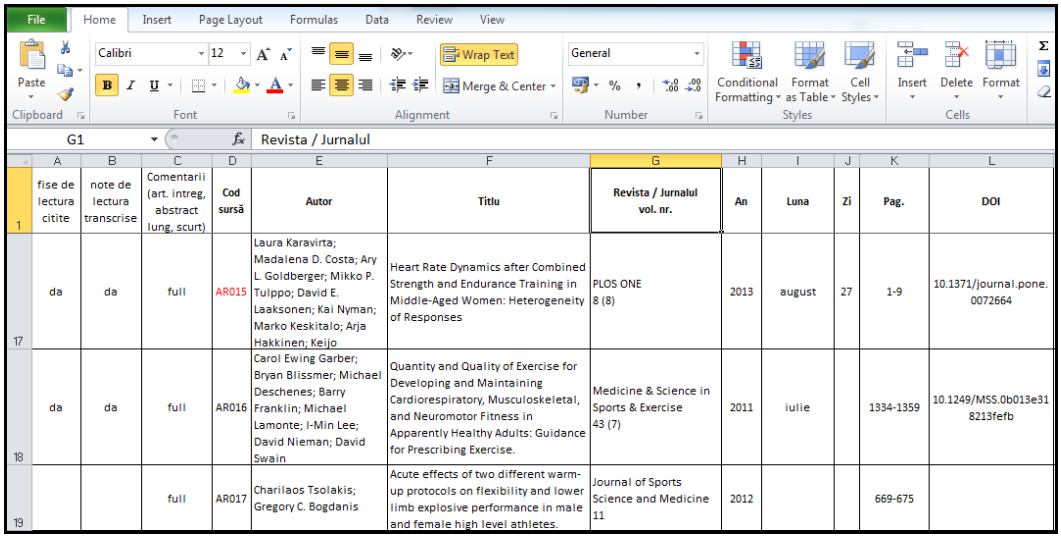


Fig. 2 - Bibliographic sources coding structure, branch CA

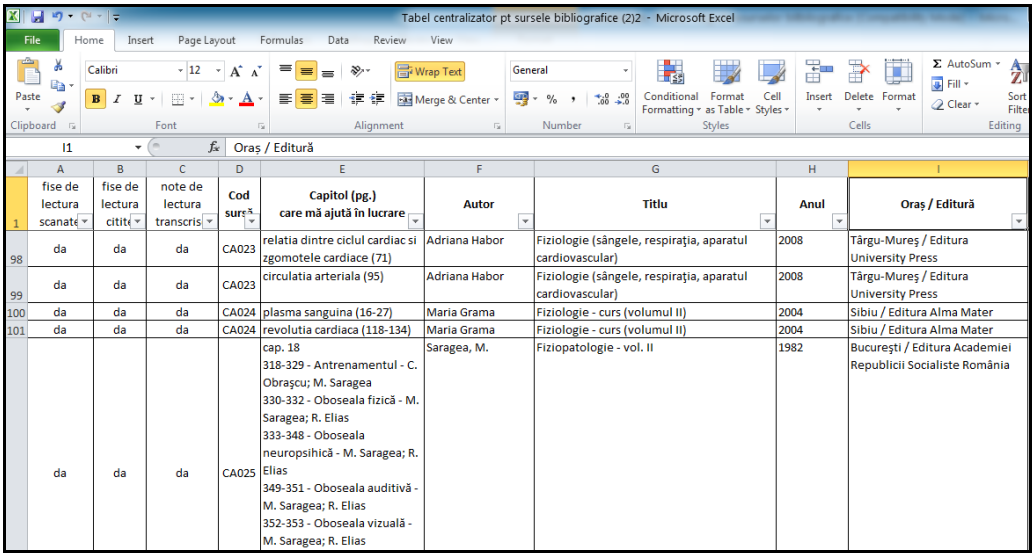
What should we write in this table? We recommend the construction of the table depending on the necessary elements required by the writing style, plus a few columns that help us to easily track and manage records and keep track of our progress. We work with the APA style (American Psychological Association) (American Psychological Association, 2014). Therefore, the most important columns for articles are (see Fig. 4): reading cards that we have read, lecture notes (transcribed or not), comments about the source (if only abstract or full), source code, author, title, journal, year, month, day, number of pages and digital identification number (DOI).



	A	B	C	D	E	F	G	H	I	J	K	L
1	fise de lectura citite	note de lectura transcrise	Comentarii (art. intreg, abstract lung, scurt)	Cod sursă	Autor	Titlu	Revista / Jurnalul vol. nr.	An	Luna	Zi	Pag.	DOI
17	da	da	full	AR015	Laura Karavirta; Madalena D. Costa; Ary L. Goldberger; Mikko P. Tulppo; David E. Laaksonen; Kai Nyman; Marko Keskitalo; Arja Hakkinen; Keijo	Heart Rate Dynamics after Combined Strength and Endurance Training in Middle-Aged Women: Heterogeneity of Responses	PLOS ONE 8 (8)	2013	august	27	1-9	10.1371/journal.pone.0072664
18	da	da	full	AR016	Carol Ewing Garber; Bryan Blissmer; Michael Deschenes; Barry Franklin; Michael Lamonte; I-Min Lee; David Nieman; David Swain	Quantity and Quality of Exercise for Developing and Maintaining Cardiorespiratory, Musculoskeletal, and Neuromotor Fitness in Apparently Healthy Adults: Guidance for Prescribing Exercise.	Medicine & Science in Sports & Exercise 43 (7)	2011	iulie		1334-1359	10.1249/MSS.0b013e318213fefb
19			full	AR017	Charilaos Tsolakis; Gregory C. Bogdanis	Acute effects of two different warm-up protocols on flexibility and lower limb explosive performance in male and female high level athletes.	Journal of Sports Science and Medicine 11	2012			669-675	

Fig. 4 - The card-index for articles

The most important columns for books are (see Fig. 5): reading cards scanned, reading cards read, lecture notes transcribed, source code, at what chapter helps me to my work, author, title, year, city and publisher.



	A	B	C	D	E	F	G	H	I
1	fise de lectura scanate	fise de lectura citite	note de lectura transcris	Cod sursă	Capitol (pg.) care mă ajută în lucrare	Autor	Titlu	Anul	Oraș / Editură
98	da	da	da	CA023	relatia dintre ciclul cardiac si zgomotele cardiace (71)	Adriana Habor	Fiziologie (sângele, respirația, aparatul cardiovascular)	2008	Târgu-Mureș / Editura University Press
99	da	da	da	CA023	circulatia arteriala (95)	Adriana Habor	Fiziologie (sângele, respirația, aparatul cardiovascular)	2008	Târgu-Mureș / Editura University Press
100	da	da	da	CA024	plasma sanguina (16-27)	Maria Grama	Fiziologie - curs (volumul II)	2004	Sibiu / Editura Alma Mater
101	da	da	da	CA024	revolutia cardiaca (118-134)	Maria Grama	Fiziologie - curs (volumul II)	2004	Sibiu / Editura Alma Mater
	da	da	da	CA025	cap. 18 318-329 - Antrenamentul - C. Obraşcu; M. Saragea 330-332 - Oboseala fizică - M. Saragea; R. Elias 333-348 - Oboseala neuropsihică - M. Saragea; R. Elias 349-351 - Oboseala auditivă - M. Saragea; R. Elias 352-353 - Oboseala vizuală - M. Saragea; R. Elias	Saragea, M.	Fiziopatologie - vol. II	1982	Bucureşti / Editura Academiei Republicii Socialiste România

Fig. 5 - The card-index for books

The whole structure with related categories will not be built in one day. It is important to know how we want to build it and what the relationships between its elements are. The structure will grow with the development of the research project. We recommend that each source to be passed to card-index when first encountered.

Now let's talk about how we use sources and the information they have. When our sources are articles from the internet, usually they are PDF files (Portable Document Format) which allow us to access and copy the text directly by using the known function "copy-paste". For reading and

processing information from these documents we used the free Adobe Reader XI (Adobe Reader, 2014). There are several programs that allow managing files of this type, but we will explain some useful features of this software.

While we read the article (opened with this software) we can insert notes into the document (see Fig. 6). These notes will be used in the process of writing our research paper. We have called this "reading notes".

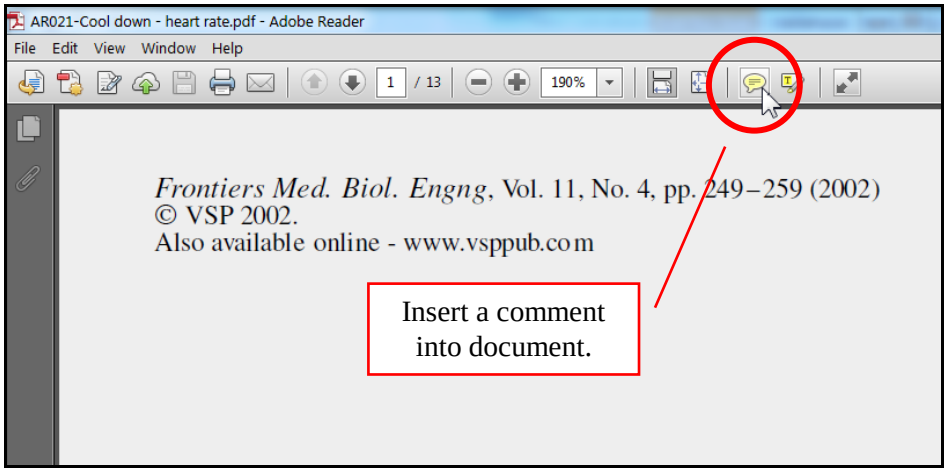


Fig. 6 - Insert a comment into document

We read the article and we take notes for what we need to build the theoretical part of our research. If our notes are no longer than one sentence than noting it is fast enough. If our notes are longer or if we want to insert a whole paragraph then we could have a problem in terms of the time required for transcription of text into written notes. Some smartphones, thanks to software developers, can help us with this problem. They have a speech to text feature. We can use this option by selecting the microphone included in the phone keypad (see Fig. 7).

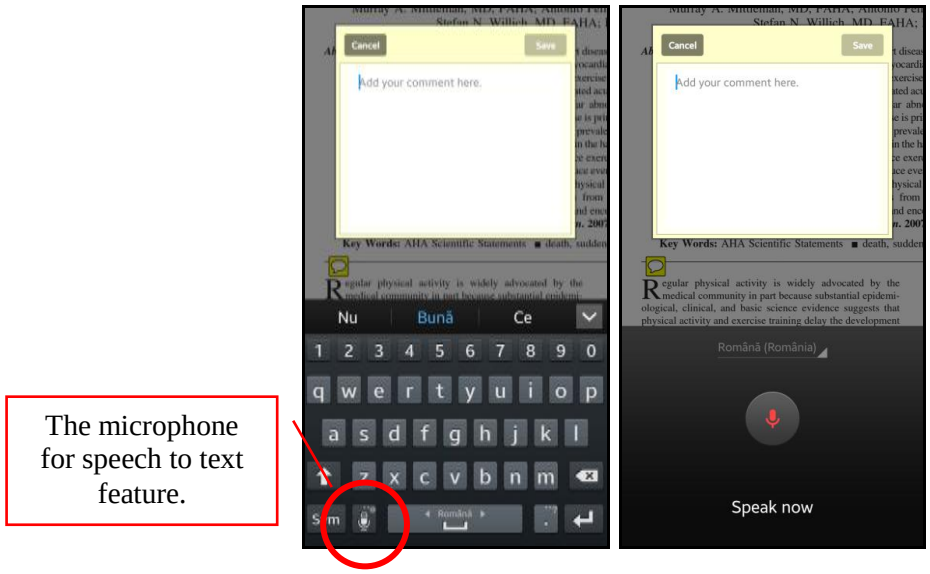


Fig. 7 - Speech to text feature

The task can be solved very quickly if we can copy text without restrictions from the .pdf format of our article. We present below two solutions to extract the text from image sources. We use these solutions when information comes in a file on which we cannot use the easy "copy-paste" feature. We present an option for those working on the Android platform (Google Inc., 2014), using a smartphone, and a second option for those who work with Windows 7 platform (Microsoft Corporation, 2014).

Extracting text from a ".pdf" file on Android platform includes the following phases:

- Open the file you wish to read with Adobe Reader for Android (Adobe Systems Software Ireland Ltd., 2014);
- Create a screenshots (with a feature of your smartphone or with specific software);
- Open Google Translate (Google Inc., 2014) and insert the screenshot created;
- Google Translate have a specific function to extract portion of text you want (for this function active internet connection is required);
- Copy the desired text in a note of your file opened with Adobe Reader for Android.

We'll explain these phases in detail.

We open the file that we want to read with Adobe Reader (Fig. 8), we take a screenshot (for Samsung smartphones, simultaneously press the button "Power" and the "Home") and open it with Google Translate, using a specific feature to insert a picture saved on your phone (Fig. 9 and Fig. 10).

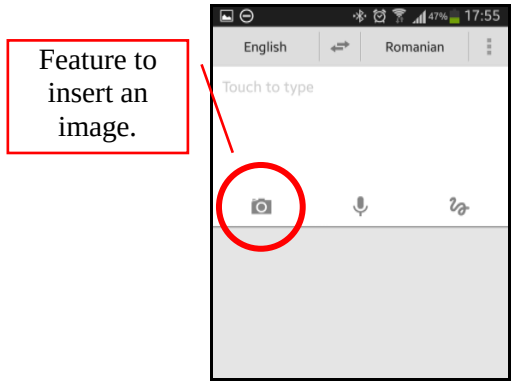


Fig. 8 - Feature to insert an image

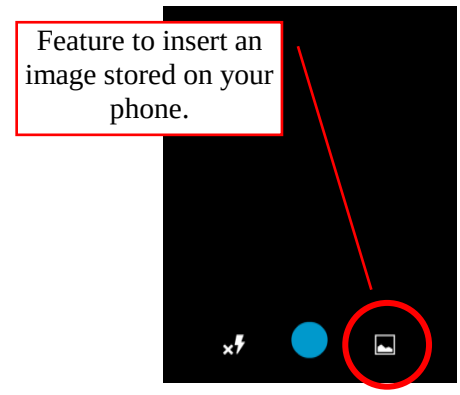


Fig. 9 - Feature to insert an image stored on your phone

After Google Translate analyses the image (Fig. 10) we must draw with one finger the zone of the image from where we want to extract the text (Fig. 11).

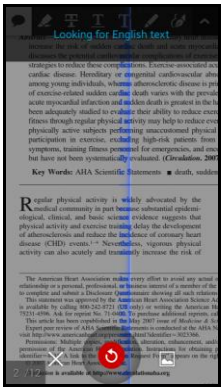


Fig. 10 - Image analysis

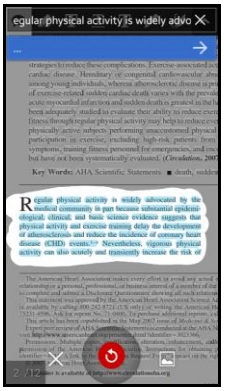


Fig. 11 - Selecting the zone of

The next step consists in copying the text extracted and insertion of a comment to file ".pdf" that we have opened with Adobe Reader (Fig. 12 și Fig. 13).

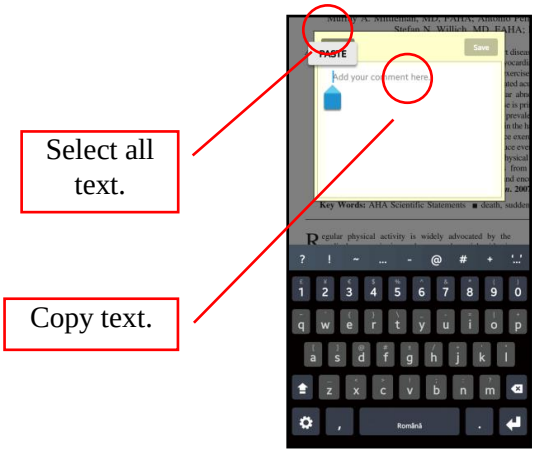


Fig. 12 - Copying the text from Google Translate

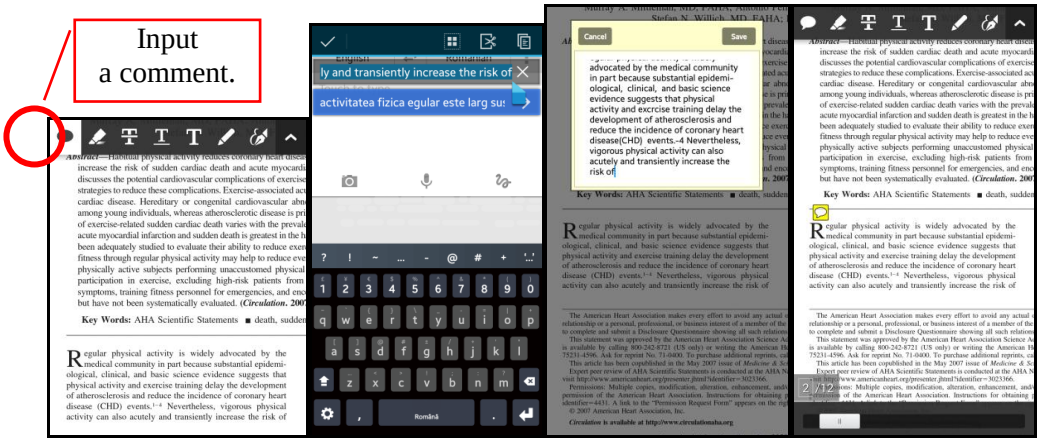


Fig. 13 - Inserting text in a note

If we work on Windows 7 and we want to extract text from a document that does not allow the use of the tool "copy-paste" then we can use the free "Capture2Text" software (Dice Holdings Inc., 2014). The steps required to create a note in the document are about the same as for the work on Android platform.

We open the desired document with Adobe Reader XI for Windows 7 and we take a snapshot for area we are interested of, using the "Capture2Text" software (see Fig. 14).

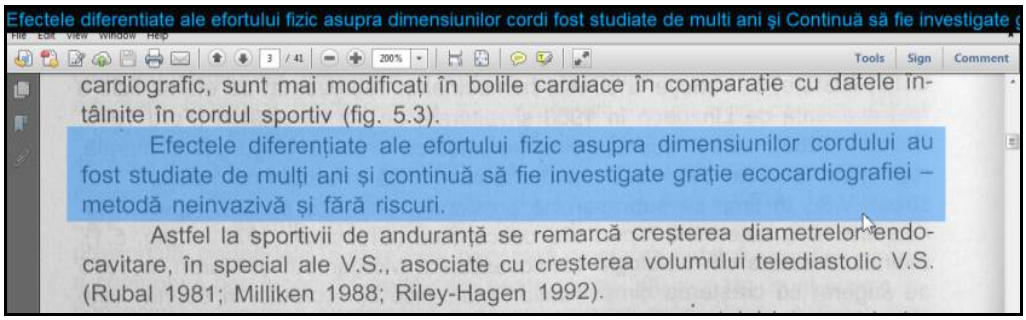


Fig. 14 - Text area snapshot

The text extracted must be tested immediately after extraction (Fig. 15), because for the Romanian language the method does not have 100% accuracy. The resulted text can now be copy to a comment into the document. When we finish reading the document we'll have our comments saved with this document.

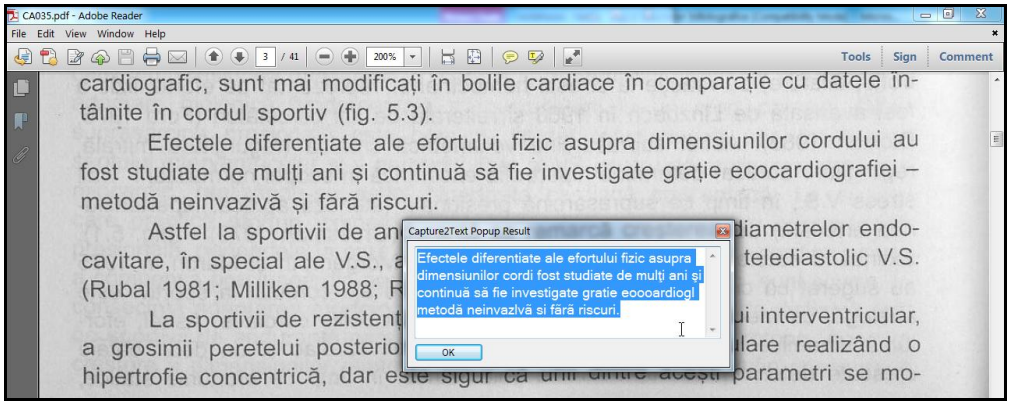
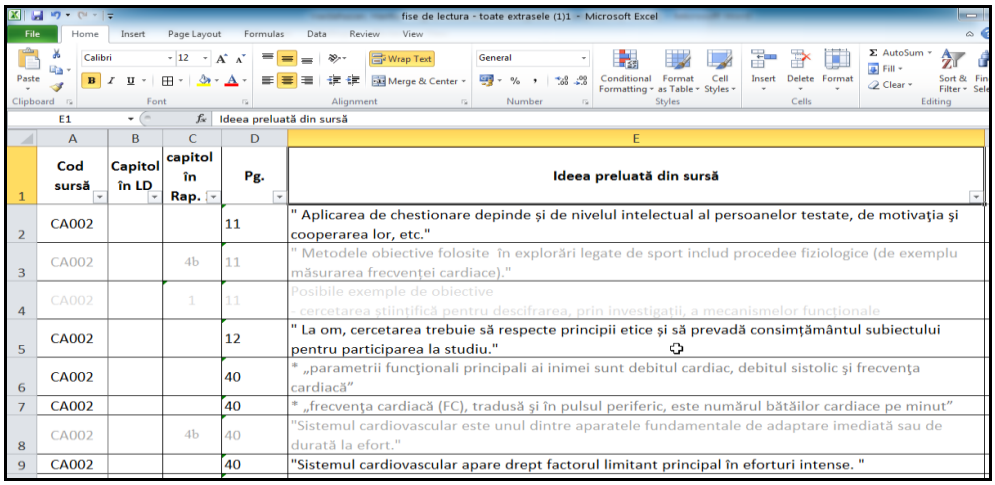


Fig. 15 - The area of text obtained from document

The next stage requires transferring the comments from sources (ideas saved while reading) into a central index for comments. We've built one using Microsoft Excel and we called it "Reading Cards - all comments" (Fig. 16). Columns included into this file are: source code, chapter into thesis, chapter into report, page, idea taken from the source, observations and, if necessary, columns with keywords.



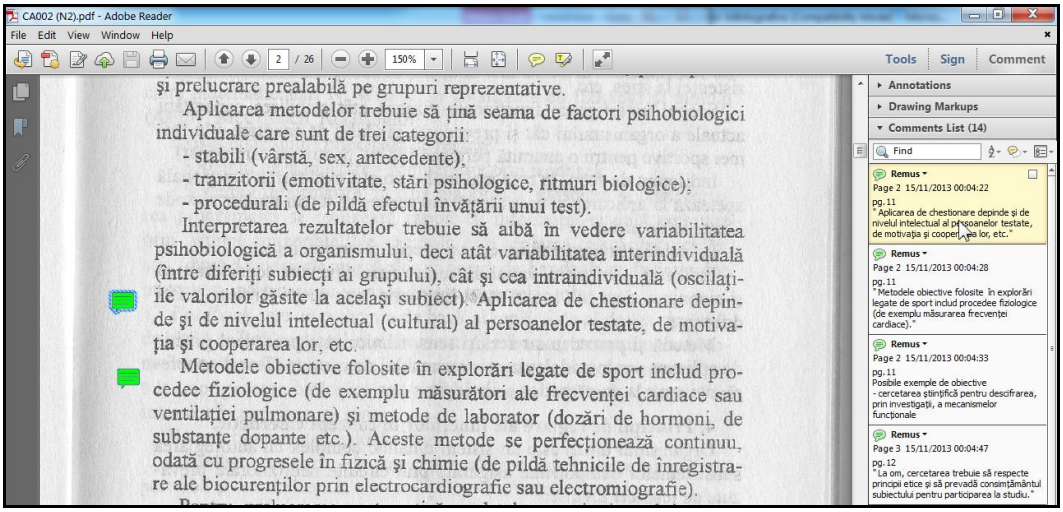
fise de lectura - toate extrasele (1)1 - Microsoft Excel

Idea preluată din sursă

	A	B	C	D	E
1	Cod sursă	Capitol în LD	capitol în Rap.	Pg.	Ideea preluată din sursă
2	CA002			11	" Aplicarea de chestionare depinde şi de nivelul intelectual al persoanelor testate, de motivaţia şi cooperarea lor, etc."
3	CA002		4b	11	" Metodele obiective folosite în explorări legate de sport includ procedee fiziologice (de exemplu măsurarea frecvenţei cardiace)."
4	CA002		1	11	Posibile exemple de obiective - cercetarea ştiinţifică pentru descifrarea, prin investigaţii, a mecanismelor funcţionale
5	CA002			12	" La om, cercetarea trebuie să respecte principii etice şi să prevadă consimţământul subiectului pentru participarea la studiu."
6	CA002			40	* „parametrii funcţionali principali ai inimei sunt debitul cardiac, debitul sistolic şi frecvenţa cardiacă"
7	CA002			40	* „frecvenţa cardiacă (FC), tradusă şi în pulsul periferic, este numărul bătăilor cardiace pe minut"
8	CA002		4b	40	"Sistemul cardiovascular este unul dintre aparatele fundamentale de adaptare imediată sau de durată la efort."
9	CA002			40	"Sistemul cardiovascular apare drept factorul limitant principal în eforturi intense. "

Fig. 16 - Reading Cards - all comments

To transfer the comments from ".pdf" document we'll open the comment column from the right side of source file (see fig. 17). We copy, one by one, all comments from our source to Excel file (the central index file), being careful to insert the correct page number from the source. We thus have all the ideas in one page.



şi prelucrare prealabilă pe grupuri reprezentative.

Aplicarea metodelor trebuie să ţină seama de factori psihobiologici individuali care sunt de trei categorii:

- stabili (vârstă, sex, antecedente),
- tranzitorii (emotivitate, stări psihologice, ritmuri biologice);
- procedurali (de pildă efectul învăţării unui test).

Interpretarea rezultatelor trebuie să aibă în vedere variabilitatea psihobiologică a organismului, deci atât variabilitatea interindividuală (între diferiţi subiecţi ai grupului), cât şi cea intraindividuală (oscilaţiile valorilor găsite la acelaşi subiect). Aplicarea de chestionare depinde şi de nivelul intelectual (cultural) al persoanelor testate, de motivaţia şi cooperarea lor, etc.

Metodele obiective folosite în explorări legate de sport includ procedee fiziologice (de exemplu măsurători ale frecvenţei cardiace sau ventilaţiei pulmonare) şi metode de laborator (dozări de hormoni, de substanţe dopante etc.). Aceste metode se perfecţionează continuu, odată cu progresele în fizică şi chimie (de pildă tehnicile de înregistrare ale biocurenţilor prin electrocardiografie sau electromiografie).

Fig. 17 - Reading card with comments

When we wish to build a chapter of the report or theoretical paper we begin by reading the notes taken from all sources that we analysed. When we find useful information for the section that we want we write the code of corresponding chapter into the column specially created for this phase (see Fig. 16, column C). This code is a code made by us in correspondence with the theoretical structure that we want to draw up (see Fig. 18). In our example it is part of the theoretical background for our research.

Perspectiva antrenamentului cu greutăți în fitnessul personal	generale (timp liber, wellness, health)		2
	accepțiune + componentele fitnessului		2a
	importanța componentei musculare		2b
	reglementări în domeniu general și pe componenta musculară - ACSM		2c
Antrenamentul cu greutăți pentru populație	scurt istoric (AcG - scurt istoric)		3a
	beneficii generale (AcG - perspective benefice)		3b
	aspecte specifice (prezentare generală)		3
	ședința de antrenament pt. AcG	generale	3c
		POE (warm-up)	3ca
		p. fundamentală	3cb
		LOE (cool-down)	3cc
		câteva considerații privind protejarea practicanților	3d

Fig. 18 - Outline for theoretical background used in our research

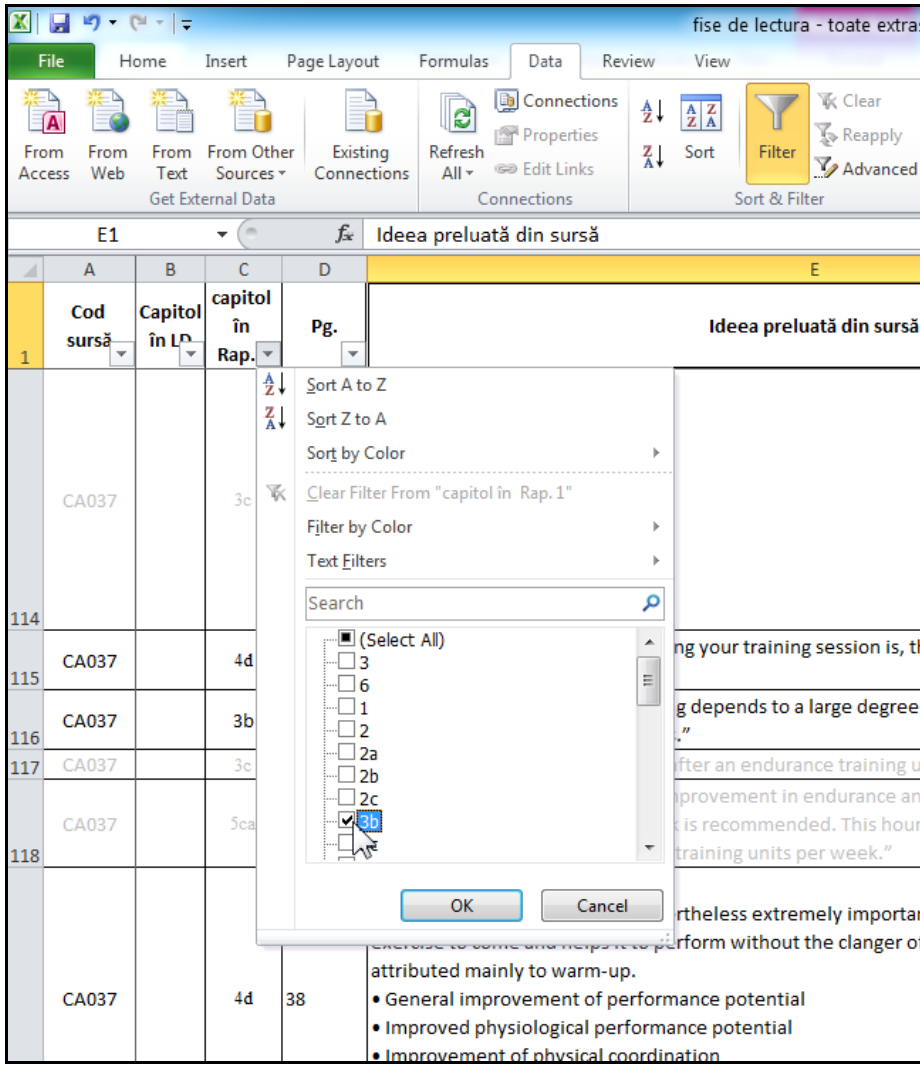


Fig. 19 - The filter option for reading notes

Once you use a particular note, in order to simplify the visual field, we make that note grey shade (Fig. 16, lines 3, 4, 6, 7 and 8). If you have notes for several chapters then it means that you have more codes. In this case you can use the filtering function provided by Excel, to be able to focus only on the notes you are interested in (see Fig. 19).

In the end, we would like to summarize the steps proposed by us to optimize the bibliographic resources management of doctoral scientific research projects:

- Choose the materials you want to use as sources of inspiration;
- Create reading records for each material (in ".pdf" files) and label them with a unique code for each material;
- Build a central card-index file for your bibliographic sources;
- Read your materials and write your ideas with comments inside every ".pdf" file;
- Copy all comments to central card-index;
- Insert corresponding codes to comments depending on the structure that you outlined for your report;
- Elaborate desired chapters using filtering function provided by Microsoft Excel.

CONCLUSIONS

We believe that the method used by us increases the efficiency of the management of bibliographic sources and the process of editing the necessary materials for research. Also, the use of software on Android platform provides a viable working solution when we do not have a computer with us.

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Extensoft Inc. (2014). *Products Download*, 1.0.4.42. Retrieved April 29, 2014, from extensoft.com: http://extensoft.com/?p=downloads

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