Avdelningen för datavetenskap

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Media database with web interface for a local history society

Improvement of the previous system

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This report is submitted in partial fulfilment of the requirements for the Bachelor's degree in Computer Science. All material in this report which is not my own work has been identified and no material is included for which a degree has previously been conferred.

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Abstract

The Swedish local historical societies have collected a large amount of multimedia material such as photos, documents, video files and audio files. All these documents needed to be computerized to speed up the handling and access to the documents. As a result, anyone who wants to can access this information.

This thesis examines an existing system used by the local history societies with the intention of both improving the system and extending it to include new technology.

The result of this thesis has been an analysis of commercial alternatives such as Panoramio [5], Flickr [8], Picasa [6] and Photobucket [7] as well as identifying and making certain improvements to the existing system. It has solved some deficiencies in the old system to do with customer requests and has added other features. The result is a web application which is more intuitive and appropriate for standard users as well as users with administrator privileges.

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1 Introduction

1.1 Dissertation overview

This documentation shows and explains in detail all the improvements made to the previous project "Mediadatabas med webbgränssnitt åt hembygdsförening" created last year by two students from the University of Karlstad. Maintenance is carried out by the “Nyeds hembygdsförening” (The Local History Association in Nyed) [1] in Molkom, Värmland, Sweden.

The project is a non-commercial web portal that serves as storage media for various formats such as images, documents, audio and video files for two Local History Associations. The website has a user interface which allows searches on different types of files in the database by setting different patterns of search and display. In addition, there is an administrative interface which allows the insertion, modification and deletion of new files to the system, with associated data such as titles, labels, albums, comments or locations. Both interfaces are connected to a common database and have been developed to provide an intuitive and simple interface for both the general user and administrators.

This project has involved studying the existing system, created in 2009 by two students from Computer Science at Karlstad University as a C-level dissertation project and consultations with the History Association about how to further develop the system. In the course of this project, a testbed system has been developed for development and upgrades have been made to the current on-line system.

1.2 Chapter layout

The layout of this report is as follows:

- Section 2 of this report discusses the project background where general concepts needed to understand the development of the current project are presented. In this section several existing systems are shown with a similar functionality to that which has been developed in this project.

- Section 3 is an analysis and evaluation of the existing system where different aspects and issues are discussed in order to prepare the way for the next stages of the project. A priority list of solutions was prepared, taking into consideration our points of view and those of the client (The Local History Association in Nyed).

- Section 4 consists of all the upgrades and improvements which were made to the system. It contains a detailed explanation about the different levels of items i.e. the improvements to be made to the existing systems proposed by the customer: priority items and low priority items.

- Section 5 is the evaluation of the project where the process of learning at the beginning of the work and the development of this work is presented.

- Finally section 6 presents the conclusions of the project including an overview of the updated system.

2 Project Background

2.1 Introduction

This dissertation describes how to improve the Nyeds hembygdsförening's (The Local History Association in Nyed) online system albums which are a storage place where photos are stored in an expository form to be displayed later by users. That system was created in 2009 by two students of Karlstad University [1].

Several free and commercial options which can be applied are shown below to have a clearer overview of existing technologies and opportunities provided by each one.

Figure 1: Conceptual diagram of the system

2.2 The previous system

In the previous system implemented by students in 2009, the basic function of the system shows the pictures stored in the database of the Local History Association in Nyed in a reasonably simple way for the users.

In the web portal different existing albums are shown and the user can perform searches in the album with both normal and advanced searches giving a series of values to fields in order to filter certain desired results. For the visualization of these pictures there is a paging system and the possibility of seeing the picture with full size by clicking on it. It is also possible to see other kinds of files such as pdf or word or audio files. In addition, the user can change the web language as well as choosing the number of files per page.

The existing system has different links such as: help, home page, contact and log in as administrator. Administrators can conduct a series of privileged tasks such as adding new files to the database, editing existing files or adding new albums.

However in this implementation there were a number of problems:

- The paging system did not work correctly (the numbering continually increased to the right).
- Links for sending comments and reading the printable version did not work.
- Help links were only in Swedish even when the user chose English.
- In the comments the carriage returns were not implemented.
- Audio files did not work when the user clicked on the corresponding icon.
- Removing tags was incorrect (all the labels with the same name were removed).

2.3 Techniques

The start point for this project is a web project created by two students at Karlstad University last year so we will follow the techniques used in creating this project which they implemented using MySQL [2] and PHP [3].

These techniques are used because they are suitable to the functionality required by such a web application project. This is an image database that will be managed and maintained through the MySQL query within a web application whose development is carried out with the corresponding PHP programming language, perfect for web page creation and allows connection different types of database servers such as MySQL.

2.3.1 MySQL

MySQL [2] is a relational database management system (RDBMS) that runs as a server providing multi-user access to a number of databases.

The MySQL development project has made its source code available under the terms of the GNU General Public Licence [41], as well as under a variety of proprietary agreements. MySQL is owned and sponsored by a single for-profit firm, the Swedish company MySQL AB, now owned by Sun Microsystems [42], a subsidiary of Oracle Corporation [43].

Free-software projects that require a full-featured database management system often use MySQL. Such projects include (for example) Word Press [35], phpBB [36] and other software built on the LAMP [37] software stack. MySQL is also used in many high-profiles, large-scale World Wide Web products including Wikipedia [44], Google [45], Drupal [46] and Facebook [47].

2.3.2 PHP

PHP [3] [4] is an interpreted language, widely used as a general purpose language and is designed to be used specifically for web development and can be embedded into HTML. It generally runs on a web server, taking PHP code as its input and creating web pages as output. It can be deployed on most web servers and on almost every operating system and platform free of charge. PHP is installed in more than 20 million domains hosted by servers with PHP installed. It is also the most popular Apache module among computers using Apache as the web server. The latest version of PHP is 5.3.1 (for Windows) on 19 November 2009.

PHP resembles the most common structured programming languages such as C and Perl, allowing most software developers to create complex applications with a very short learning curve. It also allows software developers to get involved with dynamic content applications without learning a whole new set of functions.

Although everything in its design is aimed at facilitating the creation of web page, you can create applications with a graphical user interface using PHP-Qt extension or PHP-GTK. It can also be used from the command line, in the same way as Perl or Python can do it, this version of PHP is called PHP CLI (Command Line Interface).

2.4 Existing systems

Nowadays using an Internet search, millions of hosting photographs services online may be found for example a simple search of “picture storage online” in Google.se shows us 144.000 results. These are databases for images that as well as storage facilities provide other additional services such as sharing pictures, album creation or collections and photo printing.

Among the existing systems for picture storage (Panoramio [5], Picasa [6], Photobucket [7], Flickr [8], Zooomr [9], Imageshack [10], Pickle [11], Ipernity [12] or Pix.ie [13]) four have been selected for discussion in this section, being the most used and popular or offering services that are better fitted to the requirements for this project.

2.4.1 Panoramio

Panoramio [5] is a website dedicated to exhibiting the photographs of places and landscapes that users themselves create and geo-referencing [14]. The images that meet certain requirements can be viewed through Google Earth software and Google Maps.

The goal is to allow Panoramio users of this program learn more about a specific area of the globe, looking at pictures that other users have taken there.

Advantages:

- The maps provided have many land areas covered in satellite imagery with a resolution of about 15 meters per pixel[1]. You can choose various types of maps: cartographic map, map with satellite photos and bump map (see Appendix A3).

Disadvantages:

- Every photo displayed in your site may include Panoramio's name and logo.
- Panoramio was acquired by Google on July 2007. When you use Panoramio, Google's servers automatically record certain information about your use. Similar to other web services, Google records information such as account activity

[1] A digital image is composed by squares called pixels. The more pixels an image has, the better resolution will have the image (the image will look better).

(including storage usage and number of log-ins), data displayed or clicked on (including UI links); and other log information (including browser type, IP-address, date and time of access, cookie ID, and referrer URL).

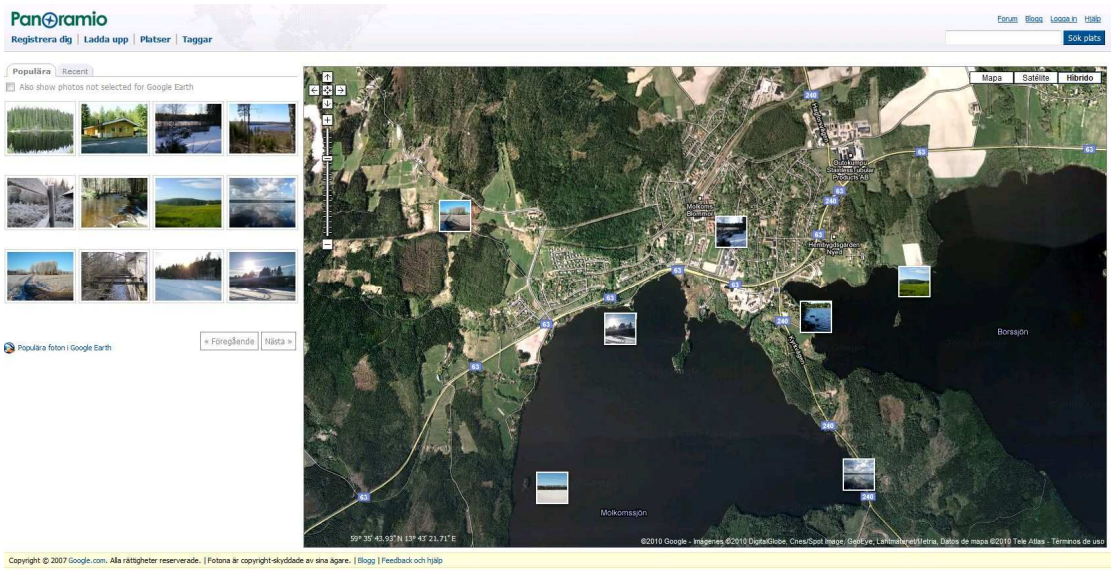

Figure 2: Molkom in Panoramio

2.4.2 Flickr

Flickr [8] is a website that allows you to store, sort, search and share photos and video online. Flickr currently has a large number of users that share pictures and videos created by them. This community is governed by standards of behaviour [16] and use conditions [17] that promote good use of content management.

Flickr's popularity is largely due to the ability to manage images using tools [18] like upload, edit, organize, share, maps, make cards, posters, calendars or keep in touch that allows authors to label their photographs and to explore and comment images from other users.

Flickr offers two kinds of accounts: free accounts and payment account (on Flickr are called "pro accounts" [19]). Currently, subscribers of free accounts can upload 2 videos per month and 100 MB of photos per month, while subscribers to pro accounts have storage space and unlimited bandwidth.

Perhaps one of the most beneficial aspects is that we can choose our rights (allowed tasks) on the photograph, such as Copyright [20], open or different copy left[2] licenses [21]. Another key feature is its system of organization because each image carries a "tag" label that identifies it.

To perform any search for any image, a series of keywords may be written as search patterns. If these words correspond to the tags of the images, the results will be narrower and closest to the desired image (see Appendix A4).

2.4.3 Picasa

The Picasa [6] program allows the inventory of all computer graphic files, classification and management, and also includes editing tools and photo retouching. The program interacts with Picasa web (album of digital images from Google via web) [22] that allow to upload photos directly on the albums like a good organization pictures way.

Picasa Web Albums are a fast and easy way to put photos online and to share them with other users. It is possible to use it with the Picasa software to upload entire albums of high quality photos in a click of the software's "Web Album" button, or use your normal web browser to add images. Here is an example of the organization of the photographs in an album.

[2] A copyleft is a play on the word copyright to describe the practice of using copyright law to offer the right to distribute copies and modified versions of a work and requiring that the same rights be preserved in modified versions of the work.

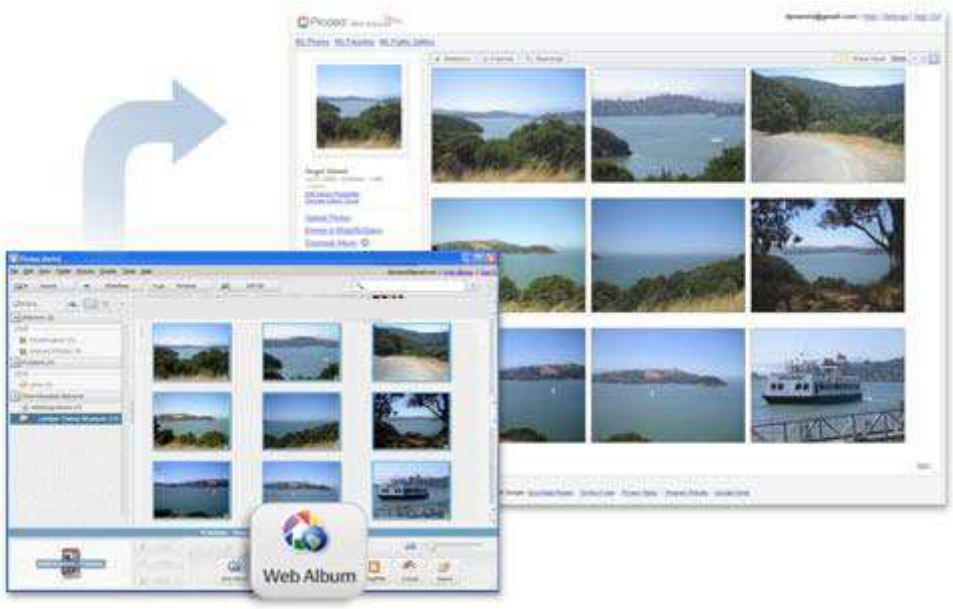

Figure 3: Picasa Web Album

With Picasa it is allowed to post pictures on the internet so people can make searches with these images. The interface is simple and can perform simple edits to images as well as change its size or name, create albums, create collections and even make rankings with your favourite photographs and then locate them faster. Other features are the ease of transferring images to the blog [23] (via Blog This! That it is a button within Picasa with which you can publish up to 4 images in Blogger [24] from Picasa directly), creating screen savers or posters, besides the conversion of photos into a movie.

Currently the application Picasa is distributed in 38 languages and has just released a Mac version. Picasa is a very complete program however sometimes it is difficult to get good results from image search because there are very many users who are free to put tags on their image thus a lot of irrelevant images are shown unnecessarily.

2.4.4 Photobucket

Photobucket [7] is a website that receives images, video, slideshows and photos. Usually is used for personal photo albums, storage of avatars displayed on Internet forums, and storage of videos. Photobucket is also frequently used by accounts from eBay, MySpace, Bebo, Neopets, Facebook or of LiveJournals [25]. Users can keep their private albums, allowing access by password, or open to everybody.

Photobucket has many limitations: It offers 1GB of free storage (10 GB with a payment account), free monthly bandwidth of 25GB. The photos submitted may be smaller than 1 MB (5 MB in a payment account).

Photobucket supports FTP [26] uploads, but the user may have to pay to use this service. It supports Windows XP Publisher as an alternative to FTP in free accounts if the user wants this kind of service.

2.5 Comparison between different existing systems.

Here is a comparison table for the four systems described above. There are a number of key characteristics responsible of the differentiation between existing systems. These key features are:

- Limited size of the photographs that can be uploaded to the database or bytes per image or bytes per month.
- Bandwidth is the amount of information or data that can be sent through a network connection in a given time period (in the table expressed in bytes per month).
- Privacy that lets you set the visibility of the pictures, i.e. who can and cannot see images at different levels of privacy.
- Organization of images in albums, groups or collections to get a quick and easy way to see or find the pictures.
- Images that allow sharing or not sharing the photos with other users. Maps to locate each of the photographs on the geographical point where they were made.
- Extra services to do with the images provided by the various systems as they are for the possibility of example posters, print photos or cards.

Importantly, in addition to these factors when choosing one of these web applications there are a number of social factors that can tip the balance in favour of either such as the social network that is more often used both the user as per their email contacts, or the mail service used because for example Picasa is associated with Gmail and Flickr with Yahoo.

FEATURES	FLICKR	PICASA	PHOTOBUCKET	PANORAMIO
LIMITED SIZE	10MB/month 5MB/image	1GB 20MB/image	1GB 1MB/image	2GB 10MB/image
BROADBAND	100MB/month	--	25GB/month	--
PRIVACY	Privacy level licenses content type security level	privacy level (only albums)	privacy level (only albums)	No private pictures. Pictures protected by copyright.
ORGANIZATION	Set and collections	Folders, albums and icon library	Groups albums	--
SHARE IMAGES	Yes (groups)	Yes(albums)	Yes	Yes
MAPS	Yes	No	No	Yes
EXTRAS	Photo Printing, posters, greeting cards, calendars, Picknic	Backups, Photo printing, making movies	Photo gifts, print store, greeting cards, shirts, calendars	Geolocation, tags(allow searching by tags, places), integrated in Google Earth

Table 1: Comparison table of existing systems

2.6 Free size limitation

With the websites reviewed above, we find a potential problem. If we want to store a large number of photos and/or photos with great resolution[3], we can fill all the space that the websites allow us. In this case we should seek other alternatives, so it would have to hire webhosting services, which allow for more storage space.

In the next table we can see the combinations that allow us to use a free website. The maximum storage size is provided by Panoramio, with 2GB. So if we have to use more storage than 2GB we will have to use other system.

	Storage <2Gb	Storage >2GB						
nº pictures \ Mb per picture	1	1,5	2	2,5	3	3,5	4	4,5
2000	2000	3000	4000	5000	6000	7000	8000	9000
4000	4000	6000	8000	10000	12000	14000	16000	18000
6000	6000	9000	12000	15000	18000	21000	24000	27000
8000	8000	12000	16000	20000	24000	28000	32000	36000
10000	10000	15000	20000	25000	30000	35000	40000	45000

Table 2: Storage needed for different pictures size

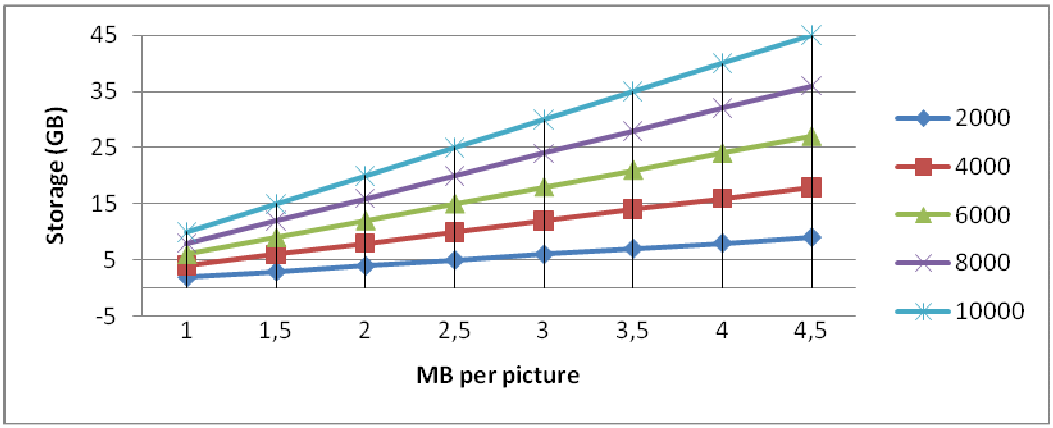

Figure 4: Representation of the Table 2

2.7 Web hosting

If we cannot use a free website, we can take into account the following services offered by the following companies of web hosting.

	Price per month	Storage	Monthly Bandwidth	Photo Gallery	PHP v5	MySQL	Country[4]
Hostso	8 Kr	200 GB	Unlimited	×	✓	✓	SWE
One	24 Kr	10 GB	Unlimited	✓	✓	✓	SWE
Hostmonster	28,46 Kr	Unlimited	Unlimited	×	✓	✓	USA
Fastdomain	28,46 Kr	Unlimited	Unlimited	×	✓	✓	USA
Loopia	83 Kr	5 GB	50 GB	×	-	✓	SWE

Table 3: Web hosting comparative

[3] i.e., many megabytes

[4] It is important to know the country of the company, because our data will be guided by the laws of the country of the company.

2.8 User interface

In software, an interface is a part of a program that allows the flow of information between a user and application, the set of methods to achieve interactivity between a user and a computer. An interface can be GUI [27] type or command line.

In a user interface there are many important factors to take into account and should be valued at the time of design. These factors are:

- *Users*

People who will use the web application, individual characteristics that form the user profile (age, sex, training ...) and frequency of use of such application.

- *Work*

Characteristics of the tasks will be performed by the application, time constraints and possible errors.

The user is in control and therefore a good interface is one in which the interaction between person and machine does not require too much hassle for the user. This means that the interaction should be maximal, the processes should be no too long and the interface should be easy to use and intuitive, facilitating the work and not diverting attention unnecessarily.

The fact that an interface was intuitive means that the icons and interface elements should be meaningful and should lead to the minimum possible number of questions. In a good interface is also important that the messages to the user should be clear and expressive and the aesthetics should be representative (similar to the real world appearance, highlight only the important aspects, and show the proper use of colours and boxes and space group).

2.9 Database

A database is a collection of interrelated data items that are managed like a single unit [28]. Thus the database is an essential part of image storage systems, since it is where the information will be stored (the picture, name, date or author).

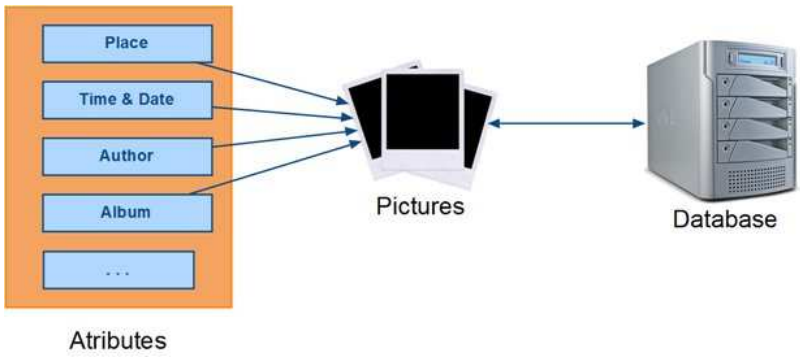

Figure 5: Representation of a database

2.10 Interface-Database-Photo system relation

The relation of the user interface with the database is the connection point between person and machine. The interface is what "mediates", which facilitates communication, interaction between two systems of different nature, typically human and a machine like a computer. This also implies that this is a translation system, since both "speak" different languages. Through the user interface it is possible to perform operations on the photos of the database such as: searches, adding comments or requests to print any of them.

The relation of database with photo storage systems consists of introducing in the selected system the images to be stored. Having introduced the image will be added additional information such as: labels to classify, author and date of picture, comments and geographic location on a map.

3 Problem description and possible solutions

In this section the problems with the previously implemented system are discussed. This system is currently in use by The Local History Association in Nyed. These problems are bound to possible improvements to implement in our current project. In addition the Homestead Association also requested that the possibility of adding the pictures in the database to maps be investigated. Section 3.1 presents issues within the current system. Section 3.2 gives an overview of the possibilities for adding map information using existing systems which include a database system. Two such systems are discussed: Panoramio and Flickr.

3.1 Analysis and evaluation of previous system

Below are listed and explained the shortcomings of currently available web system. Firstly these problems are analysed and then a solution is presented. In addition, after a meeting with the clients it was decided that the implementation of these and other points would be prioritised and the solutions implemented according to priority.

3.1.1 A Description of the Existing Problems

The first observed error when entering the web [31] is related to the design of the site because the first page view does not show all the information contained on webpage. The link back to the home website, help information, contact information and the hit counter page can only be seen if you use the scrollbar. This failure occurs in each webpage in the system.

Figure 6: Design failure

There are other errors in the design when accessing the database of photographs. The way in which the list of pictures is displayed is very primitive and not user-friendly if the number of photographs obtained after the search is very high. Because of this it is not possible to see in the view of the screen the arrow that would take us to the next group of pictures (the scrollbar has to be used to find this arrow!).

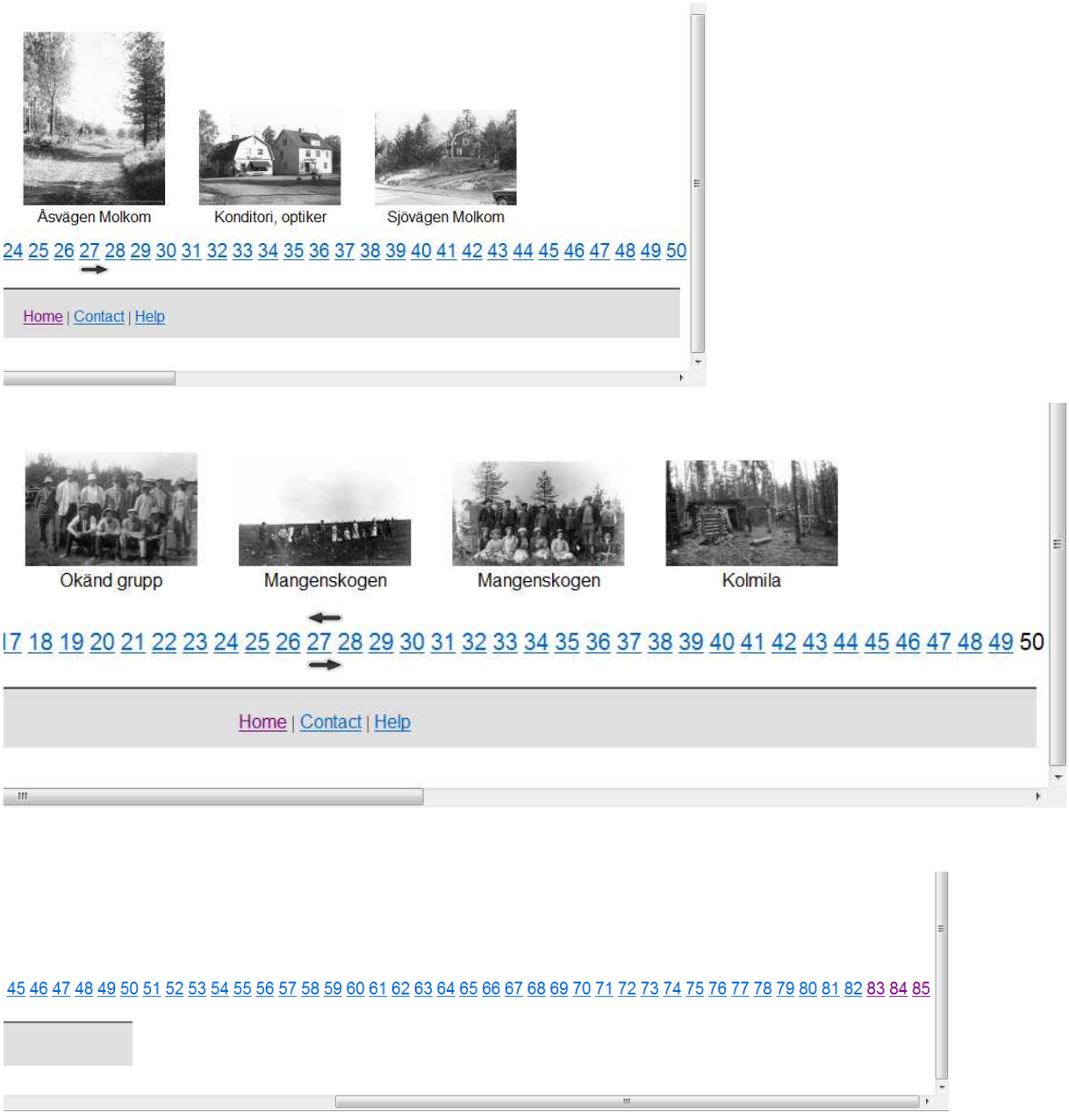

Figure 7: Design failure. List of pages too long and primitive

The improvements for these errors may be as close as possible to the features an image search engine such as the commonly used and well designed Google Image search [32]. Such improvements would include.

The list of the photos only would show the first 10 pages where these images are contained and would provide an arrow to take us to the next page. Once selected the first one is also given option to return to previous pages with another arrow.

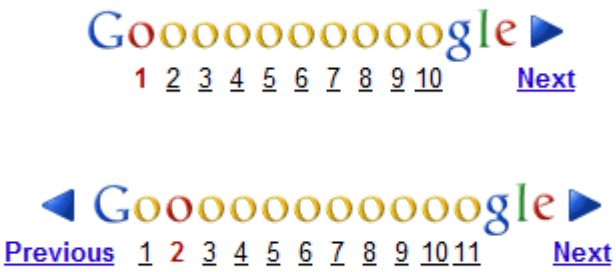

Figure 8: Appropriate list of pages with images in Google Image search

Another improvement would be the possibility of going to the first page and the last page directly in a single click.

In the individual view pictures of the database where you can see specific information for each photo (***album, province, year, title, parish, publication date, category, location, copyright owner and comments;*** see Figure 9) there is not the possibility of accessing to the next image. Therefore, this should be added in the design functionality with a forward and backward arrow for each individual picture.

Send comment Printable version

Album:	Nyeds Hembygdsförening	**Province:**	Värmland	**Year:**	
Title:	Hagalund	**Parish:**	Nyed	**Published:**	2009-10-31
Category:	Byggnad	**Location:**	Råum	**Copyright owner:**	Okänd

Comment:
År 1922 byggde pojkarna i Mörkret Hagalund. Då var Anders Larsson död. Anna Larsson levde till 1936.

Figure 9: Individual picture view

With regard to the photograph searches also there are failures. The pattern search looks for matches with words that appear in the comments of each picture. However it would be desirable also to take into account in the pictures search, the matches with the title or the tags of the images.

One last error in the existing system is that help provided by the site is not translated into English. It is only shown in Swedish. This improvement simply requires a translation to be performed and the corresponding link presented.

3.1.2 Prioritising the Solutions

From the analysis in section 3.1.1, five problems emerged:-

1. Information was lost on the web page
2. The picture display and navigations arrows were not optimal
3. After a picture is displayed the preceding and next pictures are not accessible
4. The photograph searching was not optimal
5. Most of the information in the system is given in Swedish

Further after a meeting with the clients to discuss which of the problems should be solved first, a new list of item was made:

Normal User items (N):

N1. To keep the previous album selected available for the next search

N2. To modify page numbering

N3. Right working of the arrows: next/previous picture

Administrator items (A):

A1. Fix the bugs in the system using specific search words

A2. To make the thumbnail and picture visible in the administration page

System items (S):

S1. To copy the old data to another server to be able to work on a development system

S2. To create a backup routine for the database

S3. Implementation of other file types (Djvu, Flash, wmv)

S4. Right format in the comments

The priority list established by the client was: **S1, S2, A1, A2, N1 and S3.**

3.1.3 Comparison of pictures database creation in Panoramio and Flickr

(See appendix B1 and appendix B2)

In both cases the process of uploading photos to the creation of a database is similar. First you need an account with the associated email service (Gmail and Yahoo respectively). Then select desired photos are selected and uploaded. Finally information is added to each of the photos such as title, tags, comments, and the geographic location of every picture on the map. At this point it is important to note that in Panoramio (as described in appendix B1) is easier to locate the photo without knowing the exact position on the map. This is because Panoramios´s maps are much more complete and detailed than in Flickr (appendix B2).

3.2 Chapter Summary

In this section some problems with the existing system were described. These problems were some design features on the current web pages: page numbers, the navigation arrows, and the lack of maps. Two map systems were investigated, Panoramio and Flickr. These offer the possibility to add information to the pictures such as title, tag and descriptive comments. Panoramio was judged to be the better of the two since the process of adding pictures to the maps was shorter and easier for the user.

4 Upgrades and evaluation of the existing system

From the list of items provided by the client an order of priority was established for the changes and improvements to be carried out in the project. Several priority items [3.1.2] that will be explained in the following sections have been implemented. It may be noted that the work about the maps it was an important point at the beginning of the project but now has been shelved for the moment because the client does not consider this a priority item and prefers to leave it as future work.

4.1 Copy total concept to alternative server (item S1)

The aim is to make a complete copy of the system to another server to develop the new system and be able to work while avoiding problems such as the possibility of damaging available data or making changes which disrupt the proper functioning of the existing system.

All web hosting sites have a control panel with a file manager. These file managers provide management of the contents in the server usually in a very basic way and not always particularly intuitive. An example of this can be seen in Figure 10. The file manager does not have the option to drag and drop nor allows the selection of multiple files or folders at once. Furthermore, this file manager illustrated in the picture has the added disadvantage of not working in Mozilla Firefox.

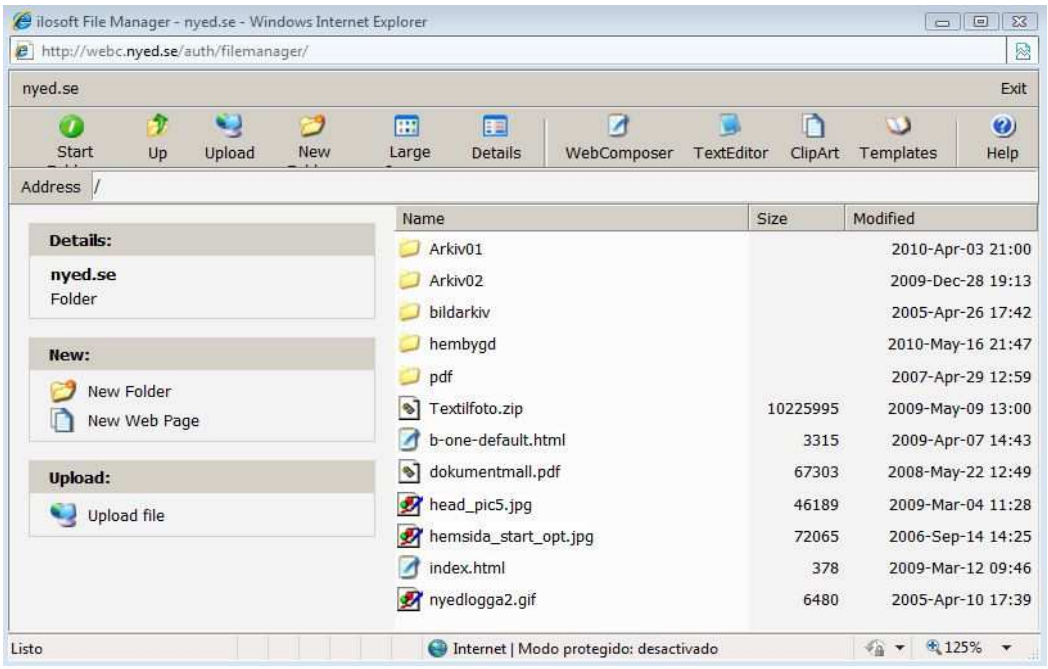

Figure 10. File manager provided by One.com

For better management of files in the server is almost obligatory to use any FTP client program. In our case we used the *FileZilla* client, since this is a free cross-platform FTP client (can be used on any computer) [39].

To access the server via FTP with *Filezilla*, the IP address of the server, the username and password may be entered in the appropriate fields (as shown in Figure 11) and finally click on "*Quick Connect*". Once connected, two main parts can be distinguished, the part on the left, which corresponds to the file system on the computer (highlighted in green in Figure 11), and in the right part, the file system of the server (highlighted in orange in Figure 11). Having explained this, files can be copied from PC to server and vice versa, simply by dragging and dropping where desired. That is, it provides almost the same functionality as Windows Explorer.

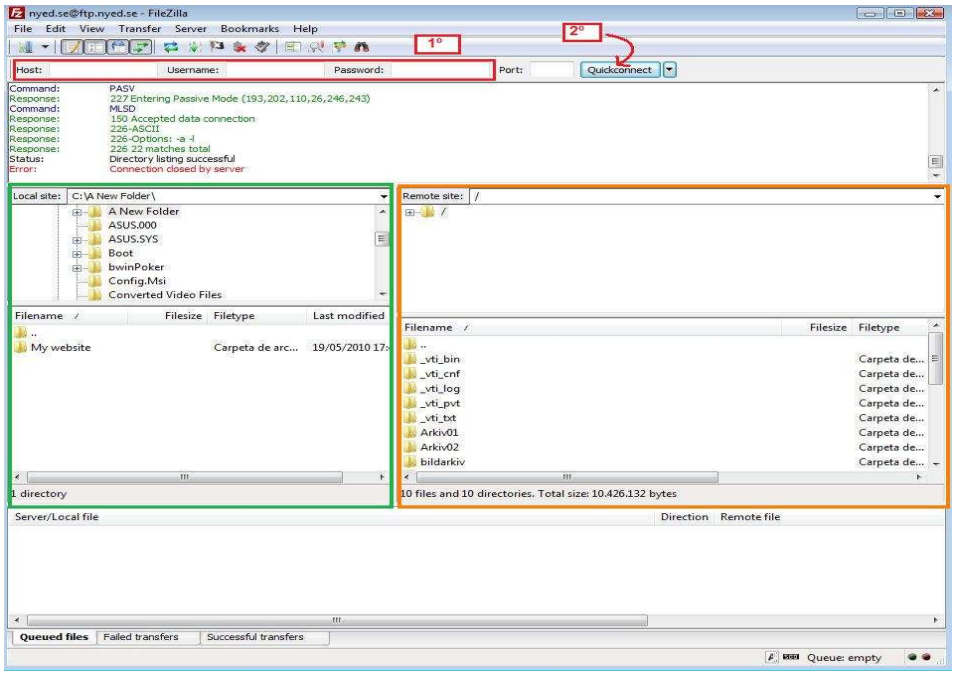

Figure 11. Filezilla working

So, if there is a copy of all the website files on the computer, one just has to drag from one side to another (from right to left). Once done, if these files should be copied to another server (so we will have a copy of our website on a different server) simply it is required to connect to the new server and drag from the area on the left (green) to the appropriate folder Server (orange area).

4.2 Fixing of the system's bugs using specific search words (item A1)

When new pictures are added to the database, it is possible to tag them with several different words to allow better searches as explained later in the Appendix A4. In the administration part these tags can be changed or deleted and other picture data can be modified (title, date or comments for example).

In this item the problem appeared when one of these tags was deleted in a picture because then the tag was also deleted in the rest of the images with the same tag. Now the tag is only removed in the record being updated i.e. only for the current record of table media. It is important to note that the tags can be separated by commas or white spaces in the field where they are introduced by the administrator (field "sokörd"). This works in all cases.

With the Figure 12 it will be easier to see that the tags are erased only in the right place that it is to say, not in all the records in the table “sök” where all the tags are stored else exclusively in the picture that is being modified.

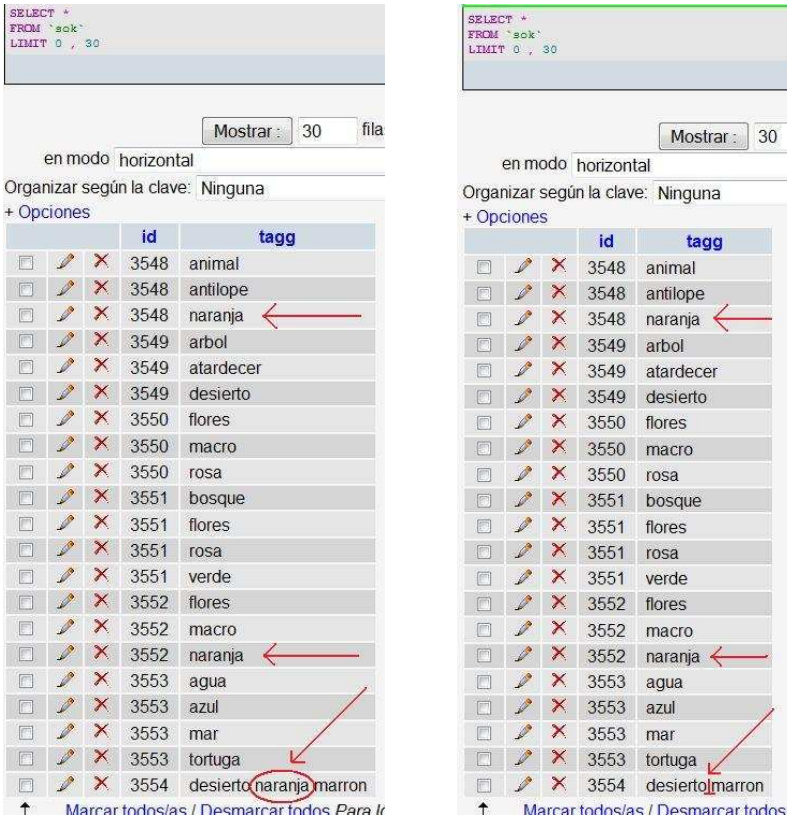

Figure 12. “Sök” table states, before and after deleting the tag “naranja” in the picture with id=3554.

4.3 Thumbnail picture and filename visible in administrator page (item A2)

A thumbnail is a reduced version of a picture and in this case it was necessary to see the thumbnail in the administration page and also in the page where the new files (images, documents…) are added (addfile.php). Now when the administrator clicks on “*Redigera*” to edit one picture the corresponding thumbnail will be shown. In the case of a picture the thumbnail of the image and the filename is shown. However in the case of a document, a music file or a file with different format the corresponding icon to these kinds of files will be shown. See examples of both cases to better understand the purpose of this item:

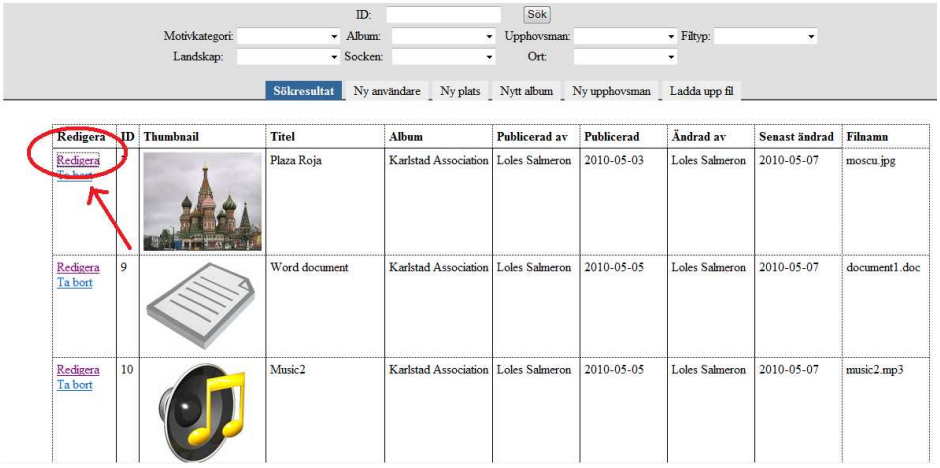

Figure 13. "Redigera" button to edit pictures in the administrator part

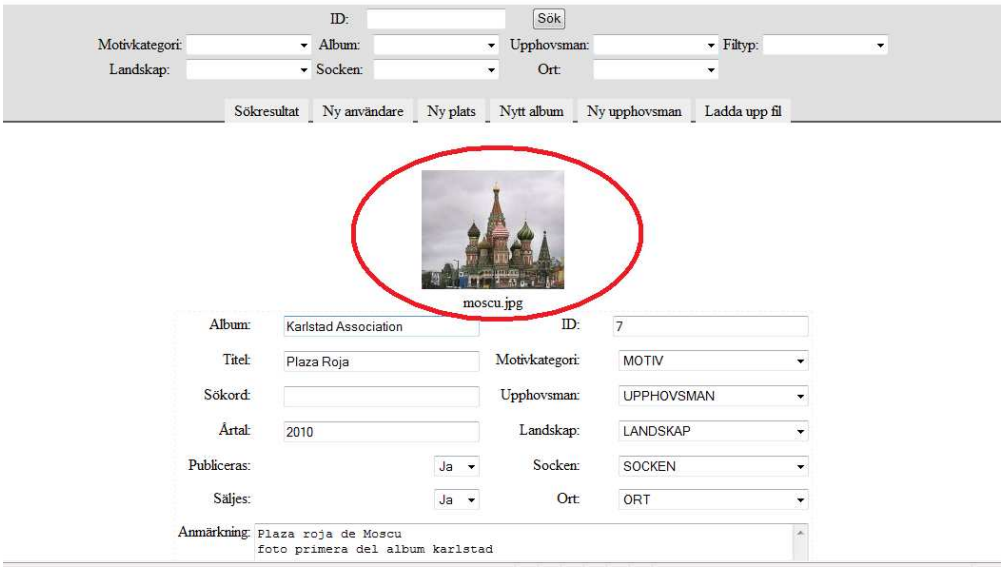

Figure 14. Thumbnail visualization in the administrator page (picture)

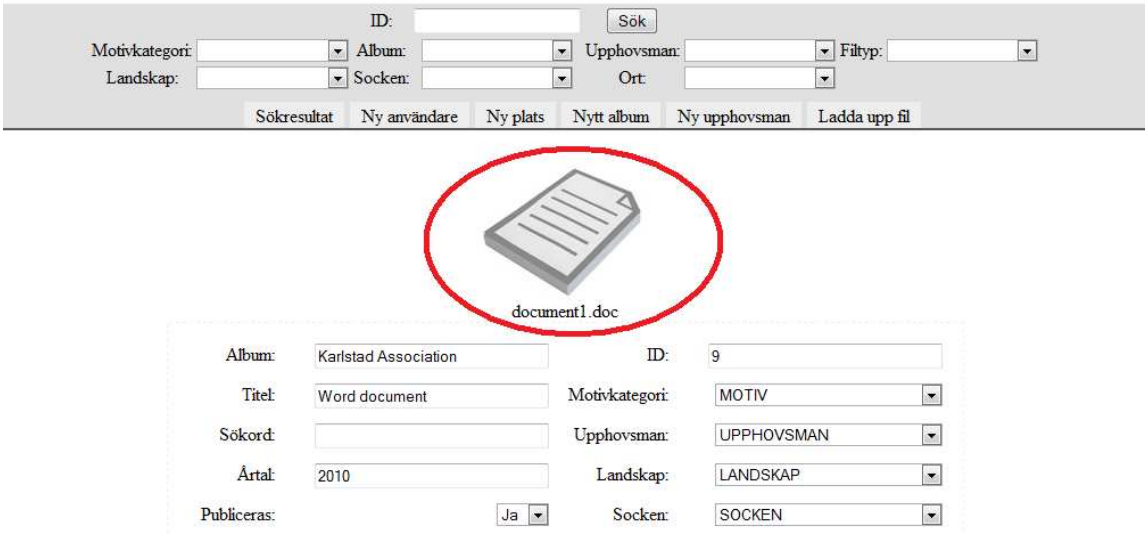

Figure 15. Thumbnail visualization in the administrator page (document)

4.4 Implementation of other file types (item S3)

The system's database allowed a series of files with a certain type such as jpg, jpeg, doc, pdf, avi or mp3. Now in our prototype, new types of files are allowed.

The first one is ***djvu*** or ***djv***. This kind of file is used to store previously scanned documents or images. It has been promoted as an alternative to PDF and is an improvement when it comes to storing information since the files sizes are usually smaller [38]. *Djvu* files are now classified in the system like a new kind of document and because of this the icon which represents Djvu files is the same as in the other documents. Another important idea regarding *djvu* files is the moment when the user of the database tries to open this kind of record. The user will only see them without problem when a *djvu* file viewer has been installed. Otherwise it will be necessary to install this software to view documents or pictures with the new format.

The second new type of files is ***Flash*** whose extension is ***swf***. This new type is included into the group of video files. As in the case of *djvu* files, if there is no Flash viewer there will be problems viewing the file and the icon which represents this format is the same as normal video files.

Here we can see these two new types of files: the first as a new document type extension and the second as a new extension type video.

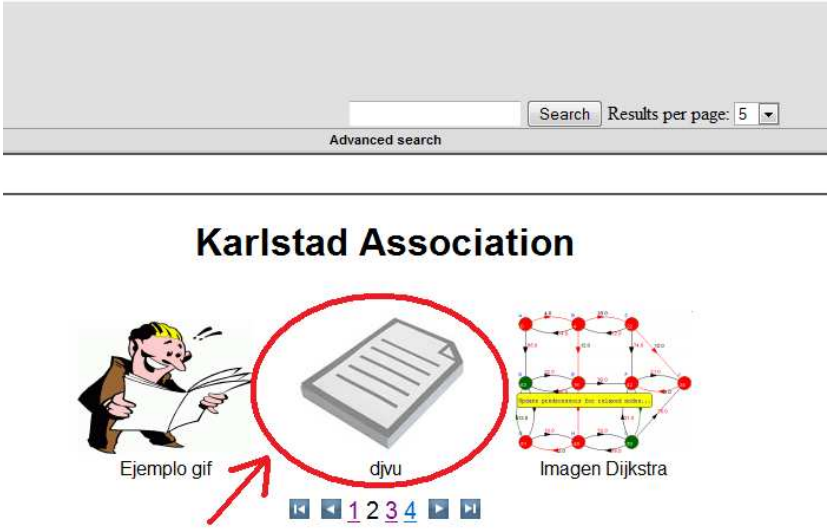

Figure 16. New file type: djvu

Figure 17. New file type: Flash (.swf)

Figure 18. Files extensions in the administrator part

4.5 Low priority items

Other low priority items have been fixed to improve the old system. These extra items are as follows:

4.5.1 Paging in the visualization of the pictures (item N2)

In the old system page numbering was not very convenient and was growing all the time to the right until the last page. This is a problem when the number of pages becomes larger, for example one hundred either in an album or search results. Now the number of pages shown is represented as a range. In our prototype we have few files in the database. Due to this, the range of pages shown has been established from one to five but the number may be changed for a larger database. Now the user has the possibility to go to the next and the previous page and also to the first one or to the last one. This may be easily seen in the Figure 19.

Figure 19. Paging in an album (visasamling.php)

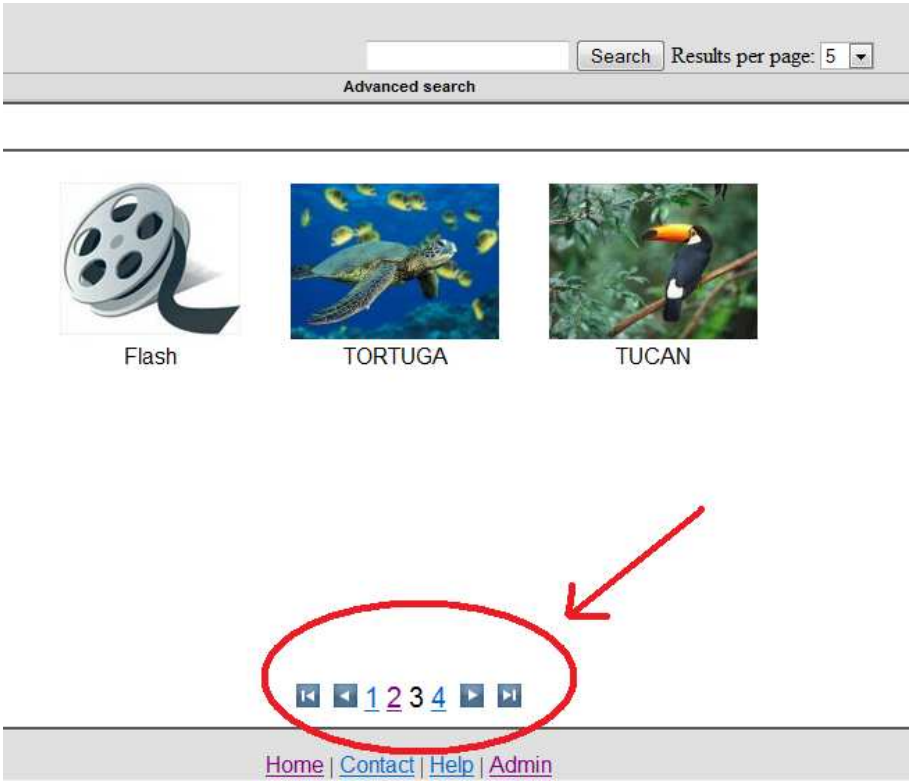

Figure 20. Paging in search results (sokresultat.php)

Besides this paging has been added to the administrator part for the search results because sometimes the resulting table is very large and it is necessary to divide the number of pages to view the information more clearly. As in the visualization of the album pictures and in the visualization of the search results by the user, there are four possibilities: go to the first file, the last file, the next file and the previous file. In the Figure 21 below we can see what has just been explained:

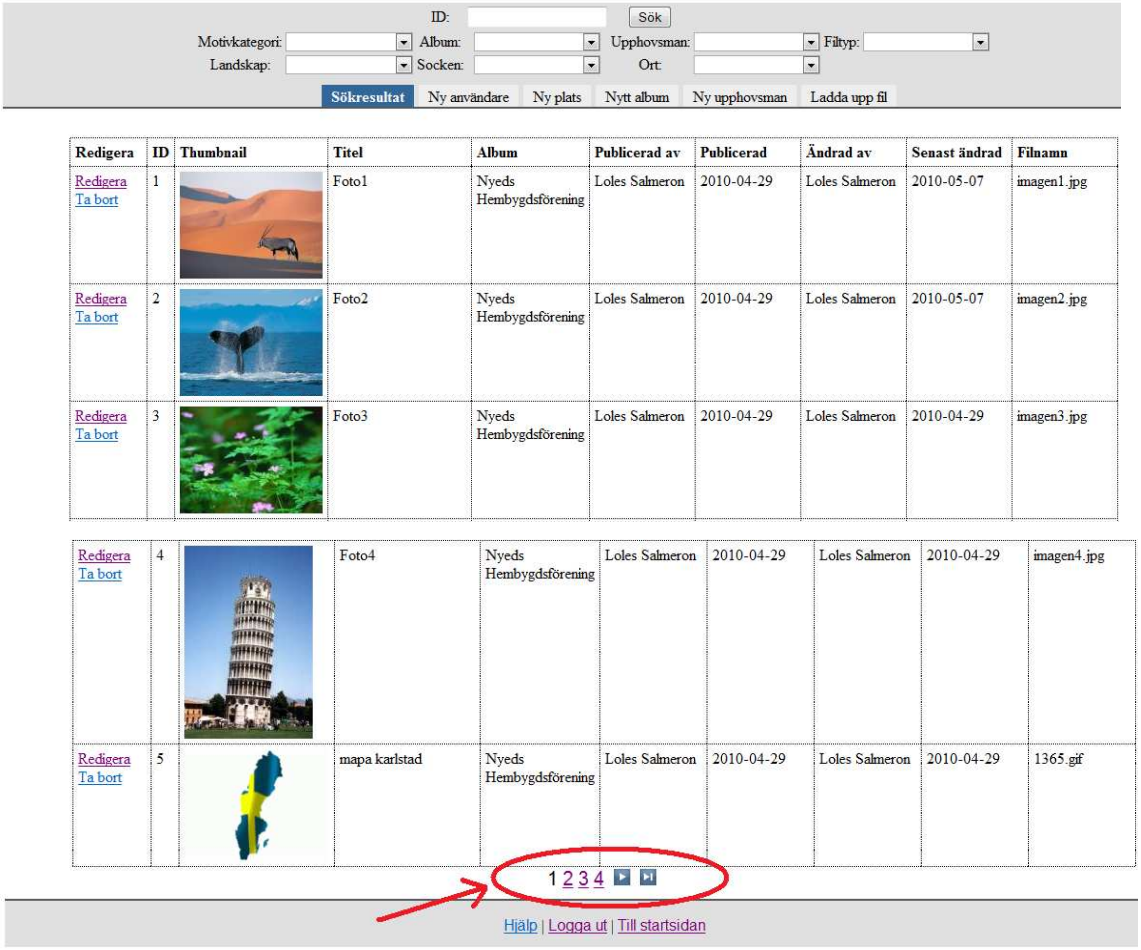

Figure 21: Result search paging in administrator part

4.5.2 Right working of the arrows: next/previous picture (item N3)

In the last version of the system the arrows to go forward or backward in the view of the pictures (*visasamlingfil.php*) did not work rightly. Now there is no problem to see the images and go to the next or the previous one by clicking on the relevant arrows or thumbnails. The Figure 22 shows this situation.

Figure 22. Previous/Next picture

4.5.3 Formatting of the text in the field for comments (item S4)

In each file of the database is possible to add comments to describe in more detail the file that is being included: the description of the picture shown or the information contained in a document.

The problem with this item was the formatting of the field where the comments are written. In the old system carriage returns had no effect while now if you write a new line into the field "*comment*", carriage returns now work. Here we can see a picture with three different lines in the comment field:

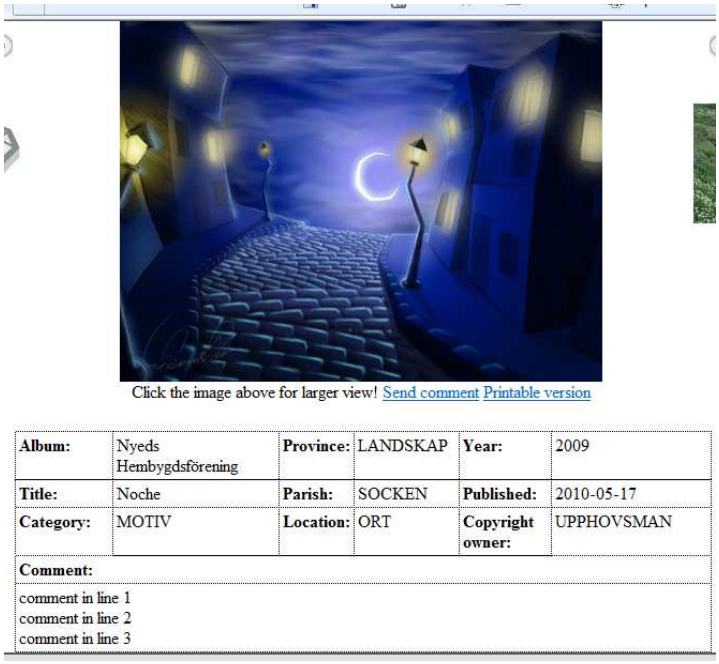

Figure 23. Fixed text formatting in comment field

4.6 Problems with other items

With the rest of the priority items we have had some problems which deserve to be highlighted.

4.6.1 Backup routine for total database (item S2)

For the item **S2** that consisted of creating a backup routine for the database we found the solution. With the system call "system ()" is possible to make this kind of action.

But it is not possible to use this type of system call in the most of existing hosting. The reason is that using this system call may create a security hole, which, in general, most web servers have it disabled. The code to allow the creation of the backup would be approximately as described below:

```
<?php
system("mysqldump -h localhost -u userDB -p passwordDB
myDataBase > backups/myDataBase.sql");
?>
```

Firstly, written in blue, see the command `system` that is used in PHP to display the result of a command that runs on the machine where the file is located, in this case this command is located inside the quotes. Between the quotes we have the command "mysqldump" which is the command that allows us to make the backup; after "-h" is the IP address or host where the database is hosted. In this case and in most cases this is on the same server where the code is run, so `localhost` may be written. After “-u” is written `userDB,` which corresponds to the user who has access to that database. After “-p” the password that has access to the database (`passwordDB`) may be written and immediately we put the exact name of the database that we will support (**`myDataBase`**) and finally, after the sign ">" the path and file name where the backup will be saved appear. This may have a “.sql” extension (`backups/myDataBase.sql`).

Nevertheless, as mentioned before, the command "system" cannot always run , therefore, to generate code that creates the backup, this should be done table by table and field by field. Apart from being a tedious task, the code would not work if some attribute is changed in one of the tables in the database, or even if any table is added or removed.

4.6.2 Permanence of the selected album (N1)

In item N1 there was a requirement if possible to allow the album selected after each search to remain selected for the next search. This action is quite complicated because some parts of the code are a mixture of *Javascript* and *Php* and the communication between these languages is difficult, since JavaScript code is executed in the client side, implemented as part of the web browser, and PHP code is executed in the server side.

Furthermore, the album field which may remain selected is in the dropdown menu: “advanced search”, so that in every redirection to a new page when refreshed the album field always appears blank.

4.7 Extra items

4.7.1 Audio player

In spite of not appearing on the list of items we have made, there were some additional improvements that may help the system. The first one is for audio files. We have included a media player in the view of the thumbnail audio files. It is a simple player for any mp3 file where the user can manage the controls. This audio player can be seen in the next figure:

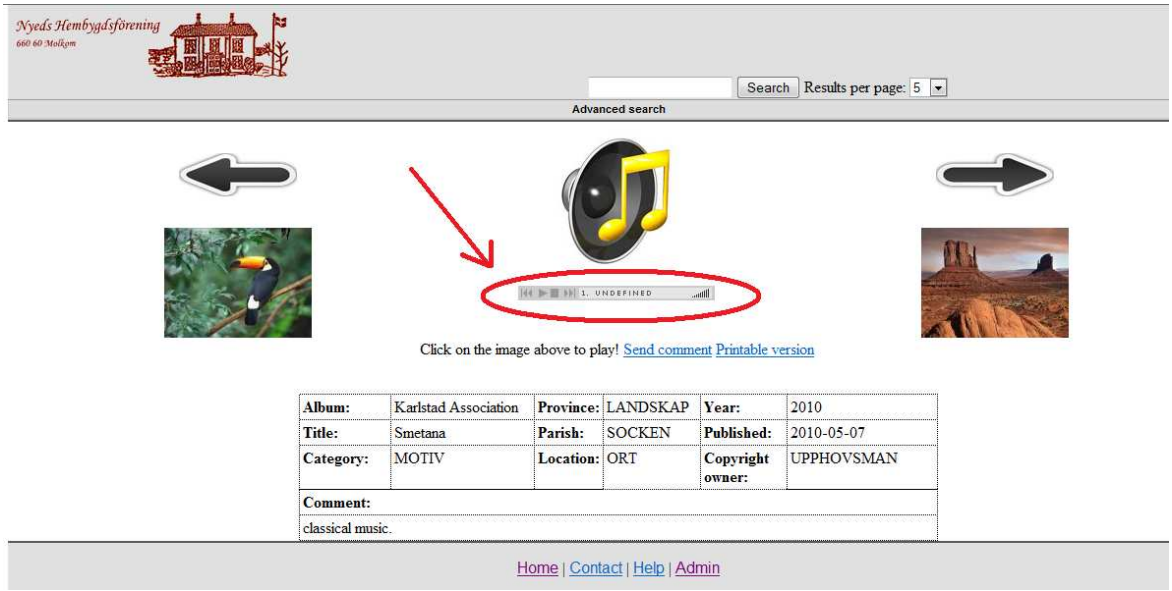

Figure 24. Extra item: audio player

4.7.2 Help

There are two different help links. One of them is for the normal user and the other one is for the administrator.

In the first case, help was only in Swedish and this is a disadvantage if somebody from another country wants to know how to use the webpage. Due to this, we have improved the help function. Now, depending on the language chosen in the homepage, the help link is in English or Swedish and is available on all pages on the web.

For administrator help, the language is only Swedish because we have assumed that people working on the administrator part are from Sweden. In spite of this some extra information in English that clarifies certain terms when adding or modifying files to the database has been added. This information explains to the administrator how to add new files, what kind of files can be added, and how to fill in all the fields for a new file. Besides this, administrator help may be specific with regard to which fields that can be changed when the administrator is editing a file and those fields which are mandatory. For the latter as a temporary measure we have added a "warning" on the table where files are added to avoid problems in the subsequent visualization of those files. For example: when the administrator is adding new files, fields: "*id*", "*landskap_id*", "*socken_id*" and "*ort_id*" may not be null so they may be filled in.

In the Figure 25 and the Figure 26 you can see both help links: Swedish and English respectively.

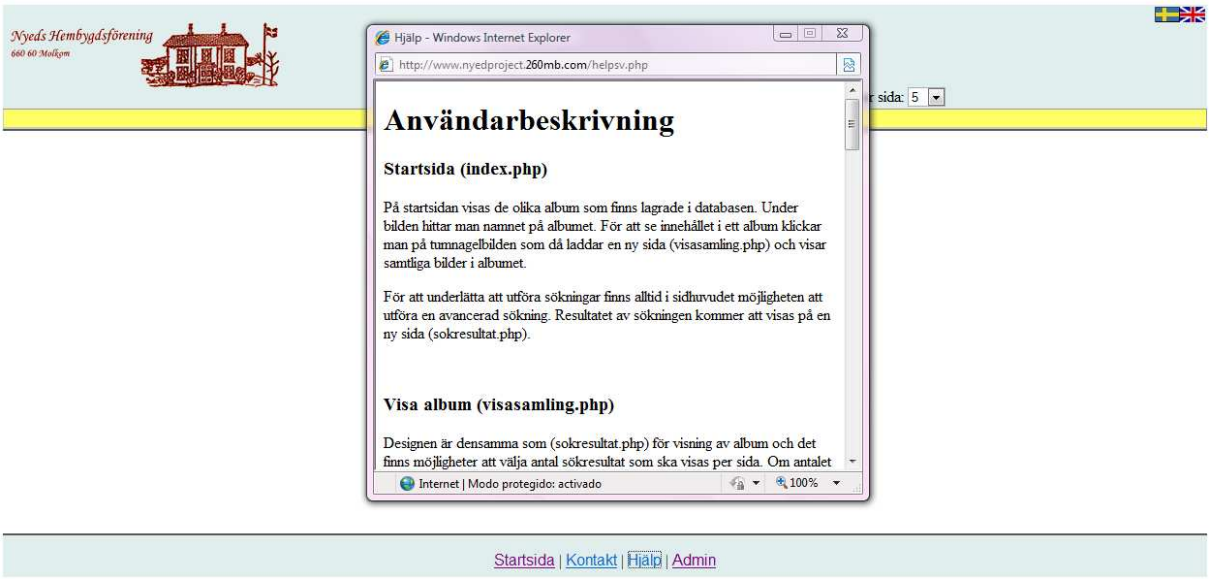

Figure 25. Help link in Swedish in the file helpsv.php

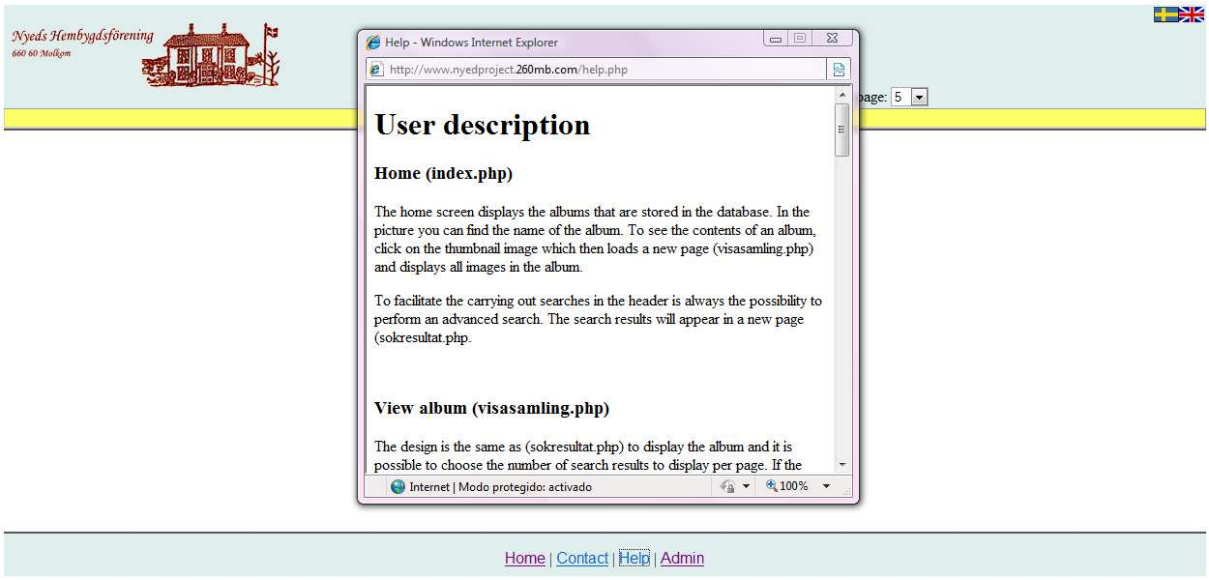

Figure 26. Help link in English in the file help.php

4.7.3 Site colour

With regard to the design of the web page only few changes in the colours have been done. The colour of the advanced search bar has been changed. Now is yellow to highlight more than the rest of the web page and when the cursor is over it changes to blue.

Besides the background colour of site also has been changed to a softer shade of blue which gives an appropriate appearance.

4.8 Security

With regard to security no changes have been introduced since there is a sufficiently reliable security system with user id and password. This information is stored in the database. The passwords are calculated through a MD5 function with hash tables.

For logging of the user in the system, a user name and a password may be written. This information is received by a Php script which determines if the information is valid or non-valid. The script takes the result from the hash function MD5 for passwords and stores the information in the corresponding table in the database (table *"anvandare"*). When the user introduces user login information, the system looks for in that table and if there is a match for this data the access is possible.

5 Project Evaluation

The beginning of the work for this project was made more complicated by the fact that this project is a continuation of a project carried out by two other students and written in programming languages which were not familiar. The first phase of the project was therefore one of reading the existing documentation and the implemented code as well as reading books and internet information and documentation on Php, Javascript or Ajax.

One of the problems for us is the language. All existing documentation of earlier projects was written in Swedish, as well as the comments in the code, the names of the variables used in the code or the help system. This was an obstacle in the development of the project is therefore devoted considerable time to the translation of all this information. Furthermore, the code contained few comments. This was another limitation since for future work it would have been useful to include a greater number of comments. These comments are helpful because when one starts to read code that has been written by other programmers it is helpful to gain a quick overview of the system.

Another disadvantage in this project was the fact that programming guidelines were not followed 100%. That is, in certain files, the programming style differs from that in other files. There was no established "standard" in the code, for example with, two PHP files with similar functionality, having a completely different structure.

Once done the initial work of learning about the previous system, a list of the items that constituted a priority for the client in system upgrades development was made in consultation with the client.

Certain existing features were upgraded to new features, such as a proper paging system or viewing of files thumbnails that works properly. Apart from these problems, others such as the lack of good comments in the files or incorrect tags removal of the records have been remedied.

Another improvement such as the use of new types of files makes the system more robust and allows a greater diversity of information to be stored in the database. Now new types of files such as *djvu* or *Flash* are allowed in the database of the system.

With regard to the priority items which have not been completed we would like to highlight the following points:

- The backup of the system can be done step by step but nowadays the most of the hosting services have a backup function for making this kind of action. In *one.com* hosting there is possibility to make a complete backup of the database exporting the script that creates and fills in the different tables of the database.

  After that, though we have an identical copy of the database, all the files on the server may be also copied (images, pdf files...), as the database itself, only addresses each file in the file system of the server. At this point would have to continue with what is explained in Section 4.1.

- In the case of item N1, at the moment only there are two albums and due to this it is not too necessary to remain the selected album before for the nest searches because there are not many possible options. When the number of albums is greater, it might be necessary to implement this item to remember the selected album.

In general terms both interfaces (user interface and administrator interface) have been improved in some aspects like paging, gallery of thumbnails, removal tags or media player. With respect to the system issues have been resolved some items such as the copy to a new server, new file types or right format in the comments of the records.

6 Conclusions

In conclusion the existing system was good with regard to functionality and security however the design and some aspects about the user interface were in need of improvement.

As in any web project, we have taken account of the user experience that is required to surf the web. Since our goal will always be that each user visiting the web site can find what they are looking for, in a simple way, so that the user will return to the site and will tell others about the content and functionality. Because of this, issues such as paging and thumbnail visualization have been fixed to make navigation easier. In general the system is quite complete. Now with the current improvements which have been implemented there is a better and clearer page handling.

Importantly, although there are a lot of systems with a similar functionality to store pictures and another kind of files, it is desirable for the client to create a custom-made system because the information is much more detailed and specific to the needs of the client. There are a number of advantages in these software systems but also there are services that the client does not need.

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8. http://www.flickr.com/
9. http://es.zooomr.com/
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19. http://www.flickr.com/upgrade/
20. http://info.yahoo.com/copyright/us/details.html
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33. http://mail.google.com/

34. https://login.yahoo.com/config/mail?.src=ym&.intl=us

35. http://wordpress.com/

36. http://www.phpbb.com/

37. http://en.wikipedia.org/wiki/LAMP_(software_bundle)

38. http://en.wikipedia.org/wiki/DjVu

39. http://filezilla-project.org/

40. **PHP5 and MySQL Bible**: *Converse, Tim Park, Joyce Morgan, Clark. John Wiley & Sons, Incorporated. 2004. ISBN: 0-7645-5746-7*

41. http://en.wikipedia.org/wiki/GNU_General_Public_License

42. http://en.wikipedia.org/wiki/Sun_Microsystems

43. http://en.wikipedia.org/wiki/Oracle_Corporation

44. http://en.wikipedia.org

45. http://www.google.com/

46. http://drupal.org/

47. http://www.facebook.com/

Appendix A. Definitions

A1 Geographic Information System (GIS) or Geographical Information System

A GIS is any system that captures, stores, analyzes, manages, and presents data that are linked to location. Technically, a GIS is a system that includes mapping software and its application to remote sensing, land surveying, aerial photography, mathematics, geography, and tools that can be implemented with GIS software. [29]

A2 Geotagging

Geotagging is defined as the process of adding geographic information in the metadata of image files, video, audio, websites, etc. Usually, these data are often coordinates defining the longitude and latitude where the media file has been created, but may also include altitude, place name, street number, postal address, etc. to later find their geographical coordinates. [30]

A3 Types of Panoramio´s maps

In the system Panoramio it is possible to choose between different kind of maps such as cartographic map, map with satellite photos and relief map. Below can be seen examples of each of these types of maps with Karlstad University as an example:

Cartographic map

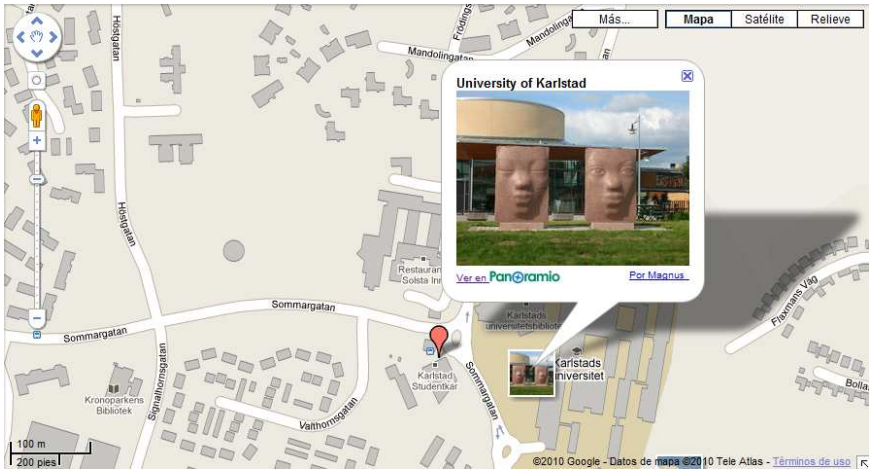


Figure 27. Cartographic map in Panoramio

Satellite map

Figure 28. Satellite map in Panoramio

Relief map

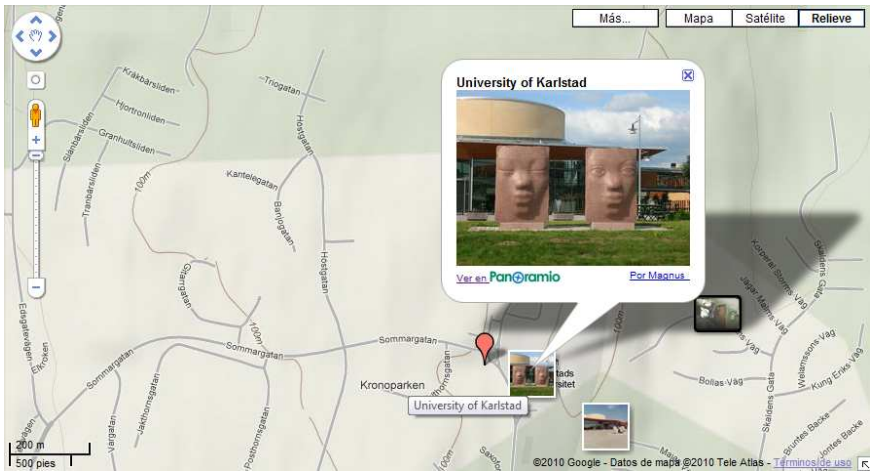


Figure 29. Relief map in Panoramio

A4 Tags in the pictures to restrict and improve the searches

An example can be how a search of any cathedral in Spain is achieved. Several keywords may be written to find pictures of a cathedral and restrict the search by tags. If in the search field is written for example: “cathedral Spain” a large number of results are obtained as seen in the following example with Flickr:

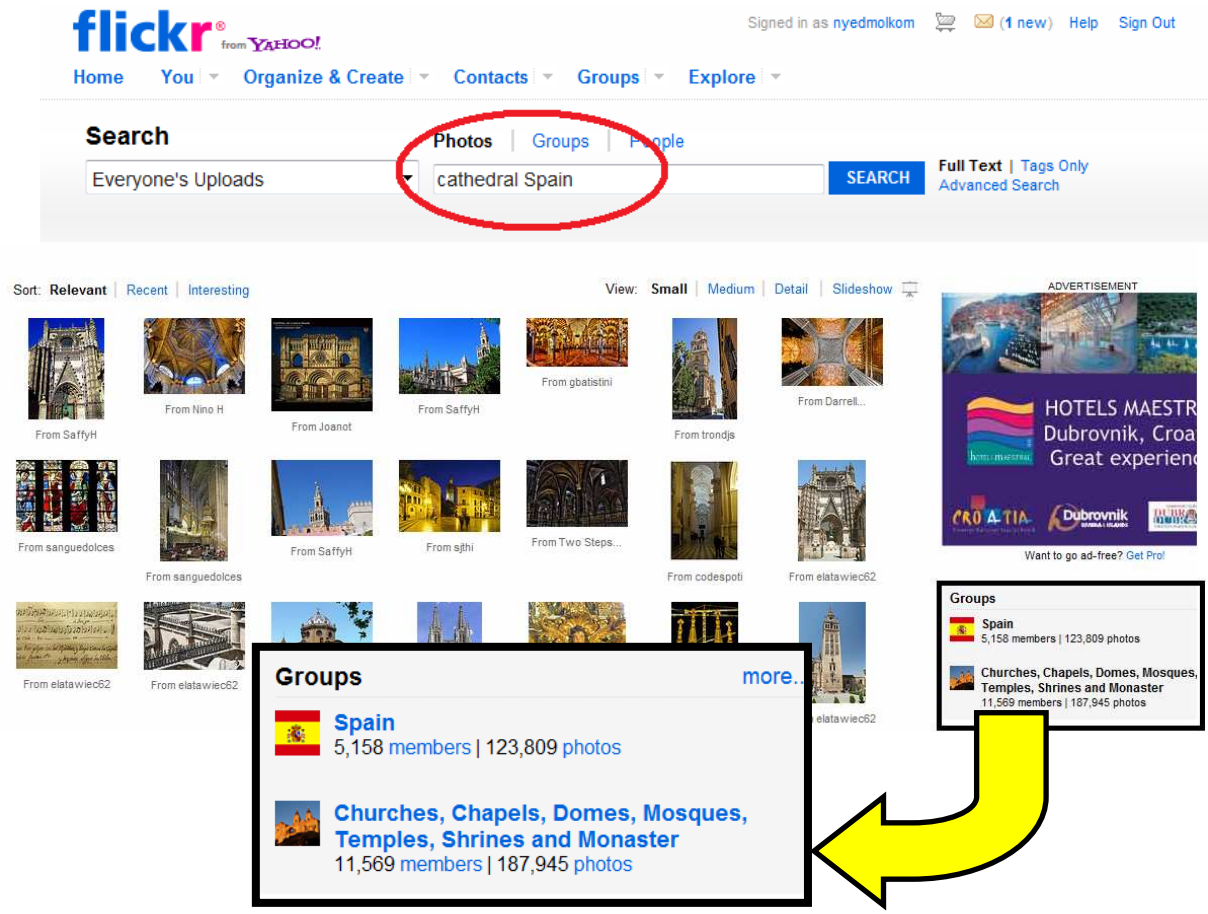


Figure 30. Results of a search using Flickr

However if the search it is more restricted using also for example the tag “Murcia” we will obtain a smaller number of photographs which are nearer to the required pictures. In the first search we have approximately 100.000 pictures and in the restricted search we can see 7.000 images.

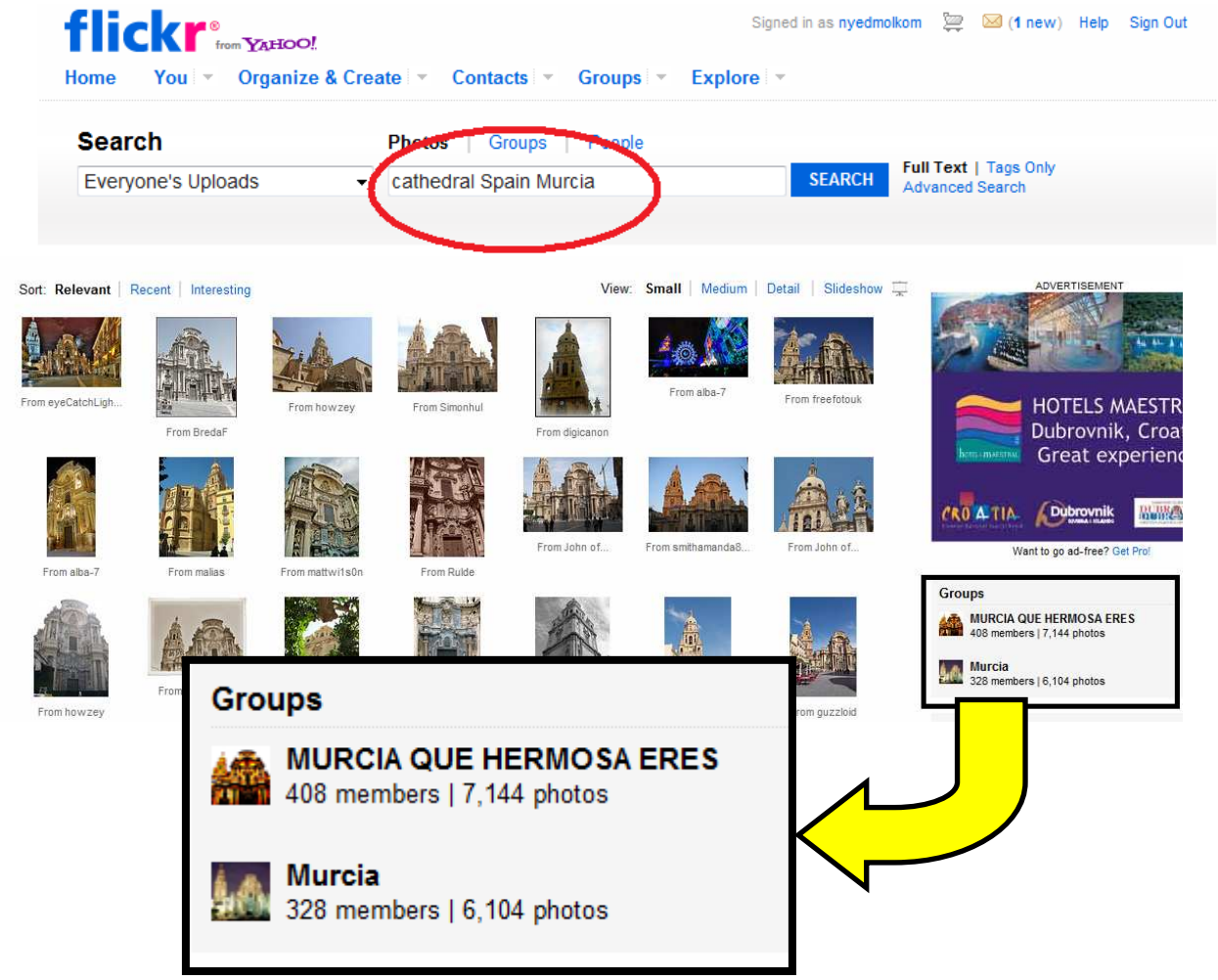


Figure 31. Results of a more restricted search using Flickr

Appendix B. Database creation with existing systems

In this section a number of existing systems for adding photographs to maps using a database are investigated. These systems are Panoramio [5] and Flickr [8].

B1 Database with Panoramio

The steps to upload pictures to Panoramio are shown here, as well as creating a database. The process is very simple once a Gmail [33] account to access to Panoramio is created. When you are already user of Panoramio you can upload pictures. This requires a title for the picture, one tag, the geographic position and also the possibility of writing some comments about the image. This step by step process is:

1. **Start page of Panoramio.**

Visit the webpage www.panoramio.com

Figure 32. Star page of Panoramio.

2. Account creation in Panoramio.

Once on the website we select ***sign up*** for a new Panoramio account. Here you need to give your mail address in Google, password and to establish a location to start to use Panoramio system.

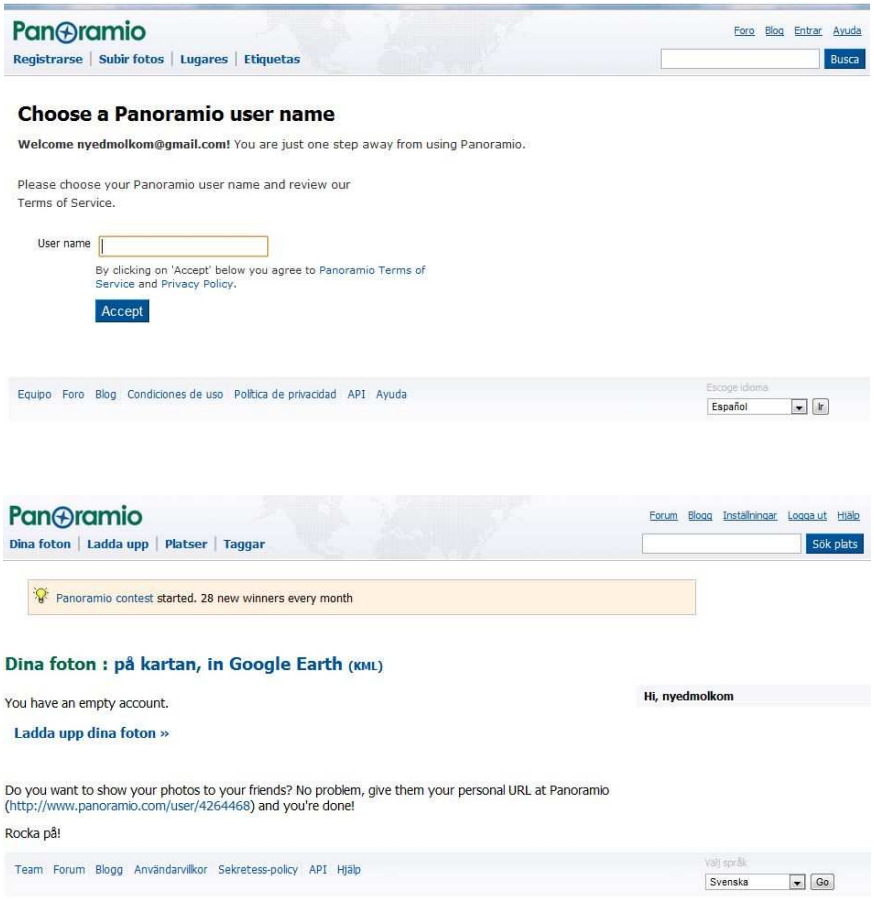


Figure 33. Account creation in Panoramio.

3. Selecting and uploading pictures.

Simply it is the selection process of the pictures will be added to the Panoramio database (selecting "*Upload your photos*" as can be seen in the Link to add additional information to the pictures). You can upload up to 10 pictures at the same time.

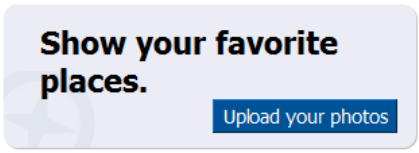


Figure 34. Button to upload pictures to the Panoramio database

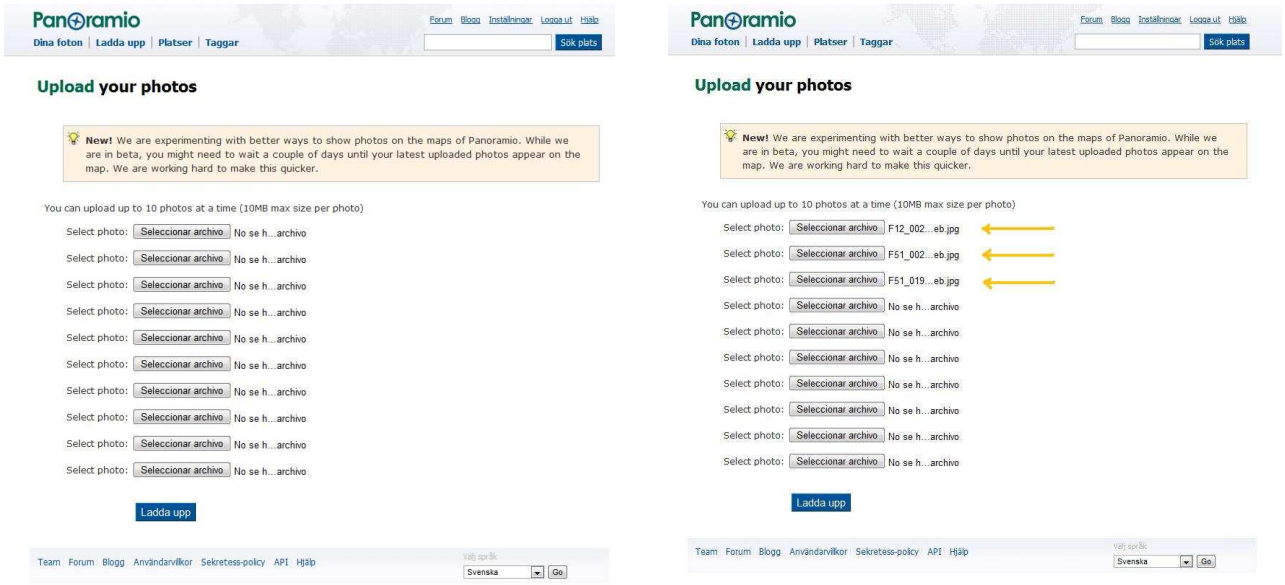


Figure 35. Selecting and uploading pictures

4. Filling the information of every picture.

In this step you can add information to each photo as a meaningful title that suggests what is in it, tags to classify and restrict the search for that photo (they may be separated by commas) and comments to explain more in detail each picture. Also in this point you can locate geographically the pictures (above each picture you can select the message "*Map this photo*" for the geographic location).

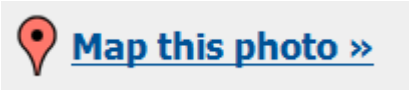


Figure 36. Link to make the geographic location of a picture.

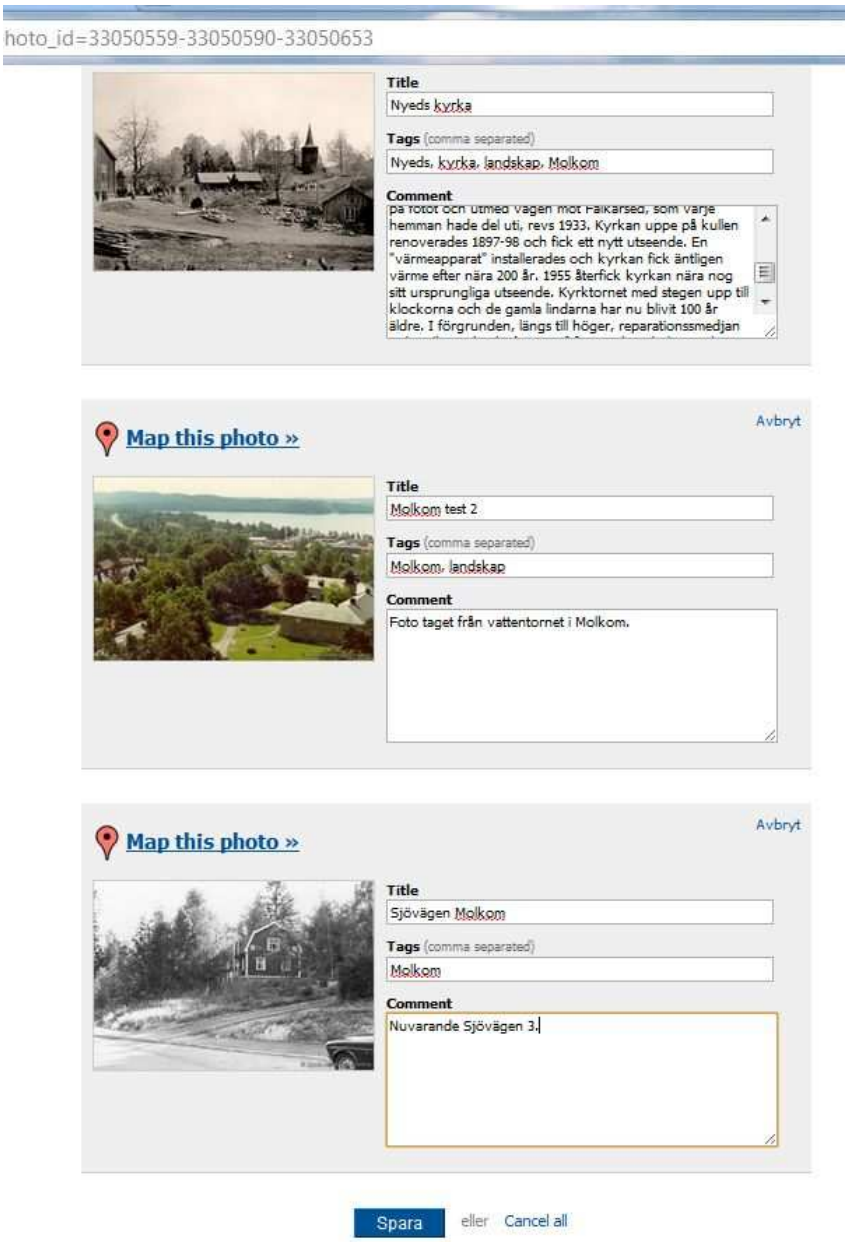


Figure 37. Filling in information of every picture (title, tags and comments)

5. End of uploading photos to the database.

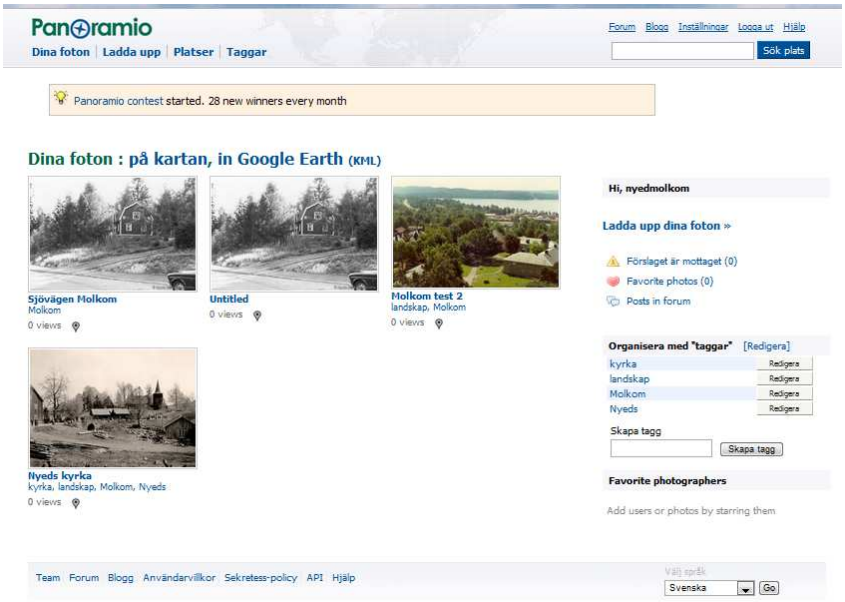


Figure 38. End of uploading photos to the database

6. Geographic location of every picture.

It can be achieved in the step number 4 or selecting the uploaded picture directly and clicking in the message "*Map this photo*" that appears on the right (Figure 39).

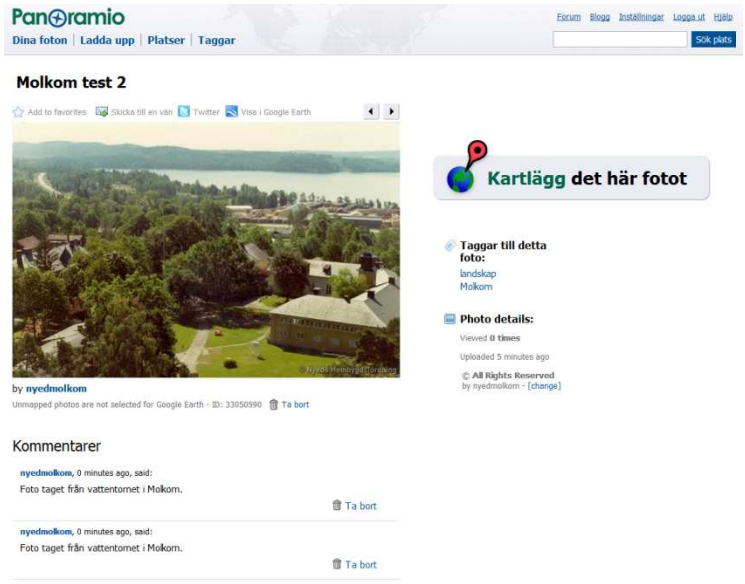


Figure 39. Geographic location of every photograph

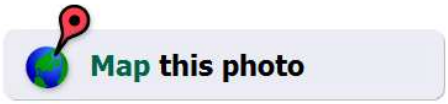


Figure 40. Button to make the geographic location of a picture.

7. **Final result**

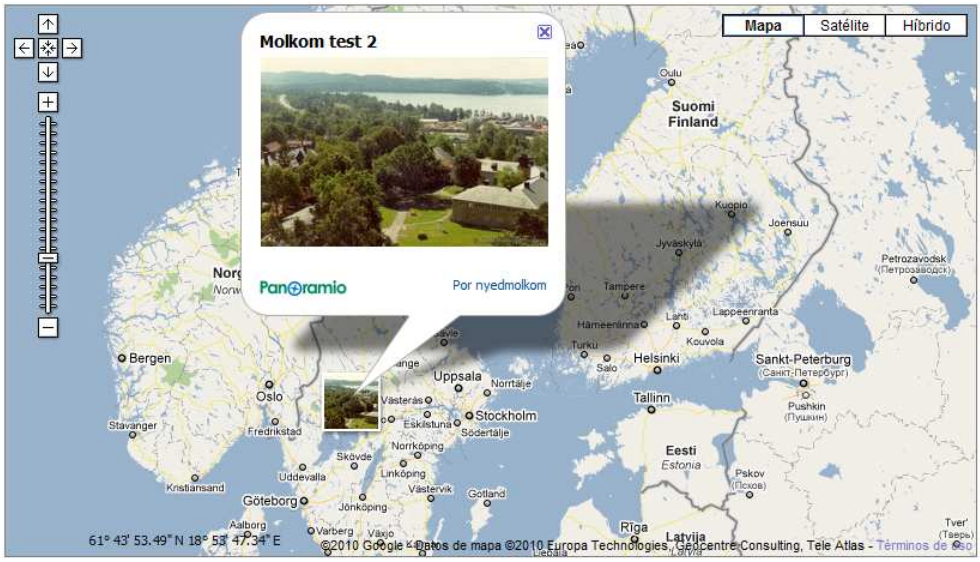


Figure 41. Final result with the picture located in the map.

B2 Database with Flickr

Firstly to create a Flickr account you need a Yahoo mail account [34]. Once you have this account you can upload photos to Flickr and create your own database of pictures. The process where images are added has a number of steps. These steps are:

1. **Start page of Flickr.**

Visit the webpage www.flickr.com.

2. Account creation in Flickr.

Once on the website we select ***sign up*** for a new Flickr account. Here you need to give some contact information, your mail address in Yahoo and a password.

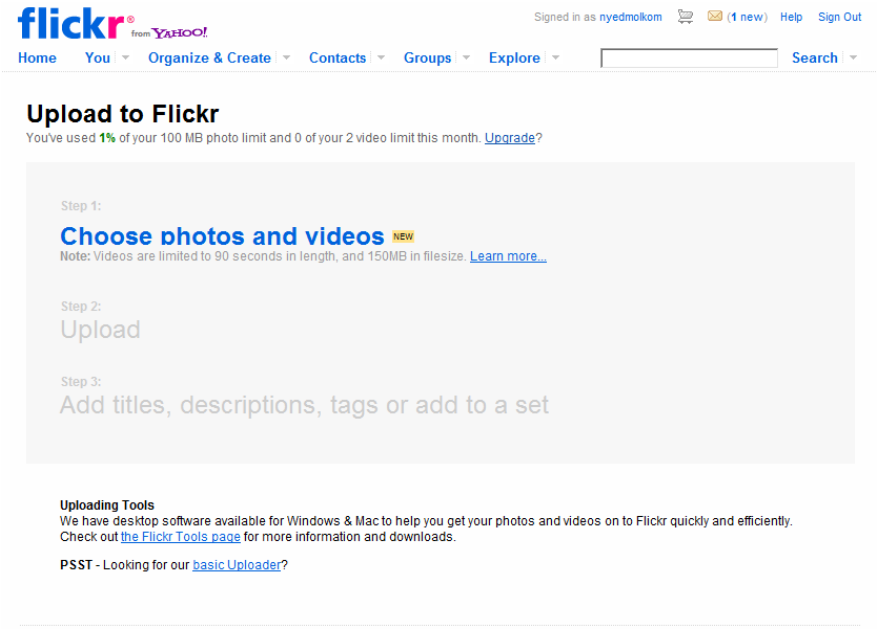


Figure 42. Account created.

3. Selecting and uploading pictures.

Simply it is the selection process of the pictures will be added to the Flickr database. You can upload up to 10 pictures at the same time and to perform this process you have to click in the button shown in the Figure 43.

Figure 43. Button to upload pictures to the Flickr database

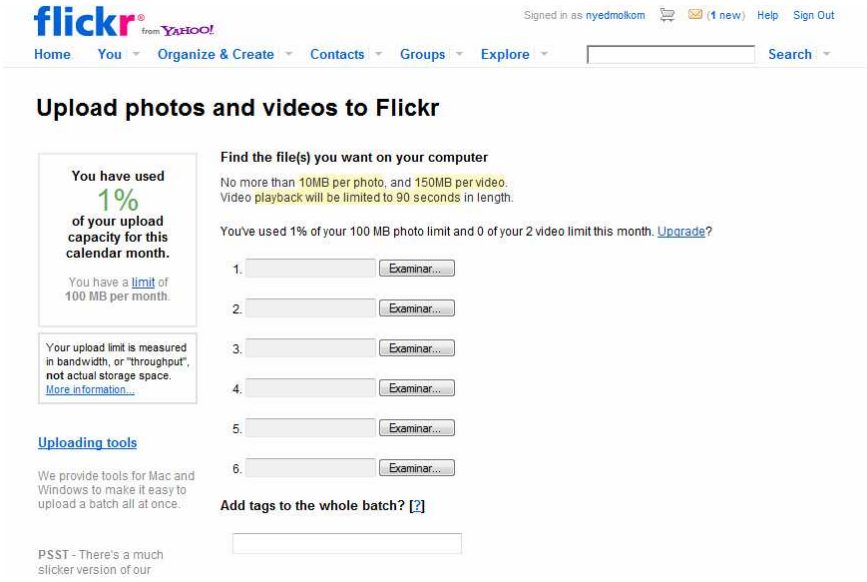


Figure 44. Pictures selection to upload

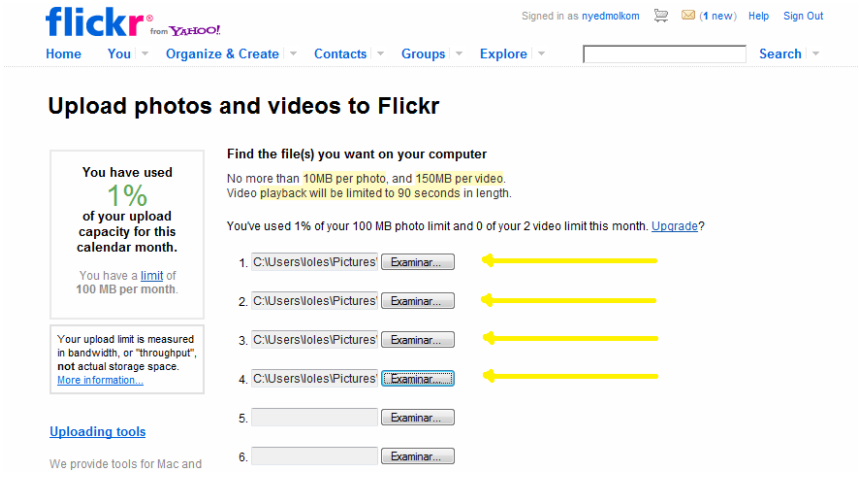


Figure 45. Uploading

4. **Privacy level selection of pictures.**

In this step can be established the level of privacy for each picture. A picture can be public or private. If it is private it can be visible to different groups as seen in the next figure.

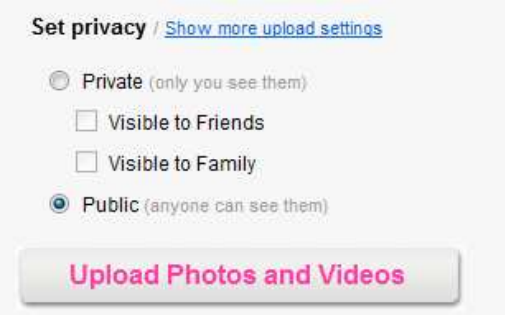


Figure 46. Privacy level of the pictures in Flickr

5. **End of uploading process.**

6. **Adding additional information in every picture.**

Here the system gives us the possibility of adding more information in the images pressing the link “add a description” in the Figure 47. You can write a title, a longer description about the photograph and tag the picture for searches with keywords.

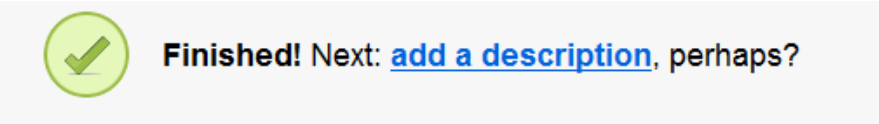


Figure 47. Link to add additional information to the pictures

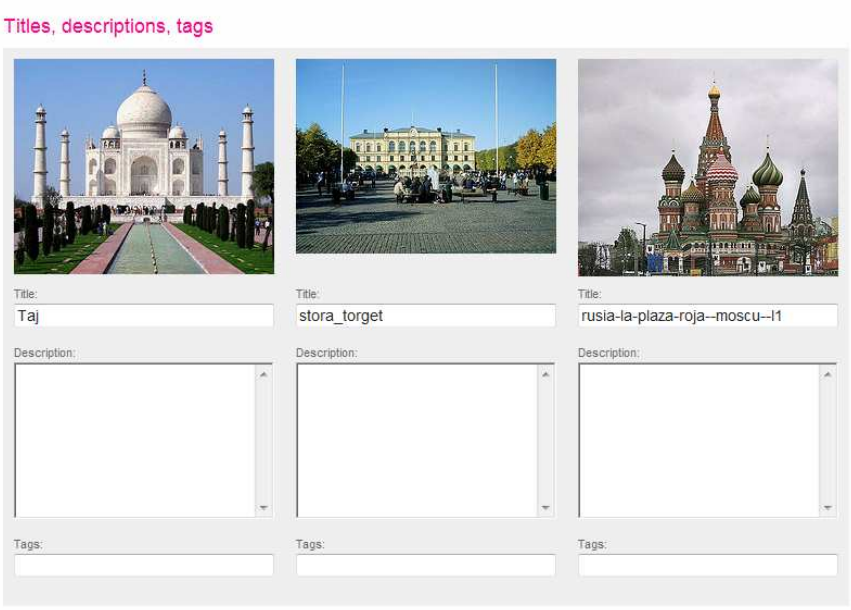


Figure 48. Adding information about every picture (title, tags and description)

7. Geographic location of every picture.

For locating the picture in a map it is necessary to select the picture and to click in the link "*Add to your map*" below.

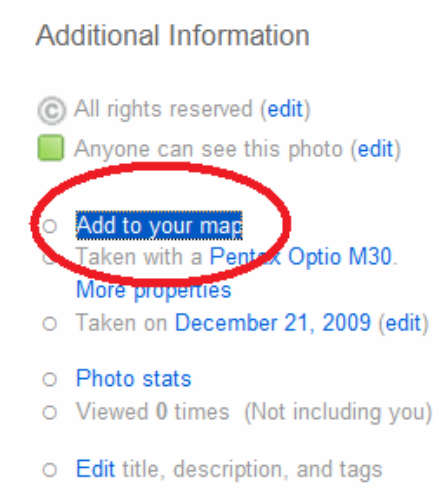


Figure 49. Link to locate a picture in a map

There you have to find the location of the image writing the name of the city in the text box to search in the map and place the picture:

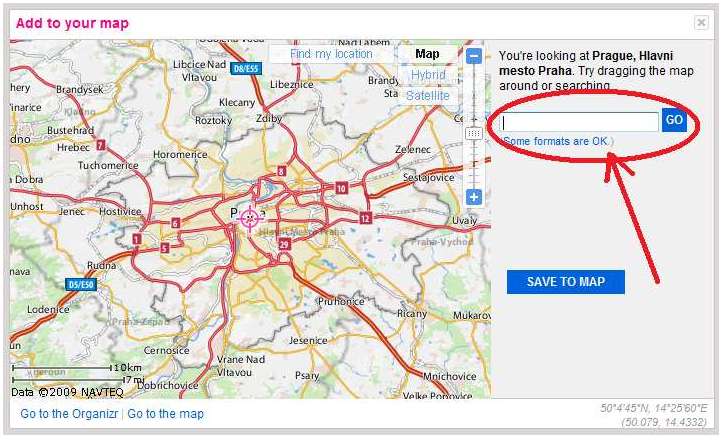


Figure 50. Field to search the location of the picture in the map

8. Final result

Once the picture has been located, it can be seen in the map.

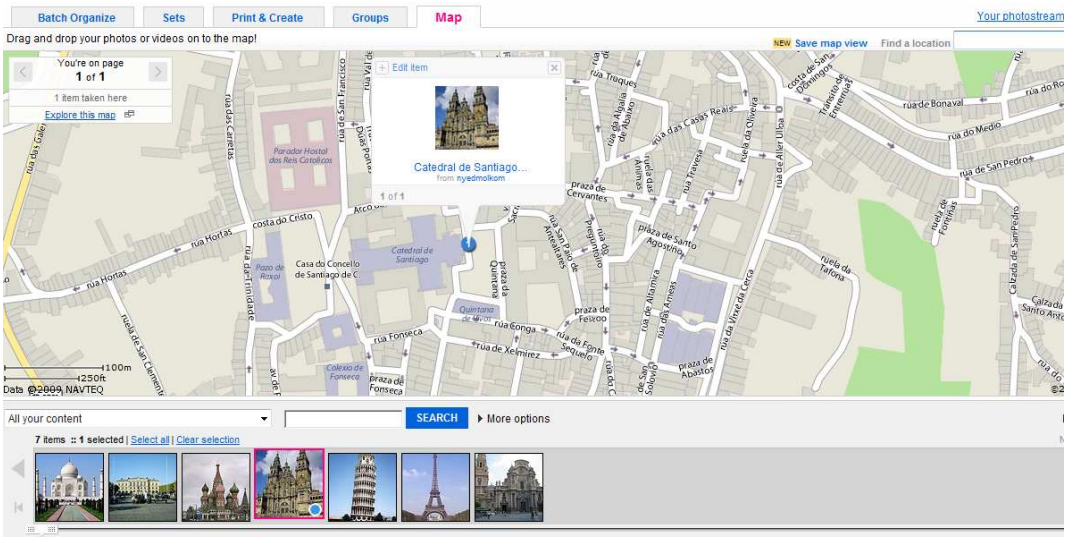


Figure 51. Geographic location of the images in the map

Appendix C. User documentation

To make it easier the use of the web portal to users, is included this documentation that contains the basic necessary information to know how successfully navigate in the website

In the starting page the user can see the web page with three distinct parts such as a header, a body and footer.

In the header there is an icon of the association “Nyeds Hembygdsförening” (The Local History Association in Nyed) that if is clicked redirects to the homepage wherever you are. Below in the header there is a field of search with its corresponding button “*search*”, and another field where you can select the number of results per page where the options are 5, 15, 30 and 50. As part of the header there is also a drop-down menu which consists of an *advanced search*. With this advanced search the user can further refine the criteria for finding a particular file. Finally in the right side of the header there are two flags to establish the desired language for the web.

The main part is in the middle. There appear the icons for the different albums in the database. These pictures can be clicked to address to the visualization of the picture gallery in each one.

Finally in the footer there are several links to come back to the start page, to contact with the administrators sending a comment, to read the help and to go to the admin part making the login.

In the Figure 52 can be seen the different explained parts of the header, the main part in the middle and the footer in the home page.

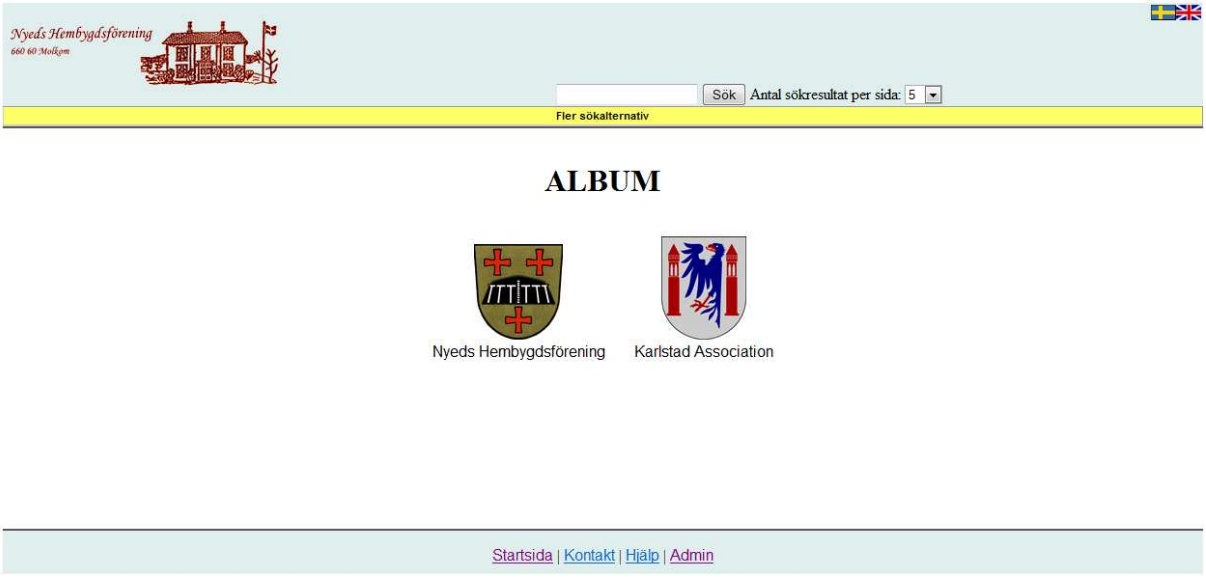


Figure 52. Starting page

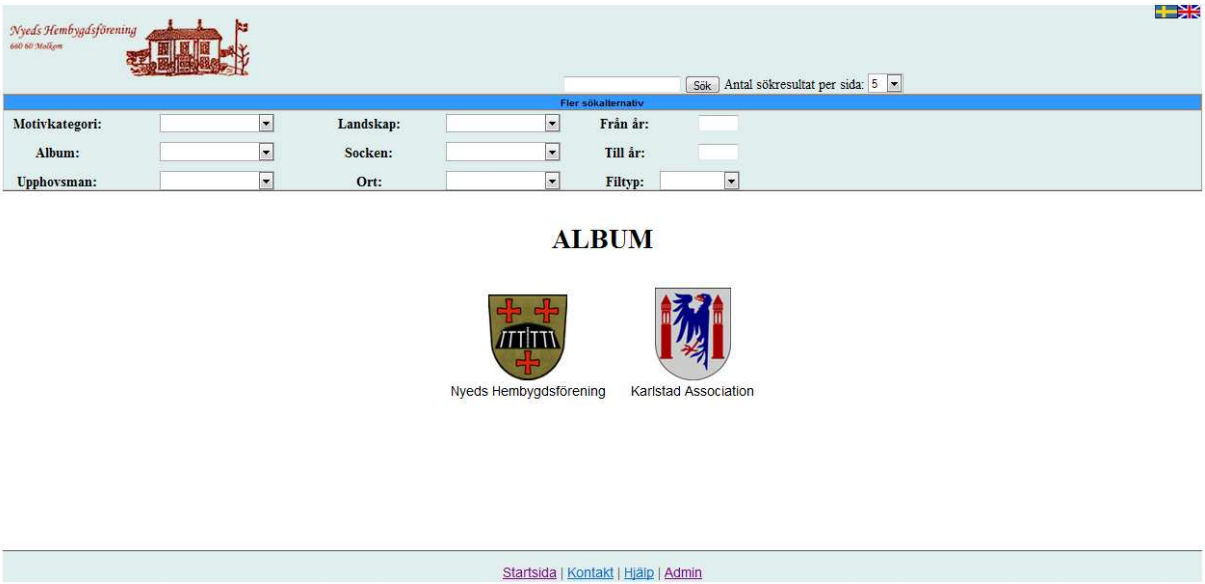


Figure 53. Starting page with advanced search menu open

After one of the albums is selected by the user, the gallery will show the files contained in that album. If the number of files is very high, it appears at the bottom of the web a pagination system with which the user can easily go to next image, previous page, first page or last page. This display shows a new part of the header which reports the number of files that are being displayed as well as the total number of files in the current album.

Figure 54. Gallery visualization of an album

If any of the images is clicked the viewing will have a larger size and pagination system changes and now is formed by the arrows on right and left or the thumbnails which redirect the user to the next or previous image. Also in this visualization the user can see the data of each file in a table that contains information such as title, the album that owns the file, tags, comments etc.

Under each image there are two links. In the first link the user can send a new comment for current file and the second link is used to open the print format of the image and print.

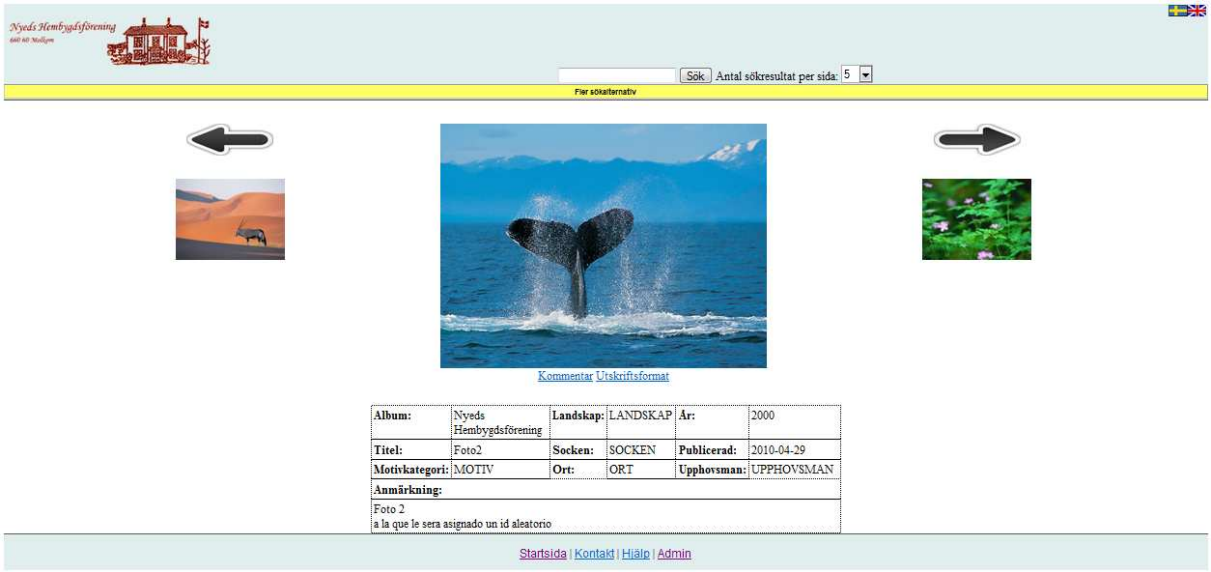


Figure 55. Individual visualization of the picture and displacement to next/previous picture.

If the file is a document, an audio file or a video file, it will be represented by following icons:

Figure 56. Icons for different types of files

When the user wants to open a document or a video file only has to click in the icon and this file will be opened (only if the relevant programs are installed in the system). The user is encouraged to preview help link if needed for any program installation.

In the case of audio files, the user can play the mp3 file using the audio player added in the web page or clicking on the icon and using the default player in the system. Here you can see this new player:

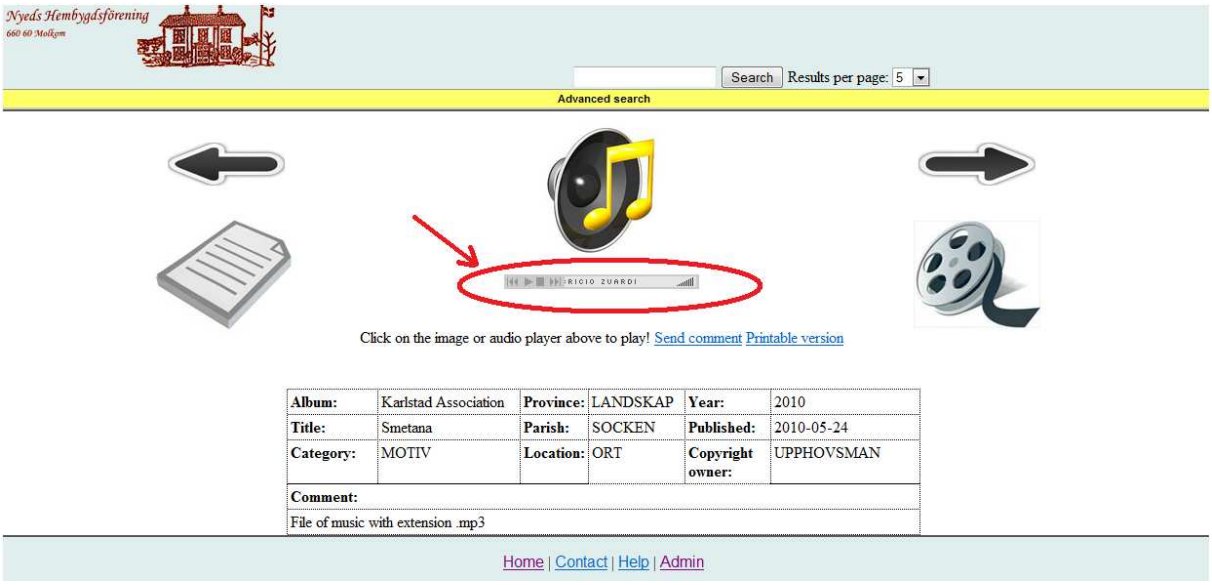


Figure 57. New audio player

Another action that the user can perform is the possibility of making a search either a normal search or an advanced. Both options are shown below.

Firstly the user writes a pattern of search depending on the information sought and then it is possible to make a normal search or an advanced search. For latter the user may clicked in the yellow bar to see the drop-down menu. In that menu search options can be selected such as album, file type, location or year.

Figure 58. Example of search with the pattern "river"

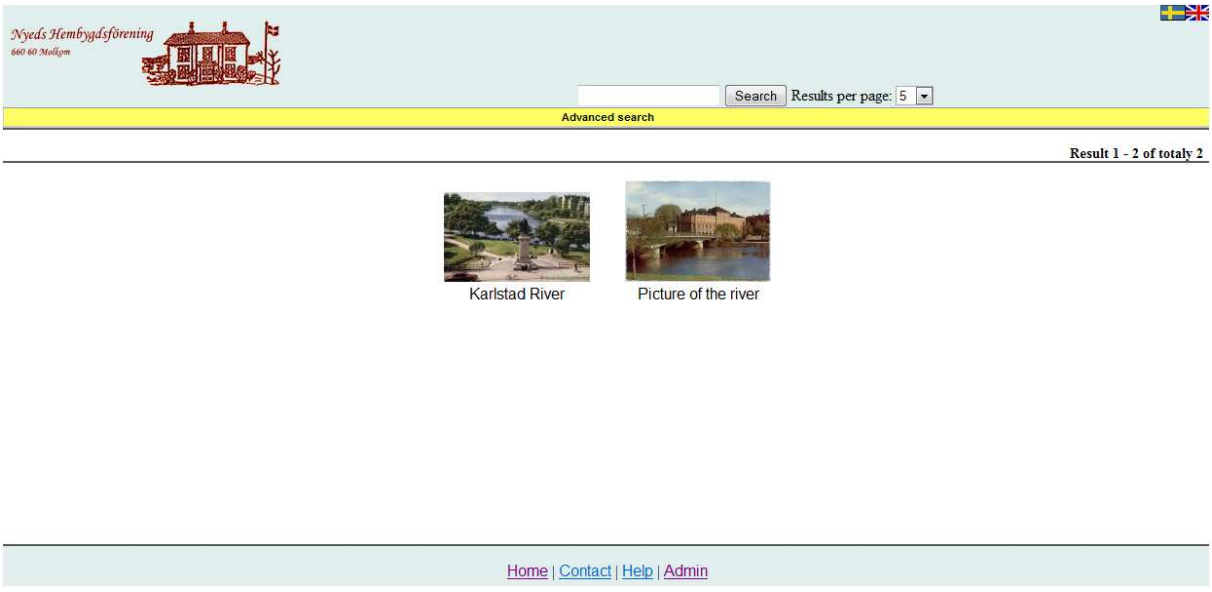


Figure 59. Results for the search with the pattern "river"

As explained in the section 4.5.1 if the number of results in a search is greater than the established number of results per page in the header, the system of paging will appear at the bottom of the web page. This situation happens either on a normal search or advanced search.

In conclusion, user actions can be limited to view files either by specific searches or directly looking at the contents of an album. The administrator has more privileges as will be seen below and can perform more actions than the normal user.

Appendix D. Administrator documentation

Administrators access the system through the page loggain.php. Enter the username and password is needed to identify the user. There is also the option to change the password, as shown in the figure below.

Figure 60. Page access for administrators

If the authentication is valid, the system redirects the user to the administrator; this page is shown in the Figure 61.

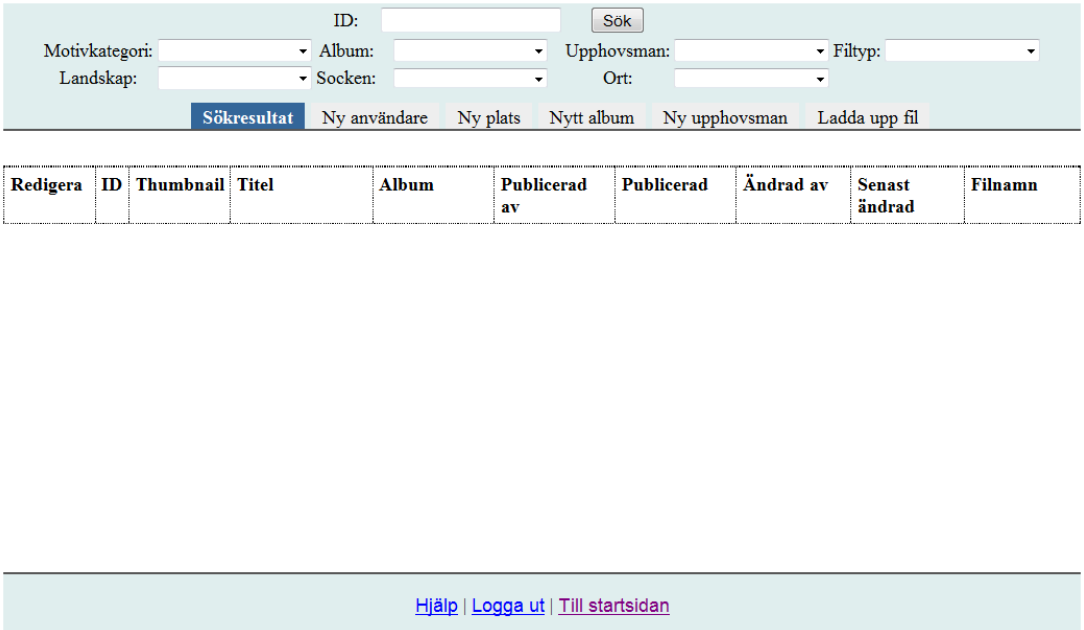


Figure 61. Homepage for administrators

As shown in the previous image, the system has a header where the administrator can perform advanced searches. Also on this page is a set of tabs to access different pages. These pages allow you to add new user, new location, new album, new author and upload a file.

The results of the searches are more detailed than standard user searches. An example is shown in the Figure 62.

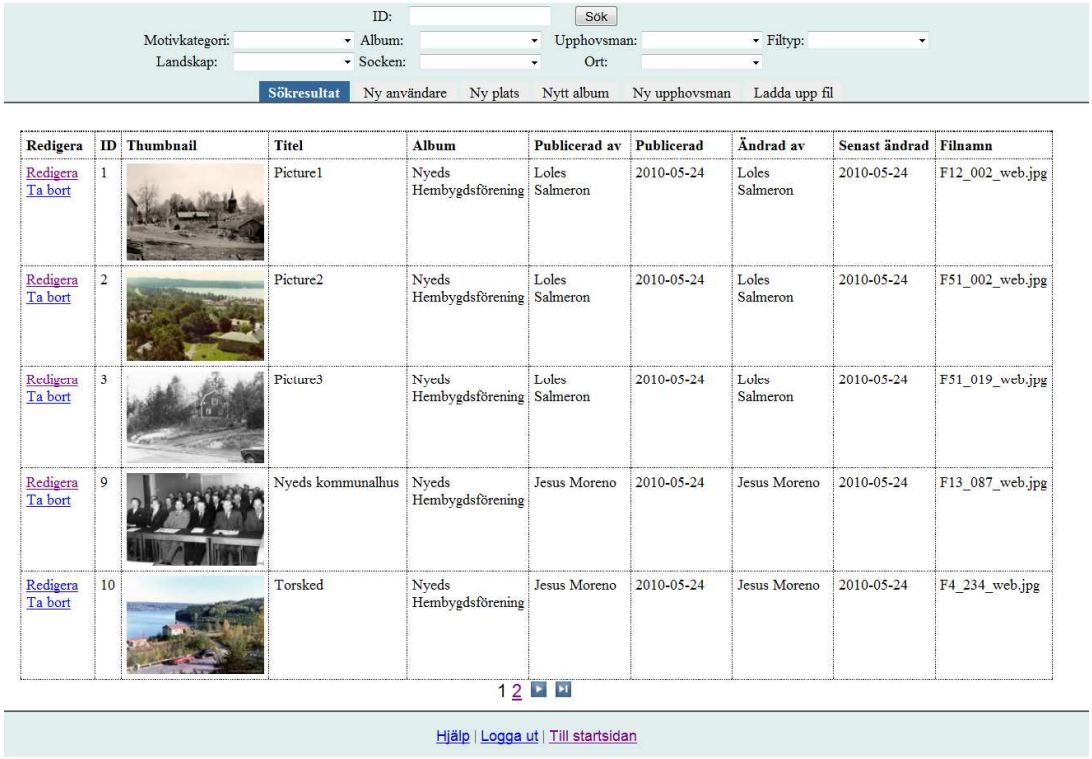


Figure 62. Example of search results

The tab "*Ladda upp fil*" provides access to the page to add a new file. Then the administrator will find a web as shown in the Figure 63. In it, the user selects the file and fills the appropriate fields. In the "*Sökord*" can add as many labels as the user wants to insert more than one label, the user may separate them with commas. It is important to explain that the fields "*Ladda upp fil*," "Sock" and "ort" are mandatory, i.e. cannot be left with the value "*Saknas.*" If the location does not exist in the system the user has to add it. To add a new location, just click on the tab "*Ny plats*."

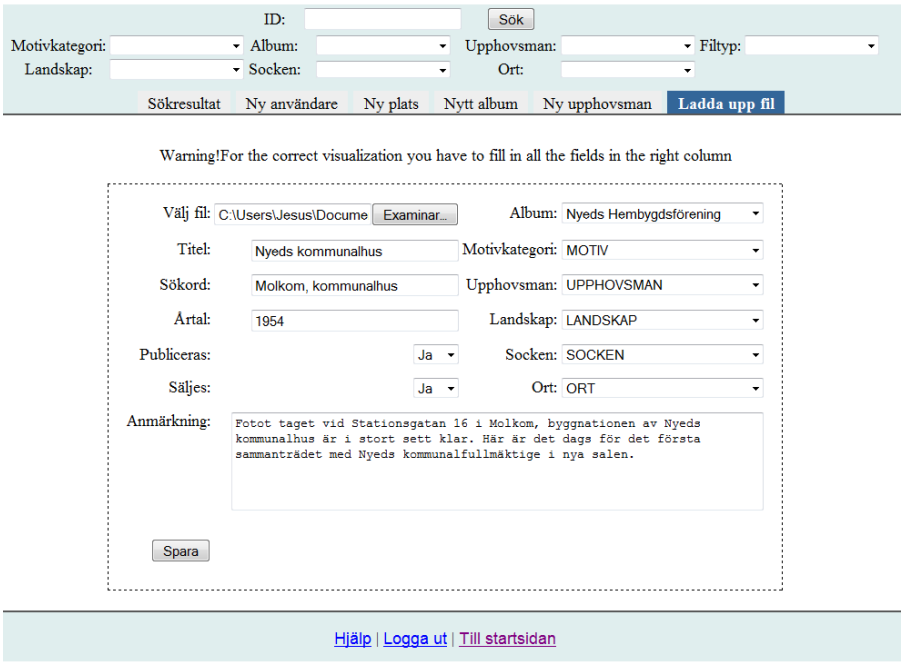


Figure 63. Page to add a file

Having introduced a new image successfully, the user may see a confirmation message and a thumbnail of the inserted image, as shown below:

Figure 64. Message after insert a picture

To add a new user, just click on the tab "*Ny användare*". Then access a website as shown below:

Figure 65. Add new user

As you can see, to create a new user just put the name in "*Användarnamn*" and the e-mail "*e-mail Användarens*".

As discussed above, each file needs to be located at a specific site. So, to add a new location just click the tab *"Ny plats"*. The fields may be filled from left to right, because each field depends on the field situated on the left.

Figure 66. Add new location

To add a new album the user may click on the tab *"Nytt album"*. In the form to add a new album should be specified:

Albumnamn: New album name.

Mappnamn: a folder with this name will store the files on the server.

Albumbeskrivning: Description of the new album.

Finally press the button *Skapa album*.

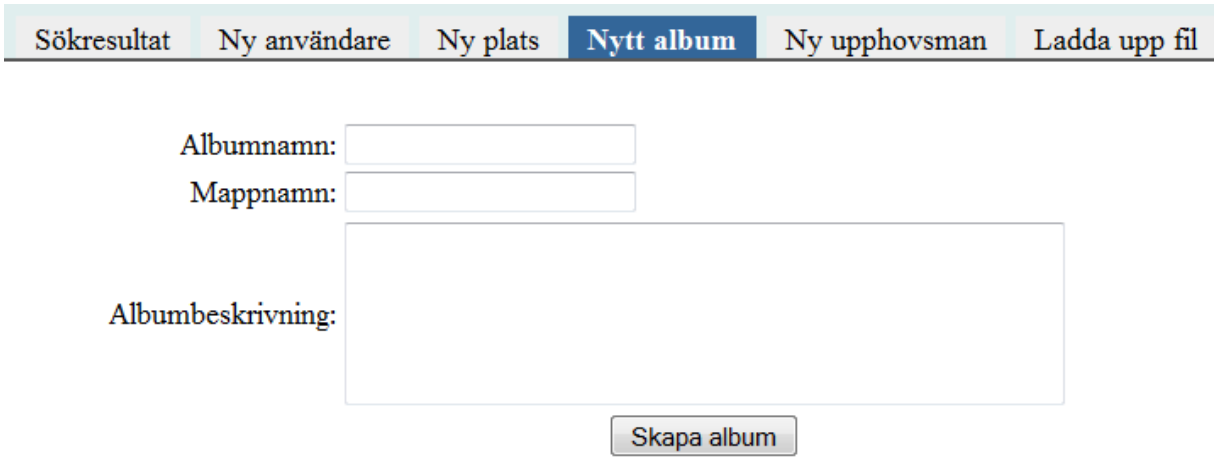


Figure 67. Add new album

The authors of each file can be added by clicking on the tab "*Ny upphovsman*". Just enter the name of the author and click "*Lagg till upphovsman*".

Figure 68. Add new author

Appendix E. System documentation

For possible future work is included this system documentation. The developed information will explain the content of the web server and roughly the function of each file within server. Below it is possible to see the set of folders in the server and all the files within "*htdocs*" which is the folder that contains all the information in this hosting.

Web server files system:

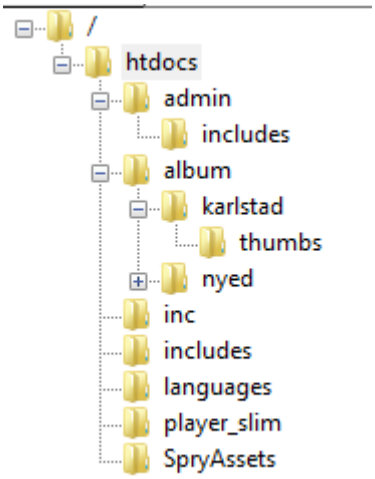


Figure 69. Web server files system.

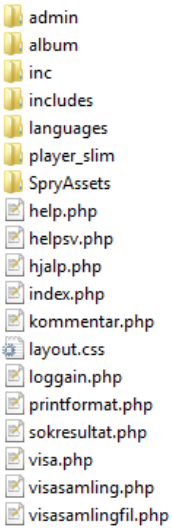
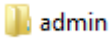
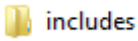


Figure 70. Root folder.

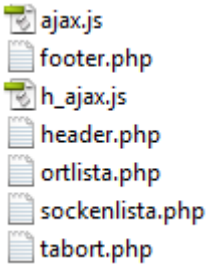
Foremost it will be explained the first level, i.e. the content of the folder "*htdocs*" made up of both another folders as files of different types. The folder "*htdocs"* contains:



This folder contains all the information relating to the system administrator who has more privileges than any normal user. It includes files for each possible action to the administrator as well as a separate help file or own style sheet.

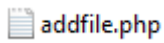


The folder "*includes*" within "*admin*" folder contains the following files:

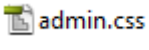


The administrator has independent files for the header and the footer. For the dependence between some fields in the administrator part are used the JavaScript files ajax.js and h_ajax.js and also the files *sockenlista.php* and *ortlista.php*. The dependence is as follows: If the user selects a "*landskap*" then has to select one "*socken*" and turn if the user selects a "*socken*" below has to select one value in the field "*ort*". Finally the file tabort.php is for deleting a file in the administrator part.

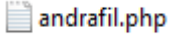
The rest of the files within "*admin*" are:



File that implements the addition of new files to the database.



This file is the style sheet used in the administrator part.



This file contains the implementation of the page where the user is redirected in the web when a click on "*Redigera*" i.e. the user wants to modify data from one file.

help.php

File with the help information for the administrator in Swedish.

logout.php

File that implements the call to the system for log out.

nyanvandare.php

File for the creation of a new user by the administrator.

nyplats.php

File for the creation of a new location by the administrator.

nyttalbum.php

File for the creation of a new album by the administrator.

nyupphovsman.php

File for the creation of a new author by the administrator.

sokresultat.php

File that implements the visualization of search results in the administrator part since search criteria. These results are shown in a table with their corresponding data and if it is necessary it will appear a system paging.

album

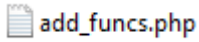
This folder contains the albums created in the database. Each album will be a new folder which will have inside all the files contained in the album whether pictures, documents or audio or video files. Each album always has a new folder called thumbs where the system will insert the thumbnails of the corresponding files.

inc

The folder “inc” contains all the icons used in the web page such as the icons which represent the different types of files (audio, video or document) as well as the icons for the arrows in the paging system or the icons which appear in the header of the web site.

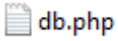
includes

This folder has an important content. The most important files are those related to the database and with login system to any user on the web. Another important aspect treated in this folder is the modification of the header and footer which are maintained throughout the complete session on the web page.

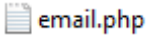


This file is called by nyttalbum.php to check if the new album name has standard chars and the long is less than 25 chars.

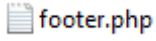
In this file there are functions to control the textboxes values of plats, i.e. *landskap*, *socken* and *ort*. When a "*landskap*" is selected, the values for "*socken*" are updated. The same functionality exists when the new "*socken*" field is selected.



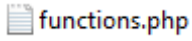
This file contains the connexion routine for the database.



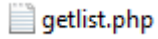
This file contains the administrator e-mail address. This file is called by kommentar.php.



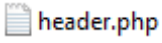
In this file is included the footer of the website. It has a link to contact administrator, help link, home link and administrator access link.



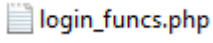
As the file name says, a set of general functions are included here, i.e. a function to get file types, functions to create thumbnails and functions to manage tags.



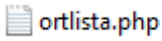
This file allows generating a query to obtain the "*socken*" of a selected landscape.



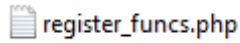
The header file has most of the functionality for the user. It allows making advanced and normal searches of files. In addition contains the option to change the language and the option to specify the number of files shown in the web (visasamling.php).



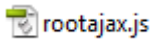
This file contains the functions related to access and exit from the site by an authenticated user.



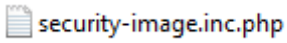
This file allows generating a query to obtain the "*ort*" of a selected "*socken*". This file and sockenlista.php are use to fill the values *socken* and *ort* automatically.

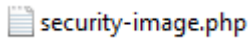


The functions included in this folder are related to creating a new user, i.e. validate the user name, insert the user in the database, password generation and e-mail confirmation.

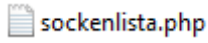


This file is related with the functions in *ajax.js.*

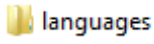




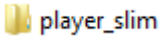
These files are responsible for generating the security image for the CAPTCHA test.



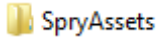
This file generates a query to obtain the "*socken*" of a selected id landscape.



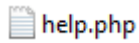
This folder contains the function responsible of obtaining the language of the web path and the different files which make translations from Swedish to English according to the selected language.



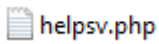
The folder "player_slim" is used to implement the new audio player for audio files mp3.



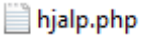
This folder is which implements all the aspects of both graphic and functional of the drop-down menu in the advanced search.



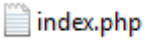
File with the help information in English.



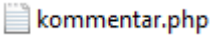
File with the help information in Swedish.



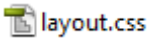
File with the help information when the user wants to send a comment to the administrator. It is the help to explain the security system called “Captcha”. Captcha is a type of challenge-response test used in computing to ensure that the response is not generated by a computer.



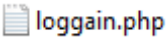
This file is the domain home page is accessed. It has the information divided into header, body and footer. The body is composed of appropriate selects in order to finally view the files in the database.



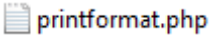
In this file is the information related to comments from the users which can be sent to the administrator about a picture or making a suggestion or compliment about the system. A security system is included in this part to avoid the messages are sent by a computer.



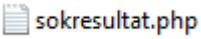
This file is a style sheet for the style of the web page: header, sidebars, buttons or footer for example.



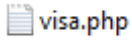
File where is implemented the process of login like administrator in the web page where the user has to introduce user name and password. The user also has the possibility of receiving the password in the mailbox if has forgotten it.



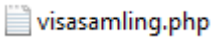
File where is implemented the printable version of each picture in the database. When the user clicks the link at the bottom of a picture “Printable version”, is redirected to this file. In that moment it appears new window with the information will be printed and the link to send that information to the printer.



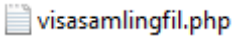
It is one of the most important files in the system because it contains the implementation of the searches (advanced or normal) in the system. It takes the search criteria from the fields in the drop-down menu in advanced search or the pattern introduced in the text box for the normal search. Since that information, search is made in the database and the results are shown.



This file contains information about how to show the files obtained from a search when the user clicks in some of them to see the image larger and with its corresponding information.



It is the file used to view the files contained in an album when the user clicks in the corresponding icon of that album. The gallery of the files is shown and if it is necessary a system of paging appears to make easier the visualization.



In this file is implemented how to show the files when the user clicks on one picture from the shown gallery of an album. The result is a bigger view of the file and the possibility of going to the next or the previous picture clicking on the corresponding arrows or thumbnails.

Appendix F. ER Diagram

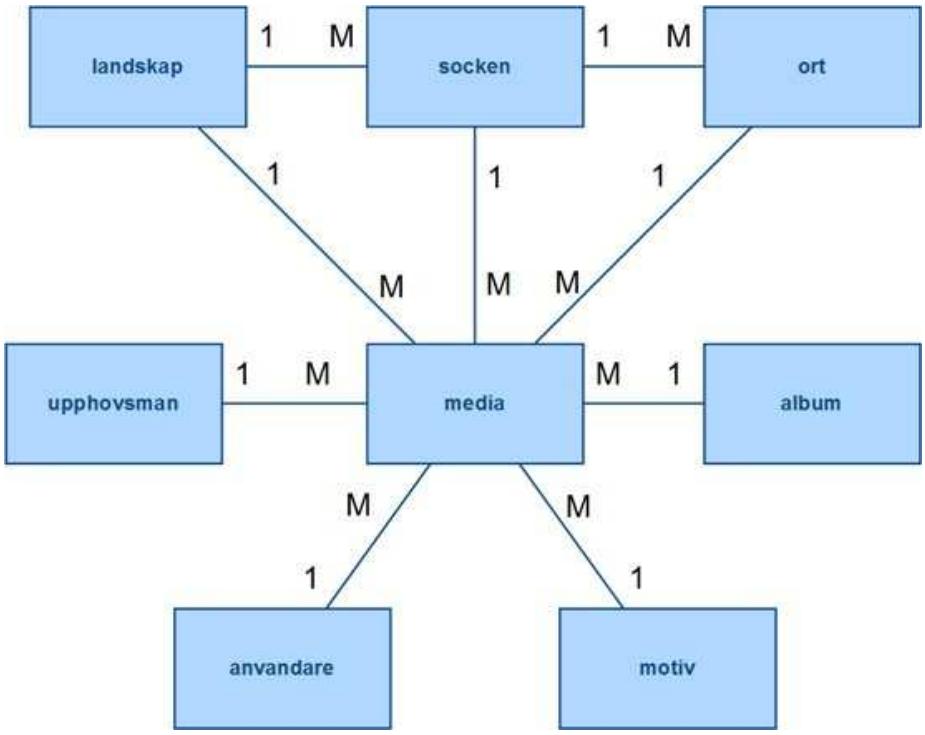


Figure 71. ER Diagram of the DB.

Appendix G. Technical information

FTP server: ftp.260mb.com

User name: pacus_5444836

Password: karlstad

To access PhpMyAdmin and MySQL: http://cpanel.260mb.com/

User: pacus_5444836

Password: karlstad

Prototype web portal:

http://www.nyedproject.260mb.com/