

## WP5: Tool tests for scenario 2.2

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P	Public	P
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### Revision History

Revision	Date	Author	Organisation	Description
0.1	20130614	Eva Toller	RA	First draft
0.2	20130618	Eva Toller	RA	Added tests results for Avis Document Converter
0.3	20130801	Eva Toller	RA	Added tests results for Avis Image Converter
0.4	20130802	Eva Toller	RA	Added test results for Universal Document Converter



## 1 TOOL TESTING FOR SCENARIO 2.2

### 1.1 SCENARIO DESCRIPTION

“A university lecturer in art history wants to use a collection of digitised art images made 15 years ago. They are stored in a format he is not familiar with. Since there are about 200 images, the researcher is looking for tools which would convert them into a format he could easily use in batch mode. He is not sure how to identify a tool or a service which could do this.”

*General comment:* for test purposes, it may suffice to use 10 – 20 images. If this scenario is reused in Proof of Concept #2, a more realistic amount of images may be used, if possible.

*Suggested test data:* see document **DCH-RP\_WP5\_Scen-2-2\_ID-66.doc**

### 1.2 DISPOSITION

Chapter 2 and the following chapters are structured in the following way:

In sections X.1, a short description is given of the tool and how it works.

In sections X.2, the data set(s) that the tool will be tested on is described. If there are several data sets, they are described in sub sections: X.2.1, X.2.2, X.2.3 ... X.2.n.

In sections X.3, the results of the tests are given (if any). If there are several data sets and the results differ significantly between them, they are described in sub-sections: X.3.1, X.3.2, X.3.3 ... X.3.n.

In sections X.4, general comments are given about the tool and its usability for digital cultural heritage preservation, dissemination et c. (This section may be skipped if it was not possible to install and/or run the tool).

### 1.3 TEST ENVIRONMENT

When nothing else is said, the test environment is a PC (Personal Computer) with Windows 7 Professional, processor Intel(R) 2,7 GHz, and 8 GB working memory (RAM).

## 2 AVS DOCUMENT CONVERTER 2.2

### 2.1 GENERAL DESCRIPTION

AVS Document Converter 2.2 converts files of **source formats**

- PDF, HTML, HTM, MHT, RTF, DOC, DOCX, ODT, PPT, PPTX, TXT, **TIFF**, TIF, EPUB, MOBI, FB2, **DjVu**, XPS

into files of **target formats**

- **PDF**, HTML, MHT, RTF, DOC, DOCX, ODT, TXT, GIF, **JPEG**, **PNG**, **TIFF**, EPUB, MOBI, FB2

It can be downloaded from <http://www.avs4you.com/AVS-Document-Converter.aspx>

Note that there is also an **AVS Image Converter** (<http://www.avs4you.com/AVS-Image-Converter.aspx>).

The reason that the document converter is tested instead is that it supports DjVu as a source format (which the Image Converter does not). However, it may later be necessary to test the AVS Image Converter too, to cover all the source and target formats (written in **bold** above).

### 2.2 DATA SETS

The data sets that were used to test the AVS Document Converter 2.2 are the following (for details, see: **DCH-RP\_WP5\_Scen-2-2\_ID-66.doc**):

- Seven TIFF images
- 106 DjVu images

The size is between 26 KB (the smallest DjVu image) and 397 MB (the largest TIFF image).

### 2.3 TEST RESULTS

**As a whole, the behaviour of the program was not acceptable, and the required results were only partly obtained.**

The results for the different types of conversions are described below. The details are described in section 2.4.

#### 2.3.1 Loading files

It was not possible to load all seven TIFF files simultaneously, and it was altogether impossible to load the largest TIFF file. All the DjVu files could be loaded simultaneously without problems.

### 2.3.2 Converting TIFF files to PDF

Only three of the seven TIFF images could be successfully converted. The quality of the output was good for these files (the target files were also smaller than the source files). The largest TIFF file (that is, the largest that could be loaded) could not be converted at all. Some seemingly converted files resulted in very small target files with only a white or grey area instead of an image.

### 2.3.3 Converting DjVu files to PDF

Most of the files could be converted, but the larger the source file, the harder the conversion (as for the TIFF files, this resulted in very small target files with a white or grey area instead of an image). The quality of the output was good for the files that could be converted successfully. However, the target files were much larger than the source files, approximately ten times larger.

### 2.3.4 Converting DjVu files to JPEG

All files could be successfully converted as long as you did not attempt to convert them all at once (when this was tried, the program stopped working).

However, the quality of the output depended on the size of the source file; it was much better for the larger source files than for the smaller ones. The sizes of the target files were about two times larger than the sizes of the source files.

### 2.3.5 Converting DjVu files to PNG

The result was approximately the same as for the DjVu-to-JPEG conversion, except that the sizes of the target files were about four to five times larger than the source files.

## 2.4 USABILITY

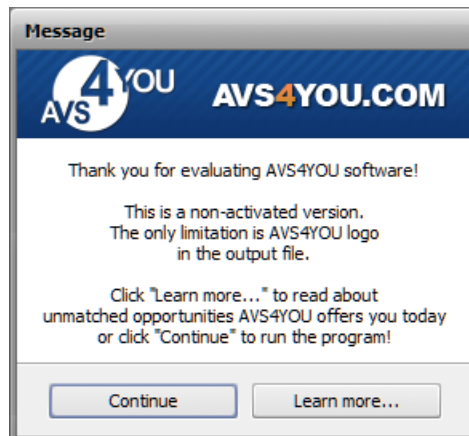
### 2.4.1 Download and installation

The download and installation of the tool were quite easy and went fast (however, it was recommended that you close all other applications before installation).

A double-click on the file **AVSDocumentConverter.exe** starts the installation. The usual pop-up windows that can be expected during program installations are shown:

- A question to make certain that you trust this provider, and the provider's certificate
- Selection of a language (the choices are German, English, Spanish, French, Italian)
- Selection of the directory for installation

Each time you start the program, the following pop-up window is shown:



*Figure 1: Pop-up window shown at program start*

“Learn more” shows a web page (<http://www.avs4you.com/Register.aspx?Type=App&ProgID=74&URL=Register>) that lists the price of the commercial version (where you don't get the AVS logo, a watermark banner, in the output files). The prices are for the whole AVS toolkit (16 tools): \$59 for unlimited subscription and \$39 for one year's subscription. However, these prices are only valid until 2013-06-30.

The start page for AVS Document Converter looks like this:

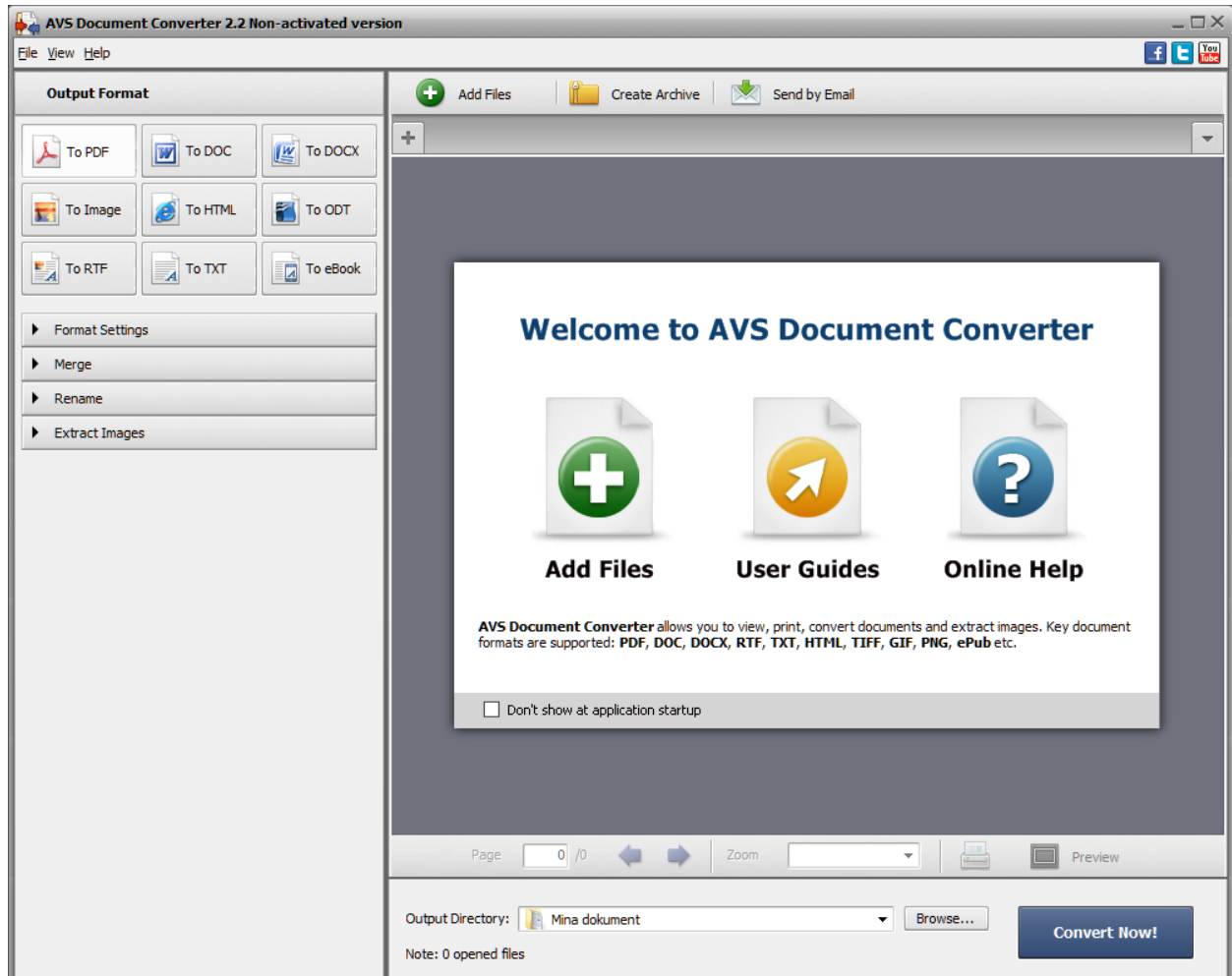


Figure 2: Start page

The User Guides are on-line guides for *all* the AVS tools. The Online Help contains instruction videos for the document converter.

## 2.4.2 Adding source files

The command “Add files” let you choose source files to work with. You can add many files simultaneously.

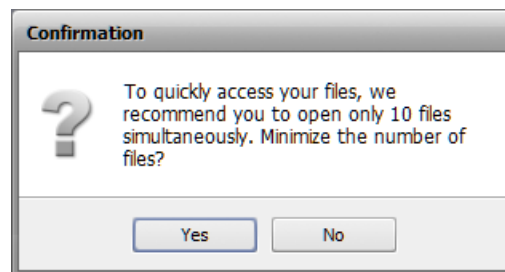
### Loading TIFF image files

When I tried to add the seven TIFF images simultaneously, the program stopped working.

When I added only one TIFF file at a time, it still was impossible to load the largest images (397 MB) and the program stopped working, but the second largest (150 MB) was successfully loaded. It was also possible to add the five smallest files (154 KB up to 29 MB) simultaneously without problems.

### Loading DjVu image files

I tried to add the 106 DjVu files simultaneously. The following message was shown:



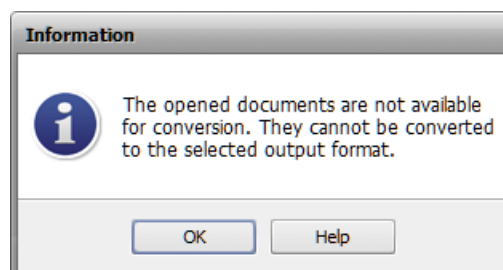
*Figure 3: Warning message*

However, adding the 106 files simultaneously went rather fast. I tested this several times, and occasionally the program stopped working, but most times the loading was successful.

### **2.4.3 Converting files**

There are nine main choices of target formats (PDF, DOCX, Image, HTML, and so on). After selecting Image, you choose one of the following: JPEG, TIFF, GIF, PNG. For JPEG, you can also choose image quality of output files (default value is **100%**). For TIFF, you can choose **No Compression** or **Lzw**.

When I added TIFF files as source files, selected JPEG as output format, and then clicked "Convert now", the following message was shown:



*Figure 4: Error message*

The same happened with the other image output formats. Thus, it is not possible to convert TIFF to other image formats with this tool. Neither can you use the tool to compress TIFF files.

### Converting TIFF files to PDF

When PDF was chosen as output format, the conversion *seemed* worked for five of the loaded TIFF images. However, for two of the images, the result image was only a grey area. These documents were scanned pages of church books (the sizes of the source files were 154 KB and 29,1 MB, respectively), and the size of the target files was very small (59 KB).

The second largest (150 MB) could not be converted at all (the program stopped working).

For the remaining three TIFF images, the conversion worked and the quality of the output files was good. The sizes of the files were reduced:

- 5,61 MB → 1,34 MB
- 1,54 MB → 908 KB
- 13,4 MB → 2,4 MB

### Converting DjVu files to PDF

Simultaneous conversion of 31 of the DjVu images went fast. All files were successfully converted, and the quality of the output was good. However, the target PDF files were much larger than the source DjVu files (approximately, ten times larger).

When converting 21 other DjVu files simultaneously, the program stopped working after converting nine of them. Furthermore, all the target files was of size 60 KB, and only contained white pages images.

A difference with the successfully converted 31 files was that these 21 files were larger; the *largest* file in the batch of 31 files was 336 KB, while the *smallest* file in the batch of 21 files was 1272 KB. When this large file was converted alone, it only seemed to have succeeded; the conversion resulted in the same white page as before. An attempt to convert the largest file (5200 KB) made the program stop working.

The rest of the files followed the same pattern: large files were impossible to convert, and some files were only seemingly converted.

### Converting DjVu files to JPEG

Simultaneous conversion of 31 of the DjVu images into JPEG went fast. The chosen scale factor was 100%. All files were successfully converted, and the quality of the output was mostly acceptable (however, the esthetic value of some pencil sketches were much diminished). The target JPEG files were larger than the source DjVu files but moderately so (approximately, twice as large).

The previously unconvertable 21 other DjVu files were now successfully converted, and the quality of the output was good.

The rest of the files were converted without problems.

Finally, an attempt was made to convert all 106 DjVu image file simultaneously. This made the program stop working (after conversion of ~35 files).



### Converting DjVu files to PNG

As for JPEG, the simultaneous conversion of 31 of the DjVu images to PNG went fast, and the rest of the files could also be converted (note that no scale factor can be selected for PNG). All files were successfully converted, and the quality of the output was acceptable. The target PNG files were larger than the source DjVu files (approximately, four to five times larger).

Again, the attempt to convert all 106 DjVu image file simultaneously made the program stop working (after conversion of ~45 files).

### **2.4.4 Recommendation**

This tool should only be used when you want to convert small amounts of files. It is not reliable for batch conversion. Furthermore, check the result if you convert to files to PDF (the conversion sometimes results only in a white or grey page instead of an image). You may also want to check the quality of the images if you convert to JPEG or PNG (the quality varied between barely acceptable and good).

Note that the PDF files that are generated with this tool are not necessarily in the specific **PDF/A-1** format. Even so, they may conform to the rules of PDF/A-1, but this must be tested (see <http://www.pdfa.org/2011/08/validating-pdfa/> ). It is possible to convert PDF to PDF/A-1, but not necessarily easy.

### Grade

On a scale from 1 (very bad) to 5 (very good). X is "Not applicable".

Simplicity of installation: 4

Simplicity of management: X

Ease of use: 3 (would be higher if pop-up window messages didn't appear all the time)

Generality of solution: 4 – 5

Quality of result: 1 – 2

## 3 AVS IMAGE CONVERTER 3.0

### 3.1 GENERAL DESCRIPTION

AVS Image Converter 3.0 converts files of **source formats**

- BMP, GIF, **JPEG**, JPG, JPE, JFIF, **PNG**, APNG, **TIFF**, TIF, PCX, TGA, RAS, PSD, CR2, CRW, RAF, DNG, MEF, NEF, ORF, ARW, EMF, WMF, JPEG 2000, SWF

into files of **target formats**

- BMP, GIF, **JPEG**, JPG, JPE, JFIF, **PNG**, APNG, **TIFF**, TIF, **PDF**, TGA, RAS

It can be downloaded from <http://www.avs4you.com/AVS-Image-Converter.aspx>

As can be seen in the lists of source formats and targets formats: with respect to the chosen test data formats and Riksarkivet's allowed formats (see and Section 1.5 in **DCH-RP\_WP5\_Scen-2-2\_ID-66-restricted.pdf** and Section 3 in **DCH-RP\_WP5\_Scen-2-2\_ID-70.pdf**, respectively), the conversions that are relevant are the following:

- TIFF to JPEG, PNG, and PDF
- JPEG to TIFF, PNG, and PDF

### 3.2 DATA SETS

The data sets that were used to test the AVS Image Converter 3.0 are the following (for details, see: **DCH-RP\_WP5\_Scen-2-2\_ID-66.doc**):

- Seven TIFF images
- Twelve JPEG images

The size is between 122 KB (the smallest JPEG image) and 397 MB (the largest TIFF image).

### 3.3 TEST RESULTS

**As a whole, the behaviour of the program was not acceptable, and the required results were only partly obtained.**

The results for the different types of conversions are described below. The details are described in section 3.4.

#### 3.3.1 Loading files

It was not possible to load all seven TIFF files simultaneously, and it was altogether impossible to load the largest TIFF file. All the JPEG files could be loaded simultaneously without problems.

### 3.3.2 Converting TIFF files to JPEG

Only five of the seven TIFF images could be converted (those that couldn't be converted were the largest ones). The quality of the output was good for these files (the target files were also smaller than the source files, except in one case).

### 3.3.3 Converting TIFF files to PNG

Only five of the seven TIFF images could be converted (those that couldn't be converted were the largest ones). The quality of the output was good for these files.

### 3.3.4 Converting TIFF files to PDF

Only five of the seven TIFF images could be converted (those that couldn't be converted were the largest ones). The quality of the output was good for these files. When converted in batch mode, all files were converted into a single PDF file "Untitled.pdf". The sizes of the images in this PDF file differed much.

### 3.3.5 Converting JPEG files to TIFF

The conversion worked without problems for all of the twelve files. The quality of the output was good. The target files were *much* larger than the source files.

### 3.3.6 Converting JPEG files to PNG

The conversion worked without problems for all of the twelve files. The quality of the output was good. The target files were larger than the source files.

### 3.3.7 Converting JPEG files to PDF

The conversion worked without problems for all of the twelve files, but when converted in batch mode, all files were converted into a single PDF file "Untitled.pdf". The sizes of the images in this PDF file differed much.

## 3.4 USABILITY

### 3.4.1 Download and installation

The download and installation of the tool were quite easy and went fast (however, it was recommended that you close all other applications before installation).

A double-click on the file **AVSImageConverter.exe** starts the installation. The usual pop-up windows that can be expected during program installations are shown:

- A question to make certain that you trust this provider, and the provider's certificate
- Selection of a language (the choices are German, English, Spanish, French, Italian, Dutch)
- Selection of the directory for installation

Each time you start the program, the following pop-up window is shown:

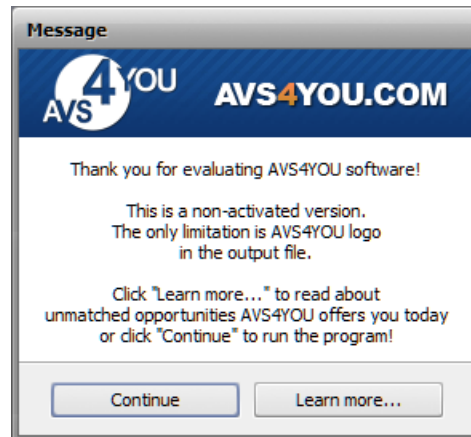


Figure 5: Pop-up window shown at program start

“Learn more” shows a web page ([http://www.avs4you.com/Register.aspx?utm\\_source=51&utm\\_medium=Register&utm\\_content=Register](http://www.avs4you.com/Register.aspx?utm_source=51&utm_medium=Register&utm_content=Register)) that lists the price of the commercial version (where you don't get the AVS logo, a watermark banner, in the output files). The prices are for the whole AVS toolkit (16 tools): \$59 for unlimited subscription and \$39 for one year's subscription. However, these prices are only valid until 2013-07-31 (when the same thing happened for AVS Document Converter, the same prices were valid until 2013-06-30)

The start page for AVS Image Converter looks like this:

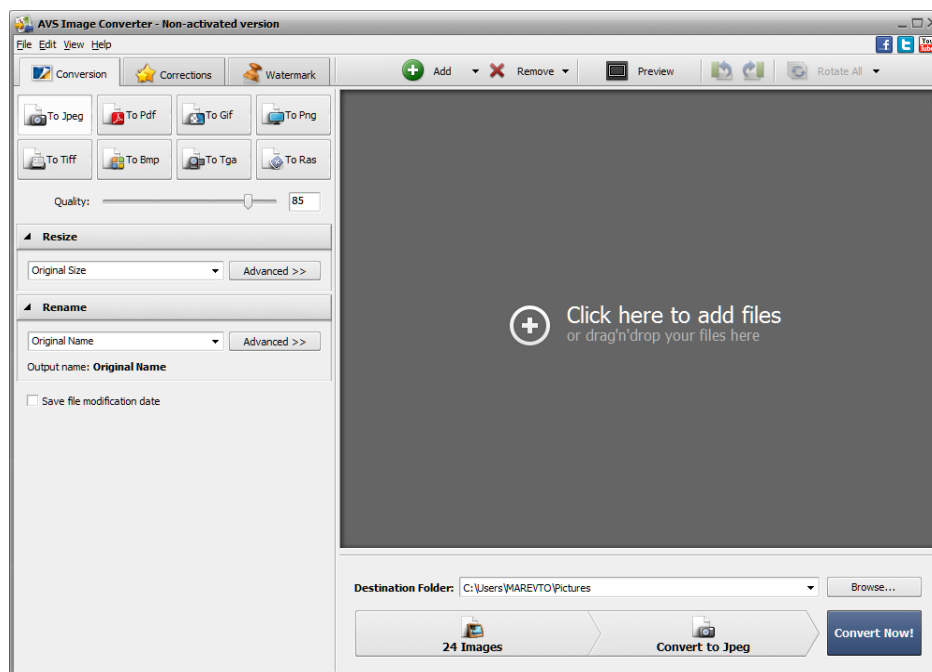


Figure 6: Start page

The User Guides are on-line guides for *all* the AVS tools. The Online Help contains instruction videos for the document converter.

### 3.4.2 Adding source files

The command “Click here to add files” let you choose source files to work with. You can add many files simultaneously. You can also drag and drop the files.

#### Loading TIFF image files

When I tried to add the seven TIFF images simultaneously, the program stopped working.

When I added only one TIFF file at a time, it still was impossible to load the largest images (397 MB) and the program stopped working, but the second largest (150 MB) was successfully loaded (although not in all the trials). It was also possible to add the five smallest files (154 KB up to 29 MB) simultaneously without problems. (These results are the same as those for AVS Document Converter).

#### Loading JPEG image files

The twelve JPEG image were successfully loaded simultaneously (and rather fast). The largest JPEG image was 2866 KB.

### 3.4.3 Converting files

There are eight main choices of target formats in the upper left corner of the window (JPEG, PDF, GIF, and so on). JPEG is default target format. When you select another target format, the text in the lower part of the window changes from “Convert to Jpeg” to “Convert to <whatever format you chose>”.

#### Converting TIFF files to JPEG

When I used TIFF files as source files, selected JPEG as output format, and then clicked “Convert now””, the following message was shown (and it is shown after all conversion attempts, regardless of the formats of sources and targets):

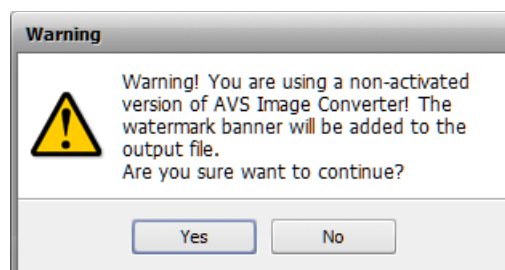


Figure 7: Warning message

After clicking “Yes”, another message was shown:

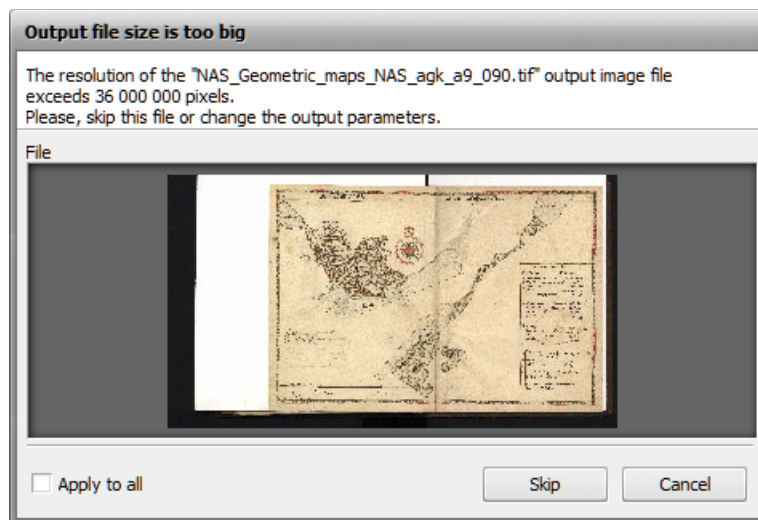


Figure 8: Error message

“NAS\_Geometric\_maps\_NAS\_agk\_a9\_090.tif” was the largest file that could be loaded (154 MB). When this file was skipped, the conversion worked for the rest of the files.

The sizes of the files were mostly reduced:

- 29,8 MB → 5,29 MB
- 13,7 MB → 1,01 MB
- 5,74 MB → 493 KB
- 1,58 MB → 375 KB

except in one case (a very small TIFF file)

- 154 KB → 3,27 MB

#### Converting TIFF files to PNG

Also for this conversion, the “NAS\_Geometric\_maps\_NAS\_agk\_a9\_090.tif” had to be removed for the conversion to work at all.

The sizes of the files were reduced in two of the cases:

- 13,7 MB → 8,84 MB
- 1,58 MB → 1,89 MB

and enlarged in three of the cases:

- 29,8 MB → 32,1 MB

- 5,74 MB → 5,96 MB
- 154 KB → 1,24 MB

### Converting TIFF files to PDF

When the chosen target format was PDF, the following message was shown:

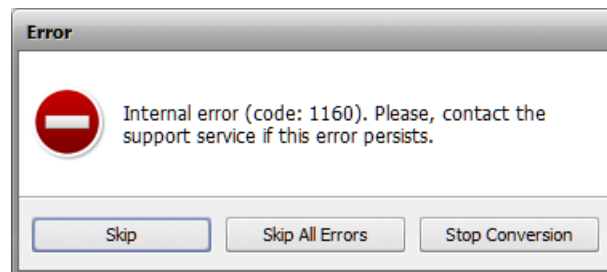


Figure 9: Error message

After clicking “Skip”, the conversion *seemed* to work, but after completion, not a single PDF file had been created. After removing “NAS\_Geometric\_maps\_NAS\_agk\_a9\_090.tif” the conversion worked; however, all files had been converted into a single PDF file “Untitled.pdf”. (There may be an option for splitting the source files into different target files, but I haven't found it).

### Converting JPEG files to TIFF

When the chosen target format was TIFF, the conversion worked without any problems.

The sizes of the target files were somewhat uniform (all target files were much larger than their source files):

- 2,13 MB → 39,2 MB
- 1,57 MB – 2,87 MB (except the 2,13 MB file) → 23,2 MB (seven files)
- 955 KB – 1,10 MB → 12,29 MB (two files)
- 122 KB → 1,87 MB
- 114 KB → 1,85 MB

### Converting JPEG files to PNG

When the chosen target format was PNG, the conversion worked without any problems.

The sizes of the target files were somewhat uniform (all target files were larger than their source files), and the ratios between source size and target size were overall proportionate:

- 2,87 MB → 16,5 MB
- 2,70 MB → 14,3 MB
- 2,64 MB → 13,7 MB
- 2,24 MB → 11,7 MB
- 2,13 MB → 10,3 MB
- 1,81 MB → 11,1 MB
- 1,72 MB → 10,1 MB
- 1,57 MB → 11,5 MB
- 1,10 MB → 5,91 MB
- 955 KB → 4,80 MB
- 122 KB → 968 KB
- 114 KB → 945 KB

#### Converting JPEG files to PDF

When the chosen target format was PDF, the conversion worked without any problems. But as for the conversion from TIFF to PDF, all files had been converted into a single PDF file “Untitled.pdf”. The sizes of the images in the PDF file were roughly proportionate to their original size.

#### **3.4.4 Recommendation**

As long as you stick to conversion between JPEG and PNG, this tool seems adequate, maybe even for batch conversion (although to make sure of this, it would have to be tested on much larger amounts of files). It is not appropriate at all for conversions to PDF if you want individual documents as target while providing several files as source. Furthermore, the largest TIFF files (407 MB and 154 MB) were impossible to load and/or convert at all.

Note that the PDF files that are generated with this tool are not necessarily in the specific **PDF/A-1** format. Even so, they may conform to the rules of PDF/A-1, but this must be tested (see <http://www.pdfa.org/2011/08/validating-pdf/a/> ). It is possible to convert PDF to PDF/A-1, but not necessarily easy.

#### Grade

On a scale from 1 (very bad) to 5 (very good). X is “Not applicable”.

Simplicity of installation: 5

Simplicity of management: X





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Ease of use: 3 (would be higher if pop-up window messages didn't appear all the time)

Generality of solution: 4 – 5

Quality of result: 3 (would be higher if there were not the problems with PDF as target)

## 4 UNIVERSAL DOCUMENT CONVERTER

### 4.1 GENERAL DESCRIPTION

The Universal Document Converter (henceforth called **UDC**) is a *printing service*. It can be downloaded from <http://www.print-driver.com/download/>. After installation, you can choose UDC as the current printer when you want to convert a file, and then choose the output format. There are eight output formats to choose from, among them **JPEG**, **PNG**, **TIFF**, and **PDF**. The conversions that will be tested are the following:

- TIFF to JPEG, PNG, and PDF
- JPEG to TIFF, PNG, and PDF
- DjVu to TIFF, JPEG, PNG, and PDF

There is no possibility to convert files in batch; you have to do it one-by-one. Thus, even if this service would turn out to give very good results, it can only be a complement to other methods that can handle batch conversion.

### 4.2 DATA SETS

The data sets that were used to test the Universal Document Converter are the following (for details, see: **DCH-RP\_WP5\_Scen-2-2\_ID-66.doc**):

- Seven TIFF images (not all of them were used in all the tests)
- Three JPEG images
- Six DjVu images

The size is between 26 KB (the smallest DjVu image) and 407 MB (the largest TIFF image).

### 4.3 TEST RESULTS

**As a whole, the behaviour of the program was acceptable, and all required results were obtained (although with inferior quality in some cases).**

The results for the conversions are described below (the details are described in section 4.4.). Since the results were rather uniform for different formats, only the exceptions are described.

#### 4.3.1 Quality of large converted DjVu files

The largest DjVu files that were converted (9,75 MB and 5,20 MB) took a very long time to convert, and the quality of the result was bad or barely acceptable. This happened regardless of the target file format (TIFF, JPEG, PNG, PDF). The problem was not the resolution of details (this was quite good) but the rendering of colours. For the smaller DjVu files, the quality was good or acceptable.

### 4.3.2 Large TIFF files were converted without problems

The success of converting large TIFF files was not an exception within the UDC conversion trials, but rather in contrast to other conversion attempts (AVS Document Converter and AVS Image Converter). In UDC, the two largest TIFF files (407 MB and 154 MB) were converted without problems to all the target formats (JPEG, PNG, PDF).

## 4.4 USABILITY

### 4.4.1 Download and installation

The download and installation of the tool were quite easy and went fast. However, you should beware of that in the end of the installation procedure, it is suggested that you:

1. Set the UDC as default printer
2. Add a toolbar to Microsoft Office

Even when I deselected these choices, the UDC was set as default printer.

A double-click on the file **udc.exe** starts the installation. It is recommended that you close all other programs before starting the installation. During installation, the usual pop-up windows that can be expected during program installations are shown:

- A question to make certain that you trust this provider
- Selection of a language (English is default)
- Selection of the directory for installation

After installation, a pop-up demo window is shown. In four steps, it describes how you can use UDC. There are also tutorials on the home page, but the demo window may be sufficient to most users. The four steps are the following:

1. Choose "Print" from whatever program you are currently viewing documents/images in.
2. Choose UDC as current printer and then "Properties".
3. From the File Format list, choose the output format of your choice.
4. Press "Print"

A step not explicitly mentioned between step 2 and step 3 is that you have to choose "File Format" (from the left column) before you actually choose the target format. There are also other adjustments you can do (although in the free version, you will always get a watermark on the target image).

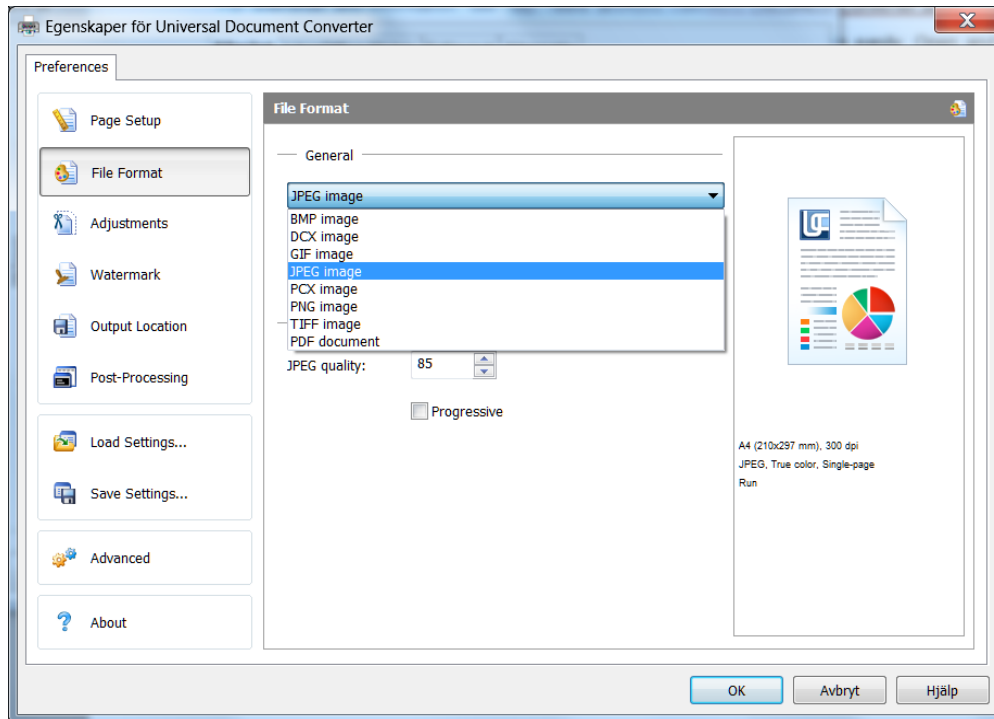


Figure 10: Properties to set for UDC

After you have pressed “Print”, you are prompted to choose a name for the output file, and a directory. (A directory named “UDC Output Files” has been pre-created as default). Unfortunately, the default name of the target file is not the name of the source file (for example, **test.tif** and **test.jpg**), so you have supply an individual name manually. This makes it unnecessarily time-consuming if you are converting a lot of files.

After the conversion is finished, the result is always shown in the image viewer.

#### 4.4.2 Converting files

##### Converting TIFF files to JPEG

When opening a TIFF file with the standard image presentation program in Windows, you have to modify the steps for printing a little. Instead of selection “Properties”, you choose “Alternativ” (= “Alternatives”):

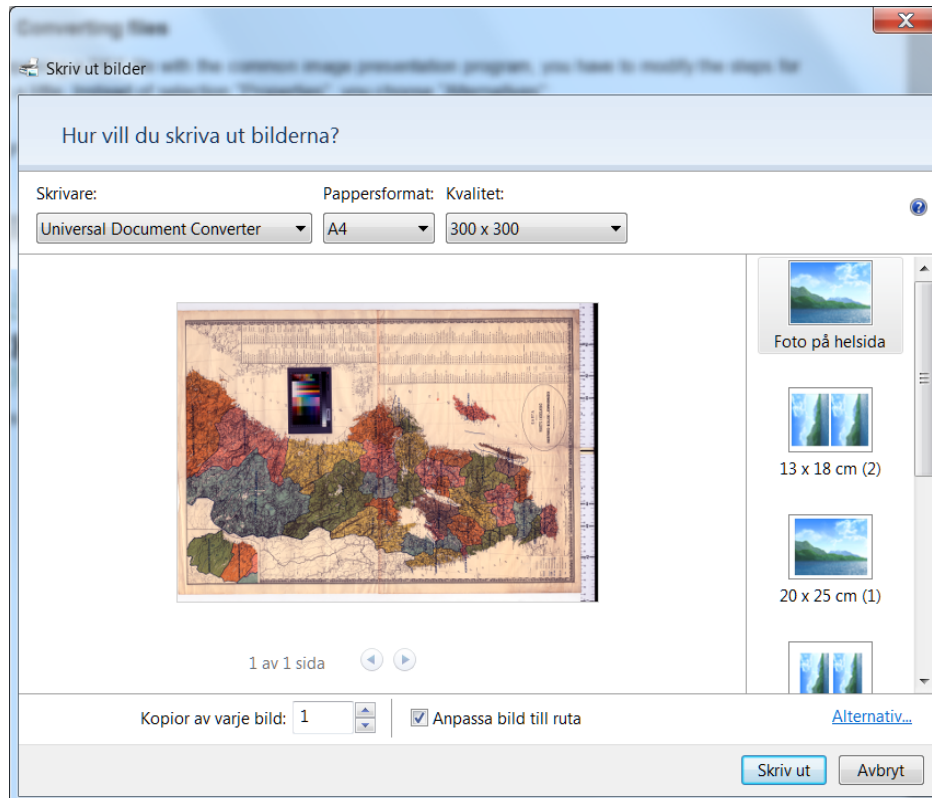


Figure 11: Choose “Alternativ” (south-east corner)

From the new pop-up window, you choose “Skrivaregenskaper” (= “Printer properties”). Then the window in Figure 10 is shown.

You can choose colour or greyscale, and JPEG quality. After pressing “Print”, a preview of the image is constructed. When I chose the largest TIFF image (407 MB), the size of the JPEG image was 3,5 MB. To the naked eye, the quality of the JPEG image was quite good. This conversion took a very long time.

When I chose the smallest TIFF file (154 KB), UDC created the new image rather fast. (Incidentally, it chose greyscale by itself for a black-and-white image, and thus you may have to manually re-set the defaults when processing a colour image afterwards). The size of this JPEG image was 1,1 MB.

The other five TIFF images were also converted with good quality. Observe that you sometimes may have to change the orientation of the image (for example, to Landscape) to get the desired result.

The sizes of the target files were mostly reduced (the largest TIFF files drastically so):

- 407 MB → 3,54 MB
- 154 MB → 1,97 MB
- 29,8 MB → 1,71 MB
- 13,7 MB → 1,58 MB

- 5,74 MB → 1,49 KB
- 1,58 MB → 1,52 KB

except in one case (a very small TIFF file):

- 154 KB → 1,07 MB

#### Converting TIFF files to PNG

The two largest and the two smallest TIFF images were used in this test. The sizes of the files were much reduced for the large files and somewhat enlarged for the small files:

- 407 MB → 5,82 MB
- 154 MB → 4,51 MB
- 1,58 MB → 2,12 KB
- 154 KB → 437 KB

#### Converting TIFF files to PDF

The two largest and the two smallest TIFF images were used in this test. The sizes of the files were much reduced for the large files and somewhat enlarged for the small files:

- 407 MB → 4,97 MB
- 154 MB → 3,88 MB
- 1,58 MB → 2,02 KB
- 154 KB → 406 KB

#### Converting JPEG

For all JPEG conversions (to TIFF, PNG, and PDF), the largest JPEG file, the smallest JPEG file, and an in-between JPEG file were used. The sizes of the files were enlarged for all the target files (the smallest file drastically so).

#### Converting JPEG files to TIFF

- 2,87 MB → 7,16 MB
- 1,81 MB → 5,17 KB
- 114 KB → 5,31 KB

#### Converting JPEG files to PNG

- 2,87 MB → 5,83 MB
- 1,81 MB → 4,66 KB
- 114 KB → 4,79 KB

#### Converting JPEG files to PDF

- 2,87 MB → 5,70 MB
- 1,81 MB → 3,81 KB
- 114 KB → 3,78 KB

#### Converting DjVu

For all the DjVu conversions (to TIFF, JPEG, PNG, and PDF), the two largest DjVu images, the two smallest DjVu images, and two in-between DjVu images were used. For all conversions, the quality of the output for the two largest DjVu was not good (but OK for the rest of the files).

#### Converting DjVu files to TIFF

The sizes of the target files were of a somewhat uniform size:

- 9,75 MB → 3,10 MB (took a long time to convert, gave bad quality of output)
- 5,20 MB → 6,88 MB (took a long time to convert, gave not very good quality of output)
- 563 KB → 3,84 MB
- 548 KB → 4,0 MB
- 34 KB → 3,71 MB
- 26 KB → 3,72 MB

#### Converting DjVu files to JPEG

The sizes of the target files were mostly proportional to the sizes of the source files:

- 9,75 MB → 3,34 MB (took a long time to convert, gave bad quality of output)
- 5,20 MB → 5,0 MB (took a long time to convert, gave not very good quality of output)
- 563 KB → 1,40 MB
- 548 KB → 1,3 MB
- 34 KB → 756 KB

- 26 KB → 709 KB

#### Converting DjVu files to PNG

The sizes of the target files were of a somewhat uniform size:

- 9,75 MB → 2,89 MB (took a long time to convert, gave bad quality of output)
- 5,20 MB → 6,27 MB (took a long time to convert, gave not very good quality of output)
- 563 KB → 3,09 MB
- 548 KB → 3,64 MB
- 34 KB → 3,05 MB
- 26 KB → 3,13 MB

#### Converting DjVu files to PDF

The sizes of the target files were of a somewhat uniform size:

- 9,75 MB → 2,21 MB (took a long time to convert, gave bad quality of output)
- 5,20 MB → 5,62 MB (took a long time to convert, gave not very good quality of output)
- 563 KB → 2,89 MB
- 548 KB → 3,11 MB
- 34 KB → 2,45 MB
- 26 KB → 2,49 MB

### **4.4.3 Recommendation**

This is not a tool/service that can be used for large amounts of images or documents, since you have to convert each image individually – and especially as you have to supply the name of the output file manually. However, if most image conversion software has the same problem with large TIFF files as the AVS programs had, this can be a complement for converting the (hopefully few) large TIFF files that cannot be handled by other conversion software.

Note that the PDF files that are generated with this tool are not necessarily in the specific **PDF/A-1** format. Even so, they may conform to the rules of PDF/A-1, but this must be tested (see <http://www.pdfa.org/2011/08/validating-pdfa/> ). It is possible to convert PDF to PDF/A-1, but not necessarily easy.





DCH-RP: Digital Cultural Heritage Roadmap for Preservation - Open Science Infrastructure for DCH in 2020

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### Grade

On a scale from 1 (very bad) to 5 (very good). X is "Not applicable".

Simplicity of installation: 4 – 5

Simplicity of management: X

Ease of use: 3 – 4 (would be higher if you didn't have to supply the name of the target file manually)

Generality of solution: 5

Quality of result: 4 (would be higher if the largest converted DjVu files had had better quality)