Binding design and paper conservation of antique books, albums and documents

www.bbinding.org

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Introduction

Larger established bookbinding workshops have been closed and a lot of small ateliers opened. The binding sections of the large printing factories have been automatized and many workers lost their jobs. A lot of binding sections in the libraries have been closed because of the tightening budgets and reduced visitors after the Internet expansion. Another negative tendency is that the printing and bookbinding industry shifted the investments to Asia.

Parallel to the declining large scale bookbinding workshops some new positive tendencies occurred. Last few decades there is an increasing demand for artistic bindings, increasing awareness of the old libraries and archives about their collections and the expansion of the Internet trade with old books. These tendencies are encouraging the appearance of a new generation of bookbinders. In relation to the bookbinding, the conservation and restoration area grows. But most of the existing training materials are covering part of the problems and are rather old-fashioned. There is a lack of training tools, and especially tools focusing on skills like entrepreneurship, intercultural learning and green skills in relation to the work of the "modern" bookbinders.

Nowadays, in times of industrial development and technological innovation, the style of bookbinding is becoming more and more unified. Most young people haven’t even seen how an 18th or 19th century binding looks. However, more and more people are expressing an interest in purchasing or making small artistic objects, such as artistic notebooks, decorative boxes, decorated paper. In some countries, with long-lasting traditions in bookbinding and art one can easily see shops and ateliers offering such artistic objects. In other countries one can hardly find something as simple as a quality artistic sheet of paper, for example.

These are the main problems addressed by the project "Binding design and paper conservation of antique books, albums and documents", BBinding (www.bbinding.org), supported by "Leonardo da Vinci" programme of the EC. The current manual has been developed as one of the main training products in the frame of the project. Its aim is to serve as a modernized structured training material in VET on bookbinding, paper and photographs preservation. It comprises not only the "classical" material related directly to how one could bind a book or maintain documents on paper, but also some up-to-date and innovative topics related to use of e-learning and CAD tools in bookbinding, entrepreneurship and intercultural learning in the bookbinding craft and alike.

The manual can be useful for VET teachers and trainers who need new modern and adequate training materials on the topics mentioned above. It can be helpful also for library and archive staff who need some basic and urgent knowledge on how to maintain and safeguard their book and photograph collections. Topics explaining the latest trends in bookbinding such as the use of e-learning and CAD tools can be useful for bookbinders (self-employed) and workers in small bookbinding workshops/
ateliers, who need to modernize their business. Unemployed workers from former large bookbinding workshops or printing factories, as well as other unemployed individuals could further develop their skills in the area and start their own bookbinding business. Last but not least, young artists who wish to start making artistic bindings can find interesting ideas and guidance in the chapter dedicated to that topic.

The book is a kind of module-based manual, divided into ten parts, where the first one is the introduction and the rest are nine chapters on the main topics (training modules) developed in the frame of the project: "Bookbinding", "Paper maintenance and preservation", "Conservation and maintenance of photographic materials", "Artistic bookbinding", "Photo albums and photography in the library", "Entrepreneurship and intercultural learning", "E-learning approaches to bookbinding and paper preservation", "Computer-aided design (CAD) of bookbindings" and "Green approaches in paper production". Each of the training modules has been adapted for the printed book and contains concrete tips and guidelines on how to bind a book, how to preserve books, photograph and paper materials, how to bind artistically and use e-learning and CAD tools in bookbinding. The chapters on e-learning and CAD tools in bookbinding give guidelines on how to use the main project products – LMS e-learning material with online training modules and the innovative CAD tool for bookbinders. At the end of the manual there is a glossary containing the most useful terms and references.

BBinding project (www.bbinding.org) developed innovative CAD tool and materials for e-learning on the above-mentioned topics. First, partners researched the situation with existing training materials and tools and found out that such innovative materials are either scarce or do not exist at all. Then, nine training modules were developed on key topics related to bookbinding, paper preservation and the modules were then integrated into a LMS (learning management system) suitable for e-learning. One of the main aims and innovations of the project was to use the advantages of e-learning in the field of bookbinding – one could read the modules in the LMS while at home, at any time of the day, trainers can use them as training materials for guided learning or people can use them by themselves for self-study. The modules in the LMS contain various tools that further facilitate the learning process – images, video, navigation and communication tools. Then, a one-of-a-kind CAD (computer-aided design) tool was developed. It’s the most innovative project product because there isn’t any such thing developed for bookbinding until now. It is an online tool that allows the bookbinder to design a book binding in real time, changing the material and colour of the binding, changing the sewing pattern, the thickness and format of the book and practically manipulating the whole design and overview of the book online. This tool will support the work of the binder by making it possible to show the clients in advance how the binding will look in real time on the screen or by sending it online from a distance. The training modules in the LMS and the CAD tool are available for free in English, Bulgarian, German, Italian and Dutch.

One of the innovations of BBinding projects is the use of those e-learning materials and modern media tools in support for the bookbinders, library and archives staff, unemployed individuals from bookbinding factories that closed down and young artists who would like to develop their artistic skills in bookbinding. By developing those tools and concrete up-to-date training modules the project and this manual aim at introducing a more modern approach in training of bookbinders and all involved in preserving and maintaining books or photographs.
Keywords
Bookbinding, quire, cover, sewing, glue, tools

Chapter aims
The chapter is suitable for beginners in bookbinding. After reading it, the learners will receive knowledge about the main steps of the bookbinding process, the main elements of a book and practical information about binding a book as a case binding.

Chapter content
This chapter is dedicated to making a case binding. The case binding is a simple but yet a very useful way of binding a book. The name (since the 1820’s) derives from the fact that the cover is made separately from the bookblock (the quires or sections sewn). In the last phase of this way of binding the cover and the bookblock are joined together. The case binding is used widely in both industrial and hand-book binderies for serial or individual bindings.

The advantage of this binding is, amongst others, the fact that there is no need for machineries: everything can be accomplished with simple hand tools. Also the materials which are used can be acquired relatively easy. As a coating material so called book cloth is used most of the times. This is a cloth that is covered or lined with a sheet of paper which makes the fabric impermeable for paste or glue. A case binding can also be covered with paper, leather or parchment.

A disadvantage of separate creation is that when a measurement error is made in the construction of the cover this becomes apparent only when the cover and bookblock are joined. Thus, strict and accurate measuring and working is required.

In addition to this training module, in the LMS online modules on www.bbinding.org “Training modules” section, there is one more part dedicated to making fastenings. It is intended to give bookbinders basic knowledge on how to make a brass fastening for a new bookbinding. In the online LMS this lesson explains how to make fastenings starting from plain brass plate to complete fastenings consisting of a clamp, a catch plate, strap plate and mounting of all this to a book. More on this topic can be found in the online Learning Management System.

The method presented is only one way of achieving fastenings: there are many more methods and materials like casting or silver fastenings.

It is assumed that the student has basic knowledge on bookbinding and access to basic bookbinding tools like paring knives etc. Also some creativity is needed: it is impossible to explain everything in a short manual.
1. Tools

To make a case binding only simple tools are needed. In fact the tools which we will use are not specific for bookbinders but widely available in normal hardware stores or do-it-yourself stores. What do we need?

**fig: 01**

**Ruler**
Because it is assumed that we don’t have a board cutter or other cutting machine all the material has to be cut by hand with a (hobby- or stanley-) knife. With a ruler all measures can be transferred to the cardboard, paper or cloth. A steel ruler is required (not wood or plastic) because it will also be used to cut along. A length of 30 or 50 cm is advised.

**Scissors**
A normal pair of scissors is used for cutting sewing thread and book cloth.

**Knife**
A snap-off blade knife or a Stanley knife with a sharp blade is ideal for our purpose. When cutting cardboard a more robust Stanley knife is more suitable.

**Brushes**
A water resistant brush will be used to distribute PVA glue and paste. A real book binders brush can be used but a normal paintbrush will also do well.

**Awl**
The awl on **figure 1** is a bookbinder’s awl but a normal (not too huge) awl which is used by carpenters also works. If none of these are at hand you can use a thick needle put in a piece of wood.

**Pressing boards**
Some flat boards (multi-ply wood) are needed to press books until dry.

**Needle and thread**
For the sewing of the sections we use a firm needle with an eye large enough to take the relatively thick thread easily. The best thread is unbleached linen thread which comes in various thicknesses (depending on the size and thickness of the sections. Size 12 to 40 are suitable. Known brands for bookbinders thread are Barbour (Ireland), Gruswitsch (Germany) and Bockens (Sweden).

**fig: 02**

**Folder**
A handy and essential tool is the bone folder. This can be made out of real bone (as can be seen on **figure 2**) or from plastic or Teflon. It is used to fold paper and for other operations where the hands cannot do that, like the application of leather to board.
Glue

Bookbinders use different kinds of glue. Traditionally only two sorts were used: animal glue like bone - or hide glue and vegetal glue like wheat starch or rice starch. Since the 50’s the synthetic glue has also set in which most times is polyvinyl acetate or similar. All glues have different characteristics and applications. For different materials we use different glues. It would go too far to explain all this but some basic rules are appropriate.

Paste is made by cooking starch in a certain amount of water (about 1 - volume part of starch on 4 - volume parts of water). After about 20 minutes of cooking and stirring the paste must be mixed after cooling and can be used. Paste takes a long time to dry and has a long open time, and makes it therefore suitable for applying to leather. Paste is also reversible so it can be solved in water after drying. A disadvantage of paste is that it cannot be kept for long; at room temperature often not more than a day; in the refrigerator - a few days. Wheat starch can be bought in the supermarket or else - at your local bakery, for instance.

Animal glue is supplied in a dry form: blocks, flakes or pearls. It is first soaked in water and afterwards heated au-bain-marie until 65 degrees Celsius. The advantage of animal glue is the enormous adhesive strength. This glue is also reversible. The availability might become a problem: the product is used less and less.

PVA or similar. This is synthetic glue with great adhesive strength (even when diluted). After drying it forms a transparent and flexible layer. When dry the glue is no more soluble in water (so not reversible). The glue can be stored for at least one year (when protected from frost). This glue is obtainable through specialized glue manufacturers but the glue that is sold to glue laminate floor parts works very well. Also the well-known white wood glue is very workable.

Tape

Sometimes it is useful to have some paper or plastic self-adhesive tape (see also fig. 3 above).

2. Folding sections

Most of the times a book consists of sections or quires. Also a book can be made of loose sheets that are joined together with a layer of glue. This process is called lumbeck and is a form of adhesive binding.

So, for our case binding we will make sections. Originally a section is a folded and printed sheet of paper which has 4, 8, 12, 16, 24 of 32 pages, more sections put together form the bookblock (or the inner part of a book). After the bookblock is sewn it is cut on three sides and the pages seem to be loose sheets.

Because we don’t use printed sheets folded to sections but blank paper (or existing sections which have already been cut, for instance, from a book that needs to be rebound) we fold 3 to 6 sheets of paper in two, depending on the thickness of the paper.
As can be seen in figure 4, for this book 4 sheets of 80 grams paper are folded to a section of which we made 4; for a heavier book obviously more sections have to be made.

3. Sewing

With the help of sewing supports (or bands) the sections are joined with thread. A traditional way of binding is the use of rope as a sewing support. This can be a series of single ropes but also double supports are used often in older bindings. Leather is also used as sewing supports (again single or double). Lots of antique books are sewn on parchment strips, and in modern bindings, like our case, on cloth strips or twill tape. On the image below you can see a simple self-made sewing frame on which a bookblock is sewn with alum tanned leather double sewing supports.

We assume that we are not in the possession of a sewing frame. However, it is worth the trouble to make one yourself. An internet query with the word "sewing frame" generates many pictures that inspire. If this is not a possibility then you can try to find a sewing frame in the second hand circuit. Either way: a sewing frame eases the work a lot.

As stated, we will sew our bookblock on two linen strips. In the fabric store this is available as twill tape. Choose a kind which is not too rigid but not too thin either.

The sewing supports are adhered with tape to the back side of a piece of cardboard; the ends of the supports should be about 2 to 3 cm on both sides. With these ends later on, a strong connection will be made with the cover. When sewing on two supports you can divide the height of the section by 3: on that location the supports will be. With the awl we punch the holes for the sewing thread. On the upper and lower side of the section (or better the left and right side since the section is laid down now) we also punch a hole on about 15 mm from the edge in the centrefold of each section. The easiest way to do this is by making a paper template on which the holes are marked. This is put in the center spread of the section and the holes are punched through then.
Now take the first section and lay it down with the back against the sewing supports. Stick the needle (with the thread in it) at right in the first hole. Let a piece of thread (10 cm) hang out of the hole. Then stick the needle at the right side of the right support back to the outside. The thread now runs over the outside of the support after you stuck the needle on the left side of the right support back into the section. Repeat this for the left support. Now you are on the left side with the needle on the outside. Now take the second quire and move from left to right in the same way as you did with the first section. Now make a knot with the outgoing thread and the piece of thread you left out with the first stitch.

Then you take the third section and repeat the operation. At the last hole on the left move your thread under the connection between the first and second section, then enter the fourth section. At the last hole of the fourth section you make a knot with the third section. If everything went well the result must look like figure 7.

The centrefolds look like this: you will see three inner stitches (figure 8).

In this example no separate endpapers are applied. The first leave of the first section and the last leave of the last section serve as pastedowns (the leaves that are pasted to the inner side of the cover). If, instead, you want endpapers, for instance in another colour, just fold two pieces of coloured paper or marbled paper in two (the size is the same as the sections) and glue them on the first and last section with a narrow line of glue (5 mm).

In the bindery the bookblock now gets (mechanically) cut on three sides to flatten out the edges (head, tail and fore edge) and to get the exact wanted size. Since we don’t have a paper cutting machine at our disposal we leave this step out. But if you are handy with the stanley knife you can consider cutting the fore edge manually: mostly this edge looks irregular because of the tapered sections on front.

Also in this example no headbands are applied. A headband is a piece of fabric wrapped around a core (mostly thin rope) which is adhered to the head and tail of the spine for decoration purposes. Headband (on spools or cards) is only available through specialized bookbinding material suppliers. Of course you can apply headbands if you want to. It is also possible to make your own headbands on the bookblock itself or on a strip of fabric or parchment. Look up in the literature references.
4. Gluing

The bookblock is now sewn and gets a coating with glue. For best results use fairly thick (so, not diluted) PVA glue. This glue remains flexible, doesn’t break and does not penetrate the bookblock through the space between the sections. Apply the glue a few times (after drying in between) and cover the whole spine: so, include the supports and the thread.

![image]

When binding heavy (thick) books often a layer of bookbinders mesh or gauze is applied to the spine. Just like the ends of the sewing supports this mesh (front and back 2 to 3 cm wide) generates a strong joint between the bookblock and the cover.

Many bookblocks are rounded. This means that the spine is cambered a little with a bookbinders hammer. We don’t do this with our binding: it will be a binding with a flat spine.

5. The cover

Now the bookblock is ready we can start working on the cover. As said in the introduction: the cover is constructed separately from the bookblock. With more complicated bindings the boards are first attached to the bookblock and only then the cover material is applied.

The cover of a case binding is made from three separate parts: the boards (2 pieces), the spine (or inlay) and the cover material. Always assure yourself that all material is cut "long-grain", i.e. with the grain parallel to the longer dimension of the sheet. You can determine the grain by feeling the resistance of the material when bending it with two hands: the lowest resistance is long-grain.

The boards have to be made from a strong kind of cardboard. Depending on the size of the design and the size and thickness of the book, the thickness of the boards will be somewhere between 1 and 3 mm, the commonly used is 2 mm. Preferably, acid free buffered board (museum board) is used because of its durability. The size of the boards is determined by the size of the bookblock (height x width) and the chosen square (the material of the cover which is bigger than the bookblock). An example on how to calculate the boards. Suppose the bookblock is 210 mm high and 148 mm wide (in fact a folded A4). A square from 3 mm is chosen. The height of the boards will be 210 + 6 (square 3 x 2, upper and lower) = 216 mm. The width is calculated in a different way. First, the width of the joint is subtracted from the width of the bookblock. Let’s assume that this is 6 mm. That actually means 148 – 6 = 142 mm. Added to this will be the square on the front side of the bookblock, so 3 mm. The width of the boards will thus be 145 mm.

The cutting of the boards by hand is done with a sturdy Stanley knife. Take care that the knife is always at right angles to the board for 100% and do not use too much power. A board cutter is in fact indispensable but occupies much space and can be a big investment.

The spine (or inlay) is made from thin cardboard (0,5 – 1,0 mm). In this case we are going to make a flat spine: after all the back of the bookblock is not rounded. When making a flat spine a thicker board could be chosen but for esthetical reasons this is undesirable.
The height of the spine is equal to the height of the boards: in our example 216 mm. The width of the inlay is determined by the next rule: the thickness of the bookblock + the thickness of the board used for the boards. The best way to measure this is to put the bookblock on a flat surface and then put one of the boards on top. With light pressure you measure the total height of this package. On the picture below it becomes clear:

You can see that the width of the spine equals the thickness of the bookblock and the thickness of one board added.

The cover material. When we work with bookbinder’s cloth the following rules apply: the height of the cover material is determined by the height of the boards. A normal width for the turn-in (the portion of the covering material folded into the inside of the cover) is 15 mm.

When having a height of 216 mm for the boards the height of the cover material will be $216 + 30$ (twice 15 mm; upper and lower) + $2 \times$ the thickness of the boards. Suppose our board is 2 mm thick, than another 4 mm must be added; each makes $216 + 30 + 2 = 248$ mm.

The width calculation is somewhat harder. In principle: the width of the inlay (or spine) + 2 times the width of the joint + 2 times "correction for type of cover material" + 2 times the thickness of the boards + 2 times the width of the boards + 2 times the thickness of the board + 2 times the width of the turn-in.

What does "correction for type of cover material" mean? From practice it turned out that the thickness of the covering material influences the total width of the cover. Or, in other words, the thicker or sturdier the cover material is a little more space is needed for the joint. For example: when 1 - mm thick leather is used to cover the boards another 1 mm will be added to the width of the joint.

In our example we cover our boards with paper. Do choose a strong kind of paper, if else the cover will not be strong enough. If you choose leather then take a supple thin type of leather.

After all the material has been cut it can be assembled to a book cover. There are several ways to achieve this. Assuming that all is measured and cut precisely one can draw a line with a pencil and a ruler 15 mm + the thickness of the board measured from the edge of the cover material. Then the boards are glued with paste and applied. Subsequently, in the middle of the open space between the two boards the inlay is pasted.

Another method is to start with the inlay which is pasted on the cover material. This is done on an over-sized piece of cloth (that is measured and cut to the final size). Next, the width of the joint is measured and the boards are applied. One must take care that all material is placed parallel and right-angled. Then the surplus material is cut off with the help of a strip of cardboard or a suitable steel ruler. What remains is the turn-in.
Now the corners of the cover material are cut in an angle of 45 degrees. The distance from the points of the boards to the sloped side equals the thickness of the board + 2 mm.

The turn-ins are pasted down and applied with the bone folder. Start with the upper and lower turn-ins and continue with the left and right sides. Finish the corners as in figure 15.

Carefully work the joint to the edge of the boards. Make sure to make a sharp crease. Now the cover is ready.
Now the cover gets united with the bookblock. Paste the front or back pastedown and place the bookblock in the right position on the cover. Be sure that the cover is not upside down (this matters only if your cover has a front and backside, for instance, when a figure or text or spine title is applied). Also look carefully if the square is symmetric. It is important to work in a clean way: take care no paste or glue gets on the edges.

Press with both hands on the cover. Then paste the other pastedown and close the cover. Press again firmly and subsequently let the book dry between two pressing boards with a heavy weight on it. After 5 minutes do check for wrinkles in the endleaves: if this is the case you can flatten them out carefully with (preferably) a Teflon folder. Now dry the book for 24 hours between the pressing boards.

6. Conclusion

In order to understand the bookbinding process and practice it, as it could be seen from the chapter, the learner has to be clear with several issues:

1. The typology and main elements of the book.

2. Bookbinding steps.

3. Styles and historical aspects of bookbinding (as described in Chapter 4: Artistic Bookbinding)

Because the bookbinding issues need special attention, careful attitudes and practice, the learner has to spend certain time in exploring cases and doing some exercises. Beginners in bookbinding are advised to consult experts.
Paper and parchment –
maintenance and preservation

Keywords
Parchment, paper, preservation of historical objects, paper and parchment damages

Chapter aims
The main and overall aim of this chapter is to create a kind of sensitivity for the specific exigencies in connection with books, maps, drawings, etc. having paper and parchment as their principal material. This implies a fundamental knowledge of the materials used. It includes some insight into phenomena of deterioration and damage. Finally, this chapter outlines some preservative measures, activities to set in advance and some principle actions to be set in case of emergency. In the end the learner should have gained an overview of the most relevant aspects to be considered.

Chapter content
This chapter deals with the most fundamental materials of book production: parchment and paper.

The first paragraph gives some summary idea about their history and early use. Another page describes their manufacture and physical and chemical properties. This description shall make evident these materials’ behaviour and the corresponding conditions of preservation.

Having done this, the presentation in this chapter proceeds towards preservative measures: from adequate handling of books in a library to elementary actions of precaution, such as control of the local climate. The final paragraph is devoted to emergency activities when damages have already occurred.

1. Introduction

This chapter addresses archivists, librarians, responsible persons of collections of any kind in connection with objects made of paper or parchment.

The presumed learner’s situation is that of a collection of documents or books, ancient and new. This collection may be mainly in fairly good condition. But there are some measurements necessary from the preservative point of view – in order to prevent further harm, in order to ameliorate the conservatory situation. We suppose this to be a frequent case.

The presentation invites personnel with few or rudimentary experience as well as interested beginners. It is downgraded from a rather scientific approach.

As the main accent is laid on the materials paper and parchment, there is a variety of materials
which are not dealt with here: leather of various sorts, textiles, metals, wood and some others. In view of these materials we kindly ask the participant to consult the respective handbooks which should be available in every collection.

Incorporating parchment as material implicitly means: there is a shift towards historical objects, books, maps, etc. This chapter includes the view on old books, on books fabricated in or according to ancient traditions. The opulent variety of contemporary modern papers is not the core focus in this chapter.

There is a number of terms inserted into the running text which are explained in detail in the glossary - including the references.

There is one crucial definition to be fixed in advance: this chapter predominantly aims at the preventive and conservative aspects: we are not dealing with paper and parchment restoration. Although these are neighbouring fields, and although book conservation and book restoration are twin terms, this course strictly divides the areas: restoration of paper and parchment is the genuine task of the conservator-restorer, who is a high professional. Nevertheless, this chapter includes aspects of preventive conservation.

2. Parchment

2.1. Historical aspects
Parchment is a writing material, which is mostly made from the skin of sheep, calves (vellum) or goats, which undergo certain preparatory procedures. Animal skin was in use as writing material from antique to medieval times. Throughout the Middle Ages parchment was the writing surface par excellence. It is being used in much minor scale up to the present day.

The name "parchment" is derived from the ancient Greek town of Pergamum, where it is said to have been manufactured for the first time in the 3rd century BC. Actually, there is some historical evidence that animal skin prepared for writing purposes after various methods was used much earlier.

2.2. Parchment in the library
Where in a library is it possible to encounter parchment?

Actually, you may find parchment in all libraries with collections of historical handwritten or printed cultural heritage. Samples of parchment would appear in various forms:

- in the form of a complete codex - in this case mostly handwritten books dating from the Middle Ages, although there is prominent evidence of using parchment for printing books as well (e.g. some editions of Gutenberg's Bible; or some editions of royal representative books, i.e. the "Theuerdank").
- as a quire which is bound together with other quires of a book made of paper.
- as parchment folium wrapping quires (made of paper) – a kind of protective envelope.
- parchment folios became the wrappers of thousands of newly printed books (made of paper) in the 16th and 17th centuries.
- after the emergence of printing books on paper in grand style many older codices made of parchment became obsolete. As a consequence parchment folios were cut into strips to be used for maculation purposes. Thus parchment slips appear at various places in connection with the bookbinding: on the spine, in the fold, as paste down linking cover and the body of the book, etc.
- of course, parchment appears in the form of a single separate sheet written or unwritten: Parchment was for centuries the privileged material used for documents. In some traditions this practice is still in use for distinguished charters.
What this all amounts to is that parchment can be found in a considerable number of repositories keeping our written or printed heritage. Although the use of this material for writing purposes had reached its peak several hundred years ago the librarian’s, the archivist’s or the conservator’s eye would perceive parchment objects in sufficient number to deal with them thoughtfully and with appropriate care.

2.3. The making of parchment

Historically, we have knowledge of some few techniques transforming skin into parchment. This is the place to outline only the most common of these procedures.

The animal is flayed and the skin produced put into water for some time to facilitate the elimination of eventual residues.

In order to promote the process of dehairing the skin will be put into a liquid (normally a lime solution) where it rests for several days. The duration of the lime bath depends from temperature, concentration and other factors.

The following step finds the skin stretched on a frame, both sides of it open to the air.

Here, the skin will be scratched with the help of a knife-like sharp instrument. Thus the rest of the hair will be removed and the parchment gets the wanted thickness. The stretching-phase may be considered as somehow decisive. The simultaneous process of stretching and drying realigns the fibres parallel to the surface of the skin, thus redefining the material. The collagen, which is a formative component of the skin, acts as natural glue keeping the parchment in form during the process of drying and beyond.

Further preparation for writing purposes consists in smoothing the surface of the parchment by rubbing pumice powder into the flesh side and in whitening the skin by the application of e.g. egg white, flour or milk.

The quality of the parchment depends from two factors: from the animal (age, sex, alimentation etc.), and from the manufacturer’s experience and abilities.

Modern contemporary production of parchment uses chemical ingredients of historically unparalleled finesse in order to obtain specific material qualities. To describe them is beyond the scope of this introductory presentation.

Manufacturing parchment differs from leather production in a decisive point: parchment is limed – leather is tanned. Thus, leather keeps its three dimensional structure of fibres, whereas the fibres of the parchment lie two-dimensionally, parallel to the surface.

2.4. Material aspects

There are some chemical, physical and biological features describing the character of parchment and its material behaviour.
In case of appropriate storage conditions parchment is a durable material, which might "survive" hundreds of years.
Parchment has a certain tenacity and stiffness, and it remains flexible.
Compared to papyrus and paper parchment is a resistant and strong writing surface.
Parchment is easy to produce and it might appear pleasant to the eye.
Parchment can be "recycled", in the sense that a writing layer can be effaced to give place to a re-script (palimpsest).
Parchment is to some extent translucent.
Parchment is sensitive against sun exposure, heat and water.
Parchment is less stable against heat and microorganisms than leather.
Its alkaline pH protects it better against acidic attacks such as ink corrosion.
Parchment is a hygroscopic material – it can absorb moisture and water.

2.5. Aspects of harm and deterioration

2.5.1. A short description of the main deteriorating causes

Hydrolytic degradation. Due to its hygroscopicity parchment is highly sensitive to abrupt changes of humidity and temperature. Collagen can be transformed into gelatine spontaneously if water is available. Hydrolytic degradation may be caused by external factors, such as extreme pH, humid and warm environment, or by oxidative substances. "Parchment is characterized by its high degree of hygroscopicity for [...] its fibres are held together by the action of water molecules. These molecules are formed by oxygen and hydrogen atoms in adjacent fibres and thanks to these chemical bonds the protein fibres are held together cohesively so long as the hygrometric balance is not disrupted." (www.unesco.org/webworld/ramp/html/r8817e/r8817e08.htm#4.2%20deterioration%20factors%20and%20preservation). To sum up, serious fluctuations of temperature and humidity would irreversibly change the quality of the material as such.

Microorganisms and fungi. Parchment is attacked by various fungi and other microorganisms.
Rodents use whatever suits them for nest-making, thus they also destroy parchment, etc.
Dirt. Parchment easily receives dirt of any kind due to its poriferous surface structure.
Physical harm. There is a variety of damages caused by inappropriate handling in a physical sense (dropping books, cutting out folios or parts of them, producing ruptures, etc.).

2.5.2. Effects
The loss of hydrothermal balance shows results in two directions. In case of dehydration (lack of humidity) the proteins get isolated, the parchment looses flexibility. Desiccation makes the material rigid, it causes considerable shrinkage and produces cracks. In case of hyper-hydration the material character of parchment changes fundamentally. The above mentioned process of gelatinisation brings the destruction of parchment.

Rodents would destroy the material by consuming parts of the parchment.

Microorganisms are biological tracers of disadvantageous or bad conservation conditions. Fungi would invade the parchment and spread uncontrollably over neighbouring objects. Such contaminated material is no longer usable without professional cleaning. There is an immediate health risk.

Dirt might cause stains by the insertion of lipids, wax, etc. Dirt possibly conceals the readable surface and in many cases it effects the aesthetics of the heritage.

Mistreatment would menace the physical integrity of the object.

Dissolution of the material structure
Shrinkage and cracks
Endangering of the object’s integrity
Illnessibility
Risk of health.

3. Paper

3.1. Historical aspects
The production of paper was invented in China at the beginning of the second century AD. China held the monopoly for its manufacture over centuries. Actually, the knowledge of paper-making spread along the Silk Road (Turfan 399, Samarkand 751, Baghdad 793), reached Cairo in the 10th c and Europe via the Moors in the 12th c. Thus, Valencia (1151) became the first place to produce paper in Europe, followed by Fabriano (Italy 1276), Troyes (France 1348), Nuremberg (Germany 1390), Vienna (Austria 1498), etc. Initially the Arabic quality of papers exceeded the European products. But this diagnosis changed due to technological developments beginning with the 15th c.

The name "paper" is derived from the word papyrus, the fibres of a grass in the Nilote regions which provided the writing material in antiquity.

3.2. The constituents
Paper is manufactured from the pulp of various fibrous substances. These fibres consist of cellulose, which is a polysaccharide, itself being built by numbers of glucose units. Depending of topographic, climatic and cultural situations the main suppliers of cellulose for paper-making are:

- grasses (e.g. esparto = Spanish Grass),
- flax, jute, hemp, linen and cotton rags
- waste-paper
- straw, wood.

In the process of paper-making, especially when refining and finishing papers, additional substances like china clay (kaolin), and wheat starch are used.

3.3. The making of paper
The procedure of paper-making consists of some few basic actions: preparing the raw material - defibration - screening and drying - finishing. In our view it does not matter whether paper is handmade or not, these actions, which are detailed in the following lines, seem to be fundamental.

Preparing the raw material. The procedure starts with the collection of the raw material, its cleaning and storage. Cleaning includes the separation of different materials. Long-term storage would cause processes of rotting which might promote the following step. The quality of the final outcome is preconditioned by the quality of the raw material (e.g. rags) and all the other fabrication factors.

![Defibration](image)

Defibration. Historically there are a number of measurements to decompose materials in order to gain the cellulose fibres. The actions of breaking and beating aim at reducing the raw material to short fibres. The result is a pulp, mashed material in the water. This is a privileged moment to put in dying materials and other substances to gain specific effects.
Screening and drying. The next step may be considered as the key phase of paper making. With the help of the mould, a kind of rectangular sieve, the fibres are screened. In former times this mould was made as a wooden frame with regularly arranged wires of metals, or of textile. The purpose was in all cases, firstly, to collect a layer of fibres, and secondly, to make the water drain off. Hence the mat of cellulose fibres was taken and laid between pieces of felt or the like in order to be pressed. Thus the majority of water was eliminated. There were various ways of further drying the paper sheet. Widespread and simple was the method of air-drying, both sides of the sheet exposed to the air.

Finishing. Once having the sheets of paper dried, they are ready for further treatment, if wanted. To make the paper better suitable for writing or printing purposes it could be sized. Sizing is the action of adding glue or other gelatinous substances to the paper with the effect of changing the permeability and absorbency. Another frequent action glazes the paper, making it smooth and glossy. There is a range of other operations, which might be summarised under the title "finishing", such as beating and polishing.

3.4. Paper format
Historically, the form of the mould determined the format of papers. In the early times of European papermaking there was no strict standardization of the formats. But there emerged some widely used expressions to indirectly indicate paper sizes – just to make mention of the most frequent of these names here. They tell us how a sheet of paper has been used to finally form the quires of a book.

The initial practice of book printing was to take a leaf of paper and print on it. The Latin expression of such a leaf is folium. There survived a considerable number of such prints from the 15th and 16th centuries.

Folium became the name of the simplest of all book formats. The bookbinder folds it once, thus producing two leaves and four pages. Another folding would produce four leaves and eight pages, etc. All these formats got specific names as might be seen in the following table:

<table>
<thead>
<tr>
<th>Name</th>
<th>Folds</th>
<th>Leaves</th>
<th>Pages</th>
<th>Abbr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Folio</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>f, fo</td>
</tr>
<tr>
<td>Quarto</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>4to</td>
</tr>
<tr>
<td>Sexto</td>
<td>3</td>
<td>6</td>
<td>12</td>
<td>6to</td>
</tr>
<tr>
<td>Octavo</td>
<td>3</td>
<td>8</td>
<td>16</td>
<td>8vo</td>
</tr>
<tr>
<td>Duodecimo</td>
<td>4</td>
<td>12</td>
<td>24</td>
<td>12mo</td>
</tr>
</tbody>
</table>

In history there emerged a rich and sometimes confusing variety of paper sizes and formats. Nowadays European paper formats are standardised. Anyhow, one can easily encounter the old terms mentioned above in many of our catalogues. These expressions give us useful hints of how paper maker and bookbinder worked together.

3.5. Watermarks
There is another peculiarity connected with the production of paper, ancient and modern: watermarks. Watermarks are a European invention. First samples appeared in 13th c Italy. They are visible viewing a sheet of paper against light.

Watermarks may be considered as the paper maker’s logo, the emblem, which connects a certain paper with the place of its fabrication. Actually, watermarks are figural, verbal, ornamental etc. designs made of metal wires, which are applied on the mould. Paper depicts not only the mould structure on which the fibres came to lie but also all signs and symbols which are woven into the fine net of wires. Watermarks may provide helpful hints about paper production – its places and dates, commerce with paper, the spread of locally produced papers, etc.
At the present time modern technology helps us making easily visible watermarks of ancient paper (beta-radiography, IR-photography, etc. Hundreds and thousands of watermarks are published and made accessible via databases (e.g. the "Bernstein" - project [http://www.bernstein.oeaw.ac.at/]).

3.6. Some characteristics of paper
This is the place to enumerate some selected characteristics of paper, which might be helpful in view of preservatory measures. We are having our eye on standard paper without very special treatments, paper that may be found in every collection of books and documents.

- Paper easily takes in humidity, water or other liquids, which might cause stains and endangers the integrity of the material.
- Paper is not tear-proof.
- Paper would change its colour being exposed to permanent sunlight.
- Paper is not resistant against rubbing, crumbling and some other treatment, which might harm the material character physically.
- Paper is combustible.
- Paper is a material that is attacked by insects and rodents.

Preservative measures are taking into consideration possible degradations caused by any of these aspects.

4. Maintenance and preservation

Storage and handling of books and documents made of parchment or paper

There are countless instructions of how to take care of books and archival documents and how to keep them available, both
on the web and as original. Some of the following aspects might appear simple to the reader. However, it is often these things, which are neglected and cause considerable problems. Here we are distinguishing two levels of preservatory measures: 1. storage conditions, 2. care when handling the originals.

4.1. Appropriate storage of books and documents
Regarding this item, there is much responsibility laid in the hands of a collection’s curator. Just to enumerate the most relevant factors:

- Regular and thorough inspection of all parts of a collection with the examination of objects at random.
- One of the main concerns is hydrothermal stability. Temperatures around 18°C and relative humidity around 55% as well as clean air and reduced light would provide good storage conditions. Electronic devices to guarantee stable storing conditions have to be controlled regularly.
- Minimal exposure to all kinds of light.
- Avoid storing objects permanently in hermetic and airtight surroundings, e.g. small security containers.
- Digitising of selected objects can have invaluable preventive effects: thus, endangered or frequently used objects should be digitised (to keep them accessible).
- Single documents or groups of documents as well as books may be slipcased. Book jackets and cardboard boxes are cheap and easily to produce – use acid free cardboard to make the boxes.
- Keep the storing areas clean (dirt, insects, fungi, etc.).
- Sufficient distance from radiators and vents.
- The better organised a collection is the easier is its preservation, and in case of emergency further actions would be facilitated.

4.2. Adequate care when handling the originals
Taking care when operating with any item of a collection, be it a book, a charter, or another document, is one of the most effective measures in view of preservation. In detail:

- Having clean hands and a clean area where using an object.
- Keeping food and drinks away.
- Taking the book from the shelf by gripping on both sides of the spine, instead of tugging it on top of the spine.

fig. 8: Characteristic damage due to wrong handling - when taking the book from the shelf

- Avoid opening a book to more than 180 degrees, but prop up the covers of an opened book to decrease the opening angle.
- Do not use acidic inserts or anything of this kind in order to bookmark places, likewise do not produce dog-eared folios.
- Do not use rubber bands, self-adhesive tapes and the like.
- Do not use writing materials the effects of which being irreversible.
5. Emergency actions

The term "emergency" summarises a range of imaginable situations that might menace a library or an archive: fire, water, mould, insects, dirt, chemical substances, etc. This short list singles out only a few frequent actions on a more general level, actions you will have to execute in case of emergency. All these actions have to be done by you before the conservator or restorer is called.

〜 In case of acute danger (e.g. fire) evacuation plans have to be disposable. These plans have to be elaborated on the highest administrative level of the location. They are beyond the scope of this presentation.
〜 In case of infiltration of water: evacuate the objects, prompt the authorities to stop the water entry.
〜 In case of detecting contaminated objects (e.g. mould): isolate the affected objects at a safe place in order to prevent further infection either for human beings or for neighboured objects.
〜 Make emergency boxes available.
〜 Collect information of about what happened or of what is going to happen to make the diagnosis clear. This allows specific common efforts to overcome the problems. A good diagnosis helps preventing the recurrence of disastrous situations.

6. Conclusion

As we have seen, parchment and paper are sensitive materials.

Objects consisting of these materials might be endangered at least twice: storing conditions, and actual use of the objects.

Paper and parchment are easily ready to react to changing parameters – especially hydrothermal conditions.

Maintenance and preservation in this respect means to keep the conservatory situation stable and under control.

The smooth handling of the objects needs responsible and trained persons.

There is limited number of fundamental precautionary measures to guarantee adequate handling.

There is a sort of equation: here the user’s sensibility – there the sensitivity in view of the materials.

The better you understand the material and its behaviour the more you will be able to show preservative responsibility.

Anyhow, dealing with parchment and paper in an appropriate way requires a certain appreciation of the objects: books, charters, maps, and archive materials of any kind.
Conservation and maintenance of photographic materials

Keywords
Photography, museum, photo-collection, conservation, photographic archive management, restoration, library, laboratory.

Chapter aims
The chapter aims to introduce participants to the principles, policies and practices of photography preservation in libraries and archives, based on the experience of the Alinari Museum with the conservation of its photographic collections and the Laboratory of Restoration created in collaboration with the Opificio delle Pietre Dure in Florence. The chapter is designed to inform archive employees and everyone interested in photography conservation for librarians and private collectors, graduates in conservation, and students.

Chapter content
The preservation of photographic materials requires knowledge of both photography and the fundamental principles of conservation, history of photography, conservation of cultural heritage and to attend a practical course to get able to identify photographic processes. The program includes the ordering and the cleaning of the photographic material, an introduction on the photographic techniques, agents of deterioration for photographic material, environments and storage system, handling and management of photographic materials. Collections of photographs can be found everywhere, photography is a widespread cultural deposit: in museums, galleries, companies, artists’ studios, universities, industries, and business archives, public and private libraries. It’s very important to acquire professionalism in the organization and preservation of photographic materials because the photographic materials have complex physical and chemical structures and need special conservation. The history of the technical photographic processes and materials is very long and each object can be subject to deterioration through time and with use. This chapter intends to provide a basic understanding of what and how you need to do to preserve a photographic archive.

1. The ordering of the photographic material

A cataloguing system that collects all of the information about each object is of great use in ensuring proper management of photographic materials. First, each object must be inventoried and given an identification number for easy retrieval within a collection or an archive. You cannot proceed with any conservation or restoration intervention without the inventory number, which for objects on paper such as photo prints, is to be documented in pencil on the bottom left corner on the back of the photo,
whenever possible. In the case of media with more than one photographic print, the inventory number must be indicated under every photograph or, as in the case of photo albums where many photos can be present on the same support, insert a report on a transparent storage sheet in the place of the photographs with the corresponding inventory numbers. For objects, such as daguerreotypes, you should report the number on a conservation card tied to or placed in the box.

The inventory number - in alphanumeric format, also indicated on the bottom - must be recorded on a document, the inventory log (even an Excel file), with a brief description of the subject (artist, subject, technique); this document will become the official document from which to draw the whereabouts of the archive, that is, the total count of stored items. At this point you can proceed with the preparation of the catalog entry - using an appropriate cataloging software - with the signs of detection: inventory number, name of the fund/archive, author, type of object, photographic technique, size, support, title (original, assigned by cataloger), date, mode of acquisition, copyright, condition, damage, restoration, container.

For each restoration intervention, it is necessary to proceed with a restoration card that the restorer fills out, in pencil, during the intervention phases, accompanying his/her work with a photographic survey of the condition of the item before, during and after. The card is divided into two parts: the first part contains the identifying data of the object and its condition at the time when the card is drawn. The data in this first part concerns the following fields: name of the institutional owner, inventory number, author, title, date, photographic technique, support, description of the primary and secondary object detection in pencil with an indication of damage, the status of biological, physical and chemical conservation. The second part of the card applies to the restoration and treatments performed. The card is signed by the restorer and the head of the laboratory or by the conservator.

2. Cleaning materials

Cleaning the object is the first essential task in safeguarding it. Not only can it improve the appearance of the photograph, but also extend its shelf life over time. The cleaning can be dry (carried out with soft brushes and the rubber type Pentel ZF11) or wet using solvents. The latter should only be used if the photographic technique and the support can withstand it. All of these operations must be carried out by the restorer in agreement with the conservator.

Biological attacks require analysis by a biologist to distinguish the microorganisms, fungi or insects, and then proceed with the disinfection and/or pest control. This is necessary to prevent such degradations, which can "infect" other materials.

The cleaning of glass negatives requires much attention to the fragility of the support, but especially if the negative are painted: in this case it is absolutely not advised to proceed with wet cleanings that use alcohol which damage the enamel and then the emulsion below. Wet cleaning will use a cotton swab soaked in a mixture of distilled water and ethyl alcohol. On the support side, you can use a surfactant such as Photoflo. A detergent film is PEC-12, useful for eliminating greasy stains, fingerprints, inks, adhesive tape residues.

3. Photographic processes

Photographic processes, especially those of positive prints are numerous and difficult to identify. Herein are the chief ones, though reference to the bibliography can provide a more in-depth definition. First it is necessary to specify how the photographic object can be either positive or negative and how in both cases, it is created by a support, a photographic emulsion and the image.
Photographic objects can be divided according to their creation process. For each photo object, it should be noted that its creation was carried out by a preparation of the emulsion (binding agents and photosensitive materials) and its support, to then be introduced into baths for developing, fixing and toning. All of these steps may have caused different reactions, not only in photography before the industrialization of the 1880s, but also its artisanal production.

fig. 1: Unidentified Author (P. Bondini?), Rome. Vesta Temple, calotype, 1850 ca. (Alinari Archives, Florence)

Regarding origins of photography, let’s briefly outline the most common ones, meaning the direct positives, which are unique objects and whose yield is a positive image; although they may use different media such as a metal plate for heliographs, paper for the Bayard process, a sheet of silver metal for daguerreotypes, a glass plate for ambrotypes, or an iron plate for tintypes (ferrotypes). The first negative procedure, but one that was not able to create multiples, was the photogenic drawing on paper. Englishman William Fox Talbot created the 1841 patent for the first negative, the first matrix from which almost infinite copies could be printed: the paper negative or calotype, followed first by the silver monochrome procedure (black and white), and later by the albumin negative (Abel Niépce de Saint - Victor, 1847), the wet collodion negative (Frederick Scott Archer, 1851) and the silver gelatin negative (Richard Leach Maddox, 1871). While the procedure first had a paper support, glass soon replaced it and then - with George Eastman’s invention of the portable camera (1888) - the flexible or film, which in the beginning was on nitrate, then acetate, triacetate, and finally in the second half of the twentieth century on polyester.

fig. 2: Fratelli Alinari, Female portrait, Glass - plate collodion negative, ca. 1865. (Alinari Archives, Florence)

Positive Print Processes - photo prints - are sub-divided between positive silver processes – i.e. where silver is used - which may be directly darkened, that is, made as a result of contact with direct sunlight (salted paper prints, albumins, aristotypes, colloids) or development using chemical baths (silver gelatin bromide, silver iodide), positive pigment processes (carbon, gum dichromate), processes using fatty inks (oil press, resinotype, bromoil) and metal salt processes (platinum print, palladiotype, cyanotype, kallitype). Photographic prints of the late nineteenth and first half of the twentieth centuries often have different toning; the first to be used was gold.

Color Processes – which are more difficult to preserve – may be positives on glass, like Autochromes (the first color process patented by the Lumiére Brothers and available on the market since 1907), film negatives, positives on film such as slides, printed positives like Cibachrome and prints using color processing.
Photography was used, particularly between the late nineteenth and early twentieth century, as well as photomechanical processes (photolithography, woodburytype, collotype, heliotype, etching, photogravure, photochromic) that are treated and conserved with the same importance and in a similar way as photo prints. The difference lies in the fact that the support used in photomechanical processes has never been photosensitive, and the image is generally constituted by inks. We recognize photomechanical techniques as those that when examined under microscope, small dots are detected that make up the image.

Photographic prints, according to the custom established by George Eastman House, can consist of 1 layer (salted paper, cyanotype, platinum print, palladiotype, kallitype), 2 layers (albumen print, carbon print, print on dichromate gum, oily inks, resinotype, or 3 layers (aristotypes, silver bromide prints, as for the presence of barite, that is used from about 1880 to separate the binding layer (the emulsion) from the primary support).

Objects in a case and photographic prints may also have coloring applied. Another protective binder used for positives and negatives is wax, as for the negatives *papier-ciré* by Gustave Le Gray.

4. Deterioration

Deterioration factors of photographic materials can be external (environmental) and internal (production materials and creation of the object).

Temperature and humidity: it is therefore advisable to find a stable environment for conservation spaces. In the case of an incorrect T, materials may undergo expansion or shrinkage or they may experience the yellowing of paper or emulsion. An environment that is too damp can cause condensation, which can cause mold to develop, silver oxidization, the swelling of the gelatin, which is hygroscopic, and yellowing of albumin. Conversely, a locale that is too dry can cause deformation and the fragility of the object.

Attacks by microorganisms and insects, rodents: attacks can cause erosion of the support, which is gelatin, causing the loss of the image, or deposits, foxing.

Attacks of mold and bacteria, often caused by thermo hygrometric changes, can tarnish the photo resulting in the decomposition of the image and the pulverization of the paper.
fig. 4: Numa - Blanch, "House of Savoy II". Maria Pia of Savoy and Luigi I of Braganza, 1901, platinum print with damage: yellowing, foxing, browning, holes. (Fratelli Alinari Museum Collections, Florence)

4.2. Internal factors
The first elements of photography to be degraded are those specifically related to the creation of the object itself, so its exposure, its development or its attachment, support. All of these factors can cause degradation which appears to be irreparable, such as fading of the image, the presence of stains or yellowing of development, the sulfurization of the image, silver mirroring or silvering, and foxing. The same support, such as paper, can result in additional damage caused by the composition of a poor quality raw material constituting the support. Other materials can produce particular deteriorations, such as platinum prints; with this procedure it is possible to assist the transfer of part of the image onto the paper before contact with the image.

Positive printing processes: yellowing caused by the lignin of paper, foxing (often caused by papermaking), alteration of the binder (gelatin, collodion, albumin). The silver processes often undergo oxidation and are subject to silvering. The image may fade and eventually disappear in some cases, or it can change color and hue. The sulfurization of silver can cause darkening and discoloration of the image, or a browning or loss of contrast. Albumins tend to crack, turn yellow and roll up on themselves. Barite prints often see detachment between the layers. The damage created by insects cause abrasions and traces indicating their presence on the surface, especially on cellulose and animal-based emulsions (albumin, gelatin); brown spots may be insect droppings. The palladium or platinum prints often result in the transfer of the image. Cyanotypes suffer the degradation of Prussian blue, which can fade, or whitening that is entirely due to the reduction of ferric ferrocyanide to ferrous ferrocyanide, insoluble and oxidized. Carbon prints instead often show deformation of the paper and the presence of discoloration on the back of the image.

fig. 5: Negative with damage: delamination and lifting of the gelatin. (Alinari Archives, Florence)
5. Environments

The creation of a suitable protective environment is the main task of photographic conservation. It is therefore necessary to monitor the risk factors of the environment (the surrounding territory and structural soundness of the building where the archive is located, how the material is received and the risks due to any fire, flood, etc.). Check the environmental factors (relative humidity: RH and temperature: T) of storage rooms, and that the materials of the furniture, the wall paint and flooring materials are not harmful to the conservation effort, as well as ventilation of premises and its lighting conditions. For the latter, please note that the photographic materials need to be protected from sunlight and ultraviolet rays (using appropriate black out shades for the windows) and the room must be illuminated with controlled artificial lighting.

The environmental conditions may vary according to the type of the photographic objects, but they must be kept stable: in fact any abrupt changes in the T and the RH may cause an irreparable degradation or damage to the object, such as a change in T from too hot to too cold and vice versa, or from a low to a high RH, resulting in the subsequent formation and attacks of mold and bacteria, detachments of gelatin, modification of the supports, especially in the films. The variations in T and RH should be stabilized to a maximum of + or - 5%.

Photographic materials on paper, positive or negative and objects on metal (daguerreotypes, ambrotypes, tintypes) require a T at 18° and a RH between 30% and 50%, black and white negatives on glass, a RH between 30% and 40% and a T at about 15°, while the film negative a T as close to 0 as possible and a RH between 20% and 40%. Color materials require instead a T less than 0 and not more than 2° (in this case it will be necessary to build a cold room). The controlled environment is achieved by monitoring the thermometer and hygrometer and the installation of humidifiers/dehumidifiers with air filtration.

RH that is too low can cause contraction or deformation of materials (curling), and RH that is too high can lead to the development of microorganisms that decompose the chemicals, oxidize the silver, soften the gelatin and detach the emulsion.
Storage environments must also undergo proper maintenance to ensure ventilation, air filtration (to avoid dust and gas pollution) and thorough cleaning. In fact, the accumulation of dust can cause damage to photographic materials, such as scratches on the negatives, deposits on the prints and mold. Maintenance of the locale thus requires that the shelves and containers are cleaned and anti-dust treatment of the walls and floor are carried out. The furniture should preferably be made of metal and not wood, Formica, plywood or plastic laminate.

To ensure sound management of a considerable amount of photographic objects, divide the objects according to the different media, for better preservation: materials on paper (photo albums, photo prints, negatives on paper) should have a dedicated place, whereas a separate place should be set aside for metal objects such as daguerreotypes, while in yet another separate room, where the temperature is lower, negatives on glass, away from those on film. These separations are also clearly necessary for different supports and formats. In these spaces, exposure to direct sunlight must be avoided.

6. Conservation and storage

Once a suitable storage environment is achieved, objects must undergo an evaluation of their state of degradation before they are introduced into the environment, because in the case of objects with the presence of mold they must be isolated in a separate environment to avoid infecting other "healthy" objects.

Before introducing the object into the storage room, it must be inventoried. This is the first measure required for the object’s registration in the database. Then it will be appropriate to perform a cleaning of the object, since its cleaning and the subsequent absence of dust and dirt is critical to a good state of preservation. After these operations have been carried out, the object is removed from its protective envelope or any paper, which in most cases is not appropriate (the original bags will be stored separately). The protective envelopes or cards for photographic materials, whether a print of a negative, glass or film, or any other material, must necessarily be made of materials suitable for conservation, with a certification given by the manufacturer (the PAT, Photographic Activity Test - ANSI Standard IT9.16) certifying the absence of acidity (acid-free). The conservation cards must be free of glue or tape obviously, you can write on them (for example to indicate the inventory number), but only in pencil. If possible, every object should be protected by conservation paper, as each album should be interleaved so as to prevent contact between the emulsion and support. When a photographic archive of considerable size, it is not always possible to proceed in the same way for all materials: in this case priority must be given to certain objects, so as to indicate which materials must first be secured and protected (the materials most fragile or degraded, but also the most important regarding artistic authorship or aesthetic value). Among the most widely used materials of conservation are paper storage bags and acid-free envelopes with transparent polyester such as Melinex or Mylar. The latter, being transparent, allow you to view the object without removing it from the bag and also allow you to manipulate it without the use of gloves. Paper envelopes, however, allow...
for better breathability. The envelopes must be transparent polyester, polyethylene and polypropylene, and it is best to avoid polyvinyl chloride (PVC) or other materials containing chlorine. For the selection of preservation materials to be used, analysis of the photographic object must first take place, in order to know the management issues it may face. For example, it is better to keep prints, which are more often manipulated, in clear plastic pockets so as to reduce possible degradation due to handling.

Photographic prints are preserved within each single archive, placed in cardboard storage boxes in certain cases, divided within folders (always preservation quality material), possibly divided by size to avoid rubbing. The prints are arranged horizontally, the boxes should not be too full of prints, as the weight can result in crushing the objects and the pressure may cause transfer or "attachment" of the emulsion on the paper or protective envelope. An effective protection method is the passe-partout, a kind of cardboard folder where the original window frames are affixed to the baseboard using Japanese paper hinges or corners. The passe-partout is made by the restorer because it must be "tailor made" to the original and must be carried out with conservation-suitable materials (cardboard, adhesives, corners or hinges) and can be more or less, depending on whether it is packaged for storage (thinner) or for exposure (most often). The passe-partout is very useful for consulting the original without handling it and without the protective paper, which rests on the emulsion.

7. Handling and management of photographic materials

Handling is often the main cause of photographic degradation, either negative or positive. Therefore the basis for a good conservation project and management of photography must be the establishment of protocol for the use of storage rooms whose management should be entrusted to the archivist, of which he will assume responsibility: anyone coming to consult the materials will have to ask permission from the curator of the archive and agree with the archivist’s consultation standards. These standards still primarily include the reason for consultation, the use of pure cotton gloves for handling and the prohibition of bringing ink pens for note taking, food, liquids and toxic materials into the consultation room. It is implied, but important to remember that smoking, drinking and eating are not allowed in the conservation room, and that bags, coats, bulky items and umbrellas are not permitted. One can take notes on the boxes and conservation cards, but only in pencil. The archivist and the restorer, must wear pure cotton gowns in the halls of the conservation and restoration laboratories, and cotton gloves when handing objects on paper or metal or latex gloves when handling objects on glass or film.

Also do not overlap too many photographs that must be placed in conservation folders within storage boxes. Boxes should be stacked at a maximum of 3-5 boxes one over the other.
8. Conclusion

For the reorganization of a photographic archive, as you can see in the chapter, it’s very important to proceed first to an inventory and a new order to conserve the archive in time, to know the cause of degradation of the objects, to prepare a dedicated environment, to approach appropriate storage and manipulation conditions. Photography conservators need to have a thorough knowledge of photographic processes which can only be obtained through a long practice with the original materials. The photographic material is a complex material and needs special attention and in particular photographic culture and knowledge of photographic processes. The photo archive conservator needs to consult experts and restores in case of restoration and for an assessment of the causes of degradation of the objects and storage conditions in a dedicated environment.
Keywords
Bookbinding, artistic bookbinding, art, craftsmanship, history, European binding, art deco, art nouveau, modern

Chapter aims
After completing this course the student will have learned about:
- A short history of European Bookbinding;
- How to look with creative mind at the process of designing bindings.

Chapter content
Artistic Bookbinding is a vast area of several disciplines in bookbinding. Many major qualities are needed to become an artistic bookbinder: extensive knowledge on bookbinding, the history of bookbinding, art and art history, craftsmanship and aesthetical abilities.

This course is only a brief introduction to all of this. It should inspire the student to dig deeper and further on this subject: many sources are available on the Internet and in specialized libraries.

1. A short history of European bookbinding

![fig. 1: Books with lead pages and wire binding were found in a cave in Jordan that could date back to the first century AD](image)

1.1. 1st-4th centuries: The Codex
A codex (Latin caudex for "trunk of a tree" or block of wood, book; plural codices) is a book made up of a number of sheets of paper, vellum, papyrus, or similar, with hand-written content, usually stacked and bound by fixing one edge and with covers thicker than the sheets, but sometimes continuous and folded concertina-style. The alternative to paged codex format for a long document is the continuous scroll.

Developed by the Romans from wooden writing tablets, its gradual replacement of the scroll, the dominant form of book in the ancient world, has been termed the most important advance in the history of the book prior to the invention of printing.
1.2. 3rd-8th centuries: Later Codex
The codex gets bigger and consists of more signatures. Instead of single signatures multiple signatures are integrated. As a consequence more information can be stored in one single volume. The sewing of the sections is still done as a chain-link, so it’s unsupported sewing. The spine and boards are not covered: limp structures are folded around the bookblock.

![fig. 2: Unsupported sewing](image1.png)

![fig. 3: Limp cover](image2.png)

1.3. 7th-12th centuries: Early Medieval Bindings
The sections are now sewn on supports. These can be made out of alum tanned leather or vegetable tanned leather. Boards made of wood (mostly oak) are attached to the sewing supports and then the book is covered with leather (at least along the spine and a part of the boards). The quires are made of vellum and are hand written.

![fig. 4: Sections sewn on alum tanned leather bindings](image3.png)

1.4. 9th-14th Centuries: Middle Ages
Several new developments took place in medieval bindings. First, metal clasps were introduced. These are mounted at the fore edge and hold the book closed to protect it from dust and vermin. Bosses are used to protect the surface (tooled leather or gemstones) of the binding. Books were shelved flat during this period and had a title written on the fore edge.
1.5. 13th-16th centuries: Girdle Books

Another form of binding is the so called girdle book: a growing number of people have learned to read and are on the move (like pilgrims and traders). The books had to be small and thus could be easily transported and protected from the elements. Most of these books contained religious texts.

fig. 7, 8: Girdle book - closed and open

1.6. 15th-16th centuries: Northern and Southern Europe

In southern Europe most books are sewn on alum tanned straps (sometimes single but also double bindings). The boards in this area are made of beech wood instead of oak or other wood. Also goat or sheepskin leather in brown or dark red was used to cover the book. Tooled decoration was done in blind or gold and mostly with abstract patterns. Often the clasps were hinged from the top board to the back board.

fig. 9: Sixteenth century Italian binding

In Northern Europe at this time the sewing was done on fibre (rope) cords, again single or double. The boards were constructed of oak or thick beech wood. Most of the times calf leather in brown shades was used but also pigskin (alum tanned) was applied. Decoration again tooled blind with abstract and pictorial elements (mostly by decorative wheels and pallets). The clasps were attached and hinged on the bottom board.
1.7. 17th-18th Centuries: Gold Tooling

During the 17th and 18th centuries the spines of the book-block were rounded and the boards were made of paper (cardboard) rather than wood. There were many changes in the appearance of the books: different colours of leather but also coloured patterns on the leather. Gold decoration was used more and more. Also the use of recessed cords was introduced: in this way the spine become flat. Several new materials and styles of binding were developed like half- and quarter-style bindings.

1.8. 19th century: Birth of the Modern Book

Industrial production of books started evolving due to the growing demand for books. Also the use of wood pulp as main paper raw material and continuous paper production started. This demanded changes in binding production: the case binding was invented. The
binding (cover) was now constructed apart from the rest of the book. The all-cloth bindings became more prevalent than leather bindings. Hand bookbinding still existed but was only for special more expensive bindings. Publisher’s cloth bindings were often exuberantly decorated with panel stamps (gold, blind or colour) and other elements.

1.9. 20th century: Modern Binding
The whole production process became fully mechanized or automated. Instead of using thread to sew the sections glue was used to attach loose leaves together (lumbeck process). Paperback books were introduced (flexible cover attached to the back of the bookblock). Hand bookbinding still exists but only for small and special editions or unique ones and is considered nowadays as an artistic craft.

![Modern industrial bindings](image13.png)

![Binding by Pierre Thielen, calf leather wrapped around aluminium plates: bookcover as a monumental artwork](image14.png)

![Box with 4 volumes of The Letters of Van Gogh by Cor Knops: mirrors inside, windows on the outside.](image15.png)

2. Artistic book design: what, why and how

2.1. Introduction
Artistic bookbinding is not something you can easily learn in a structured course or lessons. Some people are gifted bookbinders but not artists. Some artists have brilliant ideas on book design but don’t know how to bind a book.

In the Merriam-Webster Dictionary the term "artistic" is defined as follows:
Of course, everyone knows the meaning of the word "bookbinding" in its traditional sense. Because of the on-going automation in industrial bookbinding the act of the actual binding has become obsolete in the process of bookbinding. The only thing that is done by humans to "shape" the book is the graphic design of the cover of the book and the lay-out of the pages inside.

Since a few decades hand bookbinding has become more than just "binding sections to make a book". Most of the times books which are designed today are independent works of art in which the form of the final book is related to the content of the book. The content of the book is the starting point for the artistic bookbinder. The story within is often depicted (in any way) in the cover of the book. But this is still a conventional book: there are many ways to see the book as a conceptual form of art: the book as a carrier of information or ideas.

There are many ways to interpret an artistic bookbinding just like there are many ways to design a bookbinding for a certain book. A good example is the book binding contests. All participants all get the same book (in sections, uncut and without endleaves or cover). The result is as many different bindings as participants: everybody has different ideas about the same content.

In the next pages some examples of various bookbinding's are presented. The idea is to set your mind thinking about what, why and how individual book designers or artistic bookbinders have done to create the binding which is presented. Please be open minded and try to follow the creative paths shown.

2.2. Artistic Bindings Part 1

<table>
<thead>
<tr>
<th>what</th>
<th>why</th>
<th>how</th>
</tr>
</thead>
<tbody>
<tr>
<td>japanese binding</td>
<td>easy to make</td>
<td>awl or drill</td>
</tr>
<tr>
<td>exhibition catalogue</td>
<td>primitive, honest and robust look</td>
<td>binding thread</td>
</tr>
<tr>
<td>&quot;tactile paper&quot;</td>
<td></td>
<td>needle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>no glue is used</td>
</tr>
<tr>
<td>what</td>
<td>why</td>
<td>how</td>
</tr>
<tr>
<td>------</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>inflatable-lifesaver-for-children-look-a-like&lt;br&gt;art academy catalogue</td>
<td>just like that...&lt;br&gt;just air inside</td>
<td>industrial bookbinding&lt;br&gt;sewn and glued (pva)&lt;br&gt;pasted-on boards&lt;br&gt;cover &quot;made in china&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>what</th>
<th>why</th>
<th>how</th>
</tr>
</thead>
<tbody>
<tr>
<td>garment tag as spine title&lt;br&gt;undressed - marlies dekkers&lt;br&gt;paper dustjacket with opening</td>
<td>relation between content and form&lt;br&gt;peep hole&lt;br&gt;sexy lingerie</td>
<td>industrial binding (hard cover)&lt;br&gt;garment tag&lt;br&gt;paper dustjacket &amp; knife</td>
</tr>
</tbody>
</table>

**2.3. Artistic Bindings Part 2**

<table>
<thead>
<tr>
<th>what</th>
<th>why</th>
<th>how</th>
</tr>
</thead>
<tbody>
<tr>
<td>loose leaves sewn together&lt;br&gt;étant donnés (duchamp)&lt;br&gt;17 peepshows by 20 artists</td>
<td>creates two <em>different</em> sections in one binding</td>
<td>printed paper&lt;br&gt;sewing-machine</td>
</tr>
<tr>
<td>What</td>
<td>Why</td>
<td>How</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------------------------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>folded sheets glued together</td>
<td>text can be folded out to reveal the related picture</td>
<td>paper</td>
</tr>
<tr>
<td></td>
<td>designers idea - binders nightmare</td>
<td>glue (pva)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>board</td>
</tr>
<tr>
<td></td>
<td></td>
<td>boardcutter</td>
</tr>
<tr>
<td>ordinary paperback binding</td>
<td>relation between content and cover look-and-feel</td>
<td>industrial binding</td>
</tr>
<tr>
<td>cover made from genuine sail-cloth</td>
<td>typography associated with shipment crates</td>
<td>sail-cloth</td>
</tr>
<tr>
<td></td>
<td></td>
<td>glue</td>
</tr>
<tr>
<td>loose leaves bound together with brass pens and balls</td>
<td>design</td>
<td>brass pens and balls</td>
</tr>
<tr>
<td>two books: one left and one right</td>
<td>alternative binding</td>
<td>no glue, no sewing</td>
</tr>
</tbody>
</table>
2.4. Artistic Bindings Part 3

<table>
<thead>
<tr>
<th>what</th>
<th>why</th>
<th>how</th>
</tr>
</thead>
<tbody>
<tr>
<td>leparello (also called concertina)  binding</td>
<td>easy to make</td>
<td>paper (one long folded piece)</td>
</tr>
<tr>
<td></td>
<td>funny appearance</td>
<td>board</td>
</tr>
<tr>
<td></td>
<td></td>
<td>glue (paste)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>rope</td>
</tr>
<tr>
<td></td>
<td></td>
<td>rivets</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>what</th>
<th>why</th>
<th>how</th>
</tr>
</thead>
<tbody>
<tr>
<td>again the sewing machine</td>
<td>lack of money?</td>
<td>stack of printed paper</td>
</tr>
<tr>
<td></td>
<td>lack of time?</td>
<td>cover (paper)</td>
</tr>
<tr>
<td></td>
<td>or just a good idea?</td>
<td>sewing machine</td>
</tr>
<tr>
<td>what</td>
<td>why</td>
<td>how</td>
</tr>
<tr>
<td>------</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>integration of content &amp; cover</td>
<td>what goes out comes in again</td>
<td>industrial binding</td>
</tr>
<tr>
<td></td>
<td>form follows function?</td>
<td>paper cover</td>
</tr>
<tr>
<td></td>
<td>let’s go fishing</td>
<td>punch or secure hand (with knife)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>key ring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>perforator..</td>
</tr>
</tbody>
</table>

2.5. Artistic Bindings Part 4

<table>
<thead>
<tr>
<th>what</th>
<th>why</th>
<th>how</th>
</tr>
</thead>
<tbody>
<tr>
<td>is this a book?</td>
<td>&quot;werkboek&quot; (work book)</td>
<td>no specific tools needed</td>
</tr>
<tr>
<td>loose leaves</td>
<td>noting more than it is</td>
<td></td>
</tr>
<tr>
<td>corrugated cardboard &amp; rubber band</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>what</th>
<th>why</th>
<th>how</th>
</tr>
</thead>
<tbody>
<tr>
<td>case opened</td>
<td>relation between content &amp; case</td>
<td>cover: steel</td>
</tr>
<tr>
<td>inlay cover consists of same material as book content</td>
<td>book = case</td>
<td>needle &amp; thread</td>
</tr>
<tr>
<td></td>
<td>slits to hold cover in certain position</td>
<td>linen reinforcement for spine</td>
</tr>
<tr>
<td>what</td>
<td>why</td>
<td>how</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>---------------------------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>exhibition catalogue</td>
<td>challenge?</td>
<td>far-fetched ingenuity</td>
</tr>
<tr>
<td>made of only one piece of paper</td>
<td>far-fetched or ingenuity?</td>
<td>printer (preferably human)</td>
</tr>
<tr>
<td>book or box?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>what</th>
<th>why</th>
<th>how</th>
</tr>
</thead>
<tbody>
<tr>
<td>orange crate sides look-a-like</td>
<td>portable book</td>
<td>simple binding</td>
</tr>
<tr>
<td></td>
<td></td>
<td>wooden boards</td>
</tr>
<tr>
<td></td>
<td></td>
<td>jigsaw</td>
</tr>
</tbody>
</table>

2.6. Artistic Bindings Part 5

<table>
<thead>
<tr>
<th>what</th>
<th>why</th>
<th>how</th>
</tr>
</thead>
<tbody>
<tr>
<td>oeuvre overview</td>
<td>new media</td>
<td>cover: board</td>
</tr>
<tr>
<td>moniek toebosch</td>
<td>seems to be a book</td>
<td>content: CD-rom</td>
</tr>
<tr>
<td>cover/box for CD-rom</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>what</strong></td>
<td><strong>why</strong></td>
<td><strong>how</strong></td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>all leaves printed on both sides and folded</td>
<td>exciting?</td>
<td>industrial binding</td>
</tr>
<tr>
<td>pages can not be turned normally</td>
<td>teasing curiosity</td>
<td>leaves lumbecked</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>what</strong></th>
<th><strong>why</strong></th>
<th><strong>how</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>zebra pattern on cover</td>
<td>look and/or feel</td>
<td>simple binding</td>
</tr>
<tr>
<td>reflecting endpapers</td>
<td>contrast between cold metal and warm cover</td>
<td>board</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cloth</td>
</tr>
</tbody>
</table>

3. Conclusion

Artistic bookbinding is not easy to define. Bookbinding has a long tradition and has roots in various cultures. Artistic bookbindings have technical and asthetic elements; mostly combined.
Chapter 5

Photo albums and photography in the library

Keywords
Photo-album, book, archive, library, photography, postcards

Chapter aims
The chapter aims to train librarians, archivists and private collectors who wish to have knowledge of the history of the photographic album, in particular with a description of the types of albums, the conditions of degradation and the storage and manipulation of these objects, as well as knowledge of the presence of photographs and photomechanical in printed books.

Chapter content
Each archive, library or private collection conserves photo album and it's very important to raise awareness on the value of these objects, of their historical importance and how to store them and preserve them in time.

Since the fifties of the nineteenth century photo albums have had, throughout the world, an important role in dissemination and knowledge of photography, but especially over time have become complex and unique objects.

We can say that with the album photography has become part of our culture, has entered in our homes, libraries, universities. The Fratelli Alinari Museum Collections conserve over 6,000 photo albums which collection constitutes the largest known heritage in the world. Each album presents not only a different packaging and binding, but also an extraordinary diversity of types of subjects, authors, photographic and photomechanical printing techniques and of different materials which can create not a few problems for the preservation of these objects.

In addition to the digital dubbing of the album, it is important that we proceed with a stabilization of the base of the object, rather than a complete treatment and find an appropriate environment for storage.

1. History of the photo album

The photo album’s ancestor was the notebook, also a working instrument of many artists that is still used today.

The true photo albums were born in the early 1850s thanks to Louis Desiré Blanquart-Evrard (1802-1872), inventor of the albumin printing process and founder of the printing house-laboratory.
“L'imprimerie photographique” through which he encouraged the spread of photography through the use of photographic albums. The album is an editorial product that substitutes the printed book, which before the invention of the halftone process did not allow the printing of photographs and text in the same volume.

The photo album is therefore not simply a "collection" of photographs, but a complex artistic object whose structure can change over time and that can be a work of different photographers and of different "collectors". The album is not only a space of memory and documentation, but it is also a creative, collective artistic object and the photography vernacular that is sometimes found within it has recently acquired an authorial value.

The album is a complex object, consisting of the binding and sheets of stiff cardboard and is often covered in paper (sub-mounts) onto which photographs are inserted, attached or pasted in various ways. These can be of different printing technique, as can the authors differ as well as the historical period represented. There is also often the presence of different objects, such as decorations in ink or tempera, the application of fabrics, dried flowers, hair, plastics, tissue paper, shells, paper tickets or other materials.

The ultimate use of the album can either be private (family album, wedding album, an album of travel, in general the album of personal memory, constructed over time), public and celebratory (albums of exhibits and exhibitions, industrial albums, scientific albums, pre-assembled travel albums for purchase), or finally the artistic album of an author who has made a product of his creativity. In all of these cases the album meets the primary instinct to put together, much like a catalogue, images that have a common denominator: photographs of one’s family, celebrities, travel, memories, the object of scientific study or the artist’s idea.

2. Types of albums

2.1. Portrait and family albums

This is perhaps the first type of album, arising in conjunction with the 1854 carte-de-visite patent by the French photographer André-Adolphe-Eugène Disdéri and is subsequently spread, especially from the 1860s. Born as albums with pockets to collect carte-de-visite portraits, they then became veritable galleries of photographic portraits of which nineteenth century photographs of family members are preceded by portraits of famous people of the time, according to the practice in use.

Regardless of their format, whether carte-de-visite, cabinet, or margherita, portrait albums can have one or more photographs on the same page.
The portrait album evolved into the family album in which, as a true album of memories, photographs that recreated the personal history of each were included.

2.2. Travel and sights albums

![Image](image-url)

**fig. 2**: Album Constantinople C.Y.1862. Dark green leather with decoration in cold stamping in gold tooling on front cover, covers edged in brass with claps, dentelles, gilt edges, moiré paper fly-leaves, with J.Robertson and F.Beato's photos of Constantinople. (Fratelli Alinari Museum Collections, Florence)

The travel or memory album type was born in the 19th century from the work of traveling photographers who then presented the results of their photographic production in albums. The formats and bindings of these albums can be very different: in general a horizontal format prevails in order to recreate the views and panoramas of places visited: in the events of small photographs (classic 13x18 format), especially for modern albums of the late decades of the 19th century, albums with vertical formats allowed for the positioning of 3-4 photographs below one another. 19th century travel albums, particularly those of the "Grand Tour" in Italy, contain large format photographs and works by great photographers. As with portrait albums, the albums of sights collect photographs of various printing techniques, different formats, authors and subjects.

2.3. Celebration and exhibition albums

From the beginning, the albums celebrating large expositions, as well as exhibitions, inaugurations, discoveries and great buildings and celebrity visits were widely spread. The album, whose cover and title page bore, typically in gold letters, the title, place and date of the events and sometimes the famous person to whom it was dedicated (king, head of state), usually had a large format. The photographs were possibly realized by one or more celebrated authors and had a precise sequence that indicated the timeline of the event (opening, main sites, secondary sites), or the hierarchy of importance of the represented figures.

2.4. War albums

Albums of war are a very particular genre: they are albums officially created by professional photographers who have illustrated the war and who have also created commemorative albums, such as the two-volume album on the American Civil War by American photographer Alexander Gardner, *Gardner's Photographic Sketch Book of the Civil War* in 1866. In general, war albums were very popular during the First World War (1914-1918) and were realized by soldiers who carried cameras and took photographs of the trenches, their companions and significant moments.

2.5. Postcard albums

Postcard albums were made either ready for sale, or made personally and gradually over time. These albums can comprise postcards of the same type and size, but they can also be a mixture of photo-
graphic postcards, picture postcards and drawings, or an album that brings together postcards and photographs, sometimes highlighting stamps or other collected items. Postcard albums usually have slots for inserting the postcards, or adhesive corners.

2.6. Industrial albums
These albums are produced for companies with the purposes of celebrating or demonstrating the production and activity of the industry. The photography industry was born in the 19th century, but the use of representative albums is more popular in the 20th century. Also in this case, the bindings can be of different size and wealth, depending on the client and the album’s intended use. In many cases, these albums that serve a communication function are produced by the company and preempt the house organ that spread in the 1930s.

2.7. Scrapbooks and portfolios
The scrapbook is an album where one collected items related to his personal history on his own artistic studies: over time, various scrapbooks have become true artistic objects. For example, the books/album of Japanese artist Shinro Ohtake were displayed in 2013 Venice Biennale of Art. The artist uses the album to collect not only his own sketches and notes, but also photographs or other materials that are useful to his work.

Portfolios that contain limited editions of photographs are also popular. These are works of art that are for sale, for the purpose of presenting the author’s best work. It is generally intended as a complex portfolio of photographs that express an author’s central idea, collected in a folder with a narrative objective.

2.8. Albums of great expeditions and scientific albums

Great expeditions had to be photographed to go down in history, and the albums that were produced at the end of these expeditions were true artistic objects of great importance. These scientific albums can be referenced in many disciplines, from astronomy to botany, ethnography to anthropology and physiognomy to zoology.

2.9. Albums for display
A separate chapter in itself is represented by albums designed to be exhibited and therefore have an ad hoc display built for it: at the beginning of the 20th century complicated pieces of album furniture were popular, both for the table and floor, that included complex decorations and structures which made them complex artistic objects.
3. The binding, packaging and decoration of albums

Photo albums present an impressive case of varying bindings, according to size and especially destination and therefore the importance of the album itself. In fact, the first characterization of an album is its binding which is also the first part to be damaged. Albums tend to be characterized by the binding: for this reason it is very difficult to find albums with the same packaging, unless it is packaged as part of a souvenir series, but these also vary in color and paper used in covering the second and third-edition covers. In fact it is the binding, in addition to size, that distinguishes albums from books before they are even opened.

fig. 4: Portrait Albums, ca. 1880. Left: Binding with leather spine with cold stamping and gold tooling, covers with wood and mother-of-pearl inlay, brass claps, gilt edges. Right: Binding in green buckram, covers with mother-of-pearl inlay, brass claps, gilt edges with tooling and figured vignettes in tempera. (Fratelli Alinari Museum Collections, Florence)

The most luxurious types of objects can have closures made of wood, leather, canvas, lacquer, metal, cloth, pearls or ivory; in most cases these are official and celebratory albums, or instead those intended for private use for rich and important families. The bindings can have a metal closure with clasps, security sheets and a pasted counterguard.

fig. 5: Album of personal recollections, ca. 1870. Binding in red leatherette, gilt edges, pages richly decorated in India ink. (Fratelli Alinari Museum Collections, Florence)
Over time, the binding is substituted with very simple, though easily degradable materials: the covers are simple sheets of cardboard or paper held together with metal or plastic spirals, metal clasps or ribbons. In all of these cases the sheets that make up the album are perforated for the insertion of the spirals, clips or ribbons. All of these types of albums are easily degradable due to the quality of the materials, but especially because of the way they are being manipulated, which leads to tearing of sheets and their complete removal. These cardboard albums with clips or ribbons were very common between the '20s and the '40s and were used for portrait, travel and celebratory albums. Spiral albums were typical in America in the '30s and '40s and with pasted photographs.

From the '60s, there is an increase in plastic bindings of photo albums, which in general are subject to great damage, especially if the paper sheets in which two photos are inserted are substituted with PVC plastic sheets, the most common containers produced in printing labs and present in all of our homes. In the '70s and '80s these products were distributed along with the prints from developed rolls of film. In these cases, the plastic can release substances that alter the image, or the plastic support can become opaque or even become brittle and shatter.

The album is composed of two plates covered and reinforced, front and rear protective sheets hinged from the back, reinforced canvas and capital and folders or individual plates almost always in multilayered cartonboard. The pieces that hold the various sheets of the album together tend to enlarge the volume from the back as much as possible and tend to crack when being used a lot. Canvas can be more flexible and easy to use for making hinges, but is more likely to frequently break. Canvas hinges can be simply glued, without being sewn and therefore are not more unstable.

Pockets formed by folded paper and glued to the cardboard support are also present in albums. The presence of the glue and the rubbing or friction often cause damage to the object. Albums with windows or passe-partout allow for the grafting of many overlapping materials, the outer paper, the passe-partout cardboard and the cuts where photographs are inserted.

An accordion-style album, typical of souvenir albums, is constructed with many postcards held together by canvas hinges.
Very commonly, the pages are interspersed with tissue paper as a method of protecting the photographs, however, being acidic this can degrade and damage the photos over time.

The album’s decoration can also include various materials, not only in the binding, but also on individual pages where complex decorations can appear, including decorations in ink, watercolor or **gouache** pictures, printed frames and inscriptions and the insertion of different materials such as cloth, dried flowers, hair (in memory of a loved one) and so on.

Albums of memory, travel and family often include various materials such as train tickets, seals, business cards, holy cards, newspaper clippings, telegrams and all documents concerned with reconstructing the history of the person who created the album. However, these materials are often harmful to preserving the albums because items are made of low quality materials and are often glued with low quality adhesive. Preserving an album also means taking care of all of these different materials that interact with the object.

**4. Degradation**

The main causes of degradation depend on manipulation of the album and then the quality and type of the materials with which it was made and the environmental conditions in which it was stored.

![fig. 7: An album with damage to the bindings. (Fratelli Alinari Museum Collections, Florence)](image)

The mounting is often subject to a physical degradation: bonding of photographs over time can cause tension in the paper and its subsequent deformation with gaps and tear, while the glue may have an impact on altering color photo printing and paper supports. Photographs included in album pockets are often removed using force resulting in tearing of the support and the photograph itself, or they simply slipp away and are damaged by rubbing against the support. Photographs of larger size are included into albums after actions such as bending or cutting of the photograph, as in the family album or memory album. In these cases, manipulation is very common such as cropping or resizing the photo to exclude a part or a person or by making photo collages. Though sometimes very tempting, these actions are harmful to the object’s state of conservation. Glued photographs often cause a ripple in the support which can degrade over time, while photographs often placed in corners are cut and in turn have tears and folds. Also, support cards were not good quality and contain a lot of lignin, which eventually causes chemical damage to the photograph in the form of stains, yellowing or oxidation. Additionally, the protective sheets if acidic – which, in most cases, they are – can cause further chemical damage, or abrasions following rubbing.
Handling the album is in fact the principle cause of its deterioration: not only in browsing through it, inserting and removing photographs, but over time due to repair of the object different clumsy restoration attempts are visible, such as adhesive tapes, paper clips and staples.

The binding is most susceptible to degradation due to its use and the methods of conservation adopted. Frequently the binding is damaged on the plates and on the back. Exploring the album often leads to pressure on the spine that break it and then cause the separation of the sheets that make up the album. In many cases, sheets are forcibly cut out to be exhibited or sold, or are otherwise separated from the others. A hinge often tears the back of the binding and the reinforced plate can fall off.

As with all other objects of photography, poor storage conditions can cause moisture damage and exposure to dust and light, so the formation of mold, microbiological attack, as well as stains, yellowing, corrugation, delamination, etc., are possible.

Being that the album is also an artefact subject to significant handling, in time, things written in ink - to comment or describe a photograph, an event, a person, a date - or other materials (crayons, markers, colored pencils) cause further damage to the object as the ink can transfer on the opposite page, or even worse, smear onto the image.

In some cases, the photographic image transfers onto the preceding page, as in the case of platinum prints.

5. Conservation

The photo album is a complex object, composed of different materials and photographs that are in large part by different authors.

The preservation of a photo album is quite complex, especially if faced with a set of photo albums that are perhaps of different formats, types, periods and authors. In some cases it is recommended to store albums in a horizontal fashion for a greater chance of preserving an object that is itself somewhat awkward, especially if the album has a slim binding, but even if it is a heavy album that is difficult to handle. In view of the photos contained, vertical conservation is preferable instead, especially in
In this respect it is advisable to have shelves that are not too long or with dividers to allow albums a vertical position without allowing the album to bend. Pending appropriate restoration, albums can be covered with a wrapping of conservation materials to avoid its rubbing against other objects and to prevent material from tearing away from the album’s binding. It is necessary however, when placing albums in the vertical position, to determine the state of conservation and that there are no detached sheets or photographs.

Preserving a large collection of photo albums is very difficult due to the time and costs necessary for the undertaking. However, for albums that are heavily damaged or at risk, conservation is required. Aside from the digital duplication of the album, it is important to proceed with a stabilization of the actual object rather than a complete treatment and to find an appropriate environment for conservation.

It is best to avoid disassembling the album that is to pull out the sheets with photographs, in order to leave the object intact. Otherwise, the object would lose its artistic value. Only in the case of severely compromised album is it advisable to separate sheets from the binding, only after numbering the sheets to preserve the proper order of the photographs. At this point, the individual sheets may be stored in passe-partout. In order to respect the artistic and historical integrity of the object, dismantling the album should be avoided as much as possible in conservation and restoration projects. For reasons of conservation, disassembly is recommended in certain cases to recondition individual elements (individual papers with photographs) and then reassemble the object as before.

In addition, the album is often packed with different materials, and those are not only in the binding. Generally there are materials that may have superimposed with time, such as paper and cardboard, fabric, dried flowers, pigments, hair, mother of pearl and metal.

As with all photographic objects, the first step is dry cleaning with soft brushes and non-abrasive rubber instruments. In case album sheets have detached, you can proceed with reassembling the sheets with the aid of Japanese paper hinges and methylcellulose glue (Tylose). Furthermore, it is important to proceed with the introduction of new interleaved sheets to protect photographic prints, eliminating, where possible, the old sheets that are not suitable.

Another frequent conservative intervention is the consolidation of pages deteriorated by usage: cleaved sheets can be re-adhered with Tylose glue. Then, the sheets should be placed, once protected by a non-woven fabric, under weight in order to ensure stable gluing. Japanese paper can be used to remedy gaps as well as in interventions with watercolors, while tears can be further strengthened with Tylose glue and Japanese paper. To strengthen the warping of the sheets, it is expected to place them under a heavy item or under pressure, after having protected adequately photographs. If possible, remove stickers or other materials added over time that may undermine the stability of the object. The distortion of paper and photographs can be improved by dampening the photographic support (vaporizing it under a ventilation hood). In case of dismemberment of the binding, the intervention can call for the detachment of the hinge and supports, restoration of the individual pages, restoring the structure of the album and replacing the reinforced plates.

Detachment of photographs is only advised in extreme cases when the deteriorating conditions of the album may be detrimental to the prints themselves. In this case, proceed with compresses, also with enzyme. This method is highly invasive and therefore is recommended only when strictly necessary for storage.

Before any intervention, draw up a restoration card that calls for an analysis of the object, identifies the damage and outlines a restoration plan. In addition to the object’s basic information (author, title, date, format), the card must identify the support’s materials.
Intervening to restore and consolidate an album requires the intervention of an expert restorer in bookbinding. For reasons of preservation, it is advisable to produce a storage box to collect the album and avoid friction or loss of any material as well as to prevent the album from opening. In this case the container must be made to the album’s measurements and be box-shaped without any clasps or glues, only folds along the edges.

The parameters of photo album conservation are the same as those adopted for the preservation of photographs: a RH around 45% in a ventilated room protected from pollution and sunlight and with a temperature not exceeding 18°C. Of course both the RH and T must remain constant. As for light exposure, it is recommended that it does not exceed 50Lux.

6. Consultation

The photo album should be consulted like all other photographic objects and that is wearing gloves and keeping the album on a shelf or better leaning on a lectern with an opening angle of about 120°. In general, however, the album is a complex object and should be handled as little as possible; therefore the binding and all pages should be digitized so they can be read without affecting the original. At the time of consultation it is a good idea to instruct the user on how to handle the object. When browsing through it, the pages of the album should never touch the pictures. One should not put anything on the pages of the album and should use a pencil when taking notes.

7. Conclusion

For any project of reorganisation, conservation and restoration of photographic albums and books containing real photographs it is essential to have a thorough knowledge of the objects, of their history, of their making and of their meaning. As we have seen, the major cause of damage for albums and books is handling: it must therefore be limited as much as possible and it must always be done strictly following the rules outlined in the part "Consultation". The main interventions to be performed on a photographic album are the following: inventorying and preparation of a proper environment for conservation; cleaning of the object; consolidation of the binding, of the pages and of the photographs inside; protection of photographs through interleaved conservation sheets; housing of the album in a conservation box to protect the binding.
Entrepreneurship and intercultural learning

Keywords
Entrepreneurial knowledge, skills and competences; entrepreneurial factors, cultural industries; ways of funding; intercultural aspects, learning; cultural dependency.

Chapter aims
It is well known that when one gets into a bookstore without seeking a specific title, the cover of a book will be the first thing that would get his attention. The cover creates the first subliminal impression of the aura of the book. Speaking in today’s language - the cover is something like a logo or marketing tool of the book.

When a potential reader or customer reaches for the book, hardly does he reflect on how the book was made: why was exactly this kind of sewing and bonding used? Why was expensive hard cover preferred to obviously cheaper paperback? Was the book manually produced, for small circulation, or by machine equipment for commercially-run editions? What is the share of the materials for the book block and cover, and the share of the bookbinding as a whole, in the retail price of the book? Was the book partially sponsored by a national corporation or has won a national competition or public procurement? Or the book was just self-financed and supported "with a little help from my friends".

What kind of social audience is the book intended for? What would its design look like if the book is translated for another national readership? How would its cover match the historical and cultural perceptions of foreign audiences without distorting the book’s original identity or author’s messages?

These are issues beyond the specific technological or production skills of bookbinders but which directly affect the economic viability of their small business. Many representatives of the BBinding target group - unemployed, recently laid-off workers, early retirees, young people - will work in small studios with 2-3 employees, as is the most common situation in Europe which will be discussed later in this chapter. But emerging bookbinders will face competition on domestic and European markets, where entrepreneurship - or how to be successful among competitors - requires wider historical, cultural, ethnological and other socio-cultural knowledge. In brief: to be professionally mobile and adaptive in a European environment, you need to have intercultural training - to know European traditions and modern trends in the bookbinding profession.

This chapter aims at introducing initial awareness of entrepreneurial environment, main factors affecting entrepreneurial development, and intercultural approach to bookbinding as an integral part of the European cultural industries.
Entrepreneurship and intercultural learning

Chapter content

The chapter briefly introduces the reader to the basic principles of the European strategy for vocational education and training (VET). Isn’t it a bit boring or unnecessary for the creative profession of book designers and binders? Firstly, BBinding project belongs to the European Lifelong Learning Programme, addressing adults’ further education and the informal, postgraduate professional qualification. Secondly, the results of the project’s development and implementation will be evaluated in comparison with those principles. Now the reader can make such an assessment, moreover, the chapter points out the primary entrepreneurial tools of the project.

Further, the chapter reviews the cultural industries and their main influencing factors with reference to an in-depth European study. The main problem is how to provide initial and ongoing funding of the business depending on market conditions. However, the start-up business requires carefully planned spending on bookbinding tools and atelier equipment, as well as proven tips for an achievable action plan.

Manufacturing experience and technology skills alone cannot provide market success in united Europe if the designer does not know the historical traditions, cultural characteristics, diversity and differences of audiences beyond his national borders. For example, the combination of materials, colors matching, ornaments, design, aesthetic impressions of the book do not carry the same added value in different European countries. That is why the chapter presents some definitions of the term intercultural, and dares to share a definitive attempt of its own. Periods of boom or limitation of cultural events follow similar movements in the economy and social attitudes to culture as seen in the brief historical review of the European bookbinding.

1. European VET principles

Entrepreneurship and intercultural aspects of BBinding project are in close compliance with the Bruges Communique on enhancement of European cooperation in vocational education and training, released after EU ministers responsible for VET met on 7 December 2010. The EU member states’ VET systems should be developed in accordance with the following common key principles:

- Attractive VET opportunities providing innovative learning methods and building appropriate labor market perspectives.
- High-quality initial VET - to lead to acquiring both key knowledge and skills, and solid professional competencies.
- Easily accessible and career-oriented for workers, unemployed, independent businesses, university post - graduates etc. which facilitates both professional development and mobility.
- Flexible VET systems approach focused on applicable achievements, learning-by-doing approaches that support informal learning and individual career development.
- Easily accessible and high-quality information, guidance and counseling throughout life, stimulating participants to make informed decisions on their learning and professional development.

2. Entrepreneurship

2.1. Entrepreneurial tools of BBinding project

BBinding project closely follows these principles in order to professionally retrain a large social group of people who could become capable of realizing their competences in key economic sectors in the European community - cultural heritage and cultural industries, whose development requires both economic viability and creative initiative.

As a basis, for mastering existing professional practices in Europe - BBinding partners with extensive, proven experience in the field thoroughly review the existing vocational courses in bookbinding and
restoration of paper works, binding and fastening of books, restoration and preservation of photos and photographic collections, so as to provide restructured, redesigned and updated version of professional binding and preservation practices.

All updated, subject-grouped and module-structured BBinding modules are online published - to ensure easy access to high quality educational facilities plus demo, communication and monitoring tools in order to secure continuous leaning and education process. The key training vehicle of BBinding project is a vast functionality Learning Management System that supports modern easy e-learning, performance and progress evaluation.

But does the sustainable acquisition of knowledge, skills and competences in bookbinding, conservation and preservation of printed media, which is the main purpose of BBinding project, ensure a successful realization in society?

Hardly is the answer unconditional or one-dimensional. Perhaps it is implicit for employees in archival sections of libraries, museums, universities and cultural institutions who are somehow, by default, corporate driven to develop their skills within the limits of the "establishment’s" resources.

However, people who change their professional career by mastering BBinding project's modules and tools, such as the unemployed, laid-offs, early retirees, managers of small workshops, young people who wish to re-adjust or "add-on" to their professional development – they must learn entrepreneurial skills in a competitive and cross-cultural environment.

2.2. Factors in cultural industries

The book is a universal medium of social value. "Packing", binding the book always has specific aesthetic, and commercial dimensions, which over centuries, and especially in the present state of world economy, are often in disparity.

From a broader EU perspective, according to an extensive survey in EU countries of the so-called cultural and creative industries /http://ec.europa.eu/culture/key-documents/entrepreneurial-dimension-of-the-cultural-and-creative-industries_en.htm/, there are several factors that influence the development of entrepreneurship in this area:

- access to funds,
- technological level of production and services,
- entrepreneurial capabilities,
- market conditions,
- regulatory framework,
- entrepreneurial competence.

The most pressing problem is how to raise funds for their initiatives, especially in the current financial meltdown in EU. Experts confirm that around 80% of production and services units in the cultural and crafts sector are self-employed or in a company team of about 1-3 employees. Their "sustainability" strongly depends on orders from corporations and institutional customers which form their target group. Traditional customers of small bookbinding workshops are higher education institutions, universities, small printing services enterprises, local galleries and museums, corporate and state administrations.

2.3. Assessment of ways of funding

Self-financing (along with support from close friends and family relatives) appears to be the main source of funds. It is very unlikely for newcomers in bookbinding sector or their colleagues in small ateliers to seek bank financing because hardly could they meet the stringent security or collateral requirements of traditional lenders, in particular - the stipulation for co-financing of available "relevant" start-up capital.
Entrepreneurship and intercultural learning

Banks operating in Eastern Europe have recently made widely public target loans for small and medium enterprises which, however, does not make the situation considerably more attractive, despite the presence of an appropriate grace period and partially alleviated interest rates. Eastern Europe is the region, as well, that has been flooded over the near past and nowadays by financial companies which massively promote fast-extended, easily-accessible loan facilities. The problem with them is not so much that the majority operate on the edge of the law, but rather that they generally offer a higher-than-average interest rates and short repayment period. These companies, however, are worth considering, a last resort lender for the start-up phase (this is true, as well, for any type of small businesses), provided that there is a thoroughly elaborated plan for allocation of the tight funds. What are the primary cost items to spend on, we shall point out further on.

As a general practice, the bookbinding sector – unlike book publishing, all the more – printing industry – is not favored by public subsidies or grants. Book binding freelancers, atelier leaders - unless attached in any joint form to a traditional culture establishment, are reluctant to spend time and efforts to bid for public procurement tenders or public grants procedures.

The report by Organization for Economic Co-operation and Development Working Party on SMEs and Entrepreneurship (2009): “Evaluation of Programmes Concerning Education for Entrepreneurship” suggests that potential entrepreneur (bookbinders of all professional levels implicitly included) should aim to:

- Acquire key (or core) skills.
- Develop personal and social skills.
- Acquire skills related to business and finance.

As for the technology and innovation issue – as an indispensable factor for the development of bookbinding entrepreneurship, the BBinding project affords a flexible LMS to teach and train bookbinders how to gradually progress in their professional and computer awareness through digitally displayed modules of all production phases.

Some studies and projects list about some dozens of entrepreneurship competences, some of them innate in an individual (energy/drive, creative will), others pretty undefined (ability to understand, assiduous conscientiousness). Most experts agree, however, that there is no consensus about the determinants of entrepreneurship, and that entrepreneurial perceptions and training programmes vary in different countries and require specific competences for each business field and management level.

2.4. Primary bookbinding tools and organization of the work space

The bookbinding process is in close relation with the workplace itself, so for new and inexperienced binders it is a necessity to have a good knowledge of it - this way they will know that for each process there are separate space and tools needed.
For majority of BBinding project target group – unemployed, laid-off workers from once large printing houses, former administrative and technical staff from closed production companies, unemployed young people, self-employed, early retirees, etc. – the main entrepreneurial start-up problem is to set up their initial work place. Here is a short description of the most necessary things to start bookbinding.

When choosing a workplace the bookbinder should keep in mind a few things - the workplace should be near a light source and not in a residential room because of all the dust and noxious fumes exuded during the crafting. For the same reasons if a workplace should be set up in a library, it would be best if it is placed away from the bookshelves, so that the other books wouldn’t be damaged during the different processes.

Here is an example scheme of a workplace with specific positioning of tables:
The following image shows the workplace of Mr Cor Knops from Foundation Restoration and Education - The Netherlands, partners in the BBinding project, as an example of a nontraditional workplace. It is clear that this room is also used as an office which may happen if there is a lack of additional space. Despite that, necessary safety measures are taken into account - the tools are positioned correctly and there are individual tables for the different processes that would take place.
In a well organized workplace, the bookbinder keeps sets of special tools, as well as common fixing tools such as scissors, awl, scalpel, knife, pliers, hammer etc. Some of their parts should answer certain requirements for being convenient enough - handles, bumpers, blades and others (shoemaker’s hammer has an oval hitting part with which it is easier to make the back of the book round). All tools must be upright and secure.

The binder’s professional tools have been tested by many generations and still today - almost unchanged - are widely employed in manual operations in many countries. They could be provisionally divided into 3 groups: cutting, auxiliary, finishing tools.

The cutting set includes knives, designed for paper cutting, cutting of lanes, milling of the backs, thinning of the edges of the leather when preparing hard covers. Other cutting tools are universal knives, coulter.

Some auxiliary and finishing tools: smoother, crease lines, hatches, roller, fillets etc.

Several special binding devices are used when sewing, pressing, restoration of the sheets of the booklet, manual preparation of hard covers. Those tools are not produced industrially, but instructions for their construction and handling are well-described in the professional manuals.
Different types of presses are necessary for bookbinding operations such as grooves cutting, treatment of front and back covers, pressing.

Bookbinding boards are also a must so that the binder can work properly. The table has to be stable, sturdy and massive, so as to support the weight of lots of books, boards, materials, tools and gadgets. The table should be 10-12 cm higher than the average ones because the main bookbinding operations have to be performed in an upright position. The stool should also be conveniently high - usually 10 - 15 cm higher than the standard one. The table may be equipped with a shelf where knives, awls, scissors and other cutting and spiny tools could be safely stored. The metering devices have to be stored separately.

Special attention must be paid to the safety handling of the tools. A blunt knife requires greater working efforts, and poses a potential injury when movement is uncontrolled. The awls, knives, rasp and hammers should be provided with tight, firmly fixed and well-shaped handles.

This very frugal "toolkit" is appropriate for manual bookbinding at home or in small libraries while current professional bookbinding workshops require special machine equipment and tools.

2.5. Some tips from experts

"Your book is more than an end in itself: it’s about you or your organization" is the advice of the contributors to the very useful edition for book manufacturers "How to Design and Produce Your Own Book", an Indie Publishing guide for authors, artists, and designers. Along with examples of how to economically produce books of poetry and fiction, picture books, artist’s portfolios, catalogues, the guide provides commentaries on how to create intriguing book covers, and presents some practical tips to prevent unexpected problems and unpleasant effects.

The authors suggest that if a designer or bookbinder is new to the business they should keep their ideas as simple as possible and look closely at other books for inspiration. By contemplating the future book on the bases of their impressions on what has been produced so far they are more likely to avoid failures and are closer to design a product that seems classic, salient and attractive to readers or users.

All ideas about what impression and style grabs your attention should be written down and comparatively analyzed. Are you going to stick to a formal classic design or you would prefer a more inventive and challenging approach? Who is the book’s audience – friends, relatives, kids, professional groups, exhibition attendants, educational institutions, etc.?

Usually, there is a designer who is responsible for the final look of the book but not for the binding process. However, in small ateliers, the bookbinders are also designers and they need to have the proper abilities and visual taste to show a good final result before the actual work had begun.

Research carefully all other books that appear similar to your project. Prioritize all pros and cons: which ones are feasible for you to produce, which seem ridiculous. If your skills are poor, the book mentioned advises, try to seek help from professional designers, artists or photographers. Show how your project looks to others and evaluate their feedback. Remember that trial and error will make you confident.

There is more to be gained from speaking to your community instead of employing advertising tricks. Try to find out your specific trick that will catch your audience. Always stick to your budget when deciding how many copies you will produce. Keep in mind that very few book designers and binders make serious money from their profession.

All these tips seem pretty easy to implement, don’t they?
3. Intercultural aspects/learning

Intercultural learning is an important aspect related to any field of work and life, especially crafts such as bookbinding, making hand-made paper etc. Project partners have decided to include such a topic in the project because very often the bookbinder needs a lot of knowledge about the different styles of different bindings, which are related to the different historic periods, countries, cultures etc. where the bindings were initially made or the books were written and published. Thus, usually a binder needs some awareness about the fact that before embarking on the task of binding a book, he/she should first research and analyze the cultural aspects of the book which should be also reflected in the binding – the author, the topic, the culture behind it, the era and alike.

3.1. A definition attempt

Intercultural as a term is far more prolix with meaningful differences than the term entrepreneurship. That is why intercultural learning and intercultural competences are most often defined with the help of quotes by well-known academic experts, as well as references to various studies.

When relying on a common sense approach (though, lavishly criticized), then "Intercultural learning is the process of becoming more aware of one’s own culture and other cultures around the world". Its aim is to acquire knowledge, skills and competences to communicate with, and tolerate people with different, even conflicting with yours, norms, values, behaviour, language, etc. while preserving the identity of each national culture.

The international book fairs are an intriguing example of intercultural development. Statistic data emerging on these forums show the strong correlation between culture and the level of economic development. Frankfurter Buchmesse, 2012 (http://book-fair.com/images/fbm/dokumente-ua-pdfs/2013/buchmarkt_deutschland_2012_englisch.pdf_37213.pdf) provides interesting information about the book market in Germany – the engine of EU.

3.2. Social ranking of books

Books rank 11th in the German’s leisure activities, Internet being 7th, magazines occupy 10th. Which are the leading cultural favourites? "Watching television, meeting friends, spending time with children or grandchildren, listening to music, reading newspapers and going out to eat are all more popular than reading (positions 1 to 6 respectively). Likewise, driving a car comes in above reading, at ninth."

Most likely, such is the classification of cultural preferences in other leading EU countries which have comparable economic indexes.

The German statistics notes that reading is highly correlated with advanced school education and higher-income groups. School pupils and students are, naturally, the most active readers. People with larger residential place (possibly with higher earnings) tend to be more active on the book market than others.

Which social group purchases e-books the most? Again, middle-aged high earners, full-time employed and residents of larger cities.

It is no surprise that cultural activities are strongly dependent on the direct consequences of the economic level. Chinese book publishers have been among the most important licensing partners of the leading EU states over the recent years. This is an intercultural trend, no doubt, but among leading economies. So, the threats to the current state of global development are endangering cultural exchange as well.

The world leaders’ summit in January 2014 in Davos pointed out (otherwise acutely apparent) the risks for our near future - the worsening wealth gap posing the biggest risk to the world. "The chronic gap between the incomes of the richest and poorest citizens is seen as the risk that is most likely
Entrepreneurship and intercultural learning

Other threatening risks according to the world leaders we see in our everyday life: the unemployment, fiscal crisis, reduced employment opportunities for the youth, rising cost of education. (That is why the European VET programs or recently named "the dual-by-practice-education" is very important for adjusting the workforce’s skills and competences to the labor market mobility).

On this gloomy global background hardly would any global leader tackle intercultural risks. No wonder then that there are increasing signs among the leading EU countries to debate one of the foundations of the European Union – free movement of people.

At the same time there are encouraging signals for intercultural events even in the present crisis. Let’s take for example the successful publications of "Best European Fiction" - literary series, which comes out every year since 2010. It was initiated by Aleksandar Hemon – a Croatian born author based in Chicago. This anthology is readily reviewed by many respectful European media and makes a serious impact in the US where three to five percent of literary works are translations. It is worth exploring the broad picture of cultural differences in the comments and reviews by the US readers, from one side, and European ones, from the other. Here is the ultimate conclusion of Hemon as an entrepreneur and intercultural promoter:

"No country in Europe can be understood outside its relations with other European countries, no culture in Europe can be comprehended outside its interactions with other cultures...This has, I believe, always been the case, but the simultaneous process of fragmentation, interaction, and integration have certainly been intensified with the formation of the European Union... European literatures have found themselves stretched between the reductive demands of national culture (the culture that is for us, by us, whoever we may be) and the transformative possibilities of transnational culture that can exist only in the constant flow of identity and exchange in meaning*.

3.3. Book binding – a glimpse in European history

On a more limited section, with regard to economy, Intercultural learning should instill incentive and paths about how to make goods and services attractive to customers beyond traditional geographic and market territory, and socio-linguistic groups.

If you search the web for the word "intercultural", you would come across hundreds of book titles, addressing wide-ranging cultural issues, stressing the positive contributions that can be realized when intercultural awareness is incorporated into the training of various professions.

In the web, you will find many companies that offer training courses and equipment for manual craft binding of books, made by historically proven technologies and design. That is how the entrepreneurial approach (enticed by market demand) to bookbinding business, combines the historical value of the product with its intercultural identity, since the Internet is undoubtedly the most influential multi- and intercultural environment in modern society.

Bookbinding has always followed the aesthetic preferences and cultural competencies of historical eras. Although intercultural communication and training is a priority in the development of the EU countries, intercultural exchange in crafts skills has long historical roots.

Towards the first half of the seventeenth century, bookbinding rapidly degenerated in France and little was left of its former artistic value. The taste for inlaid bindings continued during the greater part of the eighteenth century. Those stamped with the name of Monnier have been especially sought after by modern collectors - these bindings are executed with extraordinary accomplishment, but they seem more likely to form a boudoir, rather than a library.
With the French Revolution, fine binding, like every other fine art, was brought to an abrupt end and the traditions of good workmanship faded off. Some bookbinding works from the French bookbinding school, founded over the post Revolution period, may be seen in the British Museum. It is attributed to Goethe’s remark that "productions are now possible which, without being bad, have no value".

The Italian bindings at the end of the 15th and the beginning of the 16th centuries significantly differ from the stamped bindings of Germany and England in which the ornament, presenting figures, symbols and scenes, was invented for its own sake. In the Italian bindings, on the contrary, a few simple elements are combined and arranged in repetition, to produce a certain total impression, to which the details of the ornament are always subservient.

Towards the end of the sixteenth century, Italian bookbinding, along with other decorative arts, deteriorated significantly but still retained some of its artistic value and style.

The ups and downs in the development of European bookbinding over the 20th century are thoroughly presented in the inspiring and artistic monograph of Roy Harley Lewis "Fine Bookbinding In the Twentieth Century", Arco Publishing, New York, 1984.

This historic glimpse illustrates the importance of binding books in the historical cultural relations in Europe.

The BBinding partners are firmly convinced to pay special attention to cultural identity and historic characteristics of old books to be restored while displaying different technologies in the pilot bookbinding centers.

4. Conclusion

Bookbinding project aims at providing entrepreneurial skills and intercultural learning potential in compliance with EU strategic frame for VET development.

Entrepreneurship in bookbinding is dependent on the overall conditions in EU cultural industries: access to public funds and other financial facilities, level of technologies, market requirements, entrepreneurial competences.

Intercultural learning, knowledge and competences are still widely divergent in the interpretations by academic authors and in the educational and VET programs in different European countries. The aim of the intercultural learning is to help students understand, communicate with, and incorporate other peoples’ cultural values in their national culture, while preserving the identity of each. Intercultural exchange, as a whole, is strongly dependent on the level and trends of the economic development. The current global crisis and political clashes decrease the magnitude of intercultural understanding as it was similar over some periods in the European history. Book binding, as an indispensable element of the cultural industry, has always reflected, followed and expressed these cultural trends.

Intercultural learning – in the EU context – is to acquire knowledge and skills to make products and services attractive to customers from different geographic and market areas, and of globalizing cultural socium.
-learning approaches to bookbinding and paper preservation

Keywords
Web, internet, advantages and disadvantages of information from the internet, LMS, Moodle, online training modules

Chapter aims
The chapter on e-learning aims to clarify what can be learned from the net and what cannot. For both bookbinding and conservation a profound understanding of the material in question is needed. There are many valuable contributions on the web to learn more about historical and recent paper production and how parchment and leather is made. The chapter will explain the advantages of the e-learning but especially in the case of conservation – the problems and dangers which can occur and thus aims also to open the eyes of the readers for these hazardous situations. Finally, the chapter aims to emphasize on the benefits of e-learning by presenting one of the main project products – online training modules for e-learning, available in a learning management system.

Chapter content
The chapter shows to the user the advantages and disadvantages of learning from information provided by the internet. It is separated into two main topics, the book binding section and the preventive conservation section. In the latter important definitions as well as addresses where further help can be found are given. Finally, the Moodle LMS where training modules in the frame of the project is presented – registration and options are described for the users.

1. Possibilities e-learning provides

E-learning bridges a lot of problems, which are especially relevant in our days. The users can find information whenever really ready to take it. This is different with different individuals. There are people who can learn well in the morning, others do better in the evening. People who have certain obligations, like looking after children etc. can schedule the learning time according to their wishes etc. But there are also disadvantages, which will also be described in the following chapters.
1.1. Independent in time and place - world wide access to information
It is only a lifetime ago, that learning, namely learning a skill which is done by hand, was definitely connected with travelling of the student. People had to come to a teacher, had to ask him/her if he/she would take them as pupils and had to keep to a regular timetable for learning. This system excluded many people from learning. It, on the other hand, had the advantage, that the teacher could support the student individually and show more, in case it turned out that the student was gifted. Or the teacher could alter the offers in case he saw a special strength in the student. In e-learning this quality is substituted by another quality, which is access to the learning no matter where the student is and when he/she wants to learn. People who have obligations during the day can learn at night, people who live in remote places where no buses or trains go can also access the information. This is a great chance. The fact that there are films in the internet makes it possible that also complex movements can be understood. However, it also depends on the quality of the film whether or not it is really understandable.

1.2. Democratic learning
The world wide access brings with itself a general democratization of knowledge. The web allows anyone, who got a new idea to exhibit it and discuss it with others. This means that the development should be fostered. One should carefully choose which sources to use because sometimes there are web pages, which are of bad quality, even if they are well-meant.

1.3. The ability to evaluate information on the Internet
The biggest problem in this case is that the web rarely is critically edited. There are hundreds of films and other pages in which, for example, book binding and book conservation are used as synonyms, which is wrong. Even heads of libraries step in front of the camera and state: they would have installed a book bindery now for conservation of books. Book binding is binding a book, this is an artistic procedure. It is art and craft at the same time. Conservation is a university field and neither art nor craft. It is based on conservation theory and not on a long tradition as any craft. That is why it is important that any person who tries to learn about bookbinding or paper preservation on the net, is aware how to evaluate the information found – if it can be beneficial to his/her purpose, if it has quality etc. Here are some clues on how to distinguish the quality information from the "rubbish": looking for references, checking who the author is, mind the language and tone of the text, the date it has been published, whether or not it was updated recently etc. However, at the end it is like in a book shop, we do not know all authors and we sometimes find material suitable just for our needs, while for another reader it is not appropriate. Only in case of conservation, this is a real problem and the reader should stick to the webpages by the big organizations given in 3.3.

2. E-learning in the field of bookbinding
There are many films on book binding in the Internet. Especially beautiful is a non-verbal series in black and white which shows the steps very carefully and in detail. But there are more "fancy" contributions too. As websites are short-living it makes more sense to encourage the reader to make his/her own search. Important is to find the proper key terms, but this is the same case when you look for special books in a library. Book binding would be one term, but you can also search for phrases like "how to make a book" or a more sophisticated way would be to enter the name of the type of binding, for example "Coptic".

2.1. The use of e-learning in bookbinding
It must be stressed that no one will become a professional bookbinder from watching web films on bookbinding. Bookbinding is a beautiful craft and needs many years of intense work to become a professional. However unlike in conservation, nothing can be made wrong if you try cut and play around with first book binding ideas. The information in chapter 1 is a good basis to judge the quality and value of web contributions.
2.2. Inspiration
The web is a great source of inspiration. Not only on how to make a book technically and how to design it, but also on how to apply the new knowledge and skills you might have won. There are numerous ways to use the new knowledge. Not only that you can make nice gifts or bind books for your own use. Manual work is a good therapy for whoever needs it, independent of age. But inspiration can also be in how to use the material, what material is used and in combination of colours and shapes. There are directly pictures available or you may find information on upcoming exhibitions of historical or contemporary books.

2.3. Connection and communities
One of the strong sides of the Internet is the possibility to form communities. It is very nice to meet people who have the same interests as you have. You can exchange ideas and experience, you can even form real groups in case you find people close to you. But the disadvantage is that sometimes people spend too much time in front of the computer. However, in bookbinding the risk to stay in front of the computer is not so big, as new books must be made.

3. E-learning in the field of preventive conservation
Although the book includes the term "conservation" any action of laymen should be restricted to preventive conservation. It is a long time still until the definitions by E.C.C.O. will have found their way to all places in Europe. The saddest fact is, that conservator - restorers are sometimes not eloquent enough to clarify these things. But there are clear distinctions.

3.1. Preventive conservation
"Preventive conservation consists of indirect action to retard deterioration and prevent damage by creating conditions optimal for the preservation of cultural heritage as far as is compatible with its social use. Preventive conservation also encompasses correct handling, transport, use, storage and display. It may also involve issues of the production of facsimiles for the purpose of preserving the original.
Conservation consists mainly of direct action carried out on cultural heritage with the aim of stabilising condition and retarding further deterioration.
Restoration consists of direct action carried out on damaged or deteriorated cultural heritage with the aim of facilitating its perception, appreciation and understanding, while respecting as far as possible its aesthetic, historic and physical properties. E.C.C.O. professional guidelines

These definitions are valuable explanations of the tasks of the conservators. In this book we are giving first understanding of preventive conservation. "Playing around" with cultural heritage is strictly forbidden. Only small mistakes can lead to extreme disaster and loss of valuable cultural heritage. This is the reason why a person, who is not a trained conservator should restrict activities to basic aid and ask a professional conservator into the team as early as possible. Best would be if any historical library, archive or collection of books would have its conservator.

However, anyone can take precaution measures, such as:

- Making first aid plans (in case of emergency)
- Survey the building where the collection is stored and in case he/she has the impression that the rooms are not good consult a conservator
- Introduce meaningful user regulations
- Try to understand more about the material and aging procedures.
3.2. Training for conservators

In Europe conservation-restoration is taught at university level. Outside Europe there are other agreements. It is a minimum study of 5 years and an MA or Magister degree.

Fig. 1: Erasmus students in conservation-restoration

Lately also doctorate studies are offered, however, not in all countries of the EU so far. The main reason for this is, that conservation-restoration is a work which involves a lot of responsibility for the cultural heritage. This responsibility includes that the conservator-restorer keeps updated on latest knowledge and contributes his/her own thoughts. To be able to do so he/she needs a profound education on conservation theory and conservation philosophy as well as ethics, aesthetics and technical knowledge on both material and methods of the heritage and the conservation. ENCoRE is the umbrella organization of universities with conservation-restoration training.

3.3. Help for non-conservators

In case there is the need to have help we would like to provide you with high quality web pages of official bodies and umbrella institutions responsible for the preservation of the cultural heritage:

http://www.ecco-eu.org/ - European Confederation of Conservator-Restorers’ Organisations
http://www.icccrom.org/ - International Centre for the Study of the Preservation and Restoration of Cultural Property
http://icom.museum/ - International Council of Museums
http://www.icom-cc.org/ - International Council of Museums - Committee for Conservation
http://iiconservation.org/ - International Institute for Conservation of Historic and Artistic Works
http://www.unescobkk.org/404 - United Nations Educational, Scientific and Cultural Organizations
http://iada-home.org/ - Internationale Arbeitsgemeinschaft für Archiv-, Bibliothek- und Graphikrestauratoren
http://www.icom.org/ - International Council on Archives
http://www.ifla.org/ - The International Federation of Library Associations and Institutions

In case the link is not active any more you can enter the mane of the organisation into a search engine and find the site. Most of the webpages are multilingual, you find specialists who know how to treat the heritage or who can provide you with further addresses, often close to your place. These experts have access to the latest research results.

There are also some links, which lead to university lectures or scientific articles on conservation of library and archival material.

You can find professional help by the universities and research centres listed as members of ENCoRE under http://www.encore-edu.org/contact.html. ENCoRE brings together all universities in Europe, where conservation-restoration is taught – do not hesitate to address them in need.

Finally, there are web pages which provide mail addresses and information on conferences where
more information is available in case of concrete questions. A very good web site for helping anyone who is responsible for the safe guarding and preventive conservation of cultural heritage made of parchment and paper would be http://www.forum-bestandserhaltung.de/
For risk assessment please see http://www.iso.org/iso/home/standards/iso31000.htm

A good book is PAS 197 Code of practice for cultural collections management.

There are also numerous good films on fire prevention. Not all of them are dealing with libraries, but you can look for first aid in hotels, much which is said there can be adapted for libraries and archives when it comes to readers and first aid for them.

4. LMS with online training modules in the frame of BBinding project

The learning management system used in the BBinding project is called Moodle LMS. This is the most popular and widely used open-source learning management system in the world. It has numerous standard features such as possibility to upload all kinds of multimedia files, video, audio, PDFs, etc. There are an event calendar, different discussion forums, quiz engine and loads of imported languages to choose from.

Also, it is a really customizable system - there are dozens of themes to choose from and users may create their own themes, according to their needs. There are a lot of customizable features such as new user roles, content rating, survey and so on.

All those features are just a few of the possibilities of the learning management system offers. A learning management system such as Moodle is a really convenient way to present a lot of text and visual information - black and white or colour images, interactive videos or audio materials. A LMS provides the possibility to organize different groups of student accounts into large groups with teachers for different classes or courses available. That fact makes the communication between users easier and provides a variety of ways to present learning information - teachers may organize learning paths with specific steps for students to take, students may evaluate how their teachers present the information. All courses students have enrolled in are quickly visible in their profiles and each student may receive an individual task.

Another advantage of the LMS is that students may read only specific and selected information, it is not necessary for them to go through topic by topic. Also, the LMS with the provided learning information and quizzes is a convenient way for self-assessment.

Moodle LMS can be accessed by entering the BBinding project website at http://bbinding.org and then choosing "Training modules" from the main menu on the left. Any new user should create an account and after that, he or she may login into the LMS itself. The learning management system is available online, it is open and physical distance does not matter - you may enter the system from all around the world.

When logged in, on the left side is the "Courses" section. By entering it, all courses available are visible. However, users can't enter any course without being enrolled in. Currently, there are five courses with identical structure, one for each of the project languages - English, Bulgarian, Dutch, German and Italian.

An administrator or a teacher should enrol the user in a course with a specific role - be it a student, a teacher, a course creator, etc. For those who need to enrol a user, this is how it is done - enter your desired course. On the right side of the screen, under the "Course Administration" field click on "Users" and then "Enrolled users".
You now see a list with enrolled users and their respective roles. (Fig. 2).

Fig. 2: A list with enrolled users in the BBinding - English course

Now click on the button "Enrol users" and from the list available, choose the user or users you want to enrol (by clicking the "Enrol" button next to their names). After you are done, click the "Finish enrolling users" button. If you would like to add a specific role to a user, you may do this by clicking the "+" sign under the "Roles" field for each user respectively.

After enrollment, users can see the information in the course. Each course consists of 8 modules with different titles, sharing the same structure. The structure elements are as follows: Keywords, Learning Objectives, Introduction, The actual content (here the information structure may vary but it is usually structured in "Books" which have different "Chapters"), Conclusion, Glossary, References and Self-assessment test.

Fig. 3: The structure of a module
Students have limited rights regarding courses - they may see and read the information without changing anything. Teachers or course creators have the right to change the structure and the information of a course or a module.

Teachers and course creators have the right to add new information. This can happen only after they are logged in. When a teacher enters a course, on the top right of the screen there is a button called "Turn edition on" (see Fig. 3) - by clicking that button you are now in "Editing" mode. This way it is possible to edit titles of modules and chapters, change different parameters or add new activities and resources.

For example, to edit a title of the module, click on the "Gear" icon below the title and you would enter in the screen where you can edit the title (see Fig. 5).

It is necessary to uncheck the box that says "Use default section name" and only then you can enter the desired title. After it is done, you need to press the "Save changes" button below and the new title is saved.
All options for interaction with the added resources are provided by graphic icons with their respective titles which will appear when you hover with the mouse over them (e.g. the "Eye" icon lets you to Show/Hide different resources or even a whole module).

To add a new activity or resource, click on the "Add activity or resource button". A list will appear (see Fig. 6). By clicking on the choices on the left, short description for each resource will appear on the right. We have already explained what a module structure should be (see Fig. 3), so each of the necessary resources are easily accessed and added from here. When you have chosen an element, simply click the "Add" button.

Fig. 6: A list with activities and resources

After pressing the "Add" button you are now automatically sent to the resource itself, so you can edit it according to your preferences.

As in some of the resources there are dozens of options available for you to adjust, it may seem difficult at the beginning - actually all you need to fill are the fields, marked with asterisk (*) and red colour - the rest of the options are to be adjusted according to specific needs (or not to be adjusted at all) and you may receive more information about each option by clicking with your mouse on the question mark next to it.

5. Conclusion

To sum up, e-learning in the field of bookbinding and paper preservation includes mostly professional web sites offering some advice as well as a lot of videos, showing how you could bind a book, for example. In this chapter we have tried to show the readers what are the benefits of e-learning in the fields in question and what online materials are actually available on those topics. However, when mentioning e-learning in no matter what field, it is also important to show people how they could best evaluate the information they have found. Last but not least, we have included information about the e-learning materials developed as an innovation in this project – namely the learning management system with training modules.

It is again important to note that in case you want to try and bind a book by yourself you could try it. The web pages give further information for those who want to learn more about bookbinding and the different materials. As to preventive conservation it is necessary to consult conservators in case you are responsible for a collection of historical books. National libraries, state archives and the respective faculties in universities often have good knowledge of how to do this and can be of help as well.
Computer-aided design (CAD) of bookbindings

Keywords
CAD, book design elements, WebGL, 3D model

Chapter aims
The aim of this chapter is to present current practices and the developed tools for bookbinders. Also, the chapter shows how the concrete developed tool in the frame of the BBinding project works.

Chapter content
The chapter describes the structure of a book, its main design elements and CAD approaches in bookbinding design. The chapter gives knowledge about developed CAD systems, technologies and their pros and cons, as well as an in-depth explanation about the developed online tool for bookbinders.

1. Introduction

Bookbinding has many centuries of traditions. Starting with simple binding methods of the early codices, then the elaborated handmade bindings of the Renaissance and proposing the varieties of handmade styles in the era of the industrial revolution in the end of the 19th and the beginning of the 20th century. The fast development of automatic, factory-based binding technologies of the second half of 20th century has completely changed the shape of the binding industry. A lot of bookbinding workshops have been closed. But, there is one positive tendency - last few years, a lot of new workshops were opened because of the need of handmade binding. This need is determined mainly by two issues: need of artistic bindings and need of binding for some old books and documents in private and public collections. Most of the existing training materials are outdated, very old-fashioned and mostly in the form of textbooks. The current module tries to fill in this gap proposing one innovative bookbinding design tool. The current text will show how modern CAD approaches could be used in nowadays bookbinding workshops. Via appropriate 3D model of the book and possibilities to change the book elements, the bookbinders could experiment and show their clients how the book would look and agree on its design. Also, the online presence of the CAD tool gives unlimited possibilities for distant work and communications concerning the bookbinding design.
2. Book elements

Every single book has elements that are known as important. There are two types of book elements - inner and outer.

The outer elements are the front and back covers, the spine and the headband.

Covers
There are front and back covers. They can be hard and soft. The soft covers are usually made from paper and are the same size as the body. The hard covers are more expensive but they could save the book from damage or wearing out.

Spine
This is the back part of the covers where the bookblock (the body) is attached. It is what is seen when the books are on the bookcase.

Headband
This is the narrow cloth band between the spine and the body. It is used only in books with hard covers. Its colour can differ from the colour of the covers. In hand-sewn books it is functional and adds strength, while in machine-bound books it is decorative.

Angles
The angles are used for decorative purposes mostly. They are small and consist of four elements on the back and front covers, which are placed on the outer corners of the covers.

Locker
The locker is used for safety and decoration purposes. It is placed on both covers and when it’s locked, it could prevent the book from unwanted readers. It could be metal or plastic and it is locked using a key.

The inner elements are the flyleaf and the bookblock, where the bookblock is practically everything between the covers.

Flyleaf
The flyleaf is partly an outer and partly an inner element. It appears only in books with hard covers. The paper from which the flyleaf is made must be stronger and more flexible than the one that is used for the body. The flyleaf could be empty but it could be painted or imprinted with text, too.

Body (pages)
The body consists of all the pages in the book. The paper from which the pages are made of could be linen, wooden and cotton.

You can view all the parts at the next two figures of books.
3. Online technologies for 3D models

Computer-aided design and 3D modelling are not new issues, but online manipulation of 3D objects is a new phenomenon. In the recent past, the low speed of the Internet connection in combination with some constraints of the Internet browsers’ tools have been a barrier to the production of online CAD tools. Even nowadays, there are not many existing online 3D CAD tools.

3.1. Examples of existing CAD tools

3DTin
This is a free online CAD tool, perfect for beginners. It is developed to offer free and multi-browser experience. The technology used for the tool is WebGL. The 3D models in the tool are stored in a cloud so you can access them from anywhere. Also, the object can be exported to multiple file formats so you can edit it with other 3D modelling tools.

Tinkercad
This is an easy-to-use CAD tool for creating digital designs, which are ready to be printed into physical objects. The users are guided through the modelling by means of lessons, which teach the basics before moving on to more complex scenarios. The tool is developed again with WebGL and runs perfectly on Google Chrome 10 or more and Mozilla Firefox 4 or more. The oldest possible operating system required for the tool is Windows Vista or Apple OS X 10.6.

3.2. Bookbinding tool 3D model technology

There is still no available CAD tool for bookbinding so BBinding is the first project working in that direction. As seen above, all of the big CAD tools are developed using WebGL, so that is the technology that is used in that project as well.

The other main technologies that were considered for using were Adobe Flash Player and Microsoft Silverlight. After some deep researching and several tryouts using each of the technologies BBinding project went on to use WebGL.

WebGL
WebGL allows for the development of 3D objects right inside the browser - something that was considered impossible not long ago. Even more - those 3D objects, using WebGL, could be moved around the screen, could be covered with textures or colors. We used WebGL to create our 3D book and display it in most of the browsers.

Here are some more technical details about WebGL. WebGL (Web Graphics Library) is a JavaScript API for rendering interactive 3D graphics and 2D graphics within any compatible web browser without the use of plug-ins.

It is based on OpenGL technology. It uses the HTML5 Canvas element to display 3D models and therefore it requires using newer browsers and newer operating systems. It is supported by most of Firefox and Google Chrome versions, by Safari 6.0 and newer, Opera 11 and newer. It is implemented in Internet Explorer 11, while on the older versions of IE you can use third party plug-ins for running WebGL. It is supported by the major mobile browsers for smartphones as well.

Why WebGL?
It is believed that WebGL will become the standard to display 3D content online in the browser. Also, working on a technology natively understandable by the browser is the only way to be working on a scalable product. Plugin-based solutions, beyond the drawback of requiring installation, have to be developed for each browser, each operating system, each platform, each device while working with WebGL allows you to provide in-browser support for more than 20 native 3D formats, and on almost 60% of the browsers.
4. Overview of the bookbinding tool

4.1. Registration and basic features
Everyone can access the bookbinding design-assisting tool through the project web site (www.bbinding.org), *Bookbinding tool menu. Both the website and the tool are translated in five different languages, English, Bulgarian, German, Italian and Dutch. As for the tool, you could switch to any of them in the login page, before you proceed any further.

Every user has to register first in order to have the rights to create, edit and sew books with the tool. There is an option to recover your lost password which is sent to your registered e-mail. When you login using your unique username and password, you have several options - you can bind your book, you can explore your own uploaded textures and delete some of them or change their privacy status (they can be public or private). Also, you can change your password and view your profile information in the settings menu.

When you proceed to the bookbinding page, you have a lot of options, related to binding your 3D model of a book. The principle of changing something on the book elements on the 3D model is one of applying different textures over it. For example, if you want to change the colour or material of which the spine is made, you have to go to the *spine* menu on the right of the screen and then choose a colour or a texture etc. The same principle is valid for the other book elements as well. At the moment there are some pre-uploaded textures for each element. One can either choose one of them or upload their own textures. The textures have to be the exact size of 512x512 pixels in order for their successful upload. You can save or load already created models which are and will be stored on the server so you can have access to them wherever you are. If you are a bookbinder and you wish to show a client in another city how his/her binding would look, you can simply send a link of the 3D model you created. Respectively the client can also send you the design for you to see.

You can also change the proportions (width:height) of the book so they could be 1:1, 4:3, 3:4 and other. You can return to the previous page to review your uploaded textures and if you try to return and had forgotten to save your model, you will be asked whether you want to save it for later use or not.

4.2. The 3D book model
There are three models of the book. The first model is a book with closed covers, the second one is a book with open covers and the third is the book body only. The difference between the open and closed book models is that in the model with open covers the flyleaf is visible and can be edited. There is also an option to change the proportions of the book. The 3D book can be rotated vertically and horizontally, zoomed in or zoomed out.

The basic elements of the book are: front cover, back cover, spine, flyleaf, body (pages) and angles at the corners of the front and back covers.

**Covers**
There are a couple of options which can be applied to the front and back covers. The cover color could be changed using the color picker. Also there are many implemented textures which can be used. There is a section where the user can upload and use his/her own textures.

**Spine**
In the first model the spine size (the part of the spine which lays on the front and back covers) can be changed using the scroll bar in the *spine* menu. There are also many textures and an option for uploading new textures. The spine color can be changed using the color picker from the *spine* menu.
Flyleaf
In the "flyleaf" menu there are two buttons: "Front" and "Back". These buttons are respectively for the front and back flyleaves. Changes to the front and back flyleaf will be applied only if you check these respective buttons. The flyleaf texture can be solid color (chosen from the color picker) or image texture. The front flyleaf can be different from the back.

Body
The body consists of all the pages of one book. The texture can be changed from "body" picture gallery.

Angles
They are at the corners of the covers and are mainly for decoration purposes. Their size can be changed from the scroll bar in "angles" menu. Also, there are several different textures and the binder can upload his/her own.

Text and ornaments
This menu enables the binder to put images (with some text or some ornament) onto the texture already chosen (on covers, the spine or the flyleaf textures). For example, if you have already applied leather brown texture on the front and back covers, but you want to put the title of the book on the front leather cover you can upload an image with the title and apply it on the already chosen leather texture.

Locker
The locker is an optional element. It can be chosen from the "lockers" menu. There are different textures for the lockers which are in "locker" picture gallery. Besides, you can always upload pictures of other lockers of your own choosing.

Headband
The headband is also an optional element and it can be chosen from "headband menu". Also, there are many textures which can be applied.

4.3. Bookbinding tool design

1 - Canvas/3D Object
2 - Textures/Images
3 - Gallery
4 - Menu

This image explains the BBinding tool main structure.

The biggest element (1) is the Canvas where the 3D object of the book is displayed. Every change that the user makes is displayed in real time immediately onto the 3D object.

The second element (2) is where the textures and images menu is displayed. The binder can select type of material, texture or color to apply to the book.

In the third element (3), the gallery, all the textures and images from the database are displayed. Every user can upload his/her own textures, ready to be placed on the book.

The fourth element of the interface (4) is the menu from which the user can select the different book elements which he/she can then edit and apply textures on. There are currently nine different selectable and editable elements.
This is how the interface of the website and the tool looks like for real. You can easily see the different parts of the structure.

4.4. Model examples
Below are some models, created, sewn and textured using the tool.

The first one is a new book, sewn with paper covers, which were first designed with another program and then uploaded to the tool as images of textures.

The next two are old books with leather covers and expensive golden ornaments. The first one is made with older paper.
The next image shows a book which was created using textures of pictures of real book so you can see that the tool could be used for real life purposes.

The final image represents the possibility to view the flyleaf of the book and change its texture or color.

5. Conclusion

The computer-aided design techniques give new possibilities to plan the design of the book in a very flexible way and from a distance. The client’s needs could be respected and the final product design could be clarified in a more precise way. Also, the CAD tools could support both binders and users to experiment and to imagine the final result before starting to manipulate the book and in this way avoiding some misunderstanding.
Green approaches in paper production

Keywords
environmentally-friendly, green printing, recycle, post-consumer waste recycled content, handmade paper, artistic objects

Chapter aims
The main aim of this chapter is to raise awareness on how all people involved in the book design, binding and printing business can have their share in helping the environment by using different green approaches in printing, making and working with paper.

Chapter content
The chapter outlines the main approaches that can be used in preserving the environment when it comes to paper production and usage. It starts with a short introduction and background to the topic and continues with concrete issues related to green printing, making your own paper and using recycled paper or old paper materials for making various artistic objects. The chapter ends with a note about green approaches in using paper for photography.

Nowadays, paper is used not only for work and books printing but also to make all kinds of notebooks, cards, journals and artistic objects. Millions of tons of paper are being produced and used every day around the world which poses significant environmental questions. Paper is being mainly produced from mature pulp wood which leads to increasing deforestation, which consequently leads to additional environmental challenges. All the negative consequences to the environment, caused by the mass paper-production industry are known by the term "paper pollution" and are considered one of the main environmental challenges for society nowadays. Taking this into consideration we should also point out some positive tendencies that gradually came up as a response to paper pollution, such as green printing, production of hand-made paper for personal use or for making artistic objects, recycling paper, growing popularity of certain small businesses that make and sell objects made from recycled paper and alike. Here we would like to add to this positive tendency and raise further awareness by describing some green approaches in making paper.

1. Green printing

Paper production involves the use of not only wood, but also a lot of other natural resources including energy and water. Additionally, different solutions that are harmful to the environment, such as inks, acids or dyes, are used in printing. Here comes the role of green printing which provides different options for reducing the harmful effects of mass paper production and printing.
1.1. Post-consumer waste recycled papers
One very "green" option for paper production is making paper from as much post-consumer waste (PCW) recycled content as possible. The PCW is paper collected by recycling programmes or paper already used after printing. Using PCW recycled content for making paper decreases the use of wood and other natural resources and thus helps the environment. Paper can contain different amounts of PCW recycled content where 100% PCW recycled content is the most environmentally-friendly choice but one can also choose 50% or 30% as well. The advantages of using paper made of PCW recycled content include not only the use of less natural resources but also some specifics related to the manufacturing process: e.g. fewer solid waste and greenhouse gases during production.

1.2. FSC-certified papers
Another possible "green" solution is using paper that has been FSC-certified. FSC stands for Forest Stewardship Council which aims to "promote environmentally appropriate, socially beneficial, and economically viable management of the world’s forests" (https://ic.fsc.org). The organization has identified ten principles, supported by respective criteria, which are valid worldwide and should be all "applied in any forest management unit before it can receive FSC certification". Thus, consumers can be more responsible by using FSC-certified papers (always explicitly branded by FSC’s logo) instead of normal paper.

1.3. Paper produced with renewable energy
There are manufacturers that use renewable energy for making their paper. Renewable energy is generated from natural resources such as wind, sunlight and rain. Then, they can mark their product as one being made with renewable energy, no matter whether they have bought the renewable energy or produced it by themselves.

1.4. Chlorine-free production of paper
Bleaching paper is an essential part of mass paper production and is usually done using chlorine. Chlorine, however, can have harmful effects on the environment because during the process of chlorine bleaching of paper chemicals and pollutants are being released into the water. Thus, yet another important criteria in choosing eco-friendly paper is using chlorine-free, recycled-content paper. There are certificates that guarantee that no chlorine has been used for paper bleaching and those should be pointed out on the product’s package.

1.5. Printing using environmentally-friendly inks
Last but not least, environmentally-friendly inks can be chosen for everyday printing purposes. Most inks are made of petroleum and these are difficult to recycle and can be harmful both for the environment and for people. On the other hand, environmentally-friendly inks are made of soy or flax which are natural products.

2. Handmade paper making
Making your own paper at home can be both environmentally-friendly and fun. It is a way for recycling paper that you have already used and do not need anymore. So, instead of adding up to the huge amounts of paper waste, you can employ this green approach and turn the used paper into brand new sheets. You can easily turn any old scrap paper (newspaper, magazines, junk e-mail, receipts, and envelopes) into brand new paper sheets. Additionally, the paper-making process is described in chapter 2 of the current manual. The www is full of web pages and videos that offer step-by-step guidance on how to do it. You have to just type in the search box something like "how to make/recycle paper".
3. Using handmade paper for making artistic objects

Today the eco-friendly business is becoming more and more popular. A lot of people, not only artists, start making artistic objects from all kinds of old and used materials, including paper. It is a way to use again the old material instead of throwing it away and thus help the environment, but also it is a special kind of artistic expression – making unique objects, jewelry, bags, purses, notebooks, cards and alike.

A wallet made from paper which was already used for calligraphy, during Computer Space 2012 festival in Bulgaria:

Eco-friendly materials and green design can be also applied in bookbinding. Handmade notebooks and journals are growing into popularity and are often made of eco paper through the so-called green printing techniques – sheets made of handmade paper or of post-consumer waste recycled paper, bindings of used wood pieces, dried leaves and alike. One has to simply use more imagination and can apply all kinds of materials that seem useless and old at first glance and turn them into beautiful artistic objects.
In this train of thought, here is another example of an artistic object made of eco-friendly materials, a photo album with a wooden binding and dry leaves application on it, where the sheets inside are made of handmade paper:

Dorian Lucas in his book "Green Design" offers hundreds of similar examples of using old materials and recycling them in making all kinds of things such as dresses and bags made of plastic food wrappers, energy-capturing devices, banknote jewelry and many more.

4. Eco-friendly paper in photography

Research proves that eco-friendly choices in paper usage can be made not only by recycling paper or using it to make various objects but also in the intelligent and informed choice of paper for photography. According to Dr Joe Zammit-Lucia in "A guide to environmentally friendly choices in photographic paper" photographers and exhibitors should take into account the type of paper they use. Dr Zammit-Lucia provides an eco-friendly rating of photographic paper and according to it the most eco-friendly one is the "100% cotton rag paper" or alternatively the paper made from wood pulp which comes from FSC (Forest Stewardship Council) certified sources "with no resin component". Resin or any other kind of coating has a great environmental impact. Mixing the paper base and the plastic coatings makes the paper difficult or impossible to recycle.

5. Conclusion

So called green lifestyle has become a very topical issue. With so many environmentally-harmful choices humanity makes every day, it is essential that we start thinking about employing more green approaches in our everyday lives. However, this is still a rather new and not very widely explored topic. Thus, in BBinding project we have also decided to look into the "green" issues in relation to paper production and making environmentally-friendly choices when working with paper objects. By including a special chapter dedicated to green printing, production of handmade paper, which is possible even at home, recycling paper and turning it into a business of making artistic objects, we hope to raise people’s awareness about how important paper production is to preserving the environment.
**Glossary**

*Albumin* - an egg white binder used in photographic printing (albumin prints, invited by Louis Desiré Blanquart-Evrard, 1855 - beginning of the 19th Century), and negatives (albumin negatives, designed by Abel Niépce de Saint-Victor in 1847), and can also be found in calotype negatives.

*Ambrotype* - a wet collodion positive process on a glass base, which is placed in contact with a black backing. The process, invented by M.A. Root and perfected by James Ambrose was used from ca. 1854 - 1865.

*Aristotype* - photographic printing paper and emulsion manufacturing invented by Liesegang around 1886. They are either collodion (called cellodines) or gelatins (citrate papers).

*Assembly* - operation with which the various components of an album are brought together in one unified whole.

*Autochrome* - first color photographic processes patented by the Lumière brothers in 1907. It used colored starchy grain and was employed until the 1930s.

*Back* - in binding it is the part that covers the seams and joins the two plates, as opposed to fitting the front of the album. It can be either ribbed or smooth.

*Baryta* - barium sulfate that is applied to the surface of the paper onto which the photographic emulsion is placed.

*Beating* - The object of "beating" is to reduce the raw material to fibres and also the length and condition of the fibres, so that they will readily felt together, in accordance with the requirements of the paper to be made from it; it is the operation with which paper making proper may be said to begin.

*Binding* - publishing process of a book or album through which the sheets are glued and/or sewn on the back and protected by a cover of cardboard or other materials, such as wood, leather or plastic.

*Bookbinding* - the process of physically assembling a book from a number of folded or unfolded sheets of paper or other material. It usually involves attaching a book cover to the resulting text block.

*Breaking* - the operation of destroying the texture of rags macerating the paper-making material into half-stuff (bringing it "out of the rag") or deforation before it is passed to the beater.

*Cabinet card* - photograph the size of about 140x110mm, mounted on paper of 160x115mm made in England in 1866 and that substituted the carte-de-visite.

*CAD* - Computer-aided design. This is the use of computer systems to assist in the creation, modification, analysis, or optimization of a design. CAD software is used to increase the productivity of the designer and improve the quality of the design.
**Calotype** - the first negative process invented by William Fox Talbot in 1841 on a paper base treated with potassium iodide, Silver nitrate and gallic acid.

**Canvas/3D object** - The canvas is an object which is used to display the book on the screen. The 3D object is the book, displayed as a three-dimensional object on the screen.

**Capital** - reinforced stitching on both ends from the back stopping at the board or the support of the plates’ cover.

**Carbon print** - photographic printing process that uses a base of black smoke (carbon), patented by Alphonse Louis Poitevin in 1855.

**Cardboard** - a good quality of chemical pulp or rag pasteboard made by combining two or more webs of paper, either with or without paste, while still wet; used for signs, printed material, and high-quality boxes.

**Carte-de-visite** - type of photographic paper, patented in France in 1854 by André-Adolphe-Eugène Disderi. It was a photograph the size of a business card, hence its name, printed on paper and glued to a piece of cardboard about 10x6cm.

**Case binding** - the most common type of hardcover binding for books. The pages are arranged in signatures (quires or sections) and glued together into a "text block." The text block is then attached to the cover or "case" which is made of cardboard covered with paper, cloth, vinyl or leather. This is also known as perfect binding, cloth binding, or edition binding.

**Cellulose** - the basic substance of paper manufacture; it is the predominating constituent of plant tissues, from which it must be separated before it can be used.

**Cellulose acetate** - flexible base of cellulose and acetic acid, used for negatives at the end of the 1930s.

**Cellulose nitrate** - flexible silver bromide negative support, used from 1889 to 1939. It is composed of cellulose and nitric acid.

**Cibachrome** - process of printing on transparencies, from the 1960s, using a dye bleach process to destroy the colorants.

**Codex** - a book made up of a number of sheets of paper, vellum, papyrus, or similar, with hand-written content, usually stacked and bound by fixing one edge and with covers thicker than the sheets, but sometimes continuous and folded concertina-style. The alternative to paged codex format for a long document is the continuous scroll.

**Collagen** - a protein constituent of mammals. In case of hydrolysis it becomes gelatinous – a procedure that is irreversible.

**Collodion** - binder that is a mixture of cellulose, alcohol and ether. Used for negatives, one of a kind items (ambrotypes and tintypes) and for photographic prints (collodion aristotypes).

**Collotype** - variant of photolithography. As an evolution of the technique devised by Aphonse Louis Poitevin around 1850. In 1868 Joseph Albert of Monaco (1825 - 1886) adhered a layer of gelatin bromide substrate to a finely sanded piece of glass and exposed it to light. The gelatin becomes dried out in a rectangular pattern. This method is also called the Albertype.

**Condition report** - document that states the conservation condition of the object, prepared by the restorer.

**Conservation** - consists mainly of direct action carried out on cultural heritage with the aim of stabilising the condition of the object and retarding further deterioration.
Conservator - officer/manager of collections who is in charge of artworks and is responsible for their preservation.

Conservator-restorer - a professional who has the training, knowledge, skills, experience and understanding to act with the aim of preserving cultural heritage for the future.

Corners - outer ends of plates. They are also called triangular coverings in leather, canvas or paper that in half bindings cover them. The corners are also small triangular pieces of paper into which photographs are inserted in an album.

Couch - the action of transferring sheets of pulp from the mould in hand-made paper making to felts to be pressed, hence also pressing them, or transferring, in the paper-machine.

Counterguard - pieces of paper, parchment, fabric or leather glued in the inner part of the plate (counter-plate) to hide the tucked-in parts and the mechanisms of securing the nerves.

Cyanotype - or ferroprussiate, is a photographic printing process that involves ferric salts, invented by John Herschel in 1842.

Daguerreotype - first photographic process, patented in 1839 by Daguerre, in which an image is produced on a thin silver-plated copper base with iodide and developed with mercury.

Development - chemical treatment that results in the formation of an image in light sensitive areas of a photosensitive material; used for negatives since 1841 and printed materials since the end of the nineteenth century.

E-learning – this is the use of electronic media and ICT in education. It includes various media such as not only text, but audio, video, animation, images etc. The advantages of e-learning are that it can happen either in or out of the formal educational system, it makes distance learning possible and makes learning more flexible, it can be either self-guided or led by a teacher/trainer and combined with face-to-face teaching.

Entrepreneur – someone who starts their own business, especially when this involves seeing a new opportunity.

Entrepreneurial approach – to take well calculated risk, using assets and capabilities in order to start a new venture with the general aim to make profit.

Esparto - short for esparto grass, also termed Alfa or Spanish Grass, which grows in southern Spain (better quality) and northern Africa. Esparto papers are distinguished by their refined silky texture and bulk, and close, uniform surface or finish. This latter quality, after their bulkiness, is their most outstanding characteristic and makes them eminently suitable for fine printings and other papers required to take a fine impression from plates.

Ferrotype (Tintype) - unique object, similar to the ambrotype, but with a collodion binder spread over a sheet of black lacquered iron (ca. 1852 - 1880), invited by Adolphe-Alandre Martin in 1852.

Film - generic term used to describe flexible supports in nitrate, acetate, triacetate and polyester.

Foxing - brown or reddish-brown spots associated with waste-products of microorganisms.

Gelatin - a protein obtained from naturally occurring collagen. Used as a binder for the image layer of photographic material. It can swell in humid conditions and become soluble after wet processes.

Girdle book - A form of binding: a growing number of people have learned to read and are on the move (like pilgrims and traders). The books had to be small and thus can be easily transported and protected from the elements. Mostly these books contained religious texts.
**Glass plate** - support used for collodion and silver bromide negatives. In the first case, production is done by hand, while the second is industrial. The glass can undergo a process of silicate crystallization, of which is composed.

**Glaze** - Glazing is the gloss or polish, and its production, applied to the surface of papers or boards either during the process of manufacture or after the paper is produced, by various methods such as rolling, pressing or by friction.

**Glue** - Bookbinders use different kinds of glue. Traditionally only two sorts were used: animal glue like bone- or hide glue and vegetal glue like wheat starch or rice starch. Since the 50's a synthetic glue is also set which usually contains polyvinyl acetate or similar.

**Grand Tour** - trip of the major cities and areas of artistic and European cultural interest, especially Italian ones. Considered in the 18th and 19th centuries as an essential part of the education of young men from good families.

**Guard sheets** - pieces of paper placed between the front plate and the first page of the album (front guards) and between the last page and the back plate (rear guards).

**Gum Bichromate print** - photographic printing process involving pigmented gum arabic, patented by John Pouncy in 1858.

**House organ** - a periodical distributed by a business concern among its employees, sales personnel or customers.

**Hinge** - acts as the connection between the plate and the back of the binding.

**Hydrolysis** - a reaction with water which causes a compound to separate into its parts.

**Hygroscopicity** - the capacity of a substance or material to attract water molecules, to absorb moisture e.g. from the atmosphere.

**Ink corrosion** - iron gall ink can cause the degradation of paper or other supports. This process is called "iron gall ink corrosion."

**Intercultural** - to understand, communicate with, and incorporate other peoples’ cultural values in your national culture, while respecting and preserving the identity of each culture.

**Inventory** - an itemized list of assets kept in an archive, in a register.

**Kallitype** - photographic printing process using metallic salts, ca. 1890 - 1920, and silver nitrate.

**Kaolin** - also called china clay, soft white clay that is an essential ingredient in the manufacture of china and porcelain and is widely used in the making of paper, rubber, paint, and many other products. Kaolin is named after the hill in China (Kao-ling) from which it was mined for centuries. Approximately 40 percent of the kaolin produced is used in the filling and coating of paper. In filling, the kaolin is mixed with the cellulose fibre and forms an integral part of the paper sheet to give it body, colour, opacity, and printability. In coating, the kaolin is plated along with an adhesive on the paper’s surface to give gloss, colour, high opacity, and greater printability. Kaolin used for coating is prepared so that most of the kaolinite particles are less than two micrometres in diameter.

**Lectern** - furniture made of wood or metal, of various shapes, sizes and workmanship used to support and opened album on a slightly inclined plane so the reader can consult it without holding it in his/her hands.

**LMS** – stands for "learning management system". LMS is a software application for the administration, documentation, tracking, reporting and delivery of e-learning education courses or training programs.
Margheritina - type of photographic paper in the size of 105x70mm.

Mould - a device consisting, roughly speaking, of a rectangular wooden frame over which brass wires or wire cloth is stretched to act as a sieve or strainer so that the water drains away from the pulp fibres, thus forming a felted sheet of paper.

Palimpsest - a term applied to any material from which writing has been removed to make room for another text, and which has thus been prepared or scraped a second time.

Paper - A substance composed of fibres interlaced into a compact web, made (usually in the form of a thin flexible sheet, most commonly white) from various fibrous materials, as linen and cotton rags, straw, wood, certain grasses, etc., which are macerated into pulp, dried, and pressed (and subjected to various other processes, as bleaching, colouring, sizing, etc., according to the intended use); it is used (in various forms and qualities) for writing, printing, or drawing on, for wrapping things in it, for covering the interior of walls, and for other purposes.

Papyrus - A substance prepared, in the form of thin sheets, from the stem of the papyrus plant, by laying thin slices or strips of it side by side, with another layer of similar strips crossing them, and usually a third layer again parallel to the first, the whole being then soaked in water, pressed together, and dried; used by the ancient Egyptians, Greeks, Romans, etc., as a material for writing.

Parchment - consists of skins of various animals, unhaired, cleaned, and dried so as to form sheets of uniform thickness suitable for writing upon and for the numerous other purposes to which such preparations are devoted.

Parchment. Vellum (= derived from the Latin expression for "made from calf") normally refers to parchment which is made from calf skin. In a wider sense the term alludes to fine parchments of good quality.

Passe-partout - a sheet of cardboard that is cut to form a more or less wide margin between a photograph and the frame. The passe-partout mount allows you to store the photo in a way that prevents it from touching other materials.

Photo album - book, notebook or booklet to collect photographs of different sizes, bound and packaged.

Photogravure or heliotype - type of intaglio printmaking or photo-mechanical processes through which recessed relief engravings are obtained. The process was invented by Karel Václav Klic.

Platinum print - photographic printing process, discovered by William Willis in the 1870s, in which the image is made platinum. Similar to the palladium print, in which palladium is used in place of platinum.

Polyester - a transparent flexible support used for negatives and positives on film since ca. 1960; it is a very stable support that is guaranteed to last about one hundred years.

Portfolio - in photography it is the selected set of works collected in a folder to present as an example of one’s work.

Postcards - rectangular pieces of cardboard used for correspondence. There are picture postcards and photographs in postcard format.

Preventive conservation - consists of indirect action to retard deterioration and prevent damage by creating conditions optimal for the preservation of cultural heritage as far as is compatible with its social use. Preventive conservation also encompasses correct handling, transport, use, storage and display. It may also involve issues of the production of facsimiles for the purpose of preserving the original.

Printing out - this refers to a photographic print created due to a reaction with sunlight, exposing the negative to sunlight on sensitive paper in a printing frame.
Quire - A collection of leaves of parchment or paper, folded one within the other, in a manuscript or a book. Also called section or signature.

Restorer - specialist who is responsible for the conservation interventions carried out on objects.

Restoration - consists of direct action carried out on demand of deteriorated cultural heritage with the aim of facilitating its perception, appreciation and understanding, while respecting as far as possible its aesthetic, historic and physical properties.

Restoration report - document that accounts for the status of the object before the restoration and after the intervention, prepared by the restorer and signed by the laboratory manager or the conservator.

Salt prints - the first photographic printing process invented by William Fox Talbot, used from 1839 to the 1850s; paper is immersed in a solution of sodium chloride and Silver nitrate.

Scrapbook - literally means "book of scraps", or small pieces. This is an album in which photographs, notes, documents, drawings and newspaper clippings are collected.

Silver bromide - photographic process that replaced collodion in the 1880s. It is made of an animal-based gelatin and silver salts.

Silver mirroring, silvering - bluish or shiny discoloration in the dark areas of a photographic image caused by oxidation of the silver, creating a mirror-like appearance.

Sizing - A water-resisting agent, such as glue or gelatinous material added to the paper to make the paper more or less impervious to ink or moisture.

Straps - pieces of fabric (silk, cotton or velvet) or leather of varying colors, fixed on the edge of the plates in various numbers, from one to four pairs, that, once knotted, keep the album closed.

Sulfurization - chromatic decomposition of the image that produces a localized discoloration due to improper washing techniques in the printing process, or contact with sulfur in the air.

Texture - This is an image which is applied to the different elements of the book.

Triacetate - created as an evolution of cellulose diacetate, containing three acetate groups for every glucose residue that forms the cellulose molecule.

Vegetable parchment, or parchment paper, is a modified form of paper produced by chemical treatment, having considerable similarity to ordinary animal parchment. It is prepared by acting on ordinary unsized paper with dilute sulphuric acid, and immediately washing away all trace of acid. Paper so treated will have acquired about five times the strength of ordinary paper; it will become soft and flaccid when steeped in water, to which, however, it is impervious; and it is unaffected by boiling water.

Vinegar syndrome - decomposition of acetic acid components (see acetate films) in which a vinegar smell is emitted along with consequent damage to the image's emulsion.

WebGL - Programming language extension for creating 3D Objects inside web browsers.
Chapter 1: Bookbinding


BLANKENSTEIN, J.C. Handboekbinden. Grafisch Opleidingscentrum. 1982


Chapter 2: Paper and parchment – maintenance and preservation


Links

www.bernstein.oeaw.ac.at/irongallink.org
Chapter 3: Conservation and maintenance of photographic materials


Chapter 4: Artistic bookbinding

Links

Book History Timetable - http://www.sren.nl/sreeng/Timetable/timetab.htm


Bookbindings in the National Library Sweden - http://www.flickr.com/photos/25300312@N08/collections/72157624849157725/

Dutch Art Deco and Art Nouveau Bookbindings - http://anno1900.nl/boekbanden1/

Peter D. Verheyen’s Book Arts - http://www.philobiblon.com/


Publishers Bindings (1815-1830) - http://bindings.lib.ua.edu/


2. Literature


BLANKENSTEIN, J.C. Handboekbinden. Grafisch Opleidingscentrum. 1982


Chapter 5: Photo albums and photography in the library


Chapter 6: Entrepreneurship and intercultural learning


Chapter 7: E-learning approaches and paper preservation

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manual

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