

Basic Printing Techniques:

Teaching Materials for Educators

PHD DISSERTATION OUTLINE

Dorota Bernacka, MA

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Thesis supervisor:

Monika Wojtaszek-Dziadusz, Ph.D.,
Professor at the Academy of Fine Arts in Krakow

Kraków, 2023

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I. Introduction

INTRODUCTION

This dissertation, entitled *Basic Printing Techniques: Teaching Materials for Educators*, is a teaching tool, developed in the form of a website containing elements helpful in conducting lectures on *Printing techniques*.

At the Faculty of Art at University of Applied Sciences in Tarnow the course takes the form of lectures for students of Industrial Design and Graphic Arts. Its main objective is to familiarize students with the main issues related to printing techniques that are currently used in the printing industry.

Using both my professional experience in graphic design and several years of teaching the subject I have prepared a program that covers basic knowledge of reproduction printing and modern printing techniques. From the very beginning of teaching this subject I saw the need to adapt the program of the course so that it would suit students of Arts specializing in design. Especially, since most of the literature available for teaching printing methods has been created for educational needs of printing technicians.

It is also my experience that some topics, especially those related to reproduction, namely, colour separations, overprinting or rasterization, require additional presentation materials.

My initial idea was to develop a cohesive set of materials consisting of individual pieces, i.e., illustrated textbook, charts, photos, and animations. However, due to the pandemic and the remote mode of teaching I changed the concept, and I concluded that a tool in the form of

a website, accessible to the instructor and shared with students, would be the best solution.

The description of the thesis has been divided into two main parts. The first one contains the description of the teaching material of the subject – *Printing Techniques*. It is followed by a chronological presentation of the material, consistent with the content of the page. The second part constitutes a presentation of the subsequent stages of work on the tool.

ASSUMPTIONS

The main goal of the thesis was to develop a webpage that would be easy to use while conducting lectures and that the images presented would be clear to the students attending the class. The distribution of the teaching content was intended to be arranged in thematic groups so that it could be used freely. It was also important to adapt the teaching content of the *Printing Techniques* course to the structure of the website as well as design its architecture so that using it would be intuitive and would work well during classes.

By design, the project belongs to the category of digital environment and as follows, it has unlimited space where important definitions, illustrative materials, animations, photos, and videos can be placed. The illustrative material needs to be designed in such a way so that it would be functional in this environment and that it would accurately illustrate the teaching content.

II. Teaching content

The teaching content of the *Printing Techniques* course was divided into 12 topics and arranged in a preferred order. For the designed tool, they have been called *lectures* and each topic is represented by a separate subpage. Thus, the entire program is enclosed in 12 lectures, however, the number of lectures does not correspond with the number of classes conducted in a semester; it is a grouping of topics.

Lecture 01_Introduction to printing

The first lecture is designed to introduce students to the subject of printing techniques and make them aware of the variety of printing products, which in consequence require different processes to be carried out successfully: from printing to bookbinding. Poster, hardcover book, daily newspaper, billboard, cardboard packaging, computer keyboard signage or custom printed fabric are only a few examples of products that require different printing techniques and often entail very different finishing processes.

Awareness of this diversity, and thus awareness of the possibilities of the printing industry serves as an encouragement to explore and learn more about these techniques. It is also time to make students aware of how important and indispensable this knowledge is.

Lecture 02_History of printing

Although the history of printing began relatively recently, only in the 15th century, the printing substrate or matrix for duplicating designs developed independently much earlier.

The events that contributed to the development of printing were presented with the use of a timeline. All consecutive events were marked chronologically, and they were dated according to available information and supplemented with a photo gallery. The presentation of this topic is

complemented with the map of the world with an animation showing information about individual events.

Lecture 03_Reproduction. Colour

When evaluating print quality, it is colour, or rather the accuracy of its reproduction, that is one of the most important criteria.

The third lecture is devoted to issues related to the notion of colour in reproduction. This lecture covers the following topics: colour systems used in printing, the need for colour separations, the overprinting needed to reproduce multicolour originals.

While using graphic design software that enables working in both RGB and CMYK colour space, each student should be aware of the difference between these colour gamut, and thus when preparing a project for printing - take these differences into account.

The difference between the additive and subtractive colour synthesis is presented with the use of several-minute long animations.

The last matter discussed in this chapter is the need of colour control in the printing process as well as during the stage of image processing in various technological environments.

Lecture 04_Printing Reproduction. Raster

During the printing process, reproduction of the wide range of colours of reproduced images requires local variation of the amount of ink applied. The printing machine, in almost all techniques of classical printing, does not offer the possibility of varying the thickness of the applied ink. The need for tonal differentiation is met by using very fine raster dots, distributed either in AM or FM screening pattern. The fourth lecture covers the issue of rasterization, types of raster and its construction. The mechanism of converting a multi-tonal monochrome or multicolour image into a raster image has been illustrated by the means of graphics and animation. Animation has also proven to be a good way to present and explain the size of the rotation angles of the amplitude raster and illustrate the formation of the moiré phenomenon.

Lecture 05_Printing techniques. Classification

The fifth chapter has been devoted to the basic classification of techniques currently used in the printing industry, taking into account the workshop graphics techniques from which they originated. This chapter begins with graphic illustration of the current classification of printing techniques.

Despite the constantly increasing digitalization, also in the field of

printing, it is the traditional printing techniques that remain dominant on the market of printing, i.e., those that require the use of a printing form in their technological process. The second group are digital printing techniques.

The presentation of traditional types of printing starts with the oldest type of printing, namely relief printing. In this technique, the print is created by reflecting the ink applied on the convex parts of the printing mould. The matrix, the stages of ink application and reproduction of the image have been presented in the form of images. Convex printing is derived from the woodcut technique, and the examples of graphics and artists using this technique in their work have been shown with the help of a photo gallery.

The principle of flat printing has also been illustrated with a simple graphic. The importance of proper preparation of the printing and non-printing areas of a flat printing form is discussed using the example of lithography, which is a graphic technique this type of printing originated from. These examples are illustrated with a photo gallery from the printmaking studio and with reproductions of prints made with this technique.

Another printing method discussed in this lecture is gravure printing, i.e., printing during which the print is created by reflecting ink placed in the recesses of the printing mould. This process has been also illustrated with graphics.

In discussing the printmaking techniques that industrial gravure printing originated from, the main focus is placed on copperplate, etching and mezzotint. Additional emphasis is put on various methods of achieving gravure printing.

The next printing technique, screen printing, was initially used only in printing. The 1930s brought the spread of screen printing among visual artists. The examples of both serigraphy and artists using this technique have been presented in the form of an image gallery.

The last printing technique discussed in this lecture is digital printing. In this method the materials for printing are delivered to the printing device in the form of computer data. This technique is also used by many artists; some examples have been included in the photo gallery.

Lecture 06_Flat printing

Lecture six includes material concerning the most important printing techniques currently used in printing. Each of the techniques described in this chapter is ordered in similar fashion as in the previous lecture.

Namely, the most important stages in the history of a given technique have been placed on a timeline along with individuals who contributed to its development. Then follows a more detailed description of the technique with presentation of the printing form, the printing unit and a presentation of the printing shop. Each technique has its own specificity that requires accurate presentation. The lecture is concluded with examples of ready-made products created by the means of the given printing technique.

Although flat printing is not the oldest printing technique, the presentation begins with the only flat printing technique that is still in use i.e., offset printing. It is also currently one of the most widely used printing methods. First, a brief history of this technique is presented and then, to supplement the discussion of the flat printing form used in offset printing, students are shown photos of matrices and a film from a CTP exposure room.

The work of offset machine technicians is illustrated with a graphic. An animated version of this graphic is also included to ensure accurate depiction of the offset printing process. In addition, with the help of an image gallery and a few short videos, students are acquainted with the interior of a typical offset printing shop. The image gallery also includes examples of ready-made products that were created with this printing method.

Lecture 07_Relief printing

The presentation of relief printing techniques, as with offset, begins with a brief historical overview: the figure of Johannes Gutenberg and the period of typesetting. Next, the discussion of relief printing techniques is focused on letterpress.

Since nowadays the use of letterpress has been marginalized, the presentation concerns mostly its use as a technique for embossing and printing graphics that do not require a raster. Using relief printing directly for high-quality packaging and newspapers is called flexography.

One of the most distinctive features of flexography is its flexible printing form, as well as the method of applying ink in the form of raster dots using a raster roller. The structure of the raster roller and the structure of the inkwells is presented with graphics, while the printing process itself is additionally illustrated with animation.

Lecture 08_Gravure printing

At present, there are two gravure printing techniques used in the printing industry and they differ significantly in terms of technology.

Rotogravure is a direct printing technique used for very large print runs that require high quality, especially colour magazines, catalogues, and exclusive packaging. It is a very interesting printing technique - the only industrial printing technique that allows to vary the thickness of the applied ink. This technique, due to its specification in terms of the print forms it uses, is an expensive technique in the pre-press phase, and thus, profitable only for large orders.

The history of rotogravure directly derived from heliogravure, which was invented in the 19th century. The main topics discussed in the first part of the lecture cover the specific construction of inkwells and the preparation of cylindrical printing forms.

The second gravure printing technique discussed in lecture eight is pad printing. Pad printing is indirect printing with the use of ink-carrying silicone pads, whose shape is adapted to the substrate printed. This technique is of great importance in the advertising industry as it enables printing on various types of plastic shapes, metal, etc.

To give students a more complete understanding of the techniques discussed in this lecture, it has been supplemented with graphics, animations, photos, and videos.

Lecture 09_Screen printing

Screen printing is derived from Japanese stencil printing, patented in 1907 by Samuel Simon as *silk-screen*. The history of screen printing slightly differs from the history of other printing methods, which are usually derived from workshop graphics techniques. Initially, it was used only in printing and the spread of screen printing among visual artists occurred in the 1930s.

Screen printing is the focus of lecture nine. This simple printing technique consists in squeezing ink with a squeegee through the open mesh apertures of a screen stretched over a frame. It is presented in the form of graphics. In addition, the lecture material is complimented with a photo gallery and videos from the print shop.

Lecture 10_Digital printing

The feature that differentiates digital printing from other techniques is the absence of a traditional printing form and instead, data from a file is used. It is reflected in the cost of printing, which is fixed for each copy, regardless of the size of the print run. Digital printing also allows for customization of prints; thus, it works well for low-volume production of marketing prints or invitations. The teaching material of this lecture includes various digital printing techniques and draws

a clear distinction between sheet-fed printing and large-format printing. As the previous lectures, it is complimented by a set of graphics, photos, and short videos.

Lecture 11_Print finishing techniques

The last two lectures have been devoted to the processes included in the postpress category. Since printing products come in various forms and are results of using different techniques, finishing and binding processes are usually carried out in several stages. Most often, printed sheets are first subjected to finishing processes, followed by various binding operations.

Print finishing involves coating either the entire surface or some selected areas with various materials or substances to decorate or protect the surface. This lecture covers also laminating, different types of varnishes and special paints used in the finishing process. It also discusses processes such as embossing and hot stamping, which are presented in the form of graphics. These processes are also portrayed in the form of an image gallery and videos from printing shops.

Lecture 12_Binding processes

Some bookbinding processes can be integrated with printing processes, while others are performed on separate production lines and separate machines. Presentation of this topic begins with explaining ideas related to giving products the right dimensions and shapes, i.e., cutting with a guillotine or punching with a die-cutter. Other common bookbinding operations include folding i.e., the repeated folding of printed sheets, and creasing.

Other topics discussed in this lecture are creasing and folding, i.e., multiple folding of printed sheets. Since the teaching material also includes an important group of products, mainly packaging, which are reinforced with cardboard, a part of the lecture is dedicated to the process of lamination. The last part of the lecture is devoted to the complex topic of book binding.

Graphics, photos, and videos showing the process flow are helpful in illustrating the topics discussed in this lecture.

While conducting university classes, it would be advisable to complement each lecture with the presentation of matrices and die-cutting machines, as well as printed sheets and finished products with different types of finishing.

III. Work stages

When approaching the design of the site, I approached the task as if it were a process of designing a digital product. The functionality of the tool and its navigation should be tailored to the needs of the user, in this case the instructor.

Initially, I intended to use one of the available templates offered by the WordPress platform. Nevertheless, the work with the template didn't bring satisfying results and after a few attempts of adding content to the template I realized that the idea was futile. Developing a tool based on a template would enable me to manage the website and its elements independently, adding or changing content. However, navigation limitations and, above all, design limitations posed by such templates made me create the website from scratch.

Developing the website for educational tool entitled Printing Techniques took place in several stages. Since creating this tool, to some extent, resembles developing a classic website, subsequent stages of work are similar to those that are usually applied in this type of project:

1. Development of tool concept
2. Content architecture
3. Graphic design
 - project assumptions
 - grid
 - typography
 - colour
 - graphics
 - animations
 - photo and video gallery
4. Sending the material to the web developer

DEVELOPMENT OF TOOL CONCEPT

Developing the concept of the website was one of the most important stages of working on this project. Poor decisions made at this initial stage would cause problems that would be difficult to eliminate in subsequent stages of the project.

Thus, I set requirements and features that the website should meet.

One of the most important conditions is website readability. It should have clean design, with an optimal number of graphic elements. The displayed content should be visible from every place in the classroom. It should be simple in its design with a form resembling a slideshow, and textual information ought to be edited into short definitions. The site will be displayed on the monitors available in the lecture hall, so I have taken 1920 x 1080 pixels as the screen dimension.

Another important decision was the choice between a large number of subpages and the ability to scroll through content. I decided not to increase the site depth and allow for scrolling through each lecture. This decision was also influenced by the sequential nature of some graphics that required scrolling.

Navigation, on the other hand, should be designed in a way that would make it possible to move easily between lectures, as well as between content within each lecture. It should allow for easy reference and return to other elements of content. Therefore, I decided that the best solution would be a side menu, expandable and collapsible as needed.

The teaching content of Printing techniques subject has been divided into 12 lectures. The number of lectures does not exactly correspond to the number of classes in semester but constitutes a complete set of topics discussed during this course. The lectures are presented as follows:

- lecture 01 Introduction to printing
- lecture 02 History of printing
- lecture 03 Reproduction. Colour
- lecture 04 Reproduction. Raster
- lecture 05 Printing techniques. Classification
- lecture 06 Flat printing
- lecture 07 Gravure printing
- lecture 08 Relief printing
- lecture 09 Screen Printing
- lecture 10 Digital printing
- lecture 11 Print finishing techniques
- lecture 12 Binding processes

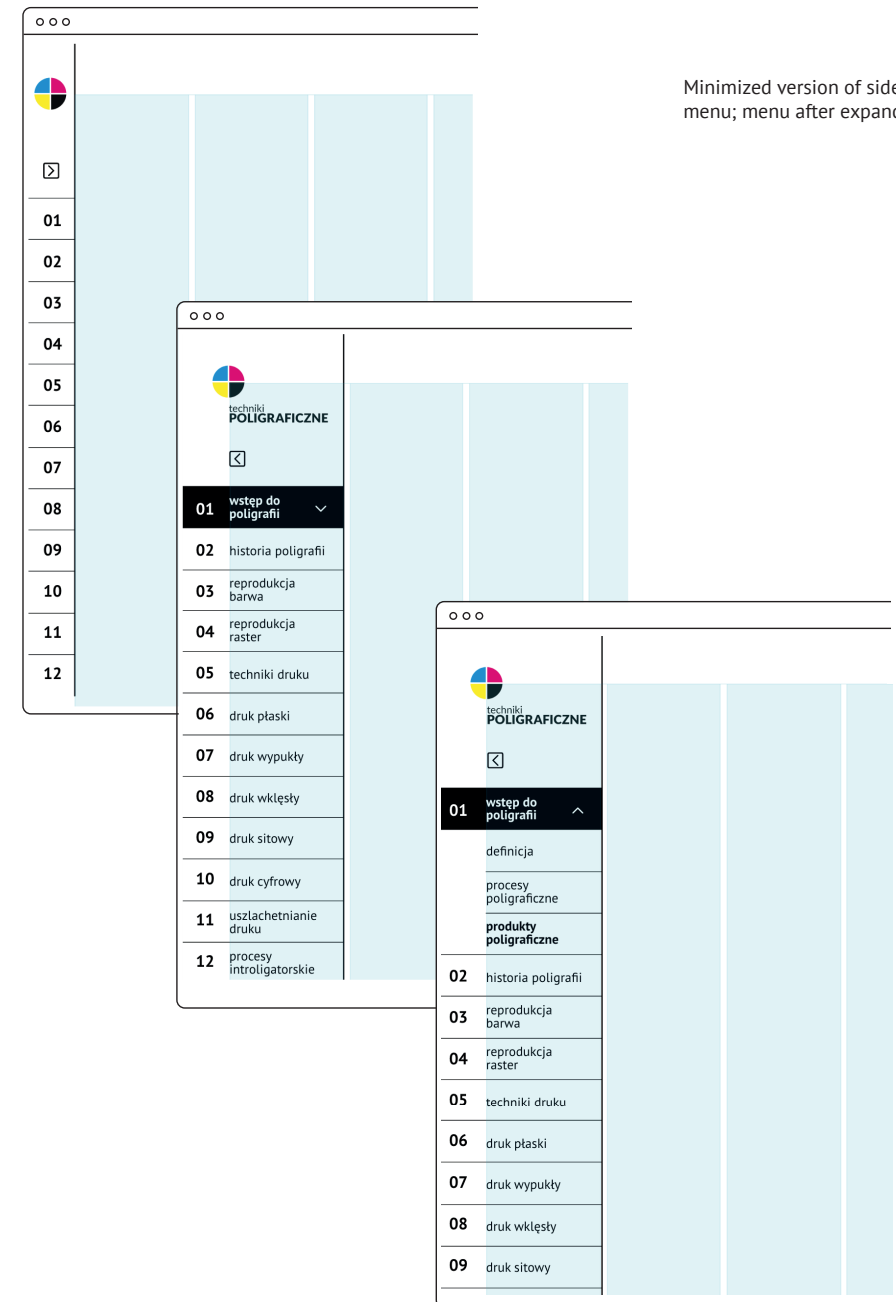
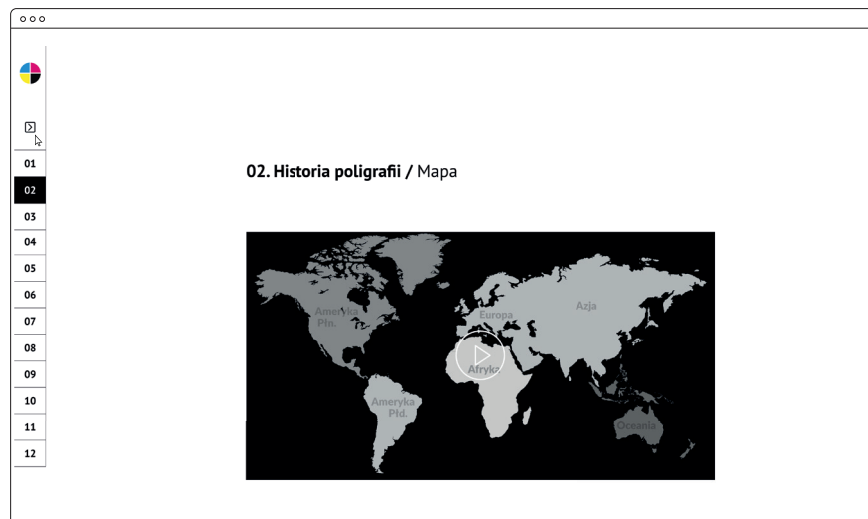
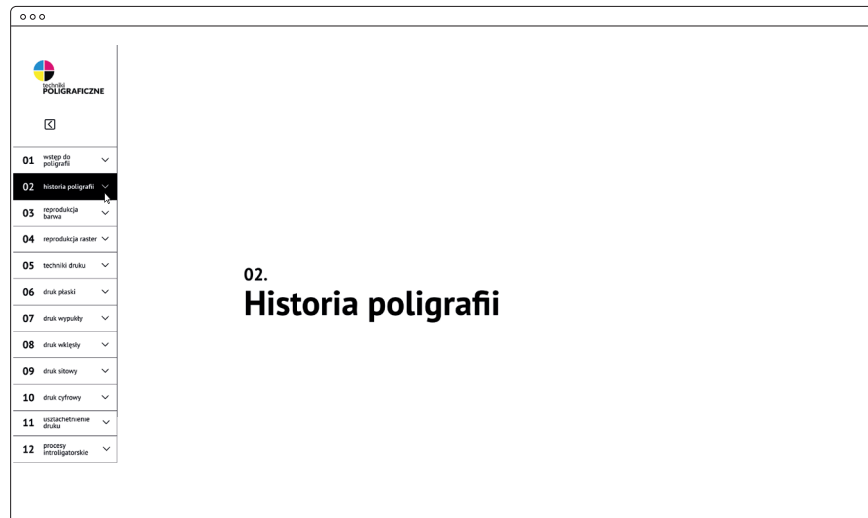
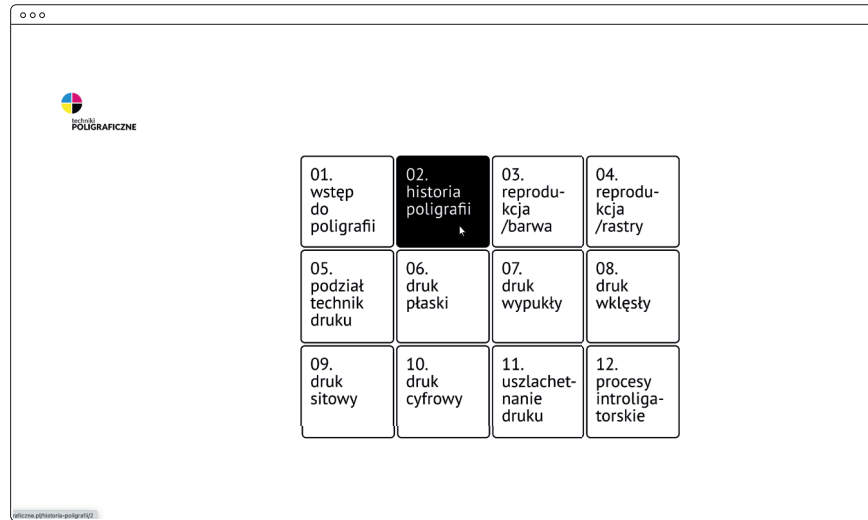
The home page, which can be displayed at the beginning and end of the lecture, includes the name of the subject. For the purpose of creating the home page, and to introduce an element unambiguously associated with printing, I designed a subject logo. The logo, in either full or minimized form, is always visible on the side menu.

An arrow, placed on the homepage, takes you to a page with access to all lectures. Graphically, I enclosed them in the form of 12 active square boxes with the number and title of each lecture.

Clicking on any box takes you to the content of the lecture. Each lecture is a scrolled page, divided into successive subsections. This division corresponds to a side menu, which allows you to choose the order of discussing the topics. The logo, located at the top of the menu, allows you to return to the home page.



Home page



←
Transition from a page containing access to all lectures, to the content of the selected lecture

CONTENT ARCHITECTURE

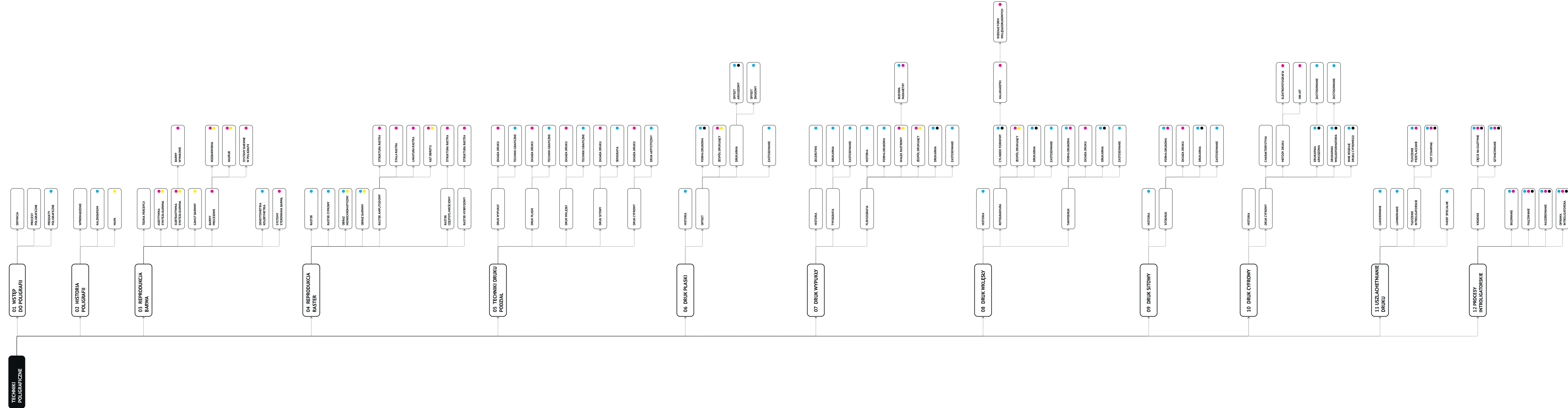
The next stage of work was designing the content layout of the entire subject in the form of a clear diagram. To draw up the content architecture, I used Miro, a digital platform for remote team communication and project management. This allowed to dissect the layout of the main page and all the sub-pages of the designed tool. Next, the content of each page was determined, and page hierarchy was defined.

I prepared the information architecture in the form of a diagram in a vertical layout, including all subsections.

The diagram had another very important function i.e., it was possible to arrange within its structure information about the illustration methods that would be used for each lecture. I used colour for labelling and since I needed four different labelling designations, I used CMYK colours. These designations correspond as follows: cyan - photo gallery, magenta - graphics, yellow - animation, and black - video material. Arranging this information on the diagram made it easier to determine the scope and type of elements needed.

Diagram of information architecture, indicating methods of presentation:

- photo gallery
- graphics
- animations
- films



GRAPHIC DESIGN

Project assumptions

The project should be designed to meet requirements of the message content and to achieve its previously set goal. Since the content displayed needs to be visible and readable to the students attending the class, the primary objective that was set for the design of the site is the readability and clarity of the graphic elements.

Along with creating the concept of the site and working on the content architecture I simultaneously started working on the graphic design. Once I knew I wouldn't be using a WordPress template for my project, I designed several versions of the site's design.

In the end, I developed the concept of a very simple and clean graphics.

The design is based on an asymmetrical layout using a limited number of graphics and leaving quite a lot of white space.

The rhythm of graphic elements also plays an important role in the site's layout, in addition to the black and white contrast, which makes the arrangement more interesting. The asymmetrical grid ensures coherence of the elements. The design of the site is highlighted by lines and outlines, which have their visual continuation in the choice of typography and graphics. Short texts and definitions are also enclosed by black outlines, forming black or white banners.

To create the website design I used Adobe XD, which is designed to create interactive prototypes of mobile applications and websites. XD is a part of Creative Cloud and therefore, it works well with other programs i.e. Illustrator, which I used for designing graphics, and Photoshop, whose tools allowed me to make animations.

Webpage prototype
in Adobe XD software



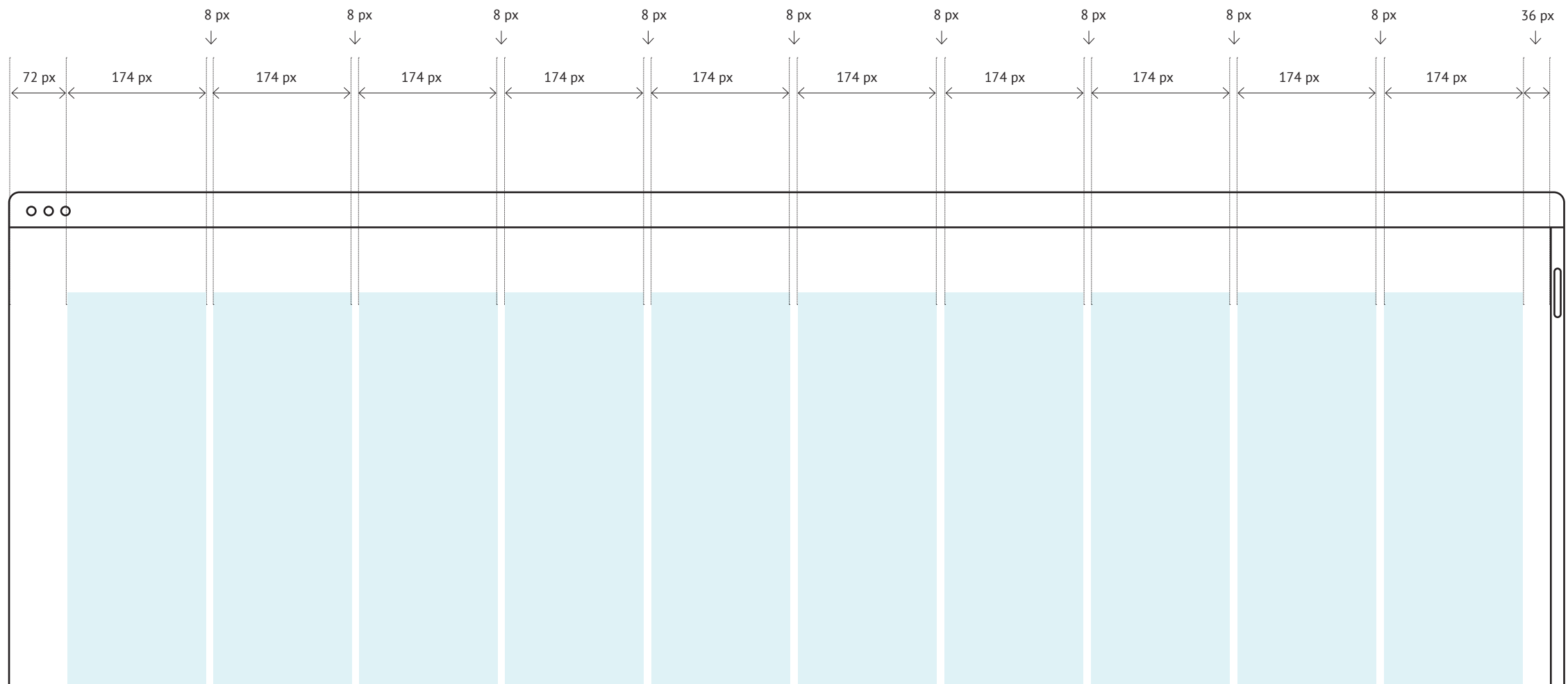
Grid

Taking into consideration that the designed site is an educational tool, intended to be displayed on a university monitor, it was necessary to define the full-screen pixel dimension of the layout, with a width of 1920px by a window height of 1080px.

The grid has 10 columns, 174px each, and the distance between them is 8px. The layout of the columns is asymmetrical. The left margin is a bit wider – 72px, which allows for placing the side menu in a minimized form. The right margin is 36px.

Arranging the grid in such a manner allowed for a relatively free distribution of elements. Most elements are arranged on the page in such a manner that two outermost columns on both sides of the screen are left blank, and as a result, the content is more visible. The height of the screen was also taken into account in distribution of the elements.


Grid layout with dimensioning



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XVIII w. Niemcy
Wynalezienie litografii

Alois Senefelder (1771-1834 r.)



Wynalazca litografii, kamieniorytu, autografii i metody kredkowej. W 1826 r. wykonał pierwszy druk wielobarwny

1837 r. Chromolitografia
Druk z wielu płyt
Prace nad wprowadzeniem pras rotacyjnych

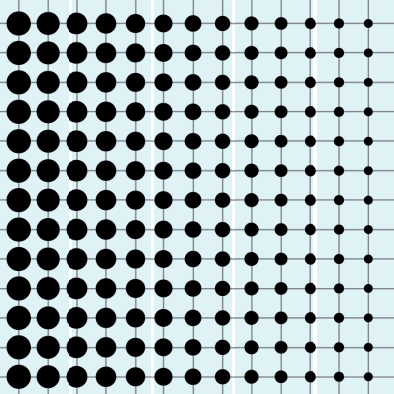
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Techniki graficzne

drzeworyt



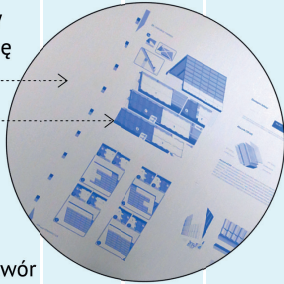
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Miejsca hydrofilowe
(oleofobowe)
Przyjmujące roztwór zwilżający i odpychające farbę

Miejsca oleofilowe
(hydrofobowe)
Przyjmujące farbę i odpychające roztwór zwilżający



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04. Reprodukacja poligraficzna / Obraz monochromatyczny

Reprodukowanie obrazów monochromatycznych



Examples of element arrangement with the use of grid

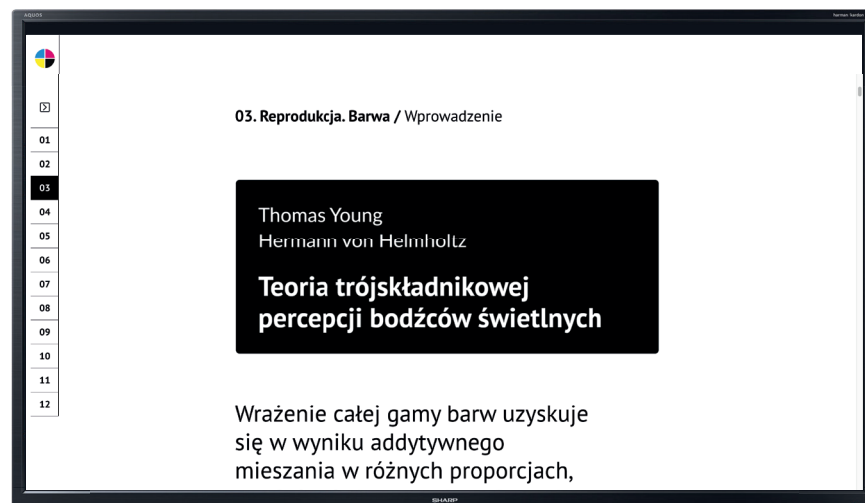
Typography

When choosing the font for the typography elements of the site, I decided on PT Sans, published by ParaType in 2009. PT Sans is based on sans serif fonts from the second half of the 20th century, but at the same time it has characteristics of contemporary designs. This typeface family consists of 8 styles. Since I intended to use a small number of distinctions, this set proved sufficient for my project.

PT Sans is a legible, sans-serif font designed for digital communication. The two main criteria that determined my choice to use PT Sans were its legibility and the sans-serif structure of the characters referring to the nature of the site's graphics.

At the same time, I determined that the font size used for the composition of the presented content should not be smaller than 40 pt. This choice was closely connected with the conditions in which the text will be displayed. In the composition of the most relevant texts, I used the regular font - 70/80 pt., for highlights - the bold type, and less frequently italic.

Typographic
composition



Examples of font sizes

Font weight bold
Font size 80 pkt
Interlineation 90 pkt
Poligrafia

Font weight bold
Font size 70 pkt
Interlineation 80 pkt
Poligrafia

Font weight regular
Font size 60 pkt
Interlineation 80 pkt
Poligrafia

Font weight bold
Font size 40 pkt
Interlineation 65 pkt
Poligrafia

Font weight regular
Font size 40 pkt
Interlineation 65 pkt
Poligrafia




Font weight regular
Font size 30 pkt
Interlineation 65 pkt
Poligrafia

Colour

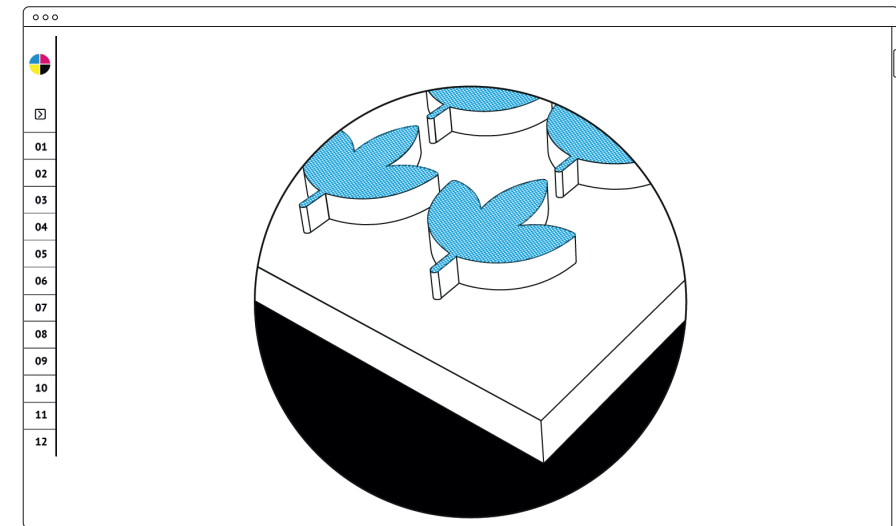
In the case of topics related to printing the choice of website colour scheme can be quite troublesome. Limiting the colour scheme to CMYK colour palette only and using it in many places is clearly associated with printing, but at the same time it can be confusing, especially for lectures related to printing reproduction.

In the end I decided on a black and white colour scheme for the website. All text or graphic elements are black or white. Therefore, when CMYK colour appears, especially in the reproduction chapters, it is readable. A simple colour scheme provides a good background for photo galleries, colour animations or videos.

An exception in the colour scheme had to be made when presenting graphics illustrating printing techniques, as there was a need to show the place when ink is applied. I decided to choose cyan as the ink colour. In my opinion, the use of minimalistic colour scheme resulted in a clean, bright design and it gave the site a modern feel, which was also very important to me.

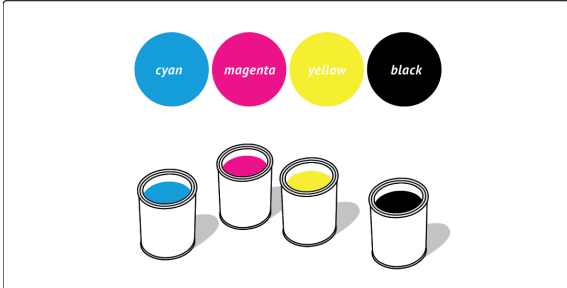
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|  | C 0% M 0% Y 0% K 40% |
|  | C 100% M 0% Y 0% K 0% |
|  | C 0% M 100% Y 0% K 0% |
|  | C 0% M 0% Y 100% K 0% |
|  | C 0% M 0% Y 0% K 100% |

Colour scheme prevalent
in graphics



Systemy barwne w poligrafii

CMYK



Charakterystyka druku cyfrowego

- Brak formy drukowej w tradycyjnym jej rozumieniu
- Krótki okres realizacji zleceń
- Jakość zbliżona do offsetu
- Możliwość personalizacji druku
- Cena jednostkowa niezależna od nakładu

Graphics

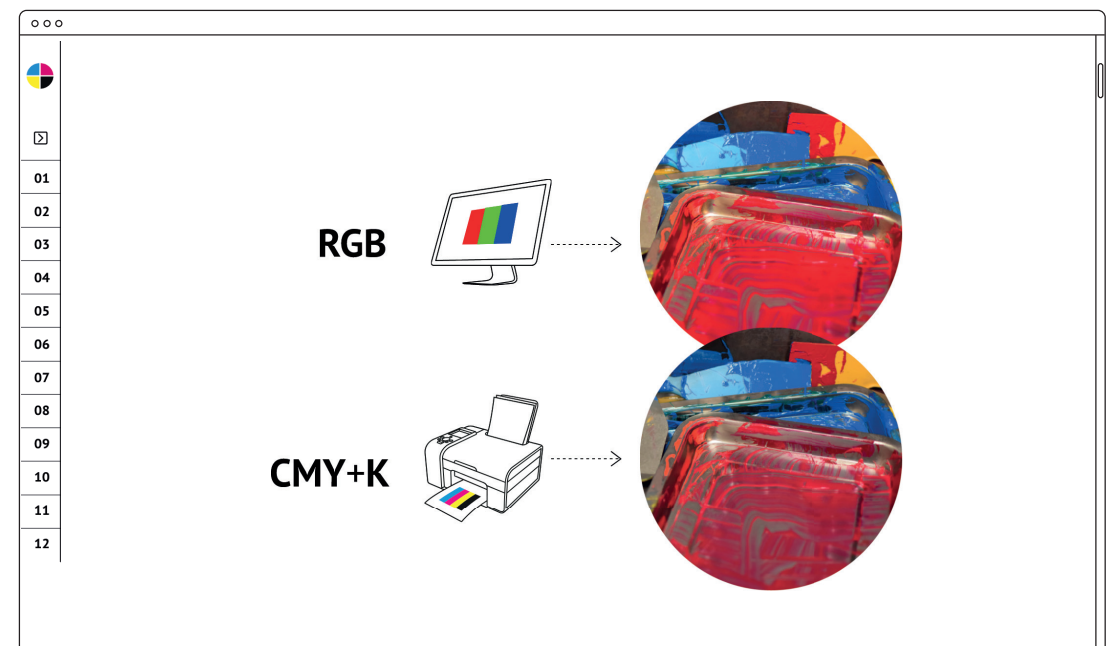
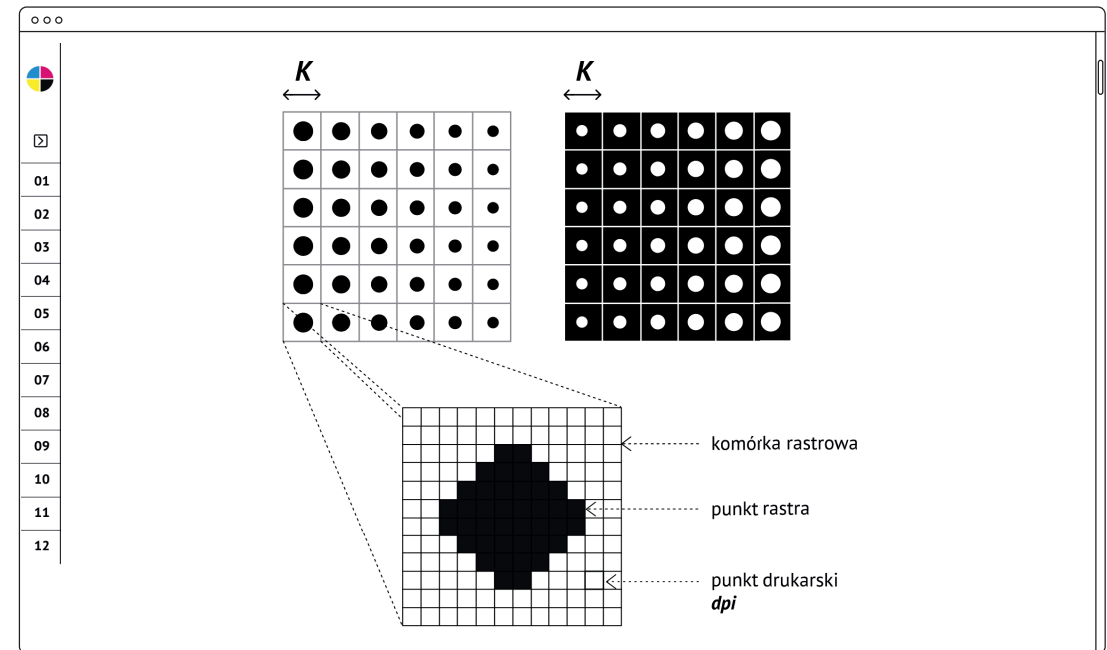
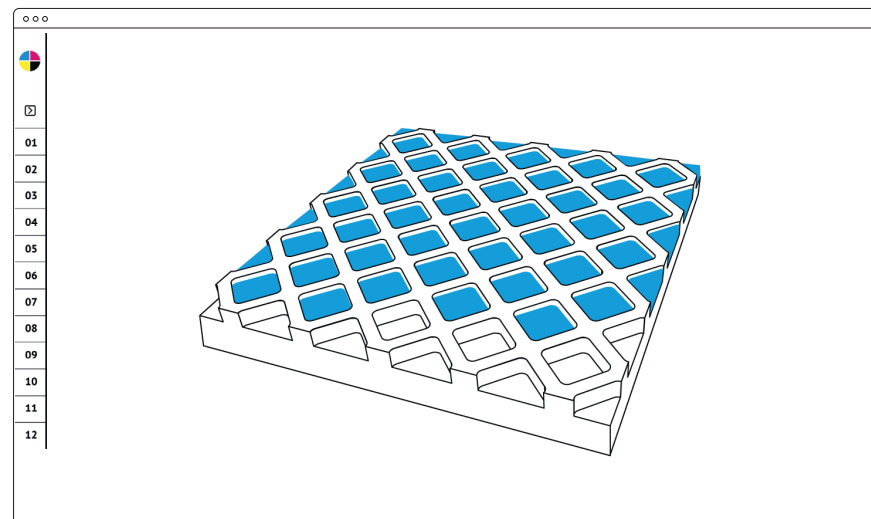
When preparing the illustration materials for the designed website, I decided to rely on simple, minimalist solutions, limit the use of embellishments and discard irrelevant elements, in accordance with the principles of *flat design*.

Flat design is my favourite designing style. The origins of this style can be traced back to the 1950s, when such images were created for electronic publications.

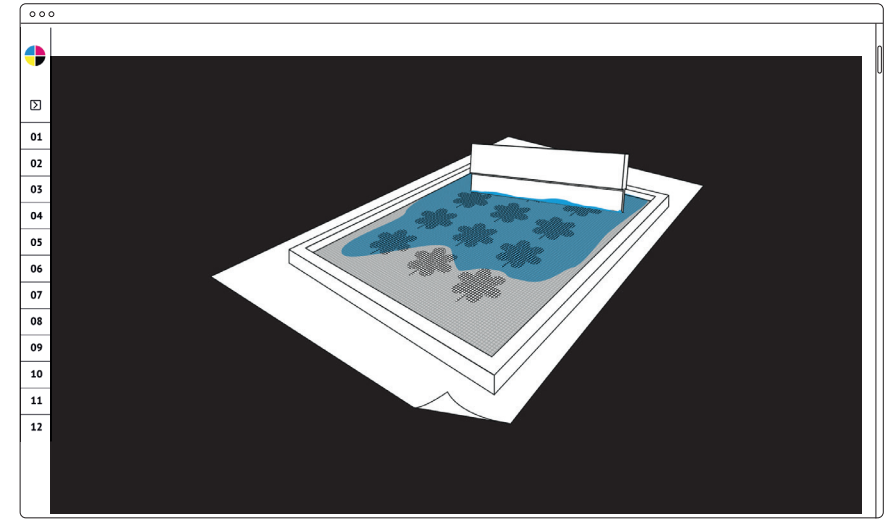
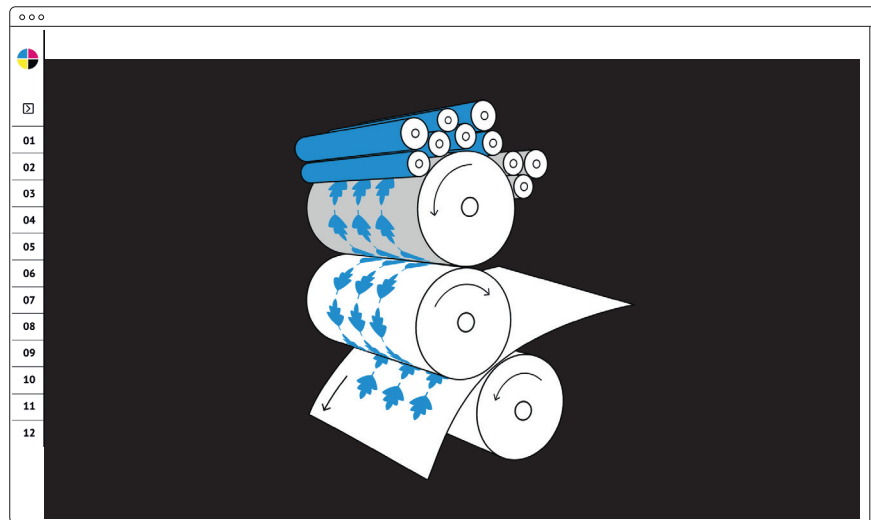
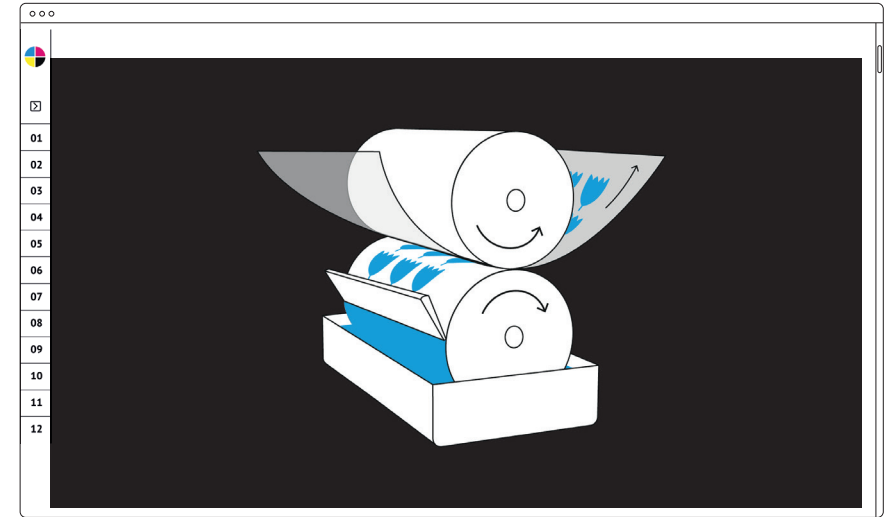
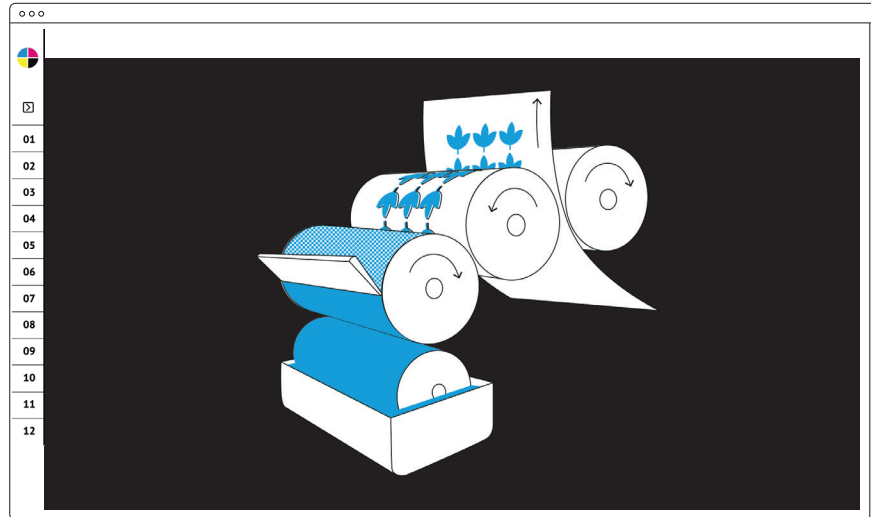
It eliminates elements such as gradients and shading. It also assumes the use of simple shapes and fonts, as well as minimalist colour scheme. The graphics are made without the use of chiaroscuro, but some perspective has been applied. To make my graphics a bit more cartoonish, I introduced a 3-point black outline to the simple shapes, as well as a gentle rounding of the corners. I wanted to achieve visual homogeneity of all elements of the design.

The black outline also appears in banners with content for display, mostly definitions. The flat, contour-closed illustrations harmonize with the tables and definition boxes.

Examples of graphics used in the website



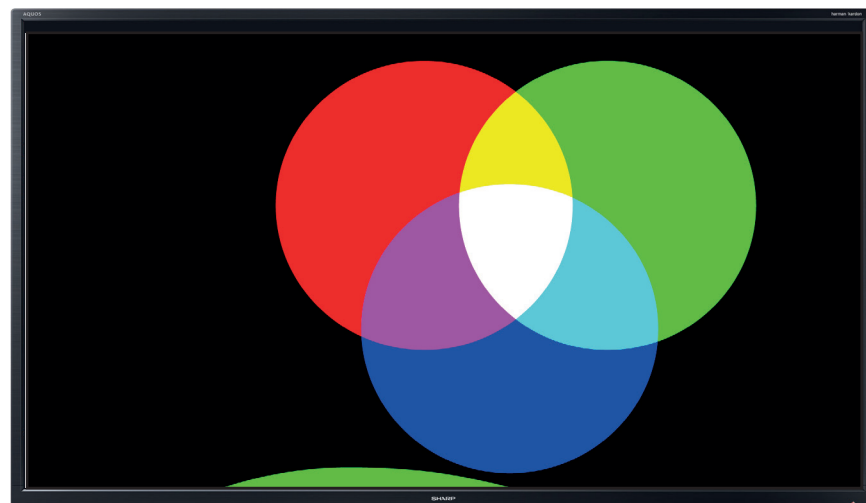
Examples of graphics used in the website



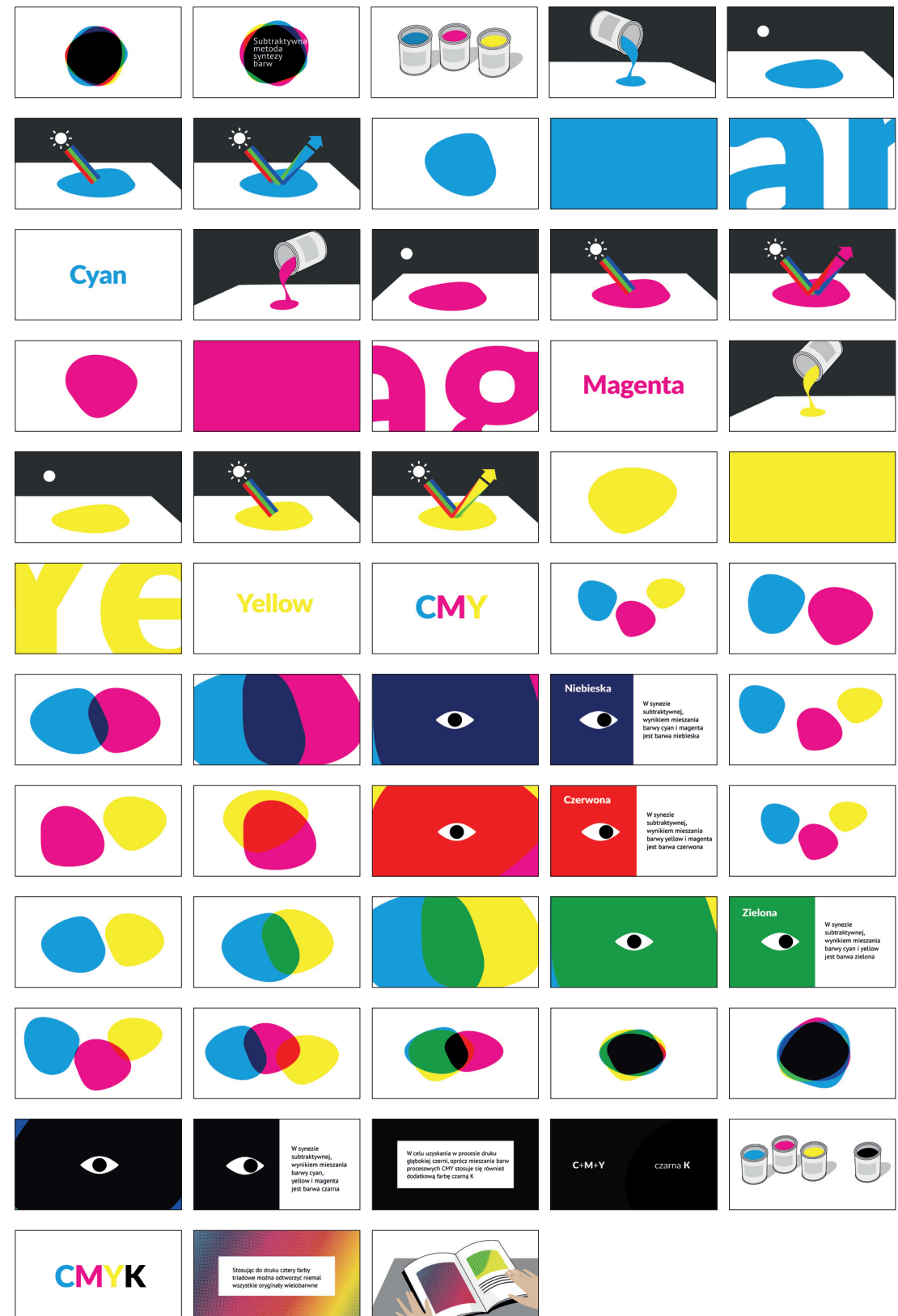
Animations

When it comes to illustrating the designed tool, the first idea that I wanted to work on was animation, or more specifically the possibilities that can be exploited with the use of animated images. I have prepared animated illustrations before, while teaching the subject of *Printing Techniques*. In my opinion, they work well for imaging, for example, the rasterization process or colour separation. I created them with the tools available in Adobe Photoshop. I took a slightly different approach when preparing animation videos explaining additive and subtractive colour synthesis along with the principle of printing on rotary machines. In a similar way, I prepared the individual frames needed for the animation in the flat design style using Adobe Illustrator. However, I had the animation made in Adobe After Effects in full-screen 1920 x 1080px. The soundtrack comes from a commercial website: www.front-music.pl.

Animation of Additive colour synthesis



→ Animation frames for Additive and Subtractive colour synthesis in Adobe Illustrator created by the author



Rasterization process
of a monochrome image



Rasterization process
of a multicolour image

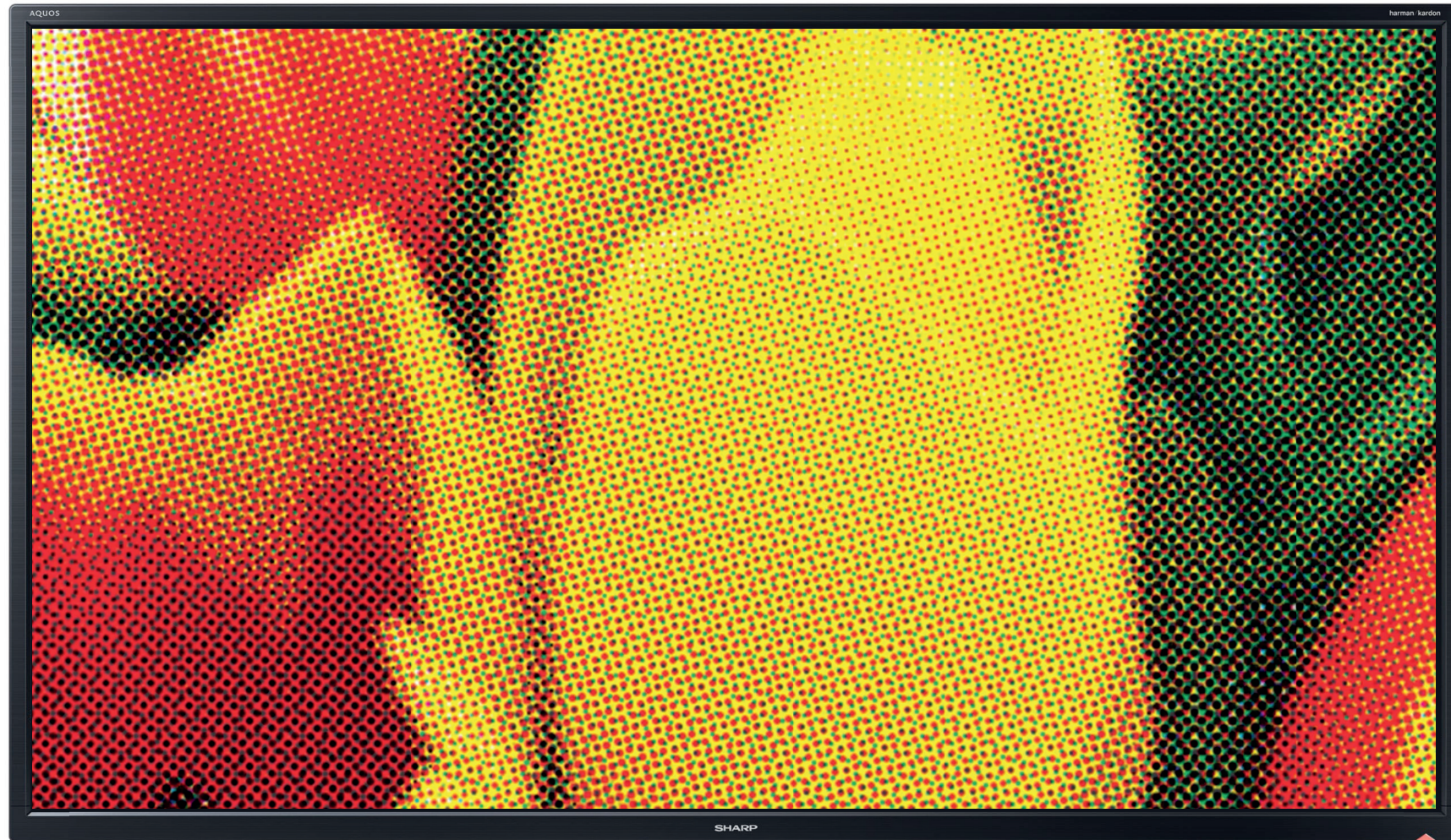


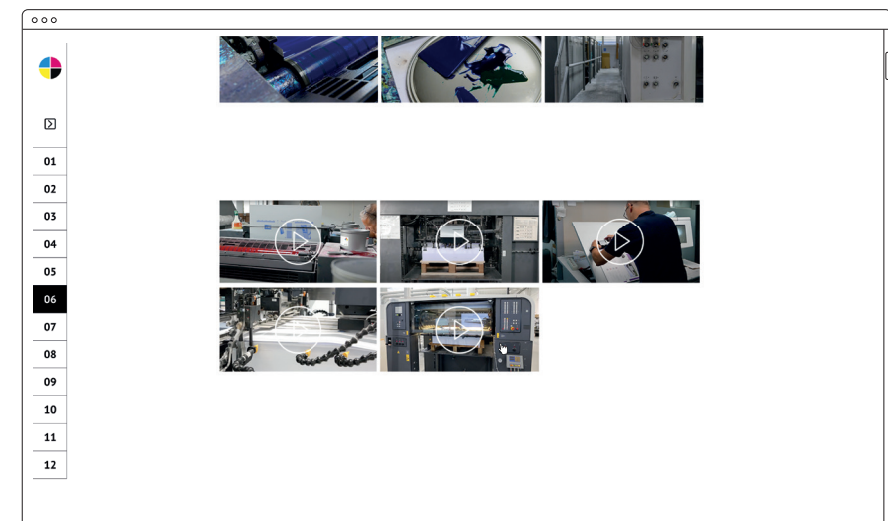
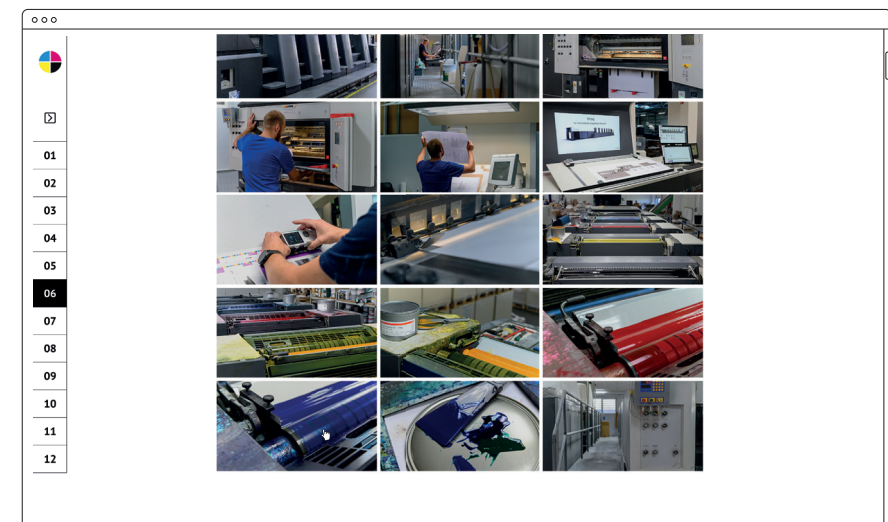
Photo and video gallery

My original idea was to prepare my own photo gallery of visits to printing shops. Therefore, I visited the *Millenium* offset printing shop in Debica and the screen-printing shop *Sitodruk Factory* in Tarnow.

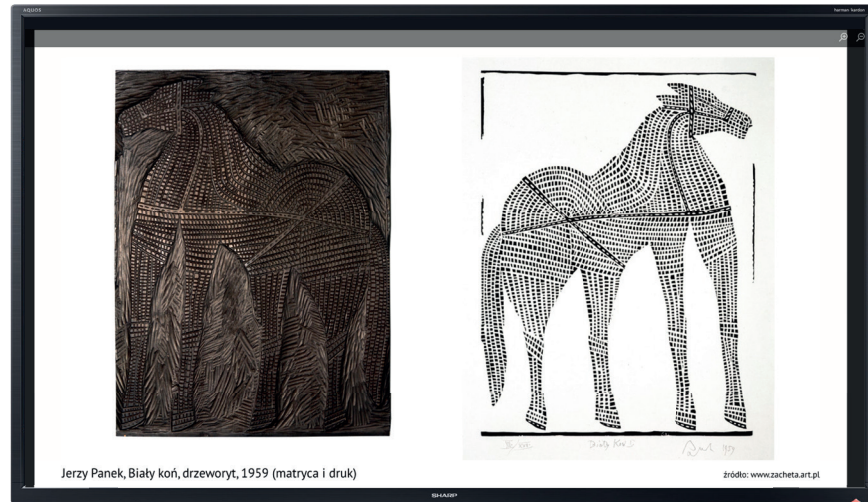
The photographs taken in these shops did not fully meet my expectations. During a regular working day, the printing shop does not create conditions suitable for photography. First, there's quite a lot of chaos and clutter that makes it impossible to take a clear photo. Moreover, some of the machines and equipment relevant to demonstrating a particular printing technique are not in use on the day of the visit. In my opinion, for the purpose of this project, it is better to use photos and promotional videos of various printing companies. Such photos are created in favourable conditions, most often during trade fairs or industry shows.

Photo and video galleries prepared for display are hidden under the thumbnails of the photos that make up the galleries. When clicked, they appear in full-screen size; slideshow display is possible. This allows to present the photos in any order.

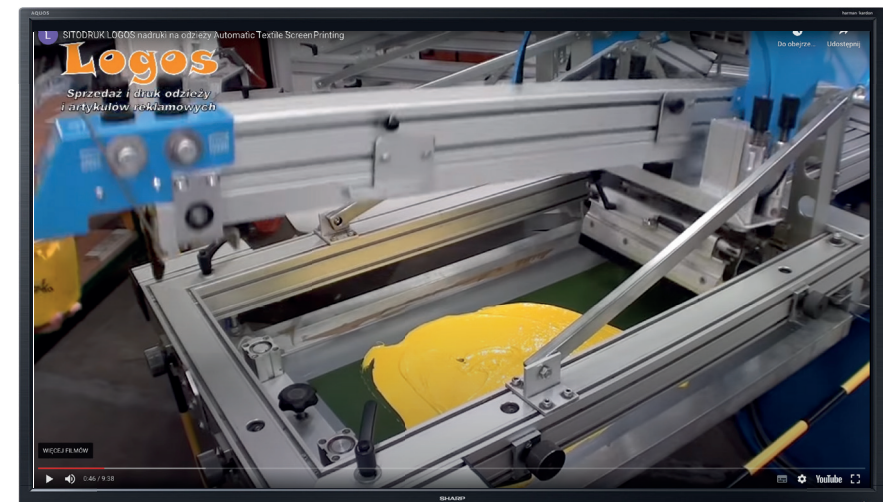
Thumbnails create photo and video galleries and allow any order of display



Displayed images



Films shown



SENDING THE MATERIAL TO THE WEB DEVELOPER

I hired a web developer to build the website. The technology chosen for implementation of the project was React.js., a JavaScript programming language library that allows you to create web applications using components.

The site is available at:

<http://t-poligraficzne.pl/>

login: akademia

password: poligrafia

IV. Summary

CONCLUSION

Developing a teaching tool in the form of the *Printing Techniques* website, proved to be a very interesting design challenge, during which I was faced with the need to find a graphic language to illustrate the content I wanted to present.

While working on the website design, I had the opportunity to use programs I hadn't used before. Interestingly, this process made me realize how much of my knowledge of book and magazine design is reflected in the design of electronic publications.

The key aspect that I had to face while designing *Printing techniques* website was finding solutions that would allow for clear demonstration of individual topics. A webpage, by design, is a medium focused on functionality and usability. These were also my assumptions while working on this project. I wanted the site to be easy to use, but at same time I wanted it to provide an original solution to a problem.

The webpage I designed was equipped with all necessary definitions, illustrations, animations, photos, and videos. Since the created tool is a digital environment, it is possible to expand, add or change its content.

Gathering all the elements in one place will ensure efficient delivery of lectures, presentation of photos and videos. It will also allow for easy reference to all teaching content, both in classroom and online mode of learning.

The designed website is a digital environment that serves as a teaching tool for the subject of printing techniques. It does not contain the whole teaching content but acts as a presentation during lectures.

The Printing Techniques website can be made available to students. It allows for an easy way to pass on material related to topics discussed during the lecture and when combined with the literature, provides a good basis for learning the subject.

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Scope of tasks outsourced:

Website development – Justyna Oleś-Bernacka

Additive colour synthesis, Printing unit: offset, rotogravure and flexography,
animation – Piotr Ostapowicz

Subtractive colour synthesis, animation – Justyna Gurbisz

Photos from Millenium printing house – Przemysław Sroka

PhD Disseration Outline:

Design and layout – Dorota Bernacka

Translated into English by Anna Mróz

ABSTRACT

The PhD dissertation, entitled *Basic Printing Techniques: Teaching Materials for Educators*, is a teaching tool, developed in the form of a website. The site does not contain the whole teaching content but acts as a presentation during lectures.

The main goal of the thesis was to develop a webpage that would be easy to use while conducting lectures and that the images presented would be clear to the students attending the class.

The webpage includes all the necessary definitions, illustrations, animations, photos and videos, and since the created tool is a digital environment, it is possible to expand and modify the content, supplement or replace it.

As a result of using an optimal number of graphic elements, the webpage design is clear, and the displayed content is visible from every place in the lecture hall. The site is simple in its design with a form resembling a slideshow, and textual information is edited into short definitions.

The design is based on an asymmetrical layout using a limited number of graphics and leaving quite a lot of white space, which results in good visibility of the displayed content. The rhythm of graphic elements also plays an important role in the site's layout, in addition to the black and white contrast, which makes the arrangement more interesting. The asymmetrical grid ensures coherence of the elements. The design of the site is highlighted by lines and outlines, which have their visual continuation in the choice of typography and graphics. Short texts and definitions are also enclosed by black outlines, forming black or white banners.

Developing a teaching tool in the form of a *Printing Techniques* website, proved to be a very interesting design challenge, during which I was faced with the need to find a way to transfer the teaching content into the structure of a webpage, as well as find an appropriate graphic form to illustrate the content I wanted to present.

The *Printing Techniques* website can be shared with students, which allows for an easy way to pass on material related to topics discussed during the lecture. Such a tool which gathers all the elements in one digital environment, will ensure efficient delivery of lectures and allow for easy reference to all teaching content, both in classroom and online mode of learning.

BERNASEY 13.07.2023

