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Design and development of a responsive website to enhance business potential - A case project for Penelope Art

Zlatil Zlatilov

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**Design and development of a
responsive website to enhance business
potential - A case project for Penelope Art**

Zlatil Zlatilov
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With the constantly increasing usage of internet all over the world, companies tend to expand their businesses to the web space. The main reason behind this is the fact that internet can become their most powerful marketing tool, bringing great and constantly increasing number of potential customers and revenues. Because of internet availability, customers can find products and services or get consultation over the web after a simple search on Google and a few clicks.

Penelope Art was launched in 2015 by Petya Ivanova, an expert in the fashion and beauty sphere. She has participated in many competitions both in Bulgaria and abroad and earned lots of prizes. Penelope Art is a company which has not been present on the web by now. However, it is one of the fastest growing businesses in the nail art industry located the city of Burgas, Bulgaria. The company offers high quality manicure procedures, aiming to provide their clients with great experience which leaves a mark in their customers' life for a long period of time.

This dissertation concentrates on the development process of a web platform for Penelope Art, based on the company's business strategy and their services, owner's needs, and wishes of their customers. This project considers the web design and development industry's mostly used practices performed by professionals in the workflow of many projects in this sphere. This work also focuses on the systems development life cycle and Waterfall as the main method used in this development work. Several qualitative data gathering methods were implemented.

This project was completed within the set timeframe. It resulted in a quality platform which meets all the defined requirements as well as trending web development standards. The development work of the platform is shown in detail, resulting in a project that has an incremental effect on the knowledge base.

Keywords: web-platform, content management system, theme development, case project

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Terms used

SME	Small and medium-sized enterprise
SDLC	Software Development Life Cycle
UI	User Interface
UX	User Experience
HTML	Hypertext Markup Language
API	Application Programming Interface
CSS	Cascades Styles Sheet
JS	JavaScript
DOM	Document Object Model
CMS	Content Management System
WP	WordPress
SEO	Search Engine Optimization
URL	Uniform Resource Locator
gTLD	generic Top-Level Domain
sTLD	sponsored Top-Level Domain
ccTLD	country-code Top-Level Domain
SSL	Secure Socket Layer
eCommerce	Electronic Commerce
HTTP	Hyper Text Transfer Protocol
HTTPS	Secure Hyper Text Transfer Protocol
FTP	File Transfer Protocol
SSL	Secure Socket Layer

1 Introduction

In today's world when every piece of information is available online and more and more people have access to the internet, the presence of a website plays a significant role for any company or business, no matter which industry they operate in. It is often seen that companies tend to update their websites on a regular basis in order to meet the frequently changing demands and expectations of their clients. Whether it is a small business company or a well-developed enterprise, websites should be the number one marketing and communication tool for companies, and there are many reasons why a company needs to get a website as soon as they start their operations.

Websites should support the business activities of a company. They are often used to showcase their products and services and advertise and expand their business activities to other markets. The goal of every for-profit business is to increase the annual revenue and gain new customers. All this combined helps a company to plan their cashflow better, in order to be able to invest more funds throughout the following years and to ensure a steady grow in the long term, as well as continuous development of their products or services.

It is often surprising how big is the number of companies that do not own a website. According to Telstra Small Business Intelligence Report (Smarter Business 2018), 50 percent of all SMEs around the world lack having a webpage. Several primary reasons have been identified why business owners do not want to invest into a website built for their company. Many of them do not understand the benefits which a website can offer. This might be due to lack of education or interest in certain sphere such as information technology, marketing, and especially the benefit of online marketing etc. They might also think that websites are often expensive, difficult to manage and time-consuming when it comes to writing own articles and creating own content. Many entrepreneurs think they need to be extremely tech savvy in order to be able to cope with their online presence. Finally, if business owners believe they have been doing just fine without having the need of a webpage, it can prove to be rather difficult to change their mind and get them to believe they need one. This is because they do not see the need of adopting a new trend until it is too late, and this is also the main reason why many companies fail to succeed, or they do not prove to do so well financially, as they had expected.

The lack of a website results in missing out on plenty of new opportunities and customers. Telstra Small Business Intelligence Report (Smarter Business 2018) shows that 62% of researched clients will stop considering a SME as a reliable source to buy from, if they cannot find information about the company online. According to Smarter Business (2018), 49 percent of the interviewees revealed that the reason why they continue using a particular company is the fact that they are able to purchase from them online. On the other hand, a badly

developed and clumsy looking website can make a business look unreliable and unprofessional. This will definitely turn customers off and will result in ruining the connection between the entrepreneur and their clients, therefore causing financial losses to the business owner. Having a well-built and search engine optimized website can showcase your products and services, attract new customers and create a trust factor among them.

1.1 The industry

Nail art is often referred to as the cosmetic beauty treatment, which has gained significant popularity since the invention of modern nail polish. Nowadays it is a popular trend across women on social media websites and platforms such as YouTube, Instagram and Pinterest. Following the it-salons and nail artists is an essential way to get inspiration from the work of talented nail performers and recreate it or even come up with beautiful and creative artwork which can be applied to fingernails and toenails by designing, painting and decorating the nails (Encyclopedia of Fashion n.d.).

1.2 The company

Penelope Art is a beauty studio located in Burgas, the fourth biggest city in Bulgaria. The company was founded in year 2015 by Petya Ivanova, a professional and ambitious make-up artist, who has gained extensive education in arts, drawing and painting. At Penelope Art the artists specialize in giving women the most beautiful and trendiest manicure by using the latest and most popular products available on the market.

Additionally, the professional nail artists at Penelope Art organize and teach at events and courses where their talented customers can sign up and participate if they wish to gain the needed knowledge base to be able to work as manicurists themselves in the future. At the end of each course, participants earn a professional certificate, which entitles them to a fresh and promising start in their new career as nail technicians or artists. Penelope Art aims to become the most popular beauty studio and the most advanced beauty academy in the city of Burgas, as well as to always have happy, returning and constantly growing clientele.

1.3 The project

After a discussion and in-depth analysis with the client and owner of Penelope Art, several challenges were identified. As a steadily growing business, the company needs to amend their current marketing strategy and implement a new one which aims at being more present and engaged in online activities such as promotional material and better visibility and availability to their clients, in terms of improved communication and reachability. As part of this new market penetration into the online world, Penelope Art would greatly benefit from a well-maintained and up to date webpage.

Currently, the company has functional accounts on Facebook and Instagram social networks, however they would inevitably benefit from a more professionally-made platform, to provide their present and future clients with essential information about the company, their services and products offered, working hours, their prices, as well as a more efficient implementation to collect feedback from customers and be able to establish good communicational channel through the website. This project should result in a complete and working final solution for Penelope Art. It needs to be implemented within a timeframe of 6 months.

1.4 Project goals

The main objective of this project is to design and develop a modern web-based platform that meets the requirements of both, the owner of Penelope Art and her clients. Such objectives are displaying of their work, services, events and courses as well as letting the customers to submit their queries for them using a contact form. The website's main objectives are shown in Figure 1 below. The desired platform is to give the growing business the opportunity and ability to reach new potential customers in the long term.



Figure 1: Project requirements and customer's needs

The project has been executed using the latest technologies and web development standards for good user interface (UI) and user experience (UX). This involves the utilization of a beautiful layout, appropriate for Penelope Art color scheme and responsiveness on all devices, delivered to the client using the front-end framework Bootstrap 4. This template will then be linked to WordPress which is a powerful content management system (CMS) that manages the back-end functionality of the website. The whole case study and its goals are divided into

smaller bits and pieces in order to be well understood, monitored and implemented. Continuous discussions have been held with the client in order to keep better track and monitor what was agreed and discussed during the meetings. The timeline for this project is set from 1st of June to 31st of December.

1.5 Project risks

Every project comes with certain level of risks. There are many challenges which can occur throughout the development cycle of a website. Some of them could be related to the unclearly defined or often changing requirements of the client. Others could be related to the restricted time availability of the client. There could also be time management issues, postponed deadlines and high costs of tools, plugins or support needed after the release of the project in order to maintain it.

Furthermore, in many of the bachelor's degree projects students face difficulties due to lack of knowledge and experience in the web development field. In order for this not to happen, a good level of risk management should be planned and implemented. Predicting the risk helps the parties involved to expose, analyze and approach the problem in the early stages, while ensuring the successful accomplishment of the project and achieving the objectives of the client despite the various difficulties and challenges that can disrupt the desired outcomes. This could happen with the help of a risk management plan, risk identification and qualitative risk analysis (Shelly & Rosenblatt 2012).

There is no doubt that project risks were involved in this development work as well. Lack of experience in extracurricular activities, and lack of client's knowledge in this field added additional stress and pressure to the implementation flow. Luckily, the client was keen to learn about the workflow, and was present during all interviews despite their busy schedules. Whenever the developer had to talk about design or approval of features, the client was more than happy to attend the interviews and help in whatever way possible.

2 Research methodology

Research methodology is the process of collecting and analysing data on a specific topic which affects and eases business decision making while helping to find the most suitable and effective solution to a certain business problem.

In dissertations, the research methodology allows the correct evaluation of the reliability of the topic to be determined. In the business world, research methodology is used to test out and evaluate new business ideas for a company (Lapan & Quartaroli 2011). Generally, it answers two questions, how the data was collected and how the collected data was analysed. Research methodologies are divided into two broader types - qualitative and quantitative.



Figure 2: Qualitative versus Quantitative research designs

Figure 2 illustrates common examples of qualitative research data collection methods such as one-on-one interviews and focus groups, case study research and more. On the other hand, comes the quantitative research, under which fall research methods such as questionnaires, surveys conducted online, observations, etc (Figure 2).

2.1 Qualitative research

Qualitative research is an approach for providing more specific and detailed information about a particular subject. It is focused on in-depth data collection and the amount of people participating is not of crucial importance. The essential mode through which qualitative research is applied, is an interview with open-ended questions (Lapan & Quartaroli 2011).

The data collection in this development project was carried out implementing qualitative research. This project required an in-depth analysis about the company and their website needs. Together with the owner of Penelope Art, these business requirements were designed, studied, analyzed and improved in order to offer their clients a user-friendly platform that has great functionality and exclusive and custom to Penelope Art design that their clients will love.

2.1.1 Interviewing

Interviews are a common data collection mode where an interviewer and a respondent are present and participate in a direct engaging conversation. It is considered that the one-to-one conversations are a better way for collecting more specific information than questionnaires, because conversations provide the opportunity for coming up with additional questions during the interview if the interviewee provides a rather vague answer during the discussion, additionally it allows the interviewer to make observations and conclusions (for example if a person is being truthful, nervous, calm, etc.). Interviews also make the examiner compile data

swiftly, since the interviewee does not have to spend time on reading and assimilating the questions. The majority of the questions asked in the interview's surveys are open-ended, which require answering in the interviewee's own words, but there can also be close-ended ones (Lapan & Quartaroli 2011).

During the thesis development, regular interviews were scheduled with Penelope Art to identify and better understand their requirements and needs. Interviews were the main way to approach the client regularly and talk about the desired outcome, the goals, the timeframe and the results of this project, as displayed in the interview process flow on Figure 3 below.

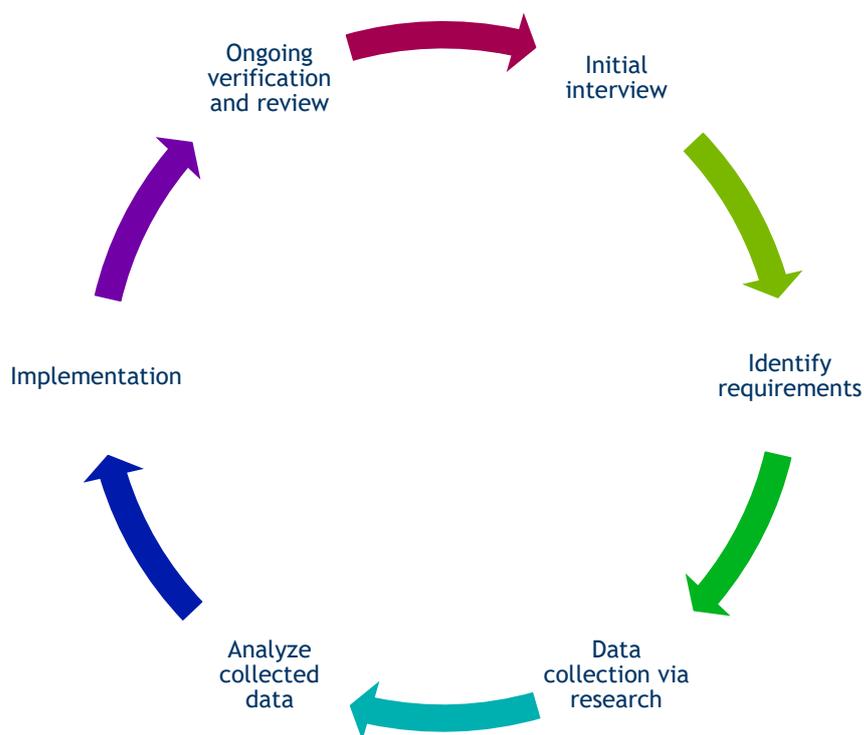


Figure 3: Interview process flow

During the interviews with the company, some extra features were identified, further discussed and considered to be added as a part of this project. These features include a section with partners they work with and their logos, and a carousel to drive traffic to specific pages and interactive tabs including photos which showcase their work. These features make the website look more professional, user-friendly and allow the business to better monitor and follow the website's visitor history. Further information about the interviews, discussions with the client and collection of requirements can be found in sections 4.1 and 4.2.

2.1.2 Benchmarking

Benchmarking is often associated with business, as the process of comparing two or more companies, products or services in a certain industry under a controlled environment. The

most typically measured dimensions in benchmarking are quality, time and cost of the change. Benchmarking considers the process and analyzes the best practices and properties to indicate their performance metrics. The benchmarking results can support the planning phase, selection of steps which will be taken and the delivery of a newly born project (Niva & Tuominen 2011).

In this project, benchmarking was used to compare several websites in the nail art industry and to see what example features combined together will work best for Penelope Art's business activities. The results were carefully studied and further analyzed to provide the owner of Penelope Art with the most efficient features which have been used by other nail artists on their websites. These features were then brought to the client and implemented after the approval of Penelope Art, which was also a part of the thesis requirements discussed with the supervisor. When applied in practice, these features provide great customer experience and enhance the recognition of Penelope Art as a professional brand on the market. Further details about the benchmarking process can be found in section 4.2.

2.1.3 Service design

Service design in business is often identified as the entire process to exemplify a project with the help of visual representation and visualization techniques. In its essence, it aims to create new or improve existing services making them more user-friendly for customers and more efficient for companies. There are five essential elements which form service design. These are user-centered (i.e. customer participation is crucial, services are made for the sake of customer's satisfaction of needs), co-creative (i.e. services are made with the help of other stakeholders), sequencing (i.e. services are well visualized with the help of key moments or milestones in the customer journey), evidencing (i.e. services should leave positive evidence or artefact of the experience on the customer's mind) and holistic (i.e. services should take into account customer journeys, considering various perspectives and touchpoints to provide customer satisfaction) (Stickdorn 2011). To be able to fully understand this project, and its demands, a service design concept was considered after the planning phase of the project when the problem was clearly identified with the help of the client and her requirements and needs. The service design should be clean, well-structured and described in detail. To implement service design in this thesis, a prototype of the final product was created, containing the customer's needs, and illustrating the entire process from the client's first interaction with the website to the very end (Figure 4).



Figure 4: Service design customer journey for Penelope Art

Service design has helped the developer and the client better understand and preview the user interface, functionality, and system architecture of the web platform, and have assisted to draw the final conclusion after this first-hand experience with the product.

2.1.4 Case study

In business and social sciences, a case research or case study is referred to as extensive, close and in-depth exploration of a subject in a specific context. Case study methodology can be applied as a research strategy type in both quantitative and qualitative analysis. Three main types of case studies have been identified - exploratory, descriptive or explanatory (Gillham 2000).

In this thesis a case study was implemented as a method for gaining and achieving extensive understanding of the case subject's processes and the core of their business activities. Case study methodology has been applied as part of the project's qualitative research, which has given an in-depth perception of the nature of the problem being investigated and resolved with the implementation of this project.

2.2 Software development life cycle

The software development life cycle (SDLC) is a generic process which lies in the middle of most software projects developed worldwide. According to Dawson (2009), SDLC consists of five phases - requirements, design, build, test and implement, as shown in Figure 5 below:

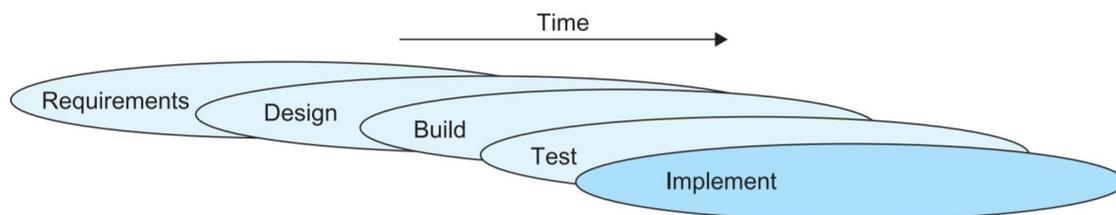


Figure 5: Software development life cycle phases

Therefore, SDLC is the process of taking customer's requirements, analysing them, designing a solution to the problem defined in the requirements, and testing that system on a computer. The result of SDLC should be correctly working and bug-free code which meets or exceeds the expectations of the client. All this should happen within a certain timeframe and budget (Dooley 2011).

Deepening on the development approach, each model may have different number of iterations, and consist of varying tasks and time to complete them. Software development models can be used for a complete build of a new project or improvement of already existing part of an old project. There are many options for development of systems but some of the most popular SDLC models are waterfall, incremental and agile (Dooley 2011).

2.2.1 Waterfall method

Waterfall is a linear software development model. It consists of 5 straightforward iterations including systems planning (i.e. describing the problem and investigating needed changes), systems analysis (i.e. gathering of product requirements using interviews, observations and other data gathering techniques), systems design (i.e. designing a physical product that covers all the specified requirements), systems implementation (i.e. coding, testing and releasing a completely working platform) and systems support and security (i.e. testing and fixing the bugs, applying security measures to make the system reliable and maintaining it) as illustrated in Figure 6 below. As a result of each phase, there should be deliverables and milestones completed, used to measure the progress of the project (Shelly & Rosenblatt 2012, 21).

In short, waterfall model is time-saving and well functional due to its rigidity. Once implemented, it has been proven to be easily analysed and testable.

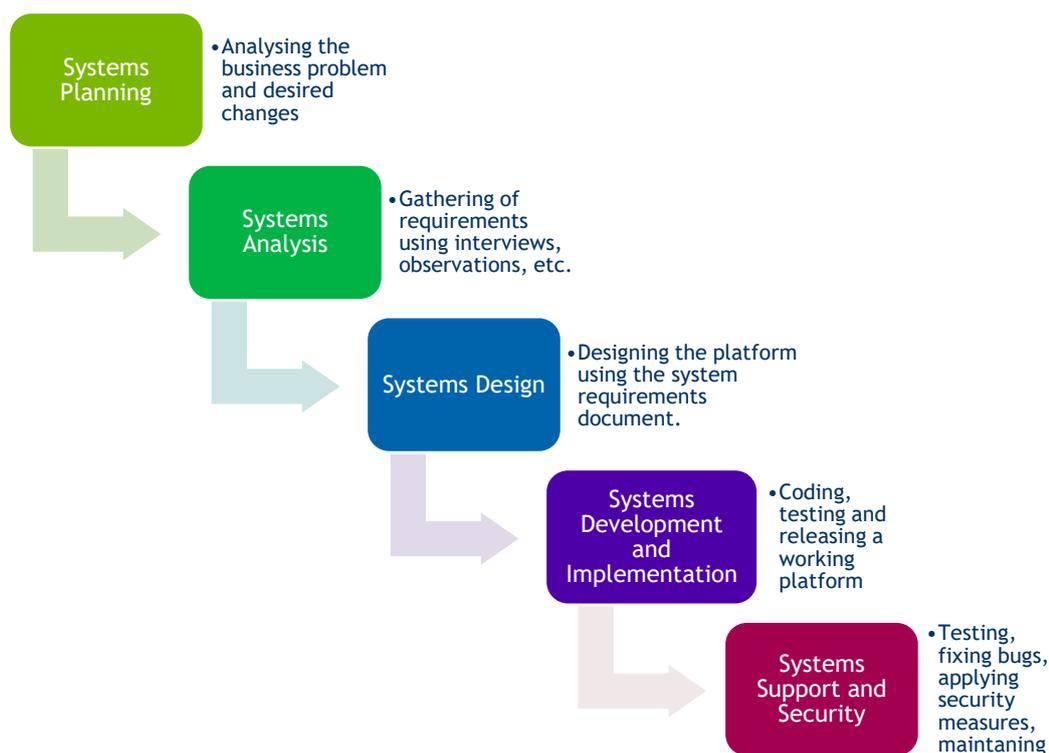


Figure 6: Waterfall model illustration

Waterfall model was used in the implementation of the system for Penelope Art because it is a project which has a set of clear and well understood requirements, which should be done within a set timeframe. It is not a constantly ongoing project and once completed, the website will only need regular maintenance and update of content. Thus, waterfall model can be seen as a great choice for the implementation.

3 Used technology and tools

This section focuses on the web development tools and concepts used in this project and the theory behind them. Each of these technical tools took place in the Waterfall model's iterations described in section 2.2.1, and each of them plays an essential role in this project. In this chapter it is also identified how the specific concepts were chosen and what is their purpose for completion of the case project.

3.1 Use case

Use case is a sequence of steps showing how an actor interacts with the application to achieve a certain goal under certain conditions. Use cases are represented with the help of use case diagrams. Each diagram includes stakeholders (i.e. the actors), use cases (i.e. the actions) and lines which connect them, showing the relationship between the actor and the action (Oracle 2007). Use case diagrams should illustrate all the possible user types and system activities which can be performed by the actors. Figure 7 by Oracle (2007) shows an example of use case diagram:

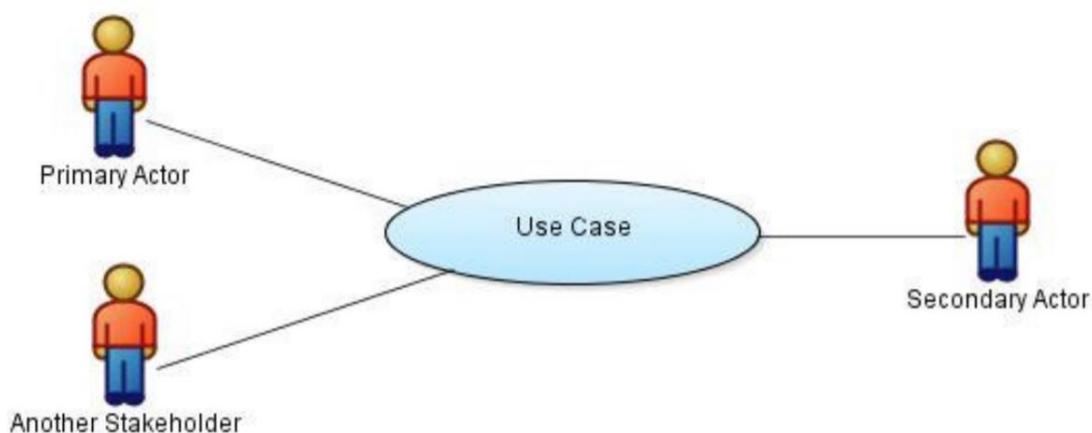


Figure 7: Use case diagram example

3.2 Wireframe

Every project starts with a small sketch to follow. Same goes with wireframes in design and development projects.

Wireframe is a term coming from the web design industry and can be described as a simple diagram-like blueprint which forms the skeleton of a website. The purpose of wireframes is to represent visually where different parts of the website stay. This includes the general layout (e.g. header, footer, sidebar), content (e.g. logo, text, images) and functionality (e.g. sliders, social media, navigational links). They help both the designers and the clients to visualize how the interface design of a website may look (DiFeterici 2012). Wireframes usually lack font styles, colours and graphics, but in some cases, these could be added as well.

Wireframes can be often seen in the form of pencil drawings or whiteboard drawings. However, there is also plenty of free and commercial software applications which can help to make wireframes in a few minutes time. Some of these are Balsamiq, Axure RP Pro and Adobe Photoshop. Figure 8 by DiFeterici (2012, 70) below shows an example of a wireframe of a website:

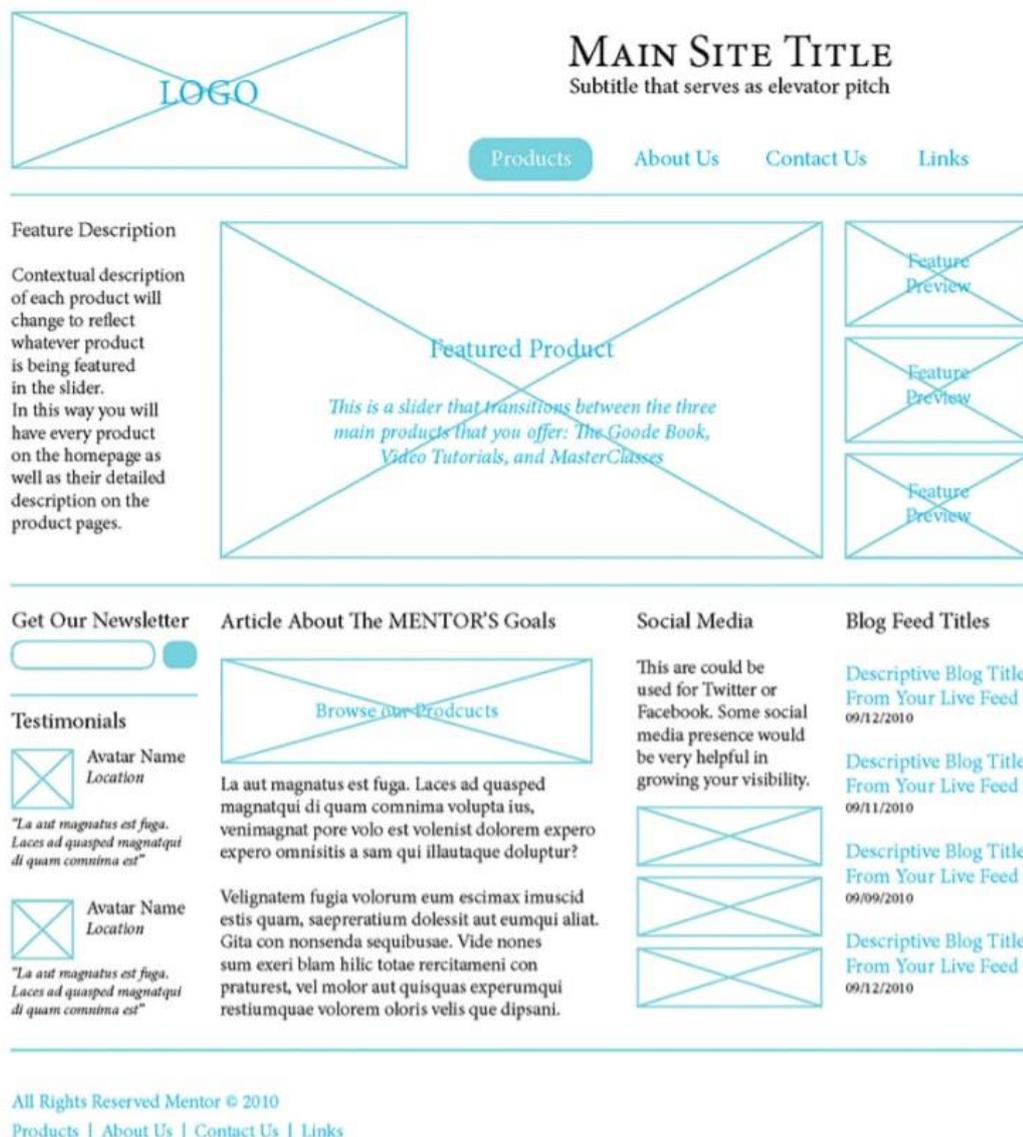


Figure 8: Example of a wireframe in web design

3.3 Photoshop

Photoshop is broadly known as an image-editing software for both Windows and macOS. It allows users to create and modify images by rotating, cropping and resizing them. In Photoshop there are also more complex manipulations which can be done to an image such as changing the contrast of the image, retouching, applying filters and patterns, combining different elements from various photos, drawing shapes, including text and many more (Starks 2012).

In the website development process, the use of Photoshop takes an essential part as it focuses on the visual representation of the user interface (UI). It involves the creation of website mockups and individual website elements with the help of templates, grid systems, icons, graphics, images and fonts. Today's modern web design workflows also include the responsive part of a website which can be also illustrated in Photoshop. Successful Photoshop designs make the coding process of a website straightforward as the developer has complete design to follow. This helps with the time management and no divagation of the project.

3.4 HTML

HTML (Hypertext Markup Language) is a mark-up language easily readable and understood by humans and computers. It is used for the creation of the skeleton of web pages and applications with the utilization of tags and elements. Examples defining some HTML elements could be headings, paragraphs, sections, tables, navigational links, images, etc. A big step up was the release of HTML5. The goal of HTML5 was to introduce the developers to the application programming interface (API) and allow them to go deeper into the creation of complex software applications by providing them the major building blocks which need to be put together to form an application. HTML5 also relieves the utilization of multimedia elements by adding extra tags and helps to render them easily in the browser (Fajfar 2015).

3.5 CSS

CSS (Cascading Style Sheets) is a computer language that takes part of the visual representation of documents written in a mark-up language. HTML and CSS are the two main technologies forming the appearance of web pages in the browser. CSS tells where on the page the HTML elements should be displayed as it takes care of the layout as well as fonts, colours and other aspects of the application. Using CSS in a project allows developers to have different stylesheets used for different visitors and devices (Fajfar 2015). Nowadays, developers use CSS frameworks which ease the development process of a website or application by making it easier and time saving. Frameworks contain a bunch of pre-defined code snippets and allow the developers to reach them using only a few lines of code. Some of the most well-known CSS frameworks of 2018 are Bootstrap, Foundation, Materialize, Semantic-UI and more.

3.6 JavaScript

JavaScript (JS) is a programming language that adds interaction rather than just static content to a webpage or application. Such motions could include interactive maps, pop-up boxes and messages, dropdown menus, animated graphics, multimedia, etc. JavaScript is used in web development projects because it allows the developers to dynamically modify and update the static HTML and CSS code and display it to the screen of the user using the DOM (Document Object Model) API in the browser (Fajfar 2015). Because JavaScript has a bit more complex structure than HTML and CSS, communities and developers have worked together

and come to a solution and it is to build JavaScript frameworks and libraries. Nowadays there are numerous JavaScript libraries and frameworks coming to live every month. They are suited for different purposes and needs and there is no perfect JS framework for every single project. However, among the most popular JavaScript libraries and frameworks are jQuery, AngularJS, ReactJS and Vue.js.

3.7 PHP

PHP (Hypertext Preprocessor) is an open-source scripting language working on the server-side of a website or application. It needs to be run on a web server or a personal computer at home which has a valid and working PHP installation. PHP is widely used because of the many powerful functions it has to offer. It allows the developers to collect data and form inputs of users, store data into a database, take data from the database and display it to UI, create dynamic content and pages and many more. PHP is working in pair with HTML, CSS and JavaScript to deliver such functionality and automation to the world (Valade 2009).

3.8 MySQL

SQL is the abbreviation for structured query language and it is the standardized language a computer or developer uses to enter a database. MySQL is the world's most popular database management system. It is an open source software, developed and launched by the Swedish company MySQL AB in 1995 (Valade 2009). MySQL works very well in pair with PHP, allowing the developers to manage the relational databases. This means that all the information that PHP processes is stored into a structured collection of data where every piece of information has a certain tag and category associated with it. In relational databases such as MySQL, the data is stored into tables which consist of rows and columns. When it comes to storing data, there could be different database alternatives to MySQL such as Oracle Database and Sybase (Valade 2009). In short, MySQL could be a great choice for building website and web applications because of its reliability, scalability and fast delivery of the database results.

3.9 Content Management System (CMS)

Content management system is a platform used to create and manage content on the web (Sabin-Wilson 2014). There are many CMS providers on the market. Some of them are free, others are paid. Depending on the needs and the budget of a business, the functionality and the options that a CMS offers may vary. Major functionalities which people look for when searching for the perfect CMS are quick and easy maintenance, vast availability of themes and plugins, strong security, regular updates, search engine optimized, mobile ready and more. Some of the most popular content management systems are WordPress, powering 59.9 percent of all the CMS websites on the internet, followed by Joomla with 6.6 percent and Drupal with 4.6 percent (Mening 2017).

3.10 WordPress

As mentioned earlier, WordPress is the most popular content management system used today. It is open-source software based on PHP and MySQL and was founded in May 2003 by Mike Little and Matt Mullenweg (WordPress n.d.). Back then, WordPress was utilized only as a blogging platform. Today, it can be transformed to anything due to the large community supporting it and the big variety of themes and plugins developed specifically for WordPress. There is no restriction for the types of websites one can build with WordPress. This includes business websites, web stores, question and answer websites, portfolios, auctions, social networks and many more (Sabin-Wilson 2014).

3.11 Domain name

Domain name is a sequence of characters put together to define the address where a website can be found. All domains have a domain suffix which is assigned at the end of the domain name. Each suffix has a certain purpose and meaning. Some of the most common generic top-level domain extensions (gTLD) are .com classified with for-profit corporations, .net used with networks or technology-based companies and .org intended for non-profit organizations. Similarly, there are sponsored top-level domains (sTLD) such as .edu used in degree-granting institutions and .gov assigned to government-related websites. There are also country-code top-level domains (ccTLD) such as .us used in websites of the United States, .uk in the United Kingdom, .de in Germany and so forth. Depending on the domain extension, the price of the domain may vary (Miller 2017).

3.12 Web hosting

Web hosting is a service which provides the space for websites and web applications on the Internet. These websites and applications are stored on servers which are used specifically for hosting purposes. When a user types the URL of a website into the browser, their computer will try to connect to the server where the website is stored and access the page (Website Solutions n.d.). There are different web hosting plans where the storage space on the Internet may vary. Also, paying more for a hosting plan will offer some more features as well. Such features could be unlimited email accounts with their domain name (e.g. support@domain.com), FTP access allowing the transfer of files from local computers, greater bandwidth connection, better support, good load time and many more. According to Stevens (2018), some of the most popular and reliable web hosting providers are Bluehost, HostGator and GoDaddy.

3.13 Security

Protecting the data of companies and their users takes a crucial part in web development. Depending on the type of web platform (i.e. eCommerce, blog, portfolio, online community, etc.), and the type of information the company collects from their users (i.e. credit card

information, name, social security number, etc.), special measures need to be taken into account to secure the data users provide from anonymous hackers. Injecting malicious code and malware into WordPress themes, plugins and outdated files is a common practice performed by hackers (Sabin-Wilson 2014). Therefore, platforms must be well secured and updated, whenever a new update is available. Another step is to secure the web platform with SSL which stands for secure socket layer. SSL is a security technology establishing an encrypted connection between the browser of a user and the web server. SSL connections can be easily recognized from the prefix of the URL of the web page which the user is viewing. Secured pages start with “HTTPS” instead of “HTTP”, where this extra “S” at the end stands for “Secure”. It is also a good idea to back up the theme files and the database on a regular basis insuring that months or years of content is safe and can be restored in case something goes wrong. According to Sabin-Wilson (2014), installing a malware scanner plugin with malware, spam and blacklisting capabilities is also a good option to consider. An example which the writer recommends is Sucuri Sitecheck Malware Scanner.

4 Outline of the project

This is the phase where the development work of the actual platform starts. The model used to perform this project is Waterfall and it consists of 5 iterations - planning, analysis, design, development and implementation, and support and security. Each of those iterations should be well considered and fully agreed with the client before the next phase begins. This is because there is no option to go back and fix something that is already implemented into the project.

4.1 Planning

The whole outline of the project began by collecting vague ideas about possible implementations, from which the client would benefit the most. Furthermore, careful system planning and contact update discussions with the client were needed in order to give a less broad and more focused goal of the project, the company was analysed, the needs of the client were gradually identified, and the implementation strategies and tools that this would require were discussed. This thesis project was intended to solve a problem, specific for the company, with strategic planning customised for the client.

An initial interview over Skype was held with the owner of Penelope Art on 9.2.2018 where she stated that they would like to run a new marketing strategy campaign which they were hoping would help them be more present and engaged with their clients, in terms of promoting their nail polishing services and learning courses as well as providing better communication channels for direct contact and feedback. The owner Petya also mentioned that with the huge and constantly increasing interest for their professional nail art courses, the company

has great potential to become the best Professional Academy and also services provider in the beauty industry in the city of Burgas.

Further investigation showed that making Penelope Art more present on the internet while bringing out their services, courses and pricelist for potential customers will make Penelope Art a more trustworthy and preferred by the clients' brand. Additionally, customers from other regions than in Burgas will have the possibility to become customers of Penelope Art since the website will be on the internet and potential clients will be able to find it with a simple search on Google for example. Furthermore, the company is currently over-loaded with customers phoning constantly, which ideally would be resolved once all the frequently asked questions and information are available and displayed onto the website. The desired outcome for the owner of Penelope Art and their workers were to focus less on impatient clients and rather concentrate better on their work and services instead. Figure 9 below shows the discussed information and requirements throughout the interview on 9.2.2018 with the owner of Penelope Art:

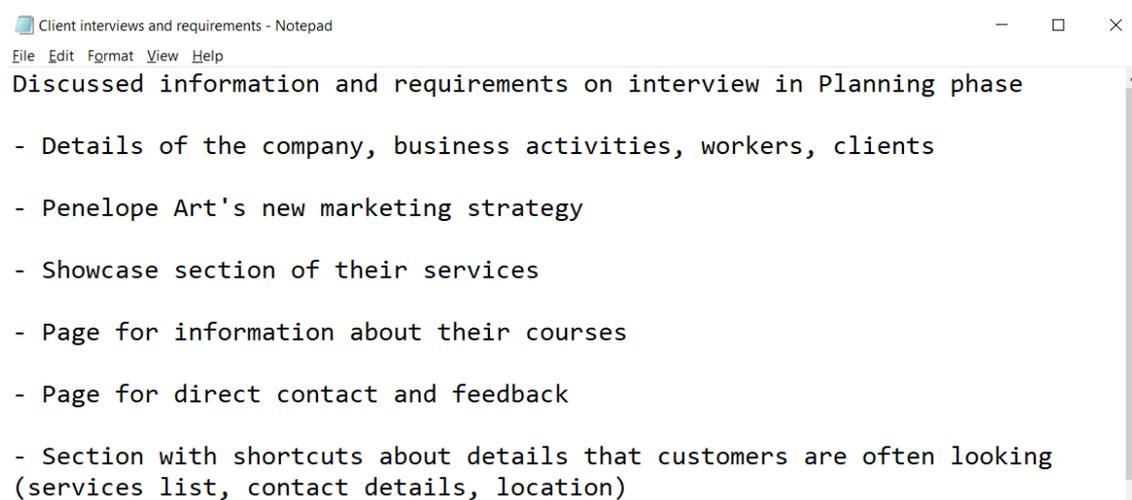


Figure 9: Discussed information and requirements on the interview with Penelope Art

Possible solutions for the design and development of such website have been discussed previously between Penelope and several digital agencies during the planning stage of the project. However, they have been offered a rather high price for the implementation of a similar platform, which Penelope Art is not yet able to invest at this early stage of their business. This is what led them to postpone such a project for the future and in the meantime to look for a freelancer or a student who would be able to do the job for less while challenging their knowledge and abilities into the project.

4.2 Analysis

The first phase of the waterfall model began with identifying the company's business activities, current challenges and listing of some of the possible desired outcomes which the

customer would be happy with. Later on, the website's in-depth requirements were gathered and carefully evaluated in terms of both the design of the website and the expected functionality of the final product with the help of interview discussions with the client, the project worker's own knowledge and observations, and common information gathering techniques, such as familiarizing one's self with the platforms which are already out there.

The two major methods for collecting the requirements in this phase were interviews with the owner who is an expert in the fashion and beauty industry herself, and investigations and data collection via exploring different websites in the fashion and beauty industry to see what sections, features and functionality these webpages commonly use, and how they are constructed in terms of layout and positioning of the different elements. Furthermore, benchmarking was considered as another requirement collection method for outlining the industry's best practices and gaining additional knowledge before meeting the client face-to-face for the final decision of the requirements and desired outcomes of the project.

An interview with the client was held on 4th of June 2018 over Skype. The purpose of this interview was to show the client the findings from the first fashion and beauty websites' investigation and to discuss her wishes concerning the outcomes and expected functions of the website. During this interview, the client's common demands were identified and listed in a system requirements document. These prerequisites were related to the layout of the platform as well as the desired colour scheme and partly the content the client wished to see onto the initial platform. Figure 10 below shows the discussed information and requirements on the interview held on 4th of June.2018 with the owner of Penelope Art:

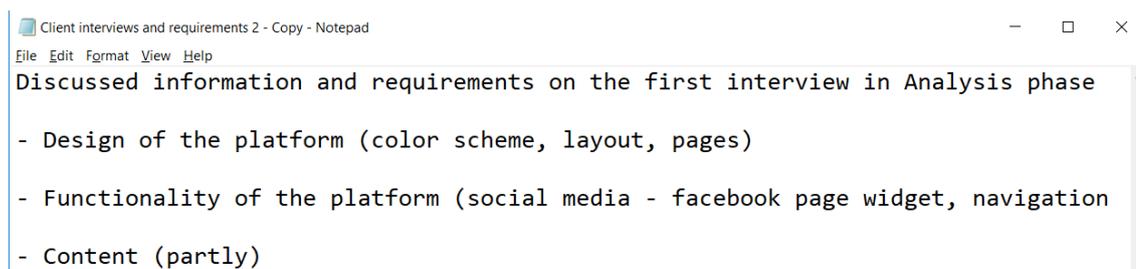


Figure 10: Topics discussed during an interview with the client on 4th of June 2018

The second and final requirements gathering meeting happened face-to-face and was held on 15th of September 2018. During the discussions, the features and functionality of the platform were defined. After a strictly conducted benchmarking process, the client was informed about the best practices of the fashion and beauty industry used by their competitors. Additionally, the client was provided with opportunity to explore together with the project worker several different websites which the developer had previously studied, from where the client had possibility to choose what kind of example features to be included in her own website. The final choices were complied with the time frame of the project, the deadline,

and the skill set of the developer. Figure 11 below shows the discussed information and requirements on the interview held on 15th of September 2018 with the owner of Penelope Art:

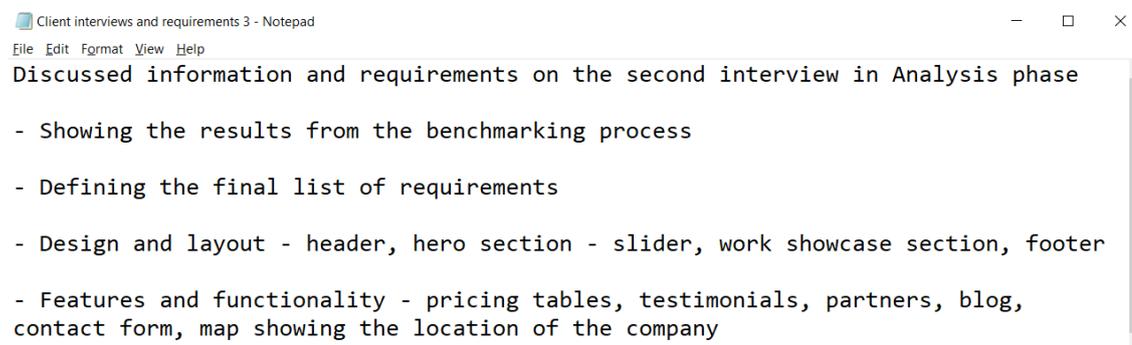


Figure 11: Topics discussed during an interview with the client on 15th of September 2018

The benchmarked examples for this project were the websites of Venera Fashion Studios and Nail Art Studio. Figures 12 and 13 show the user interfaces of the websites used in the benchmarking process:

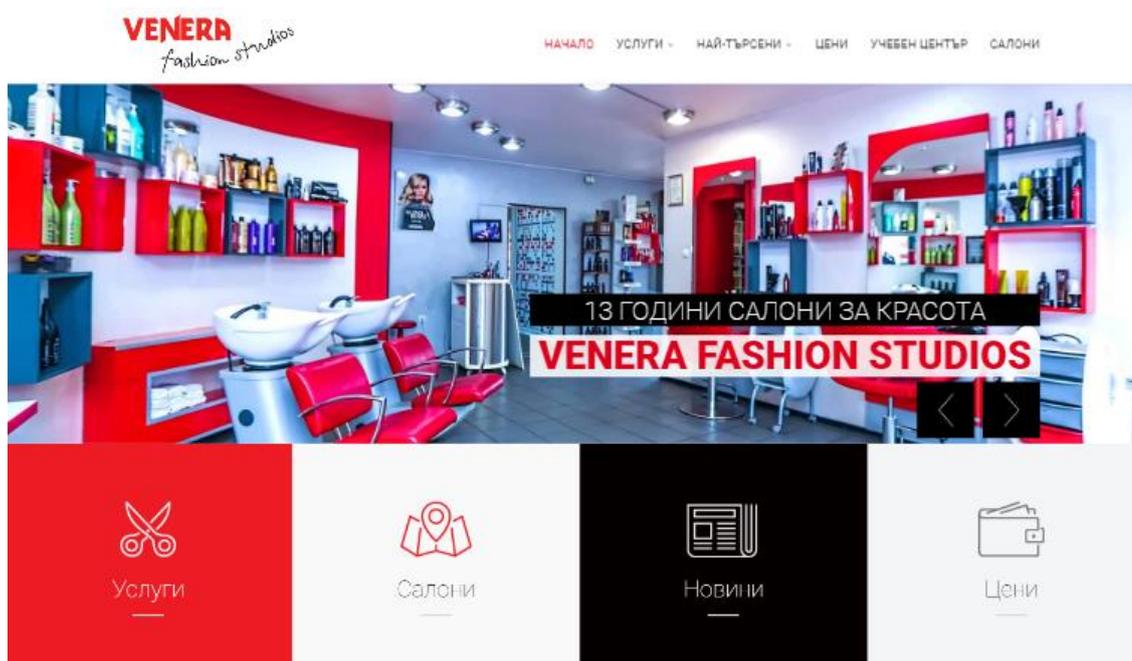


Figure 12: Benchmarking the website of Venera Fashion Studios

НАШИ РАБОТЫ В

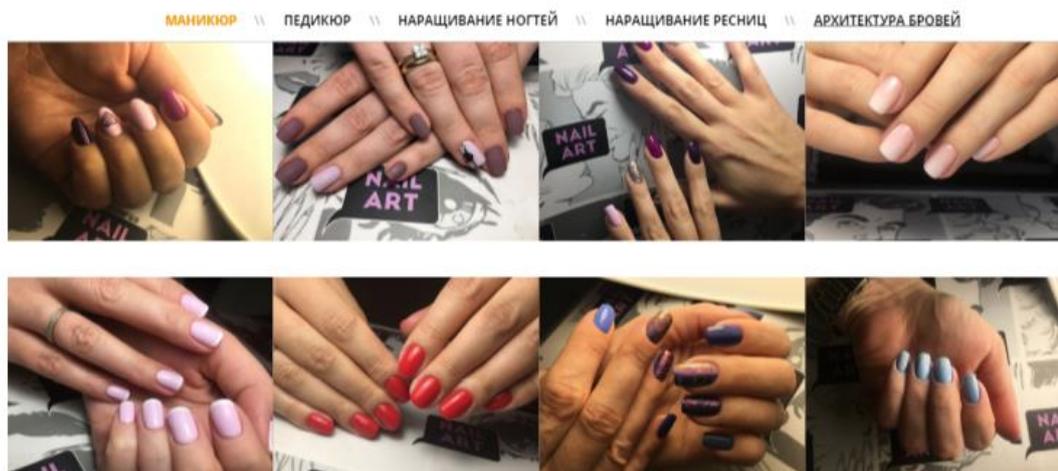


Figure 13: Benchmarking the website of Nail Art Studio

These two interviews were crucial to the client in her decision-making process about what her expectations would be. Since the client had no previous experience with website design and development processes, she had a vague idea about the whole system development process. The samples found through benchmarking provided her with the courage to choose the features herself and provide feedback on what the developer had suggested. Lastly, during this final face-to-face interview on 15.9.2018, both the client and the developer had the chance to agree on the final list of requirements which would be displayed on the design of the platform as well. Table 1 below shows a summary of the interviews held with the client and the covered topics:

Date	Topic
4.6.2018	<ul style="list-style-type: none"> - Showing findings from developer's fashion and beauty websites' investigation - Discussing owner's wishes about outcomes and expected functionality of the web platform - Defining layout of the platform, colour scheme and part of the content
15.9.2018	<ul style="list-style-type: none"> - Informing the owner about the best website practices of the fashion and beauty industry - Exploring several websites together with the owner to show her the findings - Agreeing on the final list of requirements together with the owner of Penelope Art

Table 1: Summary of interview dates and discussed topics with Penelope Art

4.3 Design

Once the requirements were finalized, a use case diagram was drawn to illustrate what possible use cases (i.e. actions) the platform of Penelope Art can deliver as well as who are the potential actors (i.e. users) who will end up using the platform. Figure 14 below shows the use case diagram of Penelope Art's platform:

Penelope Art Use Case Diagram

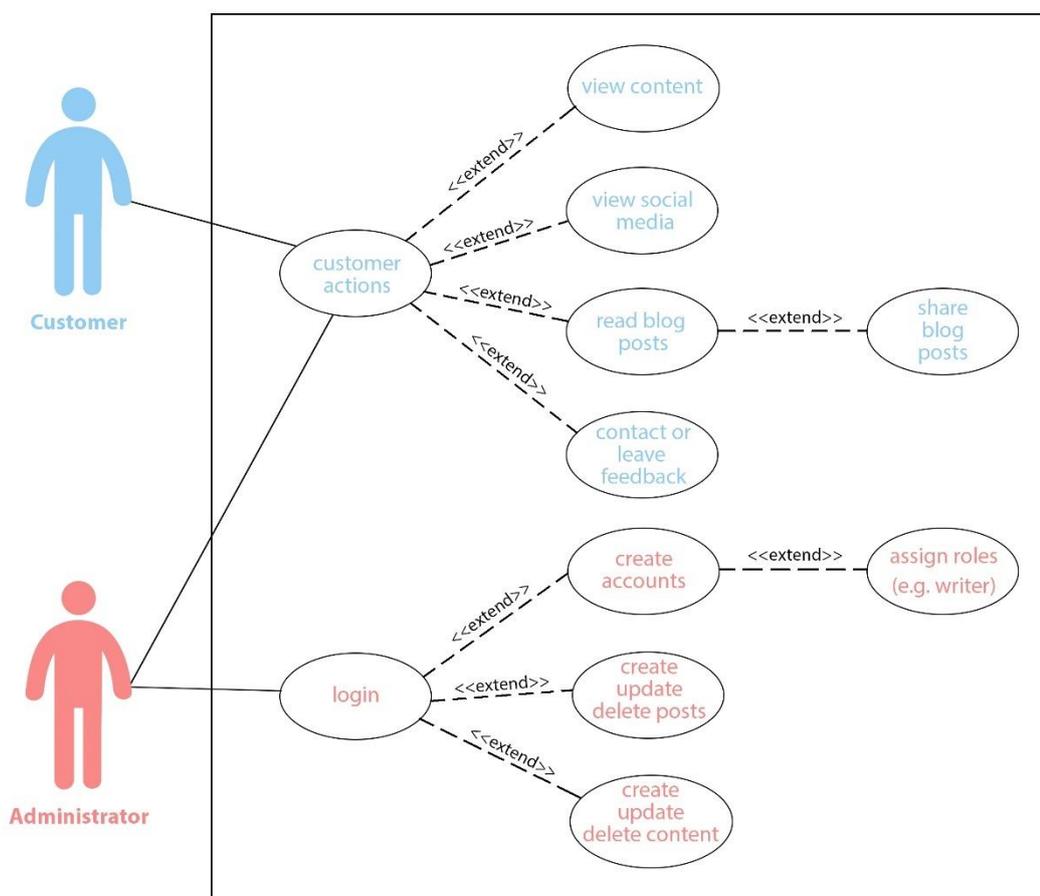


Figure 14: Use case diagram illustrating the use cases of Penelope Art's platform

Next, a wireframe of the layout of the platform was drawn on a paper and shown to the client. Following are photos from the paper version of the layout reproduced in the online wireframing tool Balsamiq. Refer to this link <https://balsamiq.com/> in order to receive more information about the software.

Figure 15 shows the layout for the header section of the website consisting of two navigation bars - top and bottom, and a slider. The upper navbar consists of social media icons for Penelope Art's Facebook and Instagram pages as well as their email address and phone number.

The bottom navbar consists of their name put as a logo for the website and navigation links. Below them comes the slider which has a heading, paragraph of text and a button which will lead to one of the pages in the website.



Figure 15: Wireframe of header section and slider for Penelope Art

Figure 16 shows the next section which is the “About Us” section featuring the logo of the company on the left, and small introduction to Penelope Art on the right. Below are four columns consisting of shortcuts to Penelope Art’s services page (column 1) as well as information on how to book an appointment (column 2), location of their studio (column 3) and working hours (column 4).

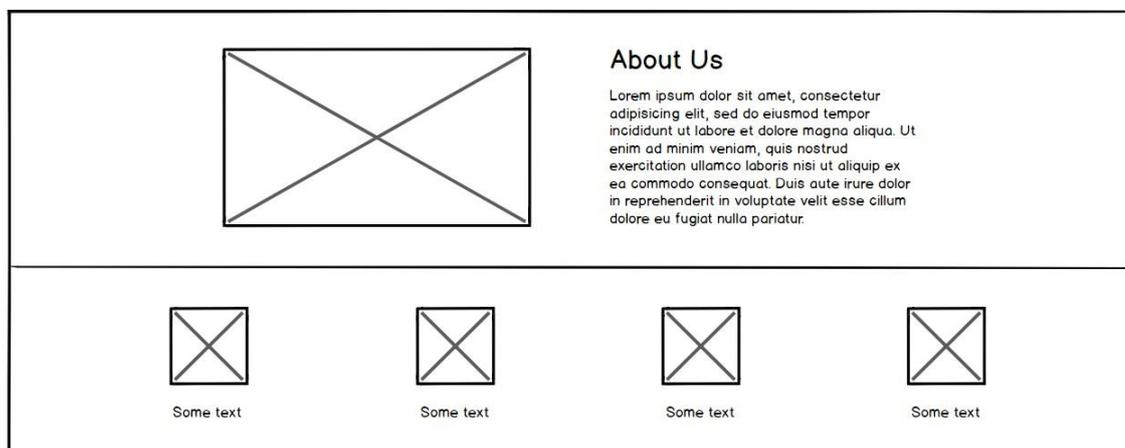


Figure 16: Wireframe of “About Us” section for Penelope Art

Figure 17 illustrates the showcase section of Penelope Art’s work. It consists of a heading, small paragraph of text, and one or more tabs representing the services of the company. Depending on the number of services Penelope Art wants to display on their website, the number of tabs may vary. Each tab consists of 6 images displayed in two rows (i.e. three images per row). The owner also has the possibility of giving each image a title and write a description. Below the showcase area there is a small section with text and a button. This will be a

section which invites the users to visit Penelope Art’s Facebook page if they want to see more examples of their work.

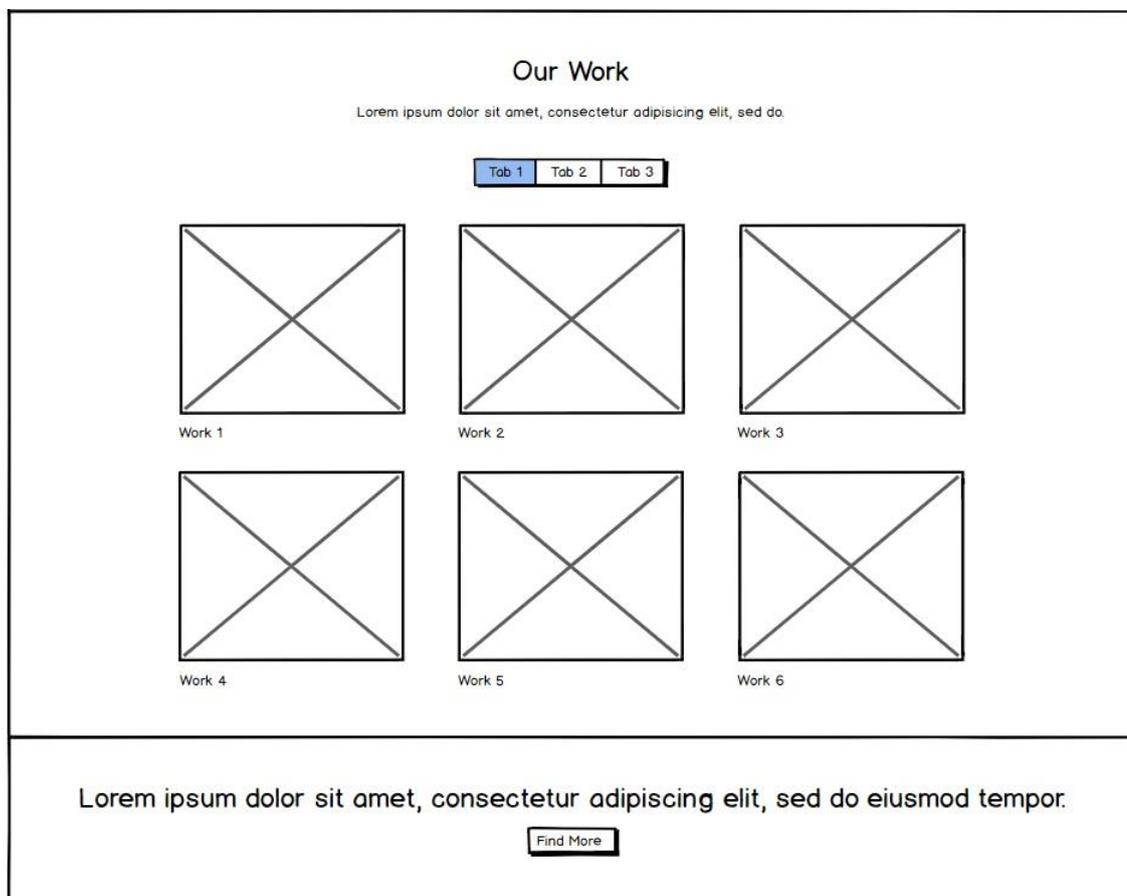


Figure 17: Wireframe of “Our Work” section displaying Penelope Art’s services and work

Figure 18 shows the “Testimonials” section for Penelope Art website. This section will consist of comments from real clients which Penelope Art has received either on their Facebook page or through the contact form in the website after experiencing their services. Testimonials section will consist of a paragraph containing the comment as well as an image (not mandatory) of the client, their name and rating. This section allows Penelope Art to display multiple comments since it works as a slider.



Figure 18: Wireframe of “Testimonials” section for Penelope Art

Figure 19 illustrates the “Partners” section for Penelope Art. This section consists of three columns and each column displays a partner’s logo. Penelope Art has the possibility to add as many partners as they wish since this section works as a slider as well.

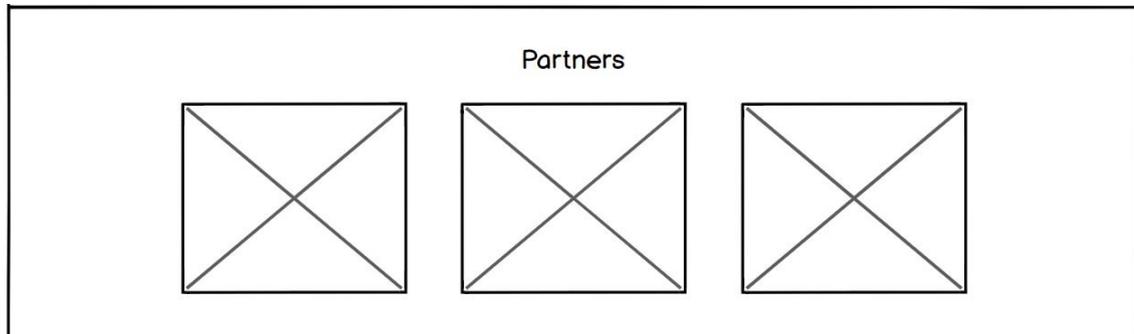


Figure 19: Wireframe of “Partners” section for Penelope Art

Figure 20 shows the final section for Penelope Art which is the footer. This footer section includes the logo of Penelope Art (same as the one in the header) and some company text on the left side. On the right side there is a widget for Penelope Art’s page on Facebook. For this case a third-party widget will be used. Therefore, the look of the widget is not specified in the wireframe nor the design. At the very bottom of the page there is copyright text.

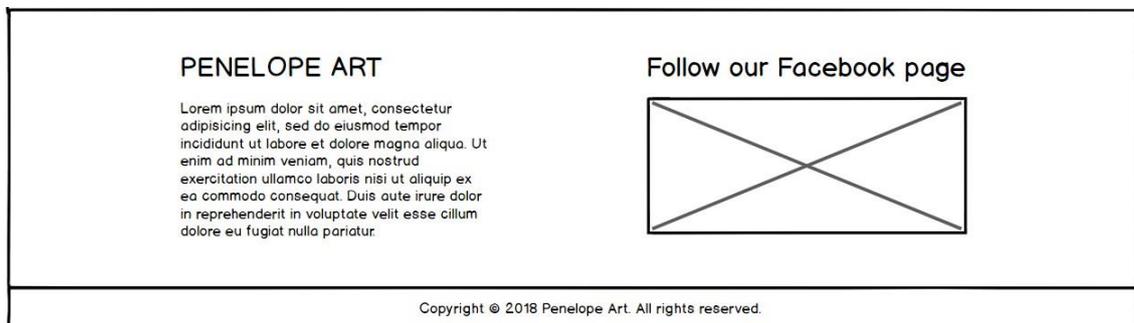


Figure 20: Wireframe of footer section for Penelope Art

This wireframe was then approved by the owner of Penelope Art and the design process continued with making a comprehensive design in Photoshop. The point of this was to facilitate the process of implementation. This is a common practice in web development. A complete version of the platform design is firstly drawn in Photoshop, which makes all the images, colours, font styles and small details to be easily exported. Thus, the project operation becomes straightforward. All these UI designs are made in Photoshop using default tools and shapes by the software, 12-column grid template, icons, images and fonts. All icons and images used in this project are free for personal and commercial use, and they do not require attribution. Figure 21 shows a photo from the grid template and the design in Photoshop. This 12-column grid is designed specifically for Bootstrap’s grid system since it also has 12 columns.

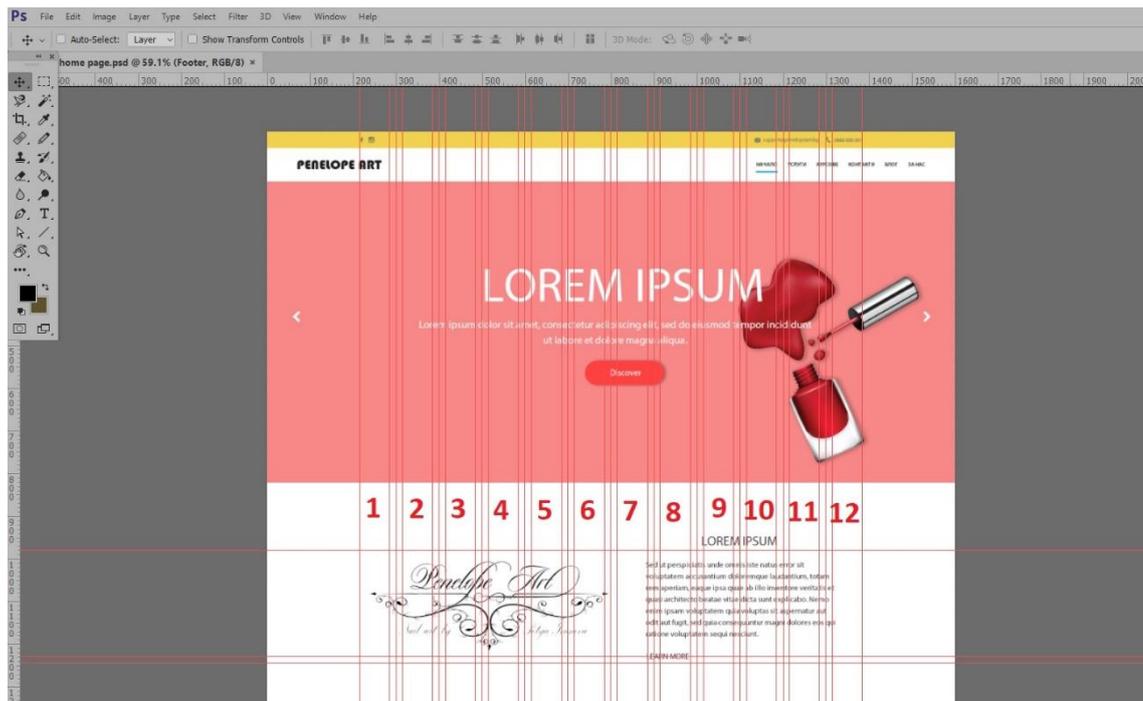


Figure 21: 12-column grid system template in Photoshop

The colour scheme used in this project was featured on Visme's blog (Chibana n.d.). The design team at Visme had decided to create a list of 50 award-winning websites nominated by Awwwards. Awwwards is a website that features latest design trends and marketing innovations, and their goal is to inspire designers and developers. Refer to this link <https://www.awwwards.com/> in order to receive more information about the website. Figure 22 below shows a photo of the colour scheme and hex values of the colours:



Figure 22: Colour scheme for Penelope Art's website

Following are photos from the Photoshop design and these are based on the wireframe approved by the owner of Penelope Art.

Figure 23 shows the user interface for the header section and the slider of the website made in Photoshop.

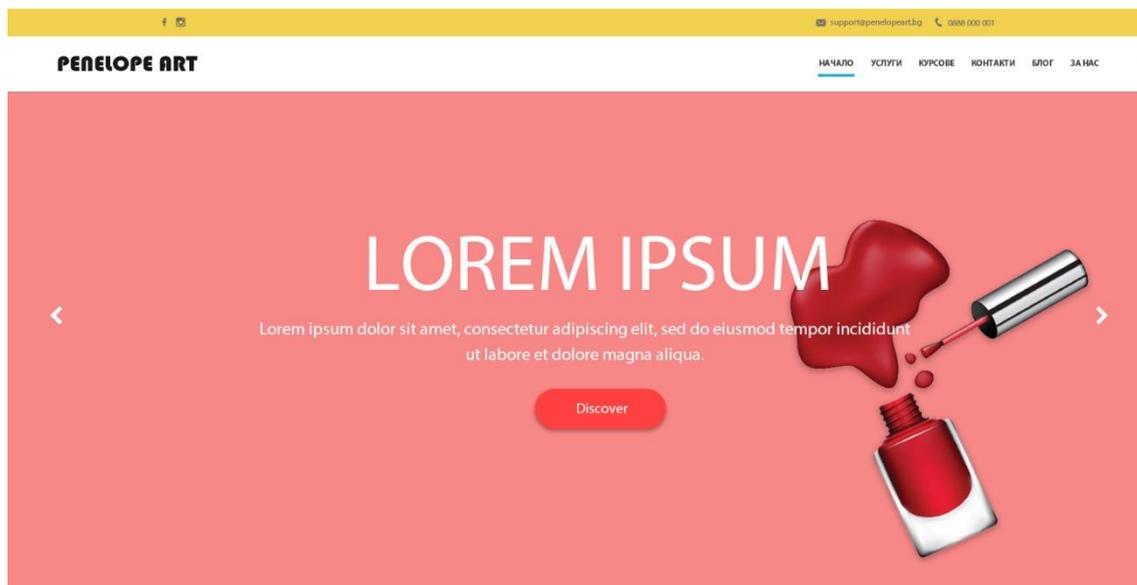


Figure 23: Design of header section and slider for Penelope Art in Photoshop

Figure 24 shows the user interface of the “About Us” section for Penelope Art. The logo of Penelope Art was sent to the developer from the owner. This is their genuine logo that they use on every photo uploaded on their Facebook and Instagram pages.

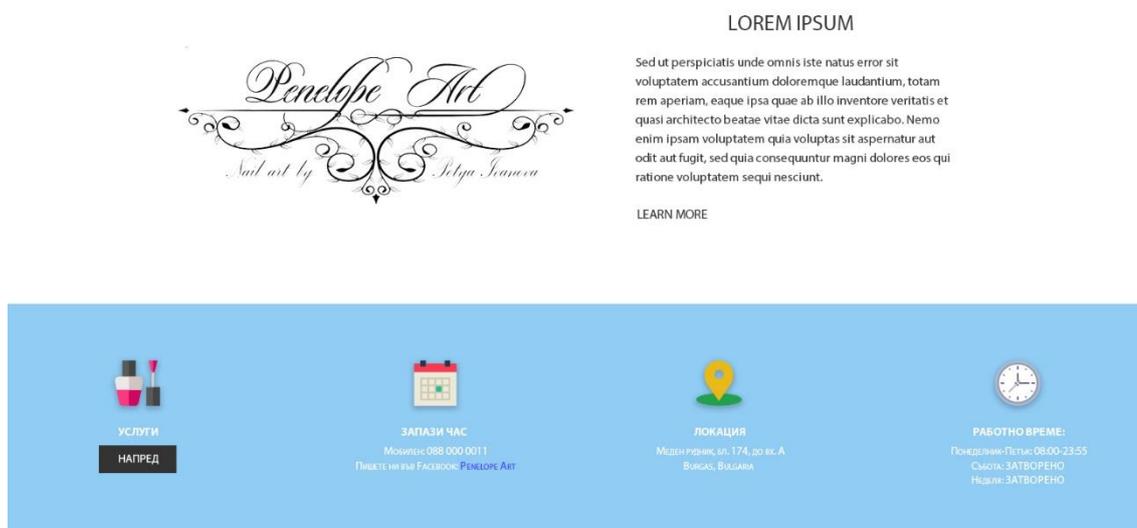


Figure 24: Design of “About Us” section for Penelope Art in Photoshop

Figure 25 illustrates the user interface of the showcase section of Penelope Art’s work. There are three tabs displayed in this particular design - “All”, “Decorations” and “Manicure”. As explained earlier in this section, the number of the tabs can vary depending on Penelope Art’s choice on what to include. The photo of the manicure has been taken from Penelope Art’s Facebook page and it is a result of their actual work.

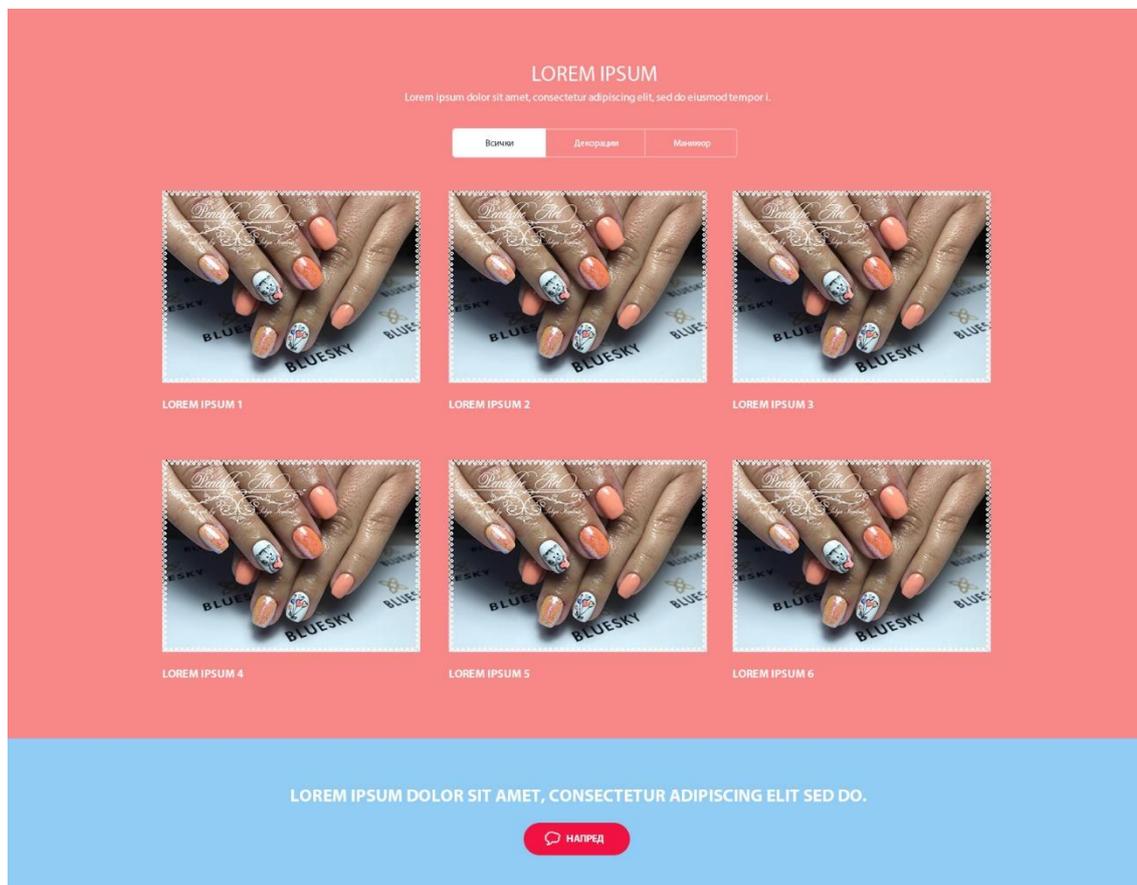


Figure 25: Design of “Our Work” section displaying Penelope Art’s work in Photoshop

Figure 26 shows the user interface of the “Testimonials” section for Penelope Art website done in Photoshop:



Figure 26: Design of “Testimonials” section for Penelope Art in Photoshop

Figure 27 illustrates the “Partners” section for Penelope Art. As described above, this section will work as a slider and Penelope Art will be able to add more than three logos. Bluesky is

one of the actual brands which Penelope Art works with. This is why their logo is included in the design.



Figure 27: Design of “Partners” section for Penelope Art in Photoshop

Figure 28 shows the user interface of the footer section. As described earlier in the wireframes, there is company info replacing this “Lorem ipsum” text as well as their studio’s location, phone number, Facebook page and email. On the right side there will be a “Follow us on Facebook” widget, the design of which is not specified yet. It is a third-party plugin which will be downloaded and installed from the WordPress plugins directory.



Figure 28: Design of the footer section for Penelope Art in Photoshop

4.4 Development and implementation

When the comprehensive design was verified by the client, the implementation of the system began, strictly following the Photoshop design shown in section 4.3. The execution of the platform started with downloading and setting up the prerequisites needed for the optimal functioning of the website. This included downloading and setting up of software called XAMPP which contains the Apache HTTP Server used to run the project locally (also known as localhost) as well as MySQL database used for creating databases and storing and retrieving essential data when requested.

The implementation stage continued with installing the latest WordPress version (WordPress 4.9.8) which is the CMS used in this project as well as linking the MySQL database in the “wp-config.php” file as shown in Figure 29 below. The “wp-config.php” file is located in the root directory of the project.

```

21 // ** MySQL settings - You can get this info from your web host ** //
22 /** The name of the database for WordPress */
23 define('DB_NAME', 'penlopeart'); ← name of database the developer created in MySQL
24
25 /** MySQL database username */
26 define('DB_USER', 'root'); ← username in developer's MySQL database installation
27
28 /** MySQL database password */
29 define('DB_PASSWORD', '');
30
31 /** MySQL hostname */
32 define('DB_HOST', 'localhost'); ← project hosted locally, transfer of project to a hosting
33                               provider will happen later

```

Figure 29: Initializing the connection between MySQL database and WordPress

When this was done, the developer downloaded and installed the Blank Slate theme which is a completely blank WordPress theme developed and maintained by the WordPress community. This theme can be found on the official website of WordPress. Refer to this link <https://wordpress.org/plugins/blank-slate/> in order to receive more information about the Blank Slate theme.

The implementation process of the platform continued with installing the first and main open-source plugin, the Unyson framework. This framework acts as a drag and drop visual page builder which uses default or custom-made widgets and shortcodes to build website's pages quickly and without much effort. As illustrated in Figure 30 below, Unyson framework offers also other extensions such as sliders, mega menus, breadcrumbs, sidebars, events and many more.

The screenshot shows the 'Available Extensions' section of the Unyson framework. It features a grid of 10 extension cards. Each card includes an icon, a title, a short description, a 'Download' button, and a checkmark indicating compatibility with the current theme. The extensions are: Sliders, Styling, Breadcrumbs, Events, Feedback, Learning, Mega Menu, Portfolio, Sidebars, and Brizy - Visual Page Builder.

Figure 30: Unyson framework extensions

However, for this project only the page builder extension will be utilized. Since the owner of Penelope Art does not have previous experience in working with widgets and writing content

into a website, such visual page builder could be a great option to have. By default, the Unyson page builder consists of some pre-defined widgets to help users to construct the content. The following figures below show how the Unyson page builder looks in WordPress:

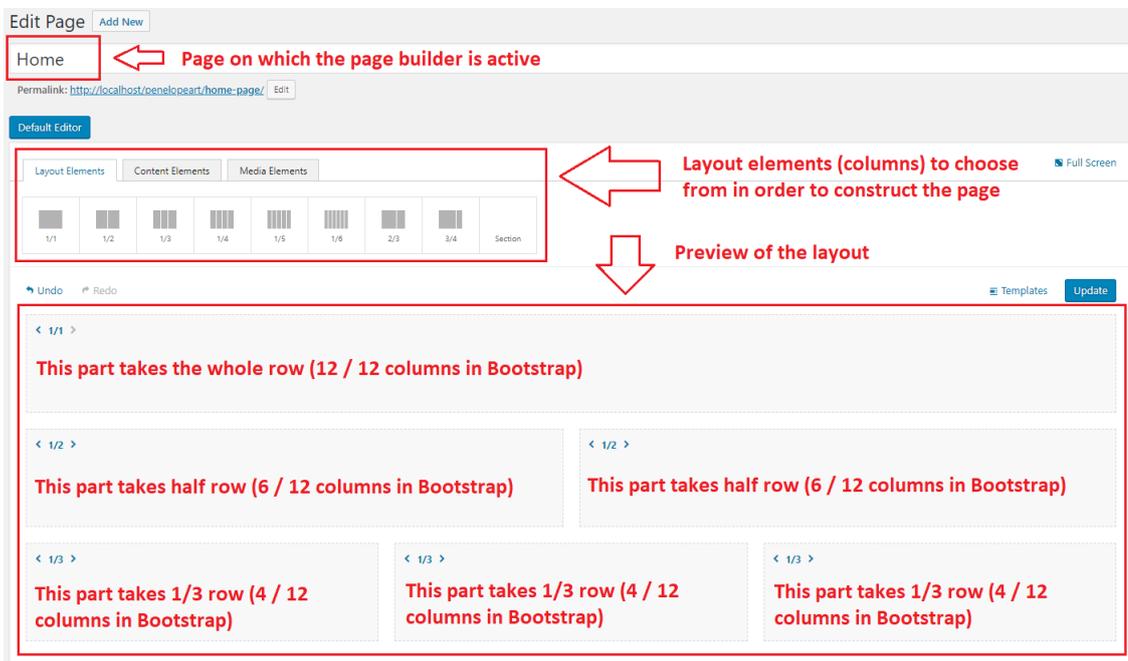


Figure 31: Layout elements of Unyson page builder in WordPress

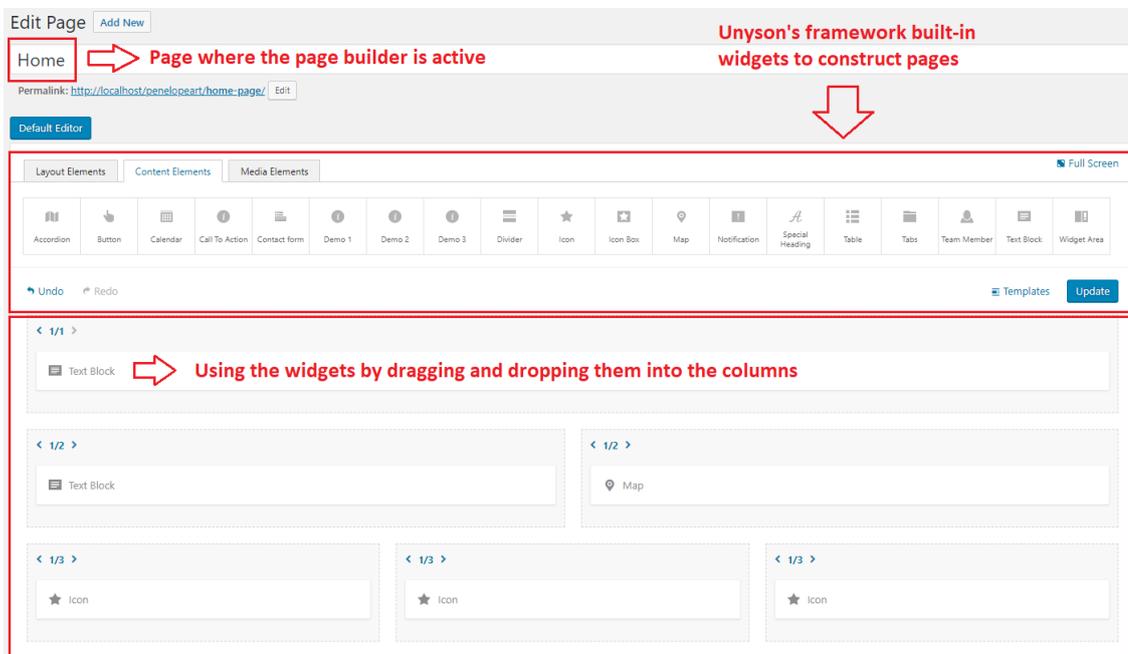


Figure 32: Unyson's framework built-in content elements

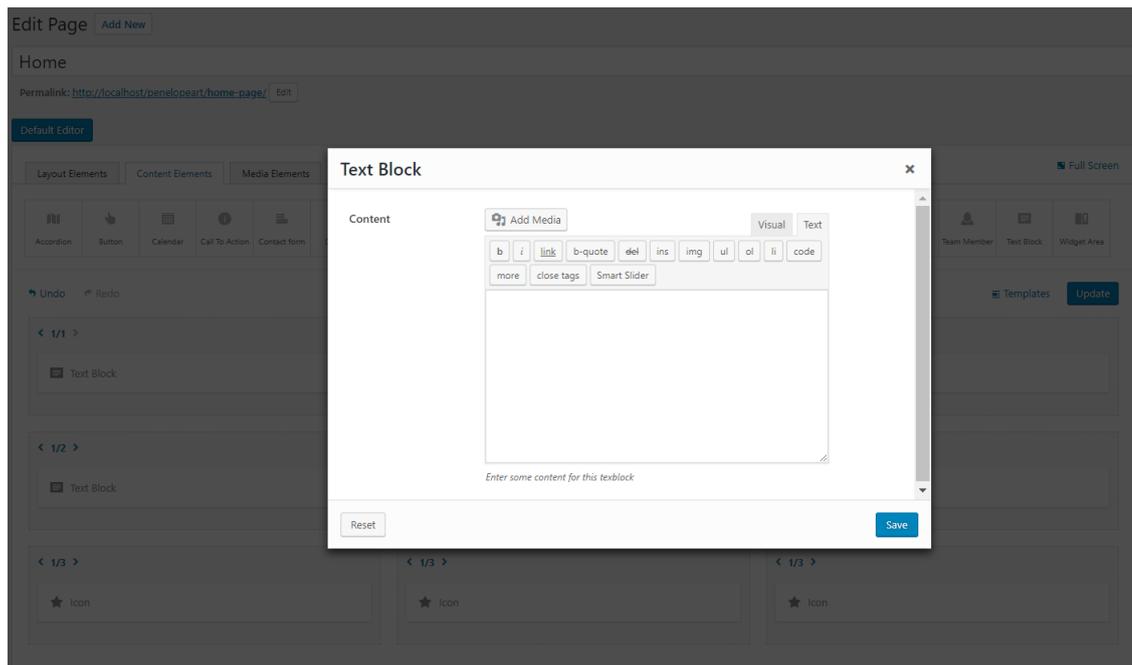


Figure 33: Preview of the “Text Block” default widget when clicked

However, this built-in default functionality of Unyson framework shown in the figures above does not solve the needs of Penelope Art and cannot be used for creating the features and functionality listed in the requirements and shown on the design in Photoshop. These widgets and extensions need to be created from scratch using PHP as the main scripting language used in WordPress to develop themes and plugins.

Luckily, Unyson framework has a solid community and provides extensive documentation and developer manuals which explain how to create custom widgets that result in a premium WordPress theme. Refer to this link <http://manual.unyson.io/en/latest/> in order to receive more information about the Unyson developer manuals.

Once the WordPress installation and setup of plugins were completed, the implementation process of the platform continued making the structure of the website with HTML5, styling it with CSS3 and applying jQuery for the interaction of the platform. When combined, these three languages form Bootstrap 4, which is a well-known, open-source front-end framework used to develop responsive and mobile-first web platforms quickly using prebuilt grid system, templates and components. Figure 34 below shows the grid system of Bootstrap. It contains 12 columns in each row, just like the grid template in the Photoshop design covered in section 4.3.

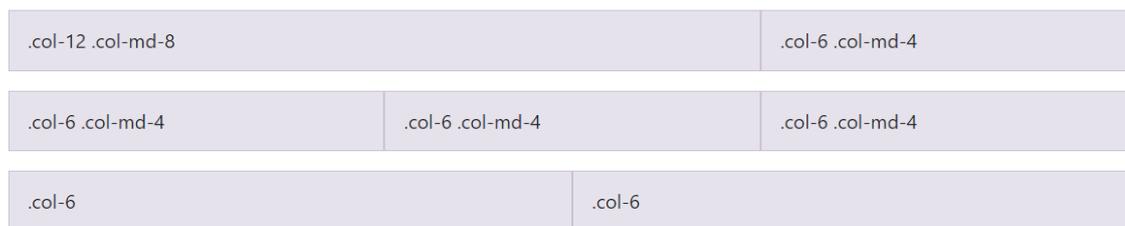


Figure 34: Bootstrap 4 grid system

The sections coded and styled from scratch using Bootstrap were the two navigation bars, about us section, services showcase area, testimonials, partners and footer area. When the user interfaces of these static templates were coded, the developer continued to work on them by turning these templates into dynamic sections using Unyson Framework and PHP.

Header section was the first one which the developer started to work on. Following are figures from the code structure of the navigation bar using HTML, and a preview of the UI after styling it with CSS:

```

15 <div class="topbar">
16   <div class="container">
17     <div class="row">
18       <div class="col-md-6 col-sm-12">
19         <div class="header-social">
20           <ul>
21             <li><a href="#"><i class="fab fa-facebook-f"></i></a></li>
22             <li><a href="#"><i class="fab fa-instagram"></i></a></li>
23           </ul>
24         </div>
25       </div>
26       <div class="col-md-6 col-sm-12">
27         <div class="header-contact-details">
28           <ul>
29             <li><a href="#"><i class="fas fa-envelope"></i> test@example.com</a></li>
30             <li><a href="#"><i class="fas fa-phone"></i> 0888 000 001</a></li>
31           </ul>
32         </div>
33       </div>
34     </div>
35   </div>
36 </div>

```

Figure 35: Top navigation bar HTML structure

```

18 .topbar {
19   background-color: #f3d250;
20   padding: 10px 0;
21 }
22
23 .header-social ul {
24   list-style: none;
25   padding: 0;
26   margin: 0 20px;
27 }

```

Figure 36: Styling the top navigation bar with CSS

```

29  .header-social li {
30      display: inline-block;
31      margin-right: 10px;
32      color: #717171;
33  }
34
35  .header-social li a {
36      color: #717171;
37      font-size: 14px;
38      font-weight: 700;
39  }
40

```

Figure 37: Styling the top navigation bar with CSS (cont.)

```

37  <div class="bottombar">
38      <div class="container-fluid">
39          <div class="row">
40              <div class="col-md-4 col-sm-12">
41                  <div class="site-logo">
42                      <a href="#"></a>
43                  </div>
44              </div>
45              <div class="col-md-8 col-sm-12">
46                  <div id="nav-bar" class="nav-bar">
47                      <nav id="site-navigation" class="navigation main-navigation" role="navigation">
48                          <ul>
49                              <li>Link 1</li>
50                              <li>Link 2</li>
51                              <li>Link 3</li>
52                              <li>Link 4</li>
53                              <li>Link 5</li>
54                          </ul>
55                      </nav>
56                  </div>
57              </div>
58          </div>
59      </div>
60  </div>

```

Figure 38: Bottom navigation bar HTML structure

```

116 #nav-bar {
117     text-align: right;
118     padding: 10px 0;
119     padding-right: 30px;
120     position: relative;
121     top: 5px;
122 }
123
124 .bottombar .row {
125     background-color: #ffffff;
126     margin-top: 0px;
127 }

```

Figure 39: Styling the bottom navigation bar with CSS

```

129  .site-logo {
130      margin-top: 0px;
131      padding-left: 80px;
132      position: relative;
133      top: 23px;
134  }
135
136  #site-header {
137      position: absolute;
138      width: 100%;
139      z-index: 1;
140  }

```

Figure 40: Styling the bottom navigation bar with CSS (cont.)

```

82  .nav-menu {
83      list-style: none;
84      padding: 0;
85      margin: 0;
86  }
87
88  .nav-menu li {
89      display: inline;
90      margin-right: 20px;
91      font-size: 12px;
92      text-transform: uppercase;
93  }

```

Figure 41: Styling the bottom navigation bar with CSS (cont.)



Figure 42: Preview of the top and bottom navigations after HTML and CSS

When the UI of the navigation bar was coded, it was time to make it dynamic, allowing the client to add and remove social media profiles, email, phone number, logo and navigational links from the back-end in WordPress.

Following are some of the custom widgets and extensions created by the developer using Unyson framework. Figure 43 shows the code which creates tabs in WordPress under which go the input fields for custom values:

```

1 <?php if ( ! defined( 'FW' ) ) {
2     die( 'Forbidden' );
3 }
4
5 $options = array(
6     'general' => array(
7         'title' => __( 'General Settings | Общи', 'unyson' ),
8         'type' => 'tab',
9         'options' => array(
10            'general-box' => array(
11                'title' => __( 'Logo and Favicon', 'unyson' ),
12                'type' => 'box',
13                'options' => array(
14                    'logo' => array(
15                        'label' => __( 'Logo', 'unyson' ),
16                        'desc' => __( 'Upload a website logo ', 'unyson' ),
17                        'type' => 'upload'
18                    ),
19                    'favicon' => array(
20                        'label' => __( 'Favicon', 'unyson' ),
21                        'desc' => __( 'Upload a favicon image', 'unyson' ),
22                        'type' => 'upload'
23                    )
24                )
25            ),
26        )
27    ),

```

Figure 43: Creating custom options for storing logo and favicon using PHP

The result of the following code can be seen in Figure 44 below:

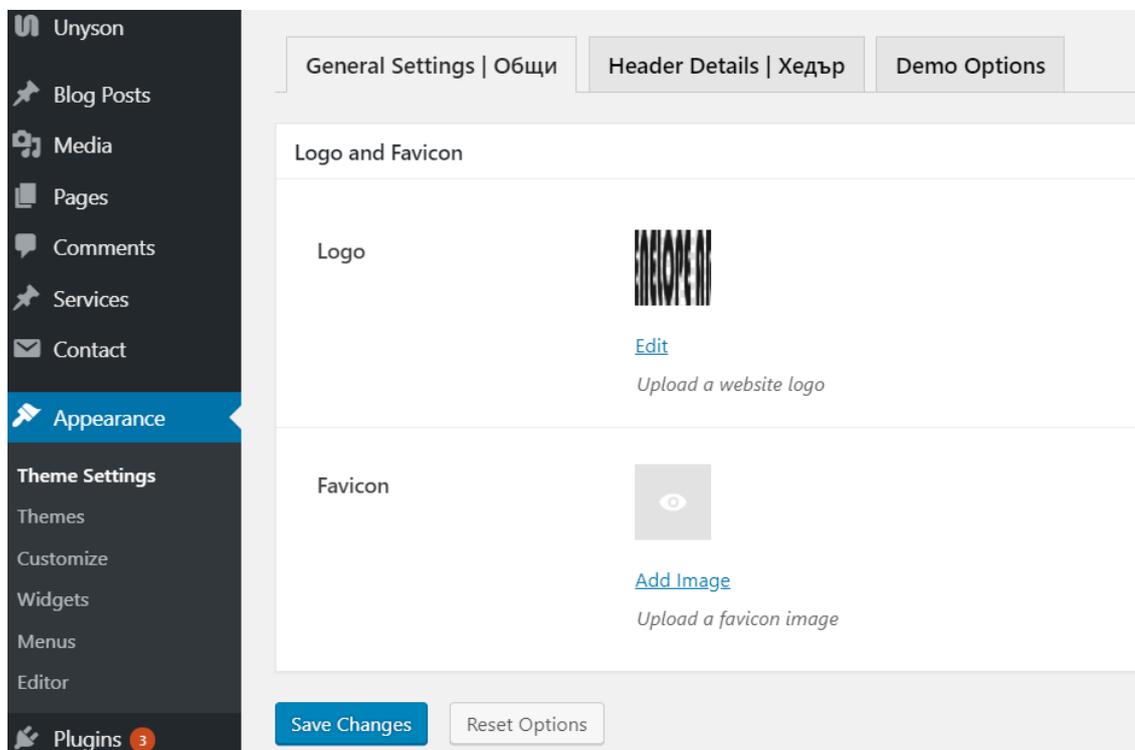


Figure 44: Preview of custom options for logo and favicon in WordPress

Figure 45 below illustrates the code for the second tab of this theme. This is the “Header Details” tab where social media profiles, email and phone number can be added:

```

29     'header' => array(
30         'title' => __( 'Header Details | Хедър', 'unyson' ),
31         'type' => 'tab',
32         'options' => array(
33             'general-box' => array(
34                 'title' => __( 'Header Settings | Настройки на Хедър', 'unyson' ),
35                 'type' => 'box',
36                 'options' => array(
37                     'facebook' => array(
38                         'label' => __( 'Facebook', 'unyson' ),
39                         'desc' => __( 'Facebook Profile Link | Линк на профил във Фейсбук', 'unyson' ),
40                         'type' => 'text'
41                     ),
42                     'instagram' => array(
43                         'label' => __( 'Instagram', 'unyson' ),
44                         'desc' => __( 'Instagram Profile Link | Линк на профил в Инстаграм', 'unyson' ),
45                         'type' => 'text'
46                     ),

```

Figure 45: Creating custom options for social media links using PHP

```

47         'email' => array(
48             'label' => __( 'Email Address', 'unyson' ),
49             'desc' => __( 'Email Address', 'unyson' ),
50             'type' => 'text'
51         ),
52         'primary_phone' => array(
53             'label' => __( 'Phone number | Телефон за връзка', 'unyson' ),
54             'desc' => __( 'Phone number | Телефон за връзка', 'unyson' ),
55             'type' => 'text'
56         ),
57     ),
58 ),
59 );
60 );
61 );

```

Figure 46: Creating custom options for email and phone number using PHP

The result of the following code can be seen in Figure 47 below:

Theme Settings

General Settings | Общи Header Details | Хедър Demo Options

Header Settings | Настройки на Хедър

Facebook

Facebook Profile Link | Линк на профил във Фейсбук

Instagram

Instagram Profile Link | Линк на профил в Инстаграм

Email Address

Email Address

Phone number | Телефон за връзка

Phone number | Телефон за връзка

Figure 47: Preview of custom options for social media links, email and phone in WordPress

At this stage the custom options fields are created, and the values are stored to the database when user clicks the blue “Save Changes” button in WordPress. However, to display these values to the UI, the developer needs to retrieve these values from the database using a pre-built Unyson function “fw_get_db_settings_option” which shows them to the front-end. Figure 48 illustrates how this is done:

```

11 <?php
12     // Storing the custom options values from the input fields to variables
13
14     $site_logo = fw_get_db_settings_option('logo');
15
16     $facebook = fw_get_db_settings_option('facebook');
17     $instagram = fw_get_db_settings_option('instagram');
18
19     $email = fw_get_db_settings_option('email');
20     $primary_phone = fw_get_db_settings_option('primary_phone');
21 ?>

```

Figure 48: Storing the custom option values to variables using PHP

Once the values are stored to the variables, it is time for them to be used. Figures 49, 50 and 51 below show how these values are retrieved and shown to the user interface. If the input fields in WordPress are empty (i.e. the owner has not specified any values), WordPress will not show the icons corresponding to these input fields and values.

```

31 <div class="header-social">
32     <ul>
33         <?php if($facebook) { ?>
34         <li><a href="<?php echo $facebook; ?>"><i class="fab fa-facebook-f"></i></a></li>
35         <?php } ?>
36         <?php if($instagram) { ?>
37         <li><a href="<?php echo $instagram; ?>"><i class="fab fa-instagram"></i></a></li>
38         <?php } ?>
39     </ul>
40 </div>

```

Figure 49: Displaying the social media values stored in the variables to the UI using PHP

```

<div class="header-contact-details">
    <ul>
        <?php if($email) { ?>
        <li><a href="mailto:<?php echo $email; ?>"><i class="fas fa-envelope"></i> <?php echo $email; ?></a></li>
        <?php } ?>
        <?php if($primary_phone) { ?>
        <li><a href="tel:<?php echo $primary_phone; ?>"><i class="fas fa-phone"></i> <?php echo $primary_phone; ?></a></li>
        <?php } ?>
    </ul>
</div>

```

Figure 50: Displaying the email and phone values stored in the variables to the UI using PHP

```

<div class="site-logo">
    <a href="<?php echo HOME; ?>"></a>
</div>

```

Figure 51: Displaying the logo stored in the variable to the UI using PHP

When the top part of the header was complete, the developer moved to the bottom part of the navigation bar i.e. making the navigation links dynamic. Figure 52 below shows the PHP code for that:

```

86 <div class="row dropdown-navigation">
87   <div class="col-md-12 col-sm-12 col-xs-12 d-block d-lg-none">
88     <div class="collapse navbar-collapse" id="collapsibleNavbar">
89       <div id="nav-bar" class="nav-bar">
90         <nav id="site-navigation" class="navigation main-navigation" role="navigation">
91           <?php wp_nav_menu( array( 'theme_location' => 'main-menu', 'menu_class' => 'nav-menu', 'menu_id' => 'primary-menu' ) ); ?>
92         </nav>
93       </div>
94     </div>
95   </div>
96 </div>

```

Figure 52: Making the navigation bar dynamic with PHP

Once the navigation bar was made dynamic with PHP, it was time to add the links into the back-end. Figure 53 below illustrates the back-end view (i.e. how the client will be able to add, delete, update pages in WordPress), and a preview of the UI after the blue “Save Menu” button is clicked can be seen on Figure 54:

The screenshot shows the WordPress 'Menus' management interface. On the left, there's a sidebar with navigation options like Dashboard, Unyson, Blog Posts, Media, Pages, Comments, Services, Appearance, Theme Settings, Themes, Customize, Widgets, Menus, Editor, Plugins, Users, Tools, and Settings. The main content area is titled 'Menus' and includes tabs for 'Edit Menus' and 'Manage Locations'. A dropdown menu is set to 'Main Nav (Main Menu)'. Below this, there are sections for 'Pages', 'Menu Structure', and 'Menu Settings'. The 'Menu Structure' section shows a list of menu items with their names and types (e.g., Page, Custom Link). A red arrow points to this section with a text box: "Links and pages which the client adds on her own using drag and drop functionality provided by WordPress. The client does not have to mess around with the code to create, update or delete them."

Figure 53: Client’s view in WordPress to create, update, delete nav menu links

The screenshot shows the website header for 'PENELOPE ART'. It features a yellow background. On the left, there are social media icons for Facebook and Instagram. In the center, the company name 'PENELOPE ART' is displayed in a bold, black font. On the right, there is a navigation menu with the following items: НАЧАЛО, УСЛУГИ, КУРСОВЕ, КОНТАКТИ, and ЗА НАС. Below the navigation menu, there is contact information: an email address 'test@example.com' and a phone number '0888 000 001'.

Figure 54: Complete and dynamic version of the header

When the header section was completed, the developer started to work on the slider of the web platform’s using a free of charge WordPress plugin called Smart Slider 3. Then it was additionally styled to fit the needs of Penelope Art and to provide extra brand awareness. Figure 55 below shows the back-end of Smart Slider and some of the settings to customize the slider in WordPress:

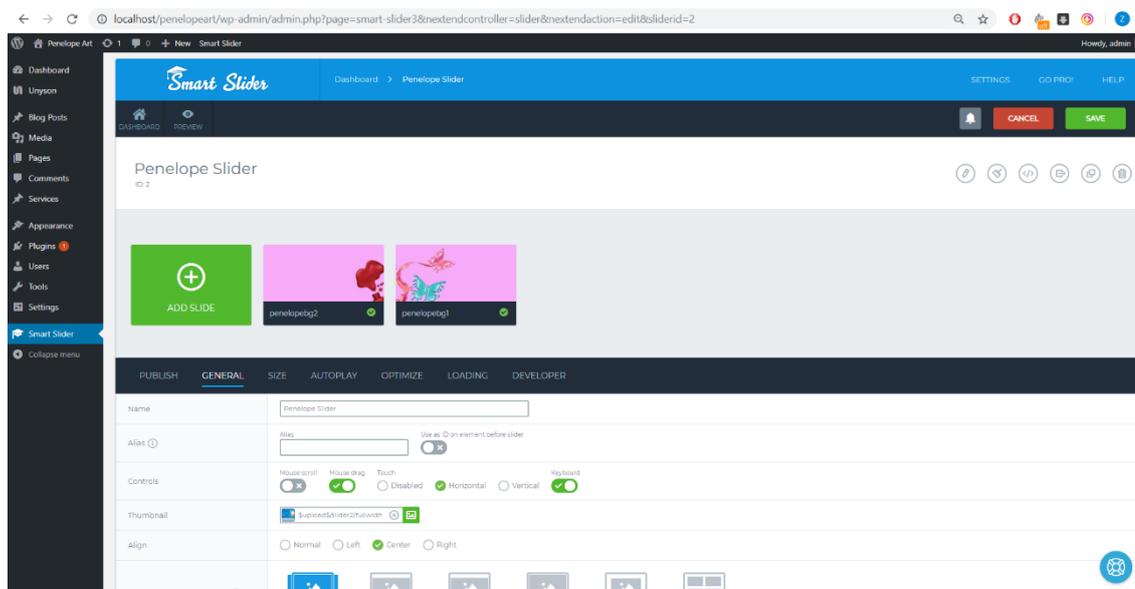


Figure 55: Smart Slider customization in WordPress

When the slider section was done, the developer moved to the next section. There, another widget was created for the logo of the company in the “About Us” area and the four icons with text below. The following figures show how the structure of the widget was created with HTML and styled with CSS:

```

10 <div class="icon-text-block">
11   <div class="icon-text-wrapper">
12     <div class="top-sec">
13       <div class="block-icon">
14         
15       </div>
16       <div class="block-title">
17         <h3>Location</h3>
18       </div>
19     </div>
20     <div class="bottom-sec">
21       <div class="block-desc">
22         Some text goes here
23       </div>
24     </div>
25   </div>
26 </div>

```

Figure 56: Creating the structure of “About Us” icon and text widget

```

431  .icon-text-wrapper {
432      margin-bottom: 50px;
433      text-align: center;
434  }
435
436  .block-icon {
437      margin-bottom: 20px;
438  }
439
440  .block-title {
441      margin-bottom: 20px;
442  }
443
444  .block-title h3 {
445      color: #ffffff;
446      font-size: 15px;
447      text-transform: uppercase;
448      font-weight: 700;
449  }
450
451  .block-desc {
452      color: #ffffff;
453      font-size: 15px;
454      font-weight: 400;
455  }

```

Figure 57: Styling the icon and text widget of “About Us” section with CSS

The next step was to make it dynamic. Following figures reveal the code and how this was done:

```

1  <?php if(!defined('FW')) die('forbidden');
2
3  $cfg = array(
4      'page_builder' => array(
5          'title' => __('Icon With Text', 'unyson'),
6          'tab' => __('Content Elements', 'FW'),
7      )
8  );

```

Figure 58: Creating the widget under “Content Elements” tab in WordPress

```

1 <?php if(!defined('FW')) die('forbidden');
2
3 $options = array(
4     'text_icon' => array(
5         'Label' => __('Icon', 'unyson'),
6         'type' => 'upload',
7     ),
8     'text_heading' => array(
9         'Label' => __('Icon Heading', 'unyson'),
10        'type' => 'text',
11    ),
12    'text_desc' => array(
13        'Label' => __('Description', 'unyson'),
14        'type' => 'text',
15    ),
16    'custom_class' => array(
17        'Label' => __('Custom Class', 'unyson'),
18        'type' => 'text',
19    ),
20 );
21

```

Figure 59: Specifying what input fields the widget will contain

```

1 <?php if(!defined('FW')) die('forbidden');
2
3 $text_icon = $atts['text_icon'];
4 $text_heading = $atts['text_heading'];
5 $text_desc = $atts['text_desc'];
6 $custom_class = $atts['custom_class'];
7
8 ?>
9
10 <div class="icon-text-block <?php echo $custom_class; ?>">
11     <div class="icon-text-wrapper">
12         <div class="top-sec">
13             <div class="block-icon">
14                 
15             </div>
16             <div class="block-title">
17                 <h3><?php echo $text_heading; ?></h3>
18             </div>
19         </div>
20         <div class="bottom-sec">
21             <div class="block-desc">
22                 <?php echo $text_desc; ?>
23             </div>
24         </div>
25     </div>
26 </div>
27

```

Figure 60: Saving the input fields' data to variables and displaying them to the UI

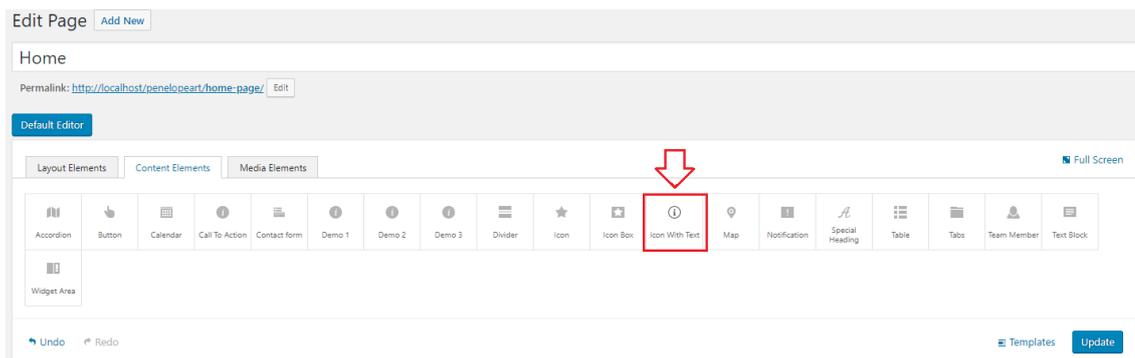


Figure 61: Icon is listed under the “Content Elements” tab in WordPress

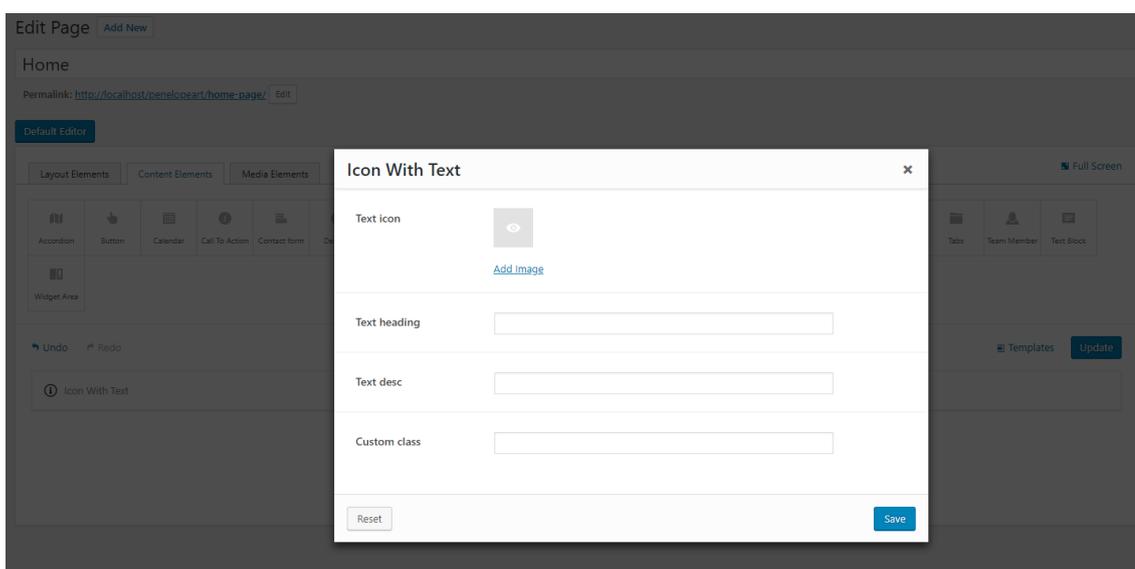


Figure 62: UI of the “Icon with Text” widget developed for Penelope Art’s About Us section

Once the widget was created, the developer started to input the information for Penelope Art. According to the design, the “About Us” section of Penelope Art has two rows. The first row consists of logo on the left and a snippet of text on the right. The second row consists of four small “Icon with Text” widgets. Figure 63 below shows how this is constructed at the back-end in WordPress:

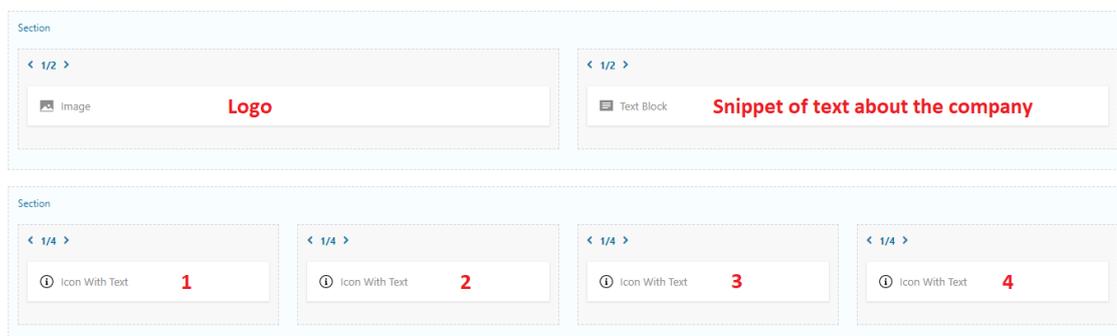


Figure 63: Construction of “About Us” section for Penelope Art in WordPress

It was then time to display this to the UI on the actual website. Figure 64 shows a complete and dynamic “About Us” section preview on the website:

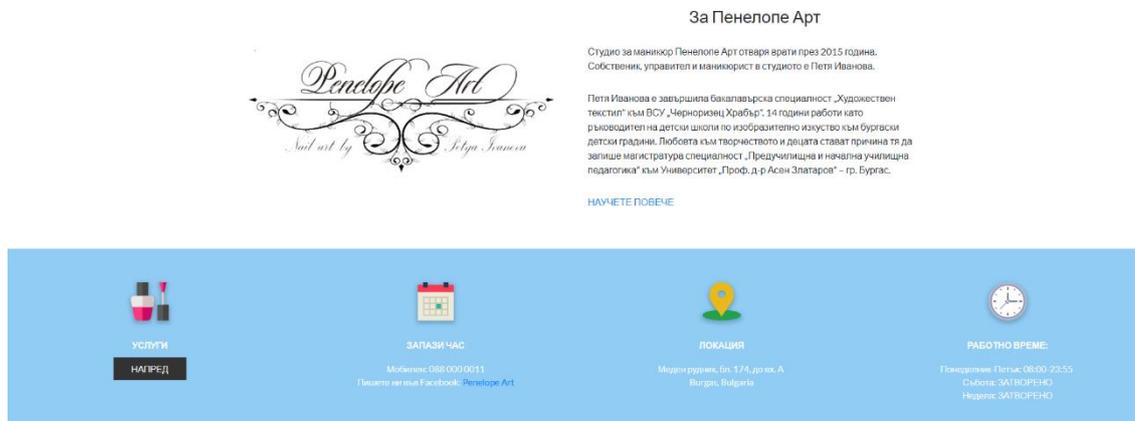


Figure 64: Complete “About Us” section for Penelope Art’s web platform

Another part of the website which had a custom widget was the “Our Work” section. Following are figures which reveal the static code of “Our Work” showcase section made with HTML, CSS and jQuery:

```

7 <div class="services-cates">
8   <ul class="tabs">
9     <li class="tabs-1 active">Всички</li>
10    <li class="tabs-2">Декорации</li>
11    <li class="tabs-2">Маникюр</li>
12  </ul>
13 </div>
14
15 <div class="services-block">
16   <div id="tabs-1" class="tab-content active">
17     <div class="col-md-4 col-sm-6 col-xs-12">
18       <div class="content-wrapper">
19         <div class="img-block"></div>
20         <div class="service-meta">
21           <div class="serv-title">
22             <p>Bluesky Glory, Matrix Gel White, Indigo Holo Green</p>
23           </div>
24         </div>
25       </div>
26     </div> <!-- FIRST ITEM -->
27
28     <div class="col-md-4 col-sm-6 col-xs-12">
29       <div class="content-wrapper">
30         <div class="img-block"></div>
31         <div class="service-meta">
32           <div class="serv-title">
33             <p>Bluesky Glory, Matrix Gel White, Indigo Holo Green</p>
34           </div>
35         </div>
36       </div>
37     </div> <!-- SECOND ITEM -->

```

Figure 65: Structure of the tabs and the items using HTML

```

282 ul.tabs {
283     border: 1px solid #ffffff;
284     border-radius: 4px;
285     margin: 40px 0;
286     display: inline-block;
287 }
288
289 .tabs li {
290     display: inline-block;
291     border-right: 1px solid #ffffff;
292     color: #ffffff;
293     font-size: 13px;
294     text-align: center;
295     padding: 11px 0;
296     width: 100px;
297     float: left;
298 }
299
300 .tabs li:hover, .tabs li.active {
301     background-color: #ffffff;
302     transition: all 0.3s;
303     color: #000000;
304 }
305
306 .tabs li:last-child {
307     border-right: 0px;
308 }
309
310 .services-cates {
311     text-align: center;
312 }

```

Figure 66: Styling the tabs of “Our Work” section with CSS

```

314 .services-cates {
315     text-align: center;
316 }
317
318 .tab-content .col-md-4.col-sm-6.col-xs-12 {
319     float: left;
320 }
321
322 .serv-title a {
323     font-size: 16px;
324     text-transform: uppercase;
325     color: #ffffff;
326     margin: 20px 0;
327     font-weight: 700;
328     display: inline-block;
329     transition: all 0.3s;
330 }

```

Figure 67: Styling the items of “Our Work” section with CSS

```

332  .serv-title a:hover {
333      color: #f21241;
334      text-decoration: none;
335  }
336
337  .serv-desc {
338      color: #ffffff;
339      font-size: 15px;
340  }

```

Figure 68: Styling the items of “Our Work” section with CSS (cont.)

```

1  jQuery(document).ready(function(){
2  jQuery('.tabs-1').click(function() {
3      jQuery('#tabs-1').show();
4      jQuery('ul.tabs li').addClass("active");
5      jQuery('.tabs-8').removeClass("active");
6      jQuery('.tabs-2').removeClass("active");
7      jQuery('.tabs-3').removeClass("active");
8      jQuery('.tabs-4').removeClass("active");
9      jQuery('.tabs-5').removeClass("active");
10     jQuery('.tabs-6').removeClass("active");
11     jQuery('.tabs-7').removeClass("active");
12     jQuery('#tabs-8').hide();
13     jQuery('#tabs-2').hide();
14     jQuery('#tabs-3').hide();
15     jQuery('#tabs-4').hide();
16     jQuery('#tabs-5').hide();
17     jQuery('#tabs-6').hide();
18     jQuery('#tabs-7').hide();
19 });
20
21 jQuery('.tabs-2').click(function() {
22     jQuery('#tabs-2').show();
23     jQuery('ul.tabs li').addClass("active");
24     jQuery('.tabs-1').removeClass("active");
25     jQuery('.tabs-8').removeClass("active");
26     jQuery('.tabs-3').removeClass("active");
27     jQuery('.tabs-4').removeClass("active");
28     jQuery('.tabs-5').removeClass("active");
29     jQuery('.tabs-6').removeClass("active");
30     jQuery('.tabs-7').removeClass("active");
31     jQuery('#tabs-1').hide();
32     jQuery('#tabs-8').hide();
33     jQuery('#tabs-3').hide();
34     jQuery('#tabs-4').hide();
35     jQuery('#tabs-5').hide();
36     jQuery('#tabs-6').hide();
37     jQuery('#tabs-7').hide();
38 });

```

Figure 69: Adding functionality to the tabs of “Our Work” section with jQuery

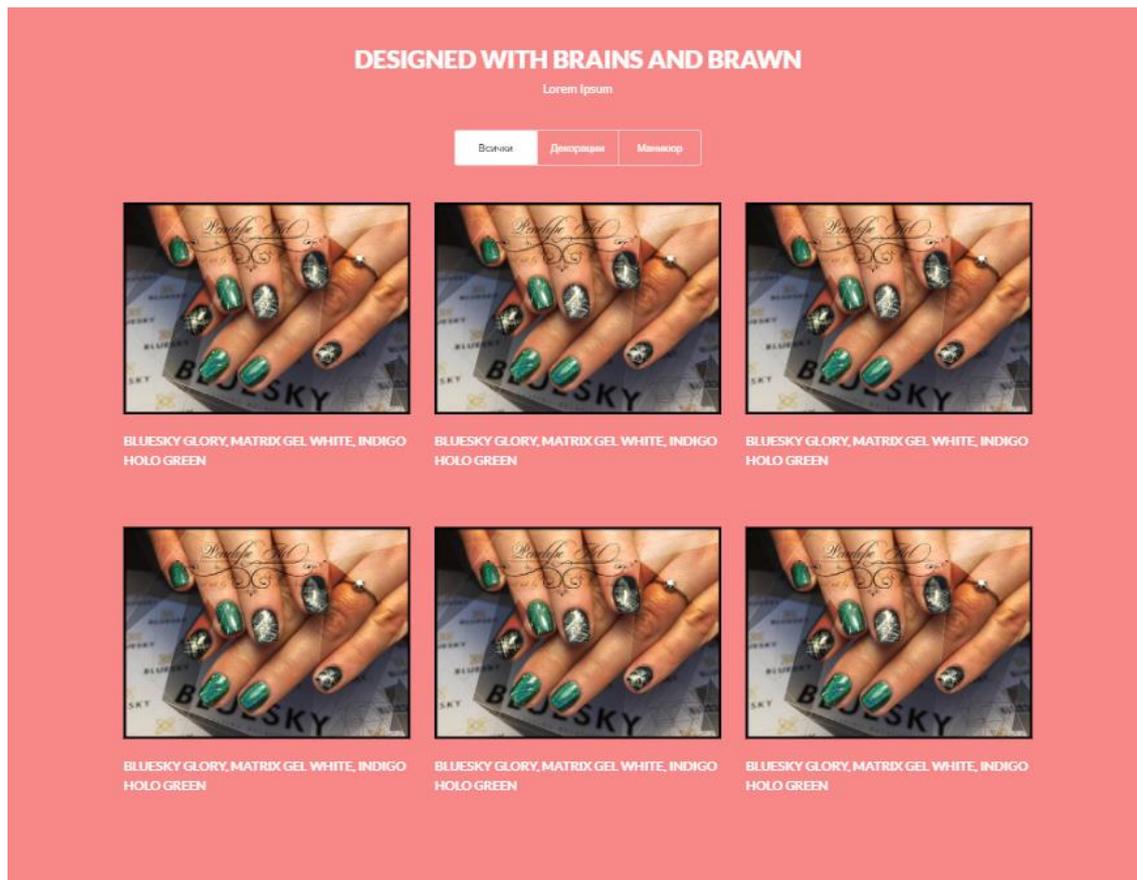


Figure 70: Preview of “Our Work” section after HTML, CSS and JavaScript (jQuery)

In the making of the dynamic section “Our Work” PHP was used. Following figures below show the PHP code which takes care of displaying dynamically the categories of their work:

```

7 <div class="services-cates">
8
9 <?php
10     $taxonomy = 'serv_cates';
11     $terms = get_terms($taxonomy);
12
13     if($terms && !is_wp_error($terms)) :
14 <?>
15
16 <ul class="tabs">
17 <li class="tabs-1 active">Всички</li>
18 <?php $count = 2;
19 <?php foreach($terms as $serv_terms) {
20 <?>
21 <li class="tabs-<?php echo $count; ?>"><?php echo $serv_terms->name; ?></li>
22 <?php $count++; } ?>
23 </ul>
24
25 <?php endif; ?>
26
27 </div>

```

Figure 71: Displaying “Our Work” categories dynamically with PHP

```

29 <div class="services-block">
30   <div id="tabs-1" class="tab-content active">
31     <?php
32       $args = array("post_type" => "services", "order" => "ASC");
33       query_posts($args);
34       while(have_posts()) : the_post();
35         global $post;
36         $icon = fw_get_db_post_option($post->ID, 'serv_icon');
37       ?>
38     <div class="col-md-4 col-sm-6 col-xs-12">
39       <div class="content-wrapper">
40         <div class="img-block"></div>
41         <div class="service-meta">
42           <div class="serv-title">
43             <a href="#"><?php the_title(); ?></a>
44           </div>
45           <div class="serv-desc">
46             <?php the_content(); ?>
47           </div>
48         </div>
49       </div>
50     </div>
51     <?php endwhile; wp_reset_query(); ?>
52   </div>
53
54   <?php $count = 2;
55
56   foreach($terms as $key=>$term) {
57     ?>
58
59     ?>
60
61     <div id="tabs-<?php echo $count; ?>" class="tab-content">

```

Figure 72: Displaying each item under the selected by the client category with PHP

```

61   <div id="tabs-<?php echo $count; ?>" class="tab-content">
62
63     <?php
64       $args = array("post_type"=>"services","order"=>"ASC","tax_query"=>array(
65         array("taxonomy"=>"serv_cates","field"=>"slug","terms"=>$term->slug)
66       ));
67
68       query_posts($args);
69       while(have_posts()) : the_post();
70         $icon = fw_get_db_post_option($post->ID, 'serv_icon');
71       ?>
72

```

Figure 73: Displaying each item under the selected by the client category with PHP (cont.)

```

73     <div class="col-md-4 col-sm-6 col-xs-12">
74       <div class="content-wrapper">
75         <div class="img-block"></div>
76         <div class="service-meta">
77           <div class="serv-title">
78             <a href="#"><?php the_title(); ?></a>
79           </div>
80           <div class="serv-desc">
81             <?php the_content(); ?>
82           </div>
83         </div>
84       </div>
85     </div>
86     <?php endwhile; wp_reset_query(); ?>
87   </div>
88   <?php $count++; } ?>
89 </div>

```

Figure 74: Displaying each item under the selected by the client category with PHP (cont.)

When the dynamic code was added into the template, it was time to add these items in the bank-end of WordPress. Following figures below show how this was done:

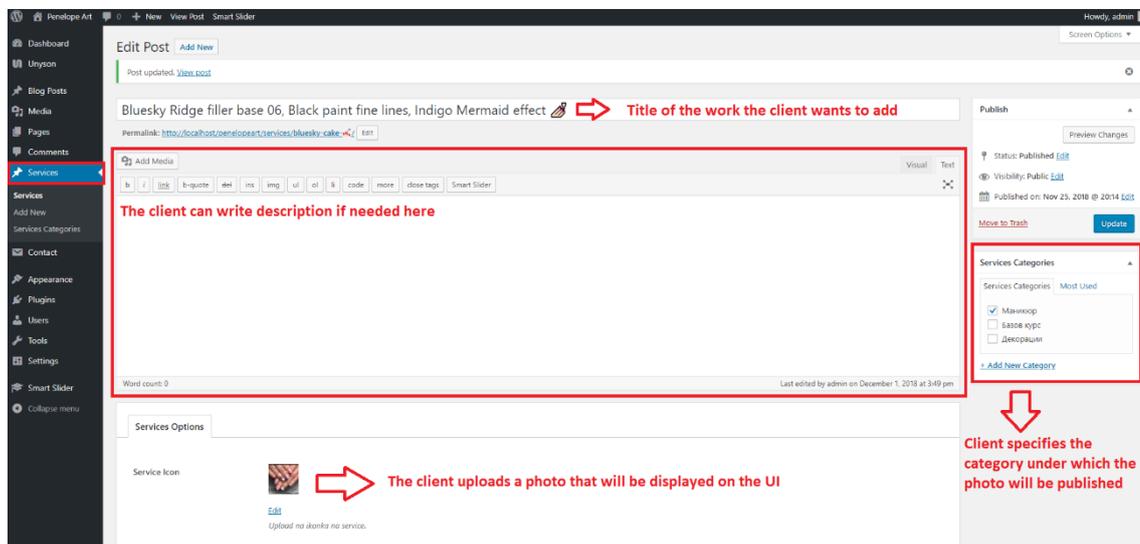


Figure 75: How the client adds a new work in the back-end in WordPress

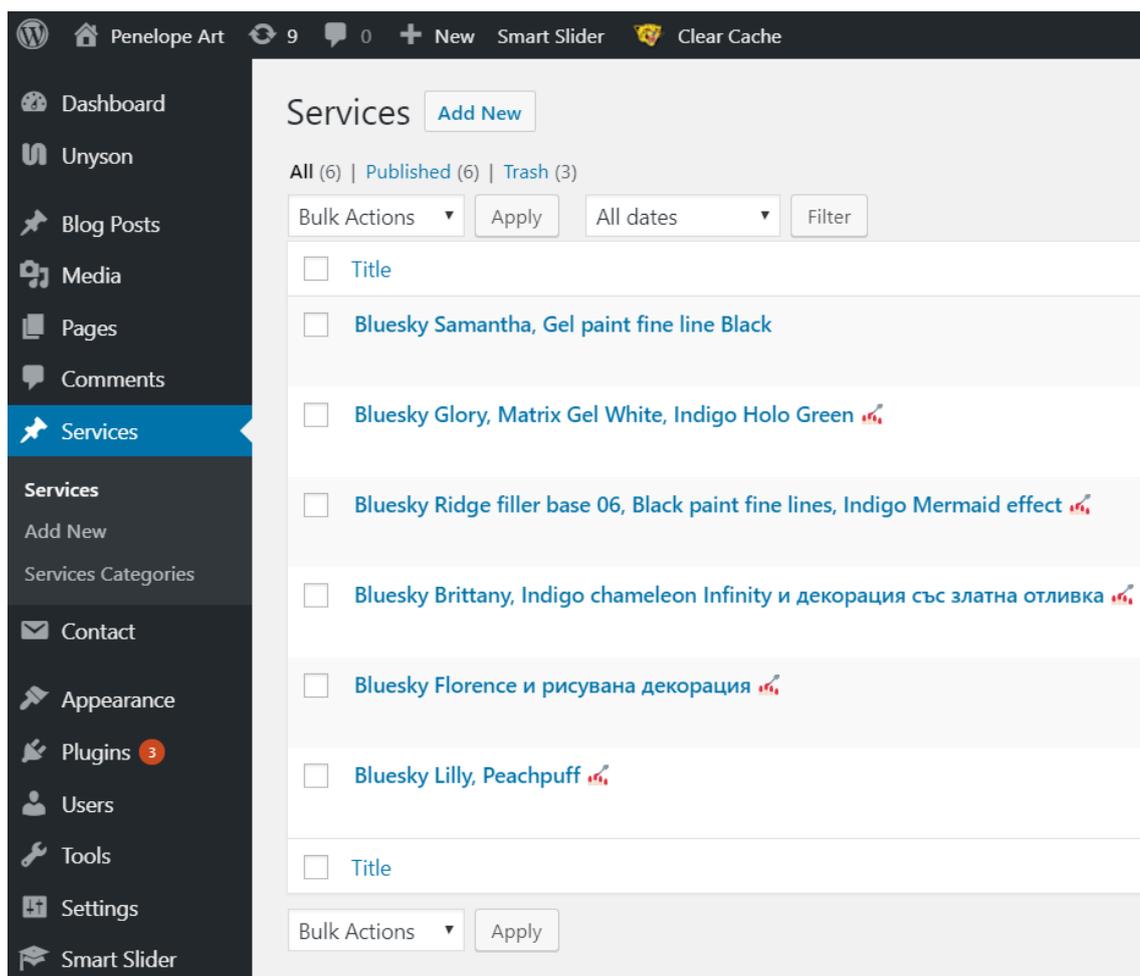


Figure 76: Back-end of WordPress showing all the works displayed on the website

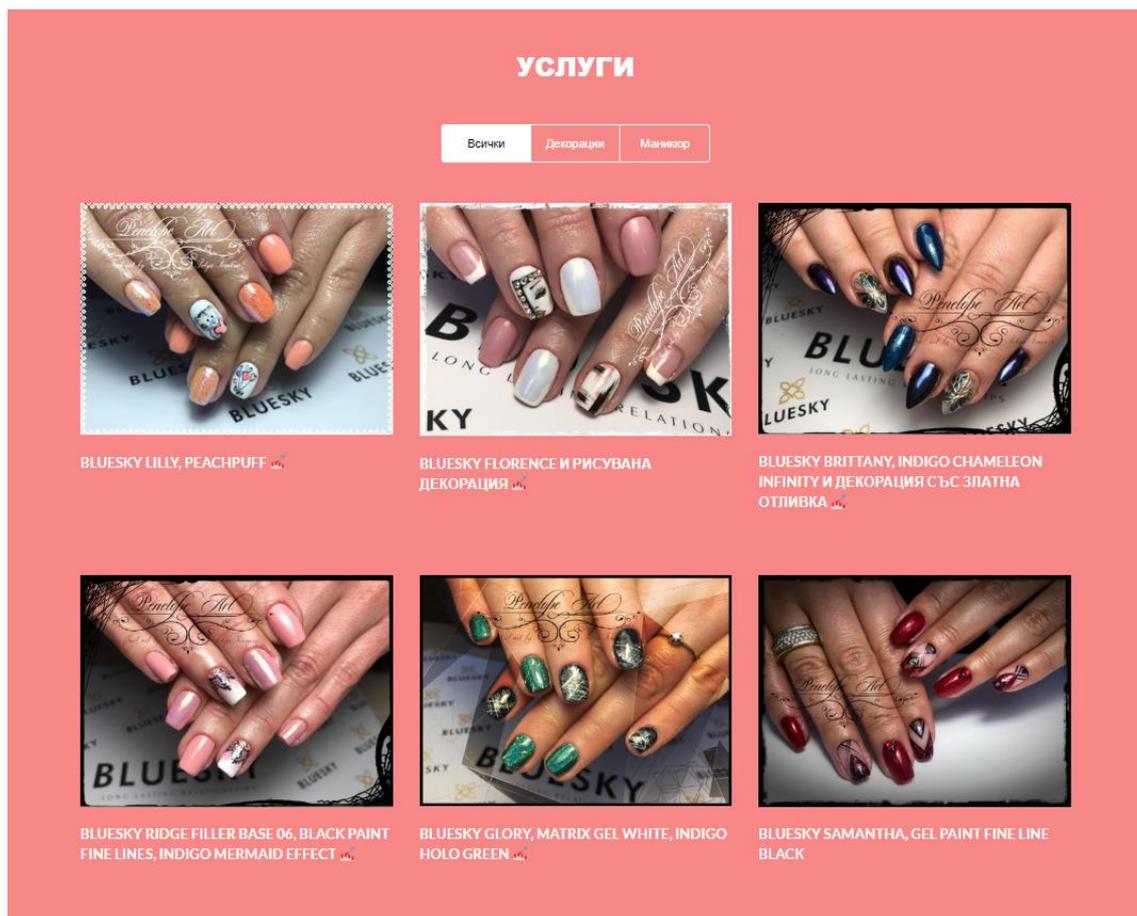


Figure 77: Displaying the “Our Work” services section dynamically

Another part created by the developer from scratch was the testimonials section. Following figures below reveal the static HTML, CSS and JS code for the template:

```

42 <div class="testimonial-block">
43   <div class="testimonial-wrapper">
44
45     <div id="owl-prev"><i class="fas fa-angle-left"></i></div>
46     <div id="owl-next"><i class="fas fa-angle-right"></i></div>
47
48     <div class="owl-carousel">
49
50       <div class="item">
51         <div class="testi-wrapper">
52           <div class="testi-text">Text</div>
53           <div class="testi-img">
54             
55           </div>
56           <div class="testi-meta">
57             <div class="testi-title">John Doe</div>
58             <div class="testi-desig">Client</div>

```

Figure 78: Structure of the testimonials section using HTML

```

59 |         <div class="testi-ratings">
60 |             
61 |             
62 |             
63 |             
64 |             
65 |         </div>
66 |     </div>
67 | </div>
68 | </div>
69 | </div>
70 | </div>
71 | </div>

```

Figure 79: Structure of the testimonials section using HTML (cont.)

```

649 | /* Testimonials Section */
650 | .testimonial-wrapper {
651 |     position: relative;
652 |     margin-top: 20px;
653 |     text-align: center;
654 | }
655 |
656 | .testimonial-icon {
657 |     margin-bottom: 30px;
658 | }
659 |
660 | .testi-text {
661 |     color: #555555;
662 |     font-size: 18px;
663 |     font-style: italic;
664 |     font-weight: 700;
665 |     margin-bottom: 30px;
666 | }
667 |
668 | .testi-wrapper {
669 |     padding: 0 150px;
670 | }
671 |
672 | .testi-ratings img {
673 |     width: auto !important;
674 |     margin: 0 auto;

```

Figure 80: Styling the testimonials section with CSS

In the testimonials section the developer implemented a touch enabled jQuery plugin called Owl Carousel 2. This is a fully customizable and responsive carousel slider which works on all devices. Refer to this link <https://owlcarousel2.github.io/OwlCarousel2/> in order to receive more information about the Owl Carousel plugin.

Next, the developer customized the plugin accordingly as shown in Figure 81 below:

```

9 <script>
10     jQuery(document).ready(function() {
11         jQuery('#<?php echo $testi_carousel_id; ?>').owlCarousel({
12             loop:true,
13             margin:10,
14             nav:false,
15             responsive:{
16                 0:{
17                     items:1
18                 },
19                 640:{
20                     items:1
21                 },
22                 992:{
23                     items:1
24                 },
25                 1366:{
26                     items:1
27                 }
28             }
29         });
30
31         jQuery('#owl-prev').click(function(){
32             jQuery('#<?php echo $testi_carousel_id; ?>').trigger('prev.owl.carousel');
33         });
34         jQuery('#owl-next').click(function(){
35             jQuery('#<?php echo $testi_carousel_id; ?>').trigger('next.owl.carousel');
36         });
37
38     });
39
40 </script>

```

Figure 81: Adding functionality to the testimonials section with jQuery

When the static template of the UI was completed, the developer continued to work on the widget by adding it to the Unyson framework options. Figure 82 shows the code for that below:

```

1 <?php if(!defined('FW')) die('forbidden');
2
3 $cfg = array(
4     'page_builder' => array(
5         'title' => __('Testimonials', 'unyson'),
6         'tab' => __('Content Elements', 'FW'),
7     )
8 );

```

Figure 82: Adding the “Testimonials” widget in Unyson framework

Next, the developer created the fields included in the widget as shown in Figure 83 and 84 below:

```

3 $options = array(
4     'testi_carousel_id' => array(
5         'Label' => __('Carousel ID', 'unyson'),
6         'type' => 'text',
7     ),

```

Figure 83: Creating input fields for testimonial values

```

 8      'testimonials'      => array(
 9          'label'         => __( 'Testimonials', 'unyson' ),
10          'type'          => 'addable-popup',
11          'template'      => '{- testi_title }',
12          'popup-options' => array(
13              'testi_title' => array(
14                  'label' => __( 'Title', 'unyson' ),
15                  'type' => 'text',
16              ),
17              'testi_img'  => array(
18                  'label' => __( 'Person Image', 'unyson' ),
19                  'type' => 'upload',
20              ),
21              'testi_desig' => array(
22                  'label' => __( 'Designation', 'unyson' ),
23                  'type' => 'text',
24              ),
25              'testi_rating' => array(
26                  'label' => __( 'Rating', 'unyson' ),
27                  'type' => 'short-select',
28                  'value' => '1',
29                  'choices' => array(
30                      '1' => '1 Star',
31                      '2' => '2 Stars',
32                      '3' => '3 Stars',
33                      '4' => '4 Stars',
34                      '5' => '5 Stars',
35                  ),
36              ),
37              'testi_text' => array(
38                  'Label' => __( 'Comment | Review | Text', 'unyson' ),
39                  'type' => 'textarea',

```

Figure 84: Creating input fields for testimonial values (cont.)

Then it was time to display the stored values from the input fields of the widget to the UI. The figures below show the code for that:

```

42 <div class="testimonial-block <?php echo $custom_class; ?>">
43     <div class="testimonial-wrapper">
44
45         <div id="owl-prev"><i class="fas fa-angle-left"></i></div>
46         <div id="owl-next"><i class="fas fa-angle-right"></i></div>
47
48         <div class="owl-carousel" id="<?php echo $testi_carousel_id; ?>">
49             <?php foreach($testimonials as $testi_vals) { ?>
50
51                 <div class="item">
52                     <div class="testi-wrapper">
53                         <div class="testi-text">
54                             <?php echo $testi_vals['testi_text']; ?>
55                         </div>
56                         <div class="testi-img">
57                             
58                         </div>

```

Figure 85: Displaying input field values to the UI

```

59 <div class="testi-meta">
60 <div class="testi-title"><?php echo $testi_vals['testi_title']; ?></div>
61 <div class="testi-desig"><?php echo $testi_vals['testi_desig']; ?></div>
62 <div class="testi-ratings">
63 <?php if($testi_vals['testi_rating'] == "1") { ?>
64 
65 <?php } ?>
66
67 <?php if($testi_vals['testi_rating'] == "2") { ?>
68 
69 
70 <?php } ?>
71
72 <?php if($testi_vals['testi_rating'] == "3") { ?>
73 
74 
75 
76 <?php } ?>

```

Figure 86: Displaying input field values to the UI (cont.)

```

78 <?php if($testi_vals['testi_rating'] == "4") { ?>
79 
80 
81 
82 
83 <?php } ?>
84
85 <?php if($testi_vals['testi_rating'] == "5") { ?>
86 
87 
88 
89 
90 
91 <?php } ?>
92 </div>
93 </div>
94 </div>
95 </div>
96
97 <?php } ?>
98 </div>
99 </div>
100 </div>

```

Figure 87: Displaying input field values to the UI (cont.)

Once this step was completed, the developer started to place the content for the testimonials in WordPress as shown in Figures 88, 89 and 90 below:

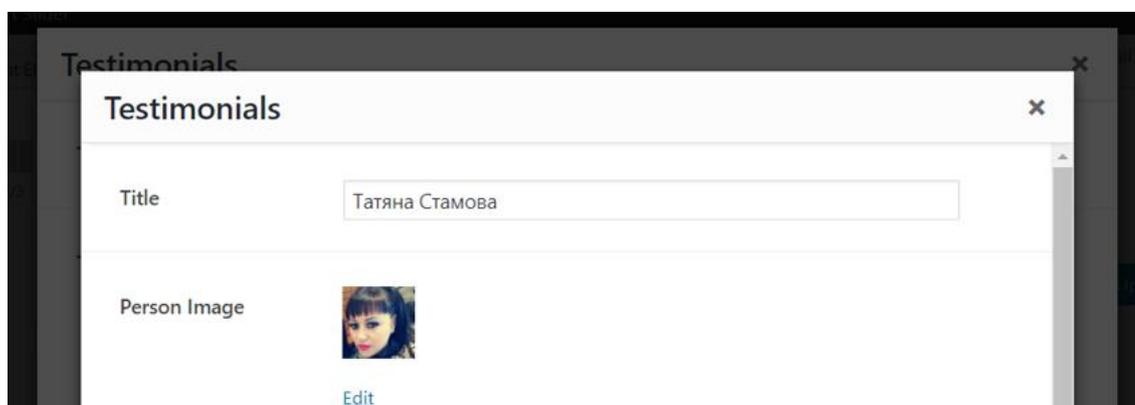


Figure 88: Creating testimonials of clients' reviews on the back-end of WordPress

Designation: Клиент

Rating: 5 Stars

Testi text: Уникален професионалист, креативни идеи, невероятни реализации...и не на последно място уникален човек :-)

Buttons: Reset, Save All, Save

Figure 89: Creating testimonials of clients' reviews on the back-end of WordPress (cont.)

Testimonials

Testi carousel id: testimonial-carousel **carousel id used for jQuery functionality**

Name	Order	Actions
Татяна Стамова	1st testimonial	Trash
Надежда Цветанова	2nd testimonial	Trash
Milena Ivanova	3rd testimonial	Trash
Росица Койчева	4th testimonial	Trash
Svetlana Kuneva	5th testimonial	Trash

Buttons: Add, Reset, Save

Figure 90: Creating testimonials of clients' reviews on the back-end of WordPress (cont.)

Once these testimonials were saved by clicking on the blue “Save” button, they were automatically displayed to the UI of the website as shown in Figure 91 below:

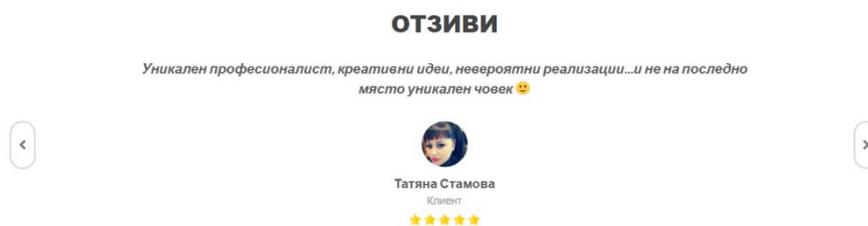


Figure 91: Displaying the testimonials section dynamically to the website

Similar steps as the ones described above were performed to the rest of the sections in Penelope Art's project using HTML, CSS and jQuery in order to create the static user interfaces. Then these static sections were made dynamic with PHP.

In order to make the load time of the website faster and to keep the website more SEO friendly, all the images of Penelope Art's project were exported using a well-known size optimization method "Save for Web" located in Photoshop. According to Photoshop this method decreases the size of images significantly resulting in quicker website load times. This process is illustrated in Figure 92 below:

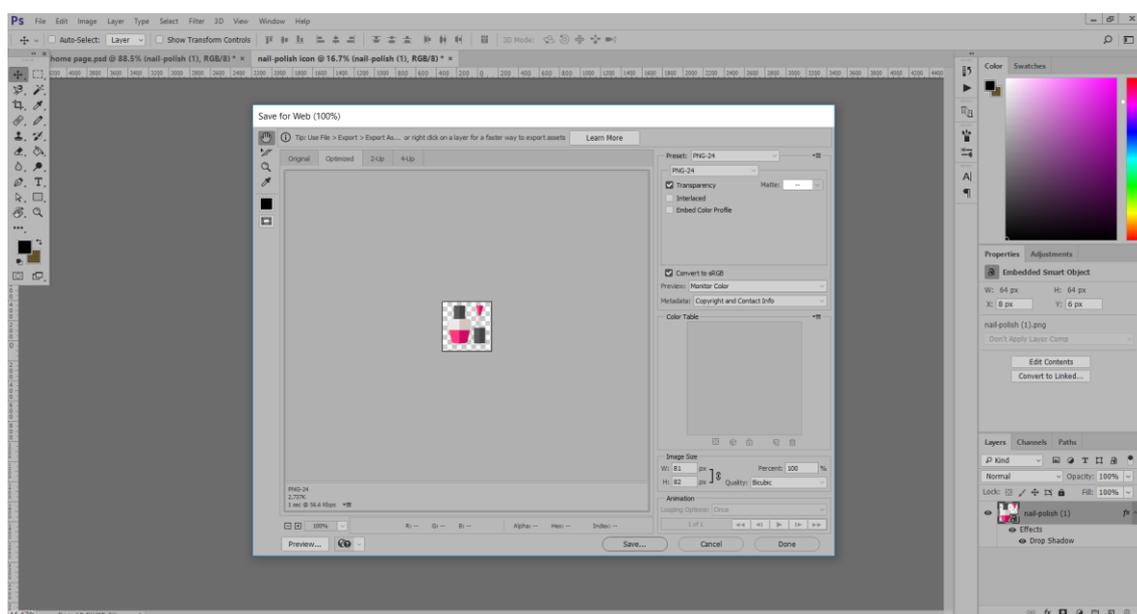


Figure 92: All images for Penelope Art's project were exported using "Save for Web"

Also, the size of all the images was further reduced by 5 megabytes using the online software TinyPNG. This is an easy-to-use, drag and drop compression tool that reduces the file size of images by decreasing the number of colours without compromising the quality of the image. Shrinking the image sizes results in less bandwidth usage and faster loading times for websites and web applications. The compression of images for Penelope Art's web platform can be seen in Figure 93 below:

2.jpg	110.9 KB	Finished	58.4 KB	download	-47%
3.jpg	104.9 KB	Finished	49.1 KB	download	-53%
4.jpg	97.2 KB	Finished	92.5 KB	download	-5%
5.jpg	313.0 KB	Finished	133.7 KB	download	-57%
6.jpg	348.6 KB	Finished	142.5 KB	download	-59%
7.png	930.8 KB	Finished	426.1 KB	download	-54%
8.jpeg	1.9 MB	Finished	666.8 KB	download	-65%
9.jpeg	1.6 MB	Finished	481.1 KB	download	-71%
10.jpeg	1.5 MB	Finished	505.5 KB	download	-67%
calendar-icon.png	2.4 KB	Finished	725 B	download	-70%
location-icon.png	4.3 KB	Finished	2.0 KB	download	-54%
logo-from-psd.png	138.3 KB	Finished	22.5 KB	download	-84%
nail-polish-icon.png	3.6 KB	Finished	1.7 KB	download	-52%
partner-bluesky.png	28.1 KB	Finished	5.0 KB	download	-82%
Penelope-Art-Logo.png	1.9 KB	Finished	682 B	download	-65%
slider-1.png	122.6 KB	Finished	42.1 KB	download	-66%
slider-2.png	350.0 KB	Finished	93.5 KB	download	-73%
working-hours-icon.png	5.4 KB	Finished	1.9 KB	download	-65%
1.jpg	174.1 KB	Finished	126.0 KB	download	-28%

Save to Dropbox Download all

Panda just saved you **63%** 5 MB total

Share your savings Tweet

Figure 93: All images of Penelope Art were compressed using TinyPNG

As described above, faster loading times help to make a web platform rank higher in search engines such as Google. However, the CEO of Penelope Art was further enhanced by adding descriptive ALT and Title tags in the images uploaded on Penelope Art's website. Figures 94 and 95 below show this procedure:

URL	http://penelopeartnails.com/wp-content/uploads/2018/11/7.p
Title	Курс за маникюристи Halloween nail art
Caption	
Alt Text	Курс за маникюристи Halloween nail art с партн
Description	Преподавател Петя Иванова, град София, партньори: Bluesky гел лакове

Figure 94: Enhancing further the SEO optimization for Penelope Art

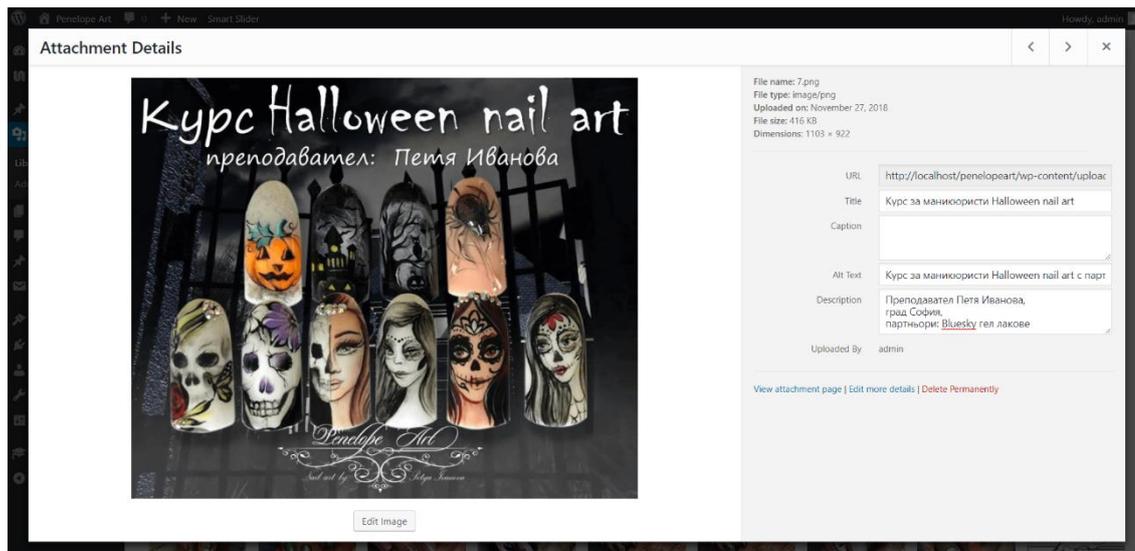


Figure 95: Enhancing further the SEO optimization for Penelope Art (cont.)

The platform was completed, shown to the owner of Penelope Art and approved. Next, the developer continued the work by getting a domain and hosting plan from ICN.bg which is a Bulgarian hosting provider. Once this step was completed, it was time to transfer the website from localhost to the hosting environment which happened with the help of a WordPress plugin called All-in-One WP Migration as shown in Figure 96 below:

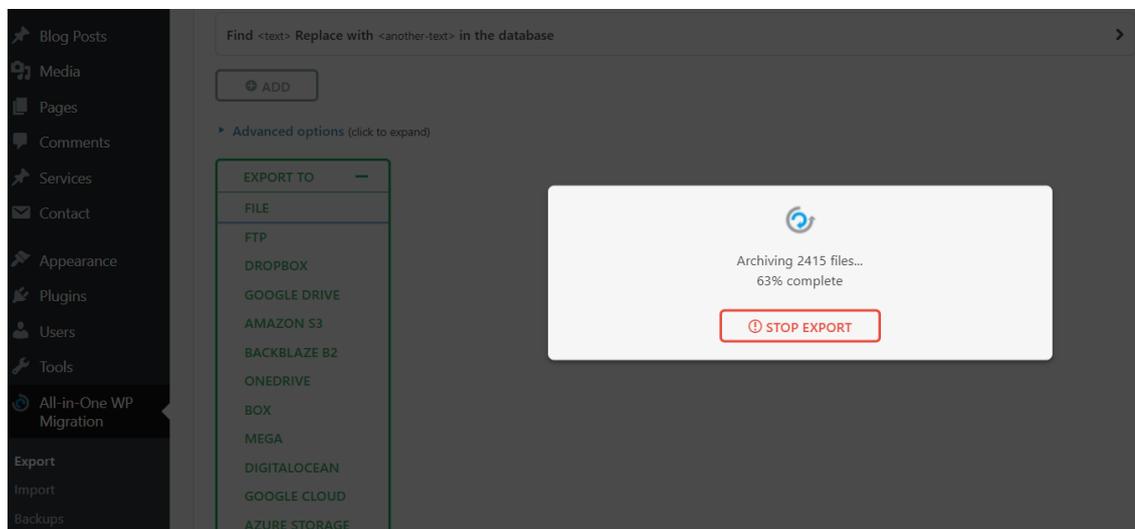


Figure 96: Exporting the project from localhost and uploading it to the live website

All the platform files and databases were cloned and saved to a zip file, uploaded into the hosting environment flawlessly. The website was accessible to the public on 1st of December 2018.

The testing period started after the platform was moved to the hosting provider. The system was tested by the developer and the client. This took a few days to complete, and it was

crucial to spend a little extra time on testing to make sure that the platform is bulletproof before sharing it with their clients on Penelope Art’s Facebook page. It was also essential to wait for a new WordPress update in order to make sure that the platform, the plugins and the widgets which the developer wrote from scratch will work fine after a new version release of WordPress.

During the testing period everything went smoothly. The tests which were performed included functionality testing such as database connection, internal and external links, contact form, custom JavaScript snippets and external plugins, and compatibility testing such as browser compatibility using Internet Explorer, Google Chrome, Firefox and platform responsiveness on different devices using an iOS-based smartphone and a tablet. Figures 97 and 98 below show the responsiveness of the platform on a smartphone and tablet:

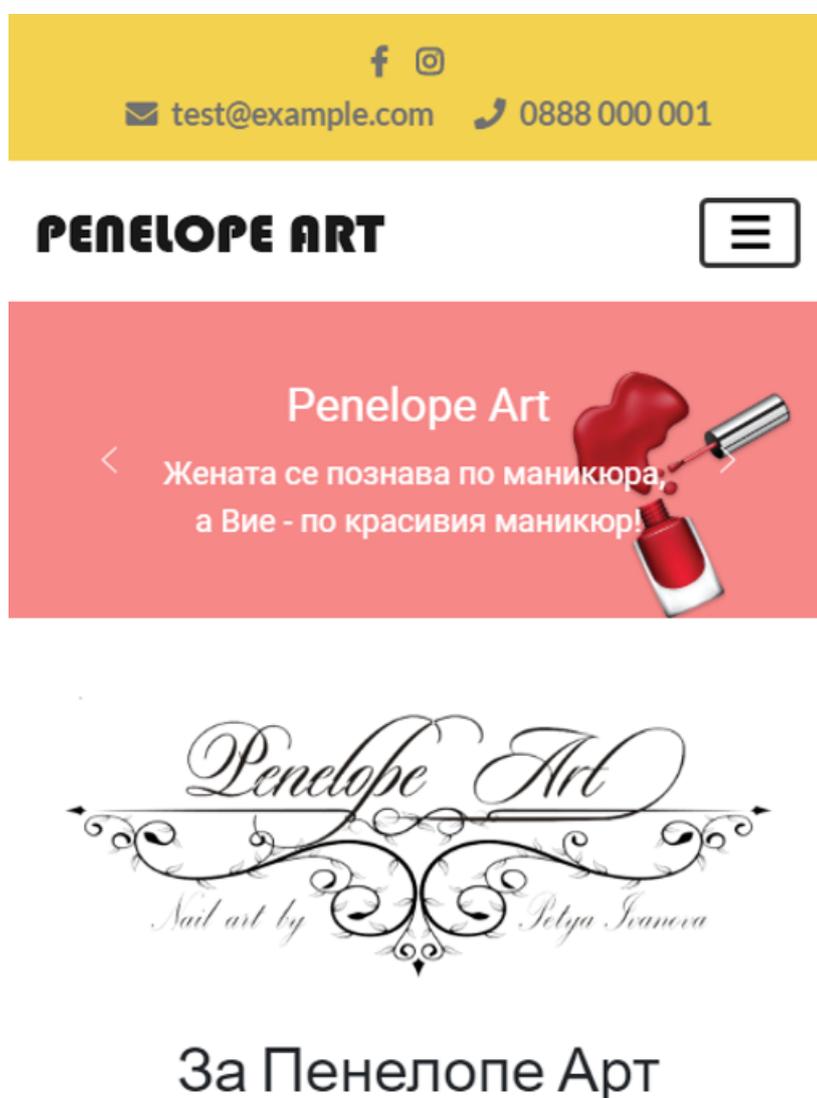


Figure 97: Responsiveness of Penelope Art’s platform on a smartphone

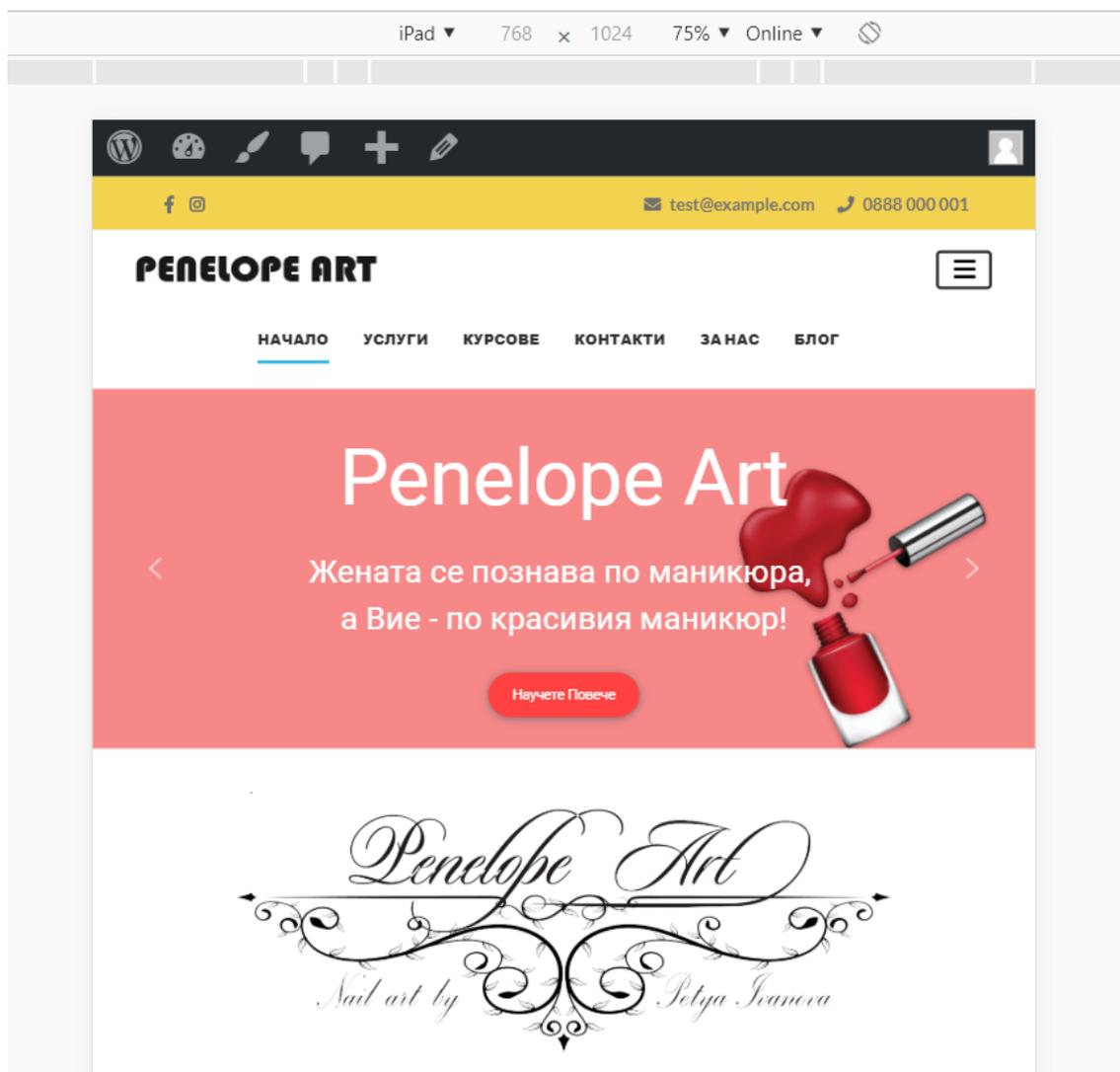


Figure 98: Responsiveness of Penelope Art’s platform on a tablet

Performance tests included page loading times with PageSpeed Insights by Google. Results are shown in Figure 99 below:

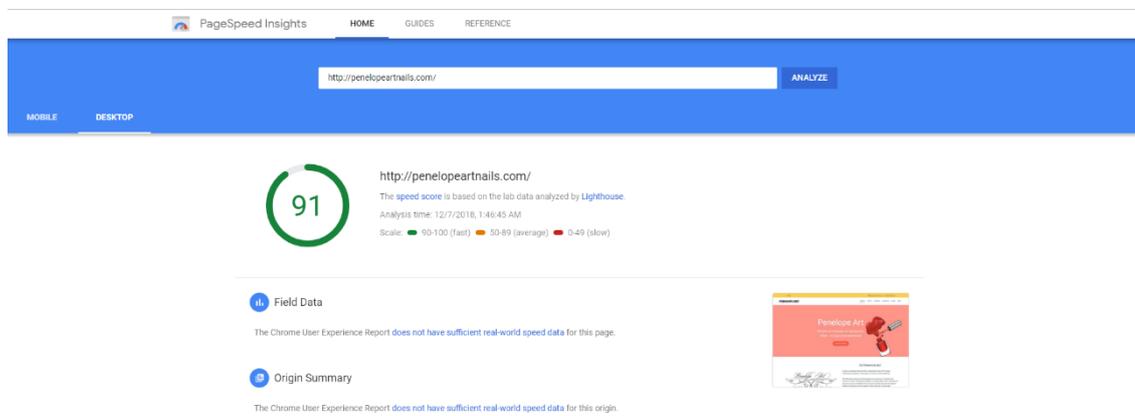
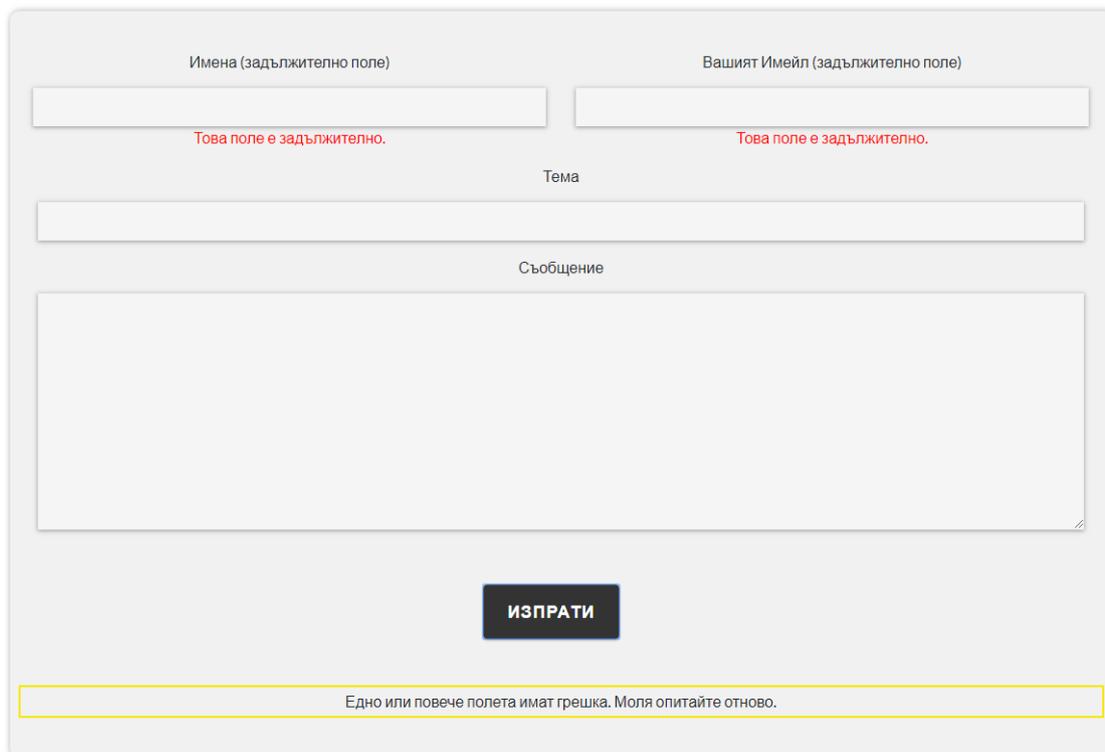


Figure 99: Page load time test with PageSpeed Insights by Google

4.5 Support and security

When the implementation part was complete, it was time to move on to the support and security of the web platform. Security testing such as invalid information of input fields and displaying error messages was performed. Results show that users are not able to send messages via the contact form if input fields are empty. Error messages are displayed to the UI if this occurs. Figure 100 shows the results for that:

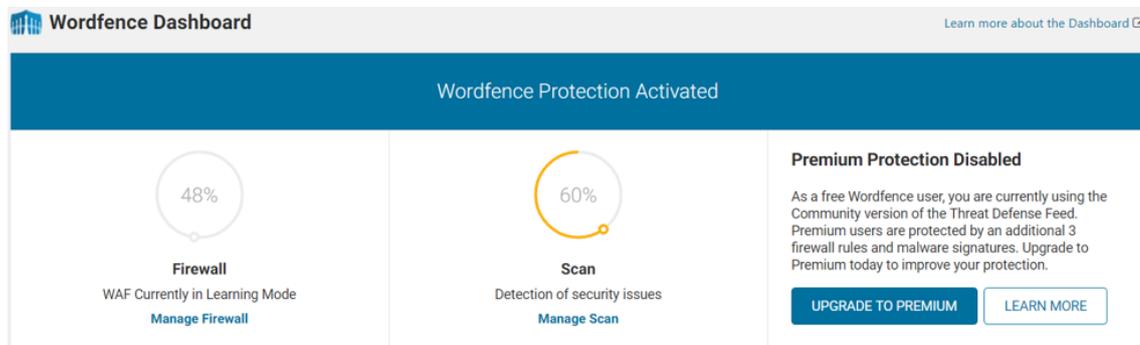


The screenshot shows a contact form with the following elements:

- Two input fields at the top: "Имена (задължително поле)" and "Вашият Имейл (задължително поле)". Both have a red error message below them: "Това поле е задължително."
- A "Тема" (Subject) input field.
- A large "Съобщение" (Message) text area.
- A black "ИЗПРАТИ" (SEND) button.
- A yellow-bordered error message at the bottom: "Едно или повече полета имат грешка. Моля опитайте отново." (One or more fields have an error. Please try again.)

Figure 100: Displaying error messages to the UI if input fields are empty

In order to provide further security for the website, the WordFence plugin was installed. It is described as the most comprehensive WordPress security plugins with over one million downloads. It includes features such as firewall, malware scan, blocking of attacks, live traffic, login security and more. Figure 101 below shows the dashboard of the plugin:



The screenshot shows the WordFence Dashboard with the following components:

- Wordfence Dashboard** header with a "Learn more about the Dashboard" link.
- Wordfence Protection Activated** status bar.
- Firewall** section: A circular progress indicator shows 48%. Below it, text reads "WAF Currently in Learning Mode" and "Manage Firewall".
- Scan** section: A circular progress indicator shows 60%. Below it, text reads "Detection of security issues" and "Manage Scan".
- Premium Protection Disabled** section: Text explains that as a free user, the user is using the Community version of the Threat Defense Feed. It offers 3 additional firewall rules and malware signatures. Below this text are two buttons: "UPGRADE TO PREMIUM" and "LEARN MORE".

Figure 101: WordFence security plugin for Penelope Art's website

These steps were essential to complete. They insured that the platform of Penelope Art was accessible, secured and user-friendly.

After the release of the platform, a Word file with detailed instructions was provided to the client by the developer. This file included information on how to create pages, posts and content in WordPress as well as how to create and update the navigation and the links inside it. In the manual it was also explained in detail how to create new slides, put content in them, add buttons if needed and update the image on the background. All the custom widgets coded by the developer were explained in detail in the manual, making sure that the client will easily understand how they work and would be able to create, edit or delete them. The owner of Penelope Art was also instructed to update the version of WordPress and the plugins in the theme on a regular basis in order to keep the website secured from hackers, data thieves and malicious code. Figure 102 shows the content of the Word file provided to the client:

Инструкции за поддръжка на сайт в WordPress	WordPress website Instructions
1 Вход в админ панела в WordPress	4 WordPress admin panel login and credentials
2 Инструкции за WordPress	4 WordPress basic instructions
3 Създаване на страници в WordPress	5 Creating pages in WordPress
4 Използване на добавки (widgets) в WordPress	5 Using widgets in WordPress
5 Създаване на блог постове в WordPress.....	6 Creating blog posts in WordPress
6 Ъпдейтване на хедър раздел.....	7 Updating the header section
6.1 Ъпдейтване на лого, Instagram, Facebook, имейл и тел. за връзка.....	7 Updating logo, social media, email and phone fields
6.2 Ъпдейтване на навигация.....	8 Updating the navigation links
7 Ъпдейт на слайдър	9 Updating the slider
7.1 Създаване на нов слайд.....	9 Creating a new slide
7.2 Опции за слайдовете.....	10 Style options of slider
8 Ъпдейтване на "За Нас" раздел	11 Updating "About Us" section
9 Ъпдейтване на "Услуги" раздел	12 Updating "Work Showcase" section
9.1 Създаване на нова услуга.....	13 Creating a new work
9.2 Ъпдейт на видовете услуги.....	13 Updating the tabs in "Work Showcase" section
9.3 Ъпдейт на раздела с текста за ФБ страницата	13 Updating the bottom widget in "Work Showcase" section
10 Раздел "Отзиви"	14 Testimonials section
10.1 Създаване на нов отзив	15 Creating new testimonial
10.2 Изтриване на отзив.....	15 Deleting a testimonial
11 Раздел "Партньори".....	15 Partners section
11.1 Добавяне на нов партньор	16 Adding a new partner
11.2 Изтриване на нов партньор.....	16 Deleting an existing partner
12 Ъпдейт на раздел "Футър".....	16 Updating the Footer section
13 Ъпдейт на страница "Услуги" и ценоразпис	17 Updating the "Services" page and price list
14 Ъпдейт на страница "Курсове"	17 Updating the "Courses" page
15 Ъпдейт на страница "Контакти"	18 Updating the "Contact Us" page
16 Ъпдейт на страница "За Нас"	19 Updating the "About Us" page

Figure 102: Detailed instructions on how to use the platform

5 Project result and evaluation

The execution of this project resulted in a complete and custom to Penelope Art platform. This website strengthens the online presence of Penelope Art and raises brand awareness while enhancing the relationship between the company and their customers. All the requirements of this project were ticked off within the set budget and time frame. Some of the objectives included development of a platform with sections to showcase their work, services,

courses, price lists, partners, upcoming events, and ability to collect feedback and queries from customers. They were discovered with the collaboration of both, the developer and the owner of Penelope Art, and were a result of previously done extensive benchmarking. Being on the internet provides Penelope Art with countless benefits and business growth opportunities such as reaching new potential customers in the long term.

6 Project continuation

The project is completed, and now live on domain name <http://www.penelopeartnails.com/>. An agreement with the client has been reached stating that the developer will be in charge for one year after the release of the platform for bug fixes if needed. The developer also had a discussion with the owner of Penelope Art that it would be a good idea to hire a part-time developer after this one year of agreement has passed. The idea behind this is to have a person with technical knowledge in their team who will be responsible for the support of the website, making sure that this platform will stay accessible and faultless.

7 Conclusion

Bringing this project to life has been a long and exciting journey for both parties. The majority of the phases ran smoothly, however, it was the cooperation and update discussions with the client, which made the execution of the project possible, and the troubleshooting and risk management minimal.

The platform for Penelope Art was up and running online within the agreed timeframe. Additionally, the client's requirements were implemented with great care and careful planning. All milestones and objectives set in the beginning of the project were achieved within the budget and the set deadlines were greatly respected. This has resulted in the client being very pleased with the final solution and result.

In conclusion, working on this project with Penelope Art was a successful development. Being a crucial part of the team and first-handedly planning, visualising, implementing and testing this project provided the developer with the extensive learning opportunity to dig deeper into the WordPress theme design and development from scratch, and cover topics which he had not gained any experience in before this project had gone live.

The final product received a lot of positive feedback, praise and compliments from the owner of Penelope Art. She was especially proud to share the beautiful web creation among her own clients, who have expressed great gratitude about Penelope Art's new branding, marketing and web strategy. Being present, reachable, modern and building a strong relationship with their clientele through better communication channels have become Penelope Art's number one priorities and their new web page marks the perfect beginning of an entire era for their growing and endless business opportunities.

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