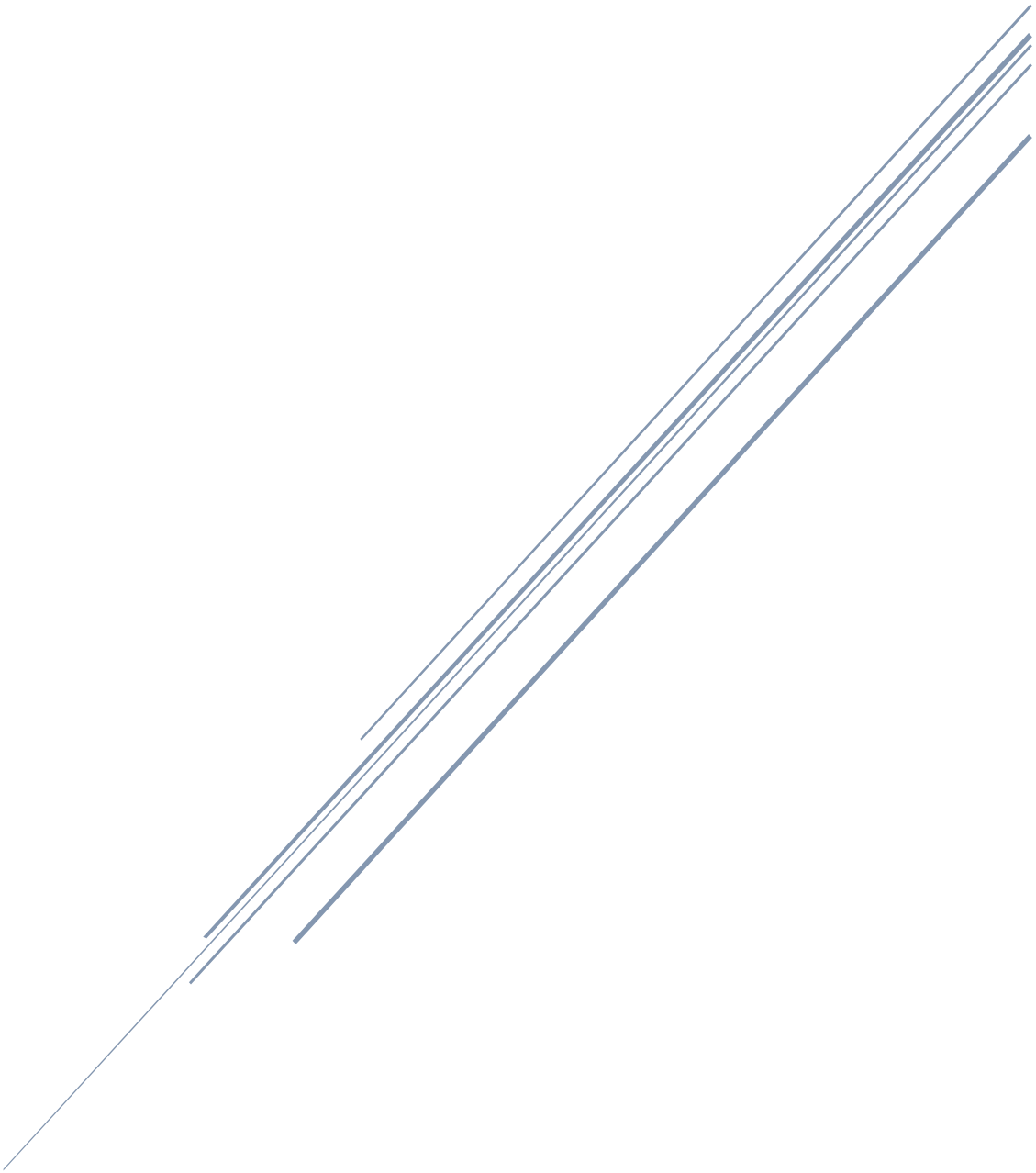
BLUE ECONOMY 2020

Documentation

By The Binary Trio



VSCPI

Blue Economy

1. Topic: Blue Economy – Energy from water/air
2. Authors:
    - Georgi Nedqlkov Georgiev
    - Petar Mitkov Dyakov
    - Stanislava Rumenova Andonova
3. Consultant: Alexander Ivanov
4. Overview

4.1. When you think of the word ‘economy’ what is the first color that comes to your mind? Many people would probably say it reminds them of grey but if one color should be defined as the representative of the future of economy, it should be blue. That’s right, blue because most of the potential of our oceans, seas, coasts and rivers could create new opportunities, promoting sustainable, inclusive growth and so much more. This is the reason why more people should learn and know about the benefits of protecting the marine resources and using them thoughtfully. All the bodies of water are critical to sustaining Earth’s life support systems and the billions of people who are dependent on them for livelihoods, food security and economic development. That is why we decided to create a website and a Chatbot who can help people become more familiar with the concept of Blue Economy.

4.2. As mentioned, our project consists of two main parts – the website and the Chabot. Every person on the team participated in creating them. First we started with our website, then we worked on the Chabot and after that we continued with some finishing touches on the website. Our team roles were as follows:

- Manager: Stanislava Andonova
- Developer: Georgi Georgiev
- Designer: Petar Dyakov

but we didn’t exactly match them. We all worked together and helped each other which is one of the best parts of working in a team.

4.3. To be honest we occurred quite a lot of problems during the process of creating our project but we hope it will all pay off.

One of the things that caused us trouble was the responsive design. All of us worked on different sized monitors and it was not an easy thing being able to build the perfect responsive design.

Another problem we encountered was running our first Chatbot. Originally it was supposed to be run on Python 3.7 but that did not work out so we had to make some changes. Additional libraries had to be downloaded and it really slowed down the whole development process. What happened at the end was that we decided to make a new Chatbot. The idea is the same but the codes are totally different. The second one we decided to call “Ivy”. Its code is way more simple than the first one we intended on making but at least it works.

4.4. ,4.5., 4.6. The first component of our project is the website. It is built using HTML5 and CSS3. We wrote it using the code editor Visual Studio Code and some extensions in it such as W3C Validation.

The website consists of 5 webpages in total. All of them have a navigation menu and a footer which are styled by a global CSS file named ‘navandfooter.css’. We decided to put those elements in one separate file just because it makes the code cleaner and organized and repeating the same code over and over again in the

```
<head>
    <!--CSS links, shortcut icon and title-->
    <meta charset="utf-8">
    <link rel="shortcut icon" href="images/dolphin.webp" />
    <link rel="stylesheet" href="styles/indexcss.css">
    <link rel="stylesheet" href="styles/navandfooter.css">
    <title>Blue Economy</title>
</head>
```

Figure 2 <head> tag in index.html

different files would not make any sense. In addition to it every page has an external unique CSS file named after the corresponding HTML files.

```
<!--Header and navigation menu-->
<header>
    <h1 class="logo">Blue Economy</h1>
    <input type="checkbox" id="nav-toggle" class="nav-toggle">
    <nav>
        <ul>
            <li>
                <a href="index.html">Home</a>
            </li>
            <li>
                <a href="#">Info<span class ="arrow1"> &#9662; </span></a>
                <ul>
                    <li>
                        <a href="#">Energy <span class ="arrow"> &#9656; </span></a>
                        <ul>
                            <li><a href="air.html">Air</a></li>

                            <li><a href="water.html">Water</a></li>
                        </ul>
                    </li>
                </ul>
            </li>
            <li>
                <a href="chatbot.html">ChatBot</a>
            </li>
            <li>
                <a href="about-us.html">About us</a>
            </li>
        </ul>
    </nav>
    <label for="nav-toggle" class="nav-toggle-label">
        <span></span>
    </label>
</header>
<!--Banner-->
<div class="banner">
    <img class="banner-img" src="images/sea-418742_1920.jpg" alt="banner-water-img">
    <h1>Welcome!</h1>
    <p>This is a website dedicated to bringing awareness to what Blue economy is.</p>
</div>
```

Figure 1 Navigation menu and banner

The next things you will notice if you take a look at our code are the navigation menu and banner of the page. They are most likely the same everywhere except the pictures used for the banners are different.

The other important and identical on all pages thing is the footer.

```html
<!--Footer-->
<footer class="footer">
    <div>
        <ul>
            <li><a href="index.html">Home</a></li>
            <li><a href="chatbot.html">ChatBot</a></li>
            <li><a href="about-us.html">About Us</a></li>
        </ul>
    </div>
    <hr class="hr-footer">
    <div>
        <ul>
            <li><a href="air.html">Air</a></li>
            <li><a href="water.html">Water</a></li>
        </ul>
    </div>
</footer>
```

Figure 3 <footer>

Just to give you a brief example of the responsive design here is a snippet of the CSS for the banner :

```css
@media screen and (min-width: 800px) {
    /*Banner*/
    .banner {
        width: 100%;
        display: block;
        margin-top: 80px;
        position: relative;
    }
    .banner > .banner-img {
        width: 100%;
        display: block;
        height: 450px;
    }
    .banner > h1 {
        font-size: 60px;
        color: white;
        top: 20%;
        left: 50%;
        transform: translate(-50%, -10%);
        position: absolute;
    }
```

Figure 6 CSS for banner (bigger screens)

```css
/*For smaller screens*/
/*Banner*/
.banner {
    width: 100%;
    display: block;
    margin-top: 70px;
    margin-bottom: 0px;
}

.banner > .banner-img {
    width: 100%;
    display: block;
    height: 300px;
    margin-bottom: 0px;
}

.banner > h1 {
    font-size: 40px;
    color: #ffffff;
    top: 25%;
    text-shadow: -3px 2px 2px rgba(0, 0, 2, 0.5);
    left: 50%;
    transform: translate(-50%, -10%);
    position: absolute;
}
```

Figure 5 CSS for banner (smaller screens)

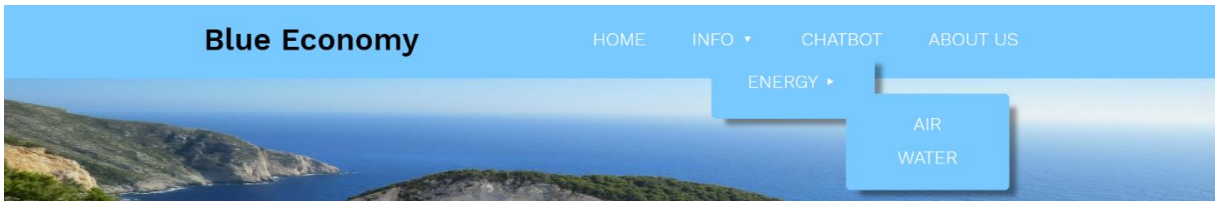


Figure 4 Navigation menu on a bigger screen

Figure 8 Navigation menu on a smaller screen

Figure 7 On-click navigation menu on a smaller screen

That was just a small peak on some of the elements in the website.

Now let me introduce you “Ivy”. Ivy is a Chatbot designed to help people learn something more about the Blue economy. It is able to answer questions like:

- What is Blue economy?
- Why is Blue economy important?
- Which companies support the Blue economy? Etc.

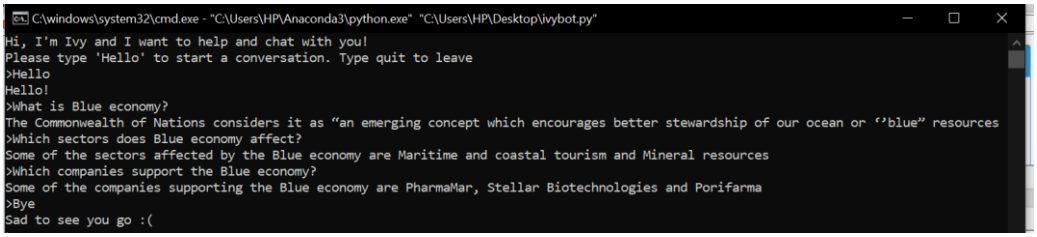


Figure 9 Ivy in action

Ivy’s code is written in Spyder using Python 3.7. Our Chatbot is very useful and will definitely help you learn some new things. Here are a few parts of the code:

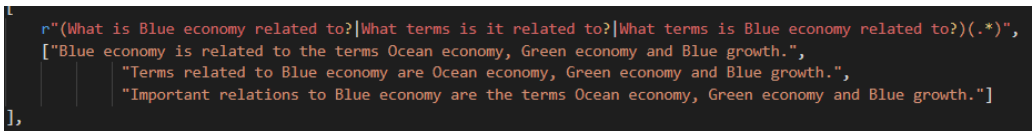


Figure 10 Example question in the code

Figure 11 Chatbot code

The first Chatbot we tried to make worked a bit differently. It used Deep learning. Deep learning is a subset of machine learning in artificial intelligence (AI) that has networks capable of learning unsupervised from data that is unstructured or unlabeled. If it worked it was supposed to be a bit “cleverer”. The method it was going to use is taking the root of the word and with that

```
with open("intents.json") as file:
    data = json.load(file)

try:
    with open("data.pickle", "rb") as f:
        words, labels, training, output = pickle.load(f)
except:
    words = []
    labels = []
    docs_x = []
    docs_y = []
    for intent in data["intents"]:
        for pattern in intent["patterns"]:
            wrds = nltk.word_tokenize(pattern)
            words.extend(wrds)
            docs_x.append(wrds)
            docs_y.append(intent["tag"])

        if intent["tag"] not in labels:
            labels.append(intent["tag"])

    words = [stemmer.stem(w.lower()) for w in words if w != "?"]
    words = sorted(list(set(words)))
```

Figure 12 "Chatbot-try" code

being able to answer questions, not initially encoded. Take a look at some parts of the code:

```
def bag_of_words(s, words):
    bag = [0 for _ in range(len(words))]

    s_words = nltk.word_tokenize(s)
    s_words = [stemmer.stem(word.lower()) for word in s_words]

    for se in s_words:
        for i, w in enumerate(words):
            if w == se:
                bag[i] = 1

    return numpy.array(bag)
```

Figure 14 "Chatbot-try" code

```
def chat():
    print("Start talking with the bot (type quit to stop)!")
    while True:
        inp = input("You: ")
        if inp.lower() == "quit":
            break

        results = model.predict([bag_of_words(inp, words)])
        results_index = numpy.argmax(results)
        tag = labels[results_index]

        for tg in data["intents"]:
            if tg['tag'] == tag:
                responses = tg['responses']

        print(random.choice(responses))

chat()
```

Figure 13 "Chatbot-try" code

4.7. If you want to open our website you should use any browser (preferebly not Internet Explorer). The Chatbot “Ivy” opens through the Command Prompt window.

4.8. In conclusion, our project is made for bringing awareness to what the Blue economy is and why it is important. We should be really careful with the way we treat our planet because this is the place where we and the people after us spend our whole lives and it is significant keeping it in the best conditions possible.

We plan on improving our website, adding more information and hoping on getting the more interesting Chatbot to work.

Thank you for the attention!