Corona Forecasting WebSite – SDD

Software Design Document

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1. INTRODUCTION

1.1 Purpose

This software design document describes the architecture and system design of a corona predication site, this document is intended for the developers and our Project Manager.

1.2 Scope

The system will receive data about global state of the pandemic spreading, and will predict future state of countries which will help countries, Researchers and public figures make their future plans.

1.3 Overview

The SDD document contains details about our products and system design information.

1.5 Definitions and Acronyms

Graph: graphic representation of the data that will be presented in site

csv: the file that we will work with (pull from global site and run in algorithm that will output updated csv file)

2. SYSTEM OVERVIEW

The project is divided into two main parts: Client-side and Server-side.

Client-side is a website, The main goal of the client-side is to interact with clients, handling the client's input and output. client-side has been written in React (JavaScript libraries) HTML and CSS.

The Server-side goal is to implement an algorithm of predication about the spreading of sick people and recovered people and handle the requests that came from the website (clients).

3. SYSTEM ARCHITECTURE

3.1 Architectural Design
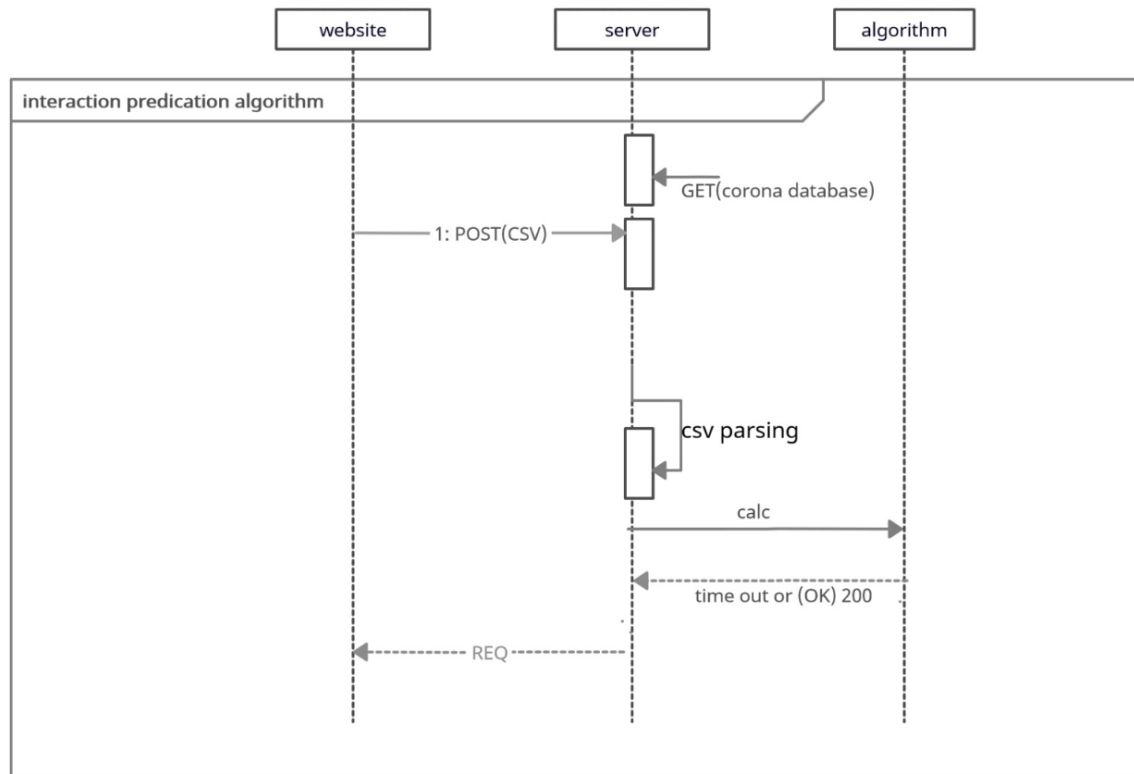
3.2 DecompositionDescription

Graph-map- Graph with the latest data of patients recovering in each country past and future.

algorithmApi – API With the algorithm which predicts the future for the sick and recovering.

APP(front) - The application which is visible to the user on the site (front-side), the user does not see the calculations.

Server side - The calculations that are performed on the server, contact and transfer data to a client side.

4. DATA DESIGN
4.1 Data Description

Our csv database which we download using Python from https://covid.ourworldindata.org/data/owid-covid-data.csv, the file is sent to the server side algorithm. The server side returns us a file of the csv data with the updated data.

4.2 Data Dictionary

```
def importData(url,data , file)
```
this function import the data from "https://covid.ourworldindata.org/data/owid-covid-data.csv" and create a file.
```
def Data_algorithem(data_before, data_after)
```
this function send the data from "https://covid.ourworldindata.org/data/owid-covid-data.csv" and to the algorithm and create another data after the algo.

5. COMPONENT DESIGN

Graph-Map
```
def createGraph(self)
```
this function create a graph with values as a country and data. Number of recovering, number of patients recovering in past and future dates
```
def changeCountry(self, country)
```
this function change the country in the graph. After that the screen display selected country.
```
def changeData(self, start, end)
```
this function change the data that the user want to see.
Algorithm Api:
This part of Elia.

APP:

Functionality:

:**return***: the home page Home.html*
```
def home()
```
this function returns the home page Home.html
:**return***: the home page Home.html*

```
def send_dom(dom)
```
this function returns any DOM objects
:**return***: the dom file the function receives in the function parameter*

```
def send_css(css)
```
this function returns any CSS objects
:**return***: the css file the function receives in the function parameter*

```
def send_images(image)
```
this function returns any IMAGE objects
:**return***: the image file the function receives in the function parameter*

```
class serverAlgorithm(Resource):
```
(this functions is RESTful API using flask-RESTful)
```
        def get(self)
```
return {'Algorithm' : 'available'}
```
        def post(self)
```
receive: graph object
return: TIME OUT or success (200 code) .

6. HUMAN INTERFACE DESIGN

6.1 Overview of User Interface

Our website is a web application that is used as the user interface. Our website has a main page that consists graph with details about Corona patients and Corona recoveries, past and future .From that page, the user can navigate to other pages; e.g. "who we are", "contact us" pages and so on.

Option to navigate to view a different graph. There is a button by which we can select the country to be displayed in the graph.

After the user selects the country and the number of days he wants to see, the graph will be displayed.

The server runs every 24 so that the user does not wait, nor wait for a computational operation from the server.

6.2 Screen Images

The following pictures do not belong to us:

But we want to build in this style.

At the first level a table with the countries and to the right of the current table the expected future from the algorithm

All	Europe	North America	Asia	South America	Africa	Oceania							
#	Country, Other	Total Cases	New Cases	Total Deaths	New Deaths	Total Recovered	Active Cases	Serious, Critical	Tot Cases/ 1M pop	Deaths/ 1M pop	Total Tests	Tests/ 1M pop	Population
	World	100,545,698	+263,136	2,157,594	+8,522	72,510,097	25,878,007	110,335	12,899	276.8			
1	USA	25,880,510	+18,913	432,166	+774	15,621,586	9,826,758	26,232	77,928	1,301	301,231,734	907,028	332,108,584
2	India	10,689,202	+11,492	153,722	+98	10,356,476	179,004	8,944	7,703	111	193,062,694	139,123	1,387,715,929
3	Brazil	8,881,853	+8,889	217,806	+94	7,709,602	954,445	8,318	41,617	1,021	28,600,000	134,008	213,419,676
4	Russia	3,756,931	+18,241	70,482	+564	3,174,561	511,888	2,300	25,738	483	100,000,000	685,071	145,970,231
5	UK	3,689,746	+20,089	100,162	+1,631	1,648,218	1,941,366	4,032	54,190	1,471	69,359,822	1,018,660	68,089,273
6	France	3,057,857		73,494		217,708	2,766,655	3,041	46,788	1,125	42,268,957	646,750	65,355,986
7	Spain	2,733,729	+36,435	56,799	+591	N/A	N/A	4,433	58,457	1,215	32,027,728	684,863	46,765,130
8	Italy	2,485,956	+10,593	86,422	+541	1,917,117	482,417	2,372	41,151	1,431	31,317,253	518,404	60,410,951
9	Turkey	2,442,350	+7,103	25,344	+134	2,322,511	94,495	1,791	28,783	299	28,828,496	339,740	84,854,582
10	Germany	2,159,358	+4,702	53,915	+513	1,844,000	261,443	4,787	25,726	642	37,449,922	446,168	83,936,831
11	Colombia	2,027,746		51,747		1,849,194	126,805	3,482	39,611	1,011	9,687,241	189,237	51,190,984
12	Argentina	1,874,801		47,034		1,666,527	161,240	3,598	41,266	1,035	5,919,820	130,302	45,431,593
13	Mexico	1,771,740	+8,521	150,273	+659	1,335,876	285,591	5,504	13,660	1,159	4,443,940	34,263	129,702,359
14	Poland	1,482,722	+4,604	35,665	+264	1,243,575	203,482	1,449	39,202	943	8,422,165	222,674	37,822,896
15	South Africa	1,417,537		41,117		1,241,421	134,999	546	23,731	688	8,019,239	134,252	59,732,948
16	Iran	1,385,706	+6,420	57,560	+79	1,177,367	150,779	4,038	16,379	680	9,015,376	106,561	84,602,832
17	Ukraine	1,197,107	+2,779	22,057	+133	965,835	209,215	177	27,467	506	6,125,257	140,542	43,583,034
18	Peru	1,102,795		39,887		1,017,544	45,364	1,805	33,185	1,200	6,113,359	183,959	33,232,222
19	Indonesia	1,012,350	+13,094	28,468	+336	820,356	163,526		3,679	103	8,881,607	32,277	275,166,779
20	Netherlands	956,867	+3,917	13,665	+86	N/A	N/A	674	55,773	796	6,970,400	406,283	17,156,521
21	Czechia	946,946	+6,910	15,618	+63	831,394	99,934	992	88,332	1,457	5,878,431	548,344	10,720,328
22	Canada	755,917	+2,906	19,357	+119	675,505	61,055	849	19,929	510	17,086,340	450,466	37,930,365
23	Romania	715,438	+2,877	17,938	+97	658,595	38,905	1,002	37,332	936	5,328,908	278,068	19,164,044

https://www.worldometers.info/coronavirus/

Home Page Illustration:

Corona Forecasting- WebSite

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Live:

World's map   Graph(date/cases)   Table(cases/Deaths/Recovered)

Prediction:

World's map   Graph(date/cases)   Table(cases/Deaths/Recovered)

7. REQUIREMENTS MATRIX

This table contains the requirements from the SRS document and all the components that respond to the requirements

1. *1. The software product will allow users to predict details about future corona sickness around the world in specific time/place*	*We will get the information from a local server that runs the data with an algorithm*
2. *Get current updated data*	*We will run the predication algorithm and upload the results to the site every 24h*
3. *Predict statistics in a specific place by choose*	*React interactivity & predication algorithm*
4. *Predict statistics in a specific time by choose.*	*React interactivity & predication algorithm*
5. *Filter the relevant data*	*React interactivity (graph library)*
6. *The site will be able to send emails if the answer is delayed for more than a minute*	*We will use with an open source API to send those emails if the results will delayed.*
7. *The site will contain all the information the user needs to know*	*The user will have, in the main page, all of the relevant information that he need.*
8. *The site will save the "cookies" of the user. The last search (country)*	*Server side*
9. *The web can handle several requests at the same time.*	*Server side*
10. *The server knew how to handle several types of API that come from the site.*	*Flask API*
11. *The server knew how to deal with a timeout problem when the request passed the minute.*	*Still on progress server + website + algorithm design*