khazanah informatika

Information System on Mapping and Geolocation of COVID-19 in the City of Sukabumi

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Abstract - Coronavirus Disease (COVID-19) has made Indonesia's health condition critical. Therefore, the President of the Republic of Indonesia disclosed Presidential Decree No. 7 in 2020 regarding the Task Force for the Acceleration of Coronavirus Disease 2019 (COVID-19) Handling. The decree relates to Act No. 14 in 2008 regarding Public Information Disclosure, Presidential Regulation No. 95 in 2018 concerning Electronic-Based Government Systems, and Presidential Instruction No. 3 in 2003 concerning National Policies and Strategies for E-Government Development. The decree demands information system development, similar to https://covid19.go .id, which describes COVID-19 nationwide. The site explains what COVID-19 and data of the COVID-19 outspread with geolocation and digital map, which may attract public attention. The presidential instruction forces local governments to build an information system, which is in line with the site by the central government. This paper describes the development of the system using a spiral model. It involves a variety of free and open-source software such as CodeIgniter, Mapbox, Morris Chart, MySQL, and WordPress. The site has been operational, and it attracts 150 visitors a day with 200 visits per day. As of January 6, 2021, the website has recorded 89,852 views.

Keywords: covid, graphics, mapping, geolocation, spiral

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1. Introduction

COVID-19 in Indonesia was initially recorded on March 2, 2020, two residents were confirmed positive for COVID-19 who were later declared cured on March 10, 2020, until at the end of March 2020, there were 114 people confirmed, 6 people recovered, and 14 people died [1] as shown in Figure 1.

The data presented in Figure 1 is an accumulation of Level 2 areas, including Sukabumi City, which was sent via the COVID-19-19. Application Programming Interface (API). API is a tool that makes website data processed by a computer so that it can view and edit data without knowing the program code inside [2]. The use of APIs on the web has been widely used, as stated by Putra, Sasmita, and Wiranatha [3], who developed an e-commerce marketplace for pet shop, and previously the API was also used to access token of population data [4].

The President of the Republic of Indonesia Joko Widodo through the Decree of the President of the Republic of Indonesia Number 9 of 2020 concerning Amendments to Presidential Decree Number 7 of 2020 concerning the Task Force for the Acceleration of Handling Coronavirus Disease 2019 (covid-19) [5] which is supported by Law Number 14 of 2008 concerning Transparency Public Information [6], Presidential Regulation of the Republic of Indonesia Number 95 of 2018 concerning Electronic-Based Government Systems [7], and Presidential Instruction Number 3 of 2003 concerning National Policies and Strategies for E-Government Development [8], emphasize that every regional head is obliged to develop information system related to Covid19, including Sukabumi City. From this instruction, the Mayor of Sukabumi, as the representative of the central government, ordered to build information disclosure regarding COVID-19 so that the surrounding community is more sensitive and alert about the dangers of the spread of COVID-19.

(a) (b) (c)
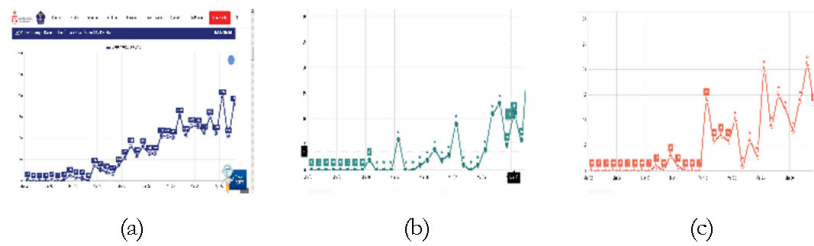
Source: www.covid19.go.id

Figure 1. Graph of COVID-19 in Indonesia in March. (a) positive confirmed data. (b) data recovered. (c) death data
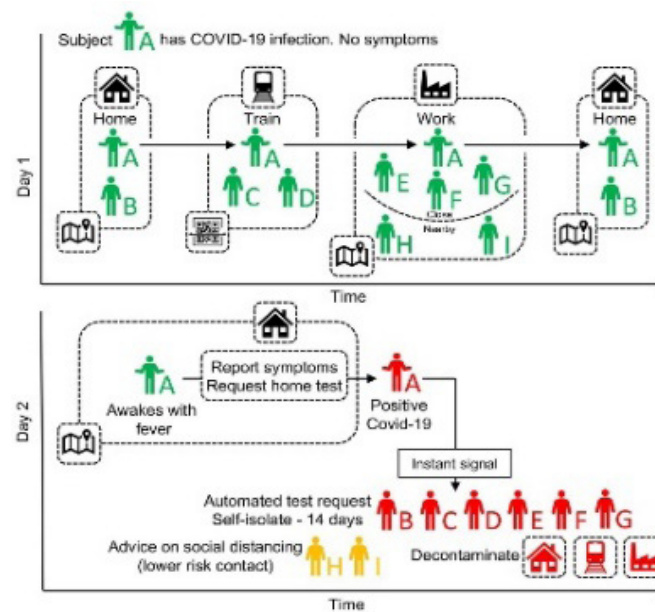

Figure 2. Covid 19 tracking techniques (Source: Ferretti et al.)

The time given is concise, and the need for engineering the information system includes mapping and geolocation of affected areas. Therefore, it needs a software engineering development strategy. This raises the formulation of the problem regarding how to make it easier for the public to know the development of Covid-19 around them, such as how to report in real-time to the Central Task Force and how to insert a digital map on the information systems. The information system engineering required by the government is also expected to track these COVID-19 victims. The tracking of Covid-19 victims needs to be carried out to find out how many people are exposed to this disease.

With the help of digital maps, it is now possible for the government to track the whereabouts of the victims of COVID-19 and the surrounding environment that must be protected and at which locations the victims were contaminated. Currently, there are digital map service providers, one of which is Mapbox which can be applied to various types of web-based information systems that also use APIs in their interactions with other sources that have existed since 2010 [9]. Therefore, in this way, it is easier for the government to trace the victims of COVID-19. The description of this covid19 tracking is demonstrated in Figure 2 according to Ferretti et al. [10].

To develop application/information software where the user requirement list (USR) in the form of a covid19 mapping requires a model that is by the user's condition, namely the Mayor of Sukabumi, in which the requested information system must be published immediately, dynamic in data changes, flexible input data, and easy to maintain when further development is required, and errors occur. The relation for this information system design team is that the system display can be described so that the requested system becomes workable, acceptable, and rational. In addition, the development of the COVID-19 map application is very sensitive and can have broad, multidimensional, and high-risk impacts. Hence, it is necessary to choose a system development approach that is suitable for these conditions, namely the adaptive System Development Life Cycle (SDLC) approach, one of which is the spiral model [11]. The main reason in using this spiral method is that the spiral model can work on the design and prototype side in one stage; it can also minimize the risk of technical work that must be avoided [12].

As an information system that has become public consumption, especially as a representation of the state, it requires software testing to ensure the system runs as it should. Software assessment using ISO-9126 is based on the Web Quality Evaluation Method (WebQem),

including functionality, efficiency, reliability, and usability [13]. To test more objectively, it requires special software to try, such as WAPT [14] to test reliability and Google Page Speed to test efficiency [15].

2. Methods

A systems development method guides every aspect of the systems development life cycle, which method uses specific models, techniques, and tools.

a. Model

Developing an information system requires a model that is by the conditions of the user, namely the Mayor of Sukabumi, in which the requested information system must be published immediately, dynamic in data changes, flexible in data input, can minimize the risk of work, and easy to maintain if further development is required and an error occurs. One model that fits these conditions is the spiral model. The advantage of the spiral model is that the stages of this model are simple, easy to understand for non-specialists, and most importantly, iterative in nature, where web application developers can return to previous phases when errors are found and make corrections to these errors—a spiral model whose general description can be seen in Figure 3.
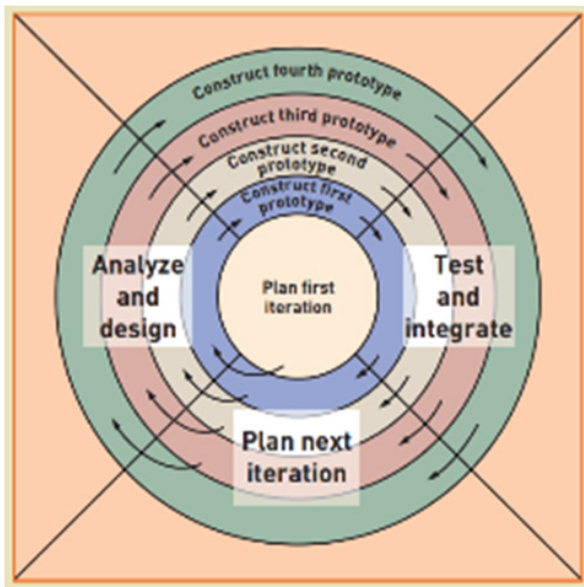

Figure 3. Spiral model

In the spiral model, the design and implementation of the program code that produces the prototype are in the same stage. The design and prototyping stages in work are the driving force behind the completion of the information system that is being worked on. Generally, programmers work on a subsystem one by one, starting from the design as the main display and then focusing on programming until the desired information system is completed.

b. Device

In system development requires devices such as,
1. Hardware: A set of computers with a 1Ghz Process Processor
2. Software: StarUML CodeIgniter Mysql Mapbox WordPress Morris Chart

c. Technique

In collecting information about detailed system requirements, several techniques need to be implemented, including user or other stakeholder interviews, reviewing input, output, and documentation, and also library studies.

d. System Analysis and Design

In completing the USR, it is necessary to interview users and see references from www.covid19.id, reviewing input, output, and literature study documentation is an indication of what the final form of the expected design. Based on interviews with the Health Office as the data owner, the example of data input for COVID-19 in Sukabumi City is diplayed in Figure 4.

DATA KASUS YANG DILAKUKAN PEMANTAUAN DI KOTA SUKABUMI

NO	KELURAHAN	KASUS									
		SUSPEK			PROBABLE			KONFIRMASI			
		TOTAL	SELESAI	ISOLASI	TOTAL	SELESAI	MENINGGAL	TOTAL	ISOLASI	SEMBUH	MENINGGAL
1	BAROS	252	242	10	1	0	1	363	34	321	8
2	JAYARAKSA	103	98	5	2	0	2	191	19	166	6
3	JAYAMEKAR	43	42	1	1	0	1	77	6	68	3
4	SUDAJAYA HILIR	70	65	5	0	0	0	113	11	96	6
5	BABAKAN	135	119	16	1	0	1	272	27	240	5
6	CIRFURFLIM HILIR	215	199	16	1	0	1	404	25	372	7
7	LIMUSNUNGGAL	125	115	10	1	0	1	186	18	162	6
8	SINDANG PALAY	89	86	3	0	0	0	167	9	153	5
9	CISARUA	308	279	29	0	0	0	446	49	389	8
10	SUBANG JAYA	202	191	11	1	0	1	382	35	342	5
11	KEBON JATI	85	81	4	1	0	1	170	11	156	3
12	CIKOLE	93	89	4	0	0	0	244	13	225	6
13	SELABATU	190	183	7	0	0	0	367	31	329	7
14	GUNUNG PARANG	83	71	12	0	0	0	160	16	133	11
15	CIKONDANG	159	143	16	2	0	2	248	26	216	6
16	TIPAR	176	172	4	5	1	4	259	10	237	12
17	CITAMIANG	146	141	5	1	1	0	204	15	183	6
18	GEDONG PANJANG	124	121	3	0	0	0	204	15	182	7
19	NANGGELENG	294	282	12	1	0	1	465	24	420	21
20	GUNUNG PUYUH	191	179	12	1	1	0	332	28	296	8
21	SRIWIDARI	179	171	8	0	0	0	263	26	221	16
22	KARANG TENGAH	238	232	6	1	0	1	439	41	386	12
23	KARAMAT	132	130	2	1	0	1	265	20	235	10
24	CIKUNDUL	52	50	2	1	0	1	90	10	76	4
25	CIPANENGAH	96	94	2	0	0	0	168	15	146	7
26	SINDANGSARI	35	35	0	0	0	0	67	6	59	2
27	LEMBURSITU	191	186	5	4	0	4	222	19	186	17
28	SITUMEKAR	64	63	1	0	0	0	82	4	73	5
29	BENTENG	192	184	8	1	0	1	308	29	265	14
30	DAYEUHLUHUR	254	247	7	0	0	0	311	24	277	10
31	NYOMPLONG	129	127	2	1	0	1	244	20	211	13
32	WARUDOYONG	72	69	3	1	0	1	110	17	91	2
33	SUKAKARYA	248	232	16	3	0	3	332	28	293	11
	JUMLAH	4915	4668	247	32	3	29	8155	681	7205	269

Figure 4. Sukabumi City Covid 19 input data

The location of the coordinates is marked using the village coordinates in Sukabumi City. The coordinate data for the village in Sukabumi City can be observed in Figure 5.

In addition to obtaining data held by the Sukabumi City Health Office as a URL, there is also data integration with the Sukabumi City Social Service in terms of disseminating information on social assistance data from the city to national levels. However, other reference results are taken from www.covid19.id which contains information and education, then adjusted to the needs of the City of Sukabumi, including important things for covid19, education, questions and answers, national task force, social media for handling COVID-19.

Based on the data mining process, the system design is based on USR, which can be clearly observed seen in Table 1. It is necessary to make guidelines such as use case

diagrams and class diagrams to keep on track. Use case diagrams to guide programmers so that the system built can perform and behave according to the results of the interview. The use case diagram using StartUML based on the USR, is illustrated in Figure 6.

Figure 6. Use Case Diagram

Figure 7. Class Diagram

The spiral model used in the development of this system produces a prototype that can produce the precise and correct output as required to minimize errors. The database used in this study uses MySQL database programming with database applications using Adminer, which can be accessed through the https://www.adminer.org site.

e.   Implementation Time and Place

The time of research was carried out from March to May 2020 at the Office of Communication and Information of Sukabumi City, West Java.

f.   Testing

Due to the fast demand for an immediate launch, this test uses the BlackBox testing method which aims to find any discrepancies based on the user's point of view. The results of this test are in the form of a prototype application that is being developed.

g.   Assessment

The assessment uses the ISO 9126 standard, which identifies six characteristics of quality software such as:

1) Functionality.

Assessment of functional aspects using a Feature Completeness assessor. The formula for calculating Feature Completeness is shown in Eq. 1,

$$X = \frac{i}{P} \tag{1}$$

Information:
P = Number of designed features

Figure 5. Coordinate data for Sukabumi City village

id	kelurahan	kecamatan	lat	longi
1	Cikole	Cikole	-6.91815	106.931523
2	Selabatu	Cikole	-6.91152	106.929606
3	Gunung Parang	Cikole	-6.91966	106.925289
4	Subang Jaya	Cikole	-6.9157	106.950701
5	Cisarua	Cikole	-6.92077	106.940179
6	Kebon Jati	Cikole	-6.92007	106.936014
7	Gunung Puyuh	Gunung Puyuh	-6.91451	106.91675
8	Sriwedari	Gunung Puyuh	-6.91099	106.927114
9	Karamat	Gunung Puyuh	-6.90257	106.921469
10	Karang Tengah	Gunung Puyuh	-6.9151	106.906758
11	Benteng	Warudoyong	-6.91931	106.913316
12	Dayeuh Luhur	Warudoyong	-6.94084	106.913921
13	Sukakarya	Warudoyong	-6.92876	106.902541
14	Nyomplong	Warudoyong	-6.92983	106.920189
15	WaruDoyong	Warudoyong	-6.93401	106.920917
16	Tipar	Citamiang	-6.93127	106.927754
17	Cikondang	Citamiang	-6.9415	106.925449
18	Citamiang	Citamiang	-6.92997	106.930161
19	Gedong Panjang	Citamiang	-6.94197	106.931068
20	Nanggeleng	Citamiang	-6.93423	106.934831
21	Babakan	Cibeureum	-6.92973	106.957602
22	Cibereum Hilir	Cibeureum	-6.93109	106.94562
23	Sindang Palay	Cibeureum	-6.95481	106.949443
24	Limus Nunggal	Cibeureum	-6.94755	106.942715
25	Baros	Baros	-6.96262	106.940262
26	Jaya Raksa	Baros	-6.9507	106.932739
27	Jaya Mekar	Baros	-6.96326	106.924807
28	Sudajaya Hilir	Baros	-6.9524	106.921794
29	Cikundul	Lembur Situ	-6.97586	106.910156
30	Sindang Sari	Lembur Situ	-6.95258	106.917226
31	Cipanengah	Lembur Situ	-6.96394	106.907641
32	Lembur Situ	Lembur Situ	-6.95948	106.891531
33	Situmekar	Lembur Situ	-6.94919	106.914165

Table 1. User Requirement List (URL)

No	List of needs
1	There is a site covid19.sukabumikota.go.id
2	There is a covid19 mapping in Sukabumi City
3	There is a graph of covid19 in Sukabumi City
4	There is the dissemination of social assistance from the Sukabumi City Social Service
5	Go to www.covid19.id and pikobar.jabarprov.go.id
6	Covid-19 education
7	COVID-19 FAQ
8	API link to the national task force
9	Social media for handling covid 19.

The class diagram is a structure diagram created to describe the relationship between model classes in the system. The class diagram design is illustrated in Figure 7.
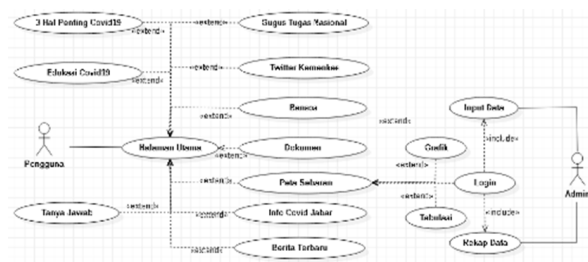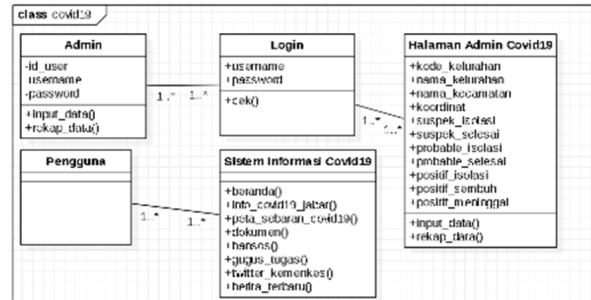
i = Number of features successfully implemented

2) Reliability

The reliability assessment uses WAPT 10 with a ramp-up type where the number of users increases until it reaches a predetermined maximum value. This results in information that the software/server can run well or not.

3) Usability

Assessment of the usability factor of the System Usability Scale (SUS) in which respondents from the general public were asked to provide an evaluation of "Very Informative" (SI) with a value of 5, "Informative" (I) with a value of 4, "Less Informative" (KI) with a value of 3, "Not Informative" (TI) with a score of 2, and "Don't Know" (TT) with a score of 1 on a Likert scale. The questions distributed are shown in Table 2.

Table 2. Question table for usability testing

Code	List of needs
R1	How informative is the information provided by the Sukabumi City Government regarding COVID-19?
R2	How informative is the information on www.covid19.sukabumikota.go.id?
R3	How informative is the COVID-19 data tabulation on www.covid19.sukabumikota.go.id?
R4	How informative is the covid19 digital map on www.covid19.sukabumikota.go.id?
R5	How informative is the covid19 graphic on www.covid19.sukabumikota.go.id?
R6	How informative is the visit chart on www.covid19.sukabumikota.go.id?
R7	How informative is the information for residents who have received COVID-19 social assistance found on www.covid19.sukabumikota.go.id?
R8	How informative is the COVID-19 educational information on www.covid19.sukabumikota.go.id
R9	How informative is the social media information on www.covid19.sukabumikota.go.id?

The table 2 questionnaire is distributed using a google form with a site address such as https://forms.gle/q2zwK9e2fpk5etKQA. The questionnaire data was calculated using the Cronbach Alpha formula [17], formulated as Eq. 2.

$$\alpha = \frac{k}{k-1}\left(1 - \frac{\sum S_i^2}{S_T^2}\right) \tag{2}$$

The value of k is the number of items, is the variance of the i-th item, and the variance of the total score formed by adding up all the items. The calculation of Eq. 2 has been represented through the website http://www.wessa.net/rwasp_cronbach.wasp [18] with the interpretation of the reliability value of Cronbach's Alpha shown in Table 3 [14].

Table 2. Cronbach Alpha reliability assessment table

No.	Score	Grade
R1	R > 0.9	Excellent
R2	0.9 > R > 0.8	Good
R3	0.8 > R > 0.7	Acceptable
R4	0.7 > R > 0.6	Questionable
R5	0.6 > R > 0.5	Poor
R6	R < 5	Unacceptable

4) Efficiency

Efficiency factor assessment is carried out using Page Speed from Google. The methodology that Google uses is to measure website responsiveness which websites should avoid landing page redirects, measure compression, measure browser cache, measure CSS minify, measure HTML minify, measure JavaScript minify, measure image optimization, measure visible content priority, and measure server response time [16].

3. Result

Information system design guidelines that are compiled based on URLs, then implemented using use cases, and class diagrams are implemented in programming form. Our programming combines various softwares such as framework programming using CodeIgniter 3 and WordPress, graphs using Morris Chart, digital maps using Mapbox, and databases using MySQL.

The database was built using MySQL, in which the tables were made according to the data provided by the Health Service as presented in Figure 4 and Figure 5. Based on the data in Figure 4, it was normalized into two tables. The first table is used to store data on the current day. The second table is used to store historical data that has existed since the first case appeared in Sukabumi City. In the second table, this is the basis for the graph of the increase and decrease in the number of COVID-19 in Sukabumi City.

The main page on the covid19.sukabumikota.go.id site uses WordPress 5.4.4. This is because of the convenience offered by WordPress, one of which is when there is damage by hackers which can immediately be repaired. One way to fix a WordPress site that was attacked by hackers is by restoring WordPress, which has previously been backed up, both content and database. Until January 6, 2021, since its launch, the system can display a total of 2045 confirmed positive patients, consisting of 597 (29.19%) people being treated (self-isolating), 1,386 (67.77%) people recovering, and 62 (3.03%) people dying. This site has been viewed 89,852 times with an average visit of 607.13 visits/day and an average visitor of 274.38 visitors/day, which is the visit graph on the main page of the covid19.sukabumikota.go.id site, which can be seen in Figure 8.
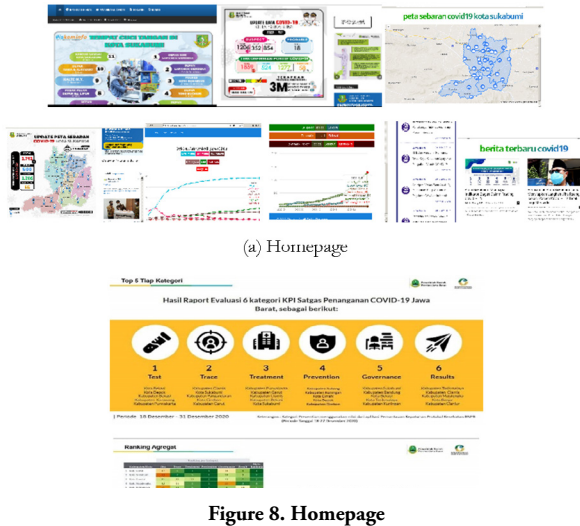
(a) Homepage

Figure 8. Homepage

On the main page, there are various extends to various purposes. Such as West Java Covid19 info with the link www.pikobar.jabarprov.go.id/ , the Covid19 distribution map with the www.covid19.sukabumikota.go.id/new/ link, the document with the www.covid19.sukabumikota.go.id/document/ link, Social assistance with the www.covid19.sukabumikota.go.id/bansos-covid19/link, National Task Force with the www.covid19.go.id link, Ministry of Health Twitter with the https://twitter.com/KemenkesRI link, and the latest news. Some of the extensions above point to three different external domains, including www.jabarprov.go.id, www.covid19.go.id, and www.twitter.com. Also, the same three subdomains with different folders use Codeigniter in them, just inserted with the <iframe> function.

The design and implementation of this system also produced results in the form of a report card from the West Java Provincial Government. The report card is about evaluating the handling of Covid19 in Sukabumi City so that it is ranked second for the period 18–31 December 2020, as shown in Figure 9.
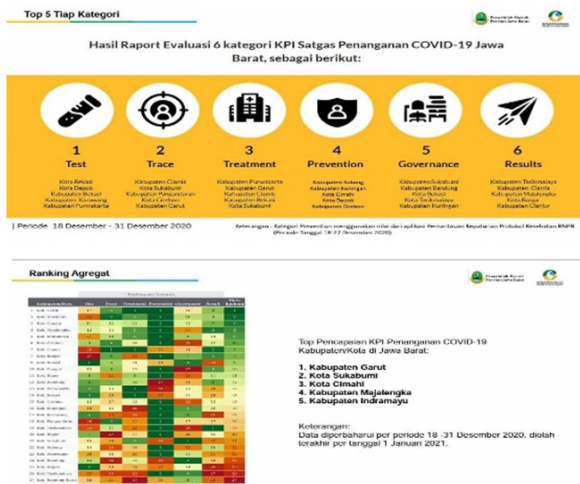
Source: https://pikobar.jabarprov.go.id.
Figure 9. Evaluation Report on Covid 19 Handling in West Java

4. Discussion

a. Mapping

Mapping installation on the covid19.sukabumikota.go.id site using the Mapbox library. Mapbox service was chosen because the features provided were more than adequate for the required mapping information. In addition, its use is also accessible for a moment. This is important for the current government, where the entire budget is a significant issue. To obtain the Mapbox services such as API or SDK, it is required to register the site to mapbox.com. After that, a token is given to associate the API request with the previously registered account. The mapping installation on the covid19.sukabumikota.go.id site is not only tokens but also has several other important properties, as can be seen in Figure 10.

Figure 10. Mapbox mapping installation program code

The program code in Figure 10 explains that the set view property contains the coordinates of Sukabumi City. The argument of 13 in the setView is an enlargement of the map at those coordinates. The layer style includes a map type, which only uses Mapbox/streets-v11. There is a URL property that serves to retrieve data which is then inserted on the map using the Geojson function with the Welcome controller. Files with the extension XML can also be used to insert geographic data in maps. The CodeIgniter v3.1 program code used in the URL property in Figure 11.

Figure 11. Geojson function program code on mapping URL

b.   Chart

The graph used for covid19.sukabumikota.go.id uses a line-type Morris Chart, which corresponds to the time series of covid19 data in Sukabumi City. By using chart, people are aware of the dramatic increase in data which makes them even warier. The chart of patient status in the March to July edition consists of ODP (Completed Monitoring, Under Monitoring), PDP (Completed Monitoring, Under Monitoring), Positive (Recovered, Under Care, Died). As for August, it has become Suspect (Isolation and Completed), Probable (Isolation and Completed), Positive Confirmation (Isolation, Healed, Died). The graphic display of the covid19.sukabumikota. go.id site can be observed in Figure 8.

The graphics developed in Sukabumi City, the program code is processed in such a way that it can be viewed based on the city, sub-district, and village levels. The data selection for each level uses SQL in such a way that when inserted into the Morris chart javascript function it produces a data structure as shown in Figure 12.

```
function getMorris(type, element) {
Morris.Line( {
element: element,
data: [ {    'period': '2020-03-27', 'ODP_Selesai': 30,'ODP_
Dalam_Pantauan': 57, 'PDP_Selesai': 2,'PDP_Dalam_Pengawasan':
13,'Positif_Meninggal': 0,'Positif_Sembuh': 0,'Positif_Perawatan': 0
},
{
'period': '2020-03-28', 'ODP_Selesai': 41,'ODP_Dalam_Pantauan':
61,'PDP_Selesai': 3, 'PDP_Dalam_Pengawasan': 12, 'Positif_
Meninggal': 0,'Positif_Sembuh': 0, 'Positif_Perawatan': 0
} }],
xkey: 'period',
ykeys: ['ODP_Selesai', 'ODP_Dalam_Pantauan',  'PDP_Selesai',
'PDP_Dalam_Pengawasan',  'Positif_Meninggal', 'Positif_Sembuh',
'Positif_Perawatan'],
labels: ['ODP_Selesai', 'ODP_Dalam_Pantauan', 'PDP_Selesai',
'PDP_Dalam_Pengawasan', 'Positif_Meninggal', 'Positif_Sembuh',
'Positif_Perawatan'],
lineColors: [
        'rgba( 0, 188, 212)', 'rgba(233, 30, 99)', 'rgba(100, 50,
        50)', 'rgba(150, 100, 100)', 'rgba(244, 0, 0)', 'rgba(8, 130,
        27)', 'rgba(153, 7, 20)'
        ], LineWidth: 2
});}
```

Figure 12. Graph program code using Morris Chart

In the graph, the visits come from the visits and visitors tables. Both are WordPress counter plugins. The way this plugin works is to count one of the pages visited by a visitor. The results of these calculations are stored in the visit table. Whereas, in the visitor table, apart from counting one of the pages visited, it also checks the visitor's IP address whether it has existed before or not on the same date. If the IP address already exists, it is only considered one visitor.

c.   API

The use of the API on the covid19.sukabumikota. go.id site is essentially just sharing data with anyone, especially with the national task force. Schematic data transactions that occur between the local government site as a server and the National Task Force site as a service requester. The REST API is used for data transactions with the National Task Force. In CodeIgniter this API configuration is located in the rest.php file in the Config folder, and some parameters are set to $config['rest_key_name']='X-API-KEY';$config['rest_key_column']='key'; on the URL covid19.sukabumikota.go.id/new/index.php/covid19/index_get.

d.   Evaluation

Application assessment using the ISO 9126 Standard includes:

1)   Functionality (X)

Assessment of functionality and calculation of Feature Completeness using formula (1) which the result becomes $X = \frac{i}{P} = \frac{9}{9} = 1$. The result of the value of 1 shows that what is being done is by the URL.

2)   Reliability

In the reliability assessment using the WAPT 10 software with a ramp-up test type scheme, there are 5 active virtual users. The virtual users increase and access every 10 seconds, and the test time is 10 minutes. The result is displayed in Figure 13.
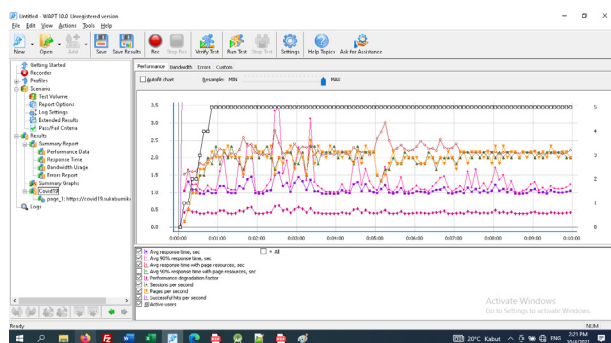

Figure 13. The results of reliability testing using WAPT 10

Based on Figure 13, resulting in five virtual users can be served < 1 second first. Average response time from 0.96 seconds to 1.58 seconds, the number of pages per second starting from 1.33 pages/second to 2.5 pages/second.

3)   Usability

Based on the results of the questionnaire that was distributed via https://forms.gle/q2zwK9e2fpk5etKQA from October 1 to October 9, 2021, 62 respondents were involved, which can be seen in Figure 14.

Figure 14. Questionnaire Results Via https://forms.gle/ q2zwK9e2fpk5etKQA
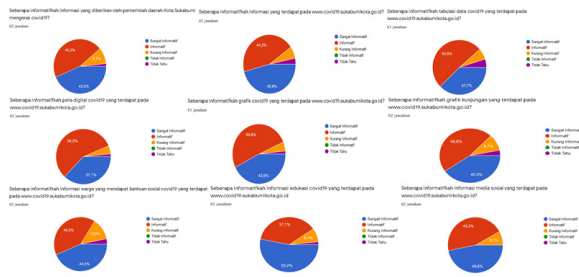
Questionnaire data that has been obtained by calculating Cronbach's Alpha value using Eq. 2. through the website http://www.wessa.net/rwasp_cronbach.wasp. The results is shown in Figure 15.

Items	Cronbach Alpha	Std. Alpha	G6(smc)	Average R
All itmes	0.9436	0.9446	0.9667	0.6544
Q1 excluded	0.933	0.9338	0.9577	0.638
Q2 excluded	0.9381	0.9386	0.9653	0.6564
Q3 excluded	0.9373	0.9383	0.9628	0.6553
Q4 excluded	0.9325	0.9325	0.9552	0.6334
Q5 excluded	0.9364	0.9371	0.9549	0.6507
Q6 excluded	0.9317	0.9338	0.9577	0.638
Q7 excluded	0.9332	0.9351	0.9574	0.6429
Q8 excluded	0.9444	0.9461	0.9602	0.687
Q9 excluded	0.9448	0.9462	0.9627	0.6875

Figure 15. Cronbach Alpha calculation results via software with a ramp-up test type scheme, there are 5 active http://www.wessa.net/rwasp_cronbach.wasp

4) Efficiency

Efficiency assessment using Page Speed from Google was conducted on October 8, 2021, at around 19:00 WIB. The result is First Contentful Paint reaches 0.7 seconds, Largest Contentful Paint reaches 3 seconds, Cumulative Layout Shift reaches 0.4 seconds, Time to Interactive reaches 5 seconds, Total Blocking Time reaches 180 milliseconds, and Speed Index reaches 7.4 seconds which is presented in Figure 16.
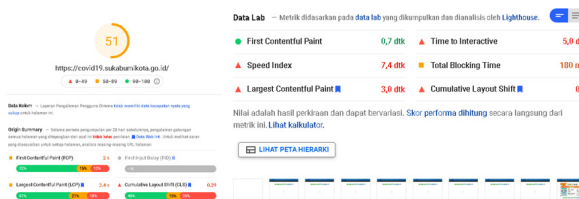

Figure 16. Google Pagespeed assessment results

5. Conclusion

The Covid19 information system, which aims to provide information to the people of the city of Sukabumi, has been completed and successfully developed. This can be seen from the large average number of visits and visitors every day, which reached 607.13 visits per day and 274.38 visitors per day for almost a year. With the spiral model, the interests of stakeholders can be appropriately fulfilled, and the development time can be adjusted to the character of the stakeholders. The use of geolocation and mapping of COVID-19 patients can be implemented and used. Nonetheless, the patient's coordinate points are shifted to the coordinates of the sub-districts in Sukabumi City. Based on a chart dated January 6, 2021, as many as 2045 people were exposed to COVID-19, and the daily increase in confirmed positive patients generally increases, including data on recovery and death. These positive confirmed patients consisted of 597 (29.19%) people being treated (self-isolating), 1,386 (67.77%) people recovering, and 62 (3.03%) people dying. Even though the death rate is still relatively low, underestimating the problem is not wise and even considered wrong. Data transactions sent to the National Task Force were successfully carried out using the covid19.sukabumikota.go.id/new/index.php/covid19/index_get website.

Acknowledgment

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