

## HOSPITAL INFORMATION (HOSPITALIZATION) APPLICATION USING WEB SCRAPING METHOD

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### Abstract

Health is the important aspect in every human life. People cannot determine when they are not healthy or detect whether sickness will come to them. However, choosing the medical treatment for a sickness is quite hard to do, especially if the sickness is come in suddenly. Minimum health care/treatment is one of main problem in Indonesia, health treatment information is quite hard to find. For example in a certain hospital, the information provided is not completely enough to give people information about medical (doctor, schedule, etc). The purpose of this research is to develop an application for help the user (patient) to search or find information about hospital, doctor name on the hospital, and the schedule. The important details of the information will scrap by the application and the data will process on the application & database system and displayed according to the user needs. There will be several features that user (patient) can explore on this application. Some additional feature like hospital list or hospital websites will also be provided. This application will provide the important hospital information using scrap method which get the data from the original hospital websites.

*Key words : web scraping, health care, hospital information*

### 1. Introduction

In this modern era, technology has become part of human life. The technology has been upgraded with the modern structure of resources, and the growth of the technology is rapidly increase time by time. Because the technology can be used for replacing or help the activities of human being in any aspect, such as academic, transportation, institution, and any general activities. The technology has fused with the activities of human, almost every human thing will be related to the technology, for example in transportation aspect, for those who did not familiar with a place, or did not know the way to a place, there is a technology that use satellite to locate and get the direction or a way to the destination place, this kind of method is implementing GPS (Global Positioning System) as their main program system, or another example is for searching or grab any information related to human needs such as medical information, medical schedule, news, etc. Internet provides many websites or applications for searching and get the information that match with people needs. The development of the technology happens in many device, and it will develop continuously. This technology is implemented in smartphone, personal computer, and it

will make human easier in doing some activities and the result of the work will be more efficient. This kind of method can also be implemented in medical field, for example to search a doctor's schedule, hospital availability, and information about hospital. In this current time, everything must be part of the technological thing, the user of the technology need a fast and quick application or program which suitable for they needs. In case of user satisfaction, the program that developed must be simple and fulfill user's needs, for example in reading news, the application must be simple and easy to use and user will reject application that have complex feature. Another example for finding medical treatment, such as hospital, doctors, or any substance related to hospital. The application must be accurate and fast, if a patient need a quick information about medical things the application should provide it with simple and fast feature, because health is the important aspect of human. Generally, health is the ability of individuals or communities to adapt and self-manage when facing physical, mental or social challenges. Everybody want to be a healthy person, if someone is unhealthy all of their activities will disturbed, even they will stop their work for curing their illness. Contacting hospital for treatment is one of the way for curing sickness, but the problem sometimes the line is busy or the schedule is not

available, better if the patient already know the schedule before contacting hospital for arrange the checkup. Hospitalization (Hospital Information) is an application that provides information about hospital, doctors, schedule, the availability of the hospital and doctor for arranging checkup. There will several hospital that given the information about, and the patient can search the information about hospital data. This application will display the list of the hospital, the list of doctor, specialist, from the websites of the hospital itself. This application will get all data from the hospital website, and will stored in application database and will be processed according to each hospital data that already collected. The data that already processed will be displayed according to belonging websites, and the user can freely look the hospital data that already saved. Other features is the application can search availability of a doctor (schedule, hospital).

### Features

Hospitalization application will provide following features:

- **Hospital List**

The application will list the hospital data that stored to the application. The data that collected are from several hospital websites. The hospital will list in the home page of the application, and the user can access the data of the selected hospital.

- **Doctor Data**

The application will provide doctor schedule on each hospital, the user can see and find the schedule of practical doctor on certain hospital. The data also get by scraping data from hospital websites. Doctor data that displayed are the name, specialist, hospital, and schedule.

- **Search Features**

This features provide user for searching their needs, for example searching doctors name, search specialist, or search the availability of doctors. In this features, user will be easier finding medical treatment they needed.

### Limitations

Some limitations of the Hospitalization Application are listed below:

- Minimum Hospital information provided
- Fast internet connection needed
- There will be some missing or error data as a result from web scraping
- Advance scraped data

### 2. Methodology

This application will be developed using Rapid Application Development (RAD). In general, RAD approaches to software development put less emphasis on planning tasks and more emphasis on development.

In RAD, the development process is started with analysis and quick design. After that, the development process is fell into the prototype cycles. The cycle will always be repeated on the built and demonstrate the application, then it will moved through the next stage which system testing and deployment.

### 3. Discussions

In this new era of technology, web application is one of popular method for delivering information or searching information, web application or a website is more customizable and there are a lot of customization for a website to look attractive and responsive in terms of attract visitor. There also many kind of framework for creating a website for example CodeIgniter Framework, Laravel, Ionic Framework for HTML and PHP language, and many other framework for creating a website. There are several method for developing website, for example create from scratch, implement template, or scrap data from another website. Scraping is popular method for getting data/information from other website, by scraping, developer can get any data from targeted website. PHP Simple HTML Dom Parser is a PHP library used for scraping data by finding data from HTML tag of a targeted website.

Nowadays, quite alot of researcher are working on extracting information from textual data and in Information extraction, text mining is used to srapt relevant information out of text files. There are many methods to scrapt information from the web [1-3].

*Hospitalization* is a web view application about hospital information which data is get by scraping from real hospital website and will be used by patient for searching medical treatment in fast and interactive ways. This application will created by using CodeIgniter Framework and using and convert into Android Web View application. This application divides the discussion into two main problems, data of hospitals including doctors, and search for medical treatment (doctor). For the data hospital, user (patient) can view data of the stored hospital includes the data of doctors who practice there, user (patient) can view the name of the doctor, speciality, and hospital. For the search feature, user (patient) can search medical treatment that they're needed in specific input, sort the search result from doctor name or by doctor speciality. The Use Case diagram is shown in Figure 3.1.

User Interface Development of this application is divided into several sections: Home Page Interface, Hospital List Page Interface, Selected Hospital Page Interface, Search Page Interface, About Me Interface, Admin Login, Admin Page and Admin Page for add/edit data Interface. User can access all of this feature by navigating on the navigation bar on the top of the application. For the interfaces, there are two view, web

view and android web-view. So all the figures will be shown 2 for each interfaces; web view and android view.

The Homepage interface is shown in Figure 3.2, Display hospital list interface is shown in Figure 3.3, Search feature interface is shown in Figure 3.4, and the Admin page is shown in Figure 3.5.

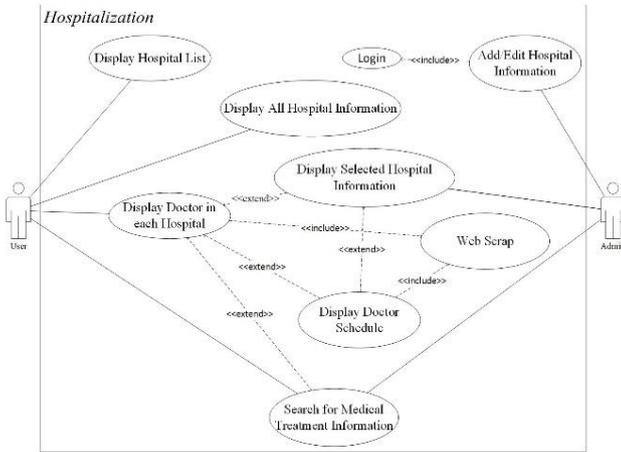


Figure 3.1 Use Case Diagram

Figure 3.4. Display Information on Selected Hospital



Figure 3.5 Search Features

No	Hospital Name	Address	Contact	Email
1	Bloom Hospital Jember	Jl. Semangko Hutan Paksi Jember	(+62 741) 681 8000	bloombh@bloomhospital.com
2	Bloom Hospital Lippo Cikarang	Jl. Bina Thamrin Kav. 102 Lippo Cikarang, Cikarang, Jawa Barat 17200	(+62 21) 2563 8900	info.srik@bloomhospital.com
3	RS Mitra Keluarga Cikarang	Jl. Industri Raya Lendah Cikarang, Cikarang	(+62 21) 894 0000	ckarang@mitrakularga.com
4	RS Mitra Keluarga Bekasi	Jl. Jendral Ahmad Yani Bekasi 17144	(+62 21) 893 0000	bekasi@mitrakularga.com
5	RS Mitra Keluarga Bekasi Timur	Jl. Pengorbanan - Plaza Komar Margabaja Bekasi Timur 17118	(+62 21) 893 0000	bekasitmr@mitrakularga.com
6	RS Harapan Kita Jakarta	Jl. Karetaya Raya Kav. 1A & 1B Cikarang Baru - Bekasi 17106	021 6681 0715	info@rs-hk.com
7	RS Mitra Keluarga Lippo Cikarang	Jl. Utama DTC No. 01 Lippo Cikarang Cikarang, Jawa Barat 17108	(021) 891 74 77	lppocikarang@bloomhospital.com
8	RS Mitra Keluarga Cikarang Baru	Jl. Anggrek 1 Blok 10 11 Blok 11 Cikarang Baru - Bekasi	(021) 891 74 77	lppocikarang@bloomhospital.com
9	RS Mitra Keluarga Bekasi	Jl. Industri Raya 17 18 19 Blok 10 Kav. 10 Blok 11 Lippo Cikarang Jawa Barat	(021) 891 74 77	bekasi@bloomhospital.com

Figure 3.6 Admin Page

In order to check the functionalities that has been developed on the application. System testing is performed by running the application. Table 3.1 listed the testing result of navigation test scenario, Table 3.2 shows the testing result of selected hospital section, and Table 3.3 shows the testing result of search section.

Figure 3.2. Home Page



Figure 3.3. Display Hospital List

Doctor No-Entry	Doctor Name	Doctor Specialist
1	Dr. Adnan Tjandjani, SpB	Bedah Umum
2	Dr. Anis Alimudin, SpB	Bedah Gigi
3	Dr. Agus Setiawan, SpB	Bedah Tumor
4	Dr. Dwi Anandita, SpB	Kardi & Keasman
5	Dr. Dian Yuliani, SpB	Plastik & Perawatan
6	Dr. Irena Widayanti, SpB	Kardi & Keasman
7	Dr. Dwidlo Sinarso, SpB	Radikologi
8	Dr. Eviha Tunjaya, SpOG	Kardiologi & Kard
9	Dr. Harry John, SpB	Bedah Orthopedi &
10	Dr. Freddy Hartono, SpB	Rehabilitasi Medik
11	Dr. Trianggus Susanto, SpA	Anak
12	Dr. Hange Suci, SpM	Mata
13	Dr. Husein Djalil, SpB	Urologi & Bedah

Table 3.1 Navigation Test Scenario

No.	Scenario	Expected Result	Evaluation
1.	Click "Hospitalization" menu	Go to Hospitalization home page	Success
2.	Click "Hospital List" menu	Go to Hospital list page	Success
3.	Click "Search Medical Treatment" menu	Go to Search Medical Treatment page	Success
4.	Click "About" menu	Go to About page	Success

Table 3.2 Selected Hospital Section

No.	Scenario	Expected Result	Evaluation
1.	Access Selected hospital page by choosing from Hospitalization home	Go to Selected hospital page on detail information section	Success
2.	Click "Data" section on Selected hospital page	Go to Selected Hospital doctor list data page	Success
3.	Click "Schedule" section on	Go to Selected Hospital	Success

	Selected hospital page	schedule page	
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[3] Patrick Hagge Cording, "Algorithms for Web Scapping", Technical University of Denmark, DTU Informatics, 2011

Table 3.3 Search Section

No.	Scenario	Expected Result	Evaluation
1.	Access "Search Medical Treatment Information" page by clicking from navigation menu	Go to Search Medical Treatment Information page.	Success
2.	Type Name on Search boxes and click "Search" button	Search result will be displayed.	Success
3.	Choose dropdown for hospital name	Dropdown for specialist will be shown	Success
4.	Choose dropdown for specialist	Result will be displayed	Success

#### 4. Conclusions

This research, Hospitalization has been successfully achieved the objectives which are:

1. Become a source of information about some Hospitals that is very useful for a patient who wants to search and find the information about the certain Hospital because this research provides the exact information about Hospital, Doctor, and Schedule in there with the high accuracy of data. So, user (patient) can find and see the information about medical treatment in the several hospitals, they can see all the data that provides by this application.
2. Became a very attractive application, because of Hospitalization can accessed through websites or by android application. There will be 2 platforms that will be resulted on this research, web-based application and android web-view application. User can access the application through different way, and the interface for the application will be the same when on the web or on the android application, because the development of the application using responsive method. Besides that, the accuracy of the program is highly accurate, because it extract the data from the original hospital website to the application. The system has been successfully developed during the writing of this research. With this application, the user is hoped to be attracted by its special features and user also gain some important information about Hospital and all of its data from this research.

#### References

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