THE COVID-19 SUPPORTING, TRACKING AND ANALYZING WEBSITE

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Introduction

Fig 1: The worldwide COVID-19 pandemic

The worldwide COVID-19 pandemic

- People are suffered the global health crisis as depression and death
- Slowing down of global economy as losing jobs and income
- Negative impact on the living standard of thousands of people
- Putting our society in a threat stage that is hard to recover

Problems:

- Brings us into the enormous challenge to face
- Deal with global health and economic crisis

Objectives and approaches

- Covid-19 Tracker Website: providing users helpful tool to solve the pandemic's problems happening in Vietnam, especially in Da Nang city.

➢ **Specifically we aim to:**

❑ Tracking how many C19P, the affected area around them, and the information of whether these patients recovered or not

❑ Supporting sponsors to approach to urgent place to provide charity products in the fasted way

❑ Generating an impressive visualization with the map Vietnam based on District's threat zone specifically

❑ Searching the safe place to go with the protective distance of around 100 meters from the affected area

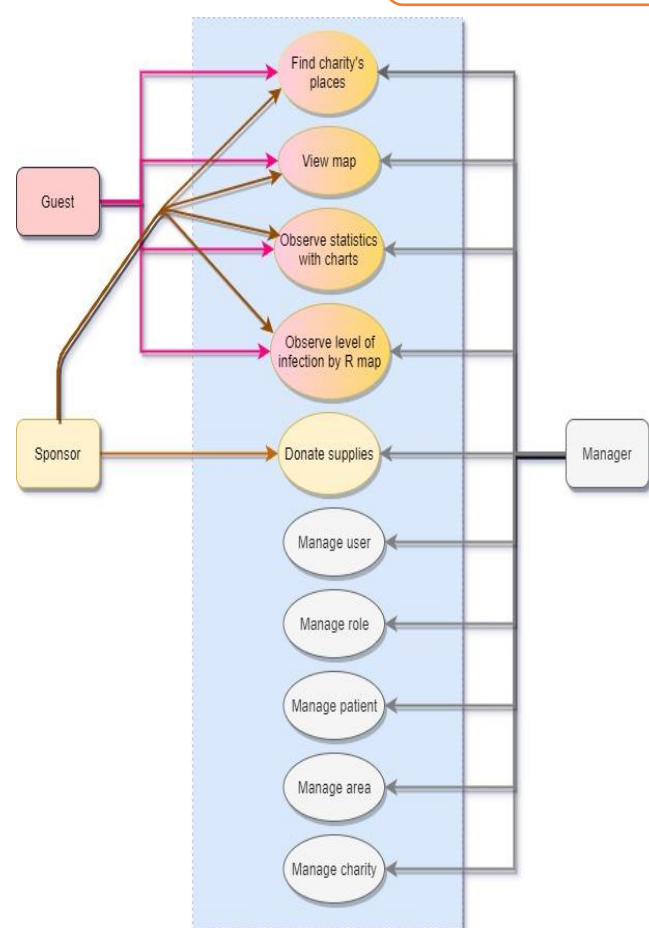### Technologies

IT frameworks — Usability functions

Fig 2: Use case diagram of HTH Covid tracker website

- Java with deployment Azure, MSSQL and Linux Virtual Machine platform.
- Backbone advanced frameworks as Spring MVC and Spring Data JPA (Hibernate).
- The group of R, BI and Embed ELF will handle data analysis.
- HTML/JSP, CSS, JS, ,DOMO, Sitemesh, Google JS API, Google Place API, Spring.
- Security part as MD5, Google Auth API, Facebook Auth API, Spring Security.
- Technological apps such as Maven, Json, SQL Server, JSTL

Data Pre-Processing

Data

- 386 Covid-19 of Da Nang
- 152 males and 234 females
- Between 2-month year old to 93 years old
- Updated by Danang Department of Health hourly by 31/08/2020

The Fig 3 illustrates the details of five C19P who are the youngest (*), the oldest (**) and the three C19P selected randomly.

TABLE I. DATA SAMPLE OF COVID-19 PATIENT IN DANANG CITY

Code	Gender	Birth	Status	District	Address	latitude	longitude
954 (*)	F	2020	R	Cẩm Lệ	Trường Chinh,	16.03157	108.1889
985	M	1955	A	Hải Châu	Nguyễn Du	16.07885	108.2206
968	M	1971	A	Thanh Khê	Võ Văn Tần	16.06678	108.2023
1011	F	1982	R	Hải Châu	Phan Thanh	16.06206	108.2085
666 (**)	M	1927	D	Thanh Khê	Lê Duẩn	16.06892	108.2092

ᵃ Five Sample of a data table in database.

Note: F: Female   M: Male   R: Recovery   A: Affection   D: Death

Fig 3: Five Sample of a data table in database

References

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[2] G. Svennerberg, Beginning Google Maps API 3. Apress, 2010.

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[4] Z. Y. M. A. K. A. A. N. S. M. A. M. M. Q. A. X. V. V. K. Z. Muhammad Khalid Anser, "Does communicable diseases (including COVID-19) may increase global poverty risk? A cloud on the horizon," Environmental Research, vol. 187, p. 109668, 2020.

[5] R. S. P. E. J. G.-R. V. & P. E. J. Bivand, Applied spatial data analysis with R, New York: Springer, 2008.

[6] H. D. I. a. Y. W. Y. Cho, "Contact Tracing Mobile Apps for COVID-19: Privacy Considerations and Related Trade-offs," arXiv preprint arXiv, vol. 11511, 2020.

Methods

1. Tracking Covid-19 patients

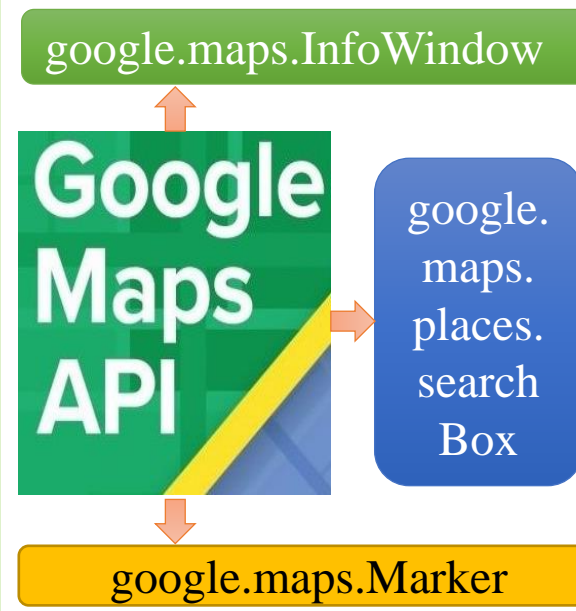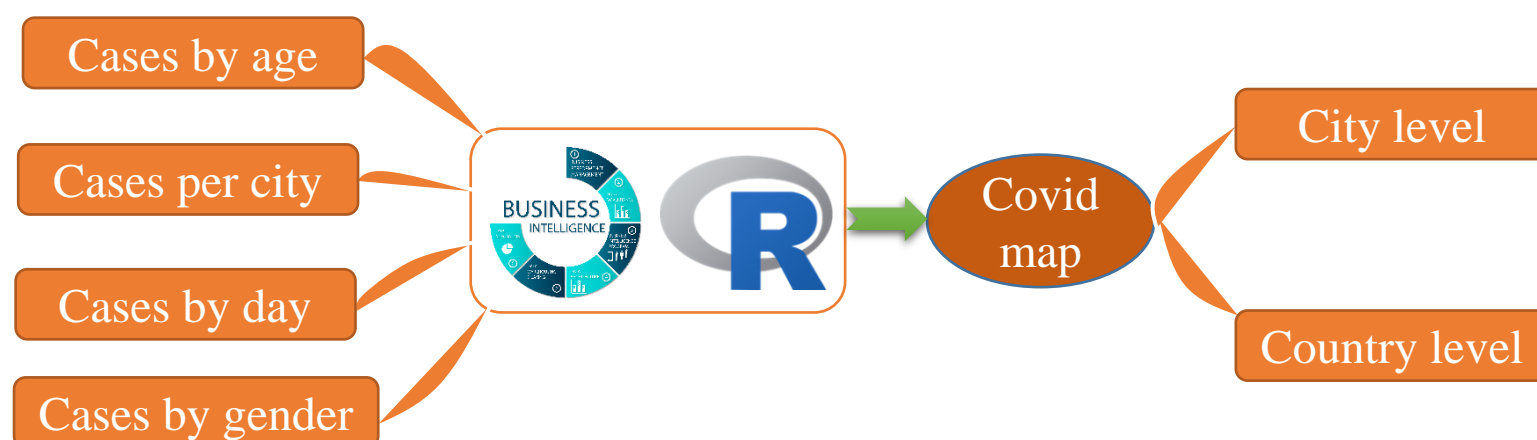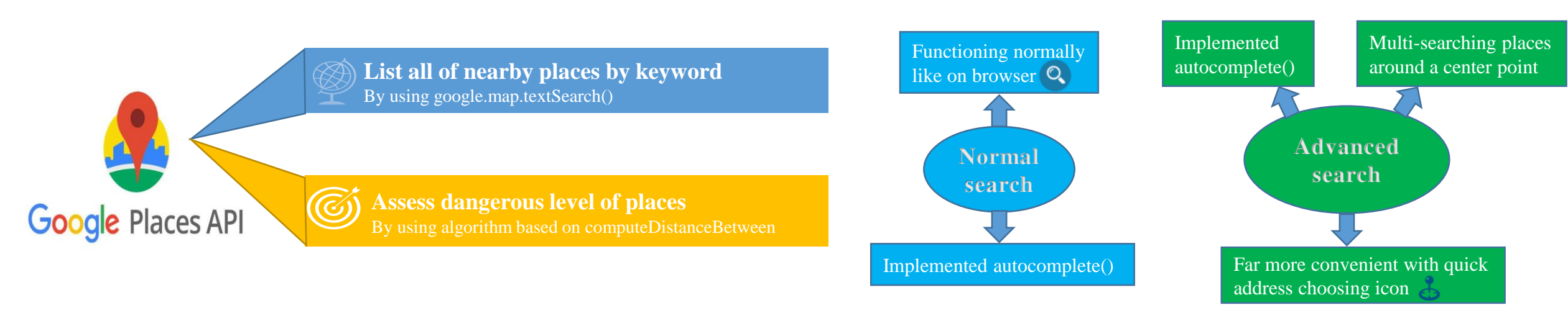*Fig 4: Usage of Google Map API*

❖ Google Maps API, Maps Embed API:
➢ Display the live data synching with its location
❖ Allow user to track:
- Deceased C19P cases
- Treatment C19P cases
- Recovered C19P cases
- Blocked areas.

2. Supporting Charity

❖ Provides the users in two categories:
❑ Finding the List of Charity
❑ Display charity place on Map
❖ Allows the sponsors to upload their own charity information into website

Fig 5: Functioning of Charity feature flowchart

3. Analyzing Covid-19 Data pattern using R and BI

- Cases by age
- Cases per city
- Cases by day
- Cases by gender
- Covid map → City level, Country level

4. Searching a safe place to go

Google Places API

- **List all of nearby places by keyword** By using google.map.textSearch()
- **Assess dangerous level of places** By using algorithm based on computeDistanceBetween

Functioning normally like on browser → Normal search → Implemented autocomplete()

Implemented autocomplete() — Multi-searching places around a center point → Advanced search → Far more convenient with quick address choosing icon

Results

1. Tracking Covid-19 patients
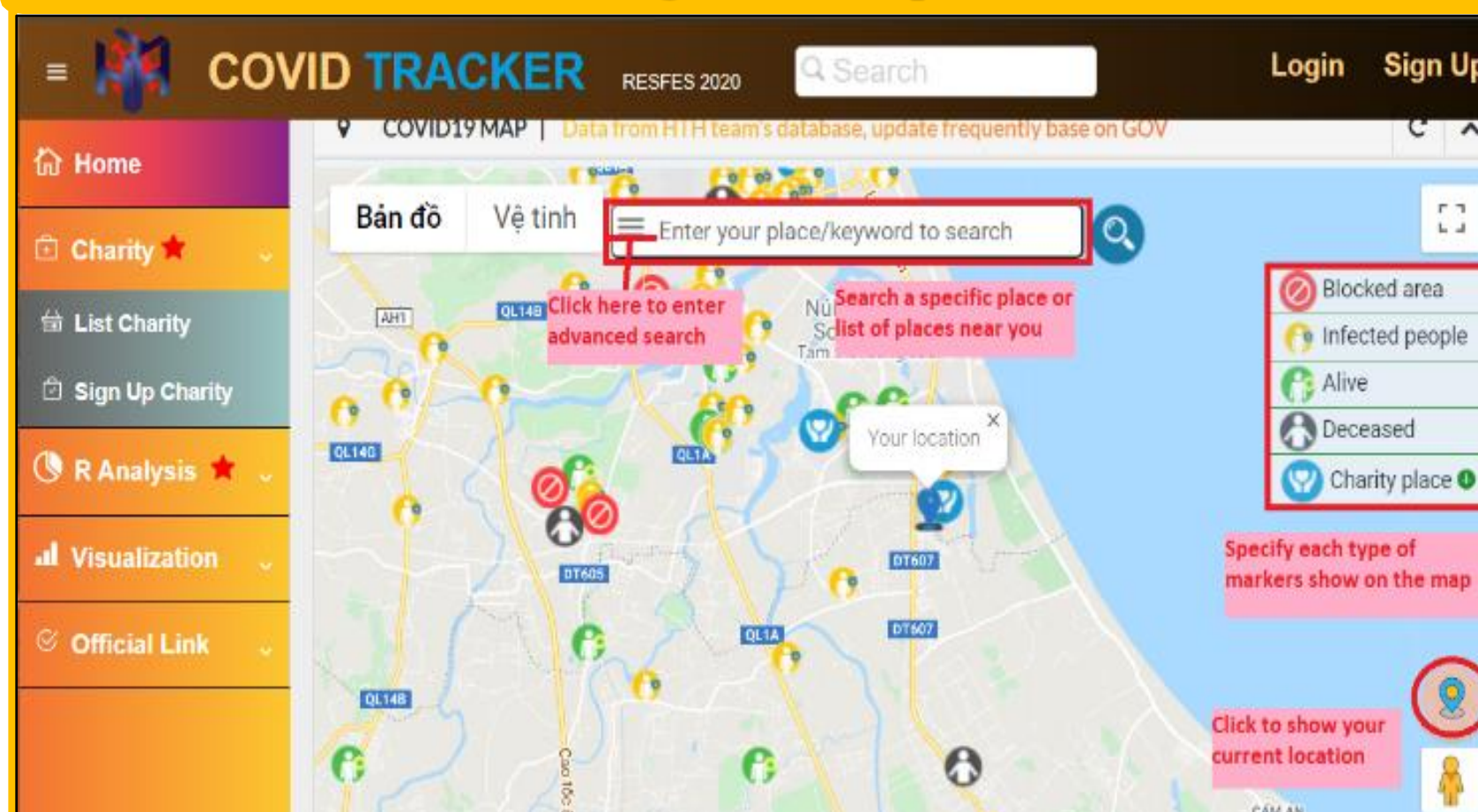
Fig 6: The home-page of HTH Covid tracker website

2. Supporting charity
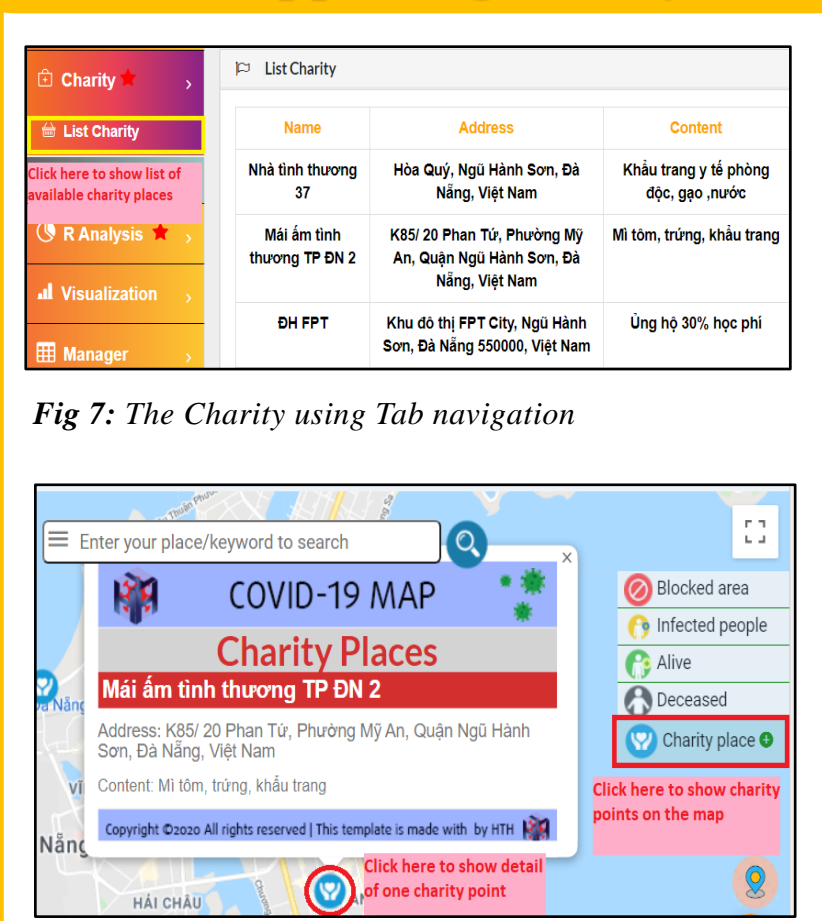
Fig 7: The Charity using Tab navigation

Fig 8: The Charity using button/icon search box
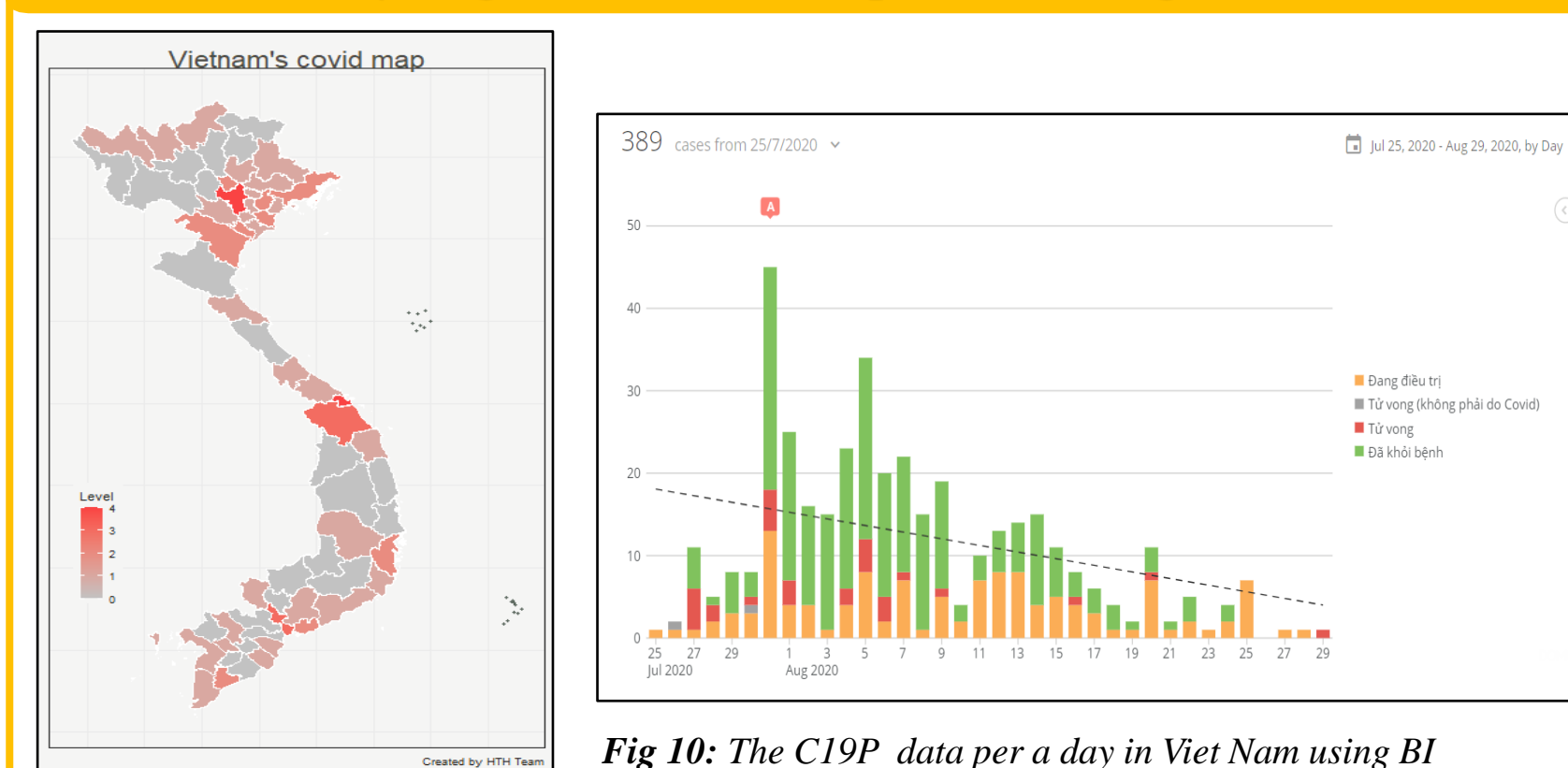
3. Analyzing Covid-19 Data pattern using R and BI

Fig 9: The Vietnam threat zone using R

Fig 10: The C19P data per a day in Viet Nam using BI
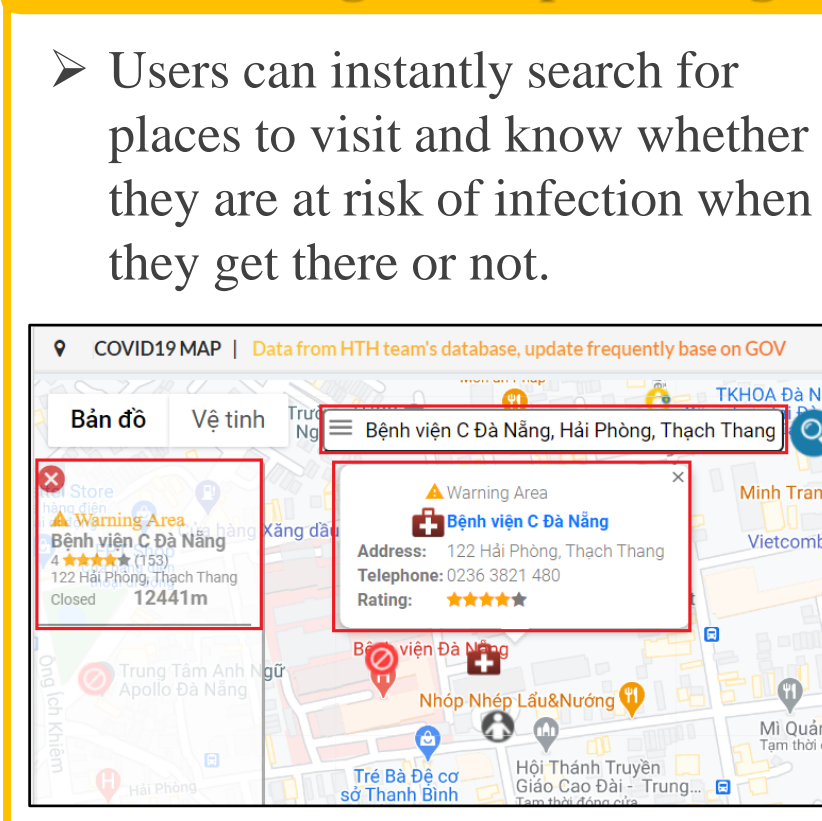
4. Searching a safe place to go

➢ Users can instantly search for places to visit and know whether they are at risk of infection when they get there or not.

Fig 11: "You are in warning area!"

Discussion

01 Reliability
Data was published and updated by Da Nang department of Health

02 Search for place
Users can instantly search for places to visit and know whether they are at risk of infection when they get there or not.

03 Active avoidance
Unlike Bluezone(detection on contact), this action will help people proactively avoid the dangerous places before they become at-risk people (exposed).

04 Friendly, professional
New users can easily operate with an easy-to-manipulation interface like COVID MAP, R and BI Charts.

05 Stop the Covid-19
Minimize Covid surprisingly spread circumstances

Conclusion

✓ Provides a user-friendly interface and the remarkable tool for avoiding, limiting the fast spread of Covid-19 pandemic.

✓ Caring environment about charity's activities where the sponsors could connect to the hard people easily and more efficiently for reducing the poverty.

✓ For the science purpose the number C19P cases was analyzed and visualized as the live map; generated by R and BI.

➢ It is expected to be implemented by the data of other regions focus on the automatically update C19P data through official sources.