

Dashboard for Monitoring and Signaling Elder's Heart Disease



Outline



01

Before Specification Design

Review Requirement

Stakeholders

- Hospital, Organizations, and Families

Users

- Doctors , Organizations , Elders, and Families

Your goal

- To identify elder's heart disease before it happen

The input to your system

- Behavior data, sensor data and medical inspection result

The output of your system

- Dashboard and Signal

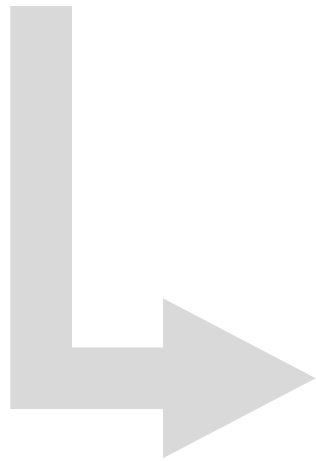
Technologies do you need to achieve your goal

- Big data and Machine learning

Recap from Conceptual design

Teacher's Suggestion

- Is the topic **too broad** ?



Resolve

- We choose **Acute Coronary Syndrome-ACS**.

Cause, Risk

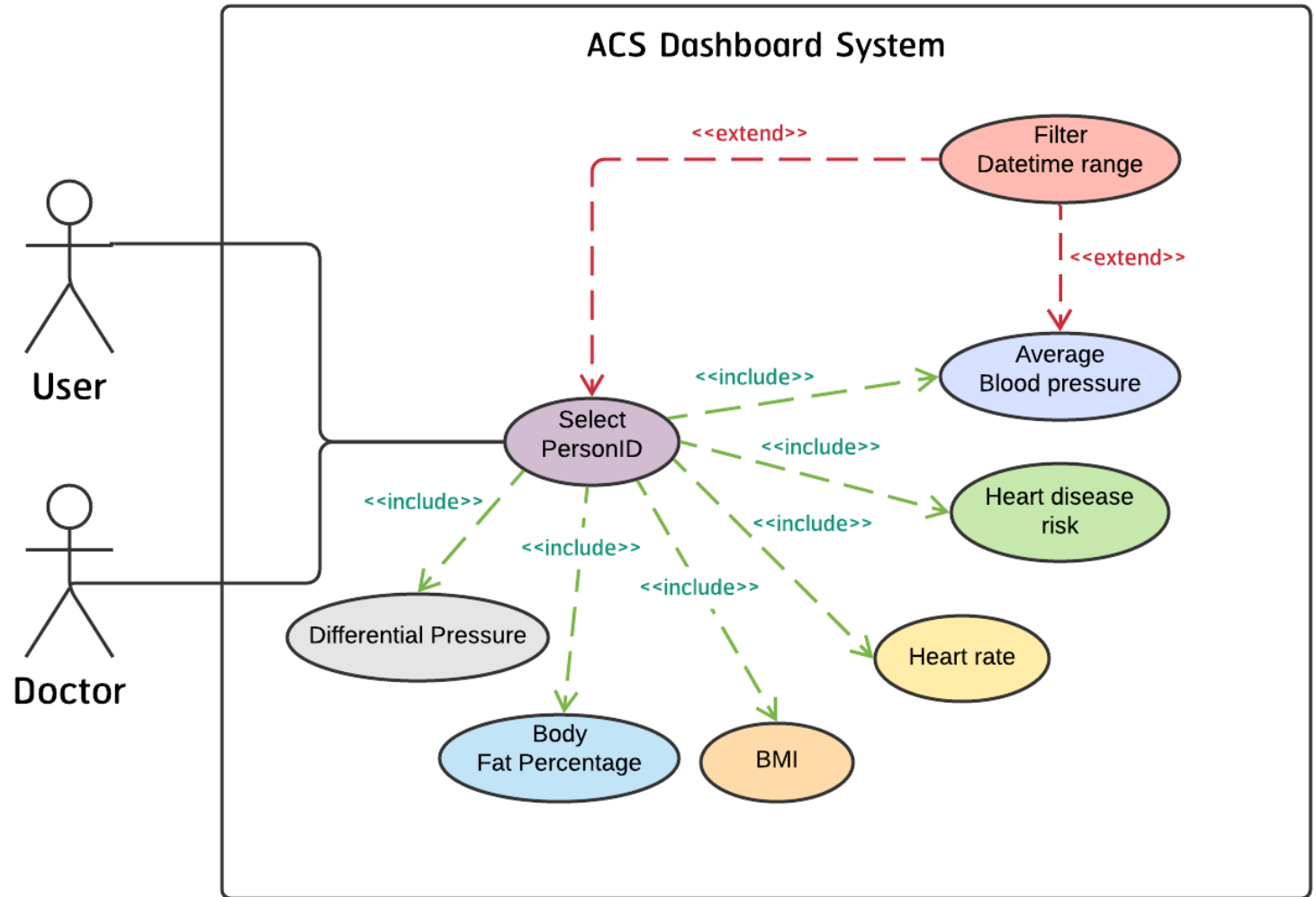
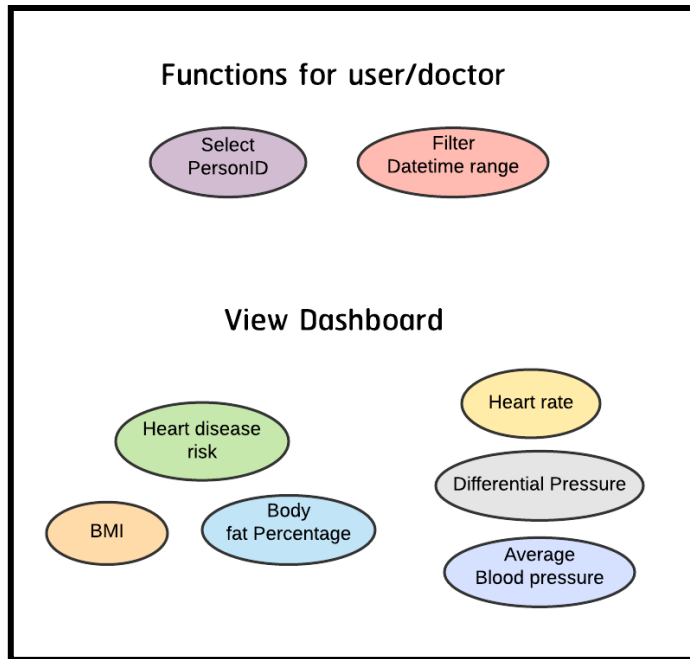
1. Smoking
2. High blood pressure
3. High cholesterol
4. Diabetes
5. Physical inactivity
6. Overweight
7. A family history of chest pain, heart disease or stroke





02 Specification design

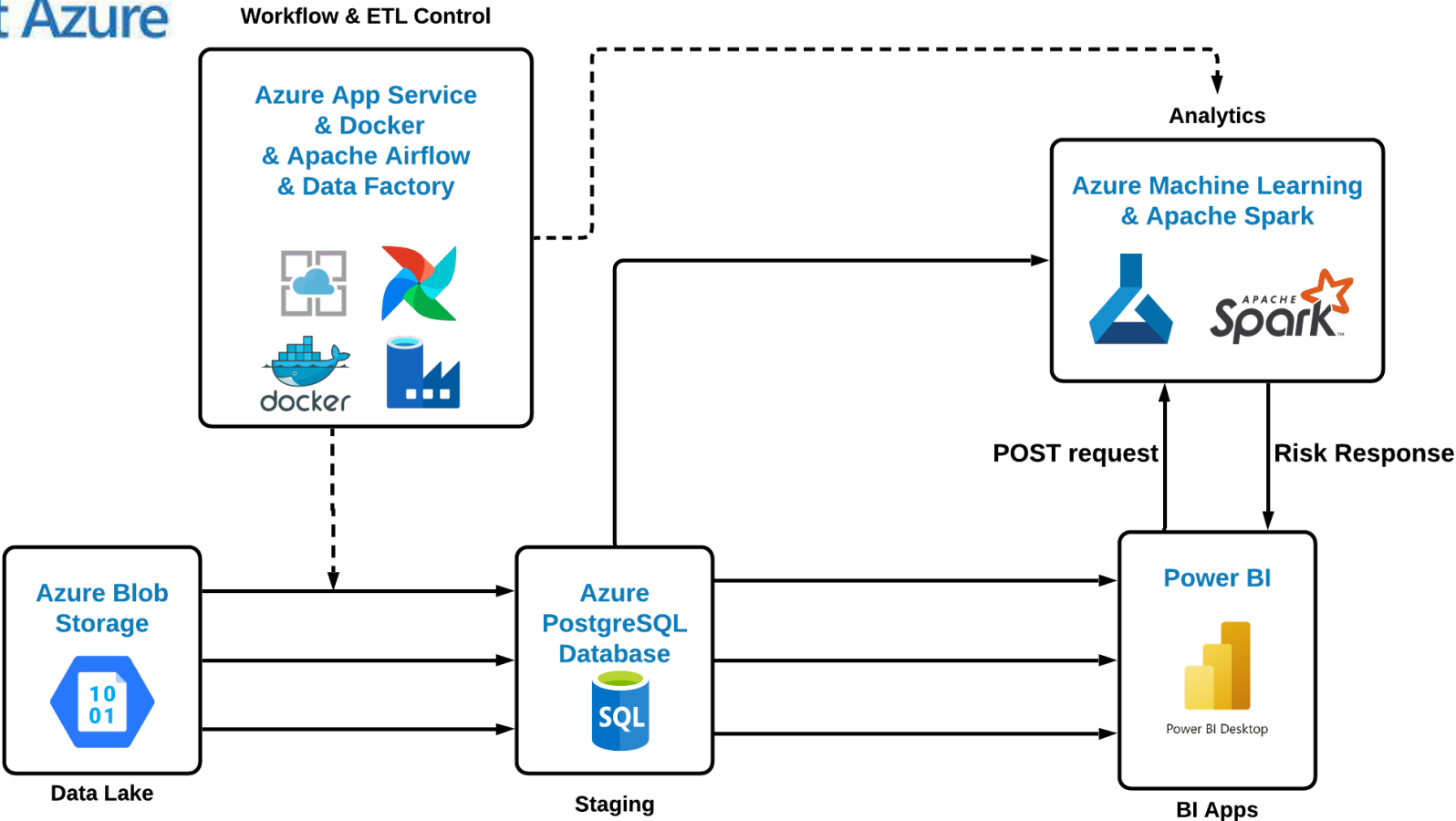
Use case

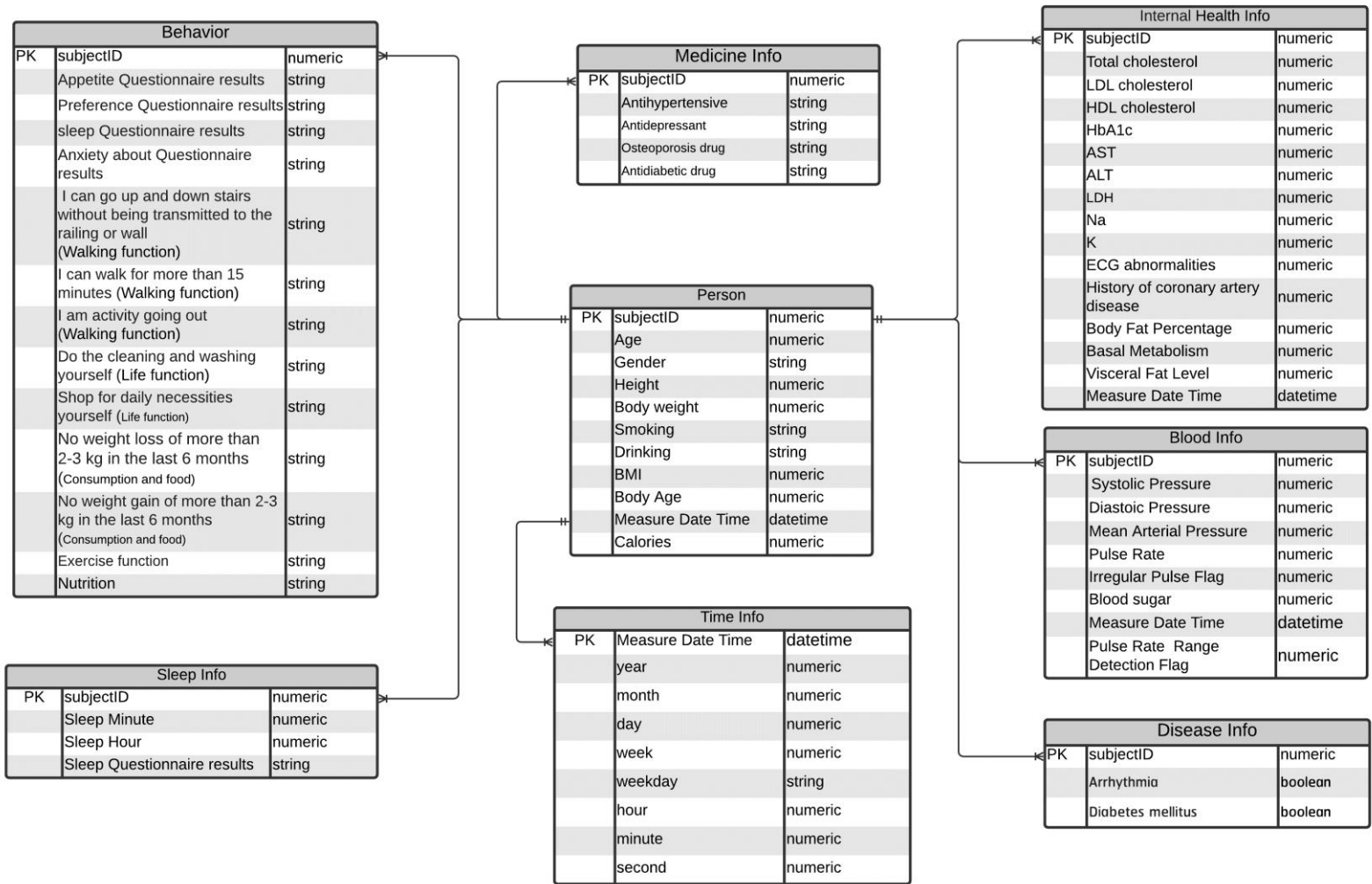




Microsoft Azure

Data Pipeline

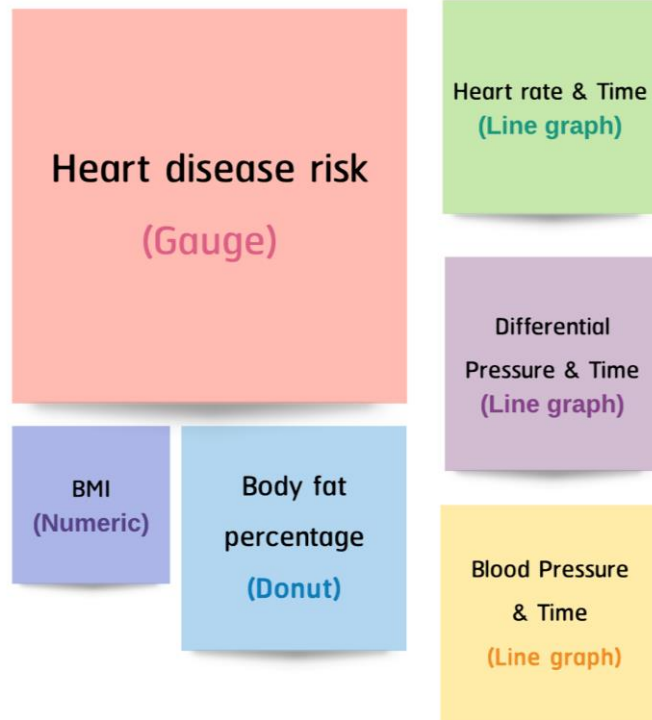




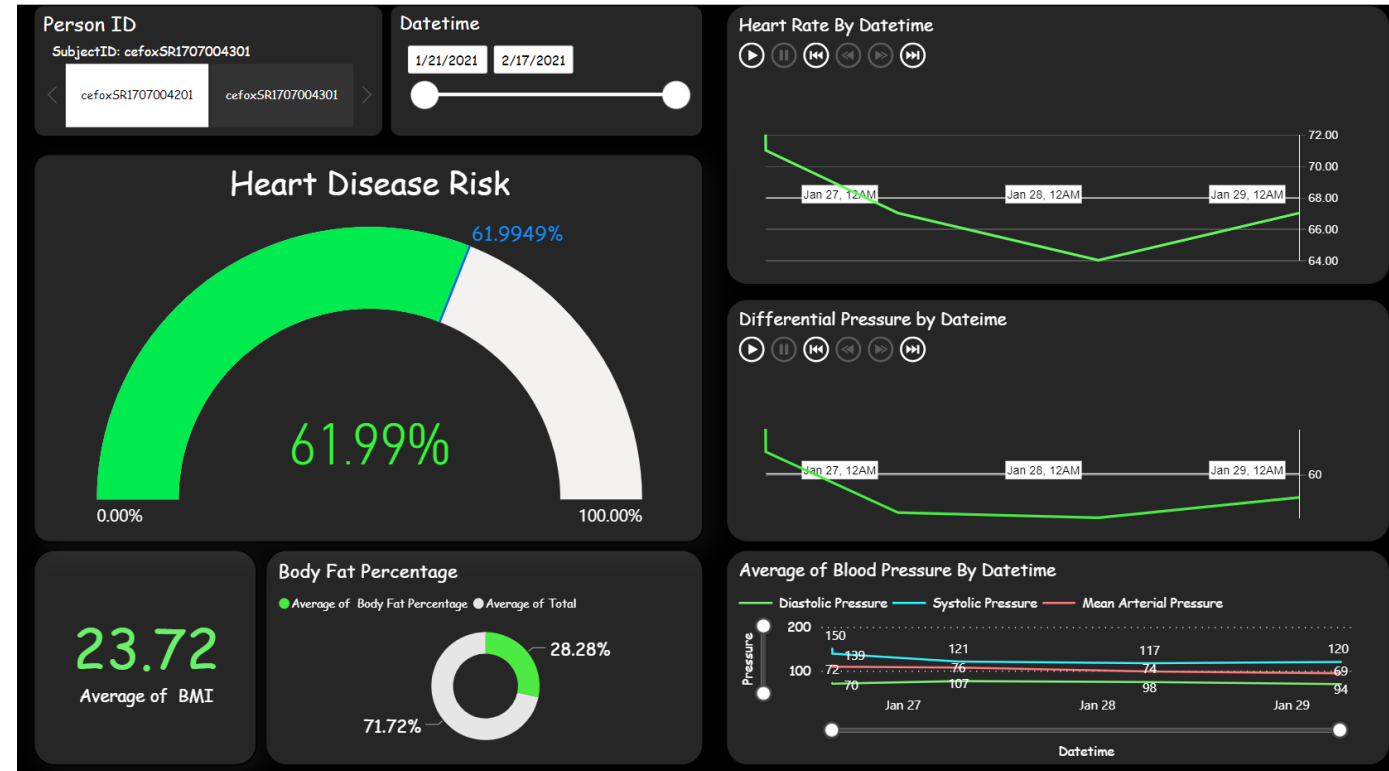
Data Model

Visualization

Query design



Dashboard design



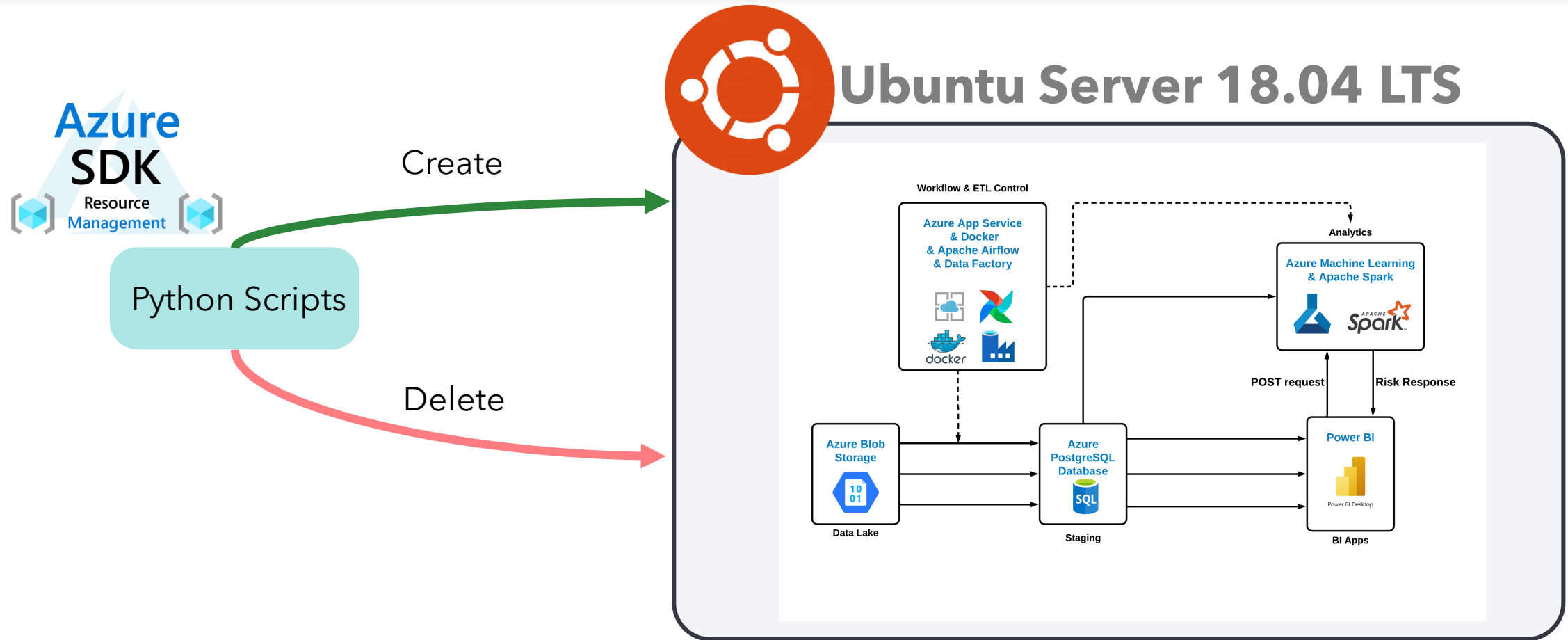
Dashboard Link

<https://app.powerbi.com/view?r=eyJrIjoieYmM3M2EzZGUtNGNkYi00ZWl1LTg0MjltZTc5OTdkYWU2YmMwliwidCI6IjZmNDQzMmRjLTlwZDltNDQxZC1iMWRiLWFjMzM4MGJhNjMzZCIsImMiOjEwfQ%3D%3D&embedImagePlaceholder=true&pageName=ReportSection1cdf8bba06e9bf1e5c10>

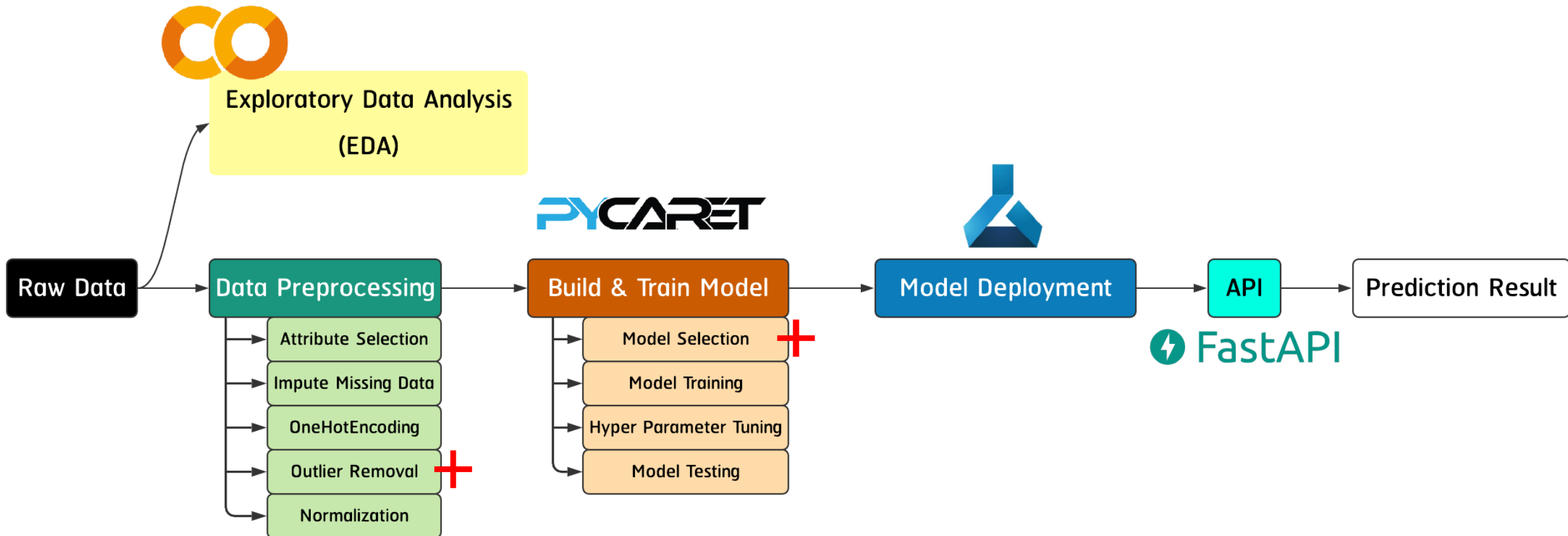


03 Structural design

Infrastructure as Code (IaC)



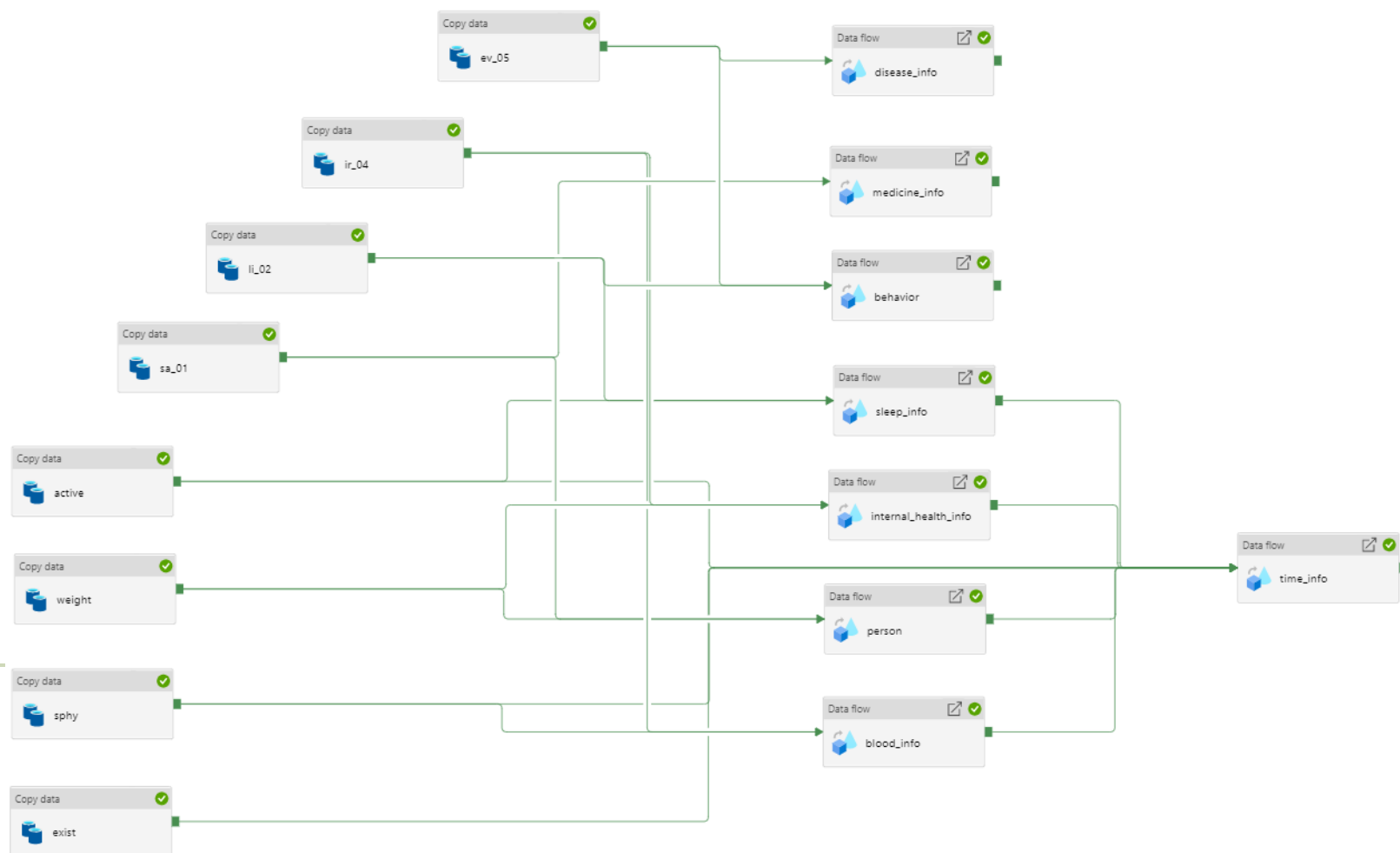
Machine Learning Pipeline



Label data for Classify model

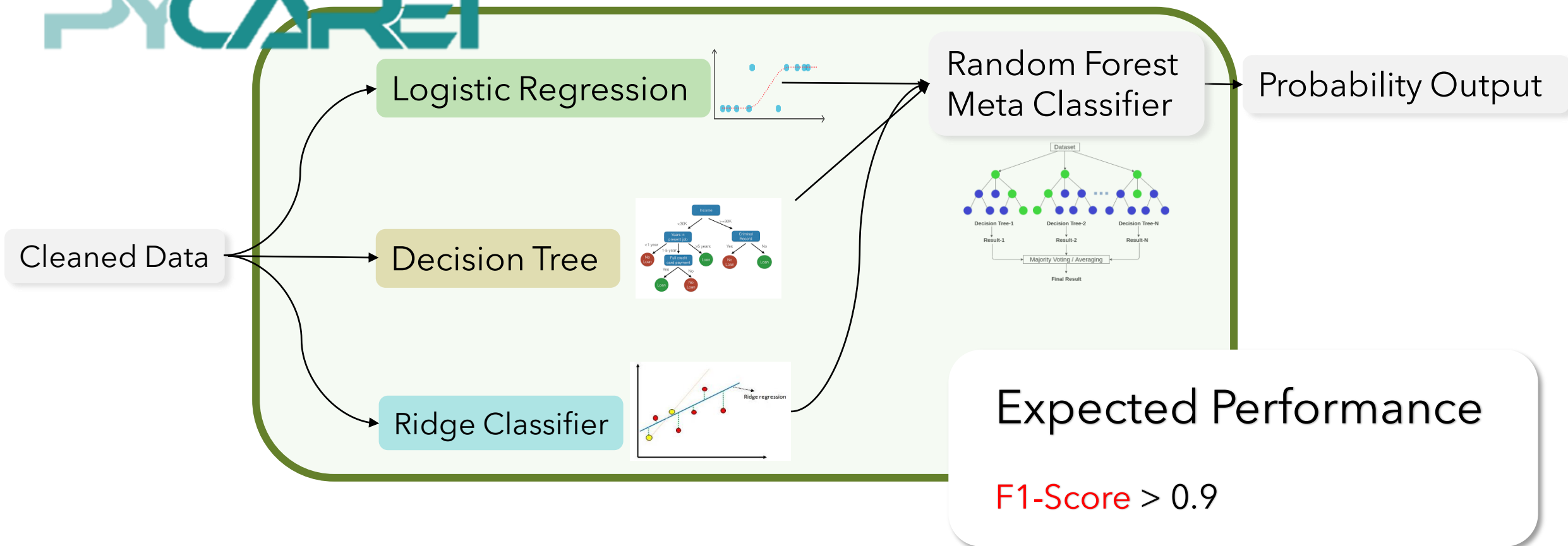
No	SubjectID	Age	Gender	Smoking	Blood sugar	HbA1c	Disease name	Systolic Pressure	Total cholesterol	LDL	HDL	Risk percentage (Use app)	Risk percentage (Use color table)	Risk Level (Based on color table)
1	cefoxSR1707004101	74	Female	no			High blood pressure	128					<10%	Low
2	cefoxSR1707003701	73	Female	no	108	6.2	Lung cancer,Diabetes mellitus	147	150	86	39	30.00%	10-<20%	Moderate
3	cefoxSR1707005101	76	Female	no			High blood pressure	140	260	163	68	13.91%	10-<20%	Moderate
4	cefoxSR1707003501	81	Man	no		5	Kidney disease,High blood pressure	167					10-<20%	Moderate
5	cefoxSR1601000701	77	Female	no	88	5.5	Hyperlipidemia	128	212	123	73	9.06%	<10%	Low
6	cefoxSR1601005001	85	Female	no	100	6.4	High blood pressure	152	244	102	116	10.29%	10-<20%	Moderate
7	cefoxSR1601005301	71	Female	no	93		Cancer (during chemotherapy)	160					10-<20%	Moderate
8	cefoxSR1601005701	92	Female	no	108		High blood pressure	140	195			15.17%	<10%	Low
9	cefoxSR1707004301	78	Man	no	126	7.2	High blood pressure,Diabetes mellitus	120	210			15.31%	10-<20%	Moderate
10	cefoxSR1707004501	79	Man	no			High blood pressure	156					<10%	Low
11	cefoxSR1707004401	51	Female	no			nothing	168					<10%	Low
12	cefoxSR1707004801	71	Man	no			High blood pressure	150					<10%	Low
13	cefoxSR1707004701	74	Man	no			High blood pressure	no info	-	-	-		null	null
14	cefoxSR1707004201	71	Man	no			High blood pressure	162					10-<20%	Moderate
15	cefoxSR1707005601	71	Female	no			Osteoarthritis of both knees (after surgery)	168					10-<20%	Moderate
16	cefoxSR1707004901	86	Female	no			High blood pressure	no info	-	-	-		null	null
17	cefoxSR1707004601	71	Man	no	91	5.8	nothing	138	166	88	65	15.01%	<10%	Low
18	cefoxSR1601000702	82	Man	no	-	-	High blood pressure,Benign prostatic hypplasiaer	179	-	-	-		10-<20%	Moderate
19	cefoxSR1707005602	76	Female	no	-	-	High blood pressure	145	260.0	163.0	68.0	15.37%	10-<20%	Moderate
20	cefoxSR1707005102	81	Female	no	-	-	Lung cancer(2015surgery),High blood pressure	170	-	-	-		10-<20%	Moderate
21	cefoxSR1707003502	76	Female	no	84	-	High blood pressure	150	200.0	126.0	62.0	17.40%	<10%	Low
22	cefoxSR1707005502	69	Man	no	140		High blood pressure	116	245.0	166.0	63.0	11.03%	<10%	Low
23	cefoxSR1707004902	69	Female	no	-	-	High blood pressure	139	-	-	-		<10%	Low
24	cefoxSR1707004502	81	Female	no	-	-	High blood pressure,Neuralgia,Diabetes	no info	-	-	-		null	null
25	cefoxSR1707004302	78	Man	no	126	7.2	High blood pressure,Diabetes	117	210.0	-	-	14.46%	10-<20%	Moderate
26	cefoxSR1707005302	80	Female	no	-	-	High blood pressure	140	-	-	-		<10%	Low
27	cefoxSR1707005802	70	Female	no	110	5.9	nothing	136	248.0	140.0	51.0	16.59%	<10%	Low
28	cefoxSR1707004802	71	Man	no	91	5.8	nothing	142	166.0	88.0	65.0	16.25%	<10%	Low
29	cefoxSR1707006002	80	Female	no	-	-	High blood pressure	176	-	-	-		10-<20%	Moderate

Data Factory Pipeline



Heart Disease Classification using Ensemble Machine Learning Model

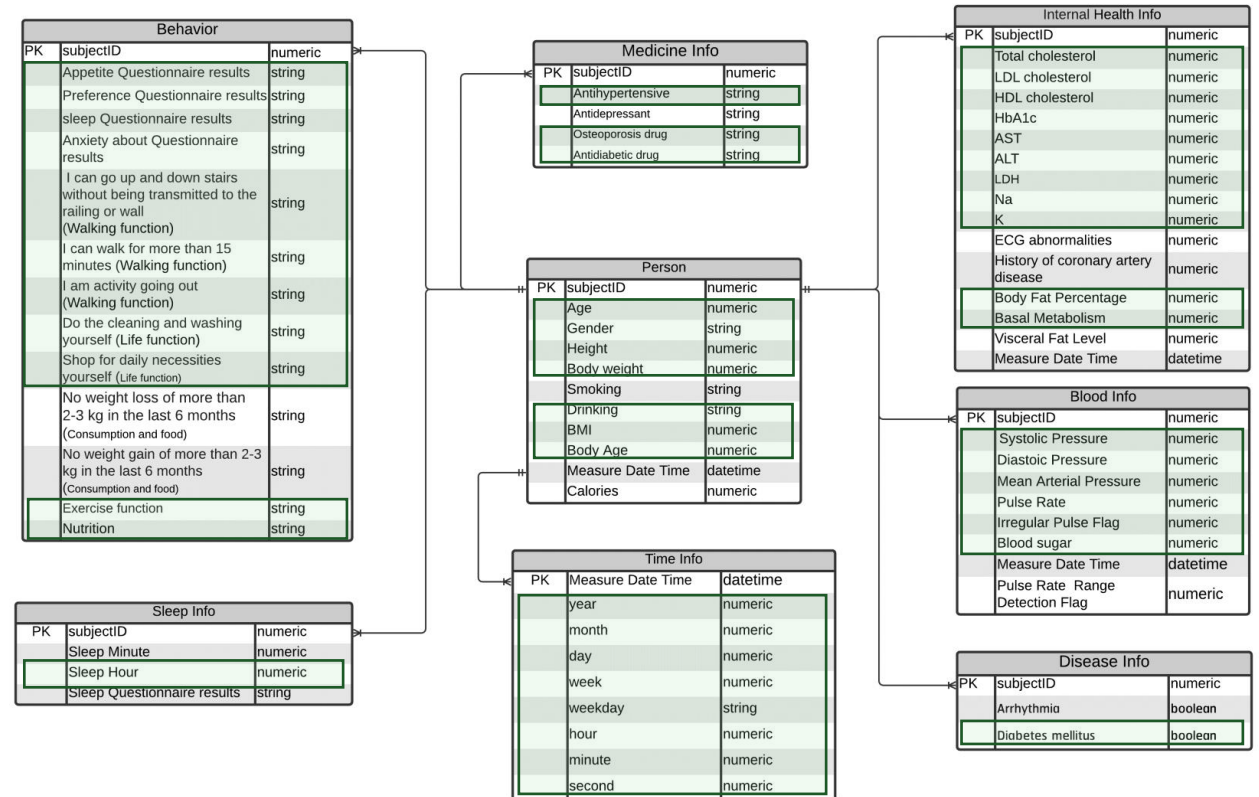
PYCARET



Input Features

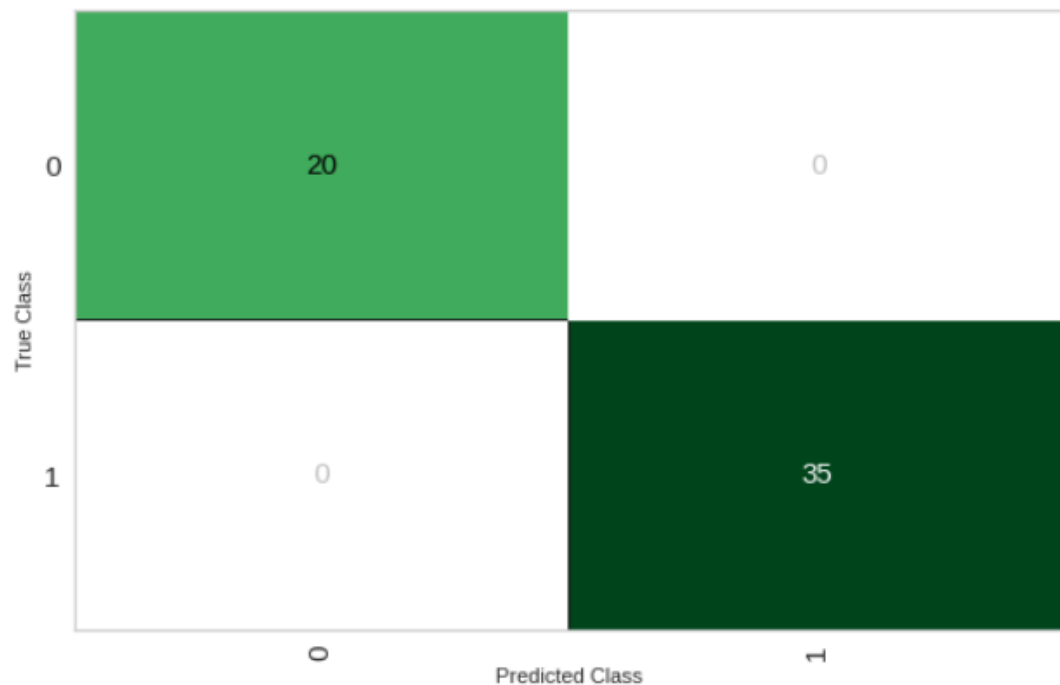
- **42 Features**

- BMI, Body Age, Age, Gender, Height, Body weight, Drinking, Sleep Hour, Antihypertensive, Osteoporosis drug, Antidiabetic drug, Body Fat Percentage, Basal Metabolism, Total cholesterol, LDL cholesterol, HDL cholesterol, HbA1c, AST, ALT, LDH, Na, K, Diabetes mellitus, Systolic Pressure, Diastolic Pressure, Mean Arterial Pressure, Pulse Rate, Irregular Pulse Flag, Blood sugar, Appetite Questionnaire results, Preference Questionnaire results, Sleep Questionnaire results, Anxiety about health Questionnaire results, I can go up and down stairs without being transmitted to the railing or wall, I can walk for more than 15 minutes, I am actively going out, Do the cleaning and washing yourself, Shop for daily necessities yourself, Exercise function, Nutrition



Performance Results

Confusion Matrix



10-Fold Cross Validation

	Accuracy	AUC	Recall	Prec.	F1	Kappa	MCC
0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2	1.0	1.0	1.0	1.0	1.0	1.0	1.0
3	1.0	1.0	1.0	1.0	1.0	1.0	1.0
4	1.0	1.0	1.0	1.0	1.0	1.0	1.0
5	1.0	1.0	1.0	1.0	1.0	1.0	1.0
6	1.0	1.0	1.0	1.0	1.0	1.0	1.0
7	1.0	1.0	1.0	1.0	1.0	1.0	1.0
8	1.0	1.0	1.0	1.0	1.0	1.0	1.0
9	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Mean	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SD	0.0	0.0	0.0	0.0	0.0	0.0	0.0

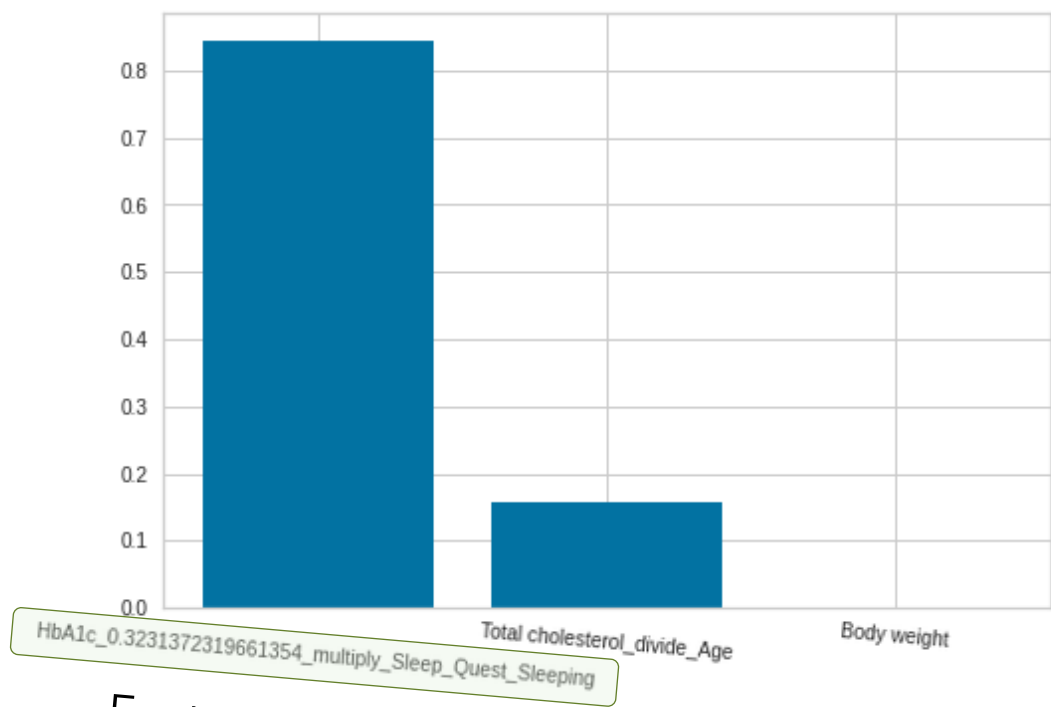


04 Discussion & Conclusion



Conclusion

Discussion



	Accuracy	AUC	Recall	Prec.	F1	Kappa	MCC
0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2	1.0	1.0	1.0	1.0	1.0	1.0	1.0
3	1.0	1.0	1.0	1.0	1.0	1.0	1.0
4	1.0	1.0	1.0	1.0	1.0	1.0	1.0
5	1.0	1.0	1.0	1.0	1.0	1.0	1.0
6	1.0	1.0	1.0	1.0	1.0	1.0	1.0
7	1.0	1.0	1.0	1.0	1.0	1.0	1.0
8	1.0	1.0	1.0	1.0	1.0	1.0	1.0
9	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Mean	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SD	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Feature Interaction

05

Schedule and Role assignment

Finished

Working Process																			
Project Lead : Mr.Natchapol Patamawisut (Bank)											Start Project : 1/3/2021							Done	
Secretary : Ms.Natchariya Wongamnuayporn (Kao)											Finish Project : 31/5/2021							In Process	
																		Late	
Scurm Master : Kao & Project Manager : Bank																	Not assign		
Work description	Assign to	Start Date	Mar-21				Apr-21				May-21				Percent (%)	Finish Date	Period Days	Note	
			1	2	3	4	1	2	3	4	1	2	3	4					
Sprint1 : Conceptual design (1/3/2021 - 31/3/2021)																			
Get requirement	All member	1/3/2021													100%	3/3/2021	2		
Midterm Exam	All member	8/3/2021													NA	12/3/2021	5	Midterm Exam	
Requirement Document	Kao,Bank	15/3/2021													100%	20/3/2021	5		
Meeting	All member	27/3/2021													100%	28/3/2021	1		
Presentation	All member	31/3/2021													100%	31/3/2021	1	End Sprint 1	

Finished

Sprint2 : System design (31/3/2021 - 26/4/2021)																						
Meeting	All member	31/3/2021																	100%	31/3/2021	1	
Create IaC	Eye	31/3/2021																	100%	I : 4/4/2021 (II : 10/4/2021)(III : 18/4/2021)(IV : 21/4/2021)(V : 25/4/2021	~ 19	Blob Storage , PostgreSQL and Data warehouse
Programming	Bank	31/3/2021																	100%	4/4/2021	5	Manage data to match the data
Demo Visualization	Kao,New	31/3/2021																	100%	4/4/2021	5	
Demo Docker	Fuze	31/3/2021																	100%	5/4/2021	6	
Meeting	All member	4/4/2021																	100%	4/4/2021	1	Update work
Extract and load Data	Fuze	5/4/2021																	100%	21/4/2021	16	Upload & Download
Visualization	Kao,New	5/4/2021																	100%	18/4/2021	13	Dashboard
Power BI POST request API	Kao	12/4/021																	100%	22/4/2021	10	
Machine Learning	Bank	5/4/2021																	100%	18/4/2021	13	
Testing & Report	Kao,Bank	19/4/2021																	100%	20/4/2021	1	
Presentation	All member	26/4/2021																	100%	26/4/2021	1	End Sprint 2

Finished

Sprint3 : Implement & Deployment (26/4/2021 - 10/5/2021)																						
Meetings	All member	26/4/2021																	100%	26/4/2021	1	
New Model	Bank	2/5/2021																	100%	9/5/2021	7	
Airflow	Bank	26/4/2021																	100%	2/5/2021	6	Automate workflow
Deploy Airflow	Fuze	2/5/2021																	100%	9/5/2021	7	
Data Factories	Kao	2/5/2021																	100%	11/5/2021	9	Transform Data
Data Label	Eye	2/5/2021																	100%	7/5/2021	5	
Testing	Kao,Bank	4/5/2021																	100%	11/5/2021	7	
End Sprint 3	All member	10/5/2021																	100%	10/5/2021	1	End Sprint 3

Working Step

Sprint 4 : Testing (10/5/2021 - 7/6/2021)																						
Meetings	All member	12/5/2021																	100%	12/5/2021	1	
Testing Model	Bank	12/5/2021																	100%	20/5/2021	8	
Testing Pipeline	Eye	12/5/2021																	100%	20/5/2021	8	
Testing Infrastructure	Fuze	12/5/2021																	100%	20/5/2021	8	
Testing Dashboard	New	12/5/2021																	100%	20/5/2021	8	
Testing & Report	Kao,Bank	19/5/2021																	100%	21/5/2021	3	All testing & Report
Final Presentation	All member	5/6/2021																	100%	5/6/2021	1	End Sprint 4

Members & Responsibility



Ms.Natchariya Wongamnuayporn
(Kao)
61070507204



Mr.Natchapol Patamawisut
(Bank)
61070507205



Ms.Thanaporn Cheenthada
(Eye)
61070507209



Mr. Rungwigrat Payakkanuwat
(New)
61070507219



Mr. Prakasit Chaiphet
(Fuze)
61070507230

Responsibility

Bank : Leader , Programmer

Kao : Secretary , Tester

Eye : Infrastructure

New : Designer

Fuze : Deployment

Reference

- <https://www.siphhospital.com/th/news/article/share/857/Acutecoronarysyndrome>
- <https://www.mayoclinic.org/diseases-conditions/acute-coronary-syndrome/symptoms-causes/syc-20352136#:~:text=Acute%20coronary%20syndrome%20is%20a,damaged%20or%20destroyed%20heart%20tissue.>
- <https://www.heart.org/en/health-topics/heart-attack/about-heart-attacks/acute-coronary-syndrome>