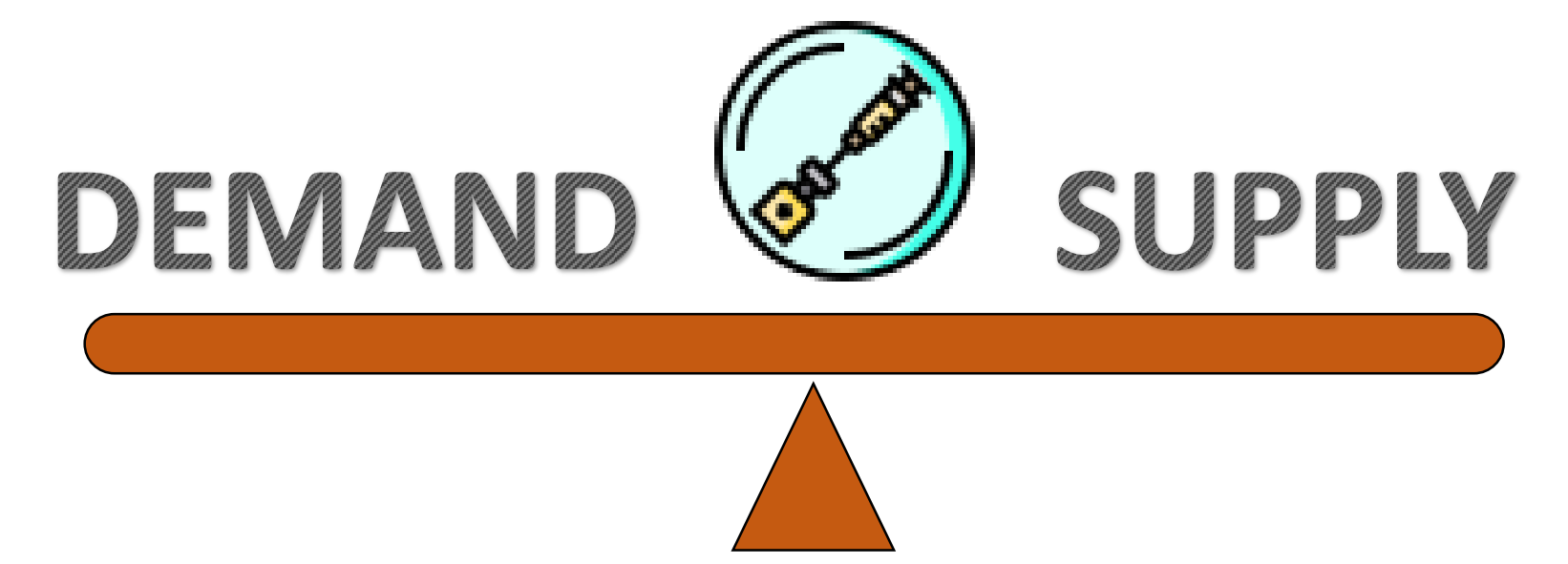




An Operational Model TO PREDICT FLU VACCINE PROCUREMENT



Singapore Healthcare Management 2022



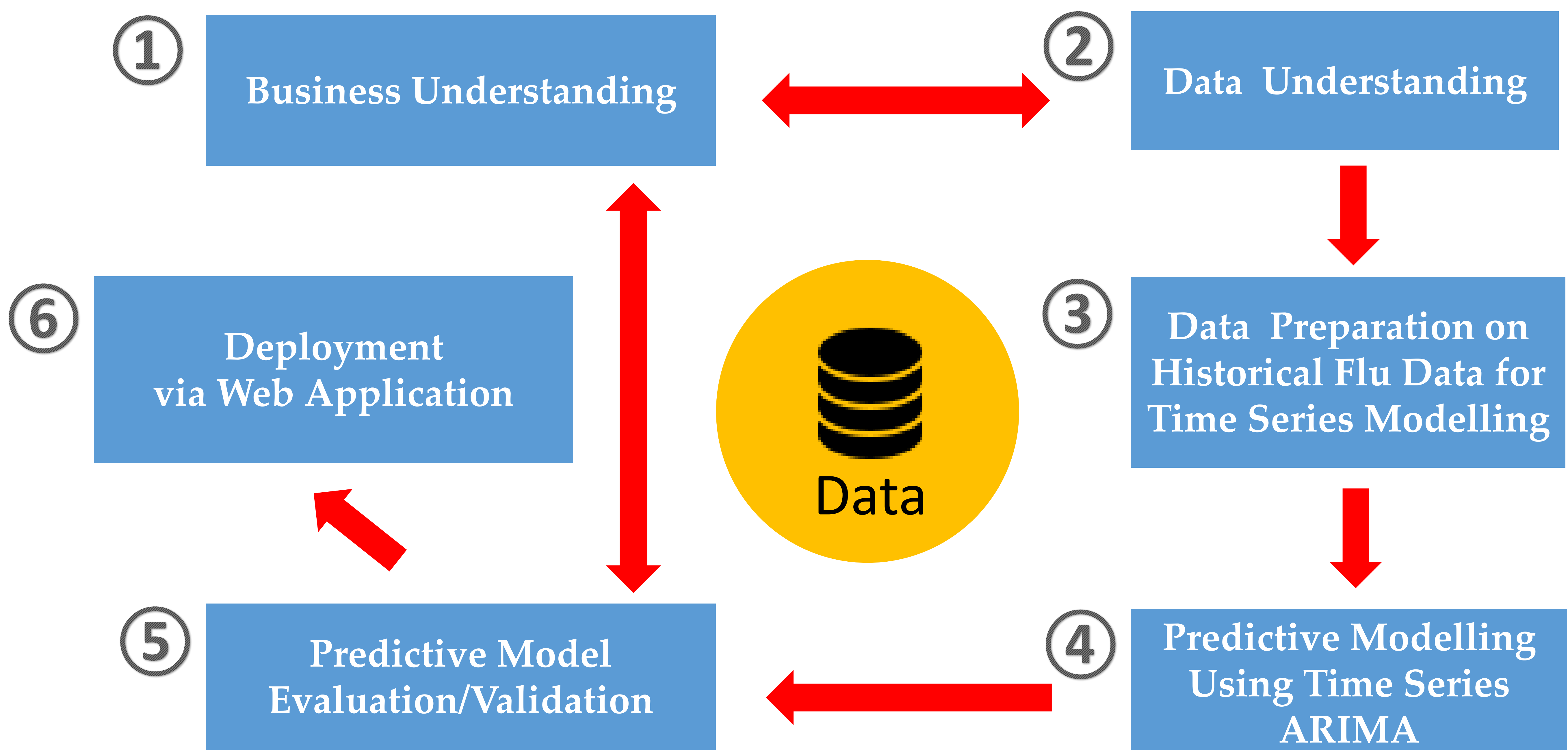
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Background and Aim

Flu vaccine drive comes every 6 months and SingHealth Polyclinics (SHP) will be ordering their flu vaccines. The aim of this project is to develop a predictive model using Data Science Time Series Analysis - ARIMA (Autoregressive Integrated Moving Average) modelling to predict the flu vaccine demand for the procurement period in the next 6 months.

Cross-Industry Standard Process for Data Mining CRISP-DM*

*CRISP-DM is a process model with six phases that serves as the base for this data science project.



Results

Descriptive Statistics found that flu vaccines has seasonal variations. Seasonal ARIMA (SARIMA) (0,0,0) (1,1,0)₁₂ is applied, with the best model chosen from a series of best Akaike Information Criteria (AIC) = 421.52 and with the lowest Mean Absolute Percentage Error (MAPE) = 19.83%. MAPE below 20% suggests that it is a good model on model evaluation. Finally, the data from April 2018 to September 2021 is used for training and validation to predict the demand for the flu vaccine procurement period of October 2021 to March 2022. The model is deployed through a web application for the users.

Conclusion

The time series modelling is a mathematical method of estimating the number of vaccines to be procured and is helpful to predict the demand of flu vaccine procurement. The data needs to be updated for training and testing so as to increase the accuracy for prediction. This helps to optimise resources and minimise wastage.

References

Cross Industry Standard Process Data for Mining CRISP-DM
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