



UNIVERSITI  
TEKNOLOGI  
MARA

# WHAT'S WHAT FSKM



2756-7729

APRIL 2026  
VOLUME 1

LEVERAGING ONLINE  
REVIEWS FOR SERVICE  
IMPROVEMENT:  
SENTIMENT ANALYSIS  
OF SUKI-YA PAVILION

---

TIME SERIES  
FORECASTING USING  
THE PROPHET MODEL

---


MEDIA SOSIAL DAN  
KESIHATAN MENTAL  
PELAJAR

---

SMALL CHANGES, BIG IMPACT:  
THE ROLE OF THRESHOLD  
SELECTION IN EXTREME RISK  
ASSESSMENT

---

VISUALIZING CORRELATION  
STRUCTURES IN DATA USING R:  
METHODS AND APPLICATIONS



# Time Series Forecasting Using the Prophet Model

Nurul Aityqah Yaccob

Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA (UiTM), Cawangan Negeri Sembilan, Kampus Kuala Pilah, 72000, Negeri Sembilan Darul Khusus, Malaysia.

[aityqah@uitm.edu.my](mailto:aityqah@uitm.edu.my)

---

## EXECUTIVE SUMMARY

Forecasting helps organisations plan and make better decisions. The Prophet model is a modern forecasting tool that breaks down past data into patterns such as trends and seasonality. This makes the results easy to understand. It is widely used because it is fast, automated, and does not require advanced statistical knowledge. While it may not always be the most accurate method, its simplicity and clarity make it highly practical for real-world use.

## INTRODUCTION

Accurate forecasting plays a crucial role in planning and evaluation, supporting informed decision-making across many disciplines such as business, education, healthcare, environment and population and demography. The most common approach is the extrapolative method which focuses on identifying regular patterns and trends in historical data and extending these patterns into the future using techniques such as moving averages and exponential smoothing. Recently, one of the extrapolative models used in time-series forecasting is the Prophet model, developed by Facebook and introduced by Taylor and Letham in 2018.

## OVERVIEW OF TIME SERIES FORECASTING

Over the past few years, numerous studies have applied the Prophet model for time-series forecasting in diverse applications, such as air pollution analysis, COVID-19 infection trends, business forecasting, and public health surveillance (Navratil & Kolkova, 2019; Mishra et al., 2021; Hasnain et al., 2022; Zhang et al., 2023). This increasing use of the Prophet model is largely driven by its practical advantages, which make time-series forecasting more accessible and efficient for both analysts and decision-makers.

## THE PROPHET MODEL

The Prophet model decomposes time-series data into trend, seasonality, and holiday components. It is suitable for practical forecasting applications involving complex temporal patterns. The model can be expressed as follows:

$$y(t) = g(t) + s(t) + h(t) + \varepsilon_t$$

where  $g(t)$  is the trend function,  $s(t)$  describes the various seasonal patterns,  $h(t)$  is the effects of holidays and  $\varepsilon_t$  is a white noise error term. Figure 1 summarises the key advantages of the Prophet model. These include its interpretability, automation, and practical applicability in forecasting.

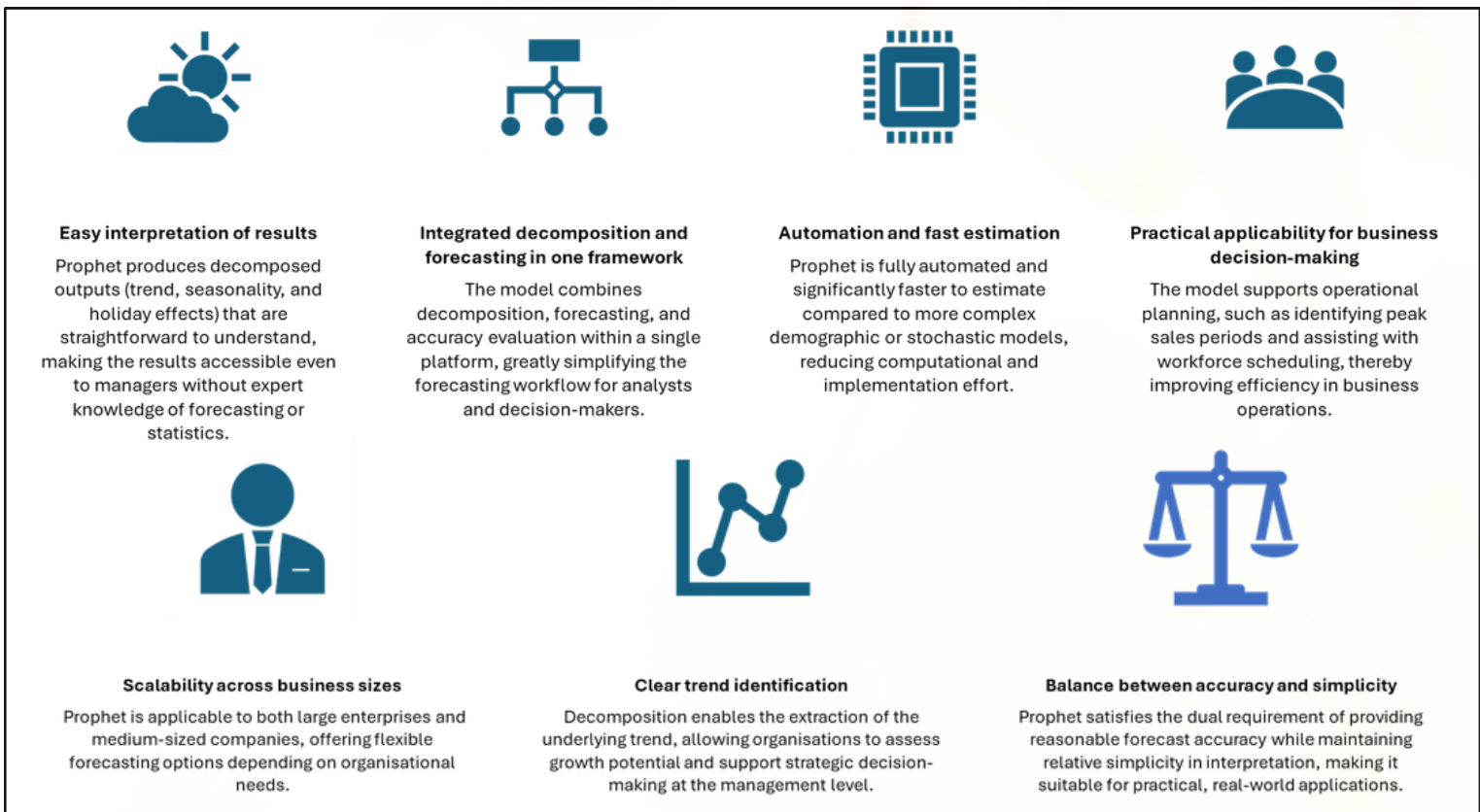


Figure 1: Advantages of the Prophet Model in Forecasting

Despite these advantages, the Prophet model may not always achieve the highest forecasting accuracy. It also has limited capability for multivariate modelling and may struggle with complex or rapidly changing data patterns.

## CONCLUSION

In conclusion, Prophet is a practical alternative for time-series forecasting. Although it is fast and easy to use, it may not always be the most accurate method. Its strengths lie in usability, transparency, and automation.

## REFERENCES

- Hasnain, A., Sheng, Y., Hashmi, M. Z., Bhatti, U. A., Hussain, A., Hameed, M., ... & Zha, Y. (2022). Time series analysis and forecasting of air pollutants based on prophet forecasting model in Jiangsu province, China. *Frontiers in Environmental Science*, 10, 945628.
- Hyndman, R. J., & Athanasopoulos, G. (2018). *Forecasting: principles and practice*. OTexts.
- Mishra, S. R., Mathur, P., Gupta, A. K., Baag, S., Nagwanshi, K. K., Tailor, S., & Verma, A. (2021, November). Statistical analysis on the COVID-19 infection spread in United State of America: A Prophet Forecasting Model. In *2021 Sixth International Conference on Image Information Processing (ICIIP)* (Vol. 6, pp. 523-528). IEEE.
- Navratil, M., & Kolkova, A. (2019). Decomposition and forecasting time series in the business economy using prophet forecasting model. *Central European Business Review*, 8(4), 26.
- Taylor, S. J., & Letham, B. (2018). Forecasting at scale. *The American Statistician*, 72(1), 37-45.
- Zhang, L., Chen, Q. Y., Xiong, S. F., Zhu, S., Tian, J. G., Li, J., & Guo, H. (2023). Mushroom poisoning outbreaks in Guizhou Province, China: a prediction study using SARIMA and Prophet models. *Scientific reports*, 13(1), 22517.