LEVERAGING TRENDS TO PREDICT ECONOMIC DEMAND

Isabella Tsui

Department of Engineering and Computer Science, University of Victoria

COM 450: Introduction to Business Analytics

Dr. Ben Lukenchuk

June 15, 2025

The Internet and Market Demand Forecasting

Today, organizations must quickly adapt to volatile customer needs and interests. The Internet, especially Internet of Things (IoT) systems, offers powerful tools for maintaining this agility. As Yerpude and Singhal (2017) note, the 4th Industrial Revolution is underway, and it is marked by a surge in connected devices generating real-time data [1]. When this data is integrated into forecasting models, it enhances accuracy and enables better decision-making. Research shows that companies using IoT generated data achieve improved forecasts, reduced risks, and greater customer satisfaction. With billions of users online and high-speed connectivity, the Internet provides a robust platform for real-time data exchange. As Kumar (2023) highlights, fostering data-driven decision-making helps organizations achieve sustainable growth [2].

Problem Definition

Traditional decision-making models, which often rely on historical data, have become insufficient in addressing the multidimensional challenges of modern business environments (Olayinka, 2021) [3]. Similarly, while macroeconomic indicators from sources like the IMF or World Bank offer valuable insights into long-term trends, they are often delayed and lack the timeliness needed for business decisions. Opposingly, short-term digital signals, such as search trend data from Google Trends, provide a more immediate reflection of consumer attention and intent. However, trend data alone cannot directly explain what is changing or how it will impact market behavior.

Proposed Solution

This project seeks to bridge the gap explained above by investigating whether digital trend signals can be systematically linked to traditional economic indicators, to forecast consumer demand and inform strategic business responses. This will be achieved through a combination Google Trends and World Bank Open Data/IMF data set. The following methods may be used to explore and answer the problem:

- Time-series correlation
- Identify leading indicators from search volume
- Predictive analytics:
    - Lagged regression
    - Decision trees
    - Neural networks

By examining the relationship between search trends and key macroeconomic indicators, such as consumer spending, GDP, or unemployment rates, this study aims to assess the predictive value of digital interest signals for strategic business planning.

References

[1] S. Yerpude and T. K. Singhal, “Impact of Internet of Things (IoT) data on demand Forecasting,” Indian Journal of Science and Technology, vol. 10, no. 15, pp. 1–5, Apr. 2017, doi: 10.17485/ijst/2017/v10i15/111794.

[2] R. Kumar, “The Role of Financial Forecasting in Corporate Decision-Making and Strategic Planning,” International Journal of Exploring Emerging Trends in Engineering, vol. 10–10, no. 2, pp. 530–544, 2023, [Online]. Available: https://ijoeete.com/wp-content/uploads/2025/01/76-rajesh-kumar.pdf

[3] O. Olalekan, “Leveraging predictive analytics and machine learning for strategic business Decision-Making and competitive advantage,” International Journal of Computer Applications Technology and Research, vol. 8, no. 12, Mar. 2025, doi: 10.7753/ijcatr0812.1006.