

Simplified Short Term Load Forecasting



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Scope and Motivation

- To proactively manage the distribution system load, forecasts should be conducted.
- Traditional ad-hoc forecasts are not sufficient for decentralised load forecasting.
- New automatic and simple forecasting techniques should be introduced.

Methodology

- The idea of sequential patterns is employed.
- The aim is to encapture loading sequences which have occurred in the past.
- These sequences do not need to be periodic.

The principal idea is the following:

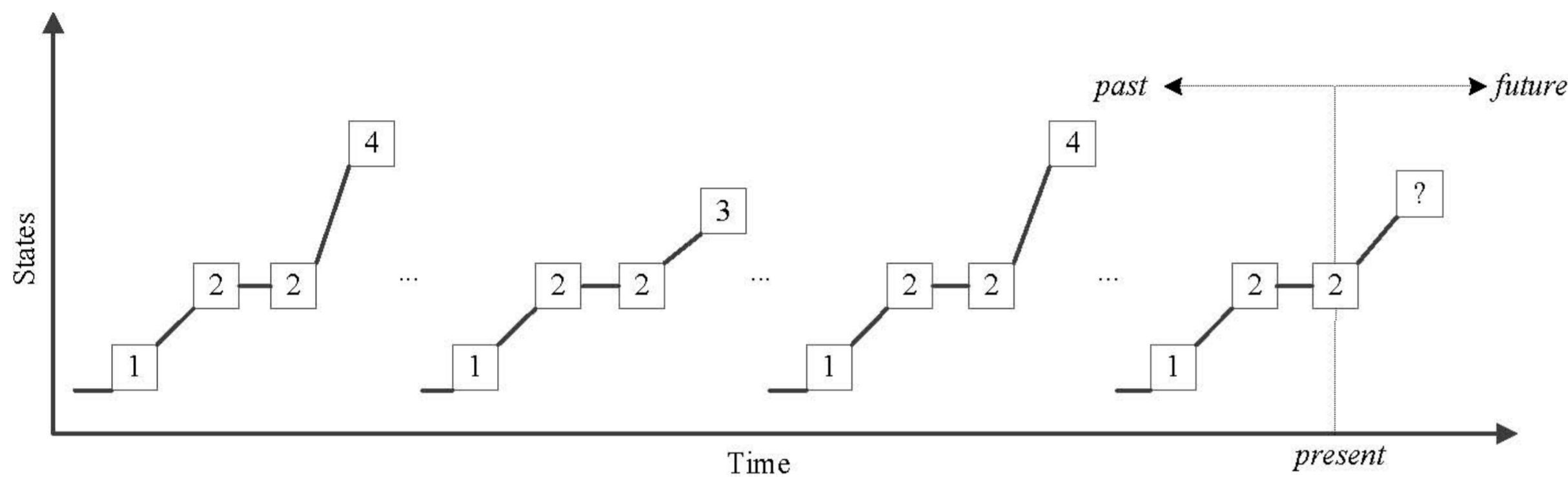


Fig. 1. Schematic representation of the sequential pattern forecasting.

- If deemed necessary, periodicity can also be incorporated, by considering only pattern sequences which have happened at specific hours of the day.

The framework of the method is:

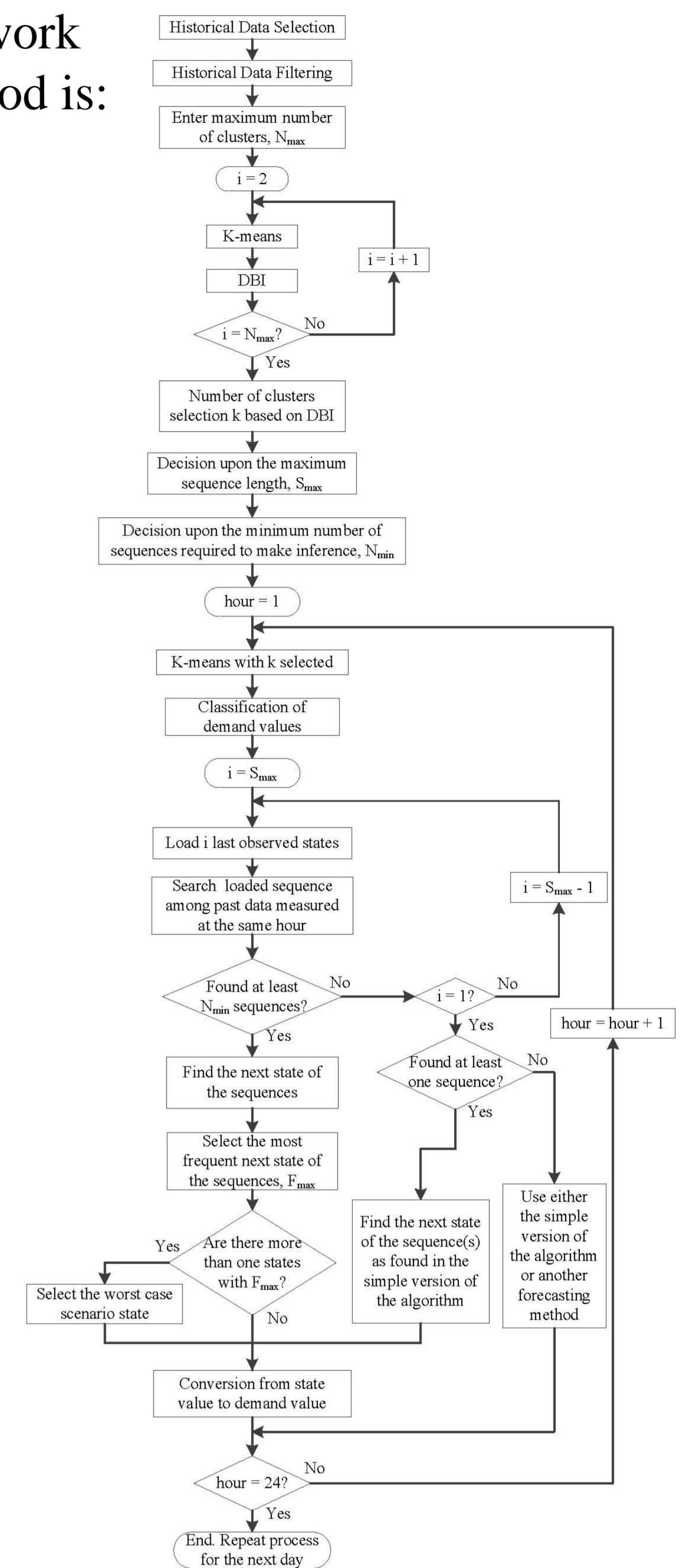


Fig. 2. Flow-chart of the forecasting algorithm.

Results

Results on an aggregated level, i.e., transformer level.

Good result:

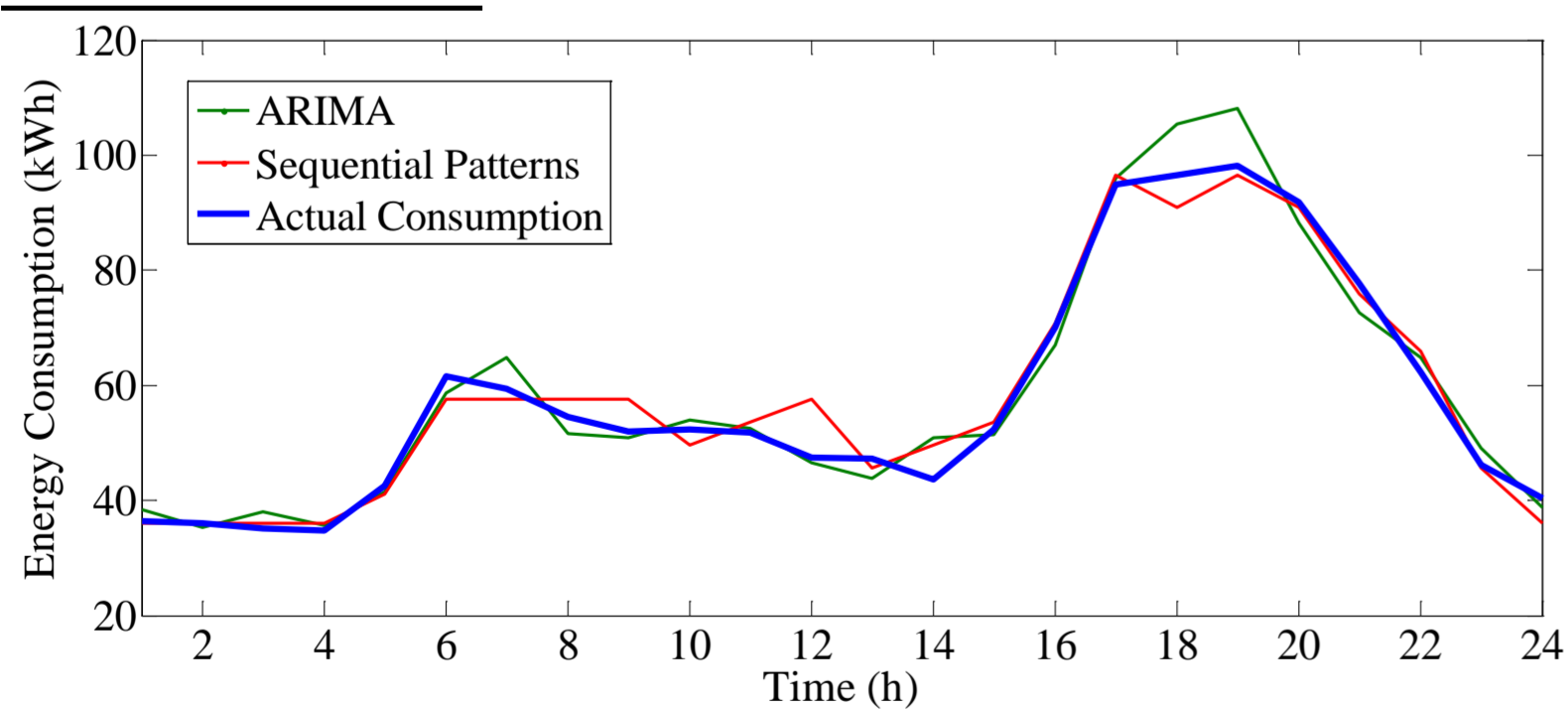


Fig. 3. Performance of sequential patterns versus ARIMA models.

Bad result:

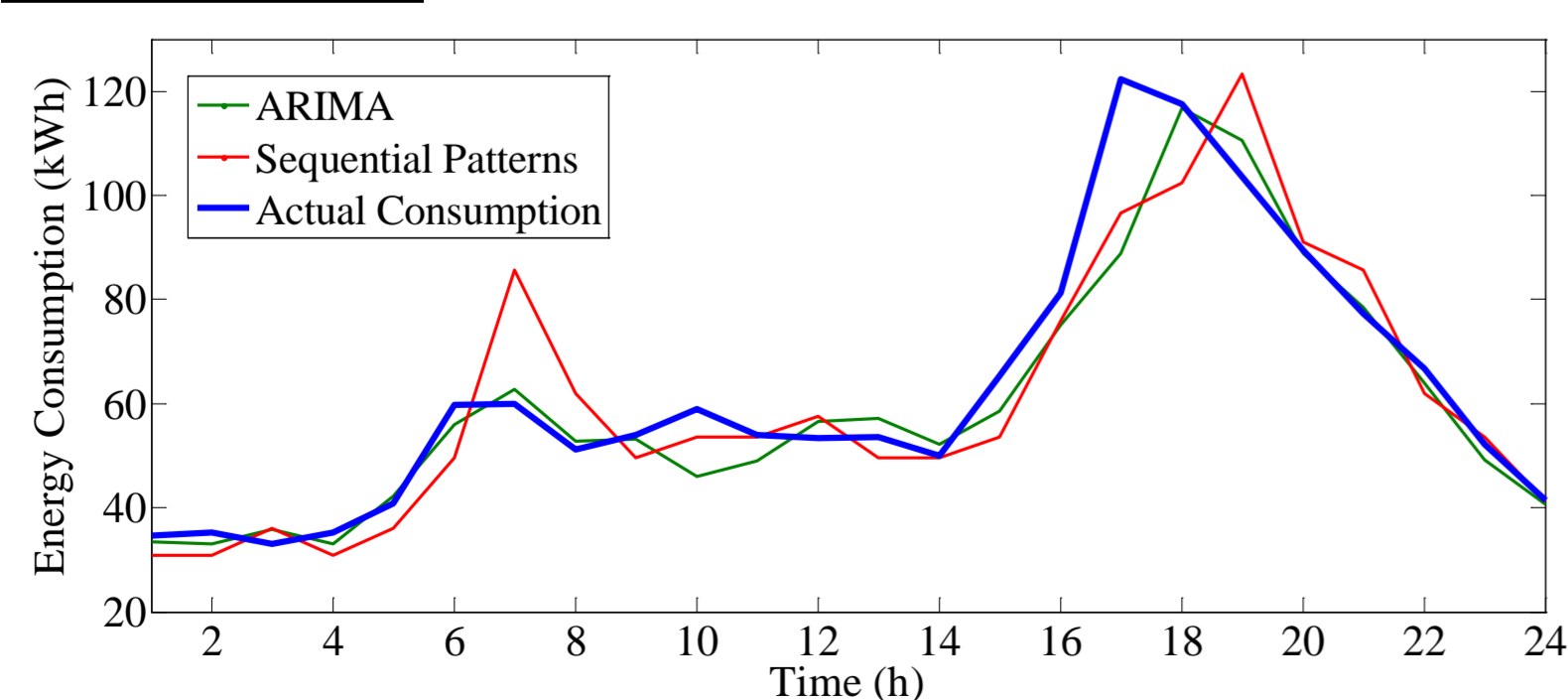


Fig. 4. Performance of sequential patterns versus ARIMA models.

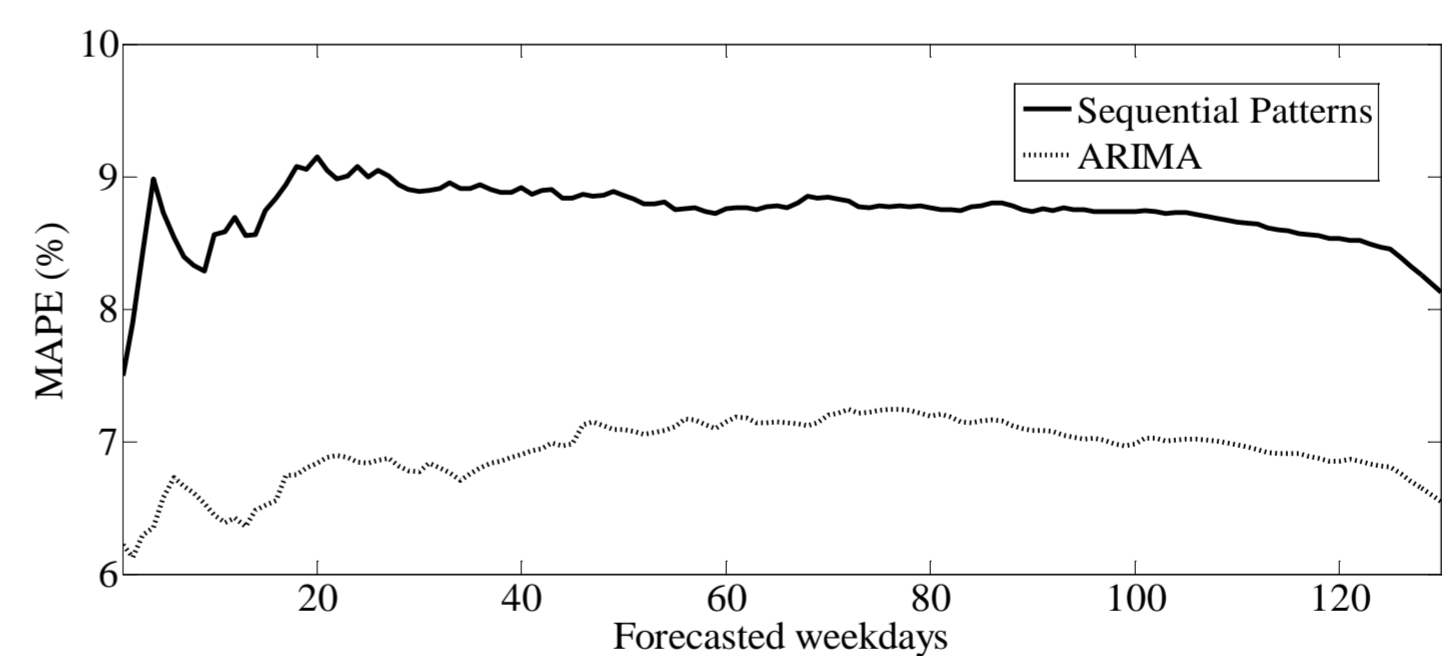


Fig. 5. Error with increasing training data.

- The more the training data the more the forecast error decreases.

Possible results on a disaggregated level.

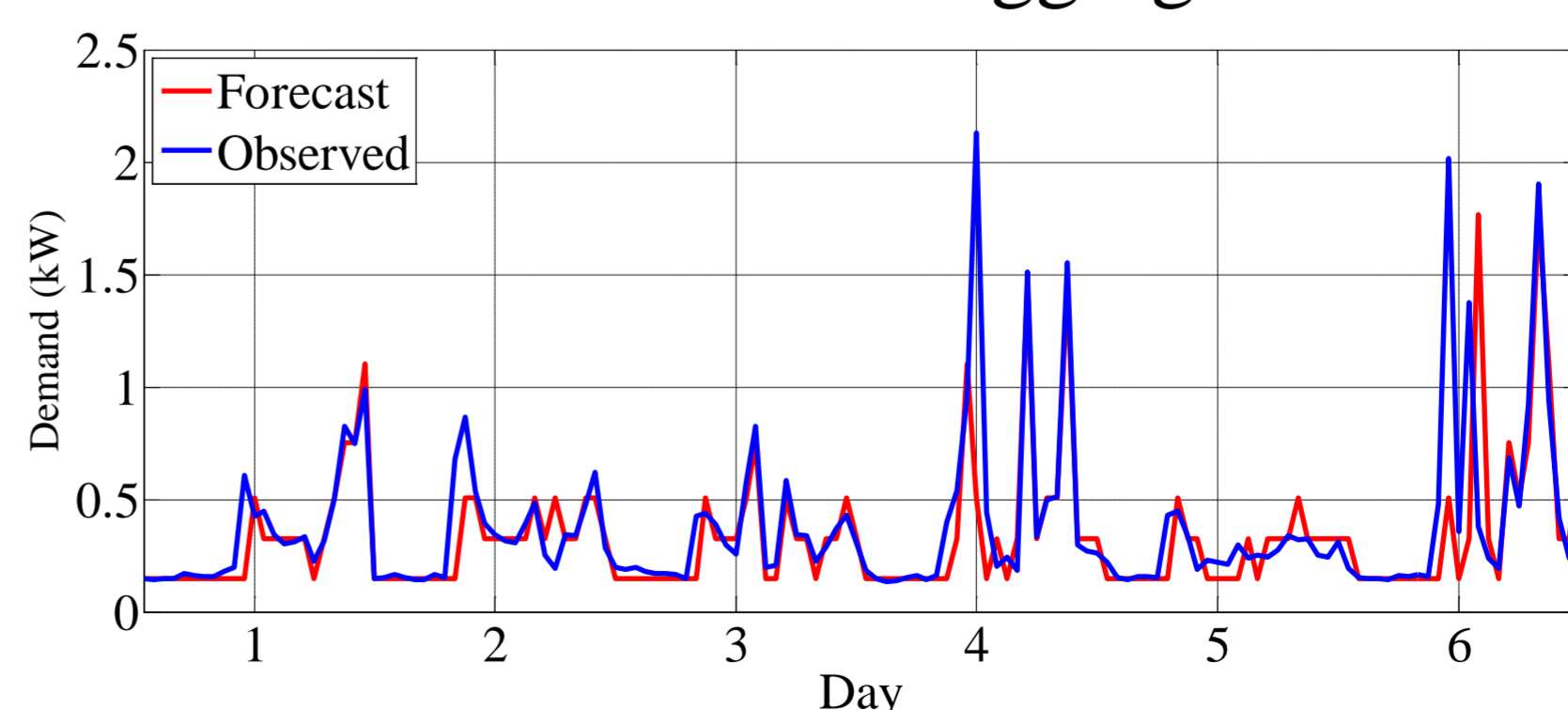


Fig. 6. Forecast for a single consumer.

- The model is able to replicate non-periodic curves which have frequently happened in the past.