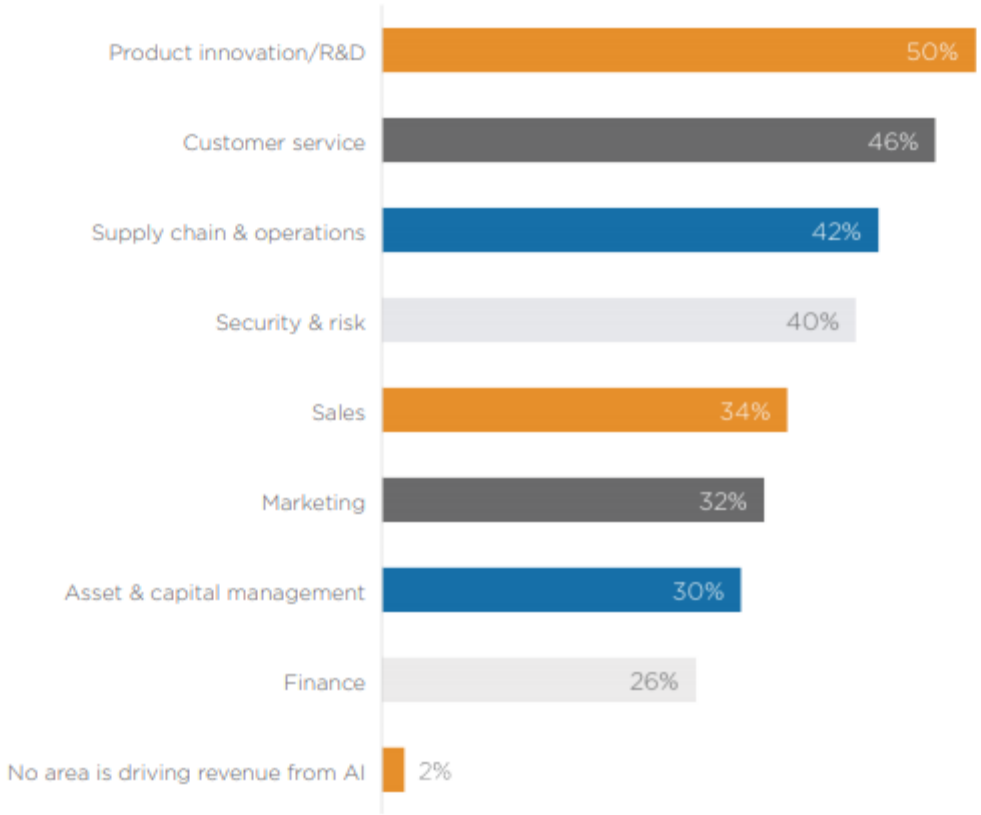
Forecasting Supply Chain Demand signals using Artificial Intelligent Methods for the Shipping Industry

- Ammar Ameerdeen

REVENUE DRIVERS FROM AI TODAY




Demand Forecasting
Resource Repositioning
Demand Dispatching
Dynamic Pricing
OOCL
Microsoft
Deep Learning
Combinatorial Optimization
Game Theory

Ongoing innovations in the industry

DHL	Predictive network to identify top factors influencing shipment delays.
Panalpina	ClearMetal
EFL	For classification and augment decision making in the process phasing out manual processes.
OOCL	Partnership with Microsoft's MSRA.
H&M	Sea Machines
Singapore Marine	Shipping broker system (Shipmax)

Project phases

Phase 1 : When.?

Demand for selected commodities over time.(Seasonal)

Phase 2 : Where.?

Demand for selected commodities across regions.(Ports / Countries)

Phase 3 : What.?

Demand fluctuations for variable number of commodities.(TEUs)

Phase 4 : Who.?

Discover potential partners for commodities.(Charterers)

Resources

Data for model designing, training and validation.

- Kaggle
- Data made available by government agencies. (Eg :- Statistics Canada)
- Masked of trend data.
- Web scraping data.

* Data will be handled with due attention to existing legal requirements as devised by DMCA and also abiding to BCS code of conduct as this research program is accredited by BCS.

Past research demo (1)

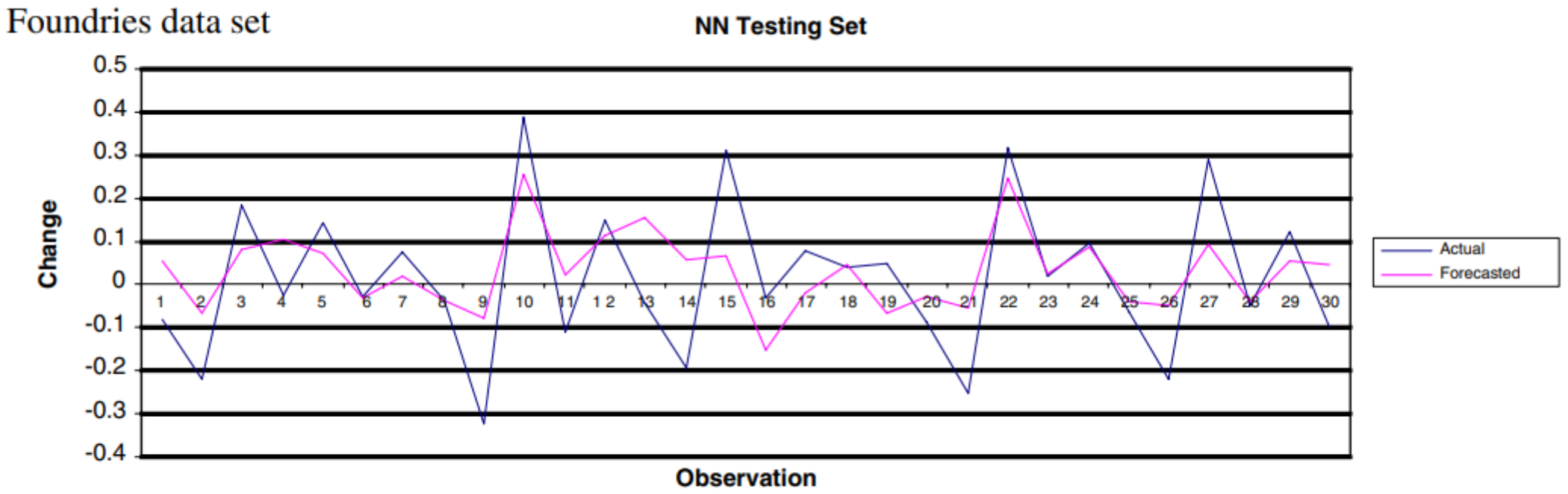


Fig. 10. Foundries testing data set results.

Management | Sales | Marketing

MANAGEMENT OVERVIEW

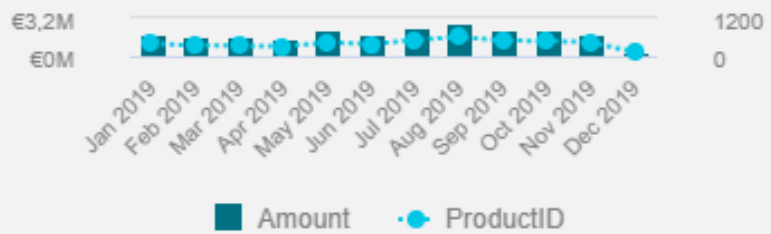
REPORT PERIOD: {time filter}

2.085
ACTIVE CUSTOMERS

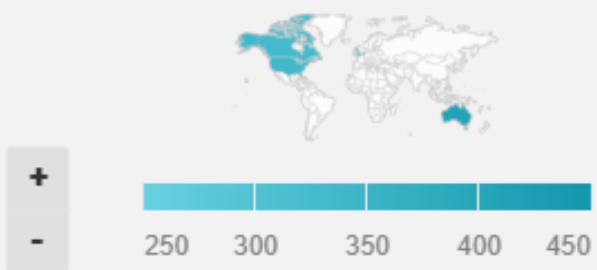
23%
VESSEL UTILIZATION

REVENUE BY COMMODITY

last 12 months

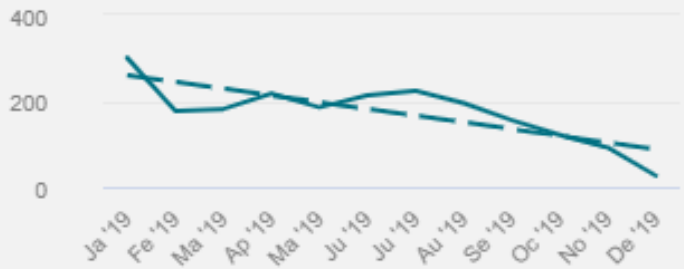


DEMAND BY REGION



TOP 10 CHARTERERS

DEMAND - RUBBER



VESSEL UTILIZATION BY COMMODITY

TOP COMMODITIES

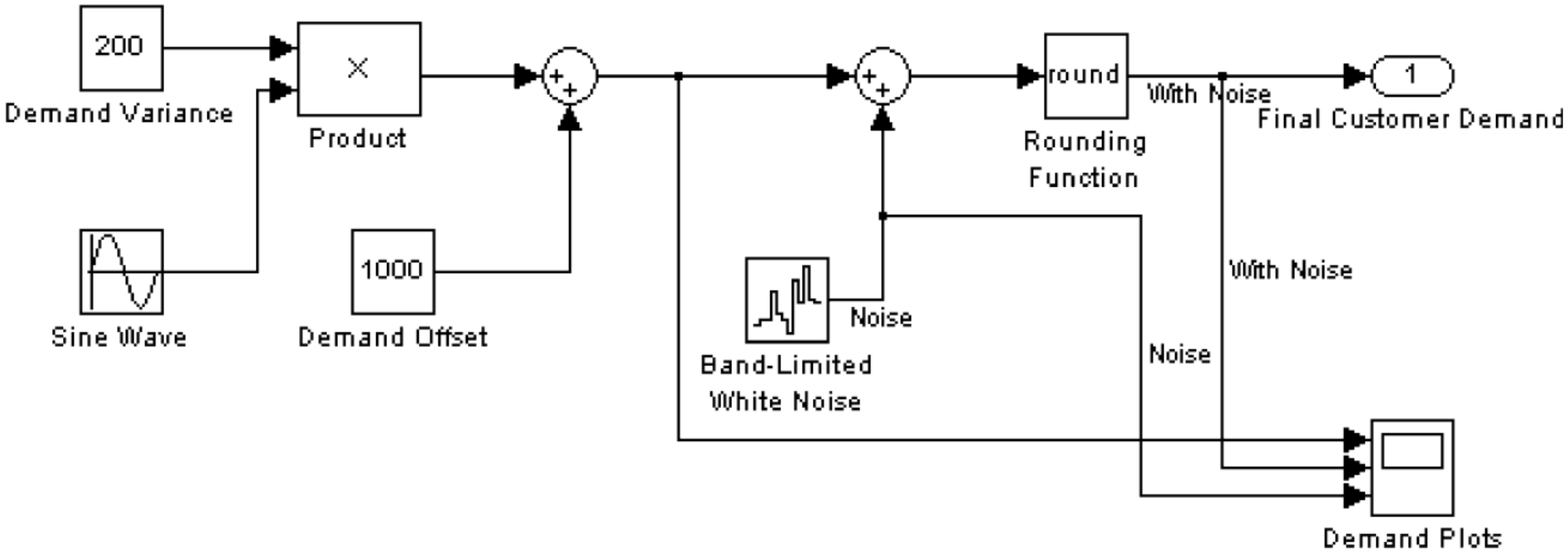
Important deadlines

Prototype	January 31st 2020
MVP (Minimum Viable Product)	April 30th 2020
Research Document	May 31st 2020

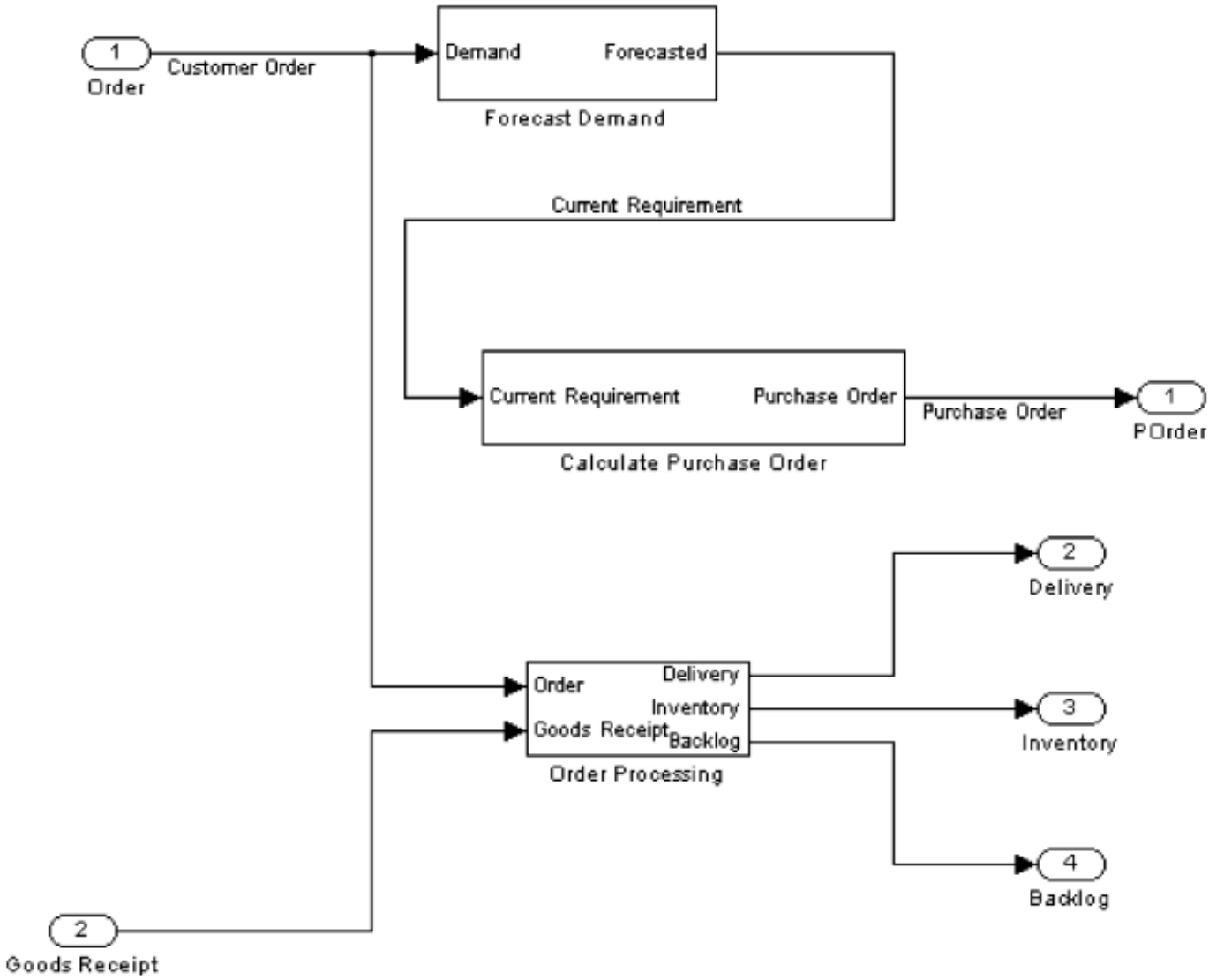
Thank you !

More technical information

Simulation (End customer)



Simulation (Partner)



Modern Methodologies & Concepts

Methodologies.

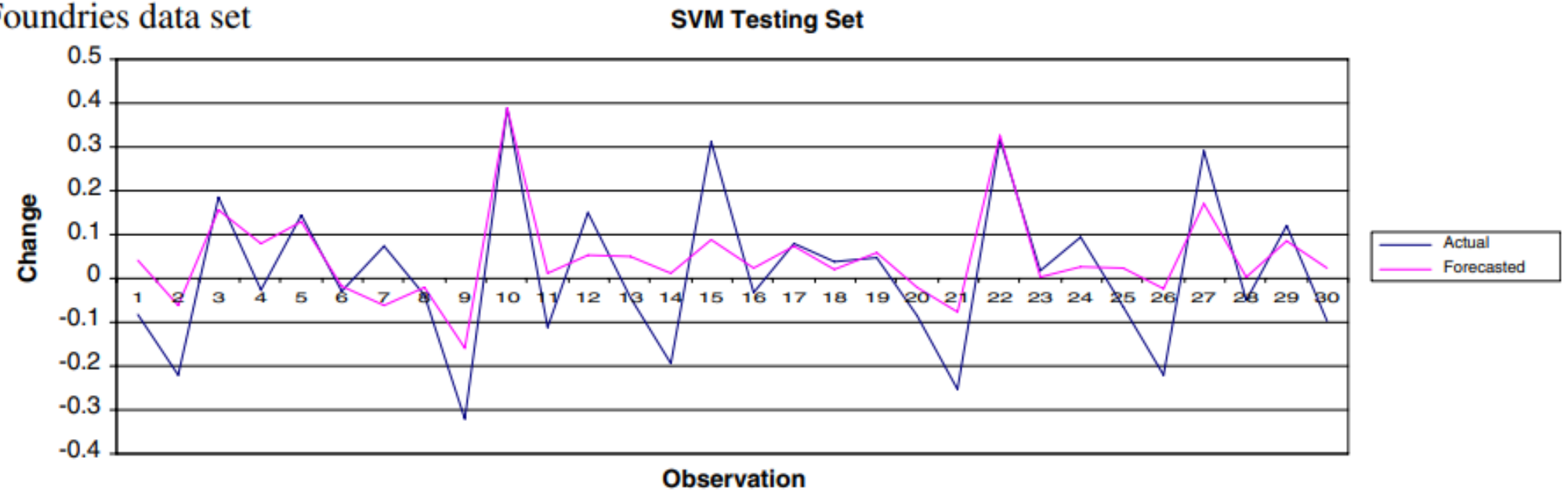
- Structural risk minimization models
  - Support Vector Machine
- Empirical risk minimization models
  - Neural Networks
  - Recurrent Neural Networks
  - Logistic regression
- Simulation

Traditional concepts

- Naı̈ve forecasting
- Moving average
- Linear regression
- Collaborative forecasting and replenishment (CFAR)

Past research demo (2)

Foundries data set

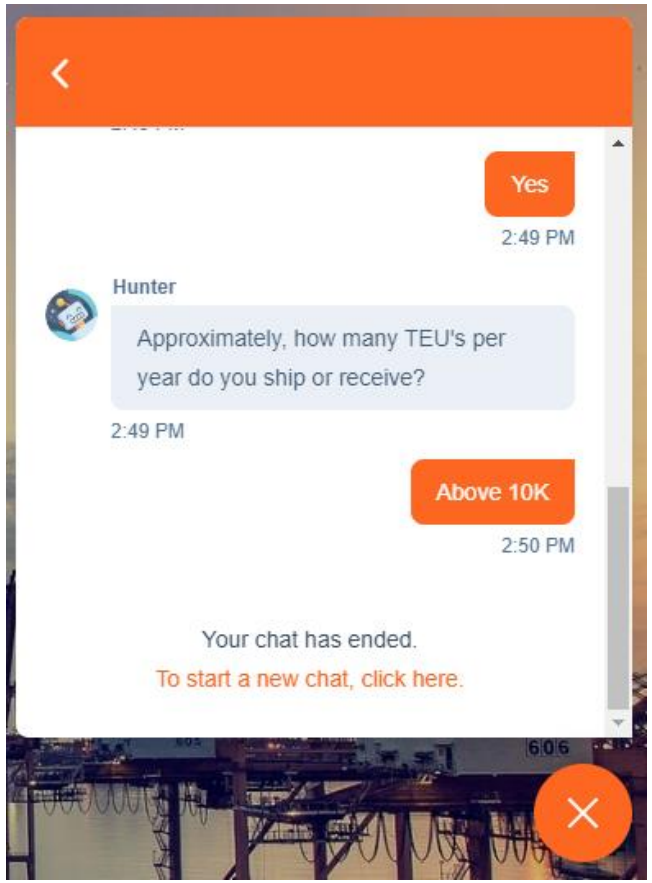


Past research comparison (3)

Comparison of the performance of forecasting techniques on the foundries data set

Forecasting technique	Testing set		Training set	
	MAE	Std. dev.	MAE	Std. dev.
RNN	20.352	16.203	15.521	12.334
LS-SVM	20.485	17.304	3.665	3.722
MLR	21.396	19.705	15.007	15.041
NN	25.260	19.733	12.855	12.057
Moving average	25.481	19.253	18.205	13.028
Trend	27.323	24.198	17.995	17.292
Naïve	32.591	23.485	20.263	17.380

Possible future ideas



Thank you again!