Understanding and Improving the Supermarket Price Reduction Process

Duncan Apthorp

Supply Chain Development

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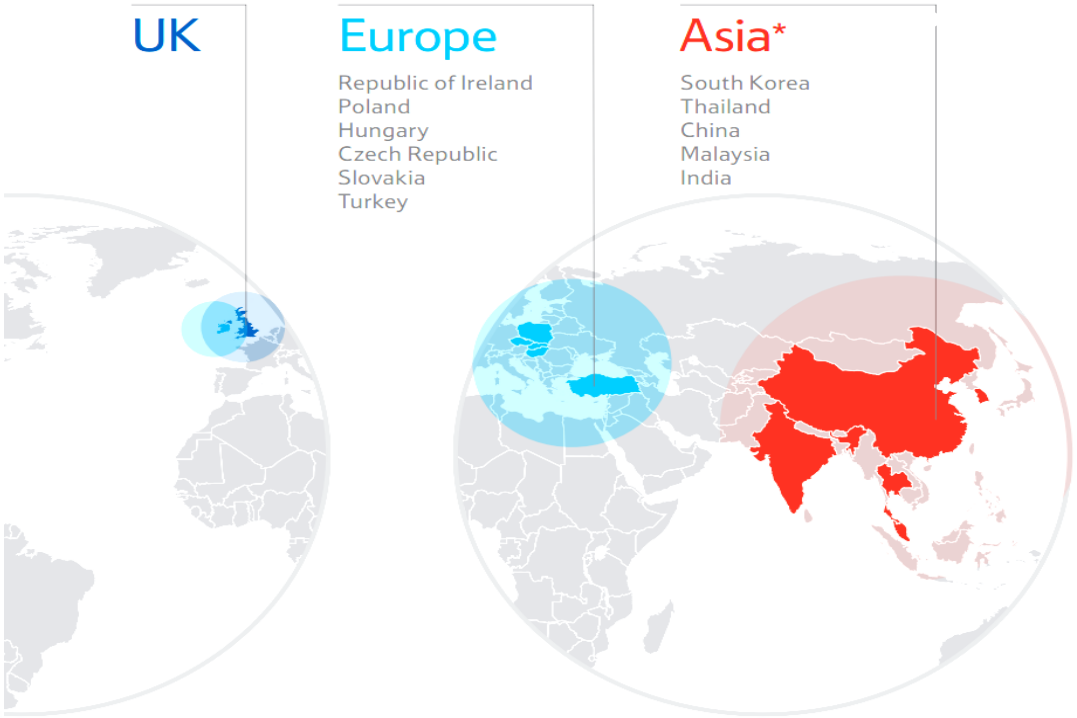
Tesco: Multinational retailer



12 countries

> 530,000 people

£72.4bn sales

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Tesco UK


3,000+ stores
30,000+ products in big stores
23 depots
60,000,000 cases delivered a week

Supply Chain Development Projects

Improving promotions

Better on-shelf availability

Predicting weather effects on sales

Less summer food waste

Replacing our sales forecasting

Reduced Waste Stock

Optimising store operations

Less Waste

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Where does Matlab fit in Tesco?

IBM Mainframe

- Runs the business
- Hard Real Time
- 24/7/365 uptime
- Monthly updates
- 12 month lead time

Teradata Data Warehouse

- 5 years of data
- 100 Tbytes, 150 cores
- Soft real time
- SQL Only for now
- Batch jobs / user queries

Matlab Desktop and Servers

- Agile Development
- Analysis
- Model Development
- Simulations

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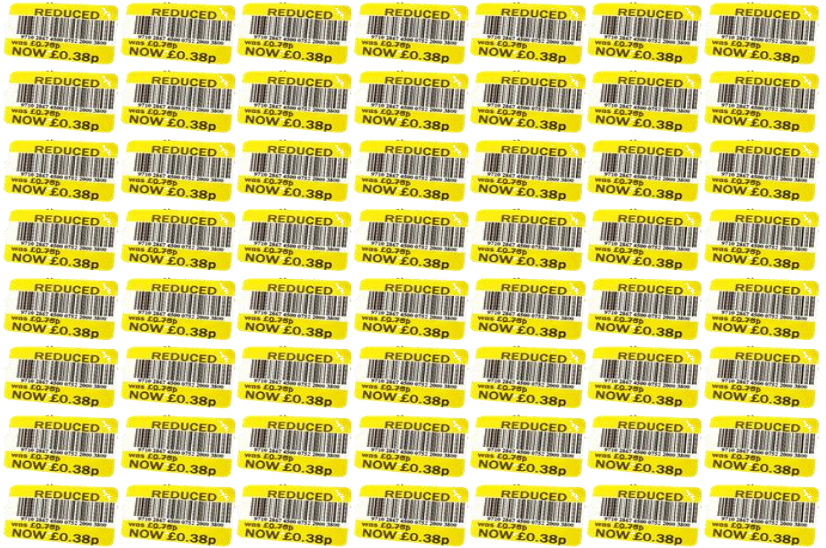
Optimising Reductions



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Why reduce products going out of date?

- It's good for our customers
- It's good for the environment
- It's good for business
- It's a legal requirement

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What is the Process ?

Up to 2010

- Products going out of date are scanned each evening
- Reduced up to 3 times
- Expiring product taken off sale before midnight
- Reduction percentages based on colleague's experience

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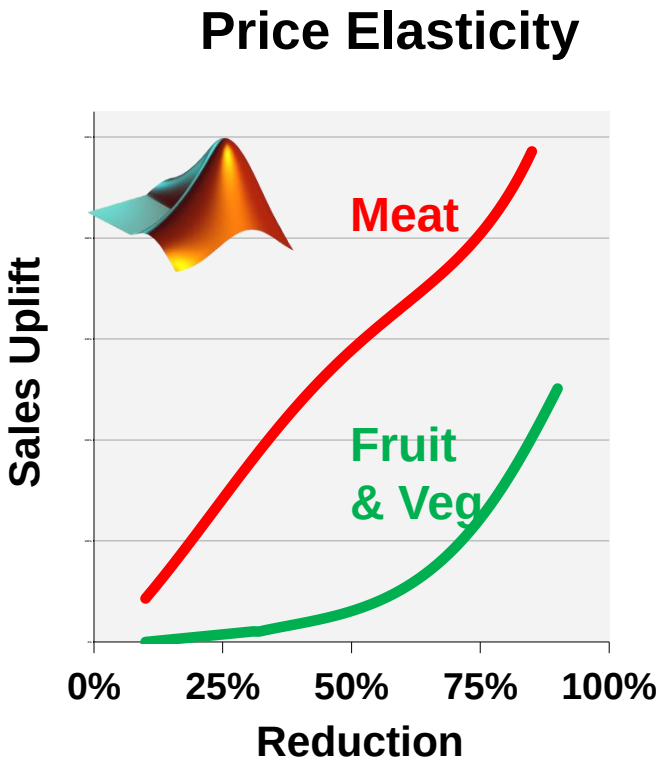
What is the Process ?

2010 – Automated Reduction Percentages

- Reduction percentages automated
- Reductions calculated automatically:
  - Quantity going out of date
  - Sales forecast
  - Product type

The automated process brought major benefits



Less Waste

Increased Sales

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2014 – New Reduction Model

- Second Tesco Mathworks joint development
- Tesco
    - Business / systems knowledge
    - Big data expertise
- Mathworks
    - Increase in capacity
    - Data Analytics – new ways of analysing and visualising data
    - Statistical Modelling – new approaches
    - Production model development
- MATLAB as the common language

2014 - Detailed Reduction Optimisation Model

Programme was based on learnings from previous project:

1. Define programme aims and KPIs
2. Understand the data
3. Build a measurement framework
4. Build your first models, get a quick win
5. Then build the final models

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KPIs - what do we want to achieve?

- Make it simple and clear for our customers
- Minimise our impact on the environment (waste tonnes)
- Minimise the cost (waste in £)
- Minimise the effort involved for our colleagues in store

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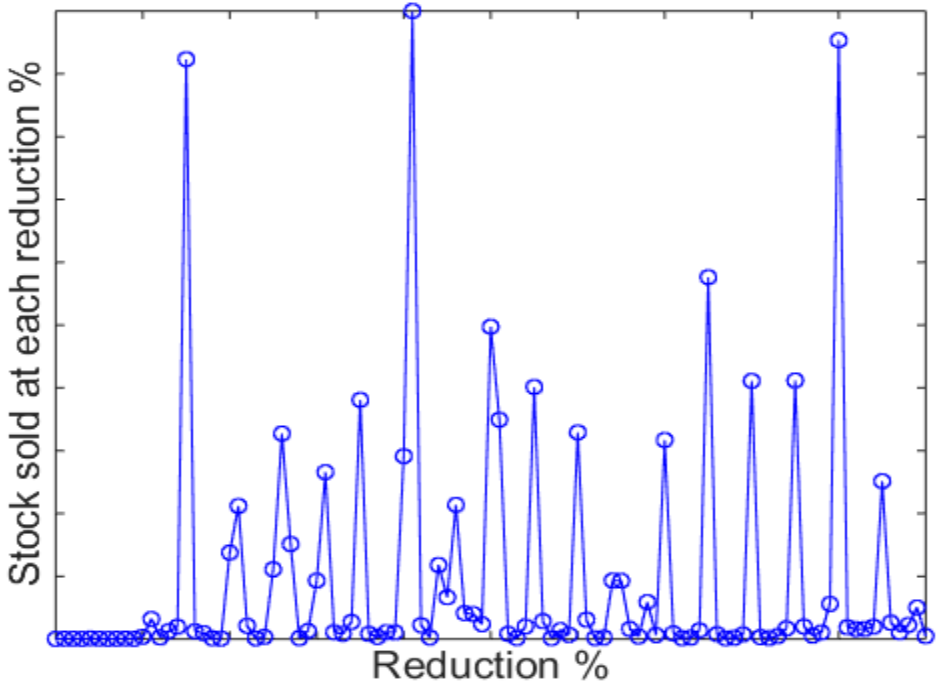
Historic data shows a good spread of reductions



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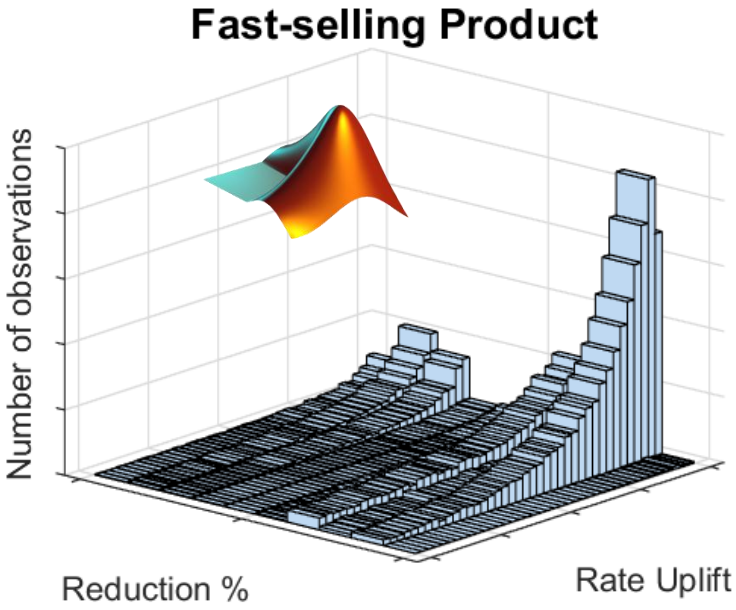
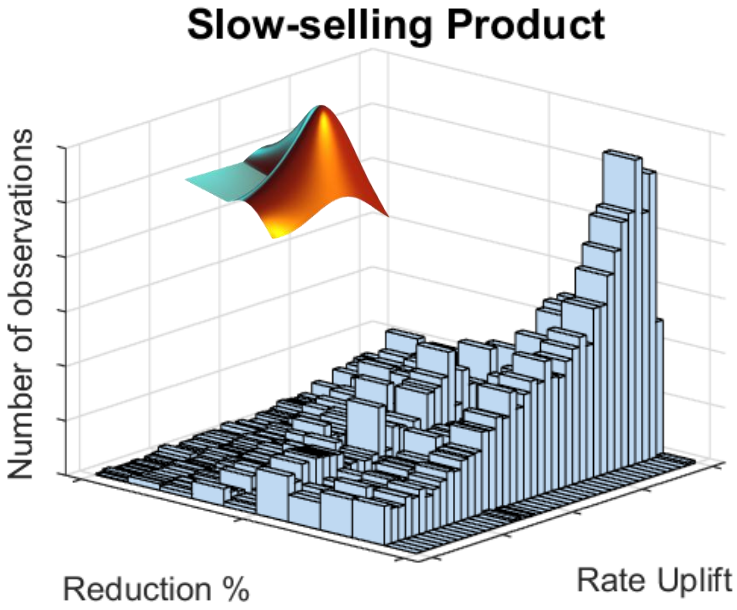
Relationship between reduction and rate of sales





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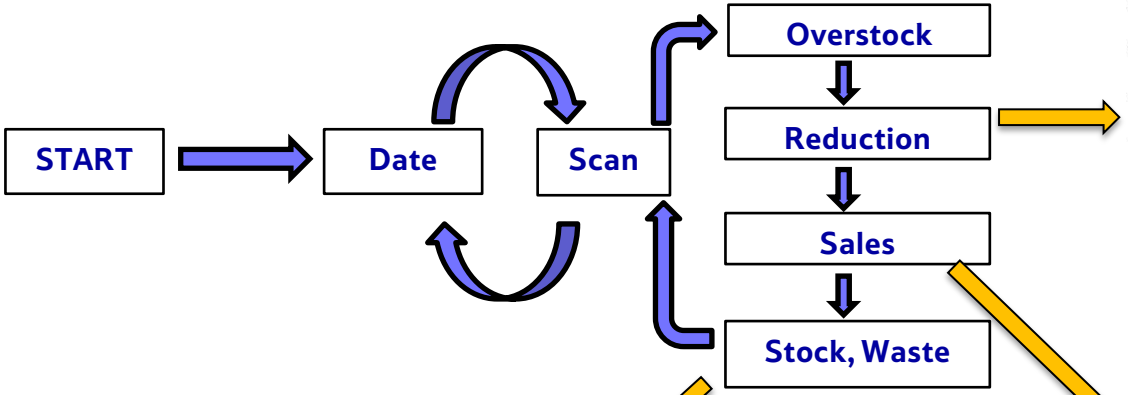
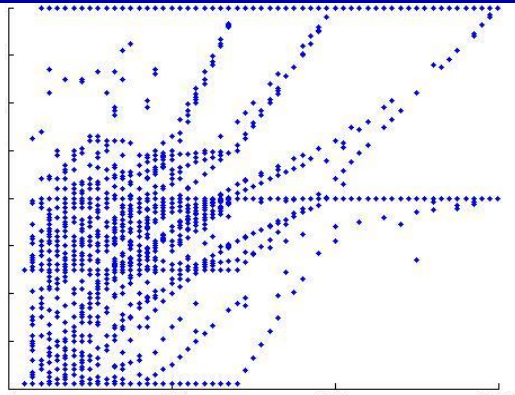
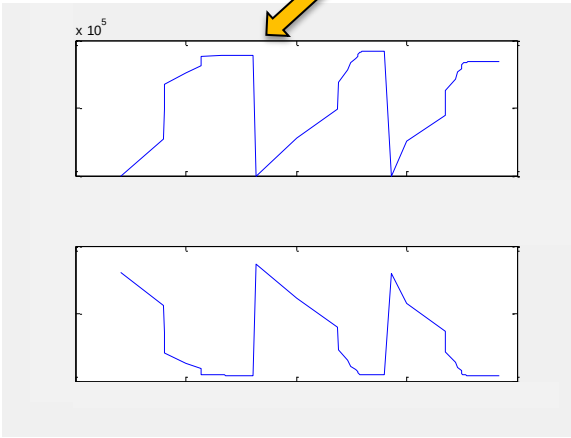
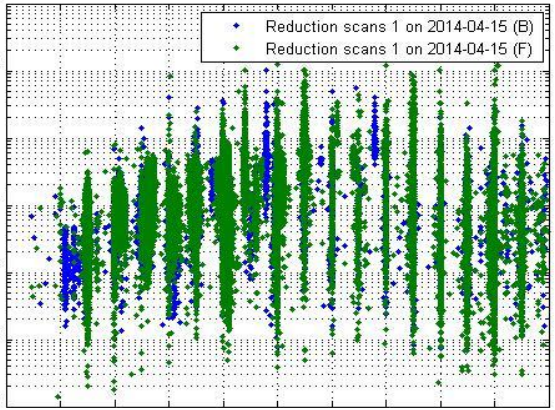
Evaluation Framework









Model

- Tesco retail and data knowledge
- Mathworks statistics and data analytics
- Models effect of reduction on sales rate
- Predicts KPIs
- Creates optimum reductions

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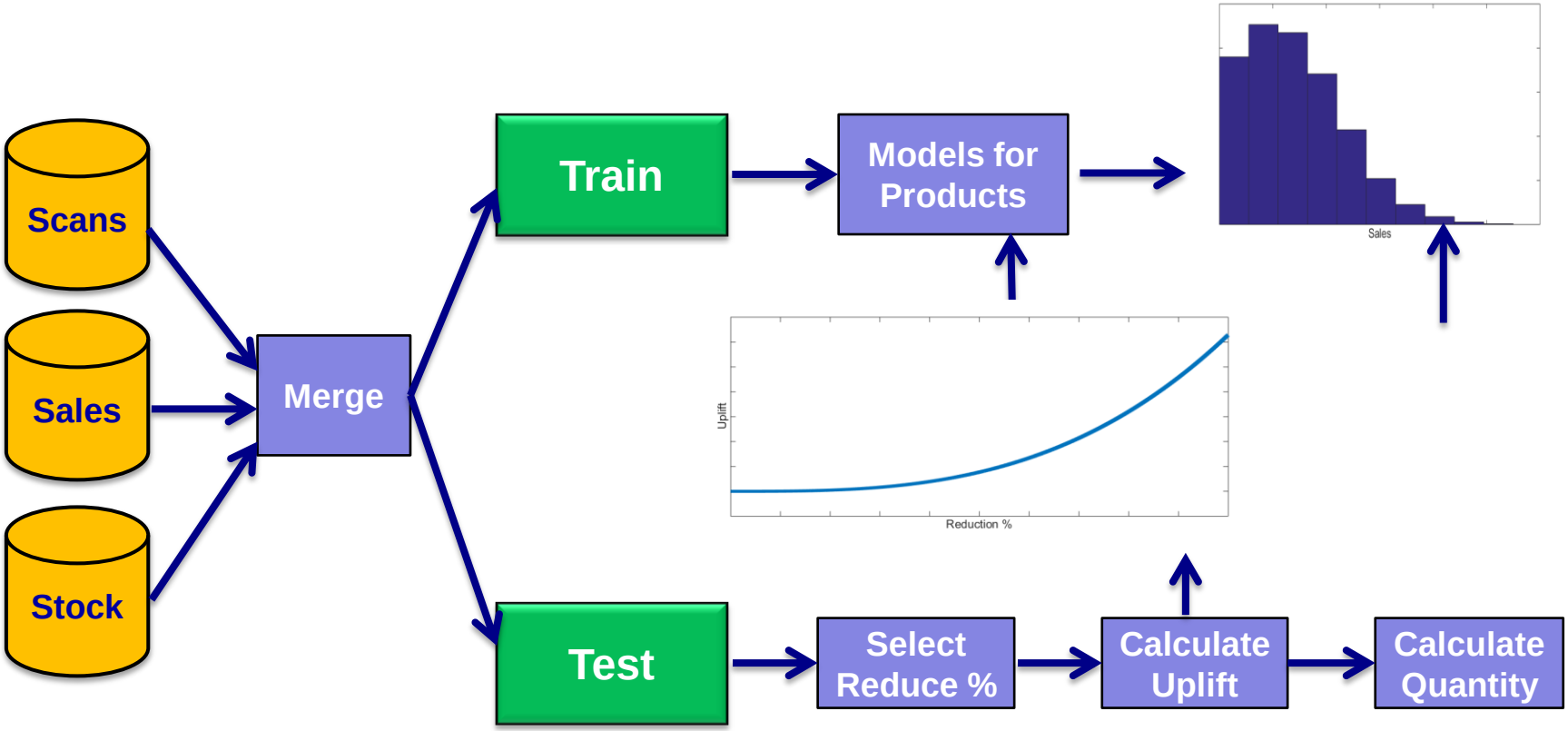
Model Simplified Schematic



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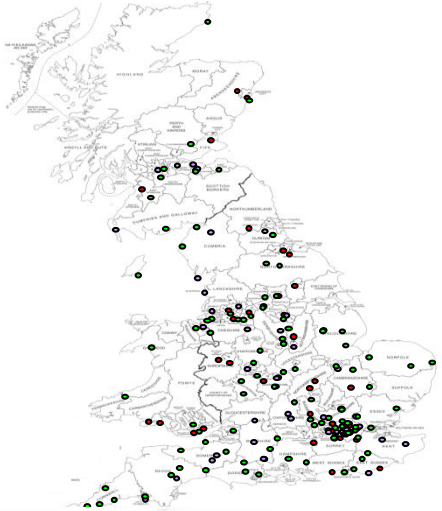
Phased roll out to learn and measure benefits

Store director group (30 to 40 stores)

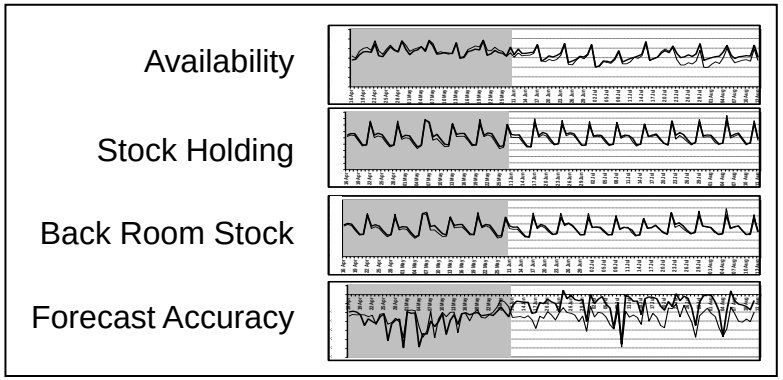
Nationally representative trial (200 stores)

F… Intr… (2000+…

Coming to your local store 2015



Automated daily project tracking



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Working with Mathworks – some tips

- Agree the goals, and how to measure them
- Make it a joint development
- Have a single contact for day to day operations
- Hold regular high level reviews
- Don’t accept things that feel wrong

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The Future – in database analytics

IBM Mainframe

Teradata Data Warehouse

- in database analytics for heavy lifting

Matlab
Desktop and Servers

Matlab for:

- Control
- Simulation
- Small models

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New Technologies for Retail

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Thank you – Question?

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