Innovation with Internet of Things, Analytics and Machine Learning.
- Past (1984)
  Stable period: 4 years

- Present (2015)
  Stable period 3 months

Computing Power Available

![Graph showing computing power available from 1970 to 2030](image-url)
IoT is an Inflection Point

Hardware is cheap
Connectivity is pervasive
Development is easy
Huge benefits fuel demand
New Innovative Scenarios
Are you in control of your (data) ecosystem...?
Pace-Layered Strategy

- Systems of Intelligence
- Systems of Engagement
- Systems of Records

- Machine Learning • Modern UI • Power BI • IoT • Big data • Unified Communications

- Field One
- Sharepoint
- Document Mgmt
- Supply chain mgt
- Finance
- PowerApps
- CRM
- Procurement
- Retail
- ERP
- HR
Interconnect your things, applications, processes and people and make them smarter and more integrated.
Azure Machine Learning
Data preparation, feature engineering
Create and train model
Operationalize: realtime scoring and re-training

Make your applications more intelligent, without making them more complex

Forecast a value:
Predict usage, demand, revenue, crowds, movement, orders, visitors, weather influences, etc.

Reduction, efficiency

Classify a customer:
Cross selling, upselling, product recommendations, neuro marketing strategy, risk, churn, etc.

Optimize a process:
Logistics, planning, distribution, resource allocation, cost reduction, efficiency.

Forecast a value:
Predict usage, demand, revenue, crowds, movement, orders, visitors, weather influences, etc.

Make your applications more intelligent, without making them more complex
Innovate at the edges of your current business model
How to get started...

- project
- journey
- adventure

Dropping
How to get started...

- Project
- Dropping
- Journey
- Adventure
Leverage asset data for analytics and into Dynamics AX with Azure IoT Suite, Power BI, Azure Machine Learning
The Internet of Bredenoord’s things:

**Things**

Various connection types
Third party hardware
Field-gateways
Device to Azure
AX to Azure
NO Azure to Device

Hybrid architecture, cloud, “edge” and on-premise

Frequency, level of detail

**Connectivity**

Telemetry:
Fuel, temperature
power, oil, location, counter

Reference:
Details, thresholds, standard maintenance cycles

**Data**

Analytics:
Visualize, dashboard, failures, data for predictive maintenance, ML generated alerts

**Analytics**

**Action**
Main learnings:
Third party vendors and connectivity
Third party vendors and data ownership
Data issues: quality, detail, size, availability
Architecture options: Premise, cloud, edge?
Too close to the core process...?

Next steps:
Expand number and variety of devices
Real-time device generated and machine learning generated alerting.
Predictive maintenance
Dynamic pricing, contract adjustments.
Customer dashboards and portals
Optimize resource allocation
Data analysis and fertilizer usage forecast in Dynamics AX with Power BI and Azure Machine Learning
The Internet of Brinkman’s things:

Things
- Third party hardware
- Push and Pull through Dynamics AX
- AX to Azure
- Azure to AX

Connectivity
- Upload and prepare historical data, historical weather data

Data
- Telemetry:
  - Daily readings of fertilizer level.
  - Historical and forecasted weather data.
- Reference:
  - Thresholds, locations, fertilizer, crops, square meters, etc.

Analytics
- Analytics:
  - Smooth and cleanup, calculate usage, delta, previous days average, visualize, statistics, correlations, predictive modelling

Action
Main learnings:
Data issues: quality, fit, completeness
Understanding the data.
Feature selection and engineering.
Correlation vs. prediction strength.
Value discovery (logistics versus forecast)
Azure ML capability and limitations

Next steps:
Use data for reporting and analytics
Further optimize forecasting algorithm
Optimize support screens in AX
Logistics support and optimization
HSO IoT: six week journey...

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<td>1</td>
<td>Outline the journey, set the timebox and budget.</td>
<td>2</td>
<td>Inventory of devices, assets, connectivity options.</td>
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Broaden and strengthen the grip on your ecosystem and make your things, applications, processes and people smarter

A truly holistic view of your business **eco-system**

Data is “the new **crude** oil”...

“Buy or build?”: are you competing with analytics?

Go on that journey...!
Any questions...

Thanks for your attention!