Azure Data & AI
Amplifying human ingenuity

Vinnie Saini
Data & AI Solution Architect
Data, analytics & AI accelerates digital transformation for every organization through data driven insights and action.
Insights is a journey
Convergence accelerates digital transformation

Cloud
Data
Intelligence
The future of analytics
Revolutionize your business

Engage customers

Empower employees

Optimize operations

Transform products
Intelligent solutions enabling differentiation

**Cognitive Understanding**
- Identify objects, people and actions
- Hear and recognize language
- Infer emotions and reactions
- Develop deeper context & understanding over time

**Conversation as a platform**
- Natural language conversational UI
- On any canvas e.g. Skype, Slack, Facebook, etc.
- Intelligent Bots powered by data & the cloud
- Accessible through personal digital assistants
Stay ahead of the curve with Cortana Intelligence Suite
Cortana Intelligence is a Platform and a Process to perform advanced analytics from start to finish
The Team

Data Science

Process

Planning, Environment, Ingest

Business Understanding

Explore and Visualize Data

Generate Features

Create Models

Train Models

Consume

Cross Industry Standard Process for Data Mining

Deploying

Evaluating

Modeling

Data Preparation

Data Understanding

Business Understanding
Why Microsoft for Advanced Analytics

Solutions at cloud speed

Accelerate your speed of business

Extensible Solutions

Scale
Agility
Low cost
Why Microsoft for Advanced Analytics

Solutions at cloud speed

Works with what you have

Analytics where your data lives

Cloud

Hybrid

On-premise

Spark

Hadoop

Teradata

R

SQL Server

Python
Why Microsoft for Advanced Analytics

**Solutions at cloud speed**

- Works with what you have
- AI driven innovation

**AI investments to power your business**

- Industry-leading investments
  - $12B in R&D investments annually
  - Open source innovation & contribution
  - Over 10,000 peer-reviewed publications

**Trusted by businesses**

- Widest range of enterprise-proven solutions
- Largest cloud compliance footprint
- 85% of Fortune 500 on the Microsoft cloud
Opportunities exist across functional areas

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Microsoft
Here are some examples of how our customers are staying ahead:

- Improving visibility and making accurate predictions with **remote monitoring**
- Getting the right products to the right places with **inventory management**
- Offering customers exactly what they want, when they want it, with **personalization**
- Fixing problems proactively before they start with **predictive maintenance**
- Exploring new business opportunities with **data-driven services**
Azure is an open cloud

DevOps
- Nagios
- Vagrant
- Grunt
- Gradle
- Android
- Xamarin
- Apache Cordova

Management
- Chef
- Puppet
- Ansible
- SaltStack
- Mist.io
- Scalr

Applications
- WordPress
- Joomla!
- Drupal
- PaaS & DevOps
- Apprenda
- Jelastic
- Cloud Foundry

App Frameworks & Tools
- PHP
- Node.js
- Python
- Java
- Ruby
- IntelliJ IDEA
- Eclipse

Databases & Middleware
- Hadoop
- Redis
- ClearDB
- Cloudera
- MySQL
- MongoDB
- Couchbase

Infrastructure
- Linux
- Red Hat
- SUSE
- Bitnami
- Oracle Linux
- FreeBSD
- Docker
Digital transformation solutions in action

- Retail & Consumer Goods
- Discrete Manufacturing
- Government & Education
- Healthcare
- Banking & Financial Services
- Professional Services
Customer Experiences
Filtering the signal from the noise

Objectives
Connect Rolls-Royce jet engine data to Microsoft’s intelligent cloud for insights to improve aircraft performance, safety and maintenance.

Tactics
Use Cortana Intelligence to scale quickly and efficiently, aggregate data across customer fleets and process data in real time.

Results
• More efficient flight and maintenance plans
• Targeted and actionable fuel efficiency insights
• Quickly-generated reports and dashboards that tell compelling stories and deliver high-quality insights

“Our goal is not data for the sake of data, but to embrace the cloud and analytical technologies to deliver more expert insights to the right stakeholders at the right time.”

Nick Farrant
Senior Vice President
ROLLS-ROYCE
Example: Data and Service Architecture

Data Sources
- Airplane
- Weather
- Maintenance
- Flight Plan

Ops/Monitoring
- DevOps

Ingest
- Copy
- Format
- Summarize

Store
- Raw
- Enriched
- Published

Interact
- Dashboards
- Reports
- Apps

Security/Identity
- RBAC

Governance
- Metadata

Analyze
- Modeling
- Machine Learning
- Artificial Intelligence
- Experimentation

Users
- Pilots
- Engineering
- Operations

Analyst Scientist
The challenge

Tangerine needed a new business approach in order to stand out in the crowded world of online banking. They lacked the ability to capture and draw insights from their expanding database of customer information and differentiate themselves from their competitors.

Machine Learning in action

- Modeled impact and effectiveness of offers and adjusted product rollouts and advertising campaigns based on real-time customer reactions
- Used predictive, context-aware targeted marketing to serve up personalized customer offers
- Integrated a predictive analysis solution that anticipates the likelihood of customer churn

“I can see us...creating predictive, context-aware financial services applications that give information based on the time and where the customer is.”

Billy Lo
Head of Enterprise Architecture at Tangerine
Liebherr is looking to provide smart refrigeration technology that enables consumers to remotely manage their perishable food inventory.

Machine Learning in action

- Developed a smart refrigerator that offers remote monitoring and predictive maintenance
- Azure IoT Suite allows to capture and analyze real time data to predict temperature anomalies
- Cortana Intelligence allows refrigerator to recognize and manage individual items stored inside
“Thousands of partners sign in to our platform every hour. The response time from the Face API is incredible, enabling us to verify our drivers without slowing them down.”

Dima Kovalev, Product Manager, Uber
How can Cortana Intelligence help you?
Our Approach

- **Solutions**
- **Cognitive services**
- **Bot framework**
- **Data Science tools**
  - Data preparation, modeling, and operationalization
- **Algorithms**
- **Unique data assets**
- **Analytics Engines on Big Data Stores**
  - (cloud + on premises)

- **Extensible Applications**
- **Easy to consume Artificial Intelligence**
- **Most comprehensive Data Science capabilities**
- **Best of MS Research & open source**
- **Rich data sources to enrich predictions**
- **Flexible Infrastructure support for analytics**
Transform data into intelligent action

- **Information Management**
  - Data Factory
  - Data Catalog
  - Event Hubs

- **Big Data Stores**
  - Data Lake Store
  - SQL Data Warehouse

- **Machine Learning and Analytics**
  - Machine Learning
  - Data Lake Analytics
  - HDInsight (Hadoop and Spark)
  - Stream Analytics

- **Intelligence**
  - Cognitive Services
  - Bot Framework
  - Cortana
  - Power BI

- **Dashboards & Visualizations**
  - Power BI

- **People**
  - Web
  - Mobile
  - Bots

- **Automated Systems**
  - Data Sources
  - Apps
  - Sensors and devices
Information Management

- Data Sources
- Apps
- Sensors and devices

Information Management

- Data Factory
- Data Catalog
- Event Hubs

Data
Create, orchestrate and manage data services at scale

- Create, schedule, orchestrate, and manage data pipelines
- Visualize data lineage
- Connect to on-premises and cloud data sources
- Monitor data pipeline health
- Automate cloud resource management
- Move relational data for Hadoop processing
- Transform with Hive, pig, or custom code
Get more value from your enterprise data assets

- Spend less time looking for data, and more time getting value from it
- Register enterprise data sources, discover data assets and unlock their potential, and capture tribal knowledge to make data understandable
- Bridge the gap between IT and the business, allowing everyone to contribute their insights, tags, and descriptions
- Intuitive search and filtering to understand the data sources and their purpose
- Let your data live where you want; connect using tools you choose
- Integrate into existing tools and processes with open REST APIs
Ingest events from websites, apps and devices at cloud scale

- Log millions of events per second in near real time
- Connect devices using flexible authorization and throttling
- Use time-based event buffering
- Get a managed service with elastic scale
- Reach a broad set of platforms using native client libraries
- Pluggable adapters for other cloud services
Big Data Stores

**Data Sources**

- Apps
- Sensors and devices

**Information Management**

- Data Factory
- Data Catalog
- Event Hubs

**Big Data Stores**

- Data Lake Store
- SQL Data Warehouse
A hyper-scale repository for big data analytics workloads

- A Hadoop Distributed File System for the cloud
- No fixed limits on file size
- No fixed limits on account size
- Unstructured and structured data in their native format
- Massive throughput to increase analytic performance
- High durability, availability, and reliability
- Azure Active Directory access control
Elastic data warehouse as a service with enterprise-class features

- Petabyte scale with massively parallel processing
- Independent scaling of compute and storage—in seconds
- Transact-SQL queries across relational and non-relational data
- Full enterprise-class SQL Server experience
- Works seamlessly with Power BI, Machine Learning, HDInsight, and Data Factory
A globally distributed, elastic-scale, multi-model database

- Turnkey global distribution
- Key-value, graph, and document oriented storage
- JavaScript, SQL, Gremlin (Graph), Mongo APIs
- Elastic storage and compute scaling
- Auto-indexed and custom indices
- Multiple transactional consistency models
- 10ms/15ms read/write latency at 99th percentile
- 99.99% availability SLA
Machine Learning and Analytics

Data Sources
- Data Factory
- Data Catalog
- Event Hubs

Apps
- Data Lake Store
- SQL Data Warehouse
- DocumentDB

Sensors and devices
- Machine Learning
- Data Lake Analytics
- HDInsight (Hadoop and Spark)
- Stream Analytics
- Azure Analysis Services

Data → Intelligence
Easily build, deploy, and share predictive analytics solutions

- Simple, scalable, cutting edge. A fully managed cloud service that enables you to easily build, deploy, and share predictive analytics solutions.
- Deploy in minutes. Azure Machine Learning means business. You can deploy your model into production as a web service that can be called from any device, anywhere and that can use any data source.
- Publish, share, monetize. Share your solution with the world in the Gallery or on the Azure Marketplace.
Azure ML & ML Studio

Fully managed cloud service for building
**Predictive Analytics solutions**

**Reduces the intricacies** of Machine Learning process

Azure **ML Studio is a powerful canvas** for the
✓ Composition of machine learning experiments
✓ Subsequent operationalization
✓ Consumption as machine learning web services
Azure ML Architecture

Data
Tables, Hadoop (HDInsight), Relational DB (Azure SQL)

Predictive Model
ML Studio

Operational Web API
Clients Interface
Build a Data Science experiment in ML Studio

Create an experiment
- Machine learning workspace
- Dataset format
- Upload data
- Prepare data
- Define features

Train and Evaluate
- Choose and apply Learning Algorithms
- Train and Evaluate

Deploy and Access web service
- Remove one model
- Convert the training experiment into a predictive experiment
- Deploy the predictive experiment as a web service
ML Studio Demo
Big Data Analytics in Azure

CLUSTER

Virtual Machines

User-installed Hadoop distros on a cluster of user-managed VMs

CLUSTER

HDInsight

Specific Hadoop distro on an Azure-managed VM cluster

PLATFORM-AS-A-SERVICE

Data Lake Analytics

Big Data as a Service

You’re more maybe a standard corporation that just use SQL.
Big data analytics made easy

- Analyze data of any kind and size
- Develop faster, debug and optimize smarter
- Interactively explore patterns in your data
- No learning curve—use U-SQL, Spark, Hive, HBase and Storm

- Managed and supported with an enterprise-grade SLA
- Dynamically scales to match your business priorities
- Enterprise-grade security with Azure Active Directory
- Built on YARN, designed for the cloud
Comprehensive set of managed Apache big data projects

- Scale to petabytes on demand
- Process unstructured and semi-structured data
- Develop in Java, .NET, and more
- Skip buying and maintaining hardware
- Deploy in Windows or Linux
- Spin up an Apache Hadoop cluster in minutes
- Visualize your Hadoop data in Excel
- Easily integrate on-premises Hadoop clusters

Core Engine

- Batch: MapReduce
- Script: Pig
- SQL: Hive
- NoSQL: HBase
- Streaming: Storm
- In-Memory: Spark

Machine Learning and Analytics
- HDInsight (Hadoop and Spark)
- Stream Analytics
- Azure Analysis Services
Real-time stream processing in the cloud

- Perform real-time analytics for your Internet of Things solutions
- Stream millions of events per second
- Get mission-critical reliability and performance with predictable results
- Create real-time dashboards and alerts over data from devices and applications
- Correlate across multiple streams of data
- Use familiar SQL-based language for rapid development
Proven analytics engine

- Get started quickly without managing an infrastructure
- Scale resources to match your business needs

- Visualize your data using your favorite data visualization tool
- Govern, deploy, test, and deliver your BI solution with confidence
Azure Machine Learning: New Capabilities

*Build, Deploy, Manage and Monitor models at any scale*

**Workbench**
*Wrangle Data, Build models, Deploy & Manage*

**Experimentation**
*Boost productivity with Spark, GPUs and agile development.*

**Model Management**
*Deploy, Version, Manage & Monitor Models*
Less Cleaning, More Exploring with Program Synthesis

Program Synthesis powered by AI

Intent

Search Algorithm

Ambiguator

Top-Ranked Program
Complete history of how your model evolves over time
every project backed by a Git repository

simple command line tool for managing experimentation and training runs

Flexibility of tools

leverage any Python tools and frameworks that you want to use

experiments can run locally, inside of a Docker container locally or remotely, or scaling out on top of Spark

Azure Machine Learning Experimentation
Docker as the vehicle to provide control and flexibility for model hosting

Repeatable and consistent environment for hosting your models

Models are exposed via web services written in Python

Deployed models can be monitored through Application Insights

Versions tracked with deployed models

No downtime – Support for managing upgrades, rollback to a version

Retraining for continuous improvement (based on new data)

Model Management Capabilities
Governance and Lineage of deployed models

Visibility into any decision and tracing it back if required

Debugging and Diagnostics story across the end to end lifecycle of a model.

Experimentation and Model Management services in conjunction
More productive in - getting data, shaping it, and preparing it

Microsoft Research on program synthesis (PROSE) and data cleaning

Inclusion of a simple set of libraries for handling data sources

Scale out transparently across our cloud compute engines

Building your data transformations by example

Easy to inject custom python code or libraries to filter or transform the data

AML workbench-AI powered Data wrangling
Rich set of capabilities for building models with deep learning frameworks including Microsoft Cognitive Toolkit (CNTK), Google TensorFlow, Theano, Keras and Caffe2

Integration with the Experimentation service and with the Model Management services

Visual Studio Code Tools for AI
Build applications that understand people

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<td>Bing Web Search API</td>
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<td>Bing Image Search API</td>
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<td>Bing Video Search API</td>
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<td>Bing News Search API</td>
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</table>

- Faces, images, emotion recognition and video intelligence
- Spoken language processing, speaker recognition, custom speech recognition
- Natural language processing, sentiment and topics analysis, spelling errors
- Complex tasks processing, knowledge exploration, intelligent recommendations
- Bing engine capabilities for Web, Autosuggest, Image, Video and News
Why Microsoft Cognitive Services?

Easy

Roll your own with REST APIs
Simple to add: just a few lines of code required

GET A KEY
BUILD

Flexible

Integrate into the language and platform of your choice
Breadth of offerings helps you find the right API for your app
Bring your own data for your custom experience

Flexible

Tested

Built by experts in their field from Microsoft Research, Bing, and Azure Machine Learning
Quality documentation, sample code, and community support

GitHub
Stack Overflow
MSDN
UserVoice
What's incredibly unique is the intelligence capabilities Cortana Intelligence offers, building on years of Microsoft research and innovation. These capabilities enable our customers to build intelligent systems and agents that can augment their organizational capabilities. For example, organizations can interact with customers and stakeholders in new ways, understand intent with vision, speech, face, and sentiment analysis to customize responses and drive appropriate actions.

Cognitive Services
Amplifying human ingenuity with intelligent technology.

- Vision
  - Computer vision
  - Face
  - Emotion
  - Content Moderator
  - Video
- Language
  - Text analytics
    - Spell check
  - Web search
    - Image search
    - Video search
    - News search
    - Autosuggest
- Speech
  - Speaker recognition
  - Speech
- Search
  - Web search
- Knowledge
  - Academic knowledge
  - Entity linking service
  - Knowledge exploration
  - Recommendations
  - QnA maker

NEW
- Video Indexer
- Cognitive Services Labs

NEW
- Custom
  - Vision Service
  - Language Understanding
  - Speech Service
- Custom
  - Search
- Custom
  - Decision Service

Microsoft Cognitive Services are cloud services, APIs and SDKs that enable organizations to build intelligent systems that can see, hear, interpret and understand the world around you and makes all applications more intelligent, engaging and discoverable. Cognitive Services expands the existing perceptual intelligence capabilities like Vision, Speech, Face detection to include new cognitive capabilities such as Emotion and customized Language Understanding. What we showcased with www.how-old.net is one example of what is possible.
Custom Vision Service
A customizable web service that learns to recognize specific content in imagery

Upload images
Upload your own labeled images, or use Custom Vision Service to quickly tag any unlabeled images

Train and Evaluate
Use your labeled images to teach Custom Vision Service the concepts you want it to learn
Use simple REST API calls to quickly tag images with your new custom computer vision model

Active learning
Images evaluated through your custom vision model become part of a feedback loop you can use to keep improving your classifier
Example Customer Scenarios

• **Customer Support**
  Enable a customer to identify a product for support by taking a photo. No finding the manual or pulling the appliance out to identify it!

• **Service Engineers**
  Identify parts for ordering

• **Data Scientists**
  Automatic tagging instead of manual, to create features or labels
Bing custom search
An easy-to-use, ad-free, commercial-grade search tool lets you deliver results you want

Customize your search
Quickly and reliably define the slices of the web that you want to draw from. Change the parameters of the sites you want and don't want at any time.

Easy-to-use
Custom Search features a straightforward UI that enables you to create your web search without a line of code

Commercial-grade
Usage is ad-free – no matter how much or how little of the service you use
Example Customer Scenarios

- **Site Search**
  - Let your users search across all your websites
  - Adjust ranking
  - Pin top results
  - Block pages, subsites

- **Vertical Search**
  - Design a search targeting hundreds of sites and pages on a topic
  - Deploy to customers, use in your enterprise, integrate into mobile apps
  - Discover related sites
Custom Decision Service

A cloud-based, contextual decision-making API that sharpens with experience

**Contextual**
Understanding context from information you provide, Custom Decision Service ranks the options and makes a decision.

**Rapid learning**
Automatically optimizes based on your feedback: it even experiments with new options to see if the best decision has changed, enabling it to adjust to emerging trends.

**Easy to use**
Cloud-based, easy to run, able to plug into your application and help to make decisions in real time.
Custom Speech Service

Customize both language and acoustic models

Tailor speech recognition to your app and environment
Custom Speech Service

Create custom language models for the vocabulary of the application

Adapt acoustic models to better match the expected environment of the application’s users

Deploy to a custom endpoint and access from any device

Record audio

Transcribe

Adapt

Deploy
Your bots – wherever your users converse

- Start quickly with built-in templates
- Reach your customers on multiple channels
- Boost the power of bots with Azure services

- No server management or patching needed
- Scale out automatically
- Pay only for what you use
Here are some of the things I can help you with…

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<th></th>
<th>Cortana for Consumers (today)</th>
<th>With the Cortana Intelligence</th>
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<td><strong>Answers</strong></td>
<td>Public reference data answers – &quot;How far is it from Los Angeles to San Francisco?&quot;</td>
<td>Answers from organizational data in Power BI &quot;What were our biggest deals in the last month?&quot;</td>
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<tr>
<td><strong>Predictions</strong></td>
<td>Event predictions – &quot;Who do you think is going to win the Germany Italy game?&quot;</td>
<td>Integration with prediction solutions &quot;Which of our customers are most likely to churn in the next quarter?&quot;</td>
</tr>
<tr>
<td><strong>Monitoring &amp; Alerts</strong></td>
<td>Flight status, traffic conditions, changes in weather, …</td>
<td>Monitoring KPIs and preemptive alerting &quot;Alert me if this customer ever has a 90% chance of churn in the next 30 days&quot;</td>
</tr>
<tr>
<td><strong>Task Completion</strong></td>
<td>Setting reminders, scheduling meetings, getting directions, …</td>
<td>Line of business process integration Assistance with expense report submission on-time within policy</td>
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Keep a pulse on your business with live, interactive dashboards.

- Analytics for everyone, even non-data experts
- Your whole business on one dashboard
- Create stunning, interactive reports
- Drive consistent analysis across your organization
- Embed visuals in your applications
- Get real-time alerts when things change
Demo: Time Series Insights using Twitter
Quickly find and view your Power BI data using Cortana for Power BI

- Use Cortana across your Windows 10 devices to get instant answers to your important business questions
- Cortana can find rich data-driven answers from Power BI reports (that contain a special type of report page called a Cortana answer card) and from Power BI dashboards
- If Cortana finds a match, it displays the name of the dashboard or report page right there in your Cortana screen. The dashboard or report page can be opened in Power BI.
- Report pages can also be explored right in Cortana - they're interactive
- At the current time, only English is supported
Power BI with Cortana Demo
Making Data Science and AI accessible to every enterprise, data scientist, developer, information worker, consumer, and device anywhere in the world.
Appendix
Explore Cortana Intelligence today

1. Learn more
   Keep up on the latest cloud-based analytics news on our blog

2. Get trained
   Watch the Cortana Intelligence Workshop
   Participate in Data Science and Machine Learning Essentials course through edX

3. Find a partner
   Connect with a partner who can help tailor Cortana Intelligence to your needs
Now we can give community banks and credit unions access to a lending platform and help them more accurately calculate credit rating and risk—and do it in nanoseconds. With our platform built on Azure ML, we can help service a market that has been largely unserviceable. For this, the technology is foundational.

Adam Cohen
Chief Executive Officer
QUARTERSPOT
JJ Food Service

Getting the right products to the right places

Objectives
Build a platform that could anticipate customer orders, recommend additional products, and, above all, cut the time it takes customers to place orders.

Tactics
Used Azure Machine Learning to analyze real-time and historical customer data and create predictive shopping lists that provide product recommendations based on cart contents.

Results
- Accurate predictions of customers’ needs
- IoT-enabled cab sensors
- Arrival of foods in peak condition
- Increase in basket value through upsell with decreased checkout times

“You have to keep asking yourself what is possible, what we can do next. With Azure Machine Learning, the wow factor is huge. Customers are amazed that we can predict so accurately what they need.”

Mushtaque Ahmed, Chief Operating Officer
Staying innovative in the crowded world of online banking

Tangerine Bank

“Without having deep access into all this data via the Microsoft solution, we wouldn’t be able to see the impact of the changes we’re rolling out, like our upcoming credit card.”

Billy Lo
Head of Enterprise Architecture

Objectives
Transform how customers interact with data by creating a scalable data warehouse infrastructure to drive data insights.

Tactics
Deployed Microsoft SQL Server Parallel Data Warehouse based on Apache Hadoop. Included Azure HDInsight to create a responsive, integrated cloud model.

Results
• Improved visibility to adjust campaigns midstream
• Streamlined conversion of customer data into insight
• Gained valuable insights into customer behavior and ability to identify at-risk clients
eSmart Systems

Keeping the lights on with an automated energy management system

Objectives
Help utilities avoid costly investment in both grid and IT infrastructure while serving an ever-growing population.

Tactics
Collected data from smart sensors, then created predictive models in Azure Machine Learning to forecast potential capacity problems.

Results
• Controlled power load to prevent outages
• Provided grid managers with a single user interface for all of their tasks
• Utilities avoided costly upgrades and still saved money

“Utilities try to stretch their investment by moving some of the load from peak to off-peak hours. Using our energy management platform based on Azure, they can cut those peak hours, avoid the upgrade, and save a lot of money.”

Knut Johansen
CEO
Global elevator manufacturing company develops service arm

ThyssenKrupp Elevator

Objectives
ThyssenKrupp wanted to better compete in their industry by offering dramatically increased uptime, taking preventative maintenance a step further to predictive and even preemptive service.

Tactics
Microsoft technology enabled ThyssenKrupp to monitor products via a real-time dashboard and instruct technicians on optimal maintenance activities through dynamic predictive models.

Results
- Increased elevator uptime
- Reduced costs for ThyssenKrupp and its customers
- Developed real-time data visualization and awareness of issues

“We wanted to go beyond the industry standard of preventative maintenance, to offer predictive and even preemptive maintenance.”

Andreas Schierenbeck
CEO, ThyssenKrupp Elevator
“Empowering people and businesses through the Internet of Things is very important. There’s an opportunity for economic and human development through the use of this technology.”

Cyril Perducat
EVP Digital Services & IoT
Schneider Electric
Schneider Electric Demo + Video
Adam Cohen  
Chief Executive Officer  
QUARTERSPOT

"Now we can give community banks and credit unions access to a lending platform and help them more accurately calculate credit rating and risk—and do it in nanoseconds. With our platform built on Azure ML, we can help service a market that has been largely unserviceable. For this, the technology is foundational."

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<tr>
<th>Objectives</th>
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| QuarterSpot, an online lender for small businesses, launched in June 2013, with a mission to make small business credit more affordable and easily available. | Develop advanced machine learning models for borrower risk assessment and leveraged machine learning to scale the modeling solutions to community banks and credit unions. | • 50% lower loan defaults leading to increased profitability  
• 15% increase in borrower approvals leading to more satisfied customers  
• 85% savings in risk calculation and under-writing loans thereby reducing operating costs |
Carnival Maritime

Harnessing an ocean of data

Objectives
Improve visibility and gain deeper insight into their business operations by centralizing data management for thousands of devices and sensors across a fleet of 26 cruise ships sailing all over the world.

Tactics
Implemented Azure SQL Data Warehouse to leverage data captured by existing industrial hardware, and utilized the big-data platform to improve operations by analyzing historical data with custom models.

Results
• Connected thousands of devices and sensors into a centralized data repository
• Created a scalable platform to extend, monitor and improve equipment maintenance across the fleet
• Used predictive analytics to optimize water consumption, saving an estimated $200,000 a year

“To build a big data and analytics strategy, our company needs to better understand what kind of data we can collect on the ships and what kind of data we need to have in the future...we want to use the data to get a better understanding of our operations and to help our ships be more efficient and sustainable.”

Alexander Klingelhoefer
Director of Continuous Improvement
Objectives
Replace an outdated forecasting system with a new solution to improve accuracy and ensure the right spare parts are available anytime and anywhere they’re needed.

Tactics
Used Azure Machine Learning to test algorithms and identify the most accurate ones to forecast the needs for spare parts 12 months in advance.

Results
• Forecasting accuracy increased up to 80%
• Inventory turnover expected to climb by 10%
• Increased forecasts from 100,000 to all 350,000 spare parts SKUs

“With more spare parts in our warehouse, we needed a way to respond to customer needs quickly. We reached that goal by using Azure Machine Learning to increase forecast accuracy.”

Burcu Aksoy,
Spare Part Team Leader, Customer Care
Hendrick Motorsports

Speeding access to decision-making data

Objectives
Hendrick Motorsports wanted to keep its competitive edge by gathering race-related data quickly enough to make time-critical decisions during races.

Tactics
Used the Microsoft Azure cloud platform and Cortana Intelligence to analyze large amounts of structured and unstructured data and automate data flow.

Results
- 50% reduction in the IT staff time needed for builds and upgrades
- Saved $200,000 by avoiding server infrastructure
- Improved team communications with solutions that work seamlessly across devices

"With Microsoft as a partner, we’re able to take data, compress the amount of time it takes to get an answer out of that data, and then turn around and make a decision."

David Hood, Engineer & Data Scientist
## Developer resources

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References

- https://github.com/Microsoft/CNTK