

Introduction to Microsoft AI

Speaker:

Date:

Introduction:

Name
Company
Experience with Azure & AI
Call for Action

Four **AI Narratives**

AI Services

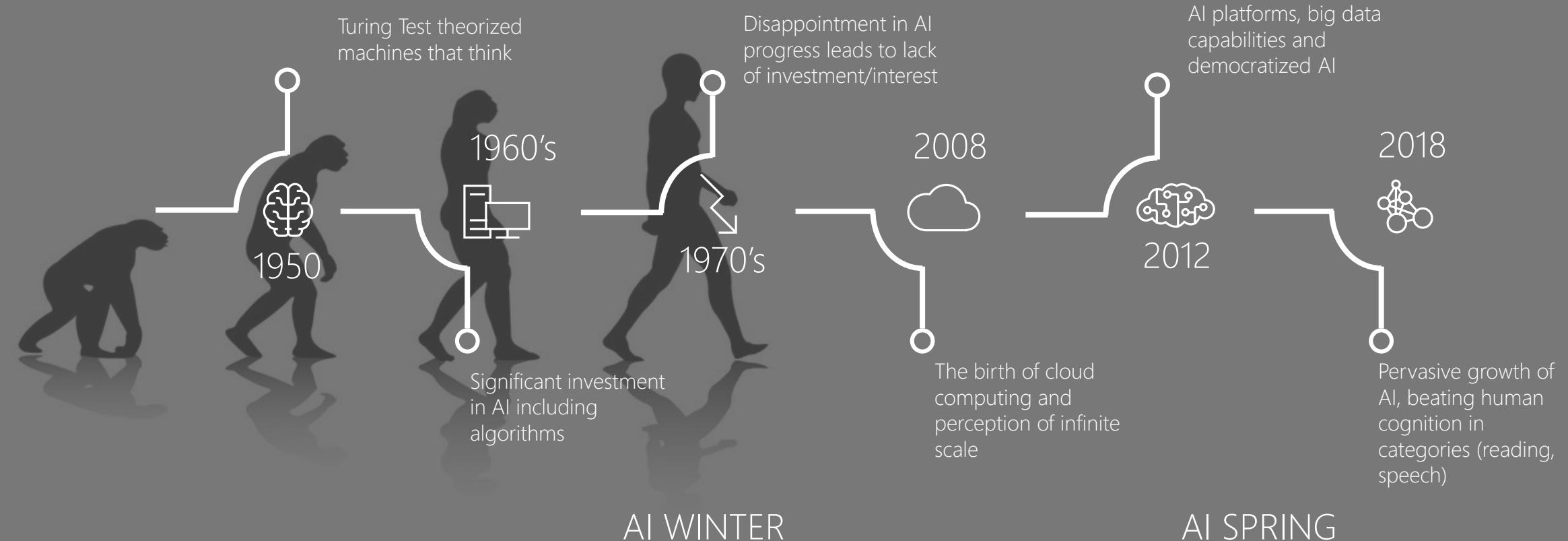
Agile AI

AI Maturity

AI Ethics

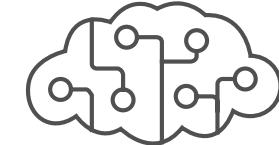
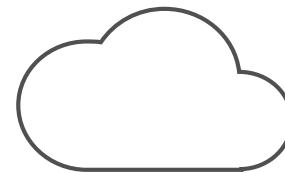
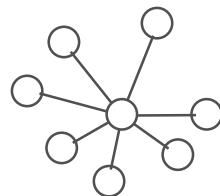
Responsible AI to
augment and amplify human ingenuity

Evolution of AI



Three Discontinuities

at the same time



Microsoft's Worldview



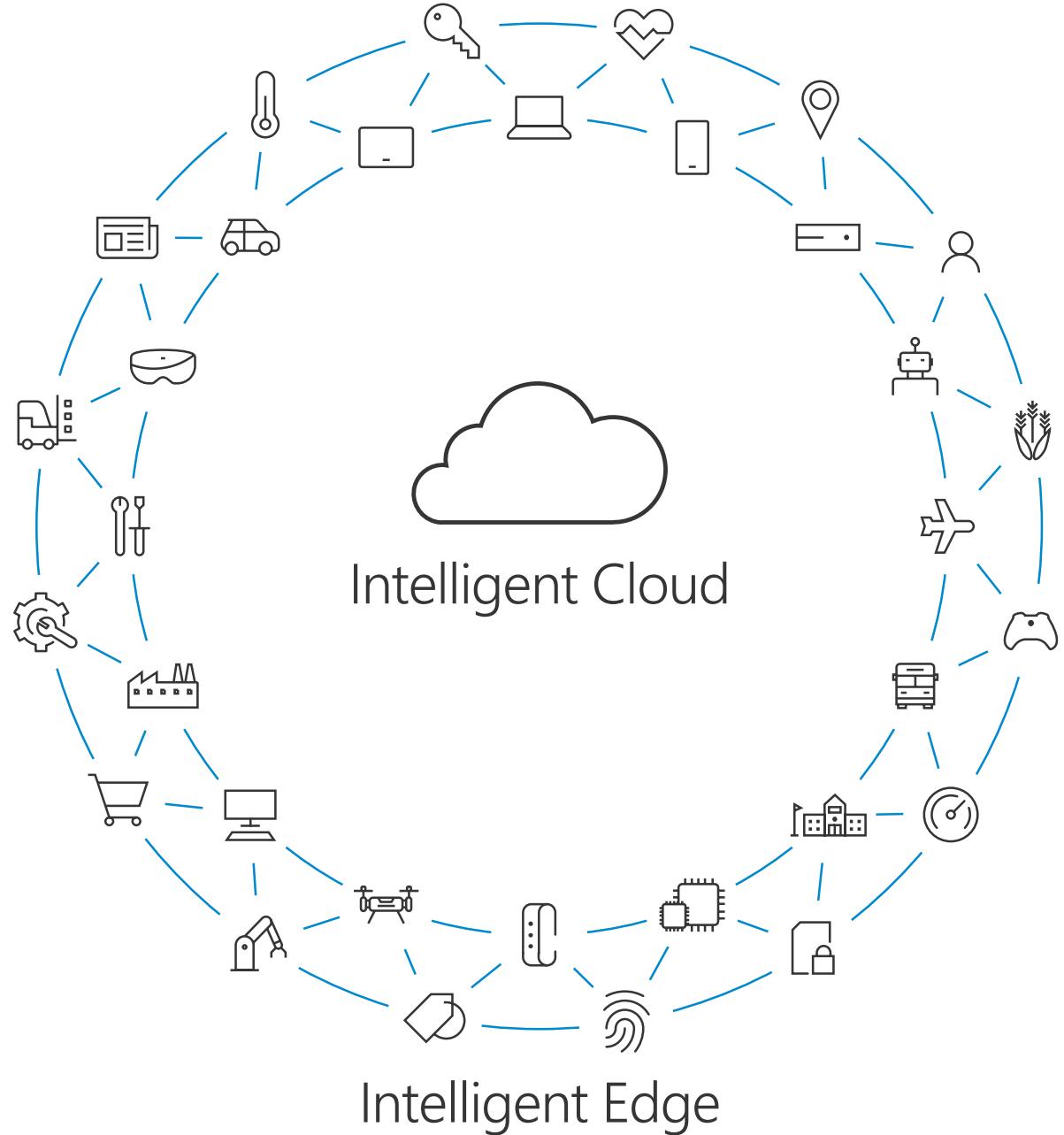
Multi-device
Multi-sense



Artificial
Intelligence



Serverless



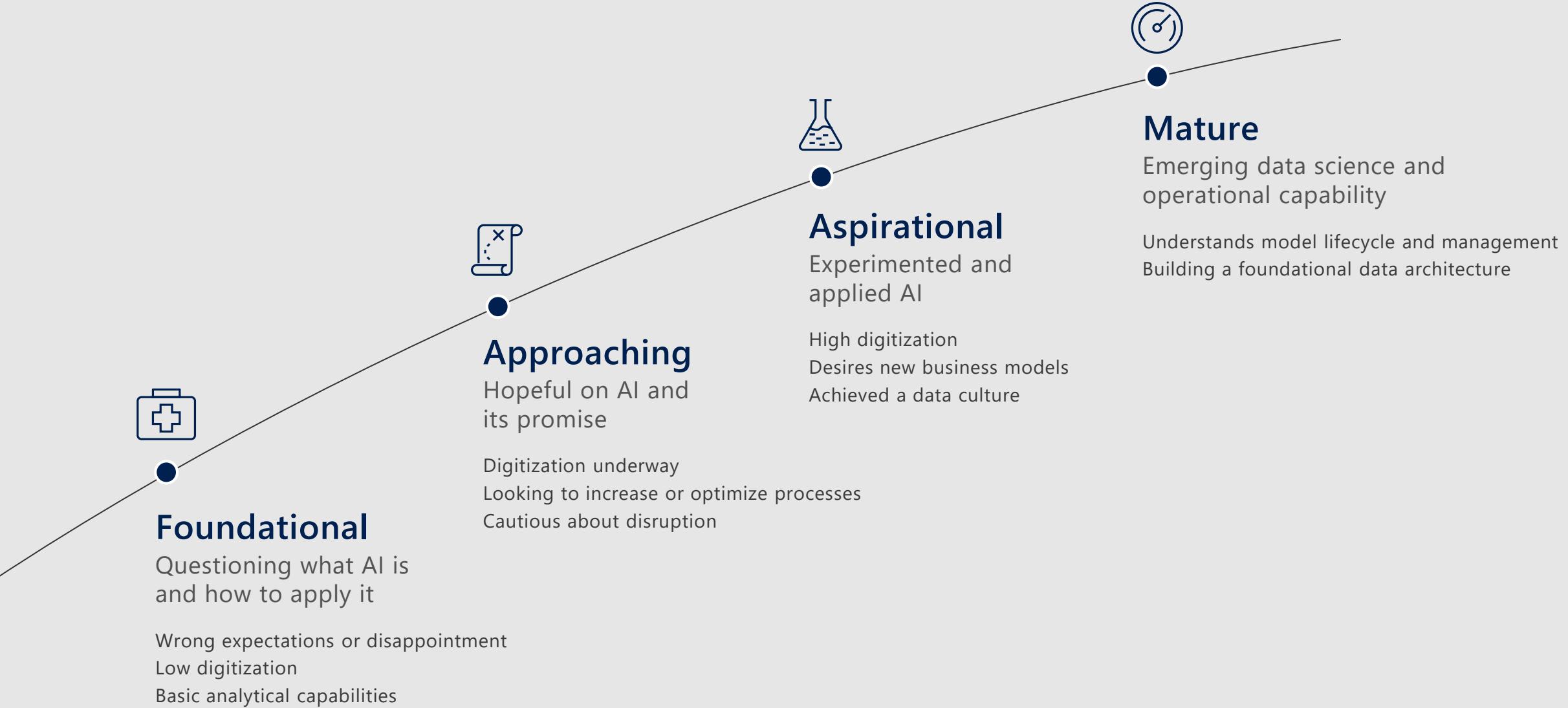


Where do we **Start** ?

Microsoft AI Product Portfolio



AI Maturity is Critical to Success



AI Maturity is Critical to Success

Strategy

Bold, long-term orientation

Linked to business strategy

Centered around customer needs

Culture

Risk appetite

Speed/Agility

Test and learn

Internal collaboration

External orientation

Organization

Roles and responsibilities

Talent and leadership

Governance/KPIs

Digital investment

Capabilities

Connectivity

Content

Customer Experience

Data-driven decision-making

Automation

IT Architecture

Do you make **Data Driven Decisions** ?

Causality





Correlation

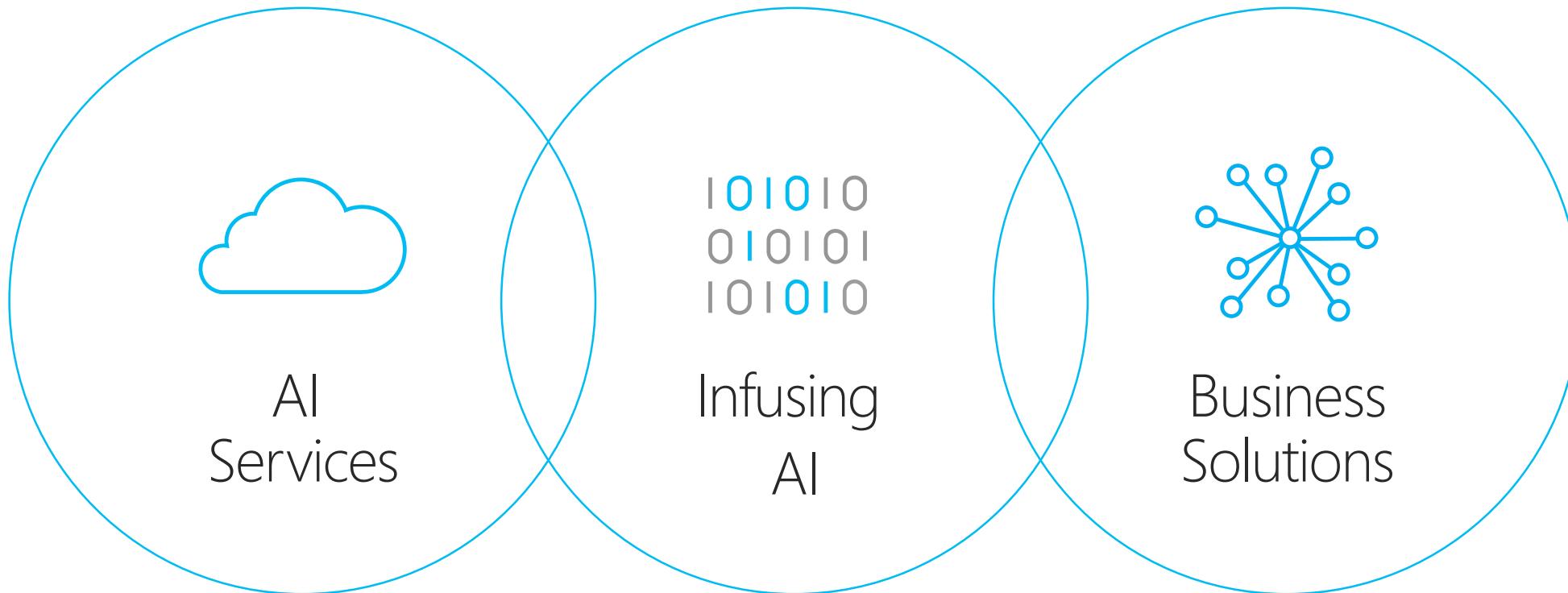
Open Loop vs Closed Loop

AI as a Catalyst for Digital Transformation





Microsoft AI



Machine Learning on Azure

Sophisticated pretrained models

To simplify solution development



Vision



Speech



Language



Search

Popular frameworks

To build advanced deep learning solutions



Pytorch



TensorFlow



Keras



ONNX

Productive services

To empower data science and development teams



Azure
Databricks



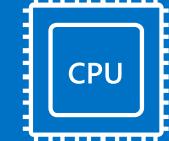
Azure
Machine Learning



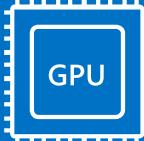
Machine Learning
VMs

Powerful infrastructure

To accelerate deep learning



CPU



GPU



FPGA

Flexible deployment

To deploy and manage models on intelligent cloud and edge



On-premises



Cloud



Edge

What is **Machine Learning** ?



Learns from example in volumes of data



Program that writes itself based on examples



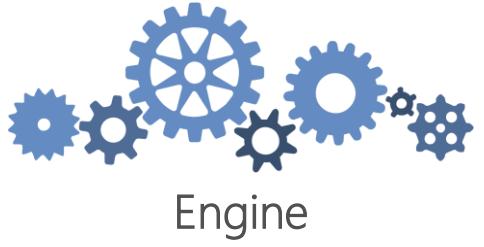
Classifies, groups, segments, recommends, predicts



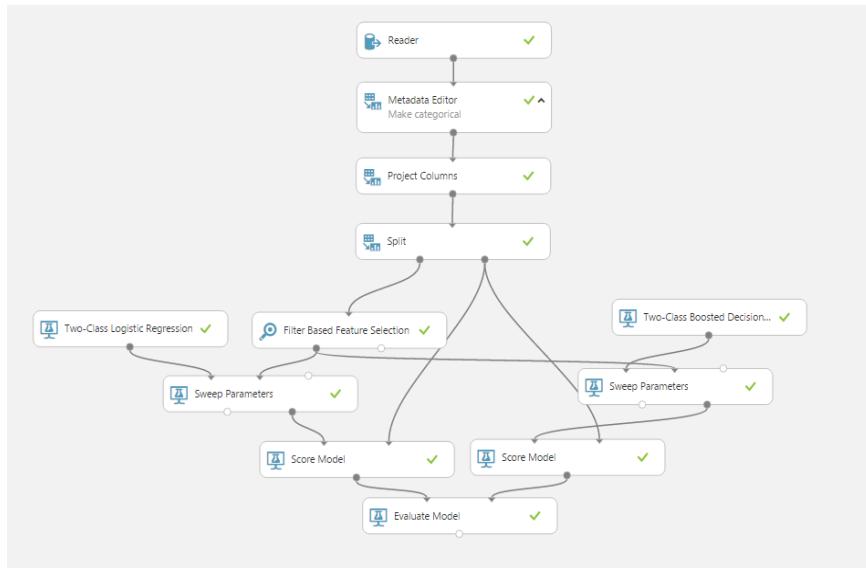
Mimics cognitive functions

What are the **Core Assets** ?

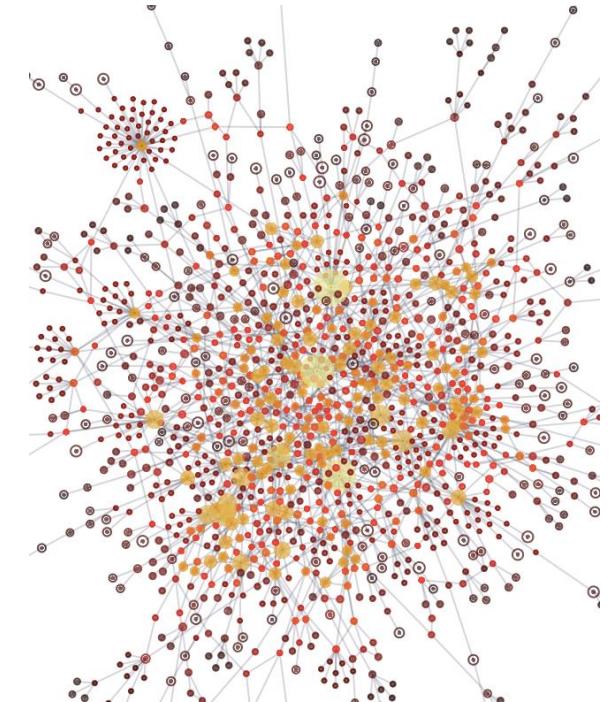
Core Assets in ML



Engine



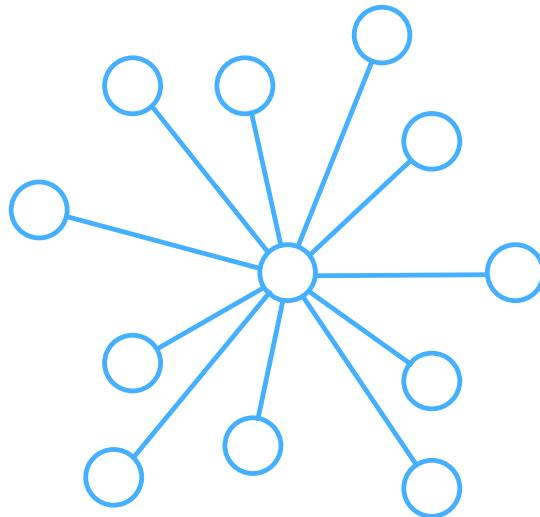
Model



Training Data

Great AI **Needs** great data

101010
010101
101010



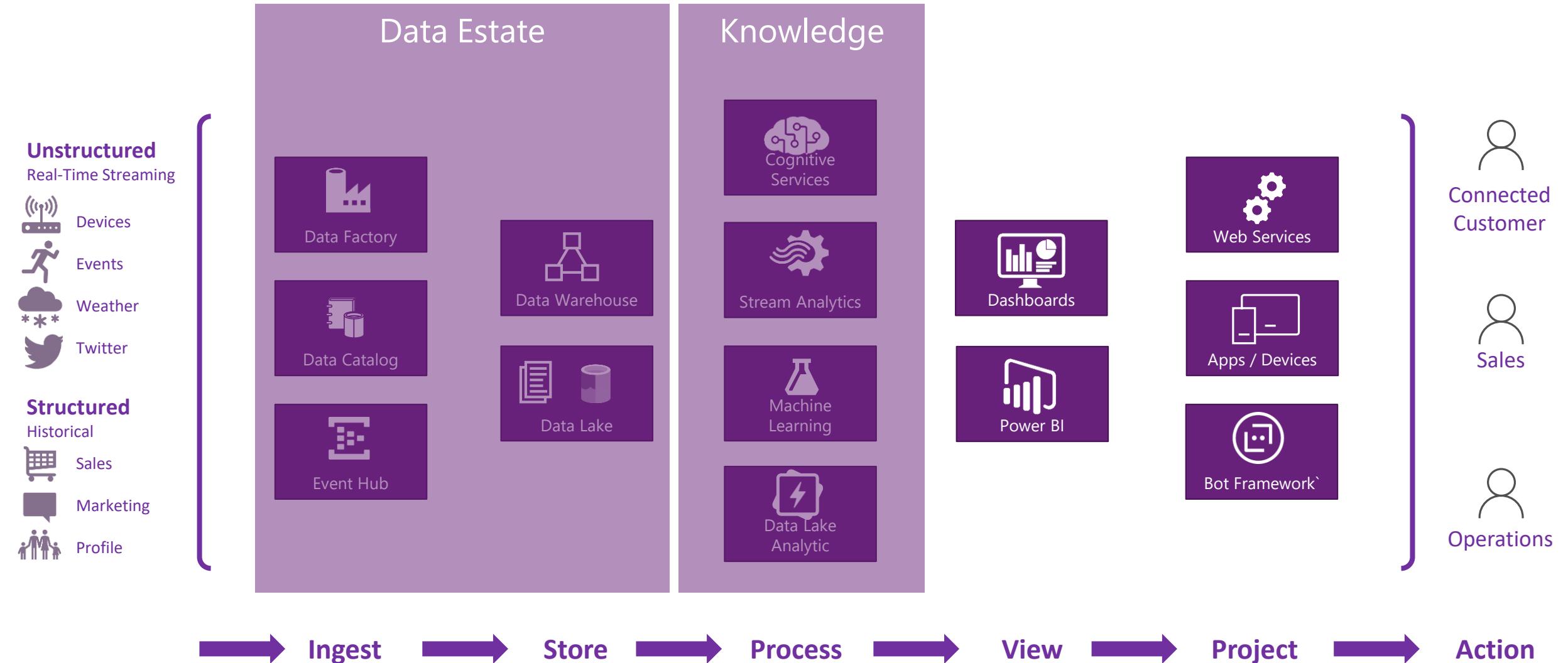


Creating New Ecosystems



Moving from **Data** to **Knowledge**

Moving from Data to Knowledge



Patterns for System of Intelligence Solutions



Samsung 22.6 cu ft 4-Door French Door Refrigerator with Recessed Handle, correct?

Yes, that's it the one.

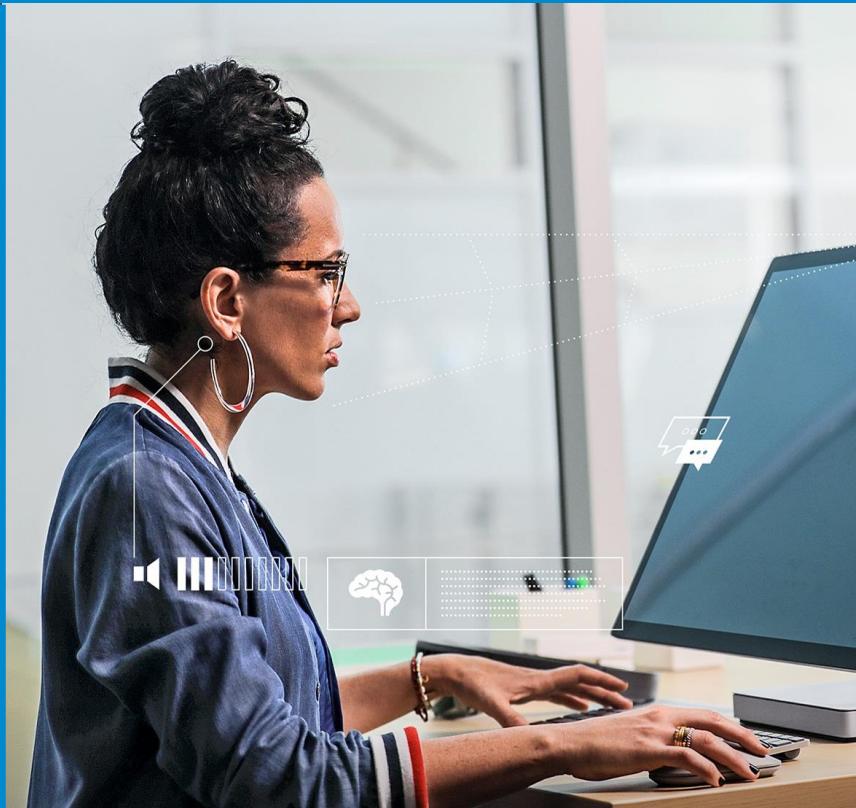
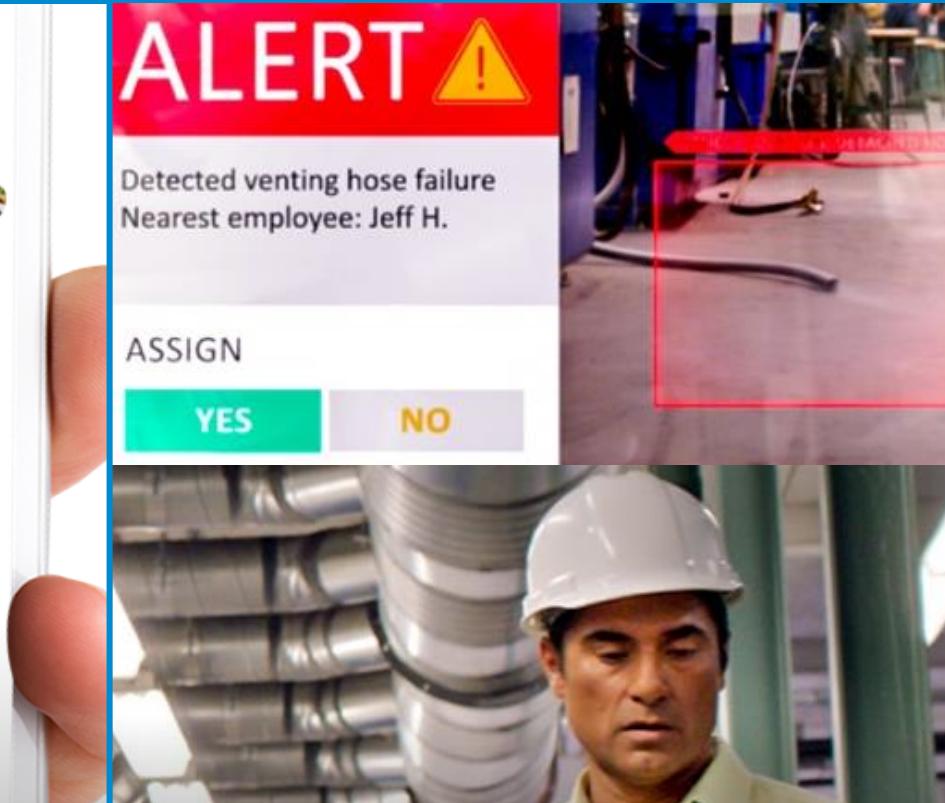


Please help me get a sense of what is wrong with the water dispenser. When you push on the dispenser handle what happens?

The light works, the dispenser is running, but no water is coming out.

The light does **not** turn on and the dispenser is **not** running.

None of the above.



New generation
of business agents

B2B

B2C

B2E

Person, object, pattern
and activity detection

Retail

Manufacturing

Security

AI assisted
professionals

Sales

Marketing

Legal

Financial



Marketing

Maximize ROI with intelligent, data-driven targeted marketing



Sales

Increase sales productivity by enabling intelligent selling



Talent

Find, retain, and empower the right talent to drive optimal business results

Digitally Transforming Microsoft



Customer service

AI and Machine Learning to solve customer issues



Inside sales

Daily Recommender drives Smart Insights



Workplace analytics

Using data to get insights on top-performers



INTRODUCING Daily Recommender

The screenshot shows a laptop displaying the Microsoft Dynamics 365 Daily Recommender interface. The top navigation bar includes CRM ONLINE, COACHING, and DAILY RECOMMENDER. Below the navigation is a welcome message "Welcome Salman Mukhtar" and a "Revenue to date vs Target" metric. A horizontal menu bar contains links for My Recommendations, My Activities, My Opportunities, My Accounts, and My Target. A sidebar on the left lists "My Activities" with icons for Home, Create, and Search.

My Recommendations

Overdue 0 Renewals & True-Ups January 2018 4 Renewals & True-Ups Q1 27 Renewals & True-Ups Q4 04

Search by Account, TPID or Product

Actions Account Name Type Play Recommendation Potential (\$)
WEYLAND INDUSTRIES Opportunity Renewal Renewal is due in 55 days and we are in stage 3-Develop Strategy More Details 3 more recommendations 122,710.07 2-28-2018 Renewal 4991224 Win Ent Office 365

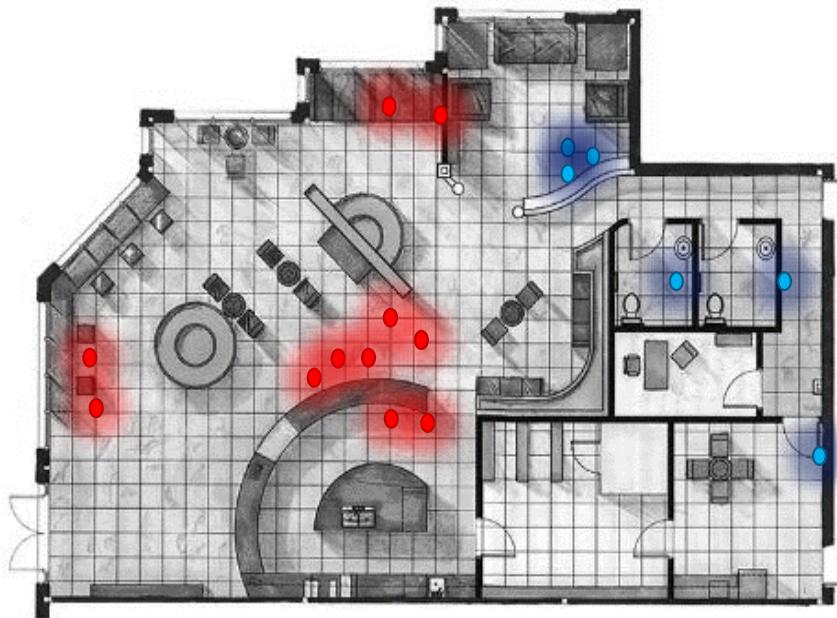
NAKATOMI CORPORATION Opportunity Renewal Renewal is due in 87 days and we are in stage 3-Develop Strategy More Details 4 more recommendations 108,105.20 4-1-2018 Renewal products SQL Serv

INITECH Opportunity Renewal Renewal is due in 86 days and we are in stage 3-Develop Strategy More Details 4 more recommendations 96,975.06 3-31-2018 Renewal 5156401 Windows

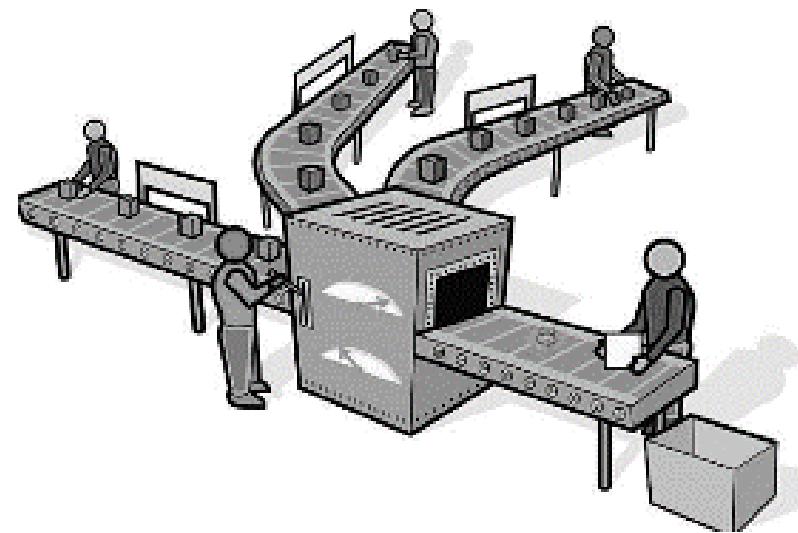
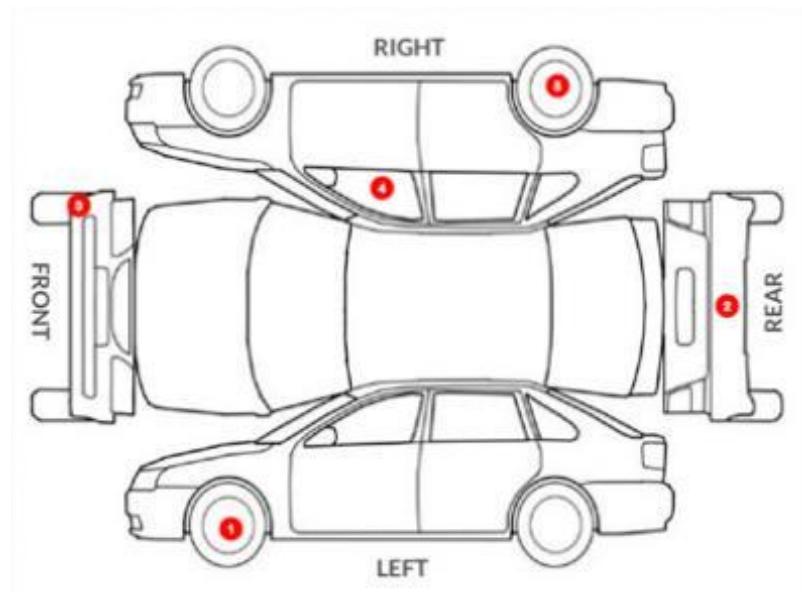
Cognitive Services Object Detection



Spatial Occupancy



Defect Detection



Case Study

A Danish construction company responsible for damage detection

Current Situation

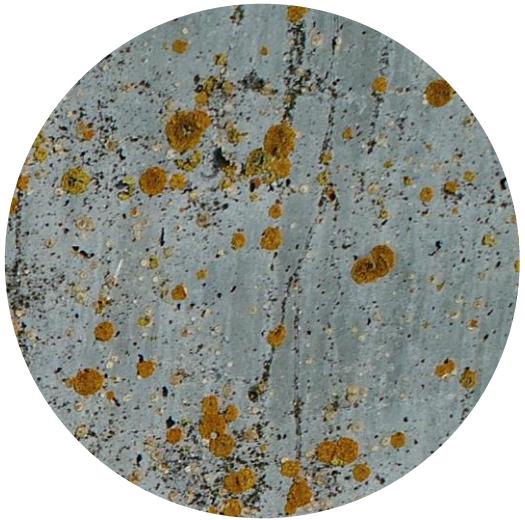
- Pictures of the bridge using a drone
- Civil engineering team analyses footage for different damage types
- Report is created based on the results

Issues

- Slow
- Time intensive
- Expensive
- Difficult to track over time



Three Main Types of Damage Detected



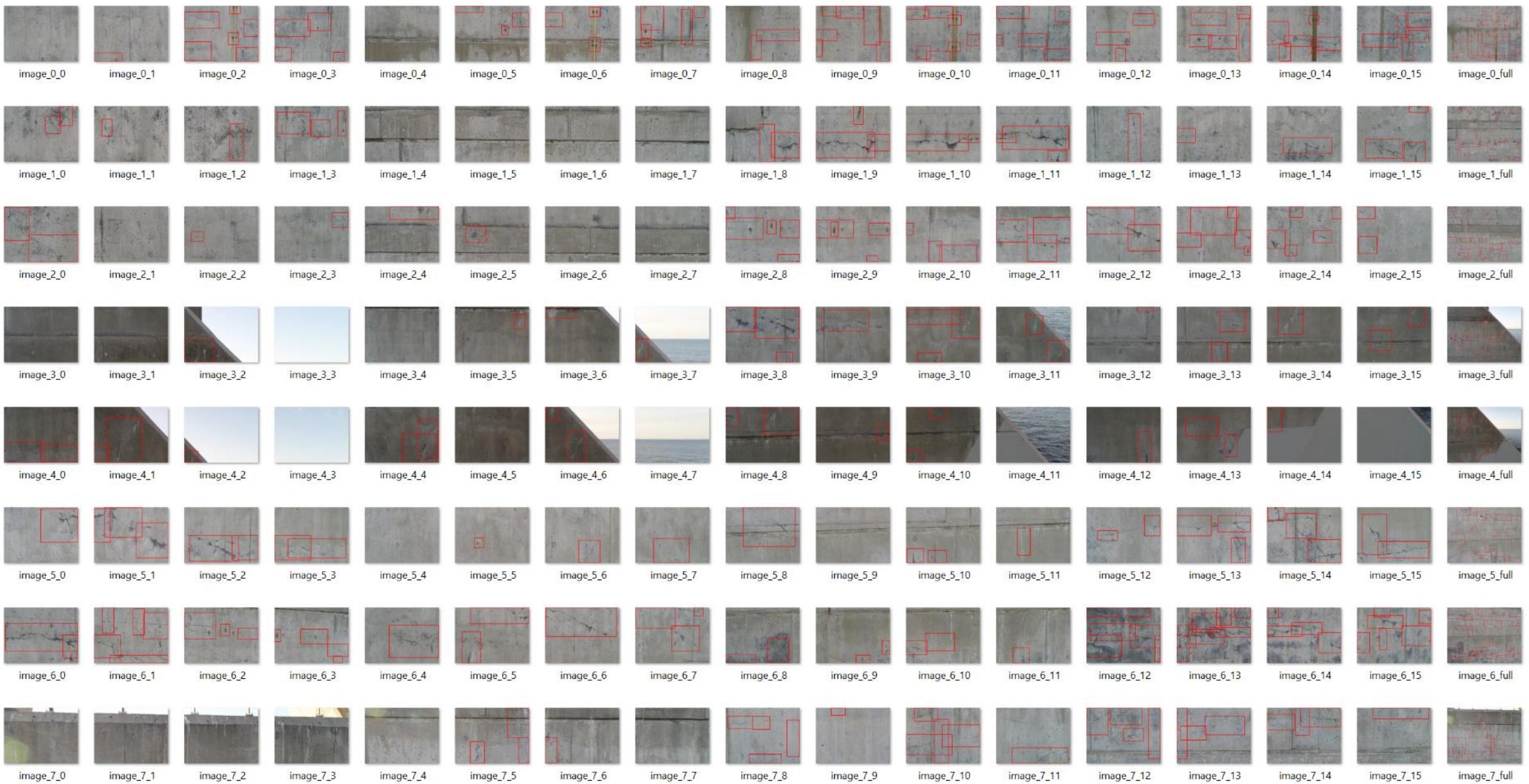
ALGAE



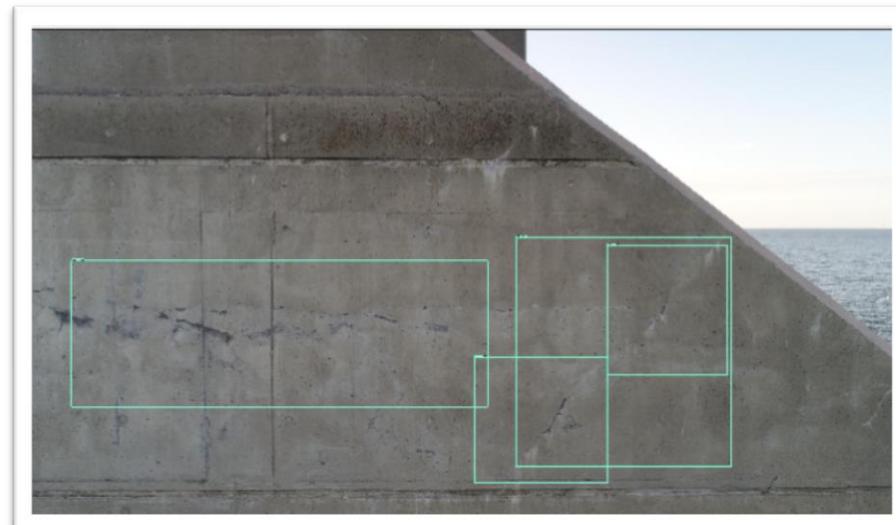
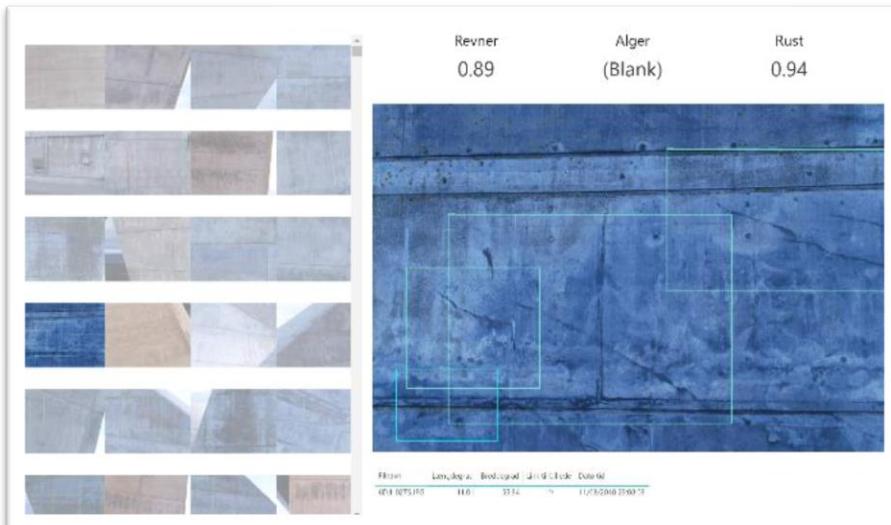
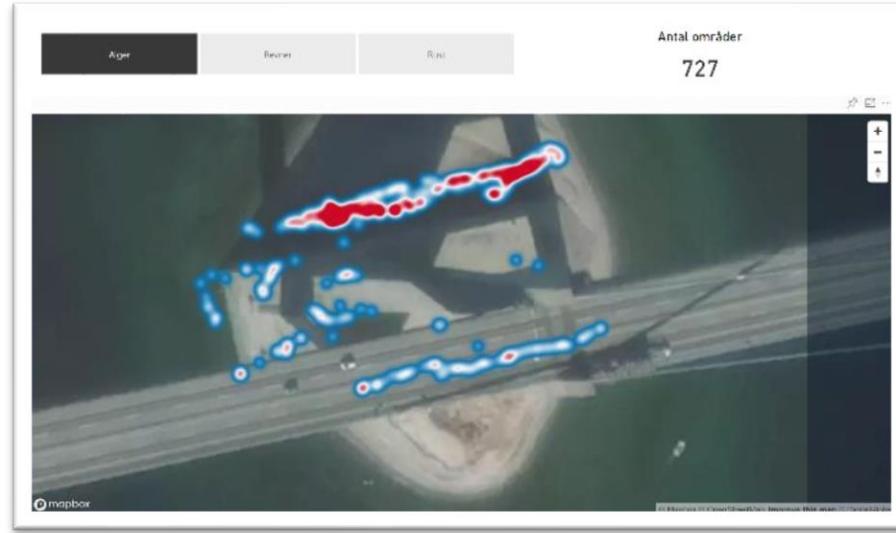
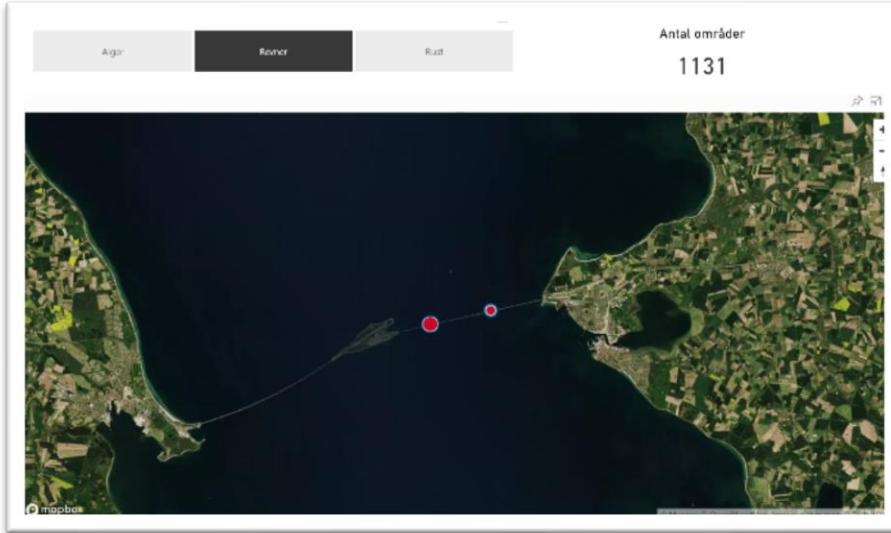
CRACKS



RUST



Visualising the Data





CASE STUDY: Strategy & Forecasting

Forecasting Accounts Receivable

Azure Machine Learning significantly improved our hedging forecasts, saving real dollars during a period of volatile currency markets



PROCESS CHANGE MICROSOFT TREASURY

Machine Learning forecasting solution that is addressing a key FX exposure for the company while improving forecast accuracy of Accounts Receivable and operational efficiency for the team

SOLUTION

Historical data in Azure was cleaned and used to create an automated forecasting solution using the R programming language and Azure ML Studio

TECHNOLOGY

- Cortana Intelligence Suite
- Azure Data Factory
- Azure Machine Learning
- Azure Blob Storage
- Power BI

RESULTS

- Cumulative forecasting improved by 6% for last 6 quarters
- Reduced FX impact on other income by ~25% during the same period

TIME TAKEN

6 weeks to complete

Cognitive Services

Infuse your apps with powerful, pre-trained AI models

Customize easily and tailor to your needs

Use language of your choice



Vision



Speech



Language



Search



Bot Service

Accelerate bot development with an integrated environment and pre-built templates

Engage your audience easily across multiple channels



1990s: Internet

- Search
- User “visits” websites

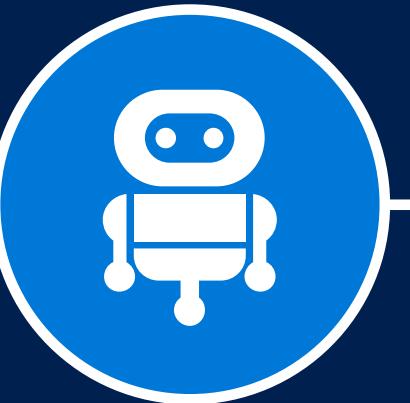


1980s: PC

- Desktop

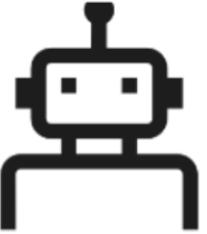
2000s: Mobile

- Social
- User download apps from App Stores



The Future: Conversations

- Natural language between people and technology
- Conversational canvas
- Bots and agents



Hi, I'm [Bot name]

I love to....add the service description of the bot here

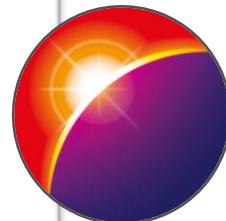
Roger

Cami

Sarah

PERSONALITY TRAITS

GOALS



MY VOICE & TONE CHANGES WHEN I'M...

Getting started



Being proactive



Troubleshooting



Sensing a problem



Wrapping up



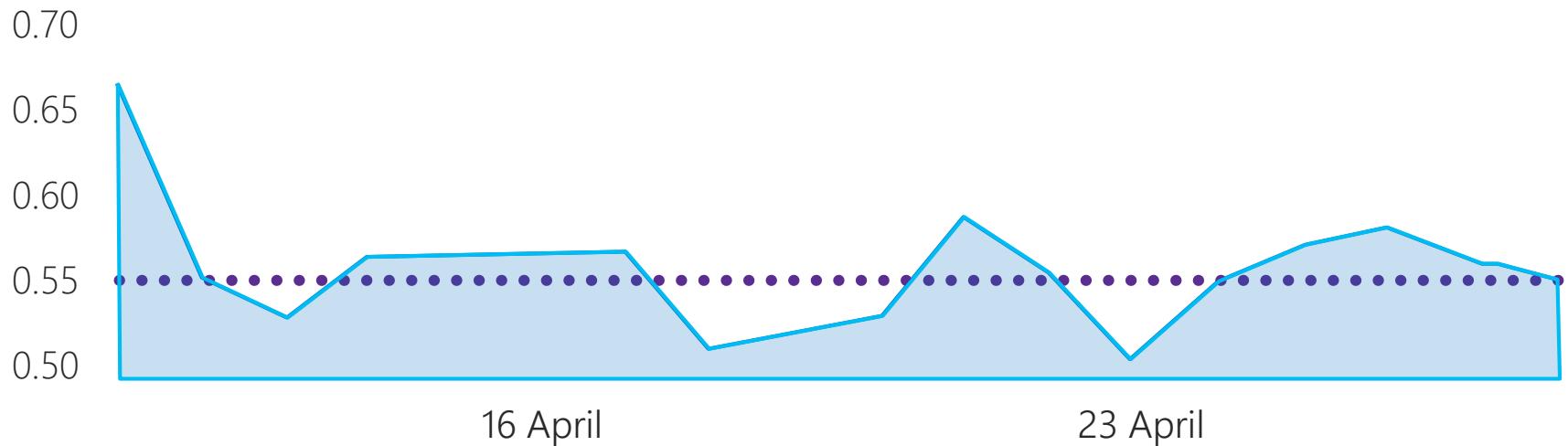
MY RELATIONSHIP WITH MY USERS

THINGS I MUST DO

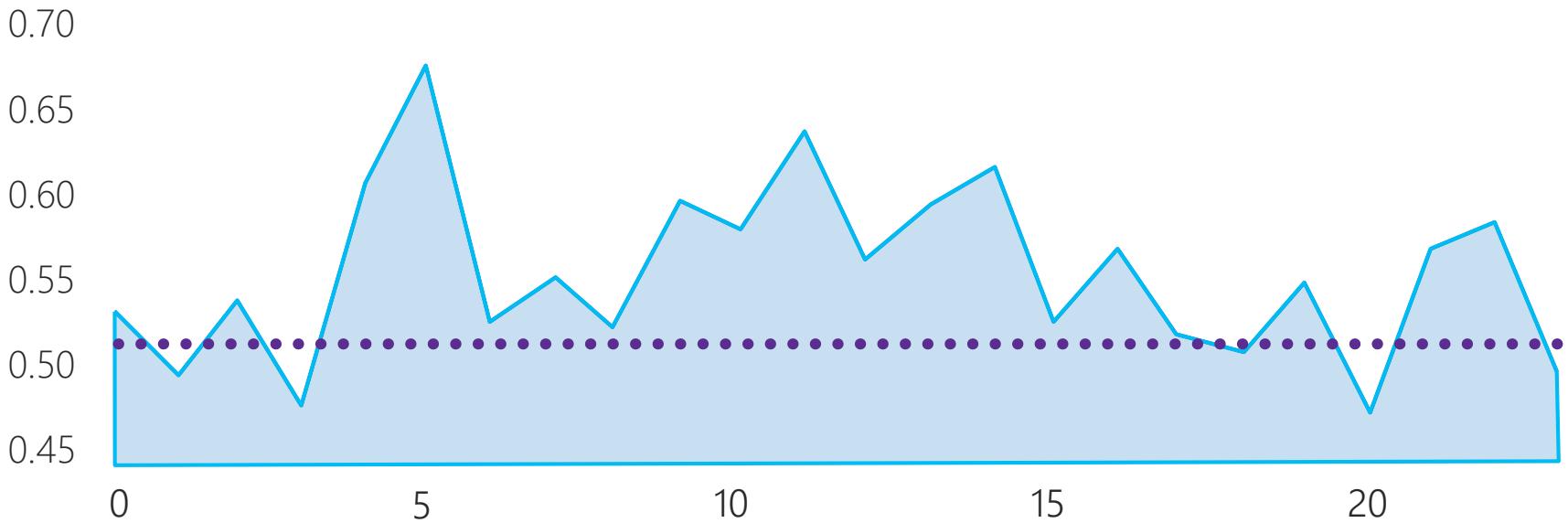
THINGS I NEVER DO

Insight as a Byproduct!

Average sentiment
by year, quarter,
month, and day



Average sentiment
by hour



A Principled Approach

Every company is a
Software Company

Every company is an
AI Company

“No AI Strategy”

Is not a strategy

“No AI”

Is not a strategy

Determine your
AI Maturity

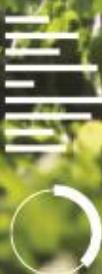
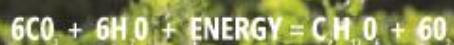
Start your
AI Manifesto
today

Responsible AI to
augment and amplify human ingenuity

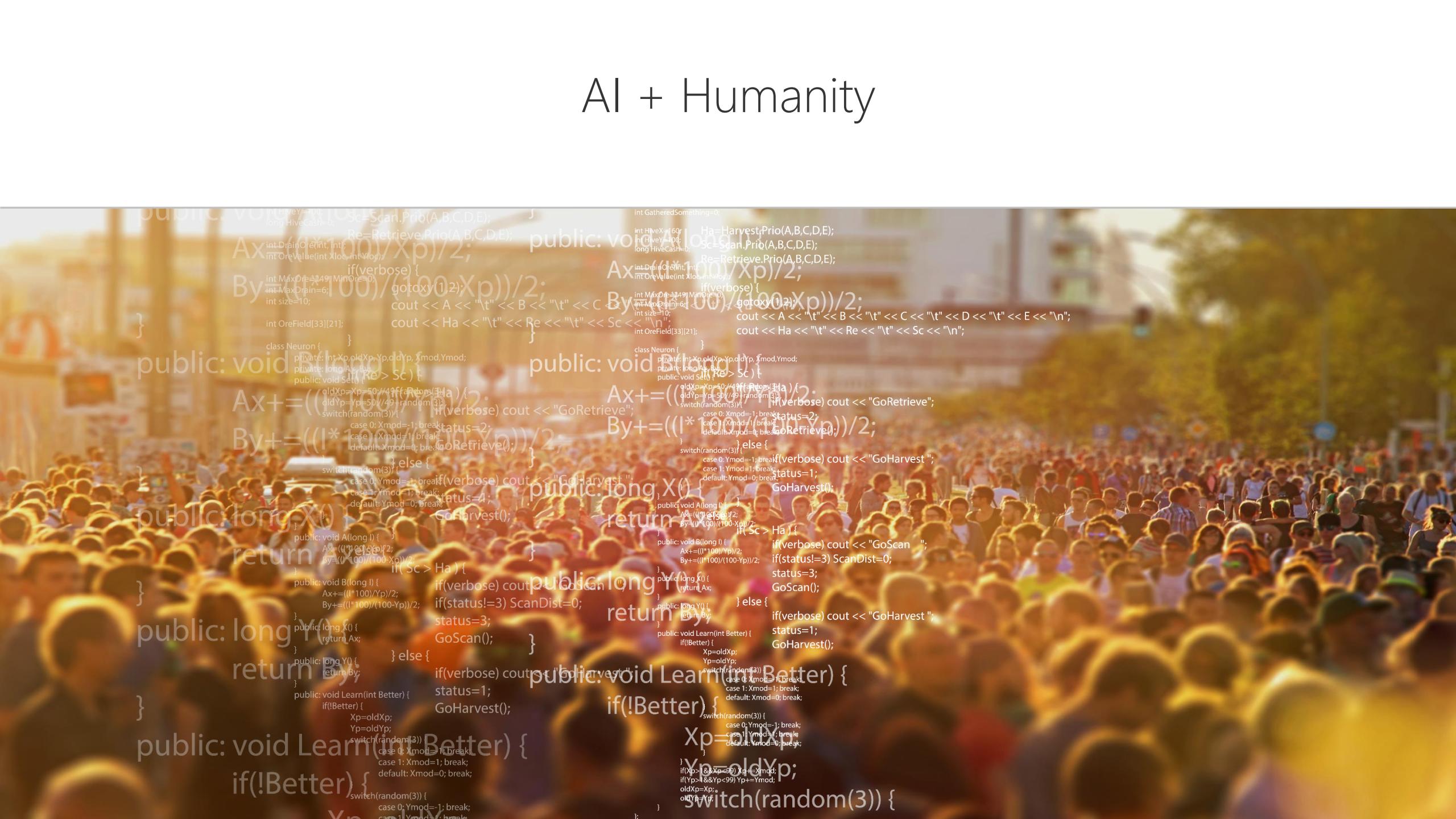


Ethical and Responsible AI

Considerations and Decision Framework



AI + Humanity



```
public: void A(long X) {
    int HiveY=100;
    long HiveCash=0;
    SC=Scan.Prio(A,B,C,D,E);
    Re=Retrieve.Prio(A,B,C,D,E);
    int DrainOre(int Int);
    int OreValue(int Xloc,int Ylog);
    if(verbose) {
        int MaxOre=249; MinOre=0;
        int MaxDrain=6;
        int size=10;
        int OreField[33][21];
    }
    class Neuron {
        private: int Xp,oldXp,Yp,oldYp,Xmod,Ymod;
        private: long Ak,Sa;
        public: void Seto () {
            oldXp=Xp-50/49*(Random(Ha));
            oldYp=Yp-50/49*random(3);
            switch(random(3)) {
                case 0:Xmod=-1;break;
                case 1:Xmod=1;break;
                default:Xmod=0;break;
            }
            GoRetrieve();
        }
        else {
            switch(random(3)) {
                case 0:Ymod=-1;break;
                case 1:Ymod=1;break;
                default:Ymod=0;Break;
            }
            GoHarvest();
        }
    }
    public: void B(long Y) {
        Ax=((Y*100)/Sc)/2;
        By=((Y*100)/(100-Yp))/2;
        if(Sc > Ha) {
            public: void B(long Y) {
                Ax+=((Y*100)/Yp)/2;
                By+=((Y*100)/(100-Yp))/2;
            }
            public: void GoScan() {
                Ax=((Y*100)/Sc)/2;
                By=((Y*100)/(100-Yp))/2;
                if(verbose) cout << "GoScan ";
                if(status!=3) ScanDist=0;
                status=3;
                GoScan();
            }
            if(verbose) cout << "GoHarvest ";
            status=1;
            GoHarvest();
        }
        else {
            if(verbose) cout << "GoHarvest ";
            status=1;
            GoHarvest();
        }
    }
    public: void Learn(int Better) {
        if(!Better) {
            Xp=oldXp;
            Yp=oldYp;
            switch(random(3)) {
                case 0:Xmod=-1;break;
                case 1:Xmod=1;break;
                default:Xmod=0;break;
            }
            switch(random(3)) {
                case 0:Ymod=-1;break;
                case 1:Ymod=1;Break;
                default:Ymod=0;Break;
            }
            if(Xp>250) Xp=Sc;
            if(Yp>100&&Yp<99) Yp+=Ymod;
            oldXp=Xp;
            oldYp=Yp;
        }
        else {
            public: void AAlong (int X) {
                int HiveX=60;
                HiveY=0;
                long HiveCash=0;
                SC=Scan.Prio(A,B,C,D,E);
                Re=Retrieve.Prio(A,B,C,D,E);
                int DrainOre(int Int);
                int OreValue(int Xloc,int Ylog);
                if(verbose) {
                    int MaxOre=3249; MinOre=0;
                    int MaxDrain=6;
                    int size=10;
                    int OreField[33][21];
                }
                class Neuron {
                    private: int Xp,oldXp,Yp,oldYp,Xmod,Ymod;
                    private: long Ak,Sa;
                    public: void Seto (Re>Sc) {
                        oldXp=Xp-50/49*(Random(Ha));
                        oldYp=Yp-50/49*random(3);
                        if(verbose) cout << "GoRetrieve ";
                        switch(random(3)) {
                            case 0:Xmod=-1;Break;
                            case 1:Xmod=1;Break;
                            default:Xmod=0;Break;
                        }
                        GoRetrieve();
                    }
                    else {
                        switch(random(3)) {
                            case 0:Ymod=-1;if(verbose) cout << "GoHarvest ";
                            case 1:Ymod=1;Break;
                            default:Ymod=0;Break;
                        }
                        GoHarvest();
                    }
                }
                public: void ALong (long Y) {
                    Ax=((Y*100)/Sc)/2;
                    By=((Y*100)/(100-Yp))/2;
                    if(Sc > Ha) {
                        if(verbose) cout << "GoScan ";
                        if(status!=3) ScanDist=0;
                        status=3;
                        GoScan();
                    }
                    public: long YU {
                        return By;
                    }
                    public: long XU {
                        return Ax;
                    }
                    public: void Learn(int Better) {
                        if(!Better) {
                            Xp=oldXp;
                            Yp=oldYp;
                            switch(random(3)) {
                                case 0:Xmod=-1;break;
                                case 1:Xmod=1;break;
                                default:Xmod=0;Break;
                            }
                            switch(random(3)) {
                                case 0:Ymod=-1;break;
                                case 1:Ymod=1;Break;
                                default:Ymod=0;Break;
                            }
                            if(Xp>250) Xp=Sc;
                            if(Yp>100&&Yp<99) Yp+=Ymod;
                            oldXp=Xp;
                            oldYp=Yp;
                        }
                        else {
                            Ax=((Y*100)/Sc)/2;
                            By=((Y*100)/(100-Yp))/2;
                            if(verbose) cout << "GoHarvest ";
                            status=1;
                            GoHarvest();
                        }
                    }
                }
            }
        }
    }
}
```



Design AI to Earn Trust & Respect Values



Fairness



Reliability
& Safety



Privacy &
Security



Inclusiveness



Transparency



Accountability

Fairness

Understand how bias can be introduced and affect recommendations

Attract diverse pool of AI talent

Develop analytical techniques to detect and mitigate bias

Human review and domain expertise

Facial recognition technology: The need for public regulation and corporate responsibility

Jul 13, 2018 | [Brad Smith - President](#)

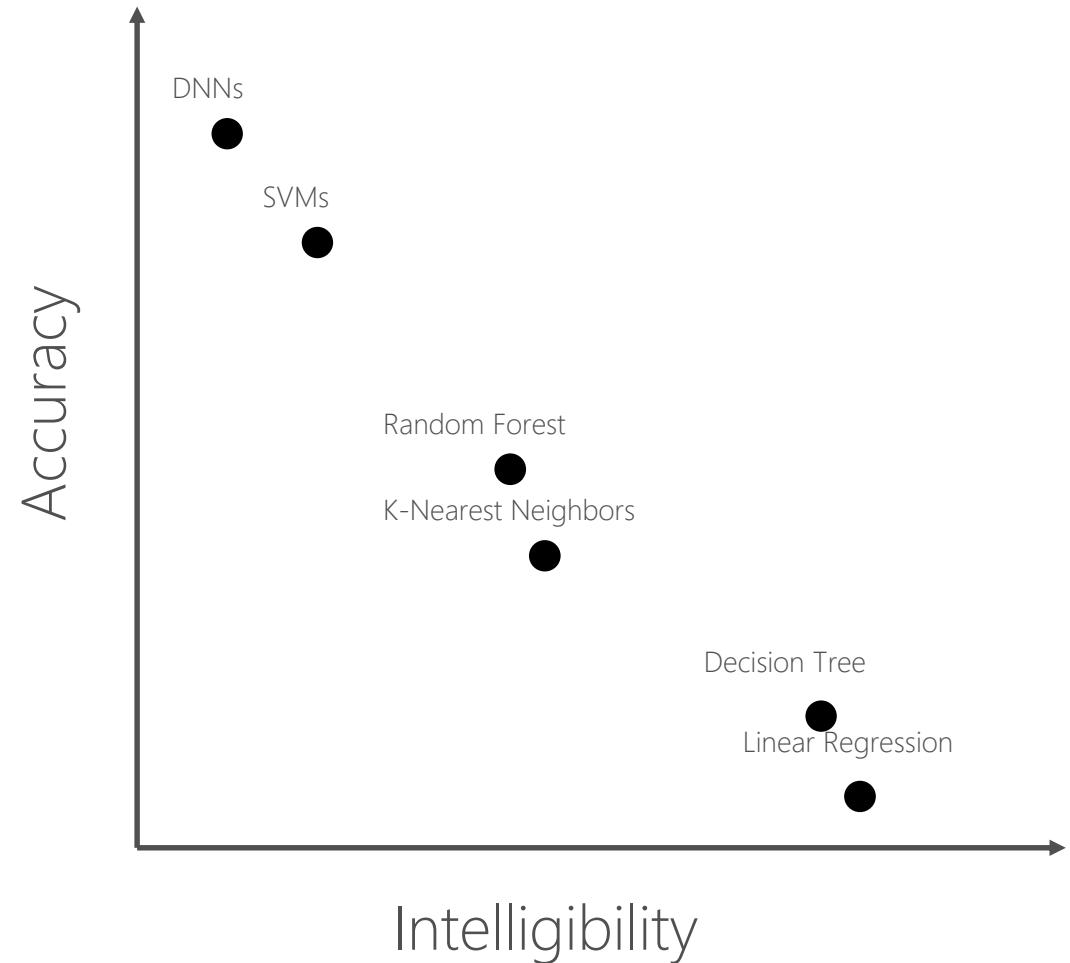


Transparency

People should understand how decisions were made

Provide contextual explanations

Make it easier to raise awareness of potential bias, errors and unintended outcomes



Understand the Sensitive Uses of AI

There are uses of AI systems which make automated decisions or recommendations which may have a significant impact on individuals and society.



Denying
Consequential
Services



Risk of Harm



Infringe on
Human Rights

Understand the Sensitive Uses of AI

There are uses of AI systems which make automated decisions or recommendations which may have a significant impact on individuals and society.



Decision Support
Services
Lending



High Stakes
Healthcare



Public Safety
Judicial Systems