Microsoft

Project 15 from Microsoft

Accelerating Environmental Conservation & Ecosystem Sustainability with the Internet of Things (IoT)

Sarah Maston

Sr IoT Solution Architect @ Microsoft

Process architect & data architect for ~20 years

Hobbies include:

Chasing my 8-year-old around to do his homework.

Building Lego buildings

Keeping up on my sci-fi reading.

Agenda

An Origin Story

Project 15 from Microsoft

Project 15 Open Platform Architecture

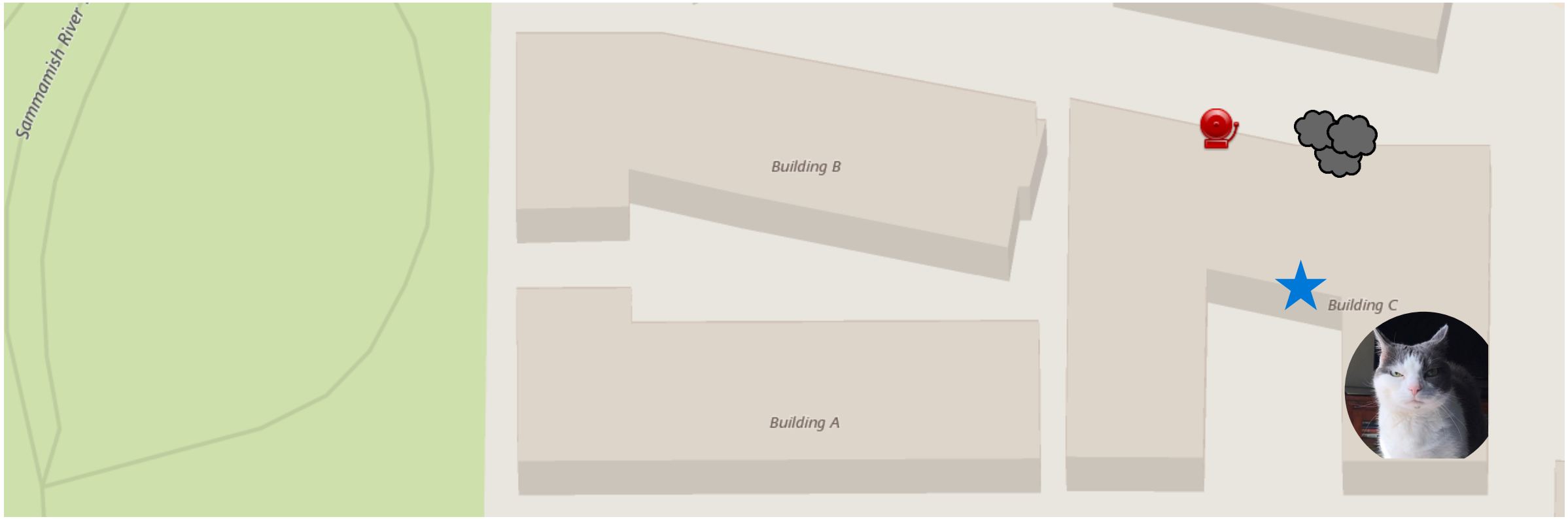
The Project 15 Challenge

Ideas can come from anywhere

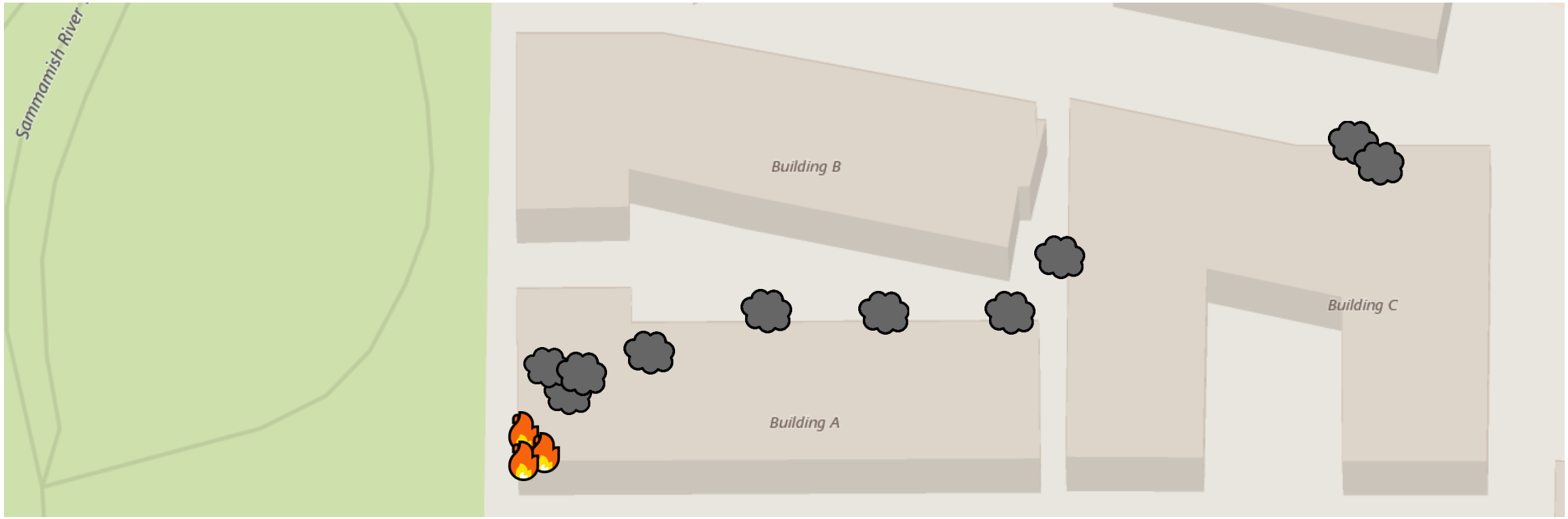
This was my cat. Her name was Thomas*.

*Her full name was “Thomas, who is a girl.”

A normal Saturday night



It was nowhere near me.

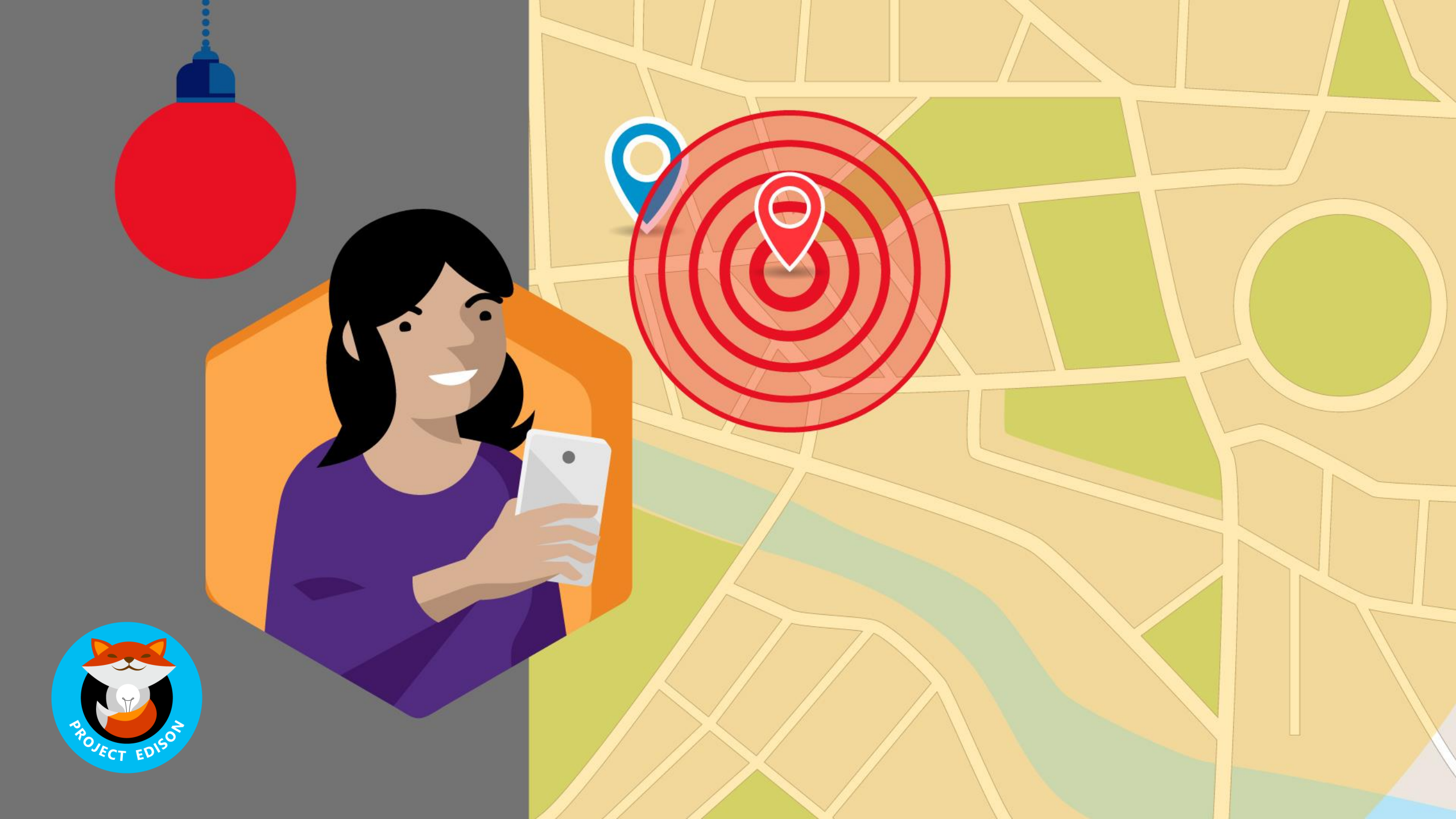


There has got be a better way to communicate in a crisis …

PROJECT EDISON

PROJECT EDISON

PROJECT EDISON


PROJECT EDISON

PRESS RELEASE

Houston Schools Deploying IoT-Enabled Building Safety Platform to Improve Emergency Responses

Published: Apr 15, 2019 8:30 a.m. ET

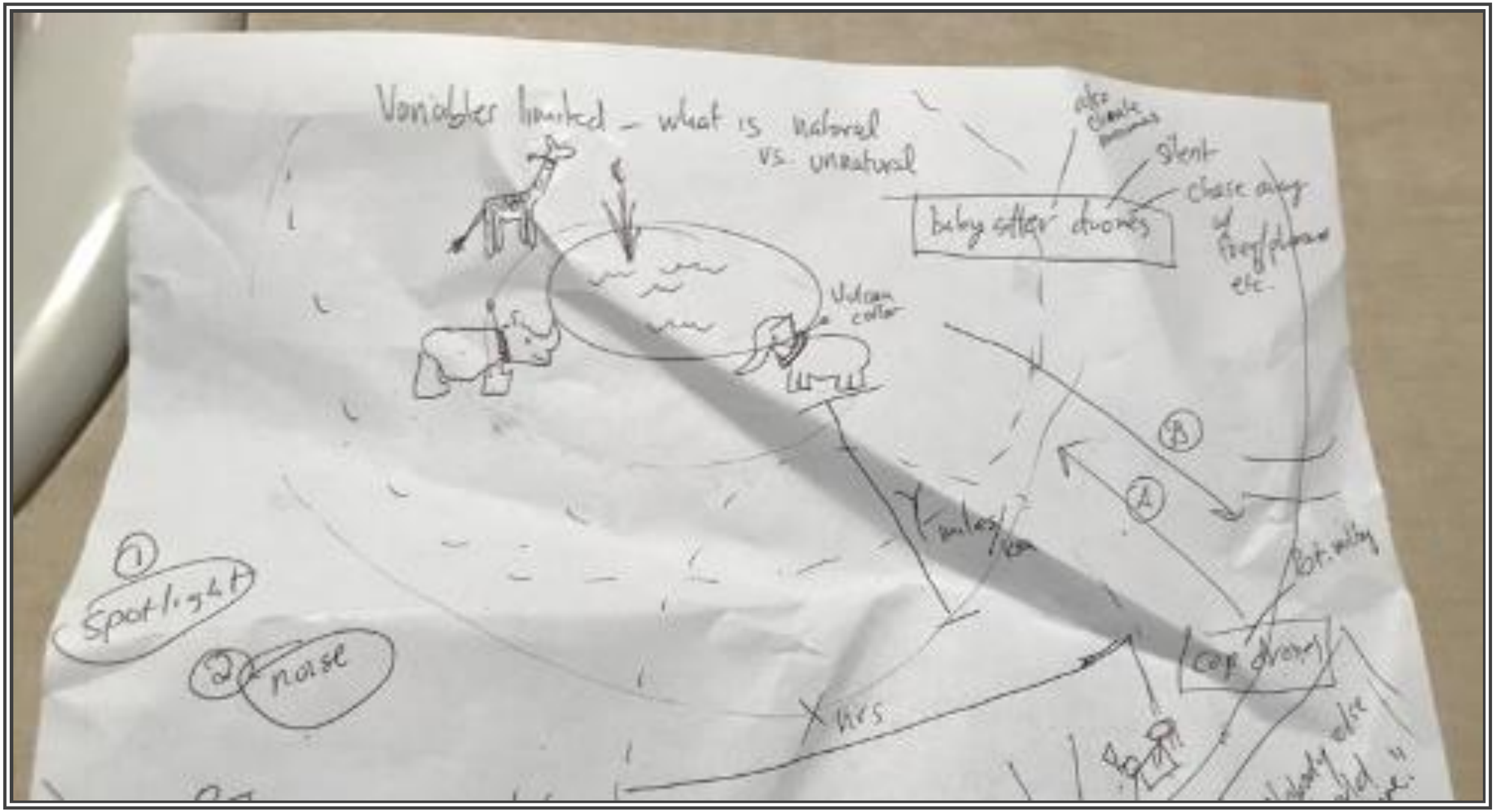
Aa

An Insight Enterprises safe-spaces point solution developed for BeSafe Technologies taps Microsoft Azure technology; provides accurate, real-time information to first responders

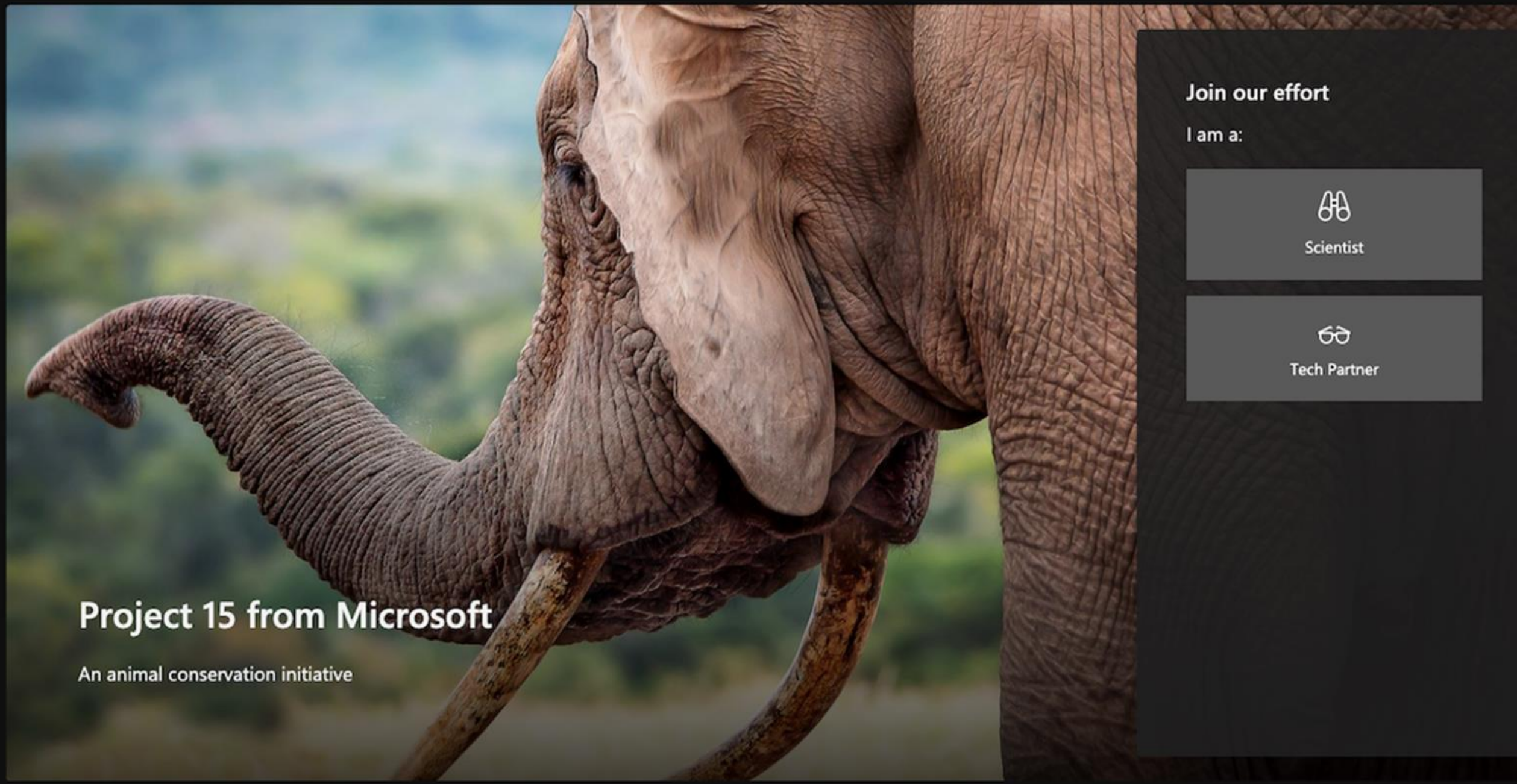
The city of Houston will be the first to implement an Internet of Things (IoT)-enabled platform called ActiveShield that redefines public safety. Two Houston schools will pilot the IoT safe-spaces technology created by Insight Enterprises NSIT, +0.28%, which integrates with a building safety platform from BeSafe Technologies to facilitate critical, real-time information sharing during a crisis.

ActiveShield leverages the power of Safe Spaces developed by Insight, part of a suite of customizable, end-to-end smart spaces solutions developed by the Digital Innovation team at Insight, a Fortune 500 global systems integrator helping organizations of all sizes manage and transform their business. Insight's Safe Spaces solution addresses communication challenges during emergency events

RESOLVE
TrailGuard AI
https://www.resolve.ngo/trailguard.htm


Variables limited – what is natural vs. unnatural
silent
chase away
baby sitter drones
Vulcan collar
B
A
Spotlight
nose
cop drone

Microsoft Project 15



Project 15 from Microsoft

An animal conservation initiative

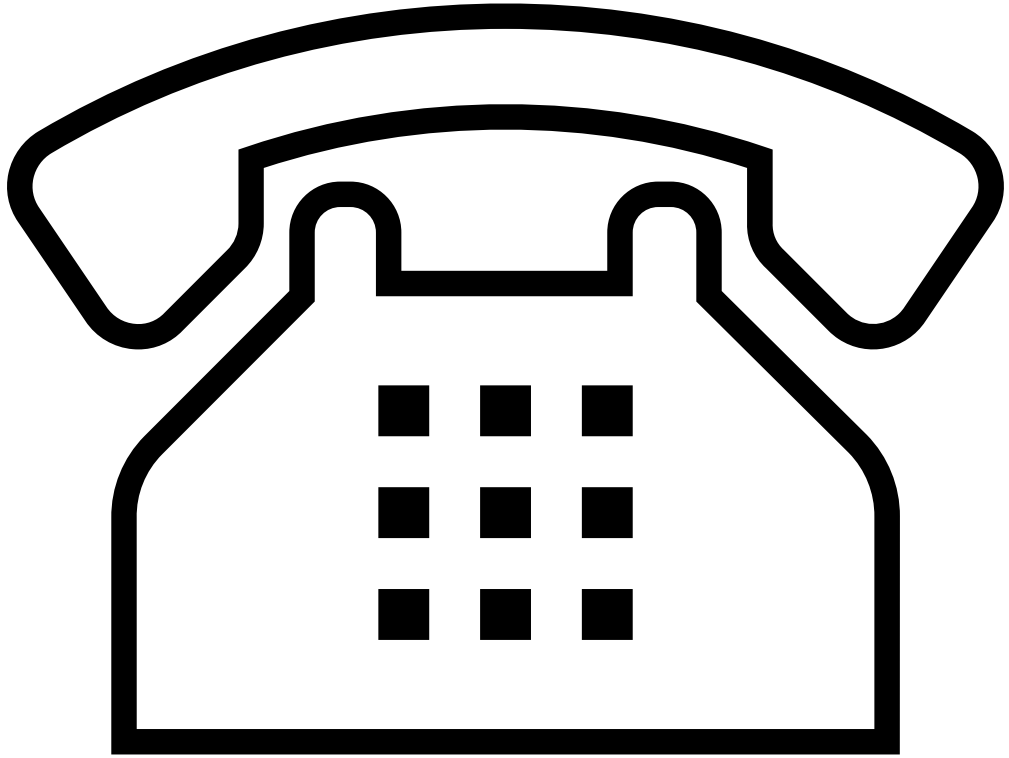
Join our effort

I am a:

Scientist

Tech Partner

It was a phone.



RED PANDA
NETWORK

zambezi

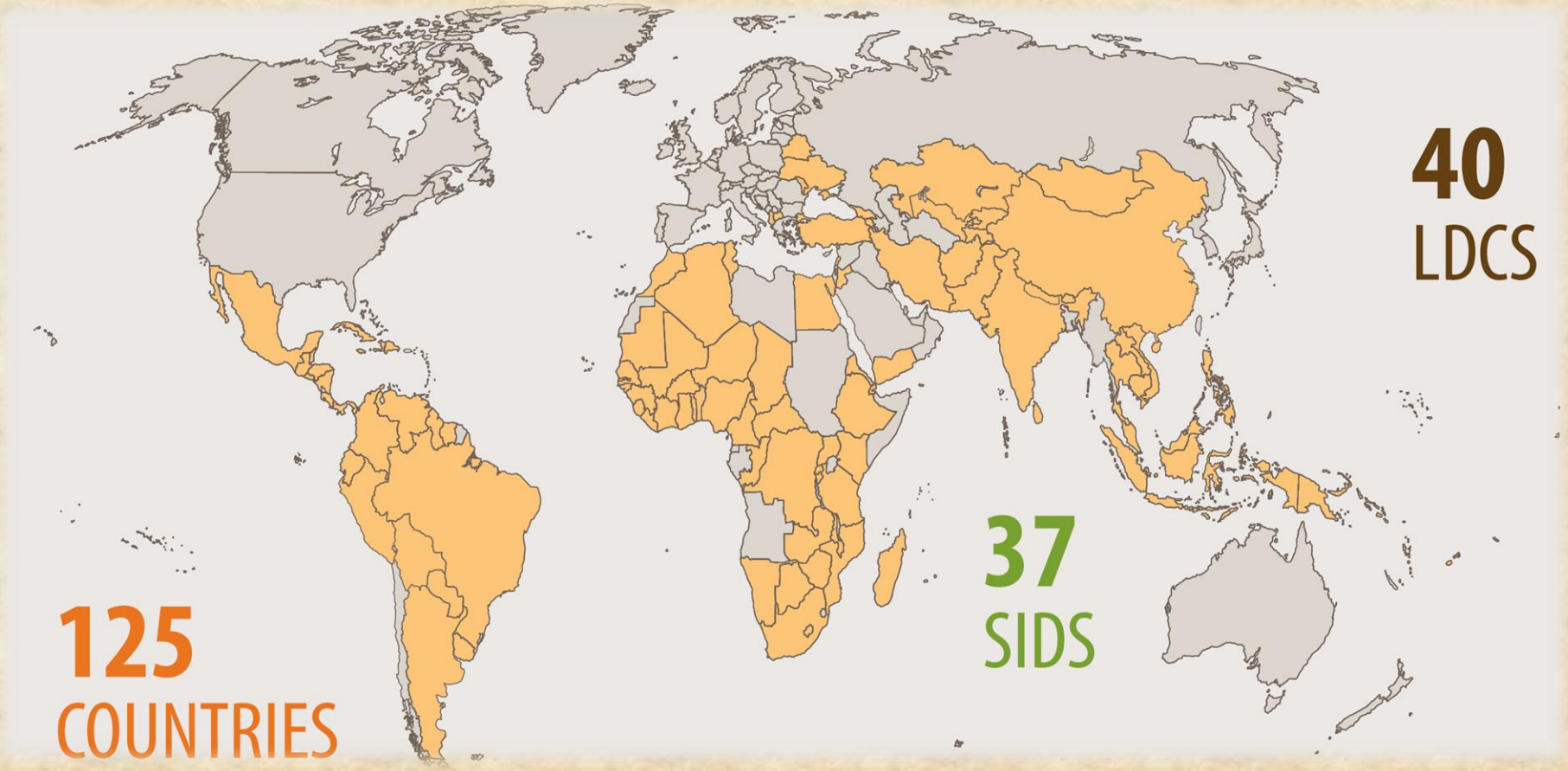
UNITED NATIONS DEVELOPMENT PROGRAMME

SGP The GEF Small Grants Programme

gef

UNDP

Empowered lives.
Resilient nations.



Typical Conservation Data Project Process

Conservation team sets project goal, scope and approach to collecting data

"Catch 22"
Know what to do with the data, could get the grant with the data but don't know how to get the data

Build a proof of concept (POC)

"DIY Devices"
I need to build my own device

"Cloud What?"
Do not have cloud and architecture design expertise

Use POC and/or architecture for Grant proposal

"Small Fish"
I have no grant yet and am not a big enough fish to get a grant without any data

Use grant money to pay for development

"Pit of Financial Despair"
Grant money is used up attempting to develop an IoT/Data solution

Implement the solution

"Showcase"
Was built to be a research paper and not a lasting-solution and is spun down

Scale out the Solution

"Myopic Build"
Solution was not built to be scaled out

Common Roadblocks

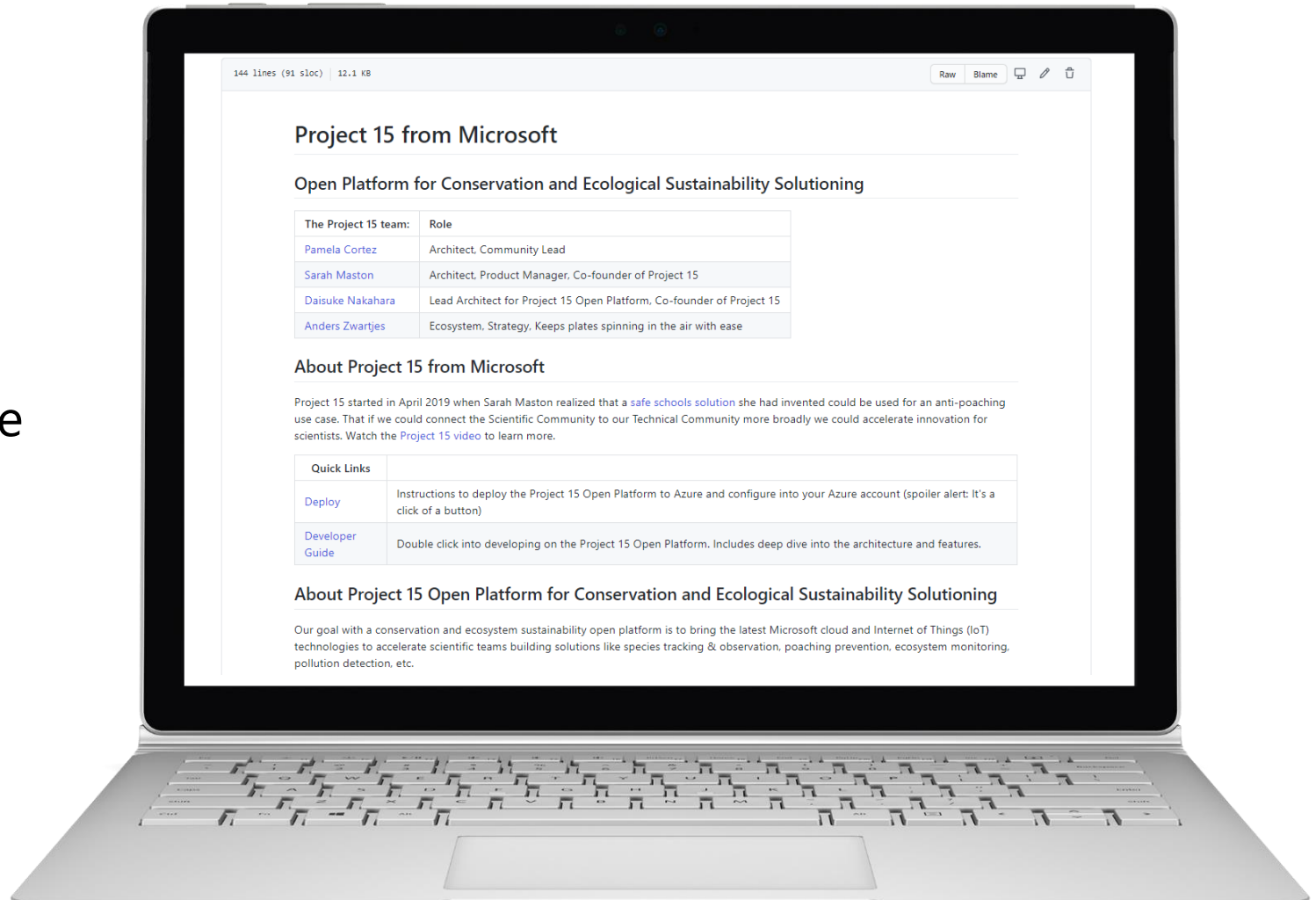
Microsoft

Project 15 from Microsoft

Open Platform for Conservation and Ecological Sustainability Solutioning

Species Tracking & Observation | Poaching Prevention | Pollution Detection | Water Quality | Ecosystem Monitoring

- An easy to deploy technology solution applicable across a range of use cases
- Provides around 80% of Code Needed for most Projects
- Free, open source code available on GitHub
- “Push Button” connection to open data sets for training data and Azure ML



144 lines (91 sloc) | 12.1 KB

Raw Blame

Project 15 from Microsoft

Open Platform for Conservation and Ecological Sustainability Solutioning

The Project 15 team:	Role
Pamela Cortez	Architect, Community Lead
Sarah Maston	Architect, Product Manager, Co-founder of Project 15
Daisuke Nakahara	Lead Architect for Project 15 Open Platform, Co-founder of Project 15
Anders Zwartjes	Ecosystem, Strategy, Keeps plates spinning in the air with ease

About Project 15 from Microsoft

Project 15 started in April 2019 when Sarah Maston realized that a safe schools solution she had invented could be used for an anti-poaching use case. That if we could connect the Scientific Community to our Technical Community more broadly we could accelerate innovation for scientists. Watch the Project 15 video to learn more.

Quick Links	
Deploy	Instructions to deploy the Project 15 Open Platform to Azure and configure into your Azure account (spoiler alert: It's a click of a button)
Developer Guide	Double click into developing on the Project 15 Open Platform. Includes deep dive into the architecture and features.

About Project 15 Open Platform for Conservation and Ecological Sustainability Solutioning

Our goal with a conservation and ecosystem sustainability open platform is to bring the latest Microsoft cloud and Internet of Things (IoT) technologies to accelerate scientific teams building solutions like species tracking & observation, poaching prevention, ecosystem monitoring, pollution detection, etc.

aka.ms/project15code

Critical research is getting held up by technology skill gap

Boost innovation with a ready-made platform, allowing the scientific developer to expand into specific use cases

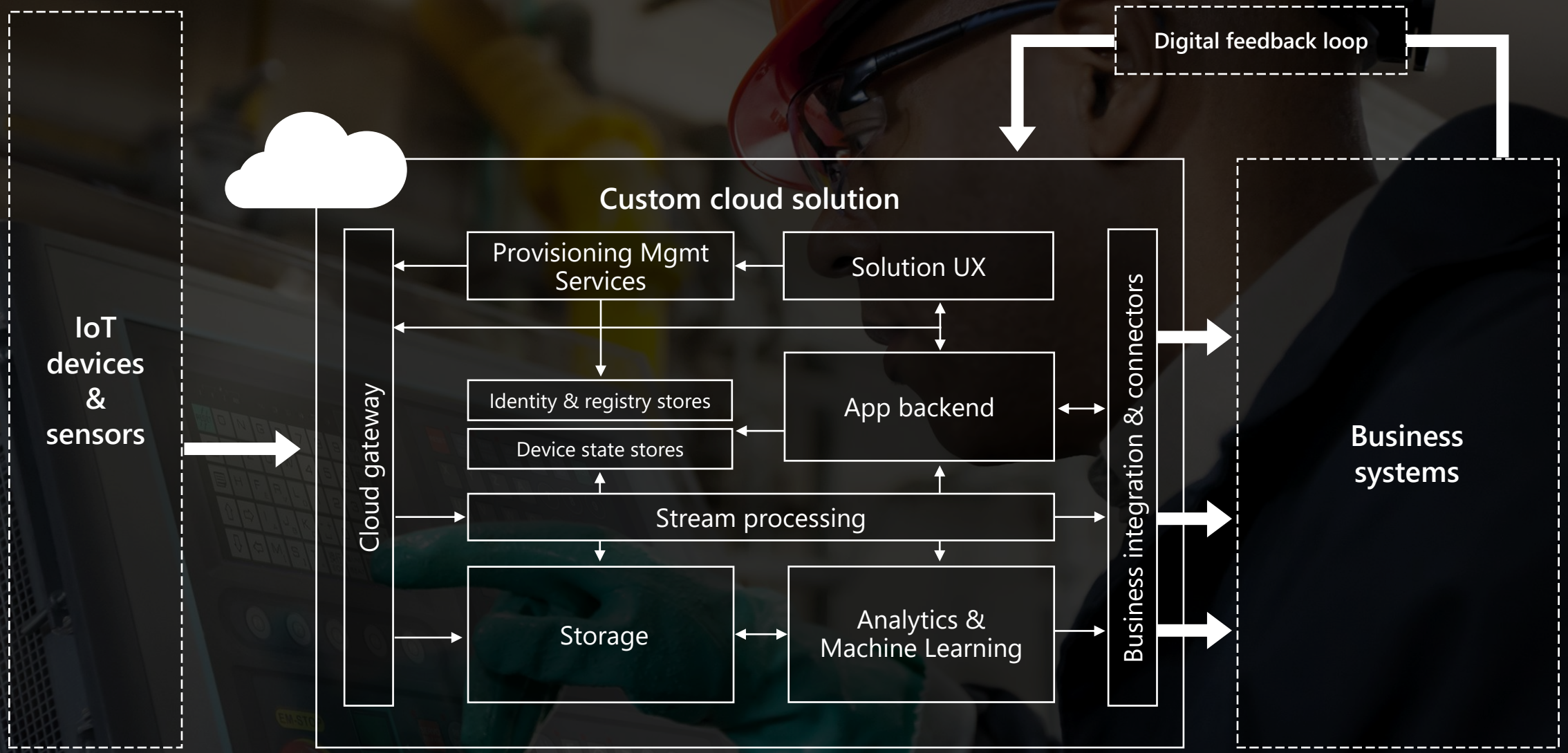
We are running out of time to our species and habitats

Open Platform gets teams 80% of the way with their projects, dramatically reducing the time to start building crucial insights

We can't let these projects fail because of development costs

Open Platform lowers cost of development and provides opportunity for university partnering

IoT Solution Architecture – Very High Level



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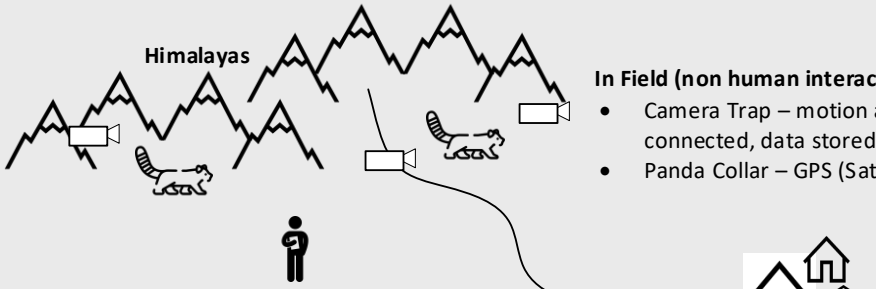
Process Architecture (existing)

Location: Nepal



In Field (non human interaction)

- Camera Trap – motion activated, not connected, data stored on camera SIM card
- Panda Collar – GPS (Satellite)

In Field (human interaction)

- Manual observation of pandas, environmental observations on paper

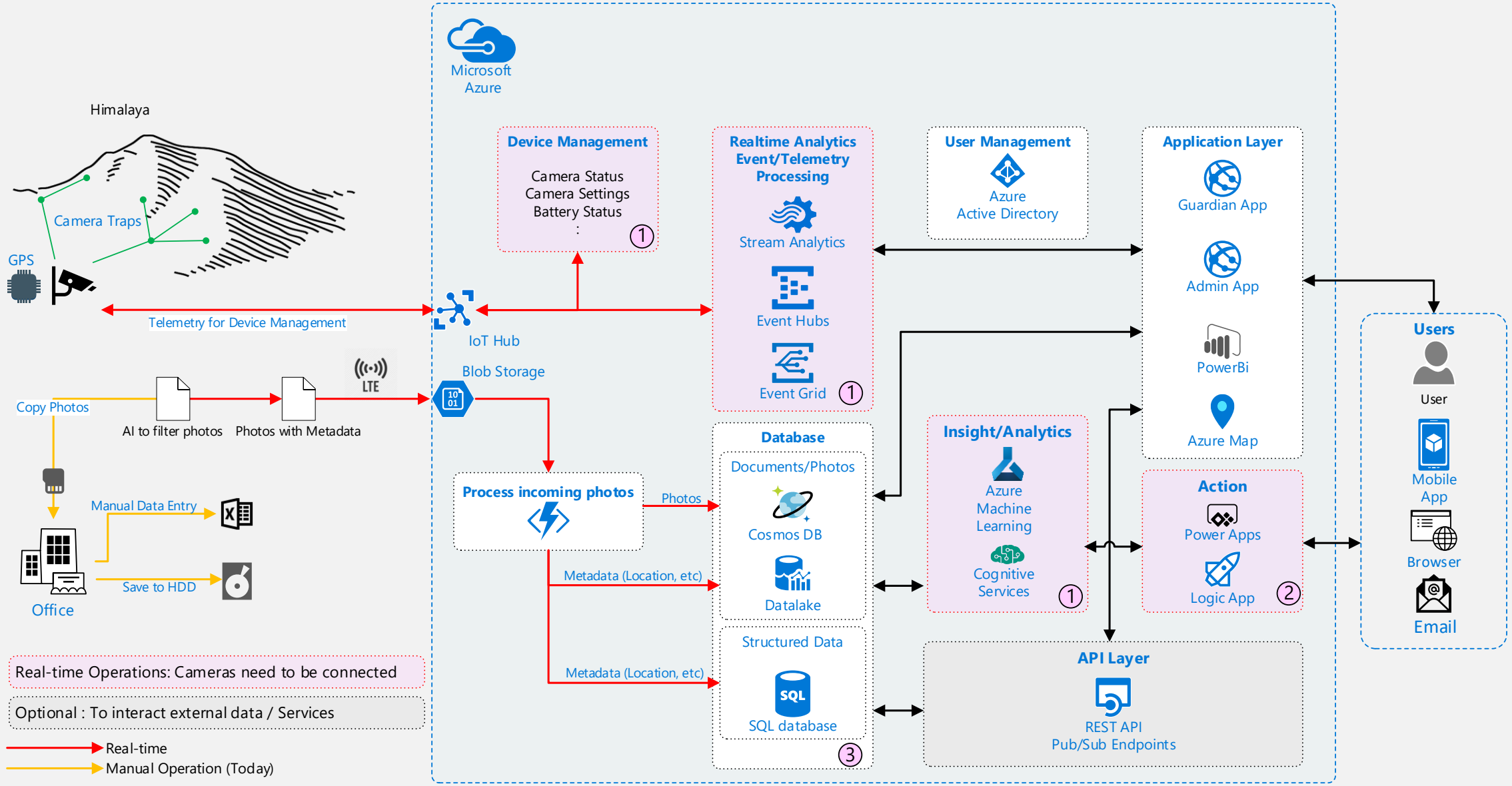
Forrest Guardian (FG) Home

- Data entry of observations taken manually (pencil & paper)
- Loading of image data from collected camera SIM card

Red Panda Network Headquarters

- Manual tagging of camera trap images
- Integration of 3rd party collar data
- Analysis of FG data entry

RED PANDA NETWORK Camera Trap Platform v.02



1 Requires cameras to be online for real-time operations

2 Take action based on data / Analysis

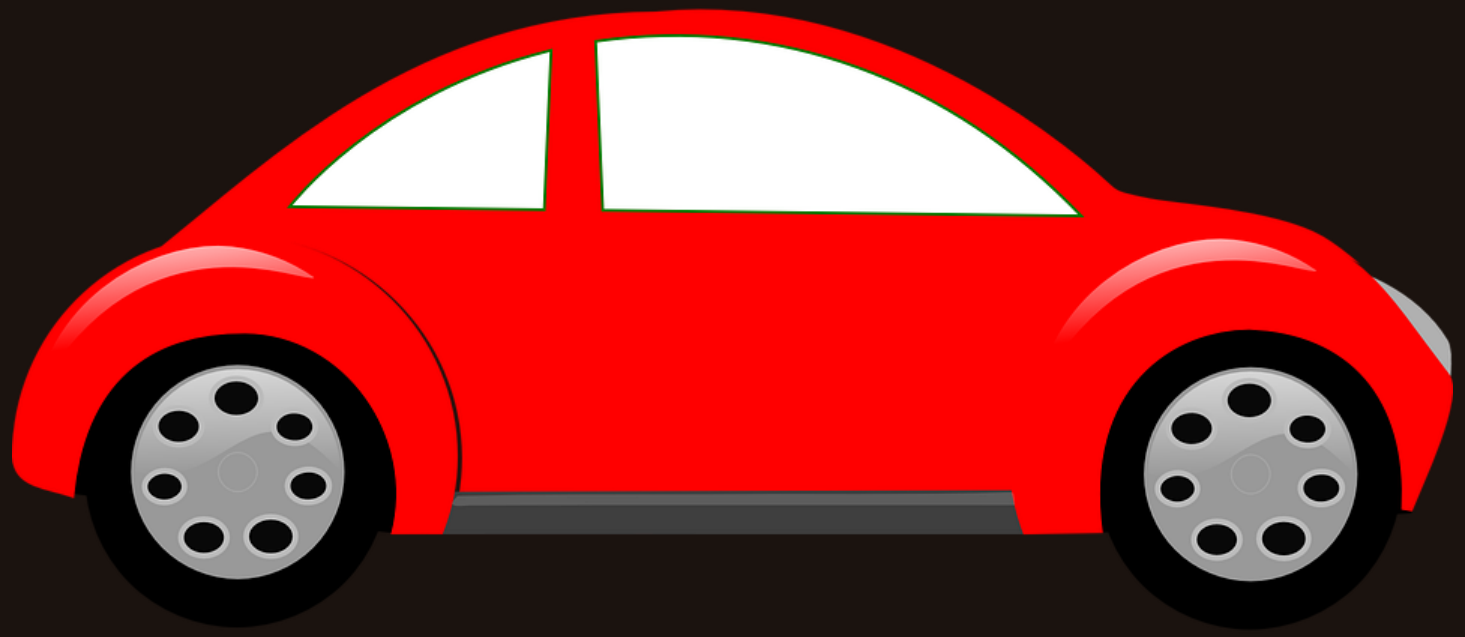
3 Select right DB for data and processing types

Project 15 from Microsoft
Lead Architect(s): Sarah Maston, Daisuke Nakahara

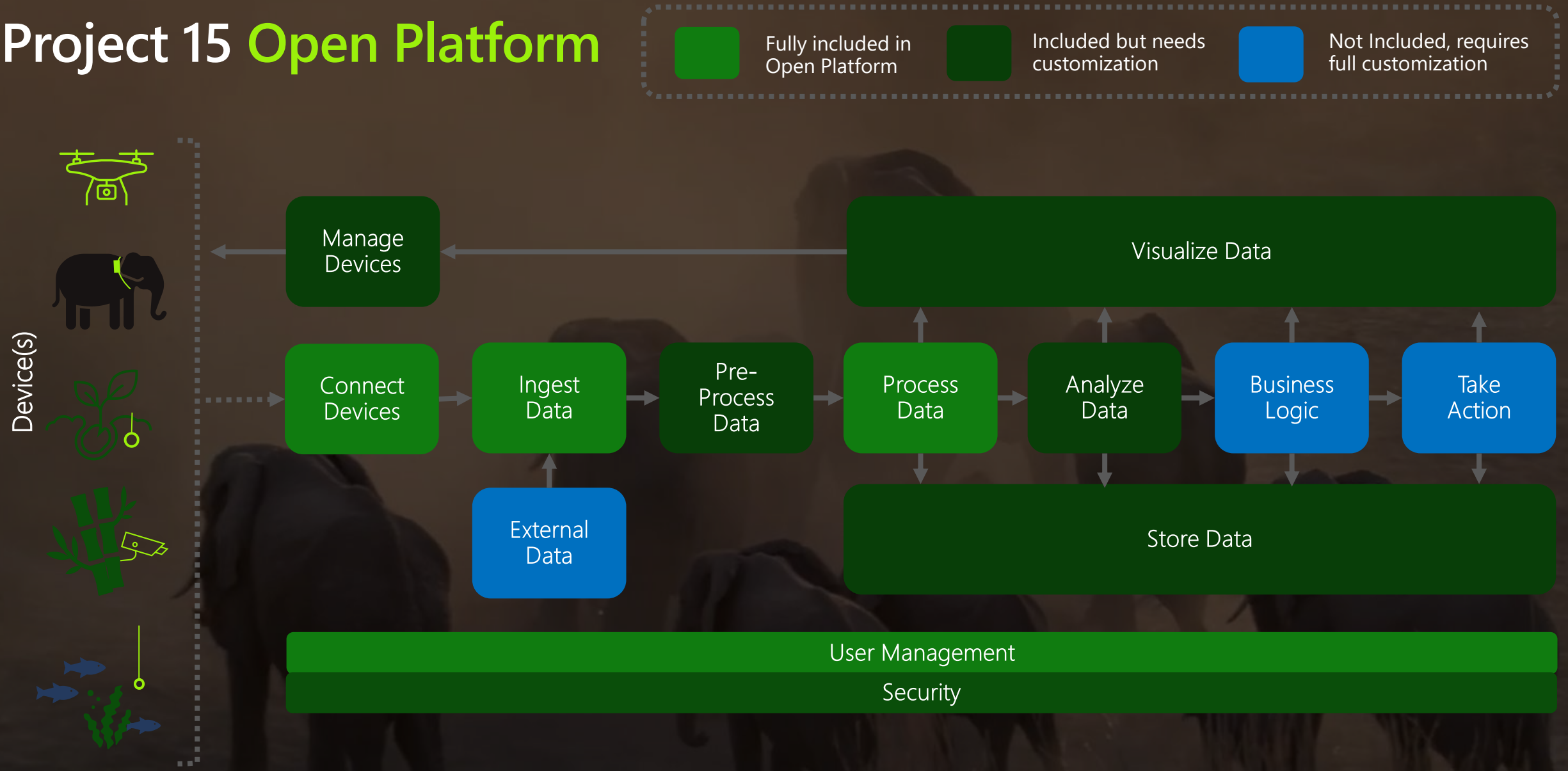
Microsoft

Would you like to learn how to assemble a car?

Or, just jump in and start driving to your destination?

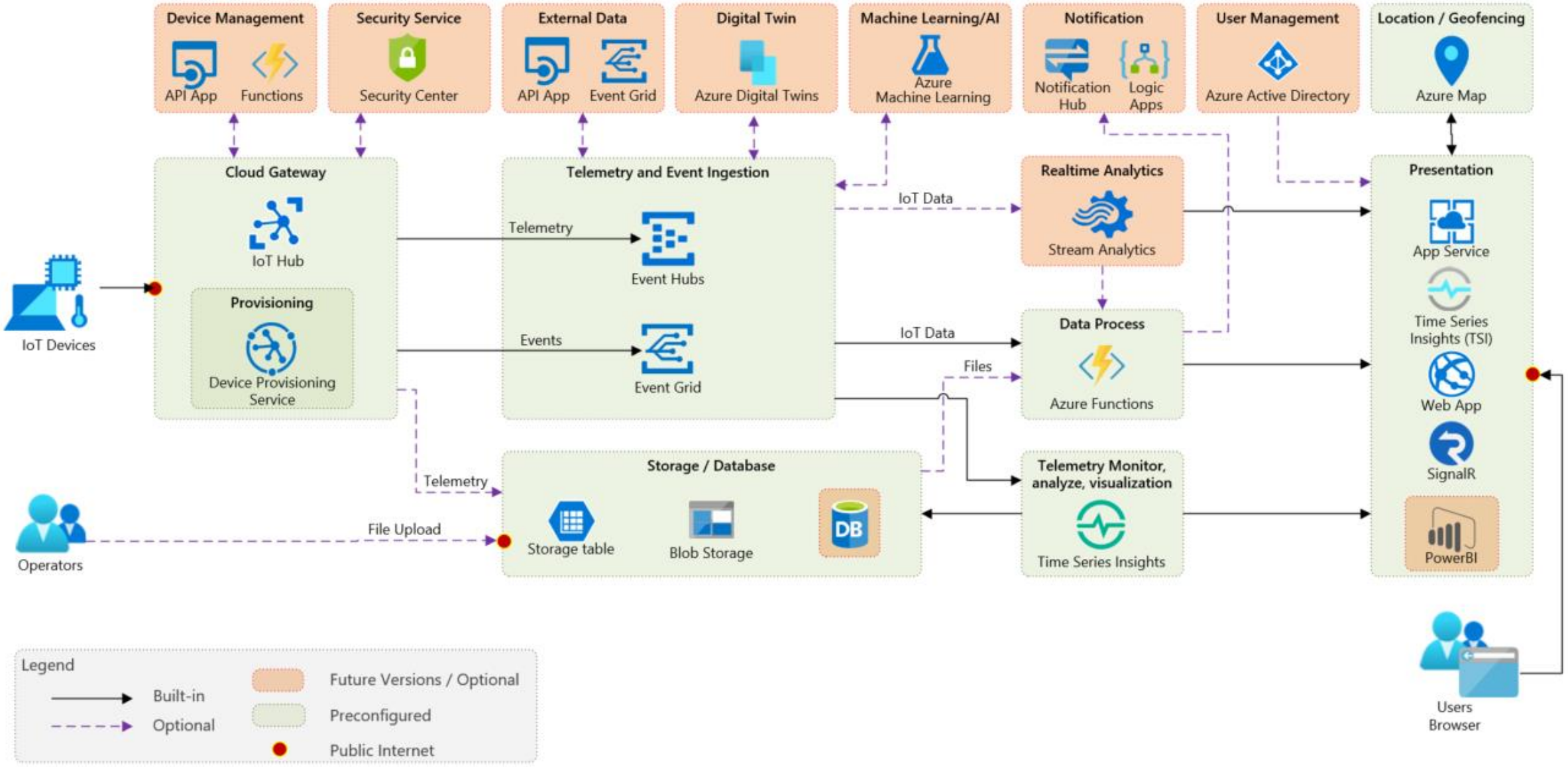


Project 15 Open Platform



Project 15 Open Platform

Microsoft



Microsoft

The Project 15 Challenge

@ UNIVERSITY OF OXFORD

Microsoft

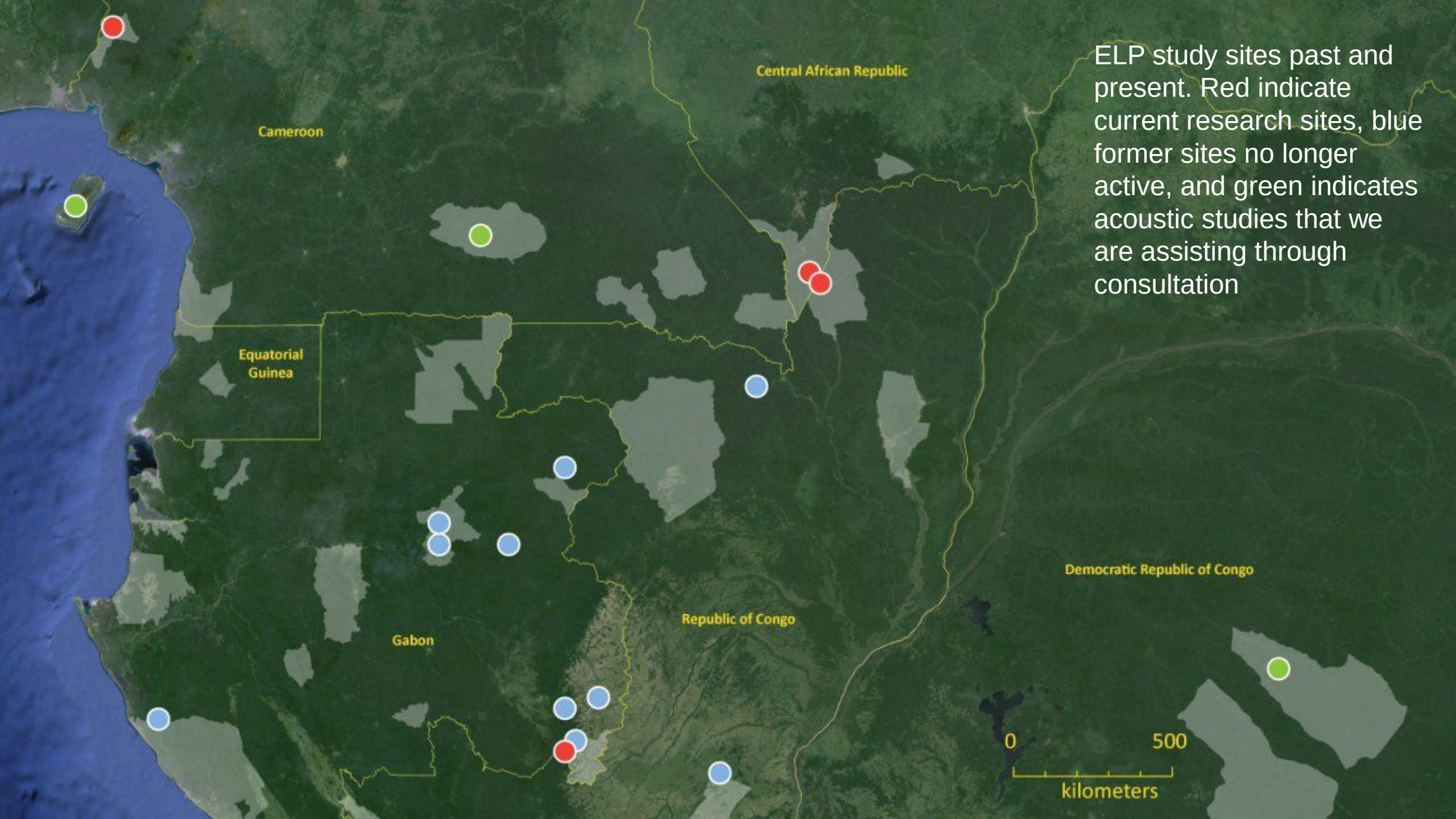
What is the Project 15 Challenge?

Cornell University

ELEPHANT
LISTENING
PROJECT

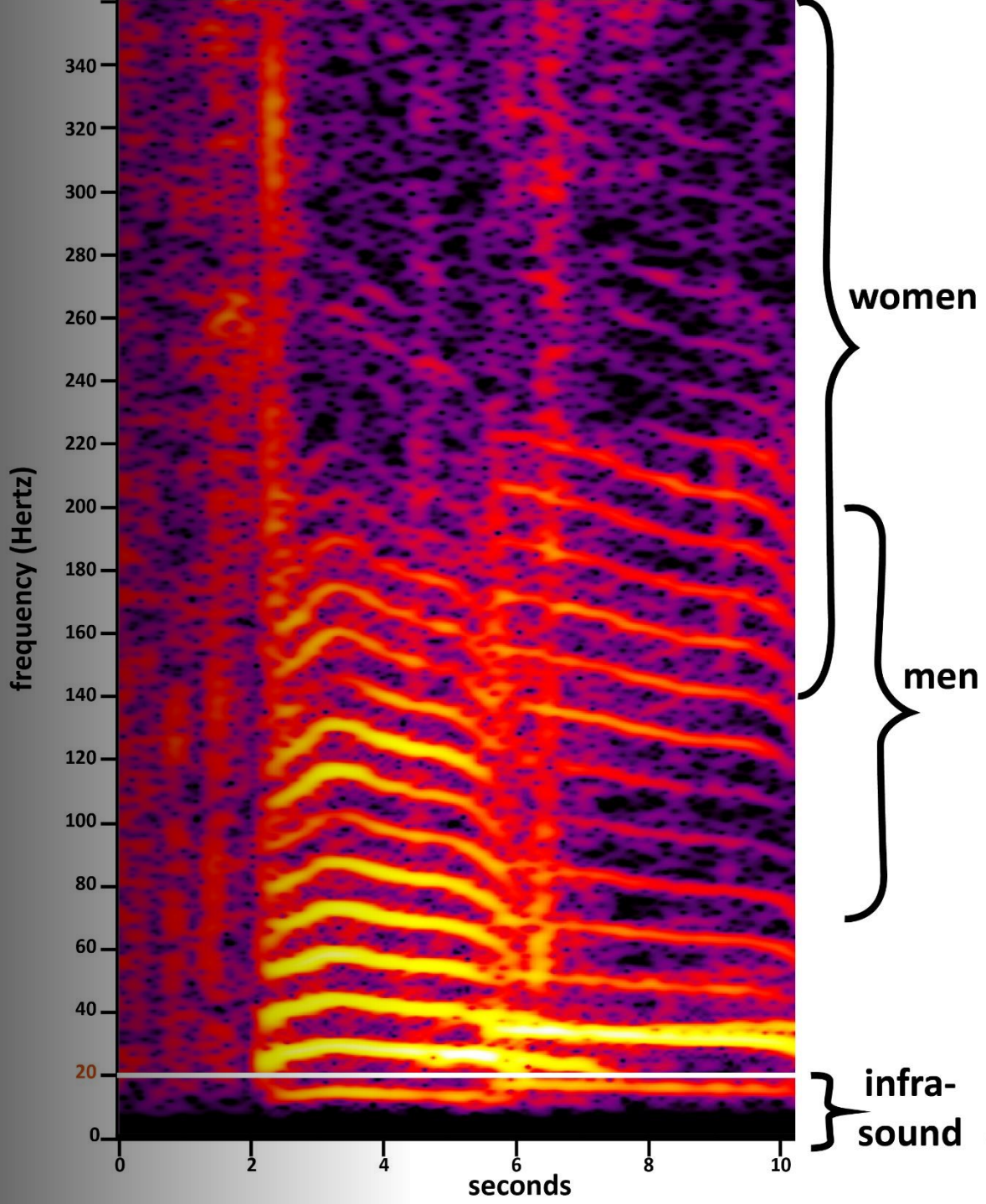
ELP Vision: *To conserve the tropical forests of Africa through acoustic monitoring, sound science, and education, focusing on* ***forest elephants.***

Elephant Listening Project



ELP study sites past and present. Red indicate current research sites, blue former sites no longer active, and green indicates acoustic studies that we are assisting through consultation

Infrasound


frequency (Hertz)
340
320
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
0
2
4
6
8
10
seconds
women
men
infra-
sound

Use Cases from ELP

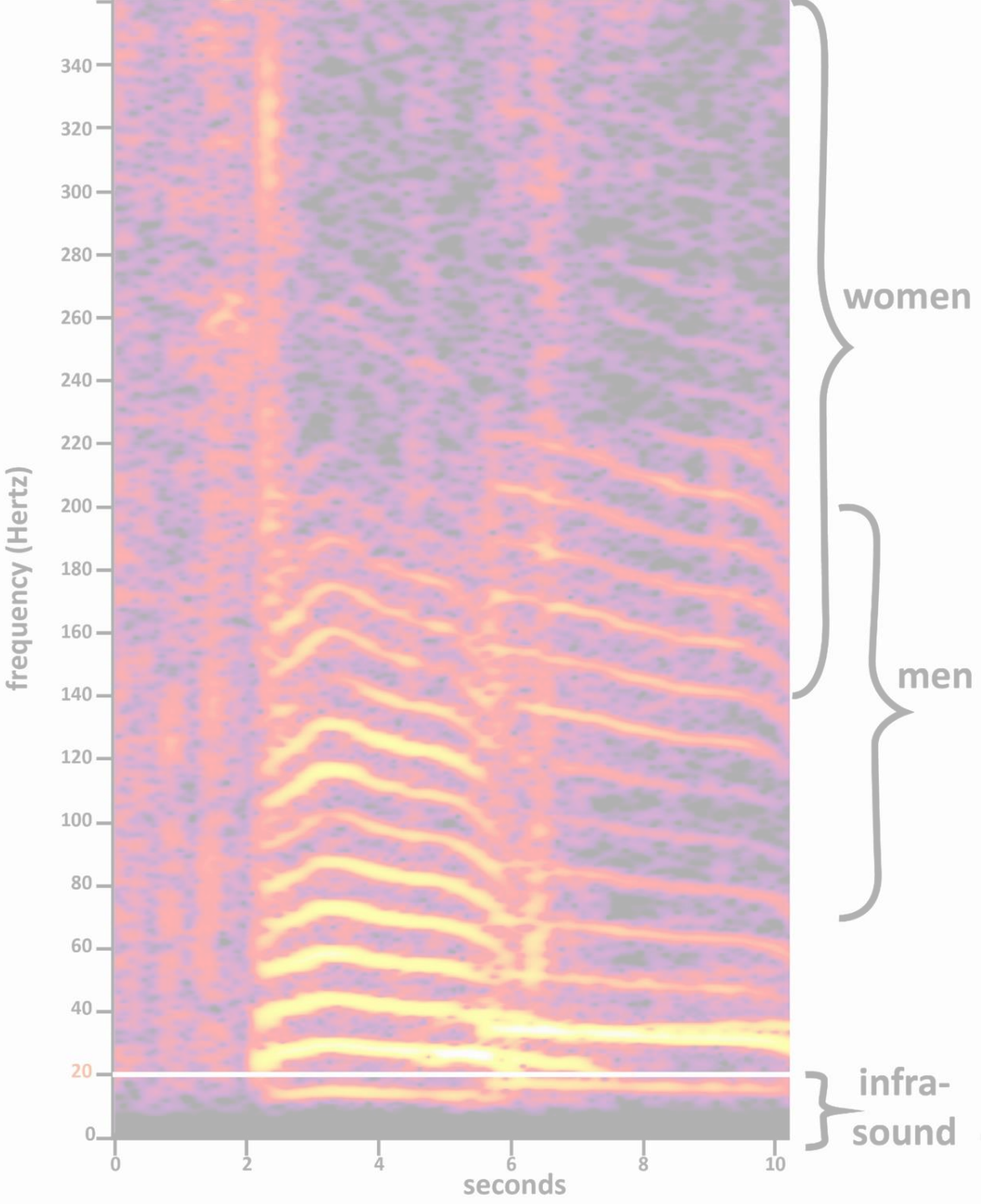
Determining demographics

Gunshot detection

Determining if more than one animal's call

Out of grid detection

Verify calls in spectrograms



Project 15 Open Platform

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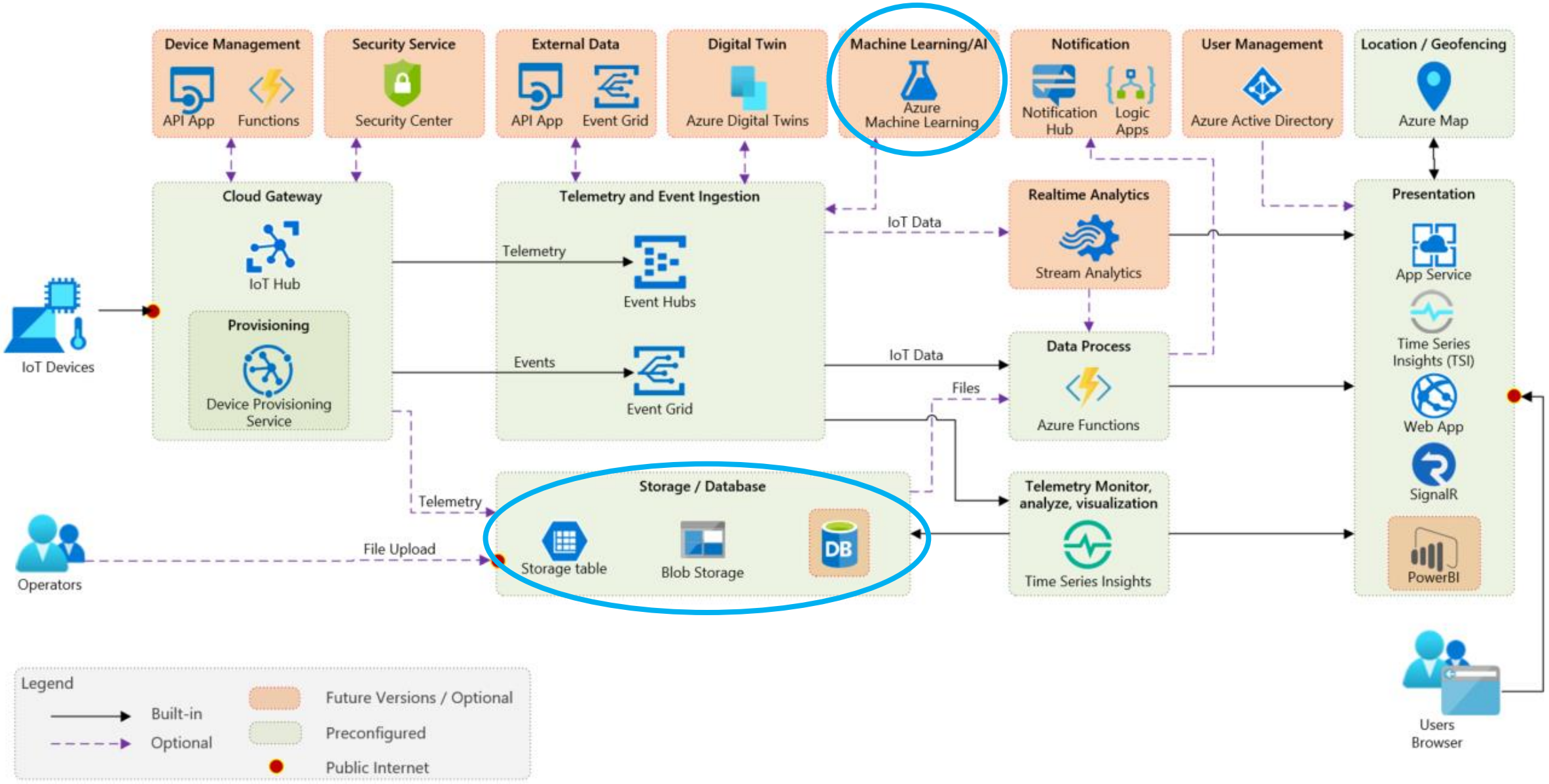
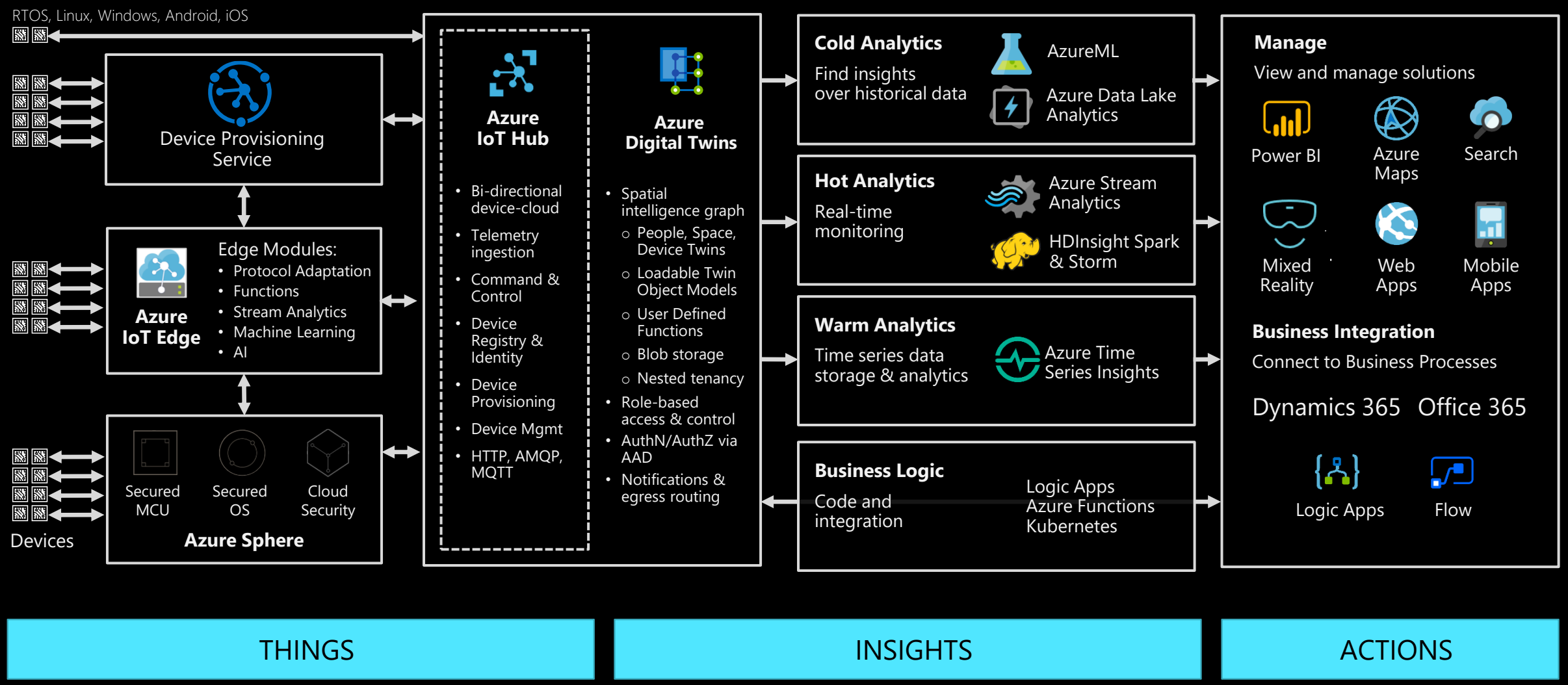


Azure IoT End-to-End Platform



Microsoft Certified: Azure IoT Developer Specialty

Exam AZ-220: Microsoft Azure IoT Developer

#gettingStarted

Microsoft Learn

aka.ms/learn

Timeline Dates

December 15th – Project 15 Challenge Lecture

February 9th – Project Submissions Completed

February 16th – Winners Guest Blog on http://aka.ms/faculty showcasing the best capstone projects

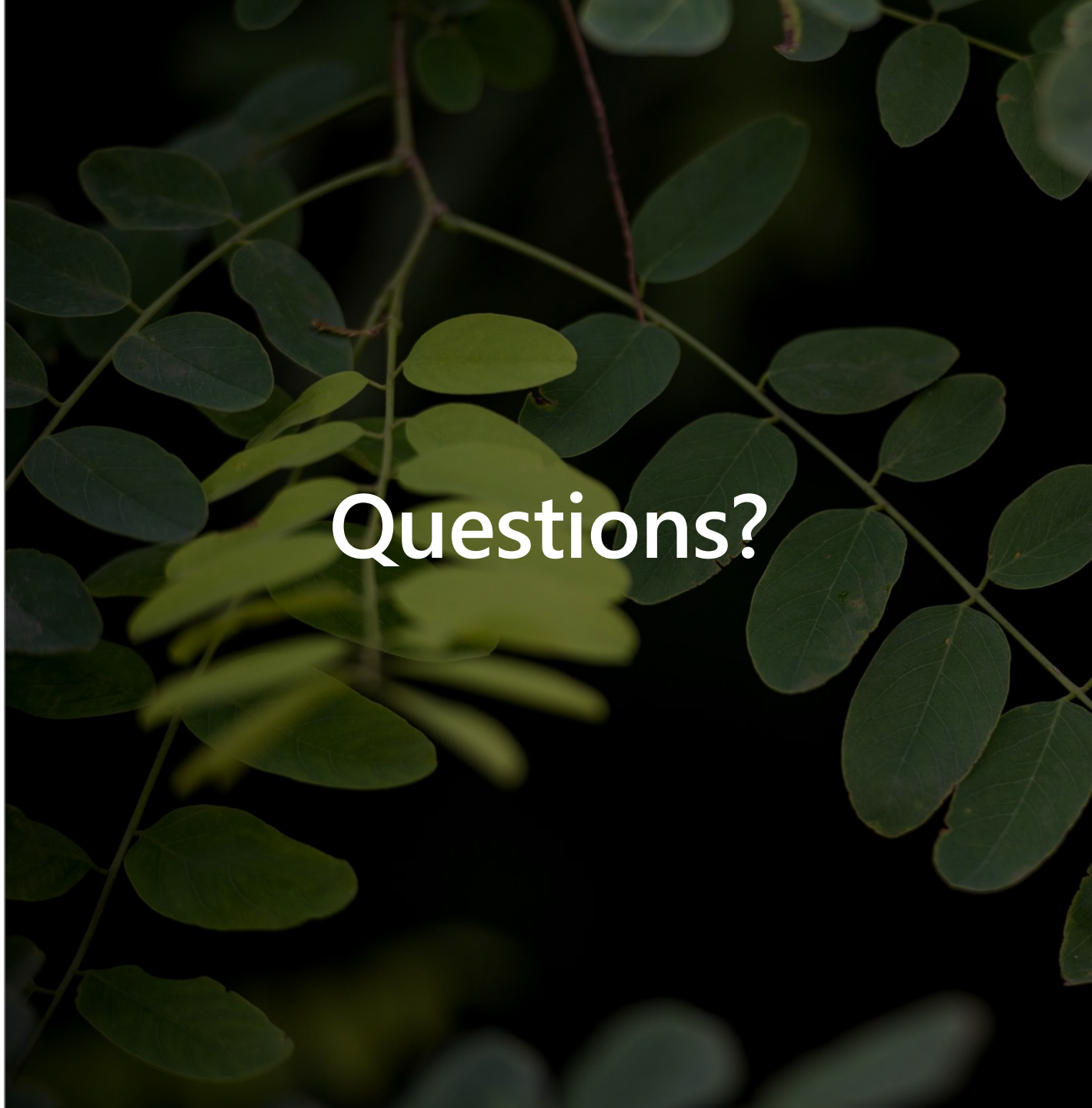
February 16th to March 2nd – Start on AZ-220 Certification

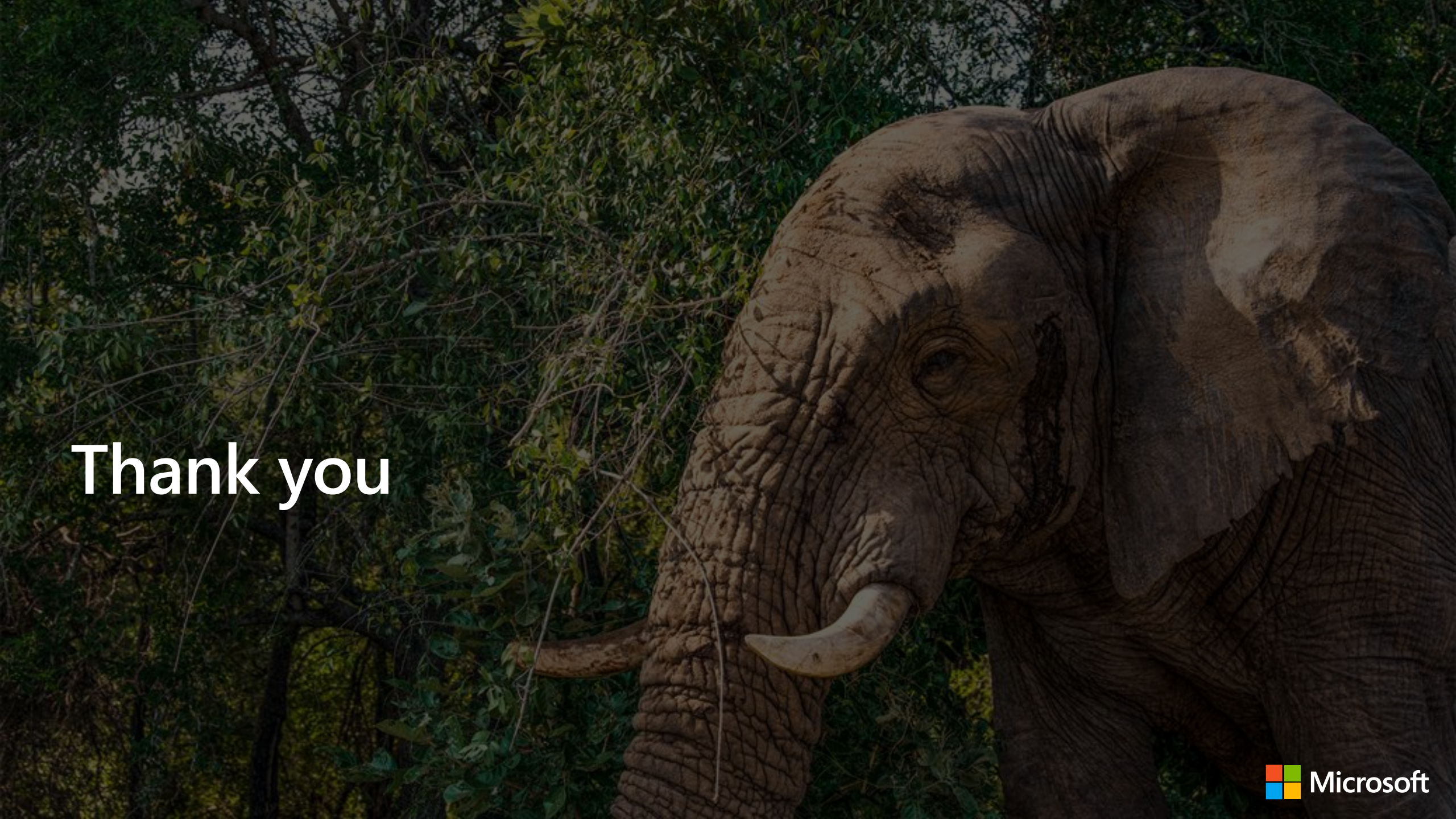
April 2nd – Deadline to book and take AZ-220 Certification

Learn more at
http://aka.ms/project15

Access the documentation and code
http://aka.ms/project15code

Reach out if you need help
project15@microsoft.com





Thank you

Microsoft

Appendix

Microsoft

Project 15
From Microsoft

We are out of time. Planet Earth is on the verge of a mass-extinction and catastrophic habitat loss. We must act now to preserve the biodiversity and natural spaces of our home.

Open Platform

Open source software designed and built by Microsoft to connect to the cloud, manage and secure devices used in conservation projects.

Mission

Empower scientists and conservationists around the world to capture and analyze the data they need to preserve critical species and ecosystems.

Approach

Pair our community of developers, students and partners with conservation teams around the world, backed with the power of the Microsoft cloud and our IoT Open Platform.

Learn More

aka.ms/project15

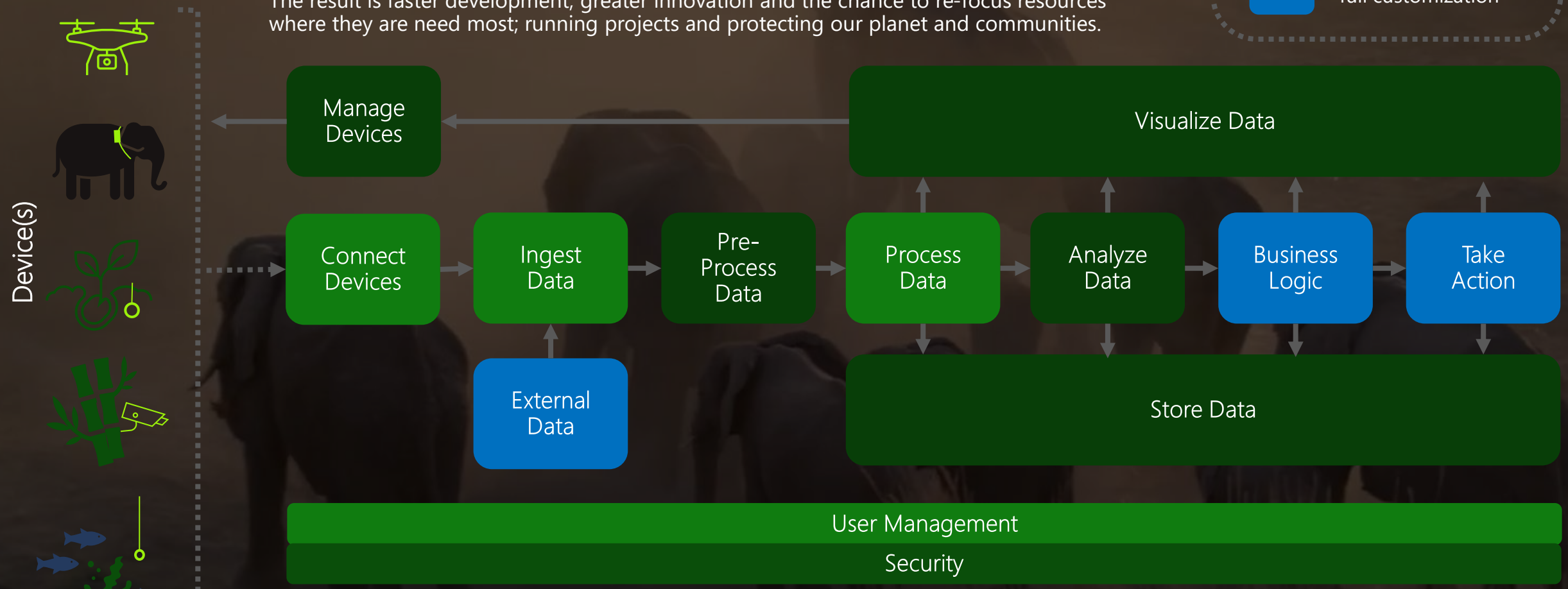
project15@microsoft.com

Microsoft

Project 15 from Microsoft Open Platform

Many conservation teams are skilled at using and interpreting the data they need to study and preserve species and habitat but can run into challenges when it comes to getting the data. Whether they are using tracking collars, cameras, drones or any other device to gather data, they have the common need of getting that data to a place to store, analyze and use it to build insights and ultimately act on those insights. Unfortunately, creating a solution to do this can be costly, time-consuming and complicated. The Project 15 open platform is open source software designed to provide ~80% of the solution these teams need with a simple push of a button. The graphic below details the parts of a solution provided by the accelerator and which will need partial or full customization by the project team or external developers to complete. The result is faster development, greater innovation and the chance to re-focus resources where they are need most; running projects and protecting our planet and communities.

- Fully included in Open Platform
- Included but needs customization
- Not Included, requires full customization



aka.ms/project15 project15@microsoft.com

Microsoft