AI in Action

A Practical Guide for the AI Era

Data Science Master – 04/27/2026

What’s your current relationship status with AI?

What's your "I'll do this someday" project?

What’s your top AI red flag 🚩?

Help us confirm we’re not talking to
AI Agents
& turn on your cameras ☺

Meet Your Speakers

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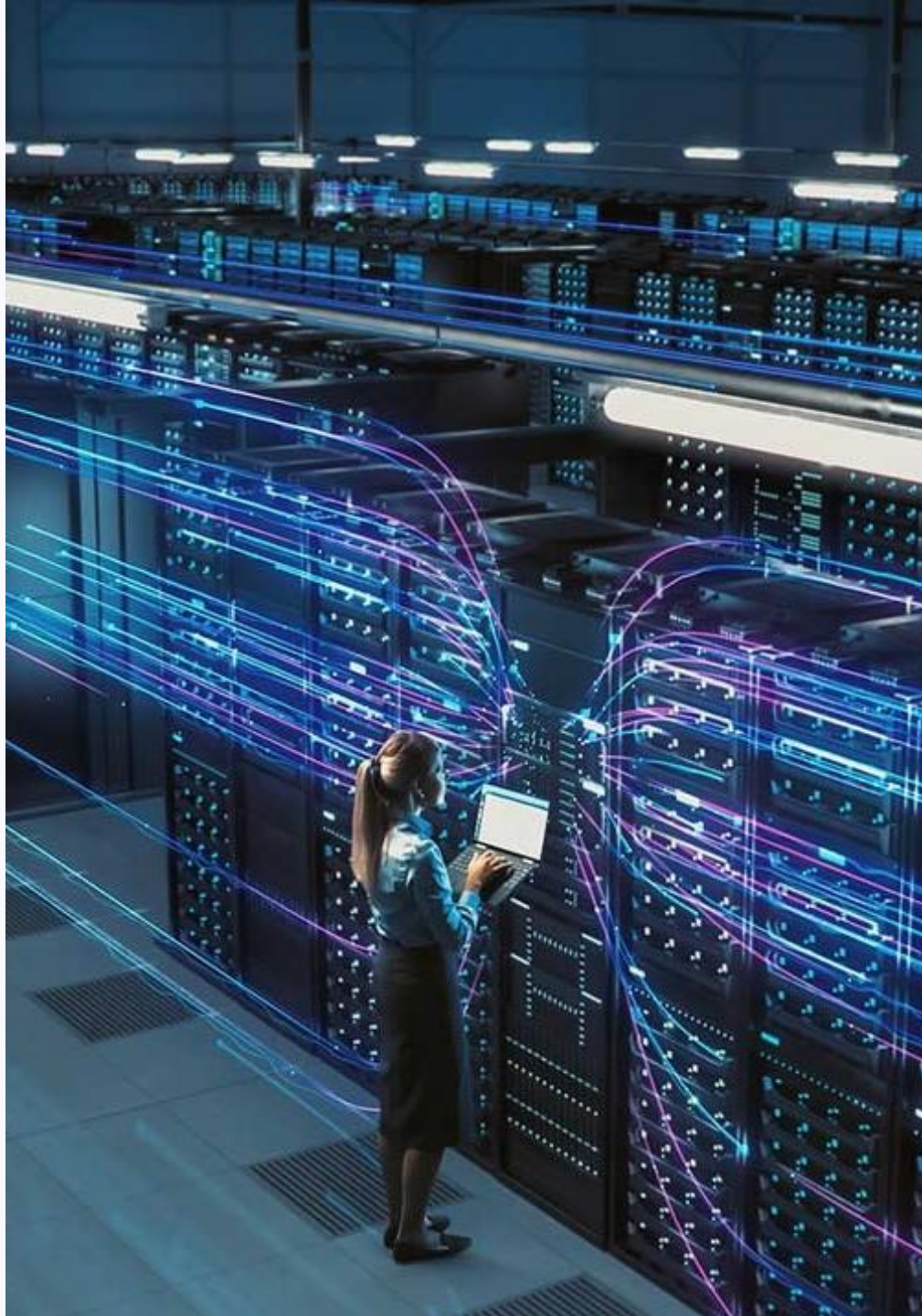
MS Datacenters

- Microsoft runs one of the largest cloud infrastructures globally
- Datacenters are football-field scale, always-on, highly secure
- Microsoft’s global fiber network could stretch to the Moon and back ~3 times
- Northern Virginia is widely recognized as the largest data center market globally. (extremely close to Washington D.C.)



World Bank

- 189 member countries — founded in 1944 to rebuild post-war economies, now the world's largest development institution
- $118.5 billion committed to partner countries in fiscal 2025 — a record year of development financing
- Helped reduce extreme poverty from 2.3 billion to 831 million people since 1990 — but progress is slowing
- RO — Romania: a member since 1972 — ~$13B received in financing over 5 decades, and now a contributor to IDA, the Bank's fund for poorer countries

Agenda

1. Intro
2. Theory
3. Practice
4. Real-world Examples

The Future of Work is Already Here

This is no longer early-adopter territory -- it's mainstream.

75%

of knowledge workers use AI at work regularly

Microsoft Work Trend Index

78%

of companies using AI in at least one function

Feedough, 2025

82%

of employees using GenAI weekly

Wharton AI Report

87%

adoption at orgs with 10K+ employees

Second Talent, 2026

Addressing the Elephant in The Room

++

Employment Level in Tech

~-3%

Growth Rate of Tech Jobs
Now vs. Pre-GPT

US Only; Federal Reserve Study

The AI Gender Gap

Left unchecked, gaps compound into lost skills, less visibility, and slower career growth

Adoption and Productivity Gap

- Women **20%** less likely to use GenAI tools globally
- **33%** of women vs **44%** of men adopted GenAI in the US
- Male researchers' productivity increased **6.4%** more after ChatGPT
- **29%** of female-dominated jobs exposed to GenAI vs **16%** male-dominated

Recognition and Support Gap

- Men **27%** more likely to be praised for using AI at work
- Men **23%** more likely to be encouraged by managers to use AI
- Women **10%** less likely to report efficiency gains from AI
- Women were **29%** more likely to question AI accuracy -- critical thinking is an asset

> *"The gap is closable. **You are the ones in control.** "*

Small AI

Big impact, small footprint.

Small AI

Affordable, accessible, context-specific

> *"Smaller datasets. Runs on everyday smartphones or laptops. Tailored to immediate, local challenges.* ***Across agriculture, health, and education, Small AI is already delivering tangible solutions.***
>
> — Sangbu Kim & Christine Z. Qiang, World Bank Voices Blog, September 2025

Affordable

Small datasets. Commodity hardware. Cost measured in dollars per user, not millions.

Accessible

Works offline. Works on the phones people actually have. Works in low-connectivity places.

Context-specific

Tailored for one problem in one place. Beats general-purpose models on niche tasks and under-resourced languages.

What's actually different?

Big AI and Small AI, side by side

BIG AI		SMALL AI	
Size	~2 trillion parameters	**Size**	1–10 billion parameters
Hardware	Datacenters, thousands of GPUs	**Hardware**	A phone, a laptop, a single GPU
Cost	$100M+ to train, cents per query	**Cost**	Cheap to fine-tune, fractions of a cent
Deployment	Online service, far away	**Deployment**	On-device, on-prem, in-country
Best for	Open-ended reasoning, novel tasks	**Best for**	Narrow, high-volume, well-defined tasks

These are different tools. *The question isn't which is better, it's which one fits your problem.*

Why now

Three shifts converging in 2026

01 Big AI capability becomes Small AI capability very fast

Today's small open models match what was state-of-the-art two years ago. The cutting edge keeps moving up — but the floor rises faster. What was premium yesterday is commodity today.

02 Sovereignty and connectivity pressures

Governments, schools, hospitals increasingly want models that don't send data abroad — and many places can't depend on reliable cloud connectivity. That favors models you can deploy and run yourself.

03 Specialization beats generality

For narrow, high-volume tasks, a small model trained on the right data wins on cost, speed, and often accuracy. The future is many specialized models, not one giant general one.

Net result: *Small AI isn't a downgrade from Big AI. It's a different tool that the world increasingly needs.*

Where it's working today

Three examples from the field

EDUCATION · GHANA

Rori

AI math tutor over WhatsApp

$5

per student per year

- Trained on 500 micro-lessons
- Delivered via messaging — no app install
- Learning gains equal to one extra year of schooling

rori.ai · Rising Academies

AGRICULTURE · KENYA

Nuru

Crop disease diagnosis, offline

0

internet required

- Farmer photographs a diseased leaf
- AI runs on the phone, not the cloud
- Diagnosis + treatment advice in seconds

PlantVillage Nuru · Penn State

HEALTH · PERU

Voice care

Health screening in indigenous languages

40+

languages including Quechua, Aymara

- Voice-based screening in local languages
- Specialized models beat general ones here
- Builds community trust in healthcare

World Bank Voices, Sept 2025

Rori

AI math tutor on WhatsApp — proving that Small AI beats expensive AI when economics force the design.

- Delivered as a WhatsApp chat — no app install, no app store, runs on a $30 phone
- Trained against a curated set of 500 micro-lessons aligned to local curriculum
- Learning gains equivalent to one extra year of schooling in randomized trials
- $5 per student per year — orders of magnitude below what big-AI services can deliver
- Currently scaling across Ghana with the Rising Academies network

Source: ***rori.ai*** *· Rising Academies Network · Karpos Learning*

THE NUMBERS

$5

per student per year

500

micro-lessons in the curriculum

+1 yr

of additional learning

October 2025: A new partnership

Google + World Bank — and the lines blur

BIG-SIDE INGREDIENTS

- Google's most powerful AI models
- Cloud infrastructure at planetary scale
- Capability of the most advanced research

SMALL-SIDE PATTERNS

- Works in 40+ languages, even on basic feature phones
- Built as public infrastructure, not a product
- Proven first with smallholder farmers in Uttar Pradesh

The interesting question isn't "big or small." *It's which pieces fit which problem — and who gets to decide.*

Sources: ***Google Cloud Newsroom · World Bank press release*** *· October 2025*

Lessons from the frontlines

Four principles for Small AI that actually works

01

Hyper-local problems

One specific crop disease. One health condition. One curriculum. Narrow scope is a feature.

02

Build on what exists

Farmer registries. WhatsApp. Community health workers. National IDs. Don't replace infrastructure — extend it.

03

Mobile-first, offline-capable

The smartphone is the computer. Connectivity is intermittent. Design for that as the default, not the exception.

04

Public-private partnerships

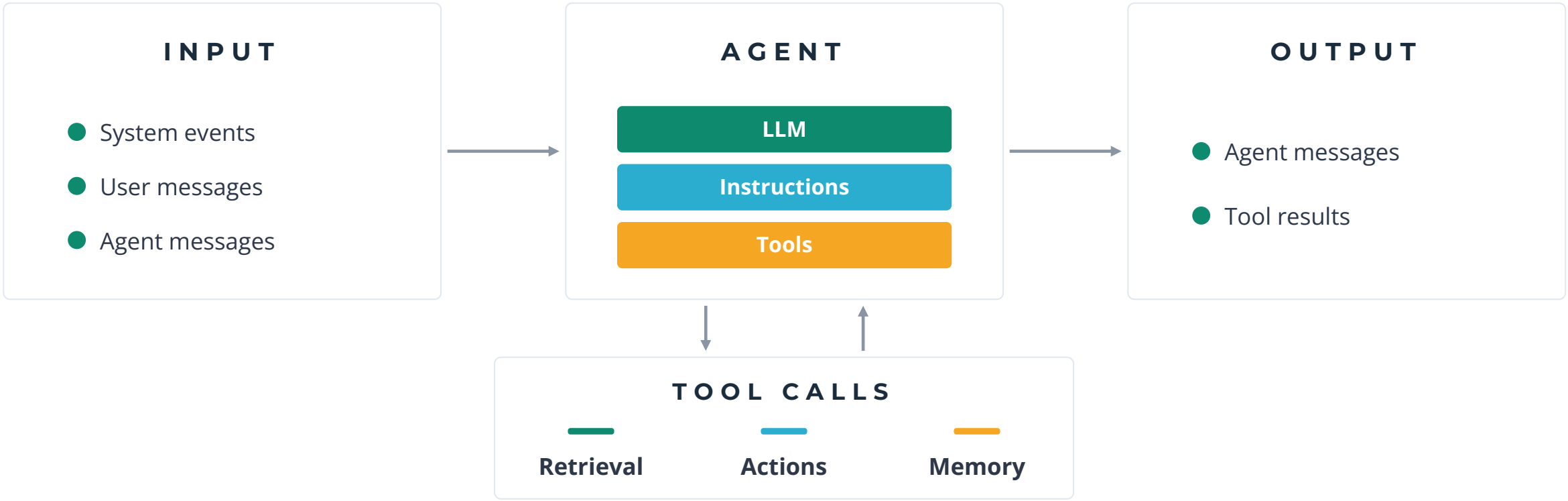
Governments provide platforms. Private sector innovates. Communities shape what works on the ground.

FURTHER READING

World Bank Voices Blog — "Small AI, Big Impact" (Kim & Qiang, Sept 2025)
Google × World Bank partnership announcement (Oct 2025) — Google Cloud Newsroom
World Bank AI Readiness Assessment Methodology — openknowledge.worldbank.org

What is an agent?

Anatomy of one



An agent isn't a smarter model. *It's a model with instructions, tools, and a loop.*

The spectrum

From single answers to coordinated systems

STEP 01

No agent

Question in, answer out

The simple case. One model call, one response. No tools, no loops.

EXAMPLE

Summarize this document.

STEP 02

Single agent

One model with tools and a loop

The model decides what to do, uses tools, checks the result, tries again until it gets there.

EXAMPLE

Research this topic and cite sources.

STEP 03

Multi-agent

Several specialists working together

One agent plans. Others execute specific parts. One reviews. Each is good at one thing.

EXAMPLE

Process an insurance claim end-to-end.

Each step adds capability — *and multiplies the number of model calls per task.*

Why agents need Small AI

More steps = more model calls = different economics

ONE QUESTION

1

model call

Traditional chat. The model answers, you read it. One round-trip per interaction.

ONE AGENT TASK

10–100

model calls

An agent looking things up, planning, retrying, checking. Routine for any production agent.

ONE MULTI-AGENT WORKFLOW

1,000+

model calls

Multiple agents coordinating, each making sub-decisions. Common in serious production deployments.

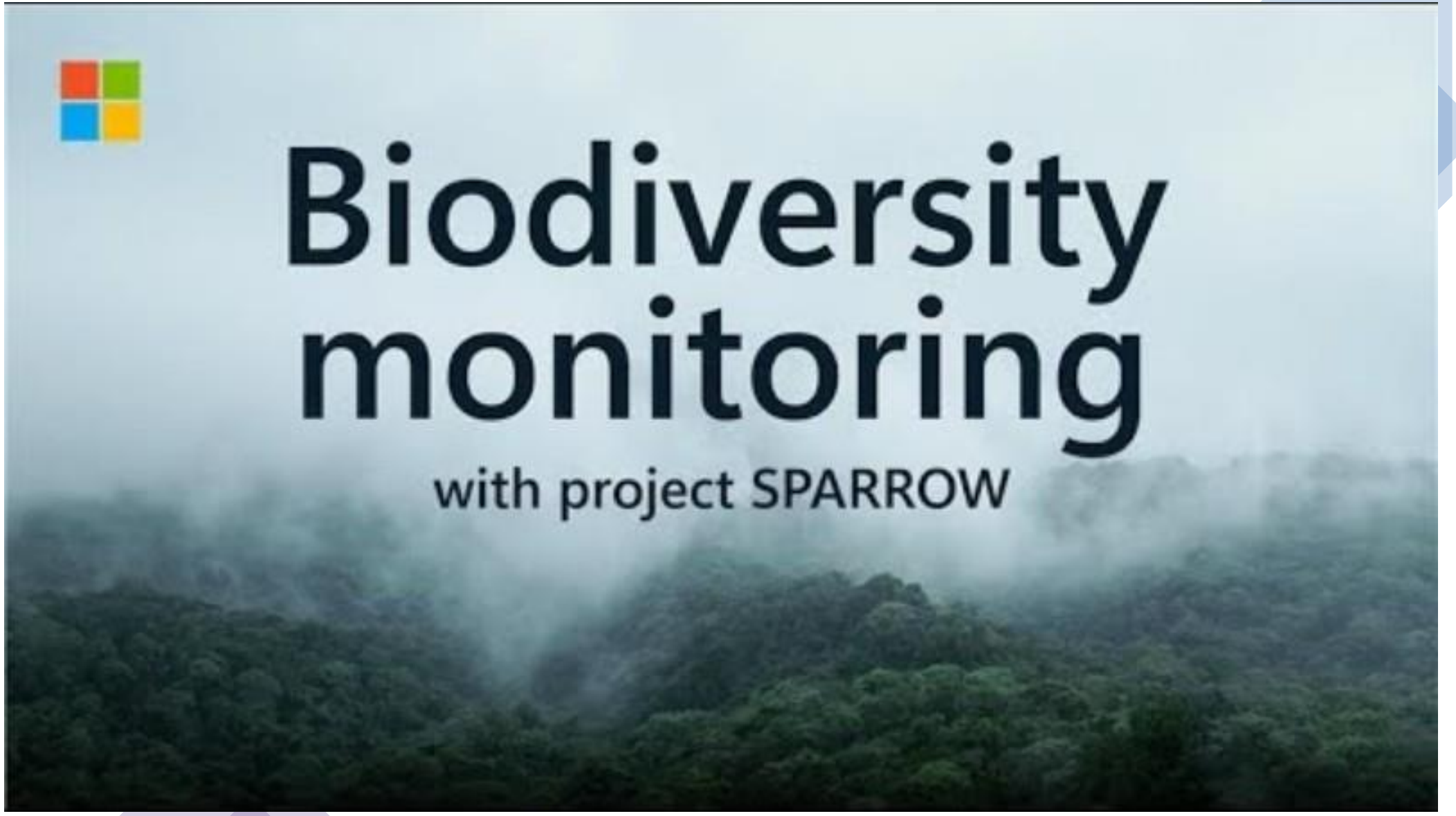
THE ECONOMICS DON'T LIE

If a single user task costs $0.10 in big-AI calls, **an agent task costs $1–$10.** A multi-agent workflow costs $10+.
At any real population scale, that math doesn't close — unless most of the calls go to small models.

Project Sparrow

Solar-powered AI monitoring Earth's biodiversity from the most remote places on the planet

- AI-powered edge device collecting biodiversity data autonomously in remote environments
- Vertebrate species populations declined ~70% since 1970
- Solar-powered sensors + on-device AI + satellite uplink to cloud
- Fully open-sourced blueprints and code
- **18,000+** researchers rely on Microsoft AI for Good wildlife tools


Biodiversity
monitoring
with project SPARROW

Seeing AI App

Turning the visual world into an audible experience for blind and low-vision users

- Free app using Azure AI to narrate surroundings through a smartphone camera
- Created by Saqib Shaikh, who lost his sight at age seven
- Reads text, scans documents, identifies products, recognizes faces, describes scenes
- Available in 36 languages on iOS and Android, reaching 3B+ Android users

Neural Voices for ALS

Preserving identity through Custom Neural Voice -- capturing intonation, tone, and emotion

- Custom Neural Voice (CNV) lets people create a synthetic voice that sounds like them
- CNV Lite: 20-50 recordings, voice ready in under an hour

> *"You took him home, Charlie" -- wife of former radio DJ who spoke again through CNV*

Reflections from our Journey

- Use AI like a co-pilot, not a cult leader.
- A lot of people are still outside the AI bubble. Invite them in.
- If you have an idea, now is the best time to build it.
- Networking is not cringe. It is infrastructure.
- Your university has more hidden loot than you think. (Erasmus, UBB & US Career Insights , Volunteering groups)
- Durable skills are the real long-term investment. (Communication, critical thinking, adaptability, collaboration, resilience, learning agility, and leadership)
- Do not let a company decide your worth.

Thank you!

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