

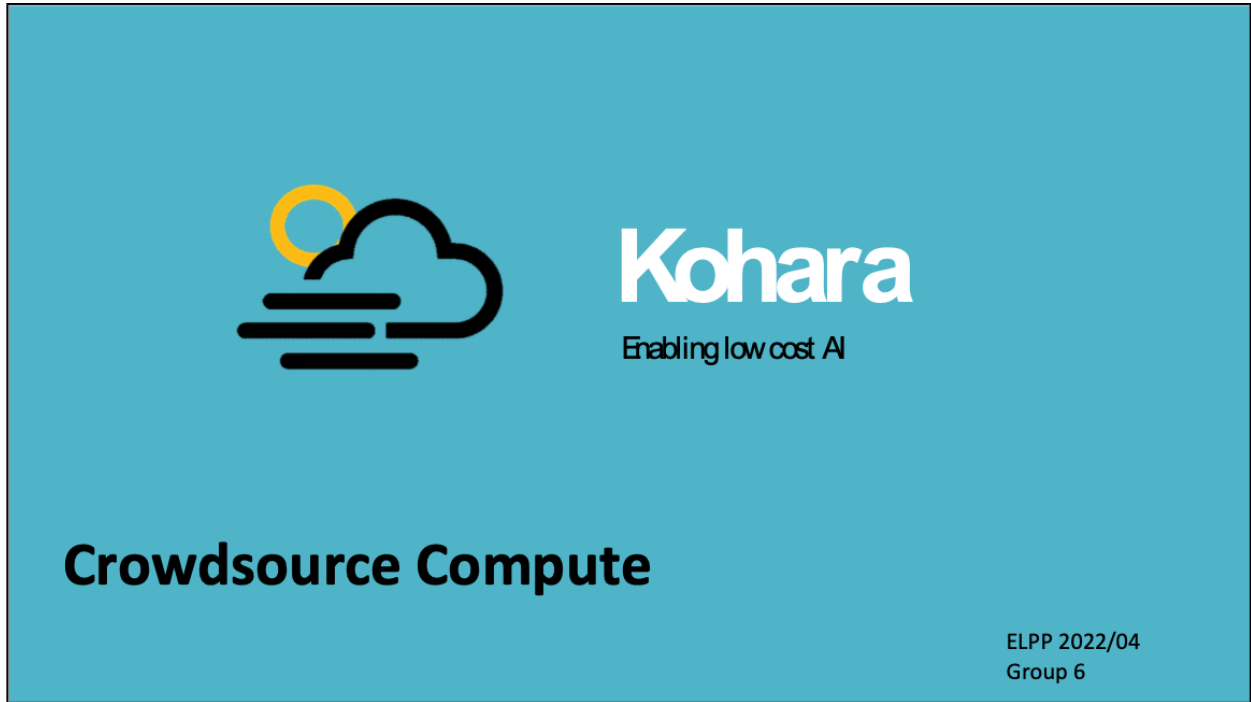
Kohara

ENABLING LOW COST AI

TEAM 6 – NATE LEE, ALEX GUAN, JOHN HOANG, MAUREEN BREILING, GABRIEL LIMA, & ANDREW KOMROSKI

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Introduction



Kohara is a company that enables low cost AI for small and medium businesses. We do this by crowdsourcing compute from smartphones. Think of AirBnB but with smartphones.

Kohara mean 'Fog' in Hindi (pronounced ko-HAH-Arrah - all soft a's and rolling the r's). We're not working in the cloud, but "The Fog" of the Internet of Things (IoT). The combo of mobile, edge, and AI/ML creates a hyperconvergence of tech, which is now being referred to as the 4th industrial revolution.

We are an AI/ML enablement company. The company's objective is to provide additional, low-cost AI/ML compute capacity while smartphones are idle and charging.

Market Opportunity



In the past few years, AI and machine learning has given a competitive advantage to companies, especially for these large companies.

If you owned stocks in these 5 companies, you're probably not complaining. But what if you were a small and medium business?

Data is growing rapidly. Amount of IoT data will grow by 17.2x to over 135 ZETabytes by 2025. MANGA companies gather and process a massive amount of data - to the point where AI /

ML models have become a competitive advantage for these companies. This data is used by these companies to engage, analyze, and grow their customer bases in a variety of ways.

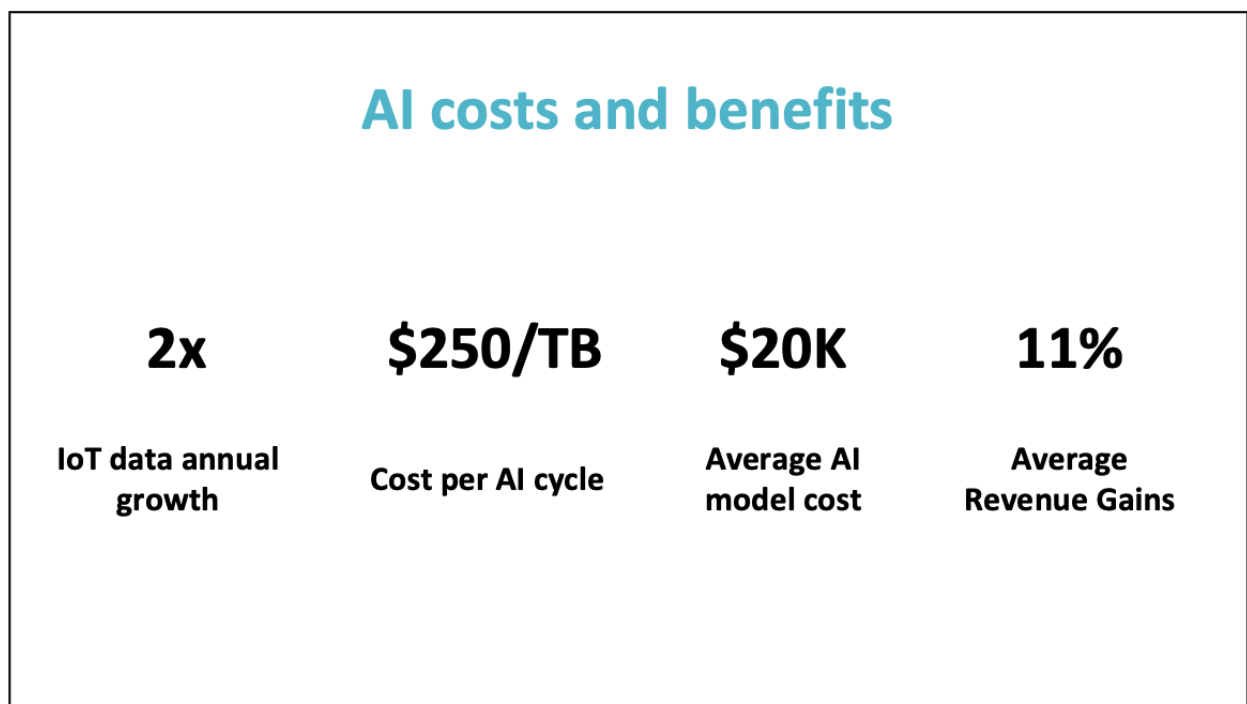
- Amazon - search / behaviors/ads
- Netflix - remember the use case? (personalization)
- Google - adwords, search training

IBM Study:

<https://www.ibm.com/thought-leadership/institute-business-value/report/ai-value-pandemic>

Berkshire Hathaway (BusinessWire) study from Comet:
<https://www.businesswire.com/news/home/20220329006049/en/Comet-Releases-New-Survey-Highlighting-AI%E2%80%99s-Latest-Challenges-Too-Much-Friction-Too-Little-ML>
Our goal is to lower the barrier for small and medium size companies to have access to AI and machine learning.

AI Cost and Benefits



Now if you're a small or medium business, you'll see that AI costs are high relative to the gains.

IoT data is growing very fast at ~2x annually.

The cost to train this data just once is \$250/TB, but typically models require multiple cycles of training with average models running \$20k. The average revenue gains are 11%. So when you're a small businesses investing in AI might seem risky relative to revenue gains. Kohara aims to lower the AI costs by adding to the current compute infrastructure. It costs \$250/TB to run an AI cycle with a cloud providers.

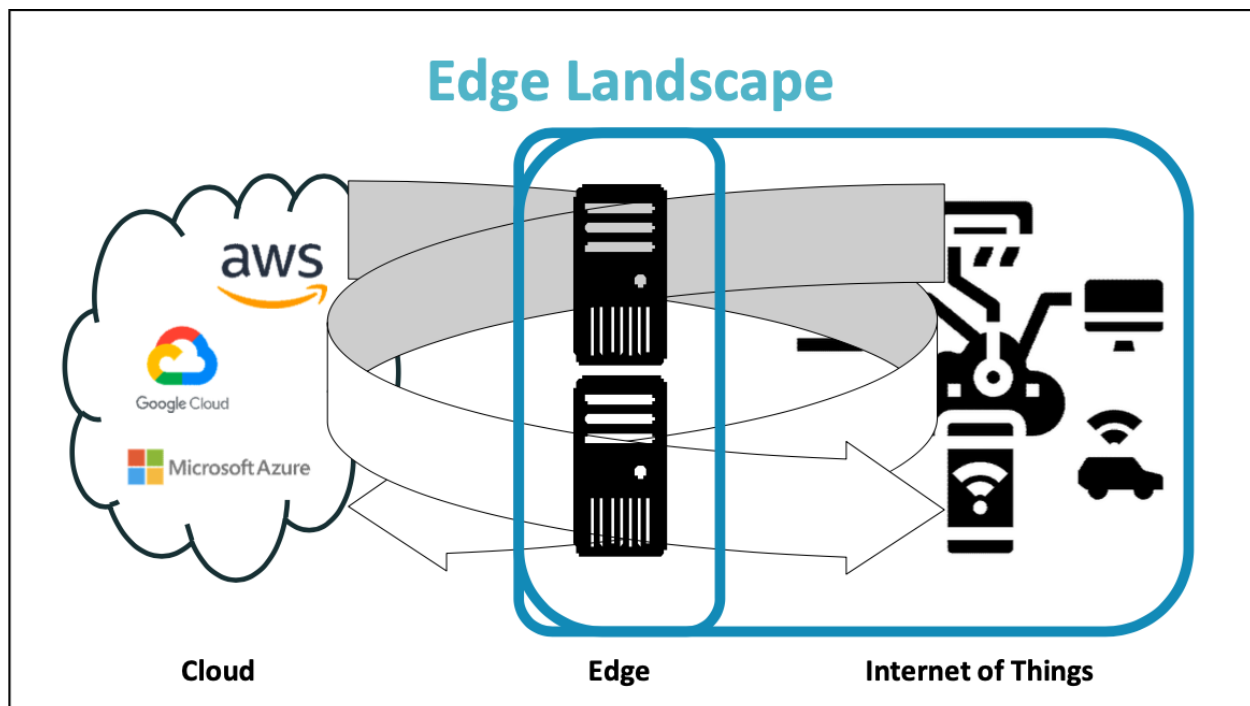
The average cost of training a single AI model is approximately \$20k for companies with experienced data scientists. Companies new to AI should expect to pay 2x-4x that amount.

However the benefits of using AI is well documented. A 2021 IBM study shows that: 85% of companies that adopted AI report operational efficiencies. 41% realized cost improvements in supply chain and production, and 39% in headcount efficiency improvements. Advanced AI adopters report an 11% average increase of direct revenue gains attributable to AI implementations. Yet, even with these benefits of utilizing AI, the costs in actually implementing AI presents a barrier of entry to SMBs.

Kohara's solution that lowers these barriers to entry.

Rev gains: IBM study - <https://www.ibm.com/thought-leadership/institute-business-value/report/ai-value-pandemic>

Edge Landscape

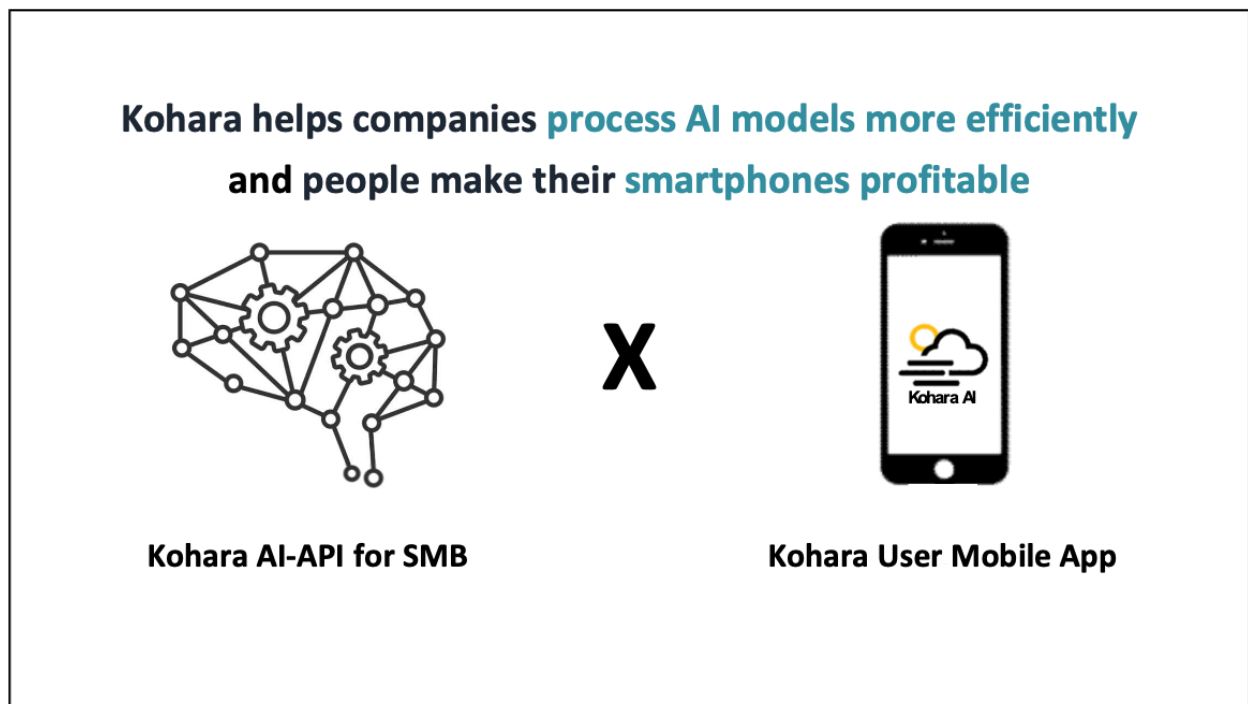


Lets start with a summary of the Edge computing landscape:

- Cloud (everyone knows about this)
- Edge servers - these are the gate / processors between the cloud and the

- Internet of things - Basically, all the smart or connected devices. Two main operations are used between these three groups
- Edge-In - consumers get info from the cloud, via Alexa, Google Home, Netflix, and most importantly - memes
- First is Cloud-out - businesses push or request info from IoT devices - traffic cameras, car telemetry, device or app updates
- Notice how both of these operations require analysis by the edge servers in the middle? This causes an expensive bottleneck in AI/ML processing and poses a barrier to entry for small and medium businesses that need to leverage edge computing. Now, what if we were able to expand this edge computing capacity by using part of the IoT?

Kohara's Multiple Benefits



Our Cloud-based Distribution Platform lets companies train AI models in a cheaper and faster way

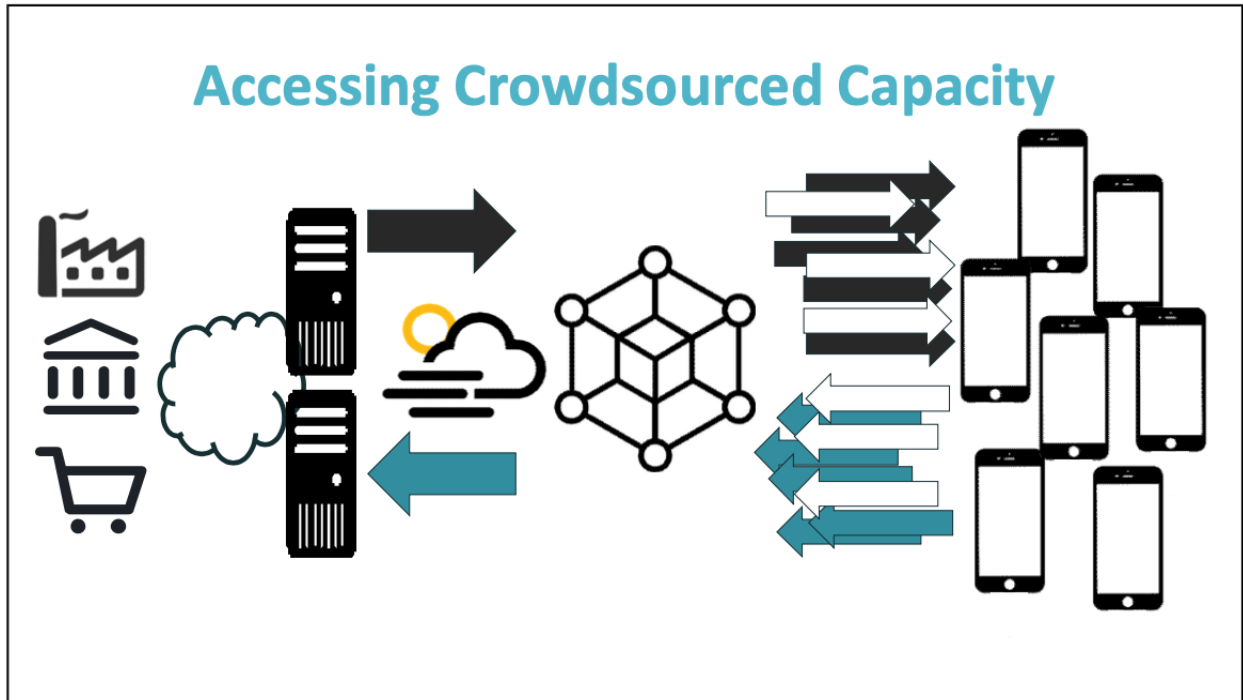
Companies can train their models and be more competitive. After all, better models mean better decisions.

Our App makes your phone available for processing data in only one click

Smartphone owners can make up to \$60 every month simply by letting their phones available every night of sleep.

How does this work?

The Power of Cloud Sourced Capacity



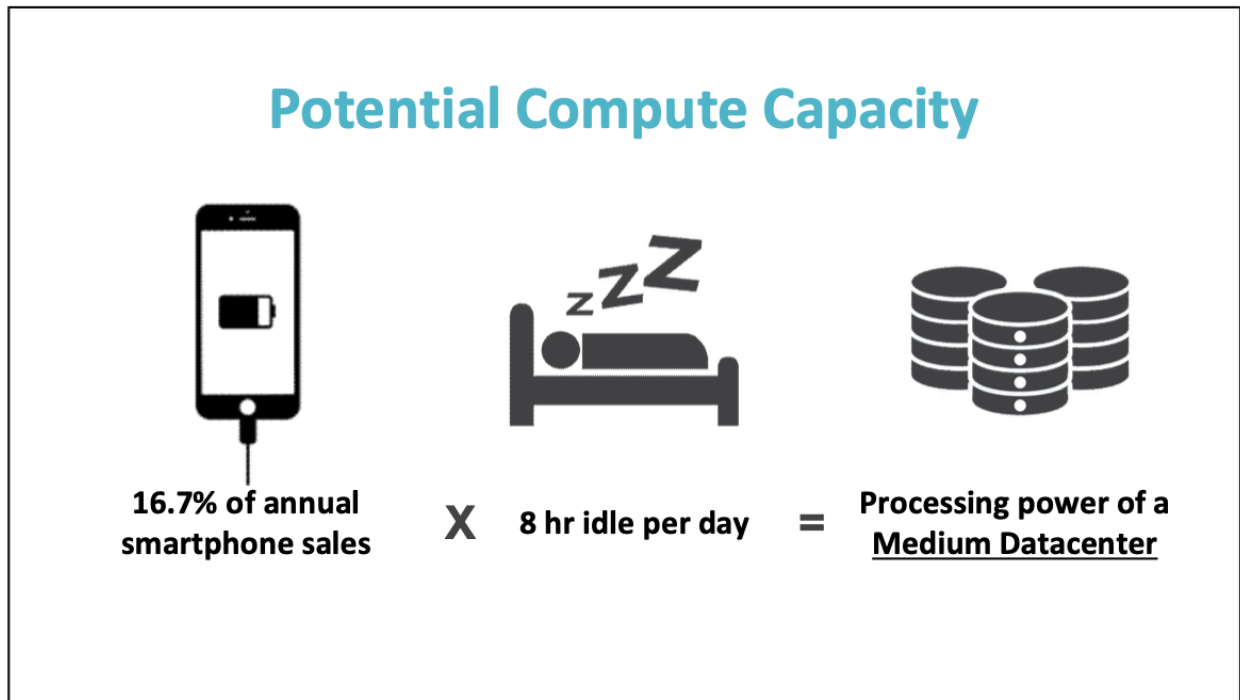
Businesses engage Kohara's APIs utilizing their current cloud and edge technologies. Kohara will leverage the secure and anonymizing packet-distribution capabilities of blockchain to utilize the compute capacity of smartphones with the Kohara app installed.

Idle smartphones add low-cost, distributed compute at the edge.

This reduces edge compute costs, while providing secure data distribution.

But how much additional capacity are we talking about here?

Potential Compute Capacity



Capturing 16.7% of annual smartphone sales is equivalent to building a medium sized data center.

*Average Sized Data Center

3870 racks x 8 GPU (high end) = 30,960 GPUs for AI/ML compute

Smart to GPU equivalent


1 GPU = 8 smartphones * 24hrs/8hrs (assuming 8 idle time) = 24 smartphones

Smartphones to achieve equivalent of 1 data center


30,960 GPUs * 24 smartphones/GPU = 743,040 smartphones (~16.7% annual smartphone sales)

Technology Exists





Old Concept - New Implementation



20 year-old technology



Folding@home
>5,000,000 CPUs/GPUs/ARM

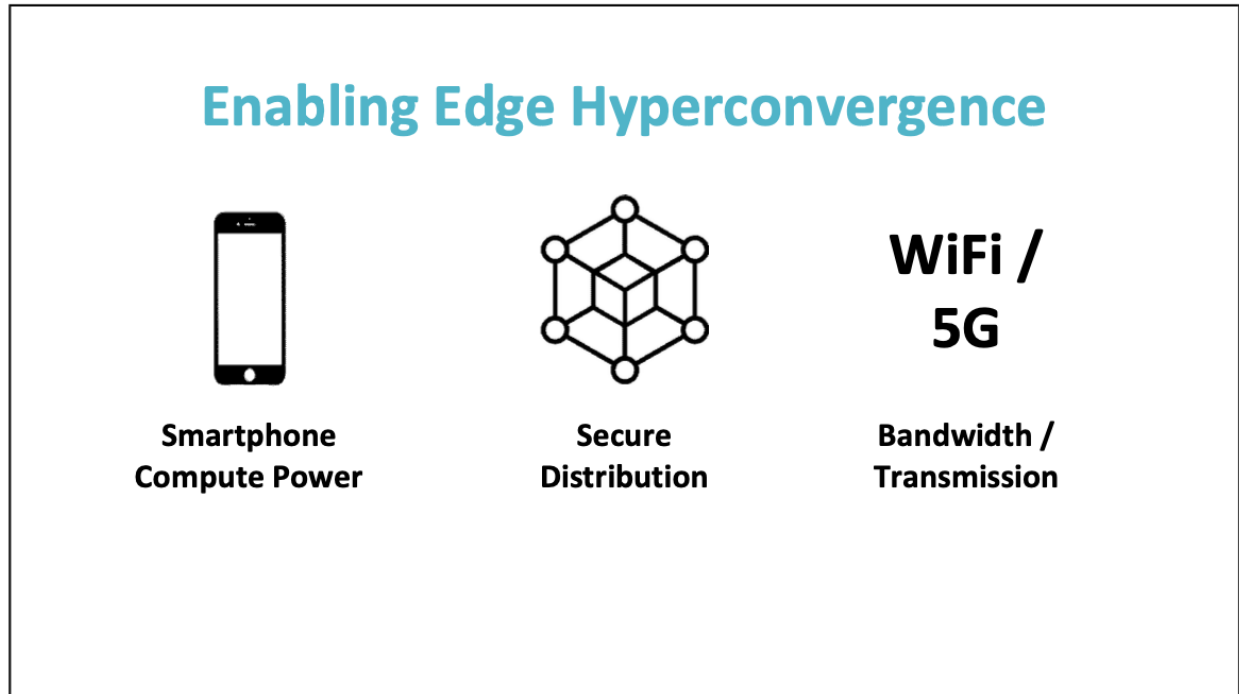


Distributed Network Computing Already Works!

Not a new idea - been around for over 20 years on desktop w/ Folding@home Reaching 2.43 ExaFLOPs in 2020. Equivalent to a supercomputer.

It never became mainstream because they were limited by the of technology of their time. What has changed?

Hyperconvergence of Technology Advances in Key Elements



1) Lack of smartphone compute power: 2017 - iPhone7 has 520Gflops on Snapdragon 820 chipset, which easily bests a 1985 Cray-2 Supercomputer with just 115 Gflops.

2) Inability to securely distribute widely across multiple mobile devices - Blockchain

- Not just for cryptoTM
- allows for encrypted and anonymized packetization of AI/ML workloads
- scalable / resilient

3) Transmission / edge bandwidth

- gigabit wireless and ultrawide-band
 - with unlimited plans, unlocks the ability to send, process, and return AI
- These solutions together are the foundation of the fourth industrial revolution.

Market Opportunity



The opportunity will only grow!

According to a 2021 Grand View Research report, the current edge market size is \$6.29B, 46.7% of edge market costs are attributed to hardware and compute capacity, which amounts to \$1.27B.

Small and medium businesses account for 20% of that edge HW market.

With a compound annual growth rate of 38.1% per year, the edge market cap will increase to \$61.14B by 2028.

With such a large potential market cap, there will be competitors in this space.

TAM

\$6.29B market cap with a 38.1% CAGR 2021-2028 \$61.14B market cap by 2028

SAM

46.7% of MEC spend is on HW(capacity), 44% of MEC market in US
\$1.27B addressable market in 2021

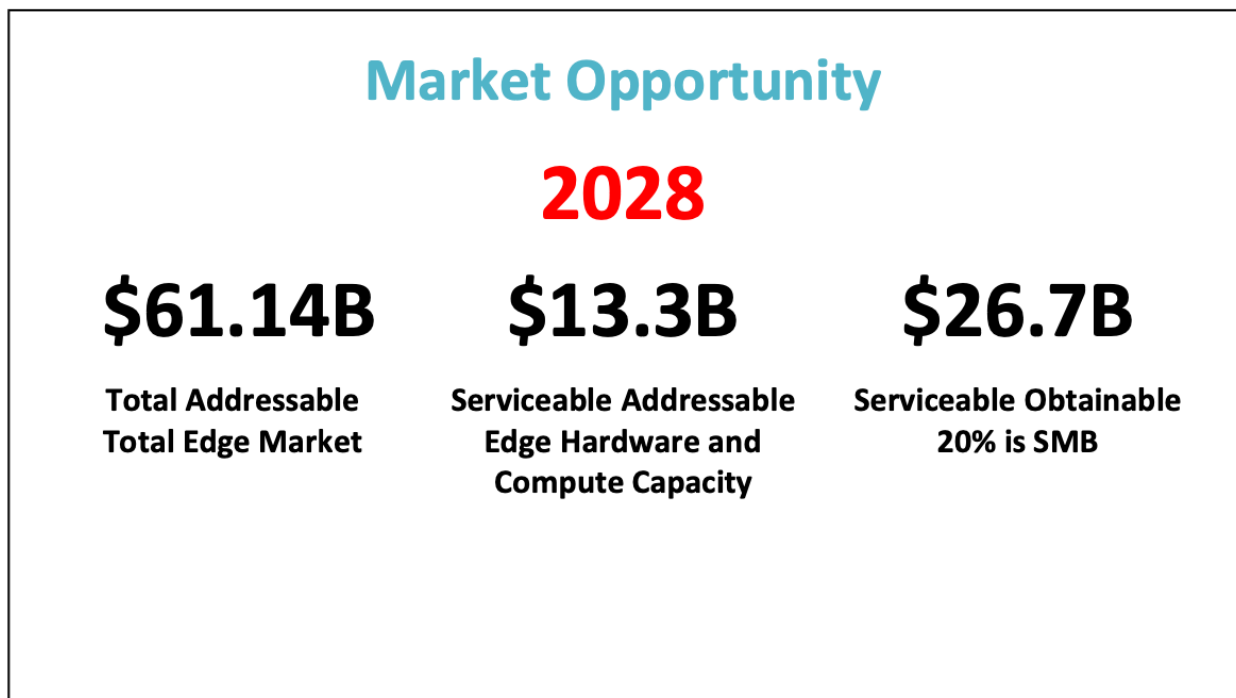
\$13.33B addressable market by 2028

SOM

SMB are 20% of MEC HW market \$245M obtainable market in 2021

\$26.7B obtainable market in 2028

2028 Market Opportunity



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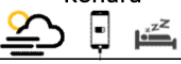
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Competitor Landscape

Competitor Comparison					
	Cost	Convenience	Latency	Security	Scalability
 Data center 	\$\$\$\$	High	Medium	Medium	High
 Edge Cloud 	\$\$\$	High	Medium	Medium	High
 Edge Servers	\$\$\$ to \$\$\$\$	Low	High	Medium	Low
 Edge hardware	\$ to \$\$\$	Low	High	Medium	Low
 Kohara	\$	High	Medium	High	High

IoT data AI/ML training cost efficiency High Medium Low

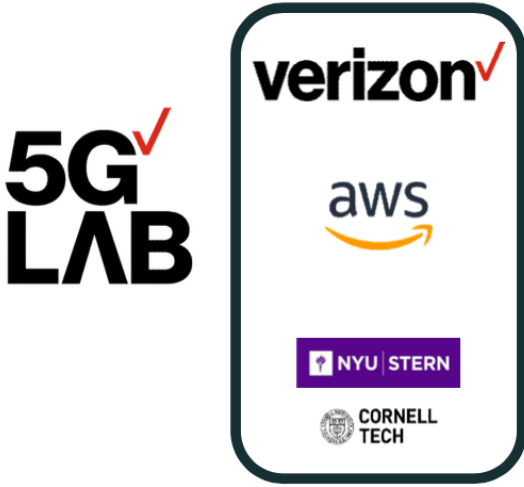
Really are two main categories of decisions when it comes to edge compute:

Either use cloud/colo service providers or buy and host your own hardware. Kohaha is an affordable, secure alternative.

But we're not going to reinvent the wheel.

Current Partnerships

Current Partnerships



5G LAB

verizon

aws

NYU STERN

CORNELL TECH

Benefits

- Access to network subscribers
- Mobile edge technology
- 5G testbed
- Access to AWS customers
- AWS experts and solutions
- AWS-API certification
- AWS 5G AI/ML tools
- AI/ML research projects
- Thought leadership
- Recruitment pipeline

Utilize 5G Lab partnership as a sales channel.

Benefits - Verizon -

- Access to Verizon MEC advisors
- Integration / distribution path to Verizon's 5G network and subscribers Amazon Web Services
- access to AWS business segments via API certification
- Access to AWS 5G AI/ML tools (Wavelength, Outpost)

Colleges

- AI/ML research techniques
- Thought leadership
- Recruitment

Transition: Even with this partnership, what solution(s) will Kohara provide to SMB?

Initial Focus



The Kohara app will handle many different types of AI algorithms. We will focus first on those models that provide greatest utility to SMBs - and allow for greater engagement and conversion of their customers.

Additional AI / ML capabilities will be built to incorporate additional use cases.

Even though we can serve the critical AI use case of small businesses, how will Kohara incentivize smartphone user engagement?

Notes: Provide use case for SMB use of system.

Demand Planning, Forecasting, Marketing

Divide and Conquer algorithm

- Understand customer demand
- Define customer segments, personalization
- Improve supply chain

Analyze customer data from many sources

Adv: Product placement/grouping within store locations/stock

Benefit: Better decisions on what to stock, efficiently provide customers with product

Use of Dynamic Algorithm

Understand consumer demand

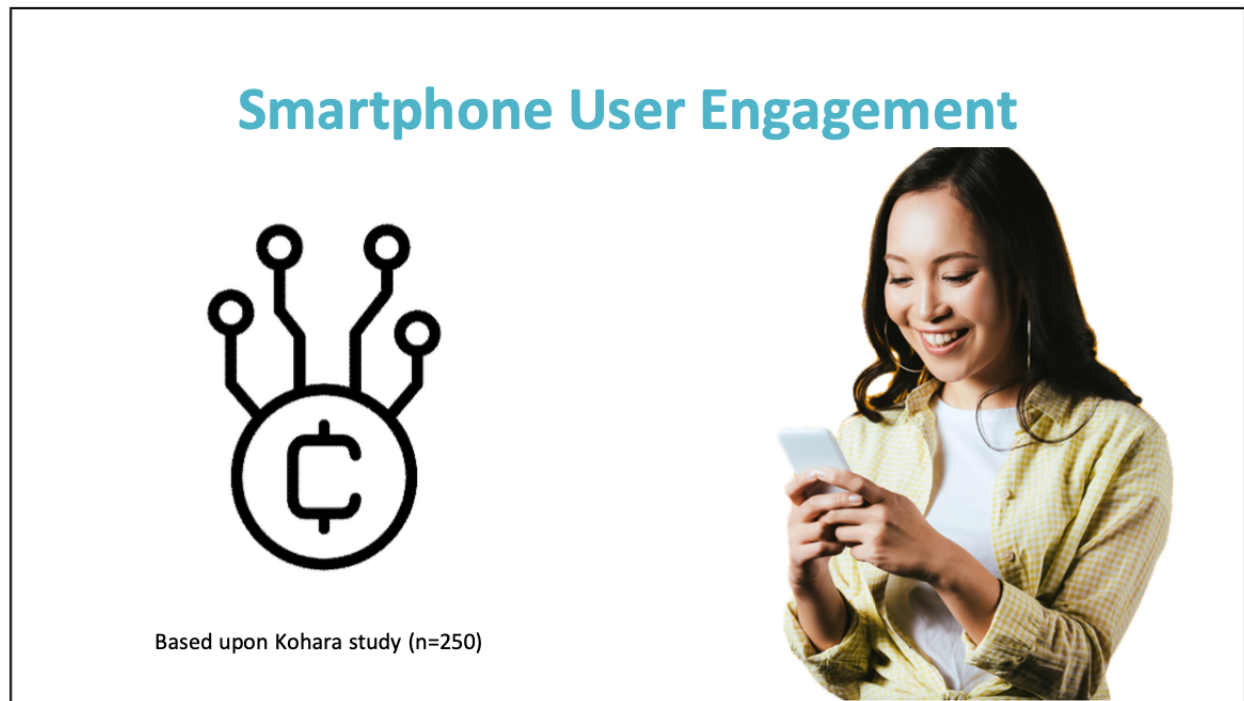
Define segments more precisely

Analyze product clusters

Adv: Automated decision making

Benefits: Improve supply chain performance, fewer stockouts, personalization

Smartphone User Engagement



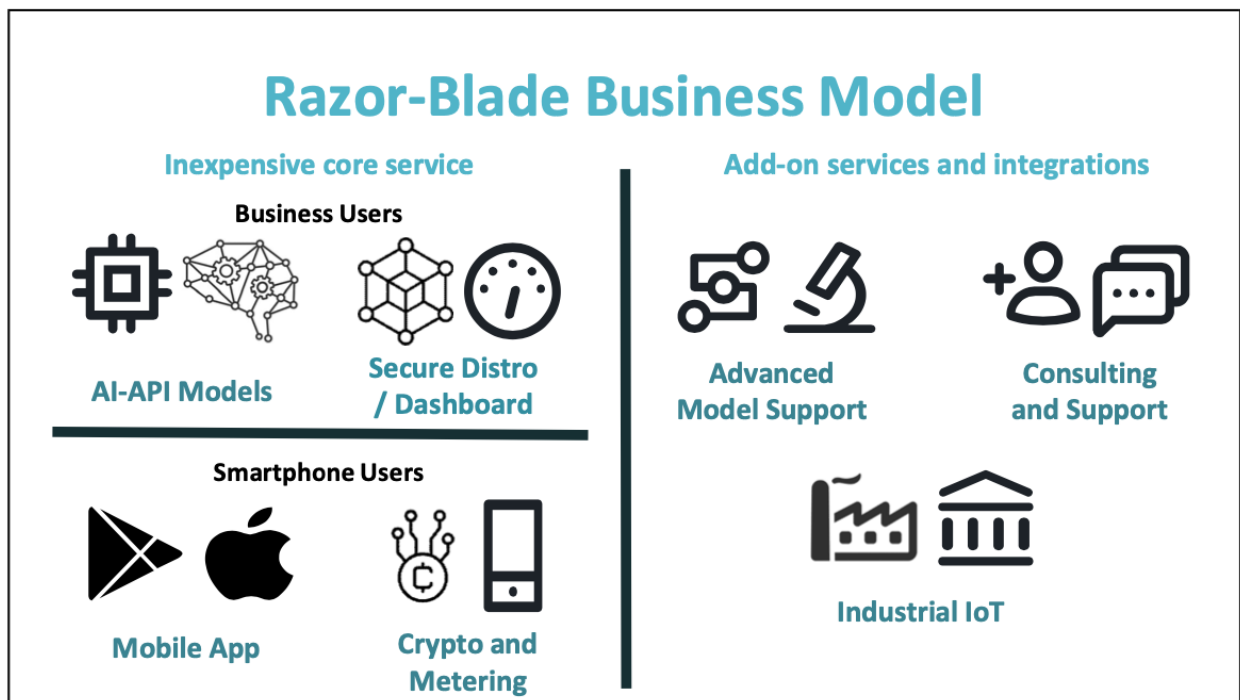
Based upon simple survey results of n=83 (of n=250 requested), smartphone users would allow a company to securely use their smartphone for AI/ML compute in exchange for cryptocurrency. Smartphone GPUs are capable of crypto-mining, which would be a byproduct of Kohara's integration. Crypto coin type(s) are TBD.

Questionnaire options:

- Crypto, based on jobs / utilization

- Capacity donation to research
- Gamification / badging / ranking
- Friends-Invites
- lotto based on jobs/utilization

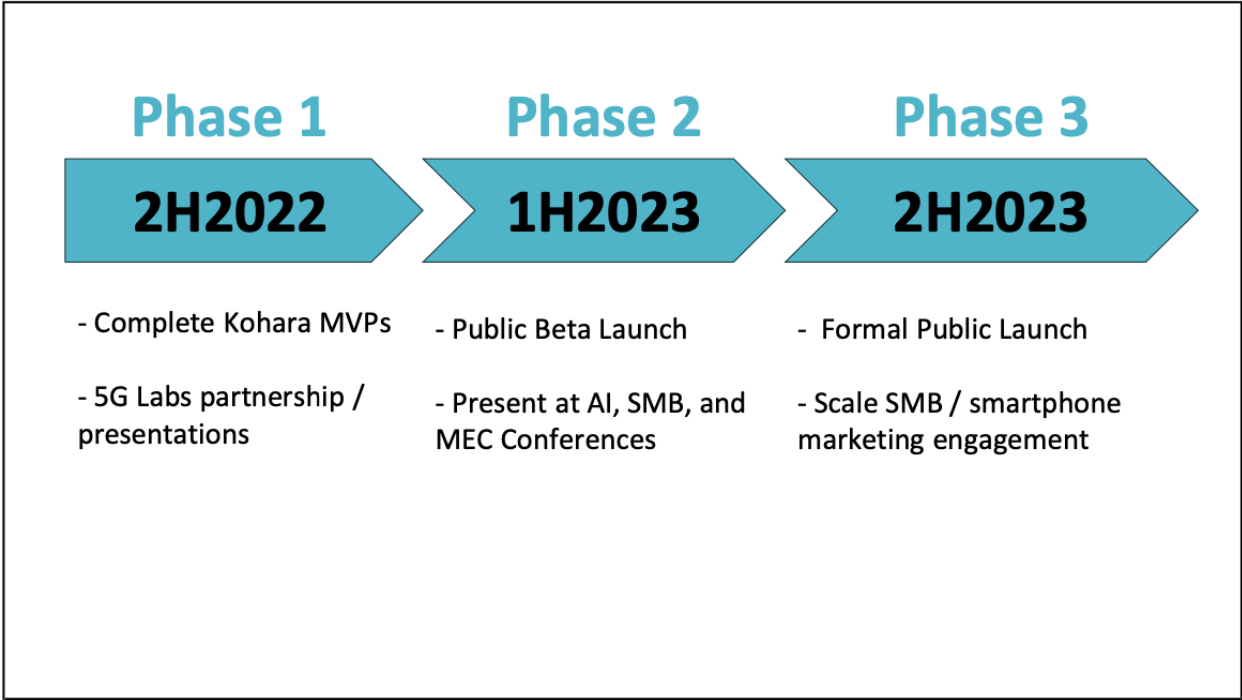
Business Model



Kohara will use a razor-blade model, with an inexpensive core service for business users for \$50/TB processed, which is 80% less expensive than the compute costs of the major cloud providers.


Smartphone users install the free app and have control over when their phone will be used compute - and start earning crypto.

Two Year Outlook




Kohara's Leadership Team


Kohara Leadership




Nate Lee



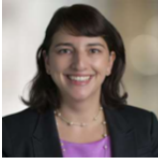
Alex Guan




(TBD)
Verizon 5G Lab Advisor




John Hoang



Maureen Breiling



Gabriel Lima

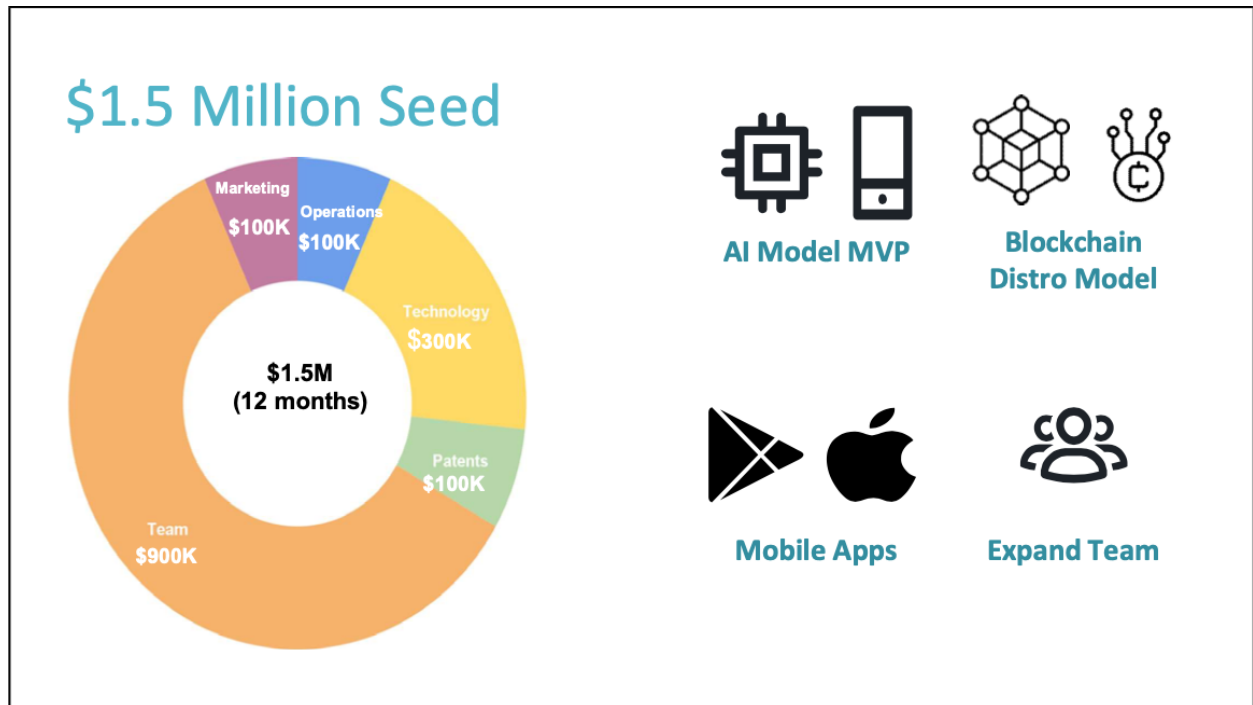


Andrew Komrowski

The Kohara team spans multiple industries and disciplines that range from app development, data science and analytics, chipset R&D, and smartphone.

Kohara will leverage our breadth and depth of talent to break down the barriers of entry that prevent SMBs from leveraging AI to run and improve their businesses.

Funding Request and Timeline



Kohara requests \$1.5M in investment to run the business over the next 12 months to complete the foundational build out of::

- Initial AI model
- Secure blockchain distribution model
- the smartphone app
- Expand team to hire additional engineers and marketing

Chart source link: <https://docs.google.com/spreadsheets/d/1YoJfldHs9TD9i-VgtrmxF5FVmvvtNyRQUi5iVhUABY/edit?usp=sharing>