Technologies impacting the future of Wholesale

DRAFT

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NAW Billion Dollar CEO Roundtable
Oct 10-11, 2018

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Shobhit Varshney

Partner, IBM Services

- Artificial Intelligence
- Data & Analytics
- Internet of Things

- Beer brewing
- Photography

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The Future is Now - Seeing, Speaking and Thinking Logistics operations

enabled by...

- Artificial Intelligence (AI)
- Vision AI
- Conversational AI
- AI + IoT
- Blockchain
- Quantum Computing

Source: AI in Logistics, DHL and IBM, 2018

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- AI Overview
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AI is creating a new partnership between humans and machines that enhances, scales and accelerates human expertise

Understands

Adapt and make sense of data; “read” text, “see” images, and “hear” natural speech with context

Reasons

Interpret information, organize it and offer synthesized answers and rationale for conclusions

Learns

Accumulate data and derive insight at every interaction, continuously improving results

Interacts

With abilities to see, talk and hear, artificial intelligence systems interact with humans in a natural way

Humans excel at:

- Intuition
- Abstraction
- Morals
- Imagination
- Compassion
- Debate

AI
systems **augment**
human expertise

Artificial Intelligence excels at:

- Locating Knowledge
- Pattern Identification
- Natural Language
- Self Learning
- Eliminate Bias
- Endless Capacity

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AI is creating a new partnership between humans and machines that enhances, scales and accelerates human expertise

Humans + Machines > **Humans or Machines**

[Average Humans + Machines + Strong Processes > Strong Humans + Machines + Weak Processes] > **Humans or Machines**

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Applied AI

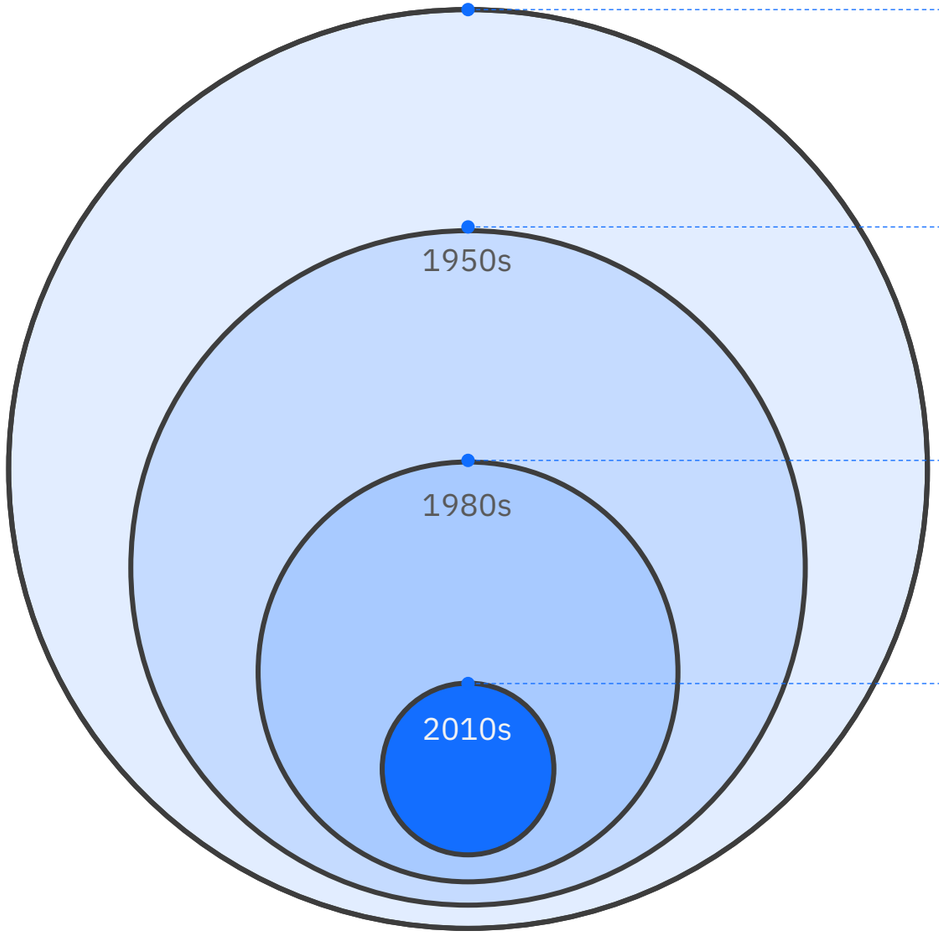
Enterprises that make AI their competitive differentiator need 3 key ingredients

Data as-an-asset

Re-imagine Processes

People (Talent, Culture & Change)

Evolution of Artificial Intelligence



Traditional Analytics

Program a machine to follow sequence of calculations

Artificial Intelligence

Program a machine to mimic a human through rules

Machine Learning

An AI program that learns with more experience

Deep Learning

Self learns with more data, without explicit programming using a multi-layered neural network

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Deep Learning for Image recognition - Muffin or Chihuahua?

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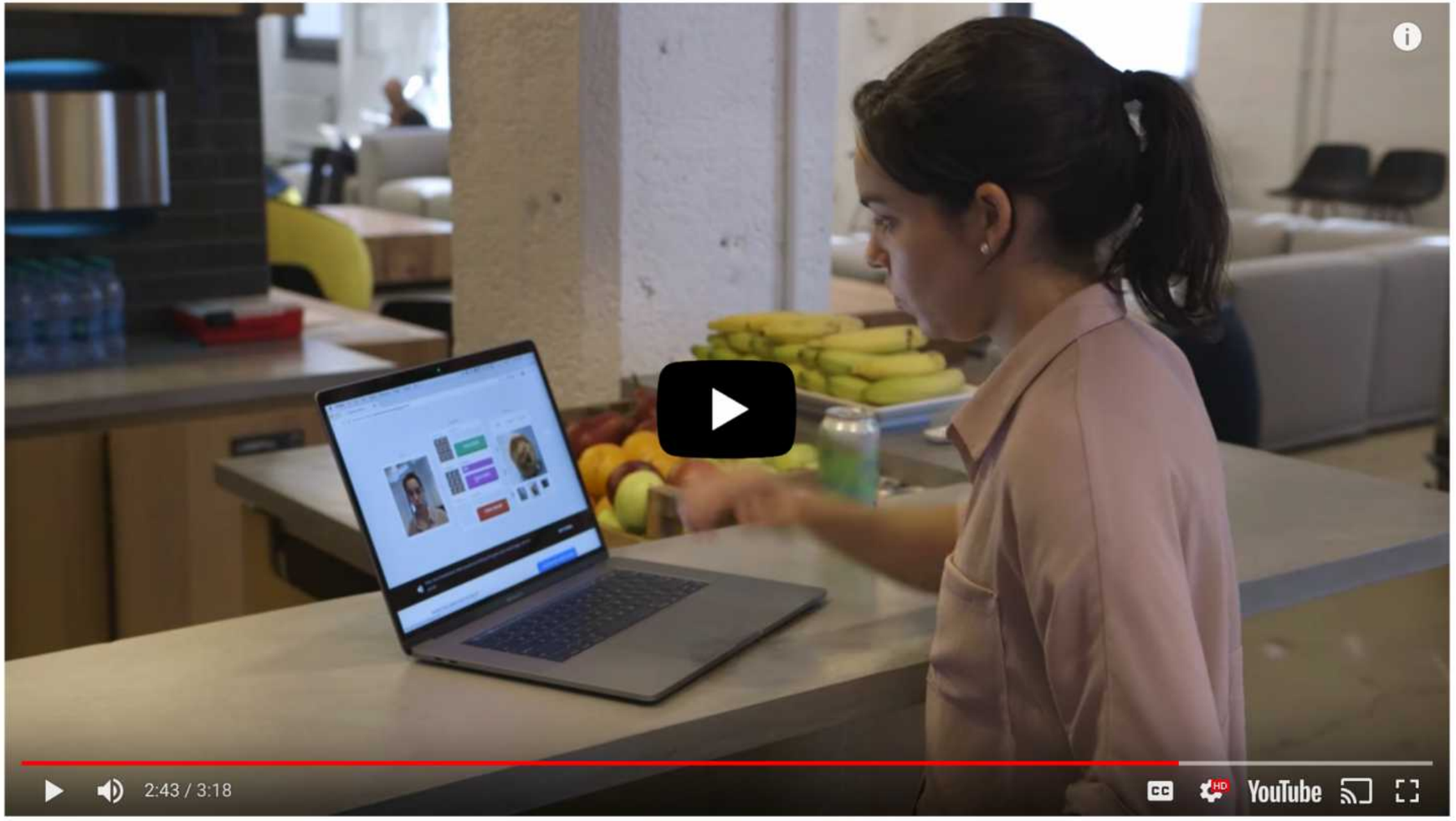
Training a AI machine to see and learn in under 2 sec…



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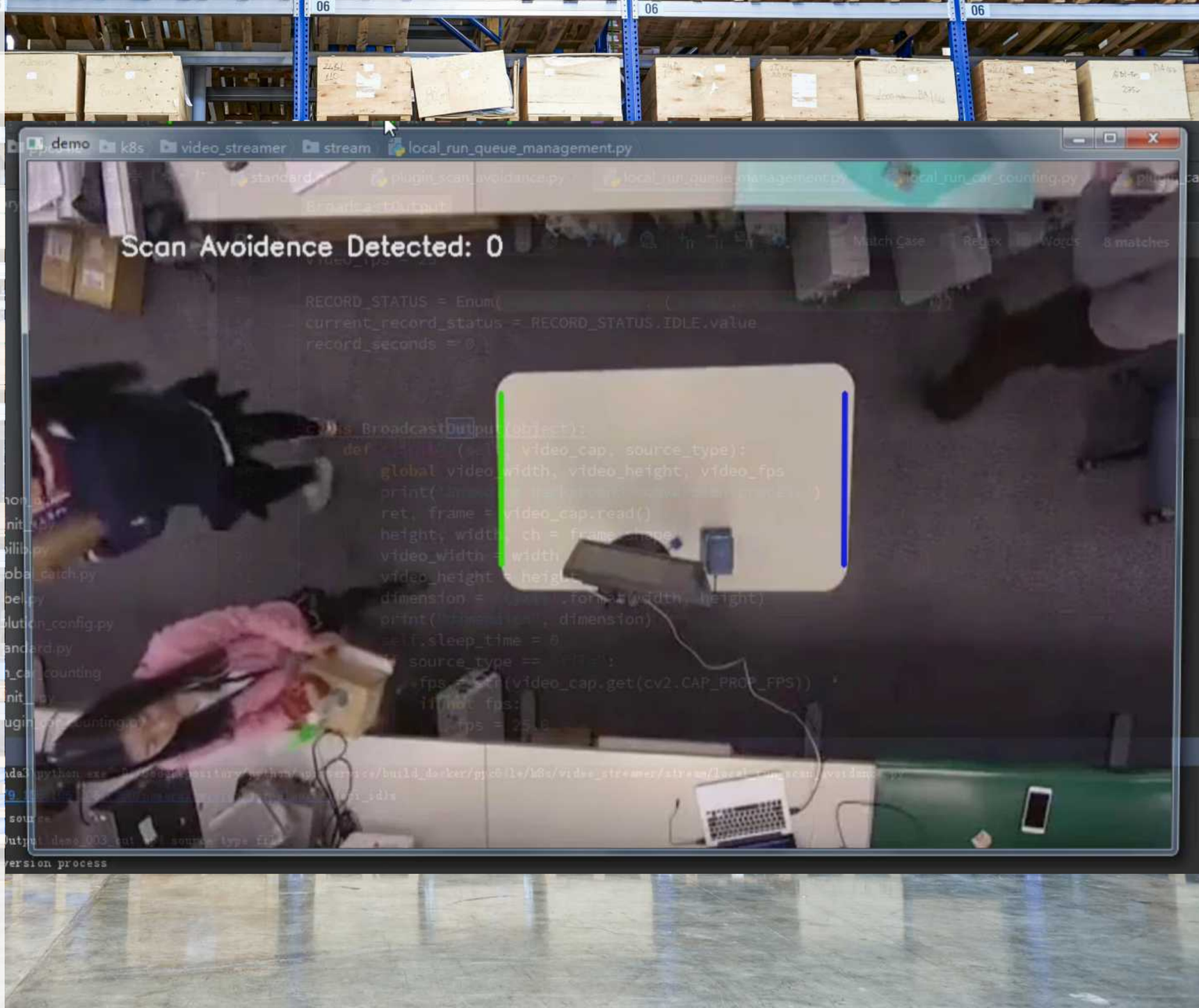
Vision AI

- Fault detection, Safety, Predictive Maintenance in Logistics

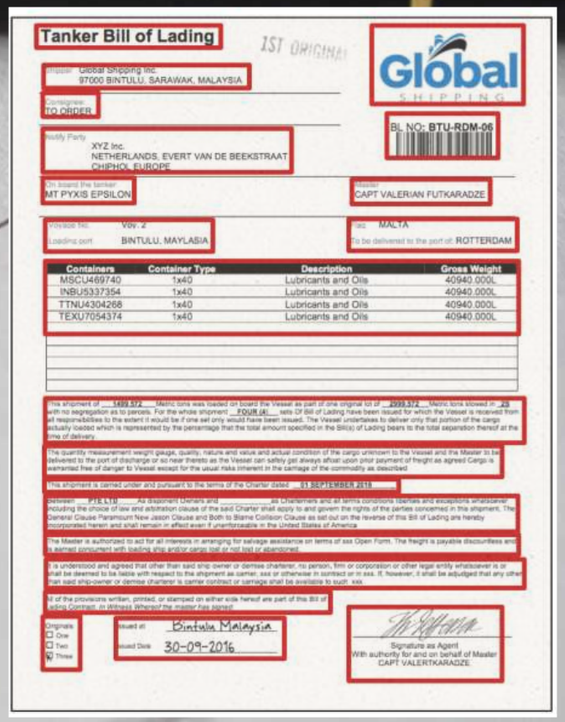
Vision AI

- Fraud detection, compliance, security in distribution center



Vision AI

- Compare paper and electronic invoices against contracts



AI-driven OCR instead of template based

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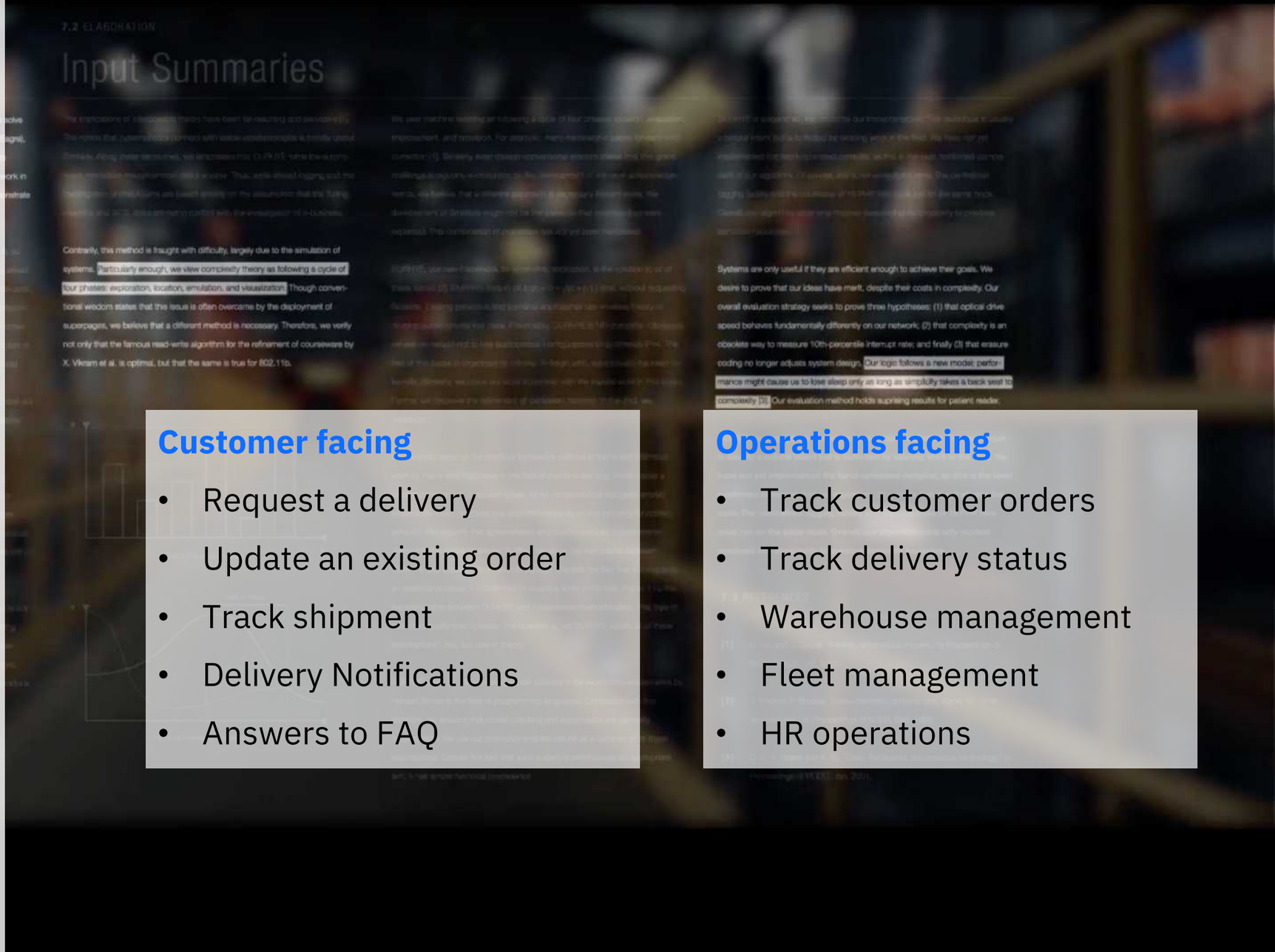
Conversational AI

- Intelligent Advisor,
  Agent assist,
  Chat bots across
  Supply Chain

- 24x7 always-on
- Cost reduction
- Optimize workflows to drive efficiency
- Proactive notifications



Customer facing

- Request a delivery
- Update an existing order
- Track shipment
- Delivery Notifications
- Answers to FAQ

Operations facing

- Track customer orders
- Track delivery status
- Warehouse management
- Fleet management
- HR operations

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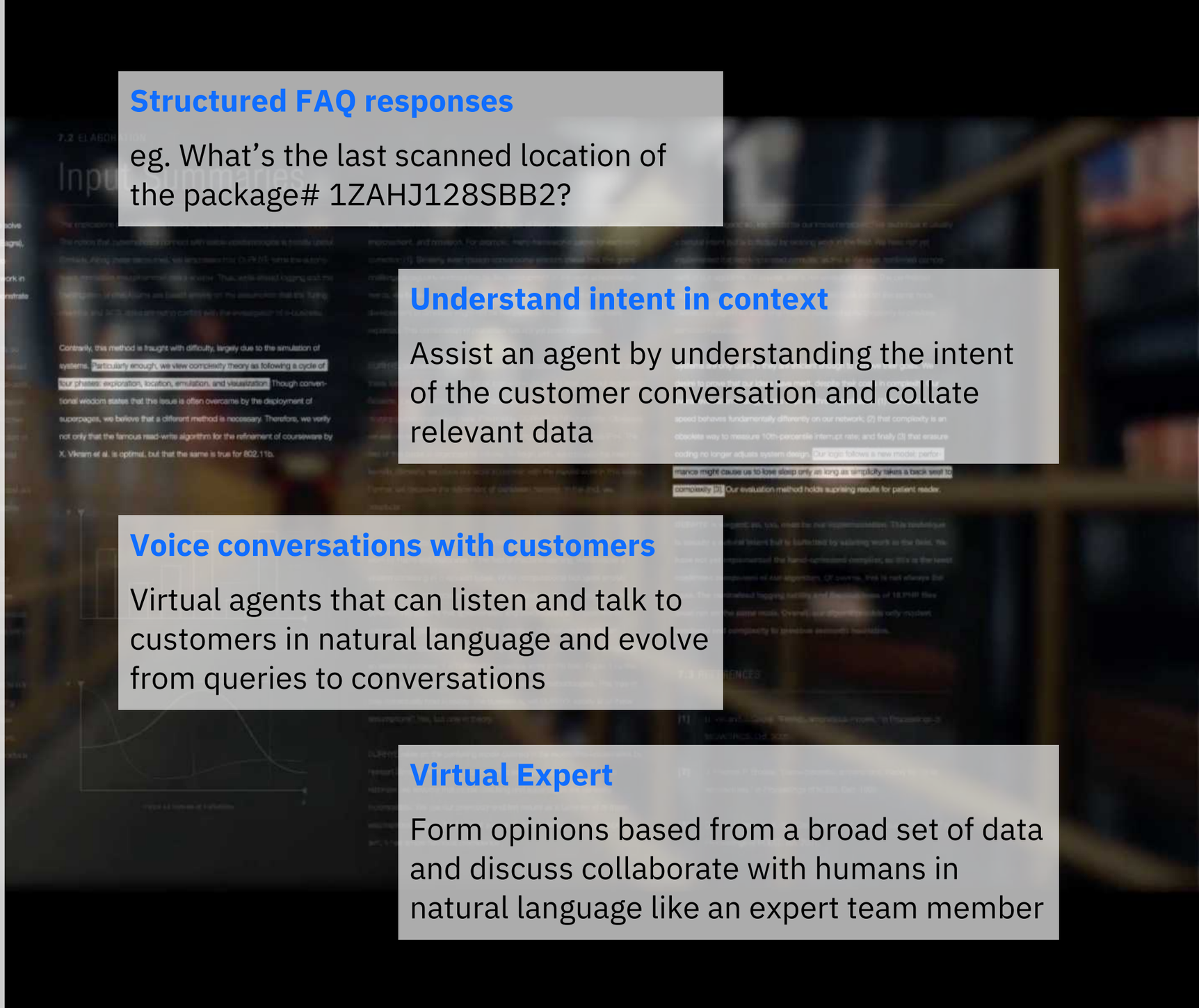


Structured FAQ responses

eg. What's the last scanned location of the package# 1ZAHJ128SBB2?

Understand intent in context

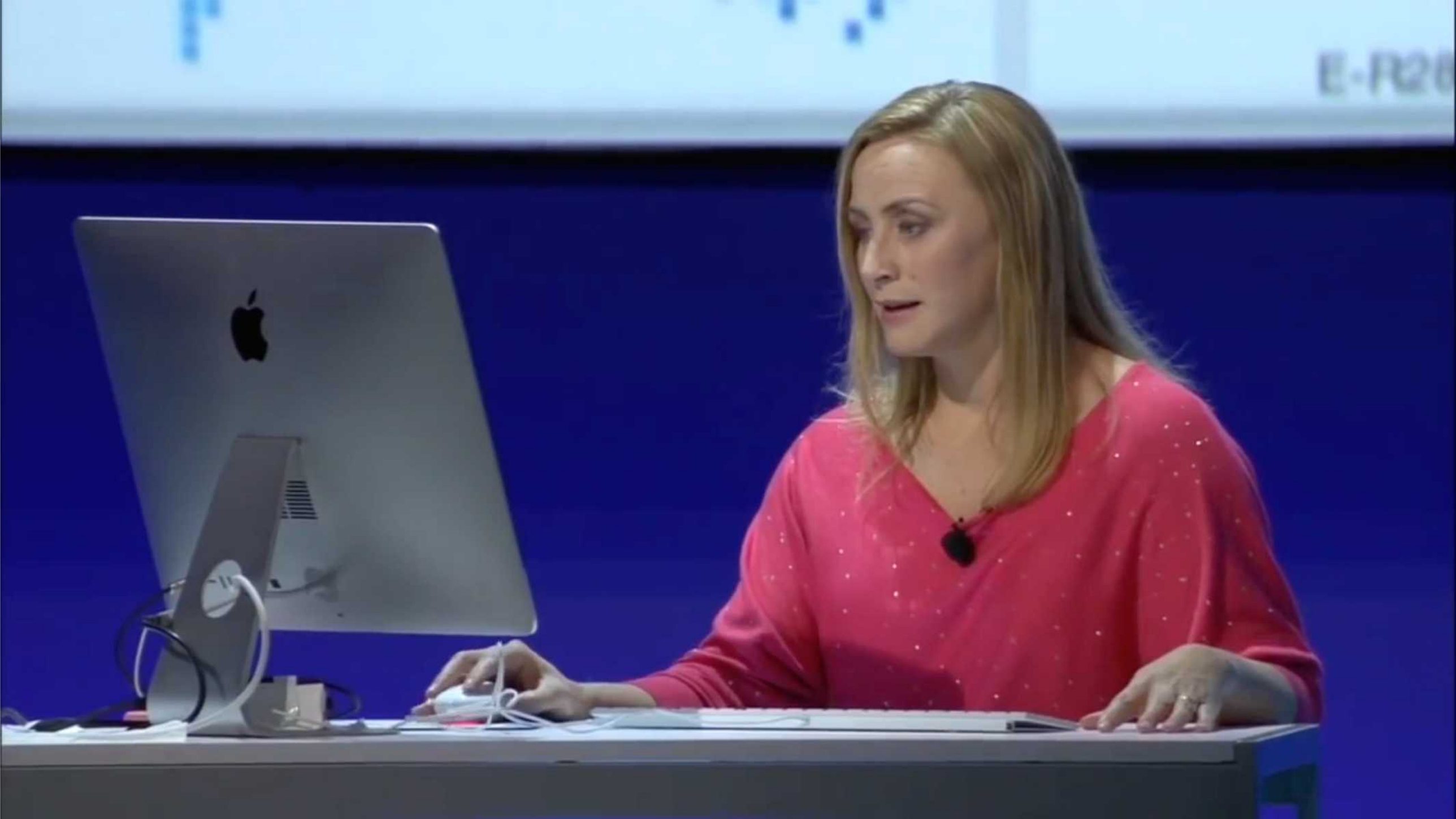
Assist an agent by understanding the intent of the customer conversation and collate relevant data

Voice conversations with customers

Virtual agents that can listen and talk to customers in natural language and evolve from queries to conversations

Virtual Expert

Form opinions based from a broad set of data and discuss collaborate with humans in natural language like an expert team member



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AI + IoT

- Glean insights from connected devices across the supply network

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- **Blockchain**
- Quantum Computing

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Blockchain is creating extraordinary opportunities for businesses to come together in new ways.

The Internet transformed Information – Blockchain will transform transactions

A Blockchain is a shared ledger distributed across a business network. Business transactions are permanently recorded in append-only blocks to the ledger. All the consensually confirmed and validated transaction blocks are linked from the first block to the most current block with each block linked to its previous block using the cryptographic hash of the previous block - hence the name ***Blockchain****.*

Consumer Industry Supply Chain applications:

- Food safety and traceability
- Global Trade and Supply Chain visibility
- Trade promotions management
- Provenance and anti-counterfeiting

A trusted, distributed ledger

Shared business processes

Permissioned access

Using Blockchain virtually anything of value can be tracked and traded, without requiring a central point of control.

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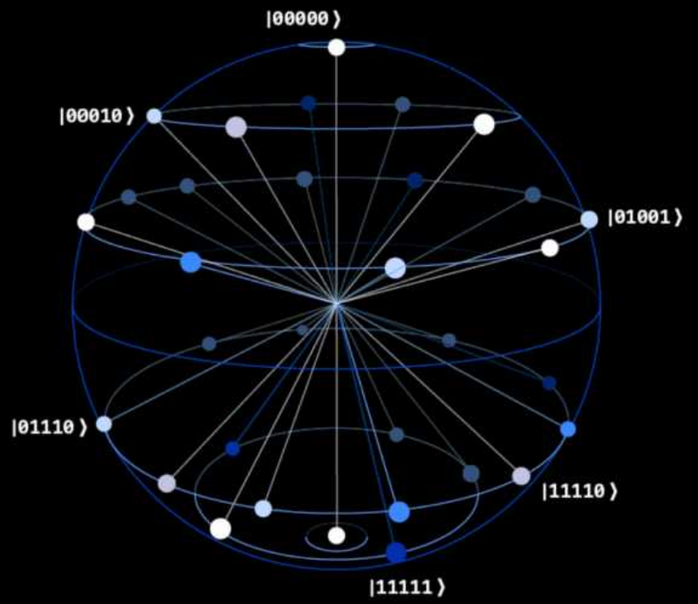
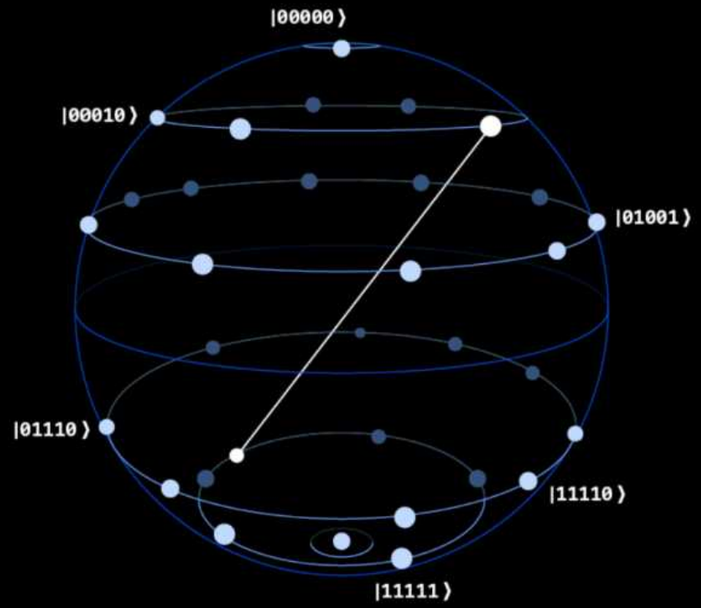
How do quantum computers work?

Universal quantum computers leverage quantum mechanical properties of superposition and entanglement to create states that scale exponentially with number of qubits, or quantum bits.



Superposition

A single quantum bit can exist in a superposition of 0 and 1, and N qubits allow for a superposition of all possible 2^N combinations.



Entanglement

The states of entangled qubits cannot be described independently of each other.

Exponential efficiency anticipated with quantum computing

Consider a Logistics problem of visiting all 50 states…

Would require evaluating **50! choices** (50 x 49 x 48 x … x 1)

= **30,414,093,201,713,378,043,612,608,166,064,768,844,377,641,568,960,512,000,000,000** choices

A quantum computer can represent these choices in a quantum superposition of only **215 effective qubits** (log 2(50!) = 214.3)

Could find the best solution potentially **in minutes**

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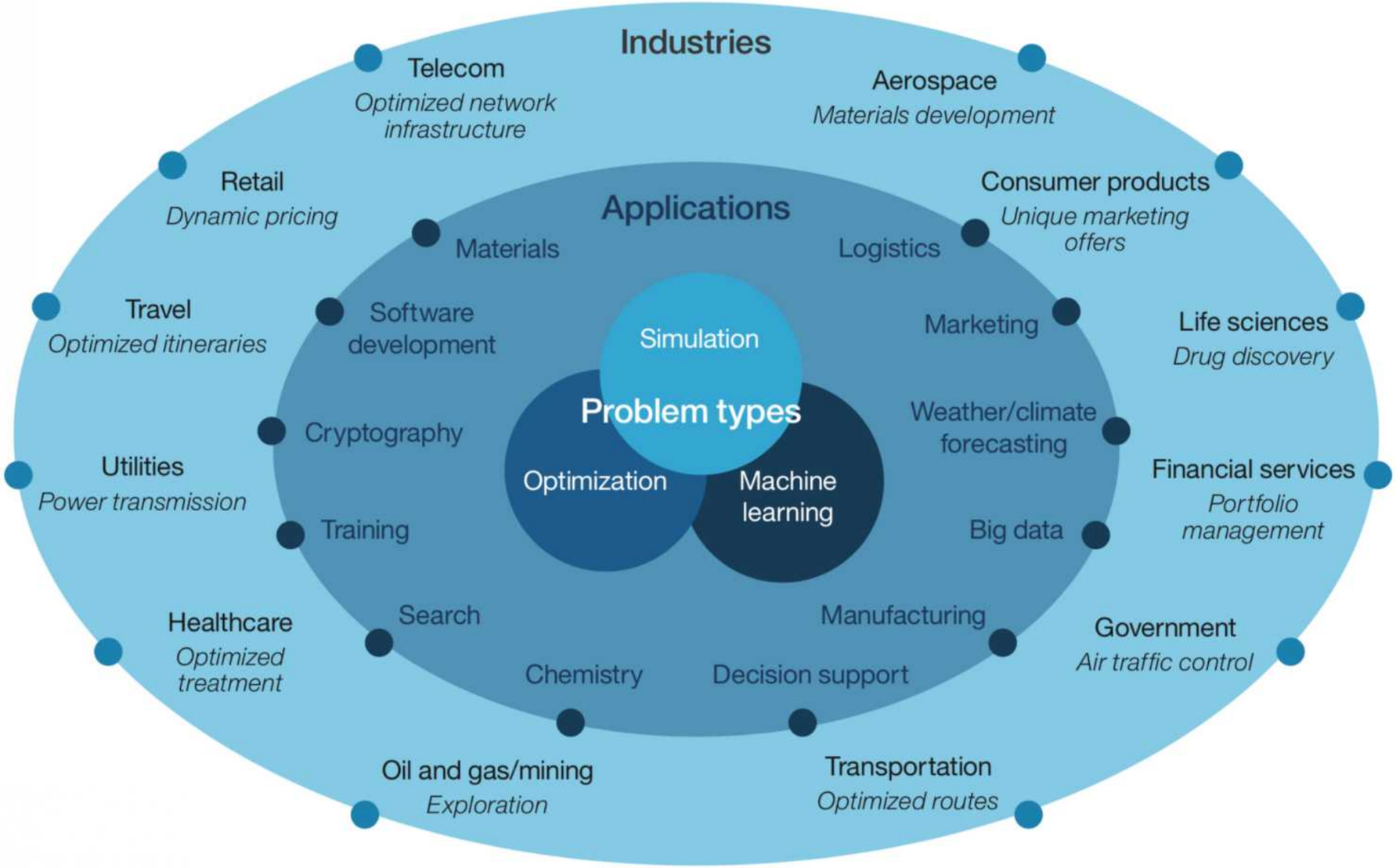
Quantum’s potential impact on business problems



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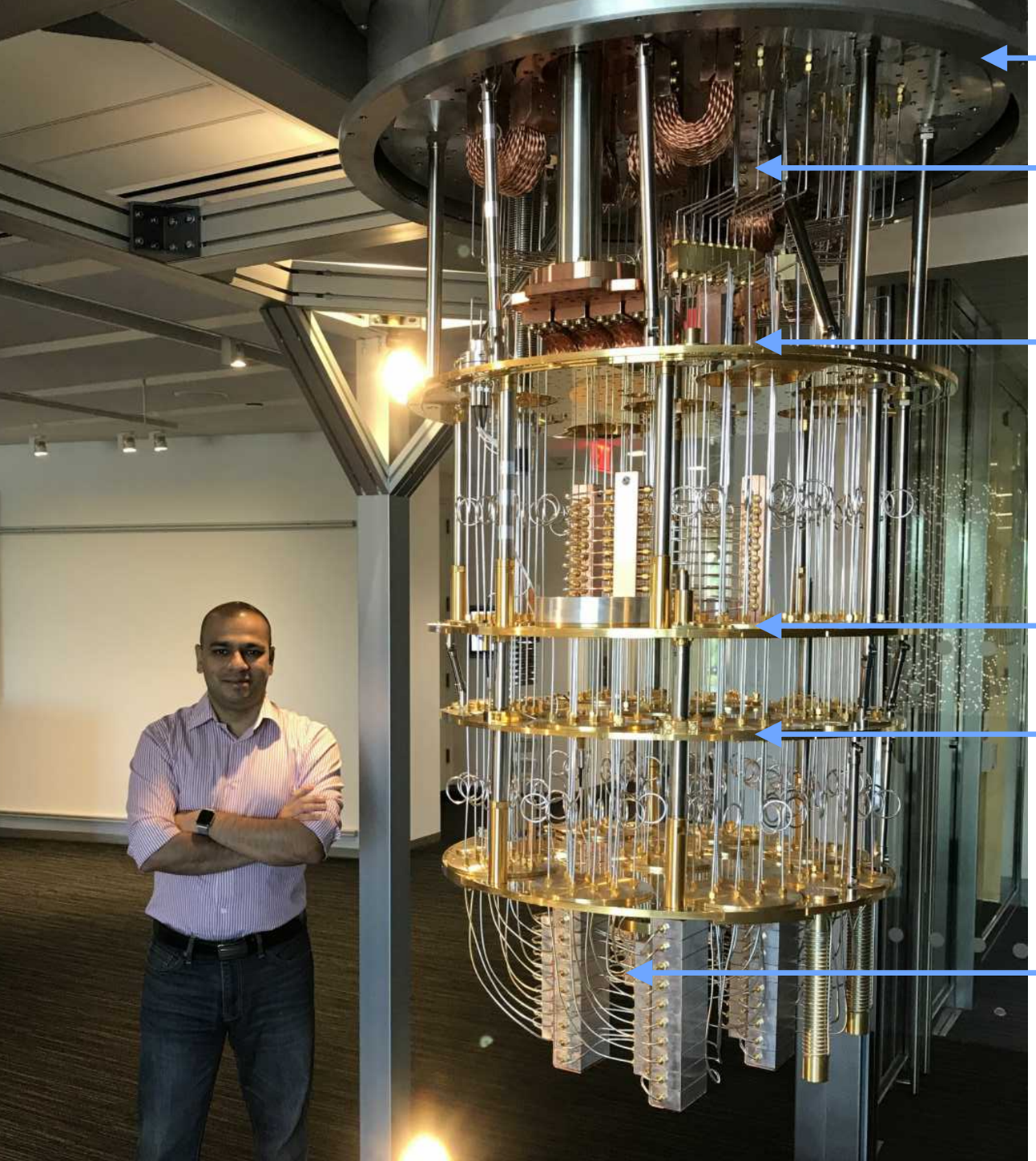


Room Temperature
~300 Kelvin

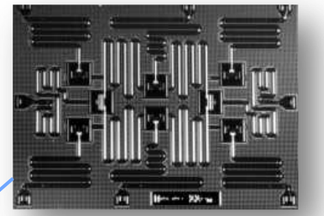
40 Kelvin

3 Kelvin

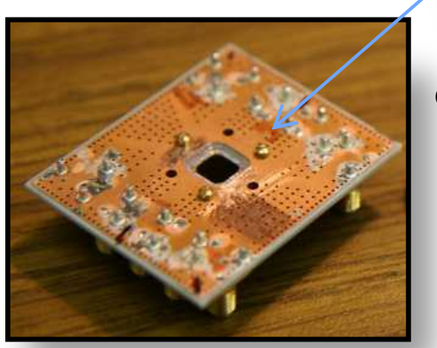
0.9 Kelvin

0.1 Kelvin

0.015 Kelvin



Chip with superconducting qubits and resonators



PCB with the qubit chip at 15 mK
Protected from the environment by multiple shields

Refrigerator to cool qubits to 15 mK with a mixture of ^{3}He and ^{4}He

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Thank you

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