
# Agile Scaling The Robotics Way

## Achieving Sustainable Enterprise Agility

**Wed 8 Apr 2026 09:00 - 10:30 at Room 514 -**
Industry and Practice
**XP 2026, Sao Paulo, Brazil**

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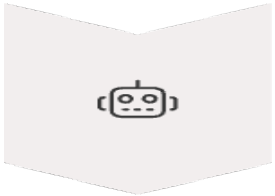
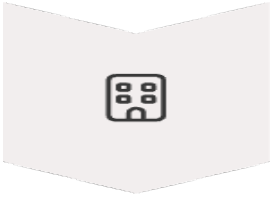
# Agile Scaling The Robotics Way



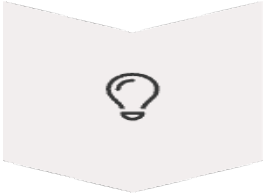
### Revolutionized How Robots Were Built

It can do the same for how we design and scale organization



### Organizational Eco-system

Foster autonomy and alignment across the organization



### At the of the session, you will be able to

- Look at your organization through a living systems lens and rethink how it scales.
- Apply layered autonomy to improve responsiveness and alignment
- Recognize patterns to enable your organization to adapt  without adding complexity

# Sue Ryu

**Connect with me on LinkedIn**

**Enterprise Agile Coach** with over 18 years of experience guiding Agile adoption at scale for organizations of any sizes, including Fortune 500 companies.

**Mentored by Agile pioneer Mike Beedle**, with a focus on solving the challenges of scaling Agile in complex environments.

**Creator and presenter of "Agile Scaling with Robotics Subsumption Architecture"**, a hands-on simulation that demonstrates decentralized decision-making and autonomous team design using a dynamic eAuction case study.

**Presented the workshop at Agile conferences -** the Global Scrum Gathering 2024, Agile Tour 2024, XP2025 (Poster), and many webinars and Meetups.

**Technical foundation in Computer Science**, holding a master's degree from NYU and bringing a systems-thinking lens to organizational design.

**Dedicated to evolving Enterprise Agile**, helping teams work as cohesive, self-managing units in increasingly dynamic and complex business landscapes.

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# Mike Beedle

Agile Manifesto Signator (*suggested the term* "Agile")

Creator of of the Enterprise Scrum

Co-author of the first *Scrum book (with* Ken Schwaber)

Passed away in 2018

# How I met Mike …

- **2016** – **Mike Beedle** came to NYC to introduce the new and improved **Enterprise Scrum for Biz Agility** around **the the start of the business agility movement.**
- Made Changes to **Scrum** & **Enterprise Scrum** for Business Agility
- **2017** – I became an **Enterprise Scrum Instructor**

# Brillian at Chess. Failed in Robotics

- Early AI built on rule-based, symbolic intelligence
- Worked in controlled domains (e.g., chess)
- Applied to robotics → slow, rigid
- Why? Relied on Centralized Control → plan → act

That works in static environment, but in real world, by the time you finish planning, the situation has already changed.

# The Same Mistake with Scaling

As orgs scale, they often add:

- **more meetings** to coordinate **(**Scrum of Scrums, PI Planning, …)
- **more roles** to manage dependencies (RTEs, Delivery Managers, Program Managers, …)

Decision-making tends to **move upward** → delays

Team lose **autonomy!**

👉 **Result:** It become **slower and more rigid**

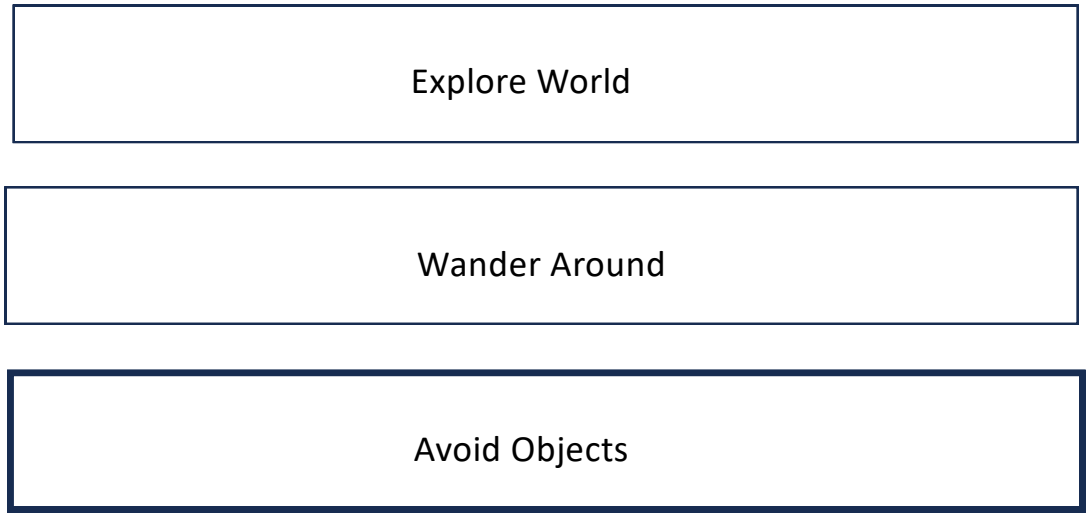
# Rethinking How Robots Were Designed

- Designed like a **living system**
- Parts work **in parallel, each on its own**
- Nervous System - Monitor & Send Signal

👉 **Result: Fast, adaptive, real-time response**

# How does a Robot Explore the World?

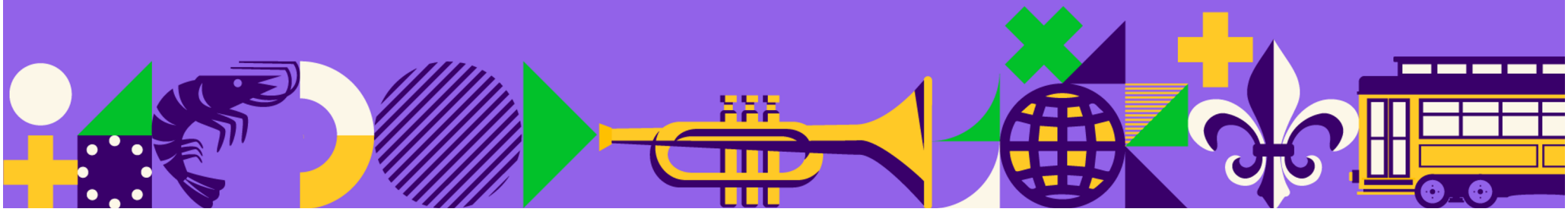
## Subsumption Layers




Each layer builds on the one below it
Each Layer acts on its own
Higher layers subsume lower layers – either using or overriding them

**That is how each part acts on its own, and together they create a coordinated behavior.**

# eAuction, Inc



# eAuction, Inc

Specialized in providing **online auction service**s. First to **Airline companies** - Passengers with **existing bookings** are invited to upgrade their seats through online bidding.

**Win-win** for both - **passengers the chance to enjoy a more luxurious** flying experience at a potentially discounted price. **Airline Companies** to maximize revenue by selling unsold premium seats. **Pop Stars** like Taylor Swift to sell concert tickets.

**Expanding** – **Artists** to sell their paintings.

# eAuction's Business Strategies

1. Craft a **customer-centric design** providing tailored solutions for each customer segment. Prioritize first affordability and then loyalties for end users while empowering our customers to thrive. Our customers include airlines and theater productions, and with artists recently added to the list.
2. Design a structure that fosters **a culture of ownership and accountability** by empowering teams to make informed decisions and take ownership of their responsibilities.

# Workshop instructions

- Group Size: **6 – 8** people per table
- Arrange the Lego cards to design the eAuction organization
- **Each Lego card** represents a **team** within the company
- We will go through **two stages** to simulate how the organization **scales as it grows**.

# Online Auction Services for Airline + Pop Stars

# 15 minutes

In this stage, design an organization that

- Provides online auction services tailored for **airline customers & pop stars**
- These services may include an **auctions app for unsold tickets, upgrades**, or special offers for users
- Lay out the teams hierarchically on the table

Note:

- Select only the necessary teams (Lego Cards) – Not all are needed.
- Ensure the design meets eAuction's **business strategies:**
  - Customer-Centric
  - Empowerment and Accountability

# Arrange Lego Cards Hierarchically

# Like the behavior of Exploring the World

**Airline Auction Apps Team**


Create airline auction apps for passengers to access seat upgrades, last-minute deals, and similar offers.

**Business Unit Team - Ticketing**


Develop and implement strategic objectives to help customers sell tickets.



**Marketing & Sales Team**

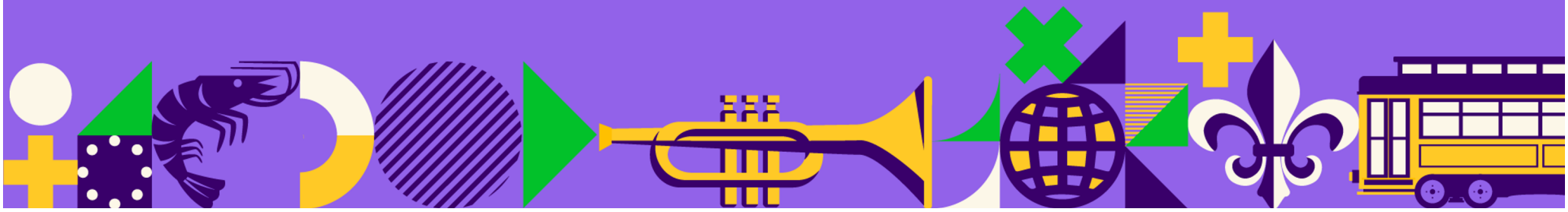

Oversee organization-wide marketing and sales efforts by aligning them with the company's overall goals.



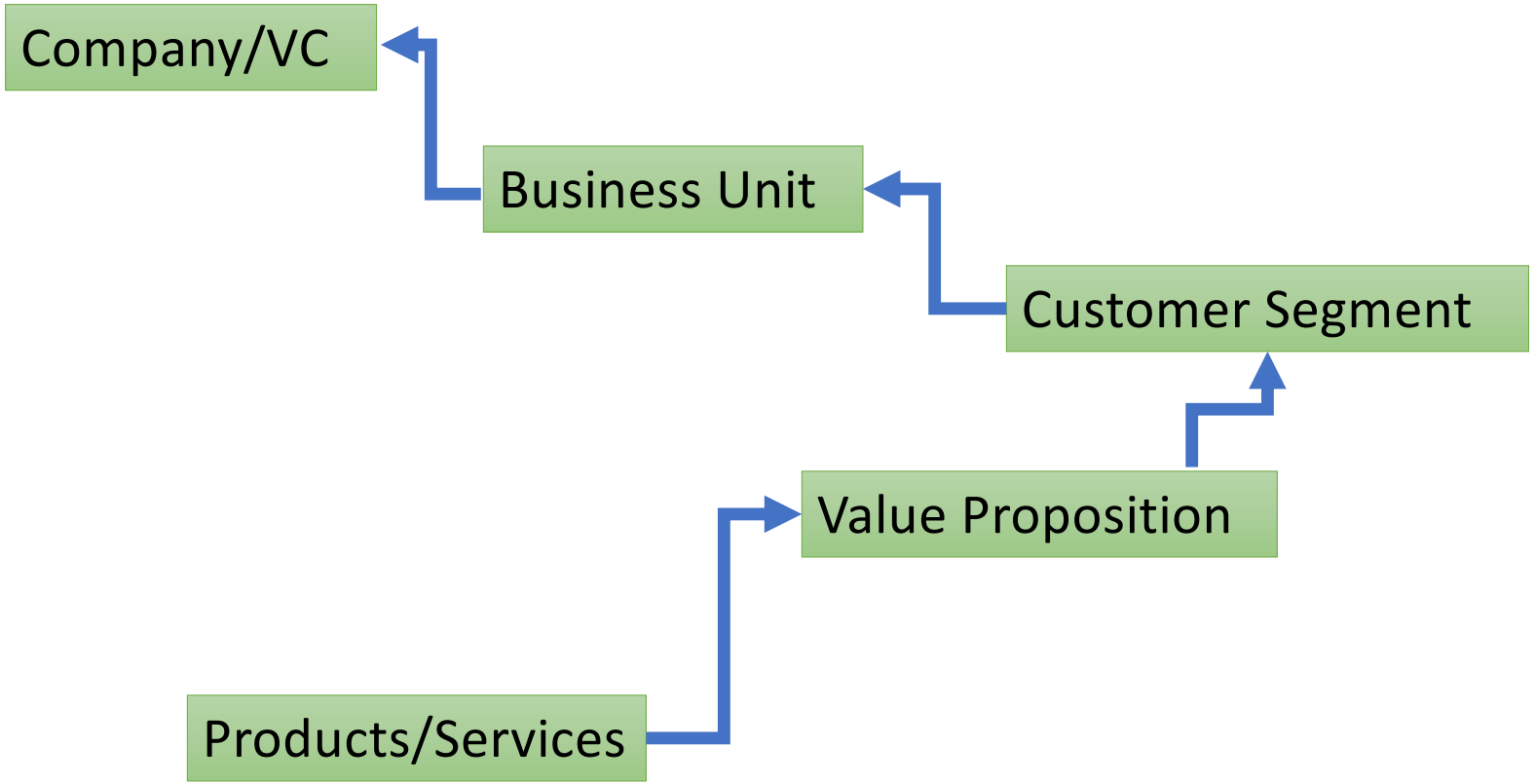
**Auction Apps Team**


Create auction apps for diverse user needs.

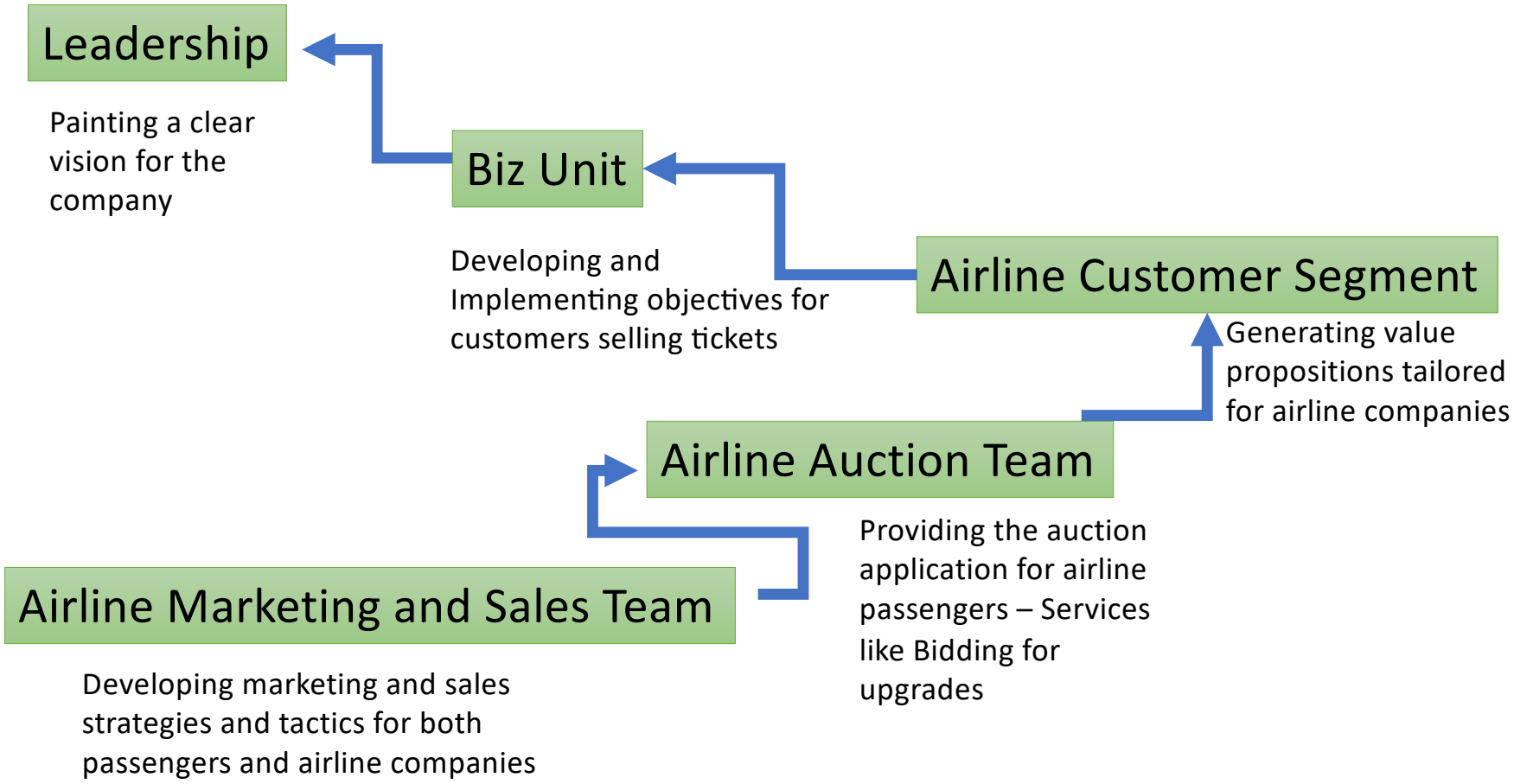
# How did it go?

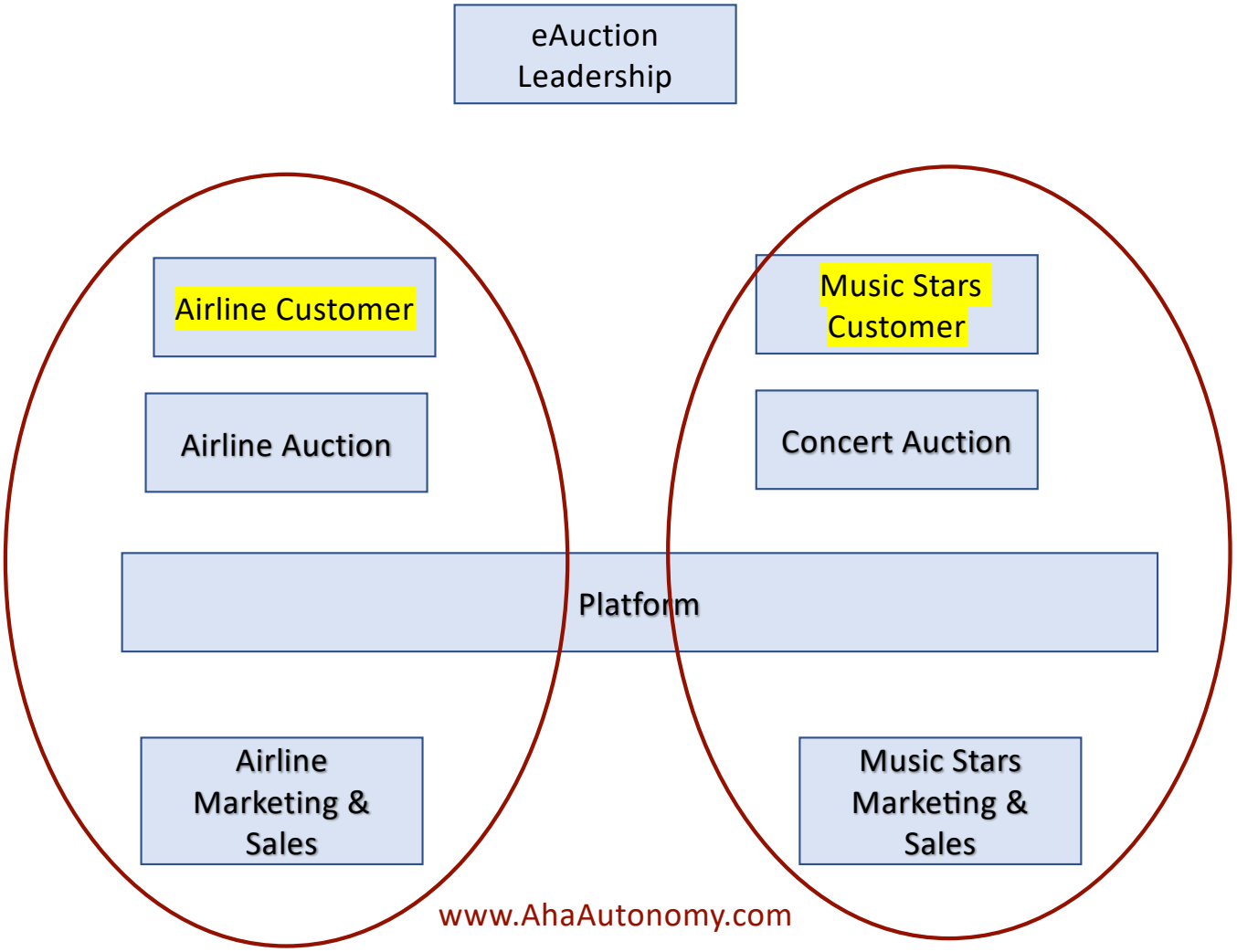


# Bottom up approach - Subsumption Layers



# How to design for eAuction using a Bottom-up Approach





# Further Scale to Serve Artists & More

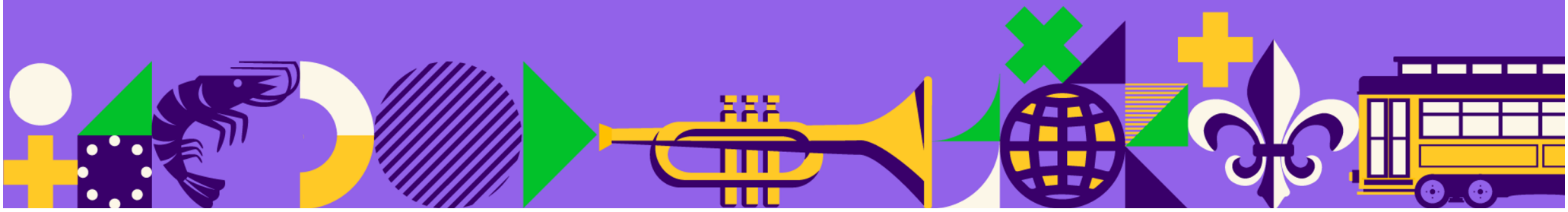
## 10 minutes

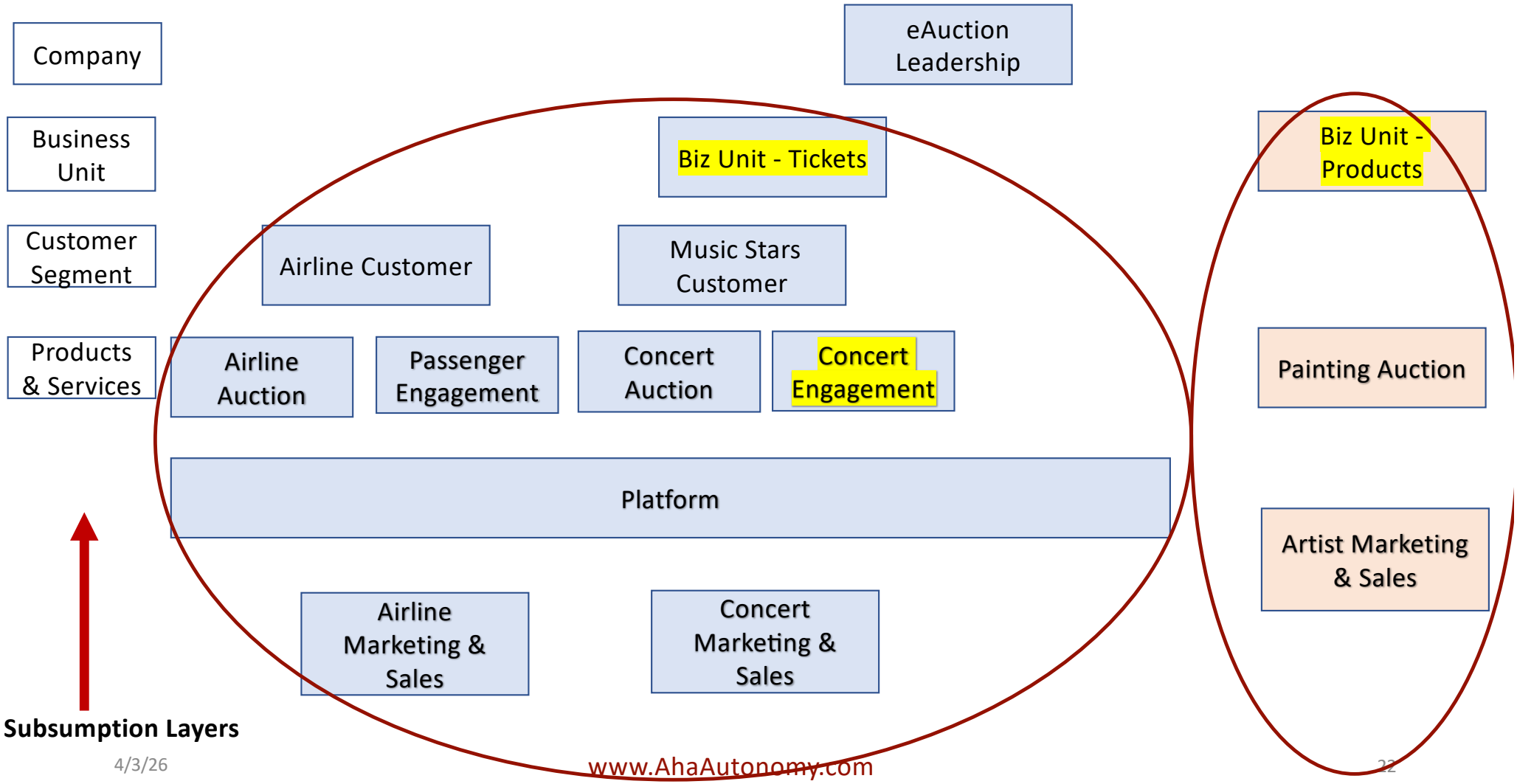
At this stage, eAuction is expanding its customer base to include two new segments: **Artists**

- **Scale the organization** to
  - Serve artists to enabling them to sell through **online auctions** for **art lovers** to bid on and buy paintings
  - Expand services for pop stars to connect with their fans
- Scale it to meet their growth while keeping the business strategies – **Customer Centric & Culture of Ownership & Accountability**

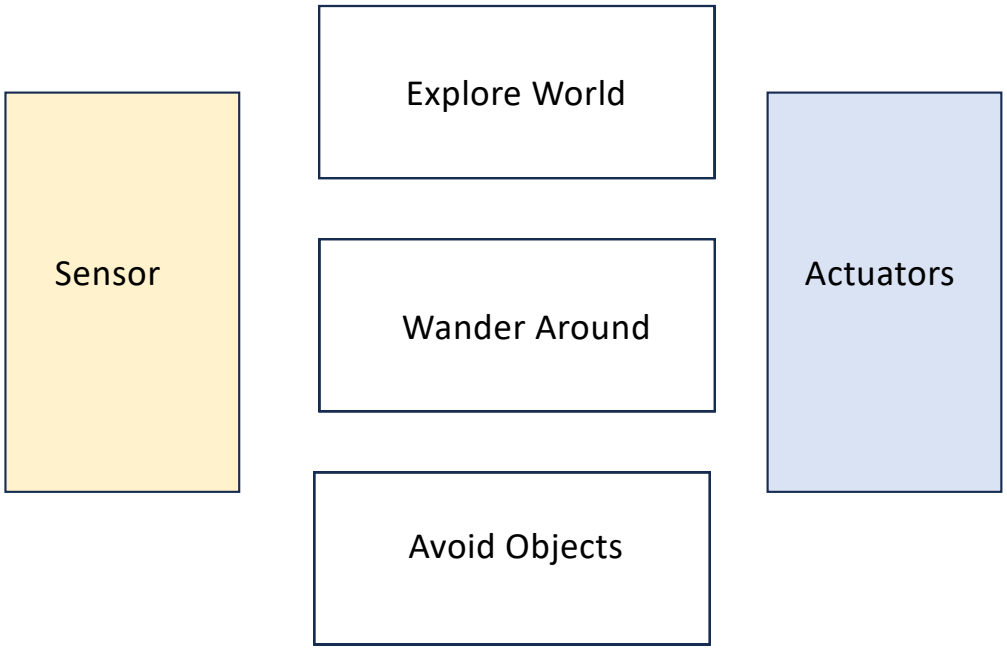
***Note:** Not all card are needed.

# How did it go?





# Sensor & Actuators



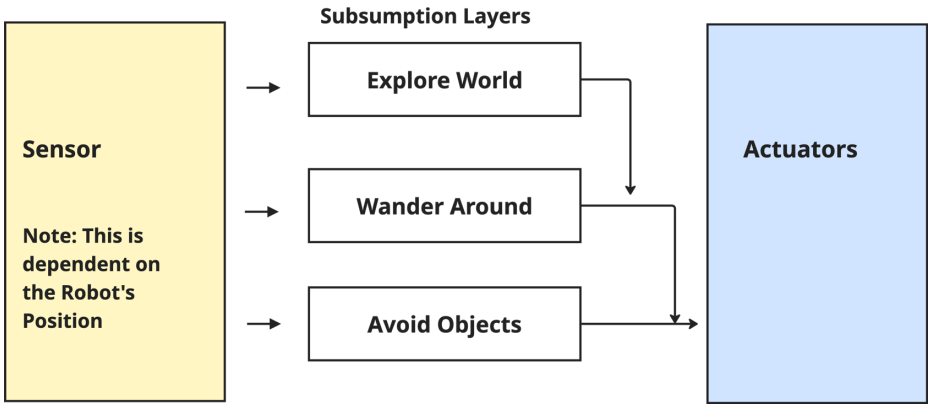

**Sensor** – Key role - Monitors its **surrounding** and Send the most recent and relevant **signals** to layers

**Actuators** – **Carry o**ut the actions - based on what have been activated by the layers.

**Layers** – Receive the signals from the Sensor and activate Actuators based on the signals they received from the Sensor

All working together to respond in real time. No Central Controller!

# How does a robot avoid hitting a wall?




As the robot roams and when it is about to hit a wall, the sensor sends a signal to all the layers that it is about to hit a wall.

Wander Around gets the signal and decides whether to avoid the wall or not. To avoid the wall, it decides to subsume(use) lower layer - Avoid Objects and then Actuators to carry out its wish to avoid the wall.
Avoid Object **does not wait for a command** from Wonder Around, rather it gets ready based on the signal it received from the sensor.

Actuators carry out the behavior based on activation set by all the layers.

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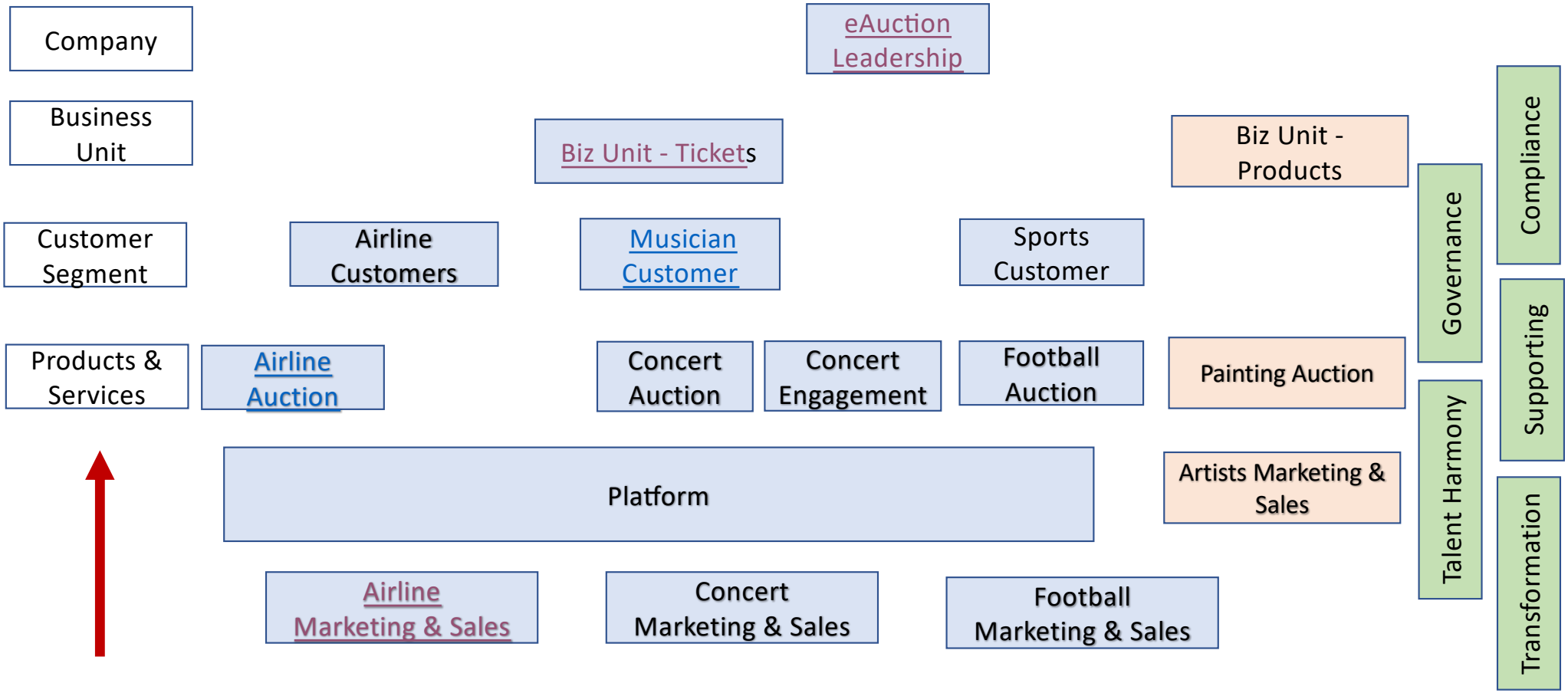
# Sensors in an organization

Sensor - Visualize everything through Canvases – For every teams

Andon as Signal

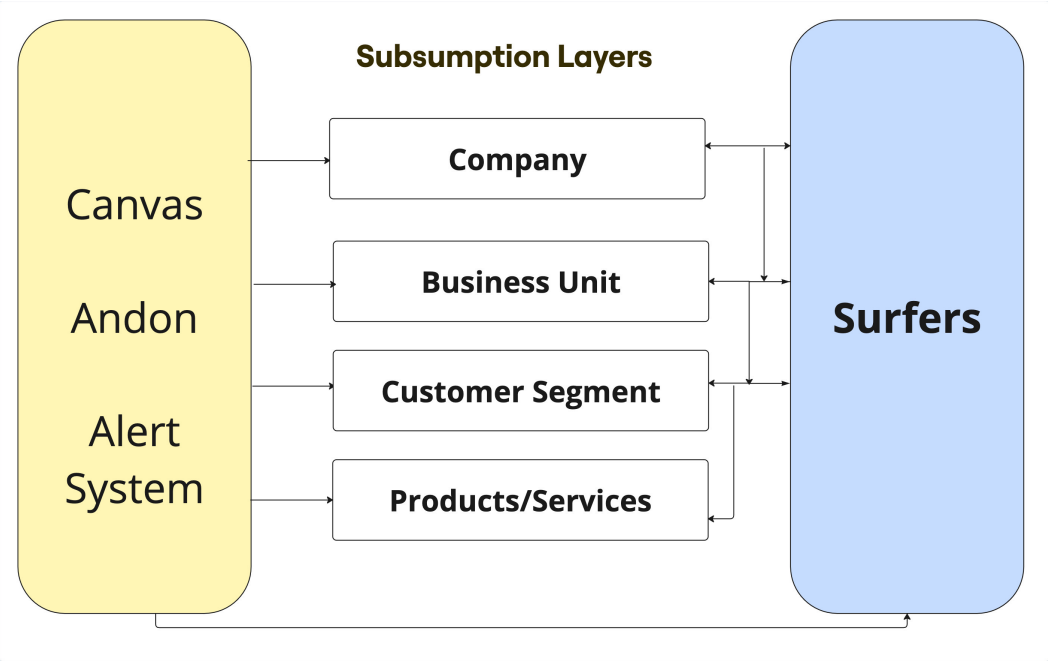
Alert System – Teams Opt-in to be notified (Sue Ryu)




**Subsumption Layers**

The **implementation of Sensor – Visualization On Steroid**. Canvases for every teams and collaborators.

# Building Blocks of a Subsumption-Based Organization




**Layers** - Customer Segment as base to subsume

**Canvas, Andon, Alert** - Monitor Market and other Conditions for the organization

**Surfers** – SMEs – working as a facilitator to enable teams to execute based on the current condition. Suppress or enables lower layers.

**No direct hierarchical control**

# Organizations Must Be Designed to Respond Rapidly

Robotics had to evolve to respond dynamically

Organizations today need to respond quickly

Otherwise, they struggle to survive

# Where Is Your Organization Toay?

- ✓ Where are the dependencies?
- ✓ Where do decisions get delayed?
- ✓ Where do teams wait?
- ✓ Where are the bottlenecks?

# Moving Toward a Subsumption-Based Organization

- Identify what should be grouped (subsumed) based on mission & vision
- Design layers so the parts fit together as one
- Identify signals (alerts) that
- Integrate all together so they operate like one living system

# Watch Webinars, ES Videos, and more

Visit

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Timeline for the session

| Time | Activity |
|---|---|
| 0:00–0:20 | Talk |
| 0:20–0:40 | Design 1 + debrief |
| 0:40–0:55 | Design 2 + debrief |
| 0:55–1:05 | Talk (post-design explanation) |
| 1:05–1:10 | Signals |
| 1:10–1:20 | Wrap |
| 1:20–1:30 | Q&A |

# What kind of Signals would eAuction need to respond rapidly?

5 Mins - Take a look at your design to find signals that would be useful.

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# Responding Rapidly In an Emergency

During disruptions, surfers rapidly carry airline intent across layers, enabling the organization to respond quickly toward passenger recovery.

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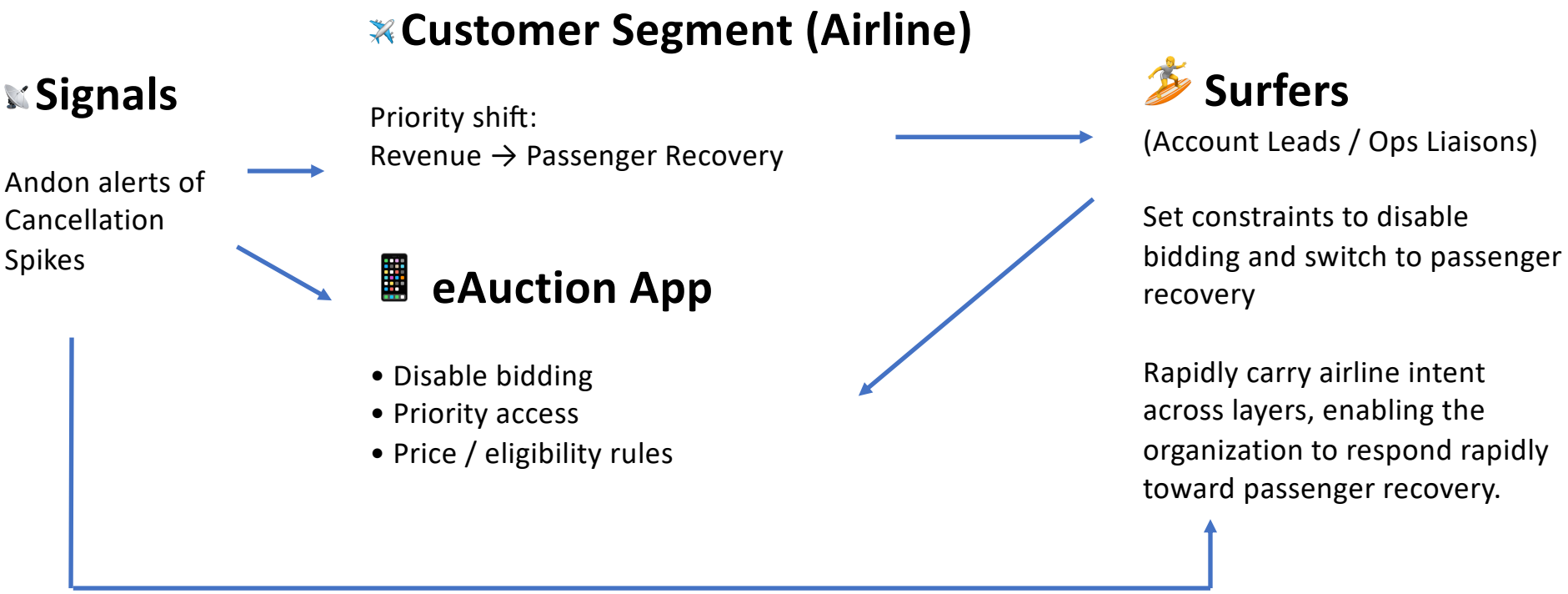
# A Major Storm causes widespread flight cancellations



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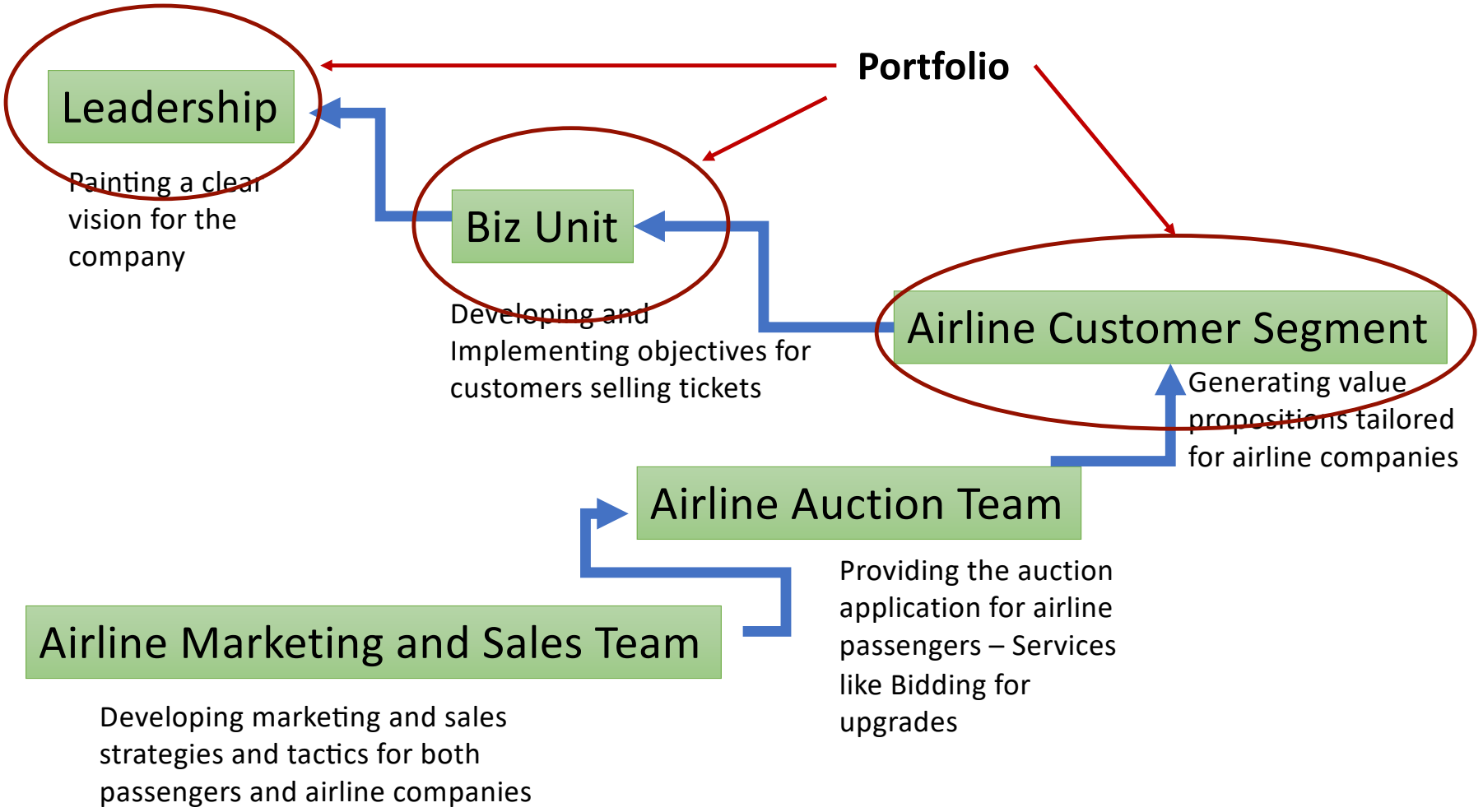

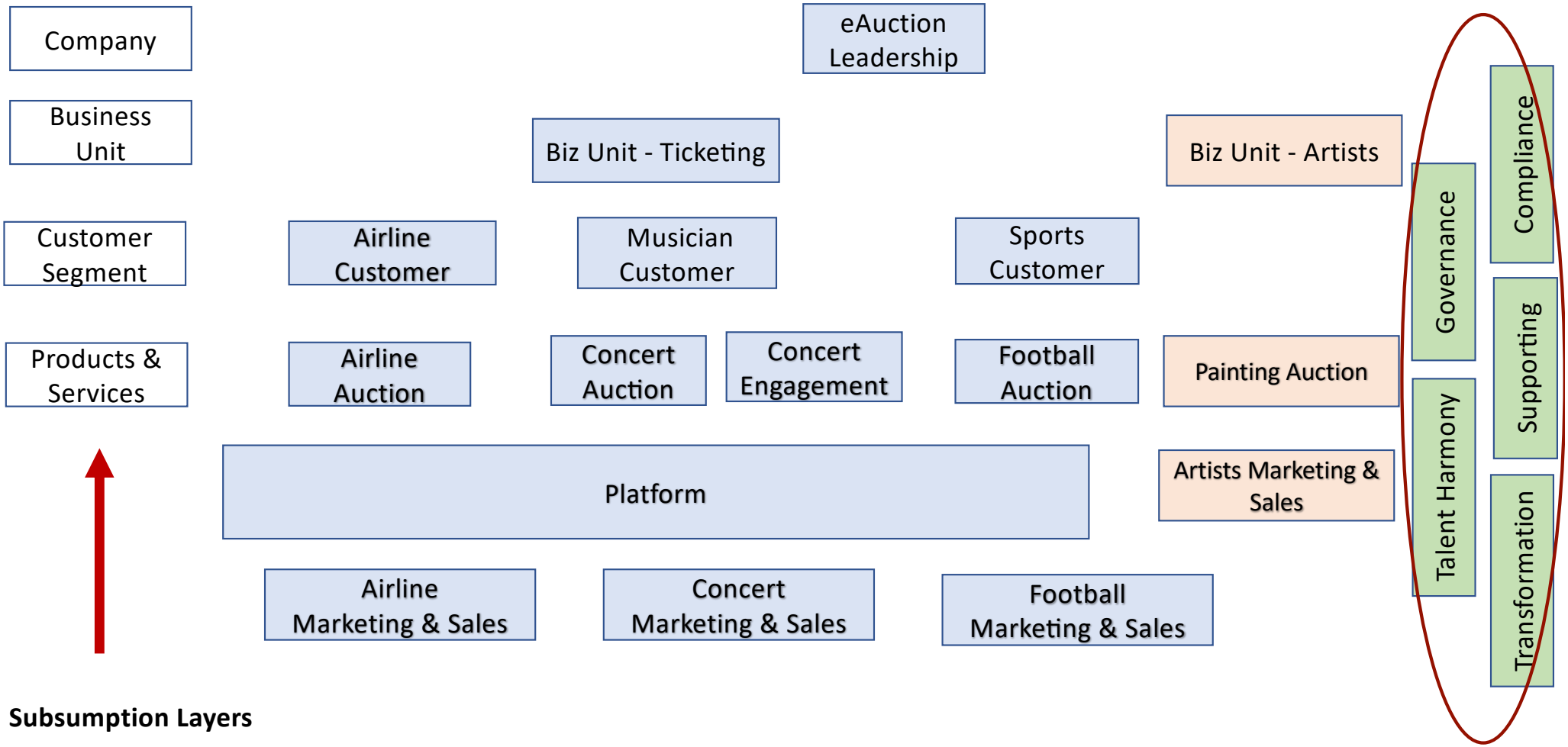


**Subsumption Layers**

# Who is using the subsumption architecture for scaling?



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- CVS Care Mark
- **Livelo** in Brazil
  - Cihangir Deniz Ozdemir
  - Betting Company
  - One of the biggest Loyalty & Reward Programs in Brazil
  - Enterprise Scrum 2017 - 2019
- Aha Autonomy

# What factors to use as a base to group for subsumption?

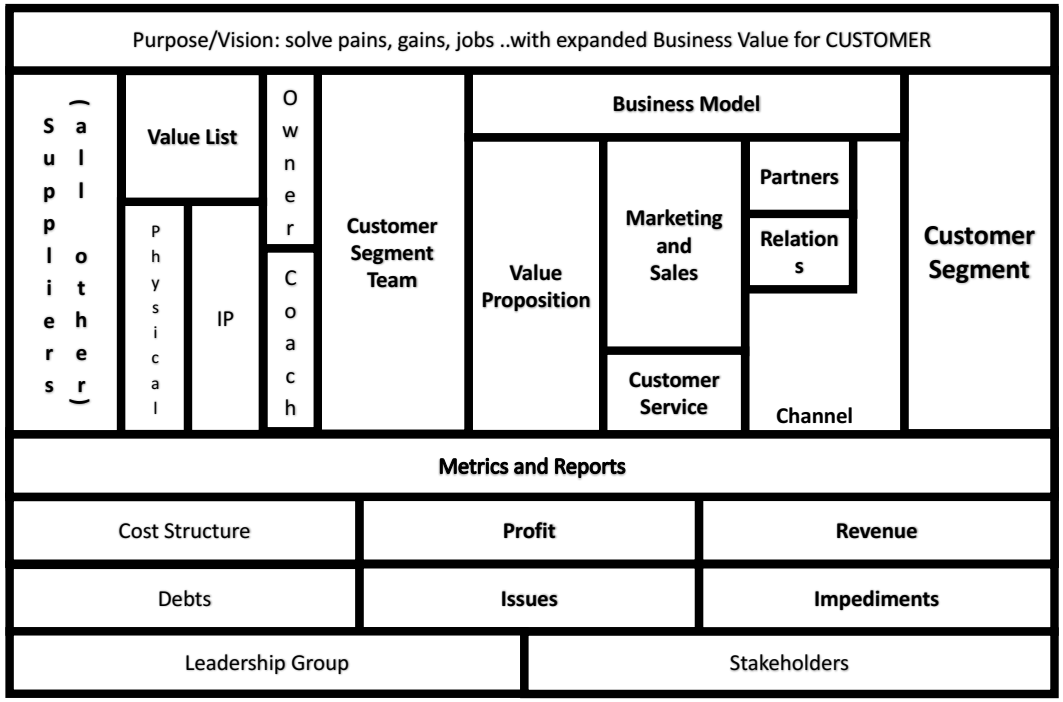
**Customer Segments** as we did for eAuction. This is recommended by Mike Beedle especially for innovative and new product developments.

**Geographic** – Giving Autonomy to each region or area

**Do Not base** on Functional, Develop-deploy, Front and Back. These tend to create functional silos that don't serve the customers well.

# Product Team Canvas

**ES – Business Model Canvas**




Like A BMC

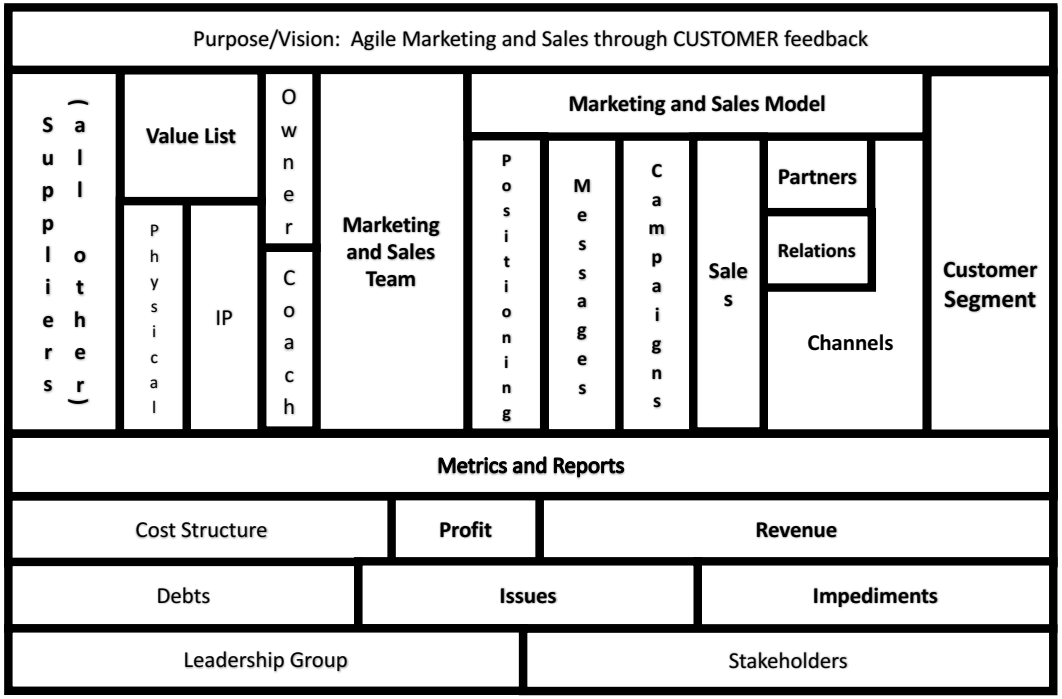
Delivering Value Proposition for one customer segment – BtoB

Keep in mind of what Clayton said - the Value Network

Look Vertically developing the products for this BtoB Customers

# Marketing and Sales Team

## ES – Marketing and Sales

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Different from the product teams

Visualize the key items needed for Marketing & Sales for BtoB

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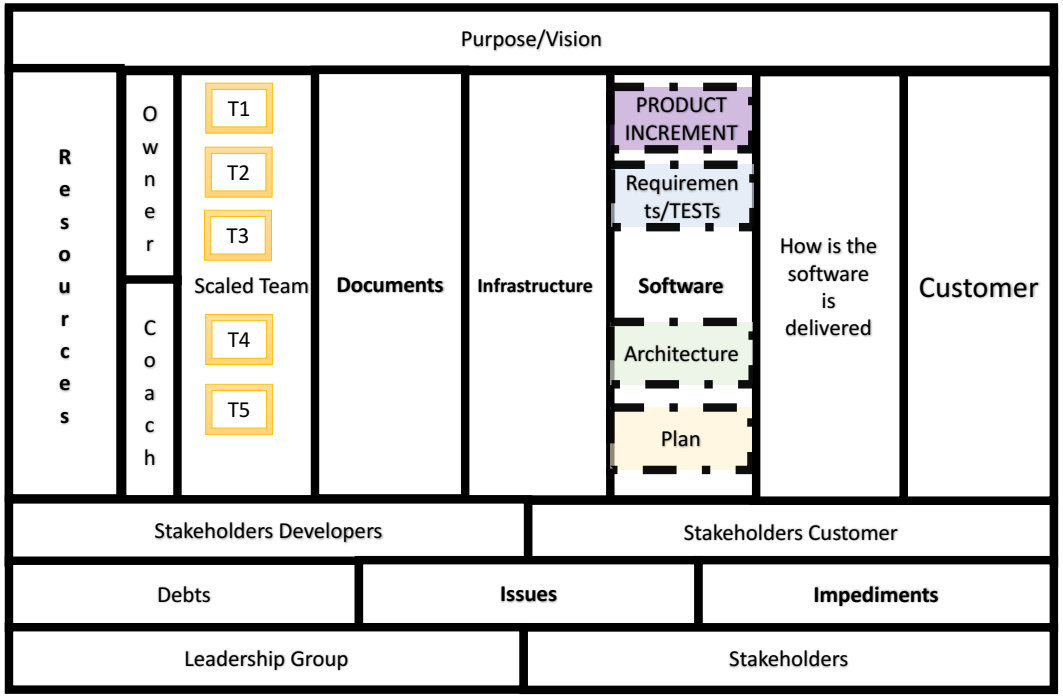
# Software Team

## ES – SCALED Software Development Canvas

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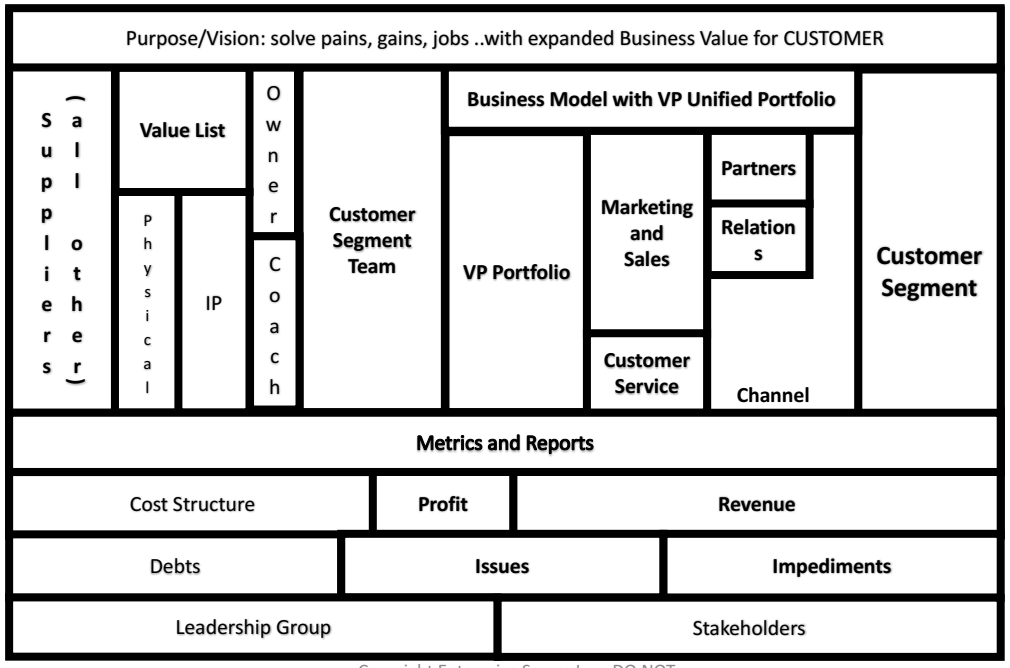
# Customer Segment with Value Proposition Portfolio

**ES – Customer Segment with Value Proposition portfolio**

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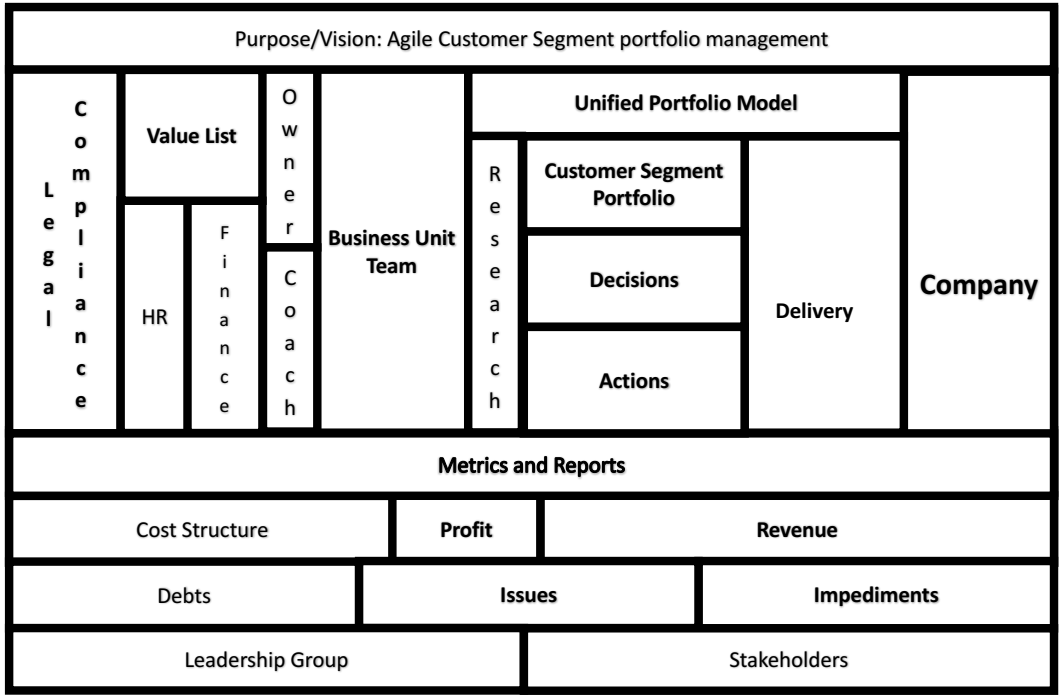
# Business Unit with Customer Segment Portfolio

**ES – Business Unit with Customer Segment portfolio**

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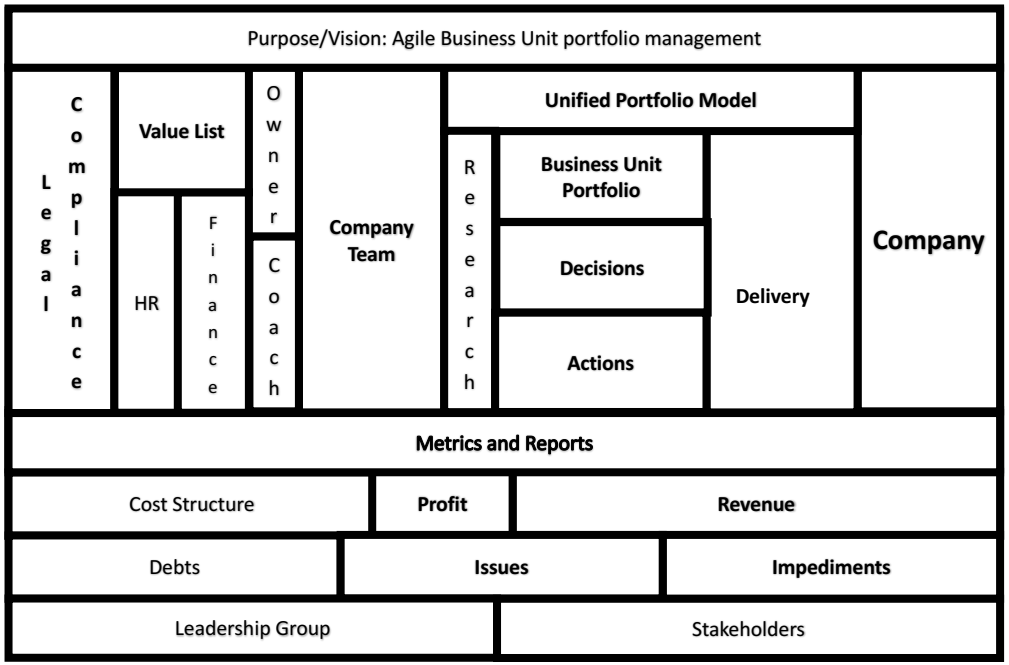
# Company with Business Unit Portfolio

**ES – Business Unit portfolio – Venture Capital**

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# Robot's Sensor  Examples

**Infrared (IR) Sensor**: Used for detecting obstacles or objects in the robot's path. This sensor can trigger the lower-level behaviors, such as stopping or turning, to avoid collisions.

**Ultrasonic Sensor**: Similar to IR sensor , ultrasonic sensor  can detect objects and distances. They are often used in robotics for navigation and obstacle avoidance.

**Light Sensor**: Light sensor  can be used to detect changes in light intensity, allowing the robot to react to changes in its environment, such as moving towards or away from a light source.

**Touch Sensor**: Touch sensor  can detect physical contact with objects or surfaces. They can be used for interaction with the environment or for detecting collisions.

**Gyroscope and Accelerometer**: These sensor  provide information about the robot's orientation, rotation, and acceleration. They are crucial for maintaining stability and balance, especially in mobile robots.

**Camera**: Cameras can provide visual information about the surroundings, allowing the robot to identify objects, navigate based on visual landmarks, or recognize specific patterns.

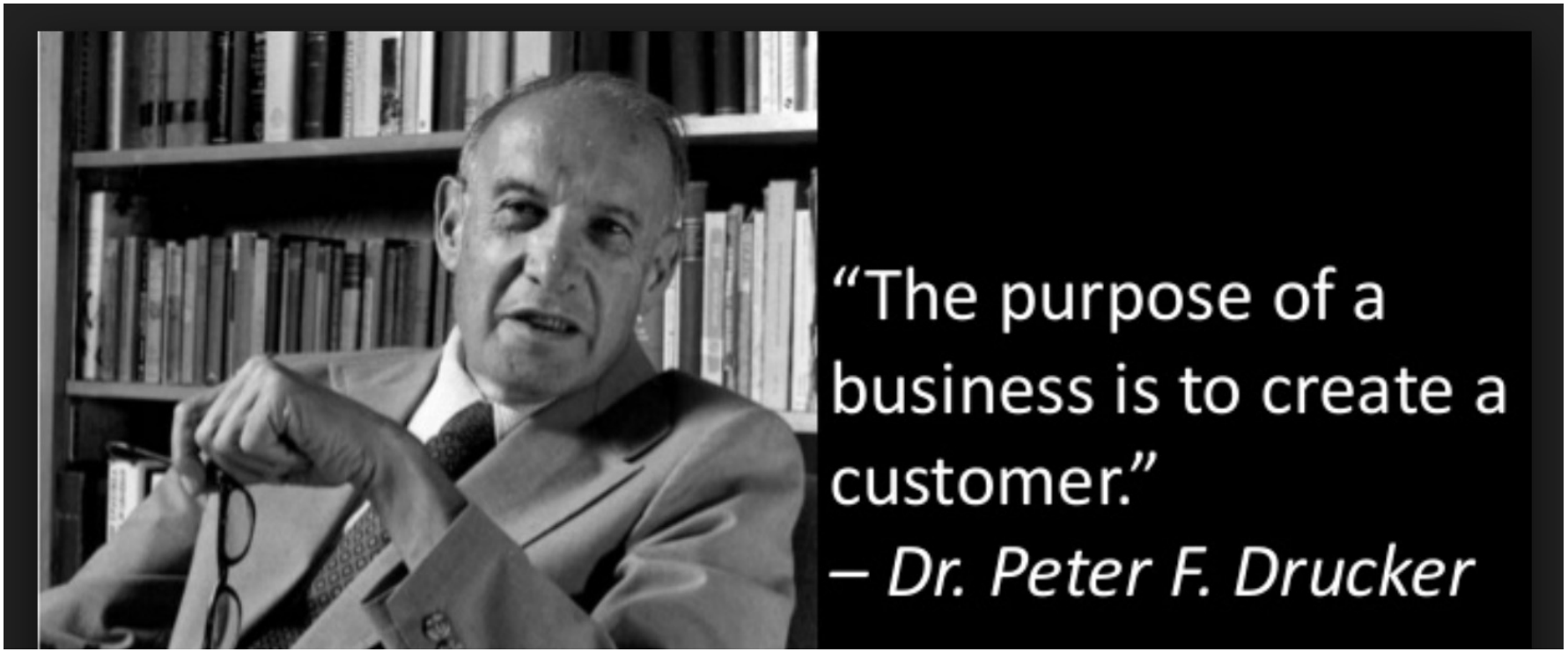
**Microphones**: Microphones can be used to detect sound signals, allowing the robot to respond to auditory cues or commands.

# Why? Answers can be found from two very **influential management thinkers**

Peter Drucker

Clayton Christensen

# Peter Drucker




Not a User but a Paying Customer!

In his book, he talks about value networks and

Not following value networks often leads to best firms failing in the face of disruptive innovation..