
LAB
SCENARIO
Design and Develop a Serverless Event-Driven Microservice-Based Solution

The Cool Revive Journey

From Frosty Beginnings to Innovation

Founding Story

- Evalyn Frost and Victor Glacier
- Shared dream: revolutionize world of refrigerator
- Believed every appliance deserves second chance
- Founded during the frosty winter of 2005
- Mission: reduce waste, conserve resources, create sustainable solutions

Early Challenges

- Prototype: ice-blue retro fridge
- Worked into late into the night, soldering wires, recalibrating thermostats, and whispering encouragement to the stubborn compressor
- Knew they were onto something

The Breakthrough

- Innovative approach caught attention of local repair shops, environmentalists, and Percy
- ChillCycle algorithm optimizes cooling efficiency while minimizing energy consumption

Manifesto

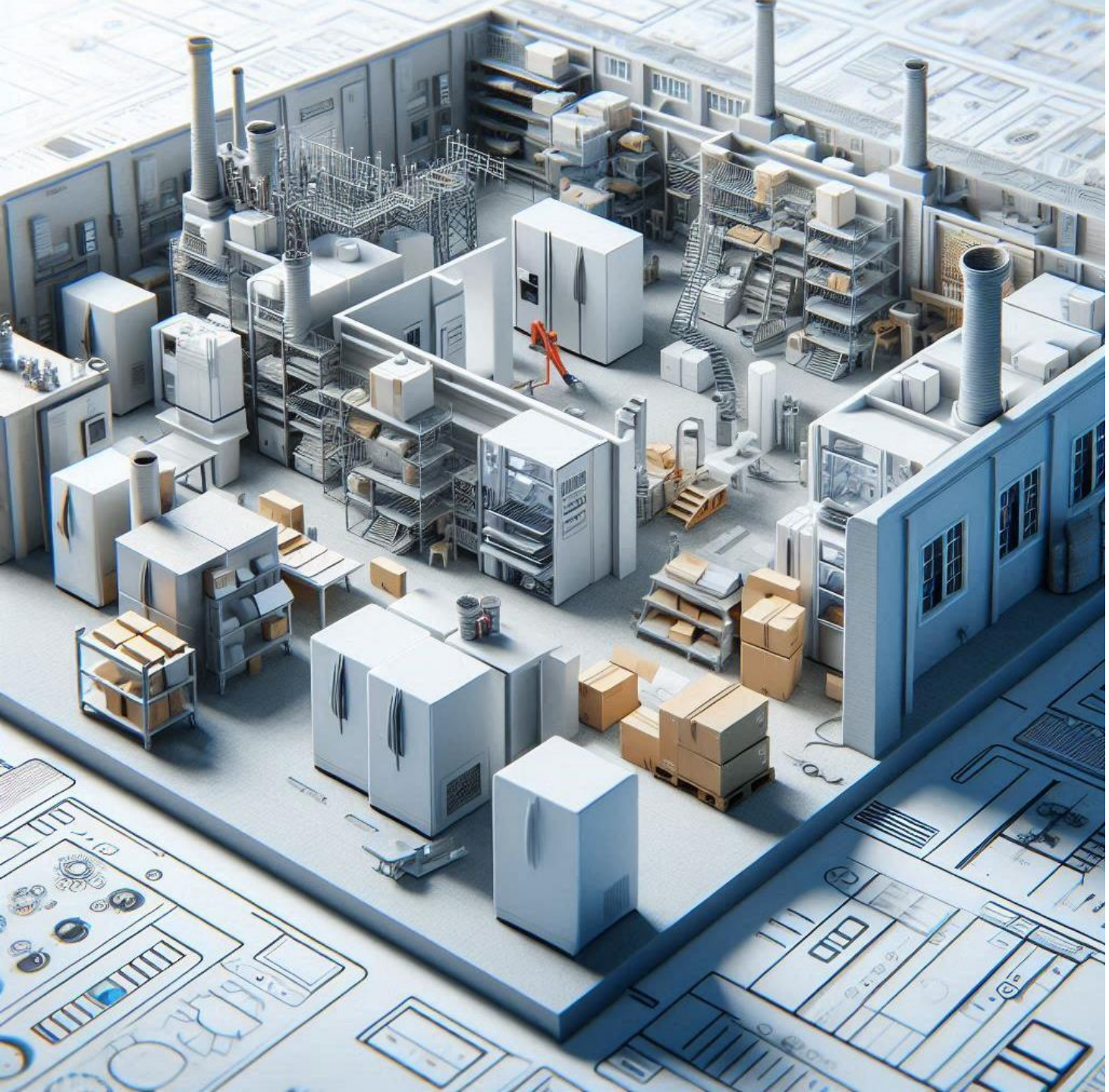
- Refrigerators Deserve Resurrection
- Eco-Friendly Overhaul
- Art Meets Appliance
- Community Cool-Offs

The Cool Revive Legacy

- Stands tall, emphasized by its logo, the phoenix
- Refrigerators grace trendy cafes, cozy cabins, and eco-conscious homes
- Frosty tale of resilience, reinvention, and art of keep things cool

Business Scenario

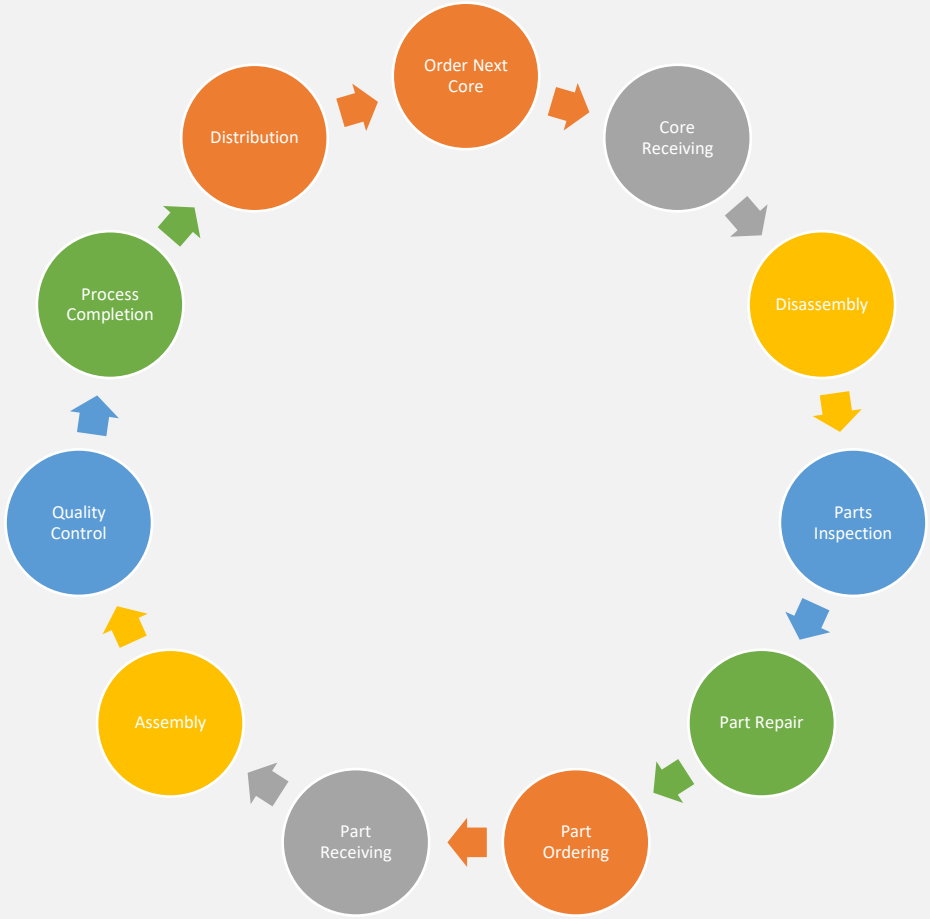
Refrigerator Remanufacturing



Business Scenario

- Relies on paper-based solutions to manage remanufacturing process
- Need better, more automated process
- Improve company’s efficiency

The Remanufacturing Process



Cool Revive's Mission and Values

- **Environmental Responsibility**
- **Innovation and Aesthetics**
- **Community Engagement**

Additional Considerations

- Exemplifies how technology, sustainability, and creativity intersect
- Saves energy and tells a frosty tale of resilience and reinvention
- “Keep it cool, but always stay warm-hearted.”
- Automated process will benefit environment

Statement of Work

Automated Remanufacturing Process

Project Scope

Core Unit Management

- Efficiently order, receive, and track core refrigerator units form the core warehouse
- Update inventory in real-time

Project Scope

Core Unit Management

Parts Inspection and Repair

- Inspect parts from disassembled units
- Determine reuse, repair, or reorder needs
- Facilitate repair requests

Project Scope

Core Unit Management

Parts Inspection and Repair

Assembly and Quality Control

- Assembly refrigerator using reusable, repaired, and replaced parts
- Implement quality control checks

Project Scope

Core Unit Management	Parts Inspection and Repair	Assembly and Quality Control	**Process Completion and Distribution**

- Finalize the remanufacturing process
- Send refrigerators to distribution (storage or shipping)

Objectives

Optimize Workflow

- Streamline processes to minimize lead time and resource utilization.
- Enable parallel execution of tasks where possible.

Objectives

Optimize Workflow

Scalability and Flexibility

- Design an architecture that accommodates varying production volumes.
- Support future expansion and additional features.

Objectives

Optimize Workflow

Scalability and Flexibility

Event-Driven Communication

- Implement event-based communication between services.
- Ensure timely updates and coordination.

Deliverables

High-Level Architecture

- A conceptual diagram outlining services, data flow, and communication patterns.
- Identification of critical components and their interactions.

Deliverables

High-Level Architecture

Detailed Design

- Specifications for each service, including triggers, inputs, and outputs.
- Data model for inventory management.

Deliverables

High-Level Architecture

Detailed Design

Integration Plan

- Guidelines for integrating services.
- Configuration details.

Deliverables

High-Level Architecture

Detailed Design

Integration Plan

Quality Assurance Strategy

- Testing approach (unit, integration, end-to-end).
- Error handling and recovery mechanisms.

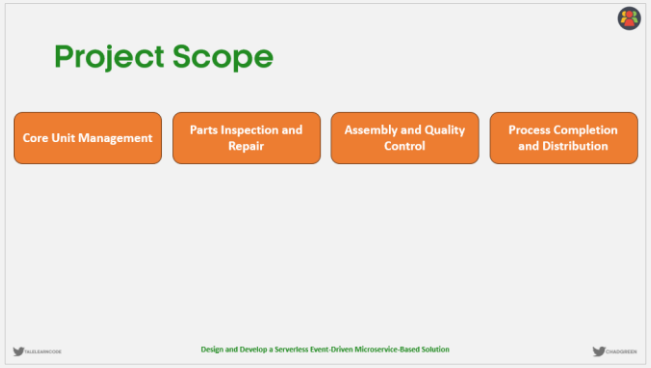
Assumptions and Constraints

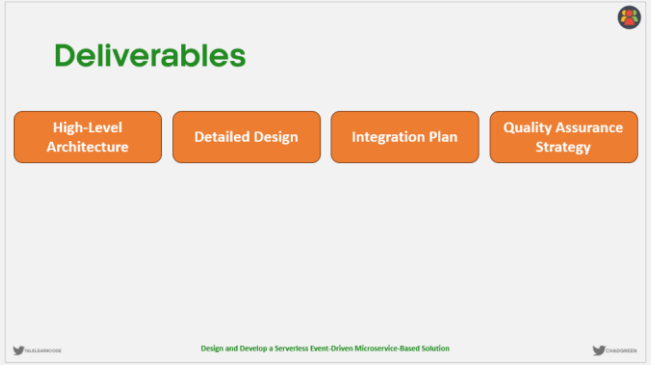
Technology Neutrality

Budget and Timeline

Questions to Consider

Statement of Work





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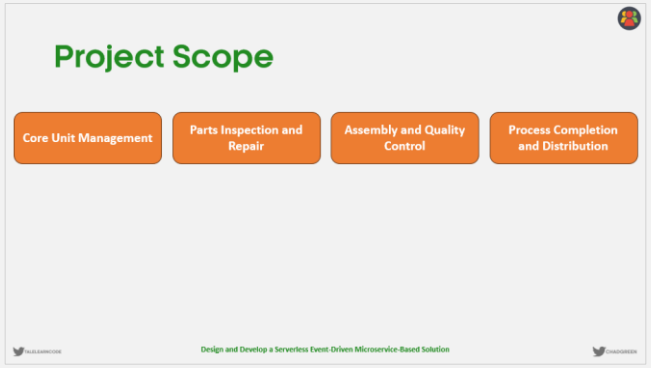

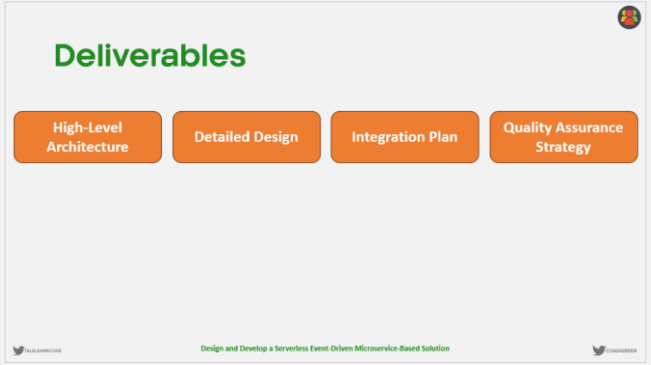

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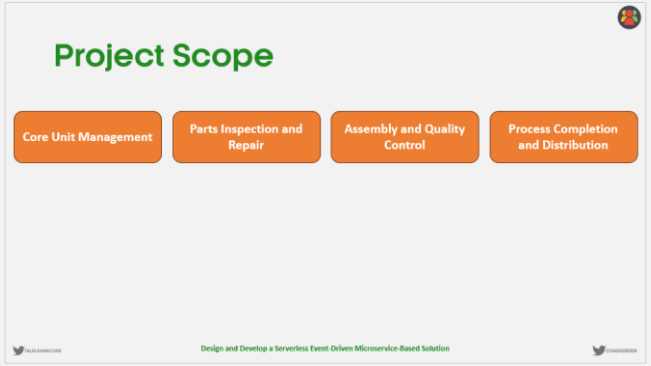

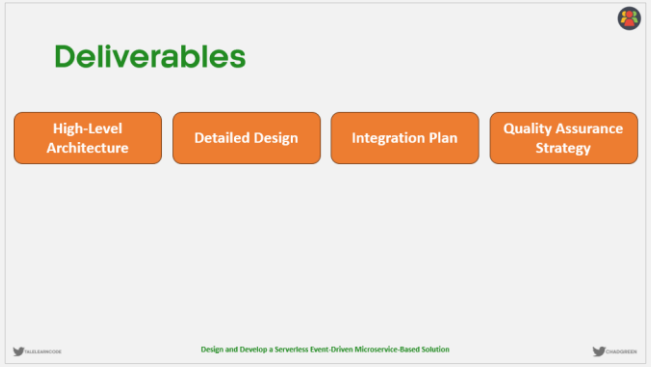

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Business Requirements

Efficient Remanufacturing Workflow

- Cool Revive aims to streamline the remanufacturing process for refrigerators.
- The solution should optimize the flow from core unit arrival to quality control completion.
- Efficiency means faster turnaround time and reduced resource wastage.

Business Requirements

Efficient Remanufacturing Workflow

Inventory Management and Tracking

- Cool Revive needs real-time visibility into inventory.
- The solution must track part conditions, repair statuses, and assembly progress.
- Accurate inventory data ensures smooth operations.

Business Requirements

Efficient Remanufacturing Workflow

Inventory Management and Tracking

Scalability and Agility

- As Cool Revive expands, the solution should scale seamlessly.
- Whether handling ten or a thousands of core units, the system should adapt dynamically.
- Agility allows Cool Revive to respond to market demands swiftly.

Business Requirements

- Efficient Remanufacturing Workflow
- Inventory Management and Tracking
- Scalability and Agility
- Cost Optimization

- Cool Revive wants to minimize infrastructure costs.
- Solutions should avoid overprovisioning.

Business Requirements

- Efficient Remanufacturing Workflow
- Inventory Management and Tracking
- Scalability and Agility
- Cost Optimization
- Event-Driven Communication

- Events trigger various steps in the remanufacturing process.
- The solution must handle event-driven communication between services.

Business Requirements

- Efficient Remanufacturing Workflow
- Inventory Management and Tracking
- Scalability and Agility
- Cost Optimization
- Event-Driven Communication
- Security and Compliance

- Protecting customer data and complying with regulations are paramount.
- The solution should incorporate robust security practices.
- Encryption, access control, and threat detection are essential.

Business Requirements

- Efficient Remanufacturing Workflow
- Inventory Management and Tracking
- Scalability and Agility
- Cost Optimization
- Event-Driven Communication
- Security and Compliance
- Global Reach

- Cool Revive operates internationally.
- The solution should support the global distribution of inventory data.

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Key Performance Indicators (KPIs)

Scalability and Flexibility

- **Auto-scaling efficiency**: How quickly the system adapts to workload changes.
- **Resource utilization**: Ensuring optimal use of resources without overprovisioning.

Key Performance Indicators (KPIs)

Scalability and Flexibility

Response Time and Execution Duration

- **Service response time:** How quickly the services react to events.
- **Execution duration:** Time taken to complete a service action.

Business Requirements

- Scalability and Flexibility
- Response Time and Execution Duration
- Inventory Visibility and Accuracy

- **Inventory update frequency:** How often data reflects changes
- **Data consistency:** Ensuring accurate and synchronized inventory across locations.

Business Requirements

- Scalability and Flexibility
- Response Time and Execution Duration
- Inventory Visibility and Accuracy
- Cost Efficiency

- **Compute cost per transaction:** Calculating cost based on usage.
- **Infrastructure savings:** Comparing costs to traditional infrastructure.

Business Requirements

- Scalability and Flexibility
- Response Time and Execution Duration
- Inventory Visibility and Accuracy
- Cost Efficiency
- Security and Compliance

- **Security incidents:** Monitoring any breaches or vulnerabilities.
- **Compliance adherence:** Meeting industry standards and regulations.

Business Requirements

- Scalability and Flexibility
- Response Time and Execution Duration
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- Event-Driven Communication

- **Event delivery reliability:** Ensuring event trigger services consistently.
- **Latency:** Time taken for events to propagate.

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Group Discussion

Architecting a solution for Cool Revive Technology

Code of Conduct

- Respect and Inclusion
- Professional Behavior
- Confidentiality
- Collaborating and Listening
- Conflict Resolution
- Compliance with Laws and Policies
- Safety and Well-Being
- Feedback and Improvement

Group Discussion

- Understand the business scenario

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- Security and compliance
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- Integration points
- Cost considerations
- Document the architecture

Solution Overview

Order Next Core