



Powered Drug Distribution: Saving Lives Using SAP Internet of Things

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About the Speakers

Arvind Kumar Jha

- Sr. Advisory Consultant, IBM
- 17+ Years IT Experience with 9+ Years in SAP SD
- I love playing chess, solving puzzles, watching TV and spending time with family & friends.

Neeraj Kumar

- Sr. Managing Consultant, IBM
- 18+ Years Experience in SAP SD
- I like playing and watching Cricket. I like music, movies and playing with kids.

Key Outcomes/Objectives

1. Understand the need of new transformation in Drug Distribution
2. Understand high level SAP IoT architecture
3. Applicability of SAP IoT in Drug Distribution Business

Agenda

- Drug Distribution Business Overview and Challenges
- Internet of Things Market Opportunity
- Capabilities of SAP Leonardo Internet of Things
- SAP Internet of Things
- SAP IoT Use cases –
 - Cold Chain Transport
 - Distribution using Drone(Futuristic Solution)

Drug Distribution is at an inflection point and companies must continuously redefine their role and value proposition

- ▶ The traditional distributor value proposition is built on the availability and efficient flow of high volumes of product...



- ▶ ... however this value proposition is under threat and undergoing radical transformation

IT as a source of competitive advantage

Technology will enable new business models to emerge and flourish as the distribution environment realizes the power of information flow over the physical flow of products



Non-traditional Competitors

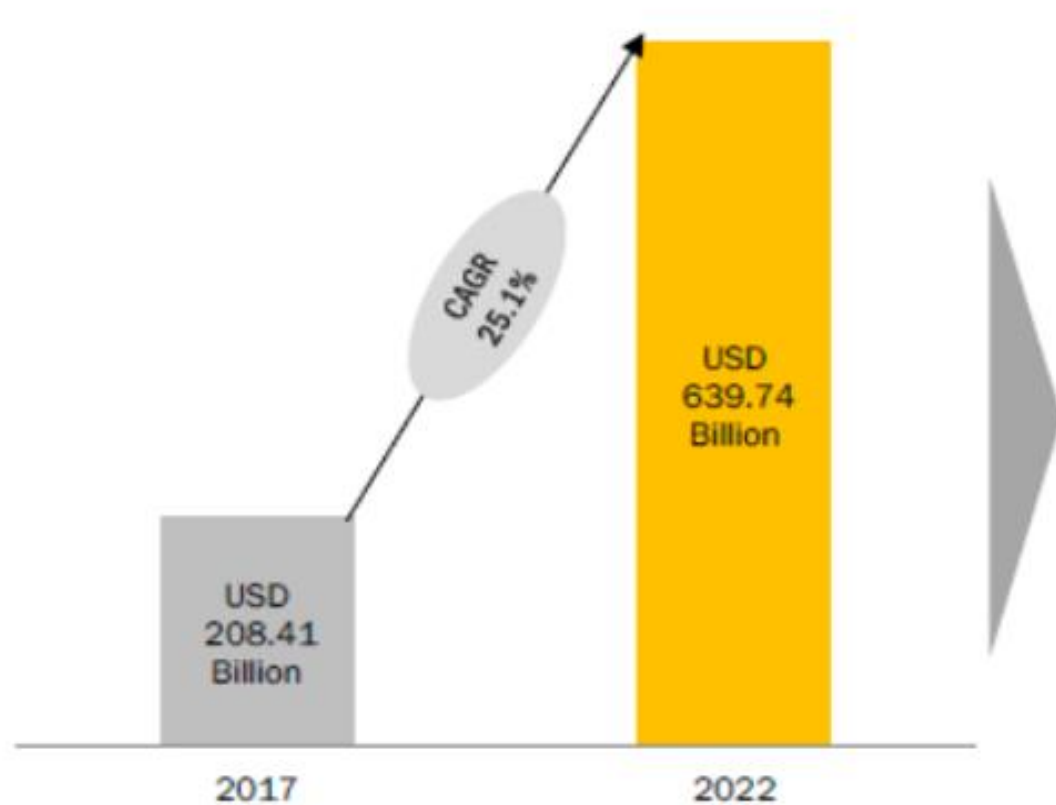


Value-Added Services

- Vendor- and Customer-Managed Inventory
- Market insights using IoT
- Pharmacy management
- Robust Cold chain distribution
- Reverse logistics
- Non-traditional distribution
- Procurement outsourcing



Attractive Opportunities in IoT Technology Market



ATTRACTIVE MARKET OPPORTUNITIES

- The overall IoT technology market is expected to reach USD 639.74 billion by 2022, at a CAGR of 25.1% between 2017 and 2022.
- The market growth is attributed to the integration of connectivity capabilities in an increasing number of devices, declining cost of sensors, and increasing adoption of cloud platforms.
- Significant funding by governments for R&D in IoT would also drive the growth of the IoT technology market.
- The IoT technology market in APAC is expected to grow at the highest CAGR of 30.4% owing to the growing penetration of the Internet across commercial and residential areas, improving IT infrastructure and high consumer base.
- Industrial, automotive and transportation, and oil & gas are some of the major end-use applications of the IoT technology market.

SAP Leonardo Internet of Things capabilities

SAP Leonardo IoT Bridge

on SAP Cloud Platform

Connected
Products

Connected
Assets

Connected
Fleet

Connected
Infrastructure

Connected
Markets

Connected
People

SAP Leonardo IoT Edge

Streaming

Persistence

Business
transactions

Predictive and
machine learning*

Analytics*

*Planned Service

SAP Leonardo Foundation

Technical Services



Device management

Connectivity

Messaging

Data Management



Aggregate store

Times series store

Data archive

Business Services



Thing model (SAP Digital Twin)

Application development

Reuse UI and APIs

on SAP Cloud Platform

SAP Internet of Things - Introduction

Key Capabilities

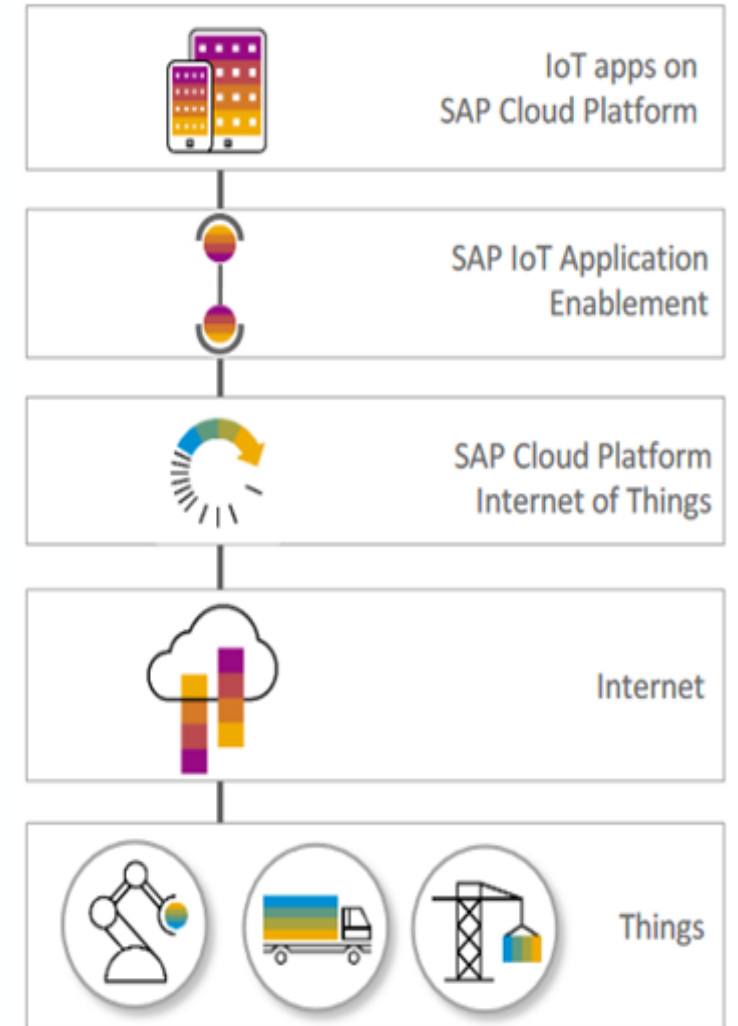
- **Lifecycle management** at scale for devices from onboarding to decommissioning
- **Securely connect** to remote devices over a **broad variety of IoT protocols** (HTTP, MQTT, CoAP, SNMP, File, ModBus, Sigfox, OPC-UA)
- Collect and **process sensor data** at scale already at the **edge or in the cloud** and store it on SAP Cloud Platform
- Integral part of SAP Leonardo IoT Foundation & Edge to build and run IoT applications in cloud

Product Innovations

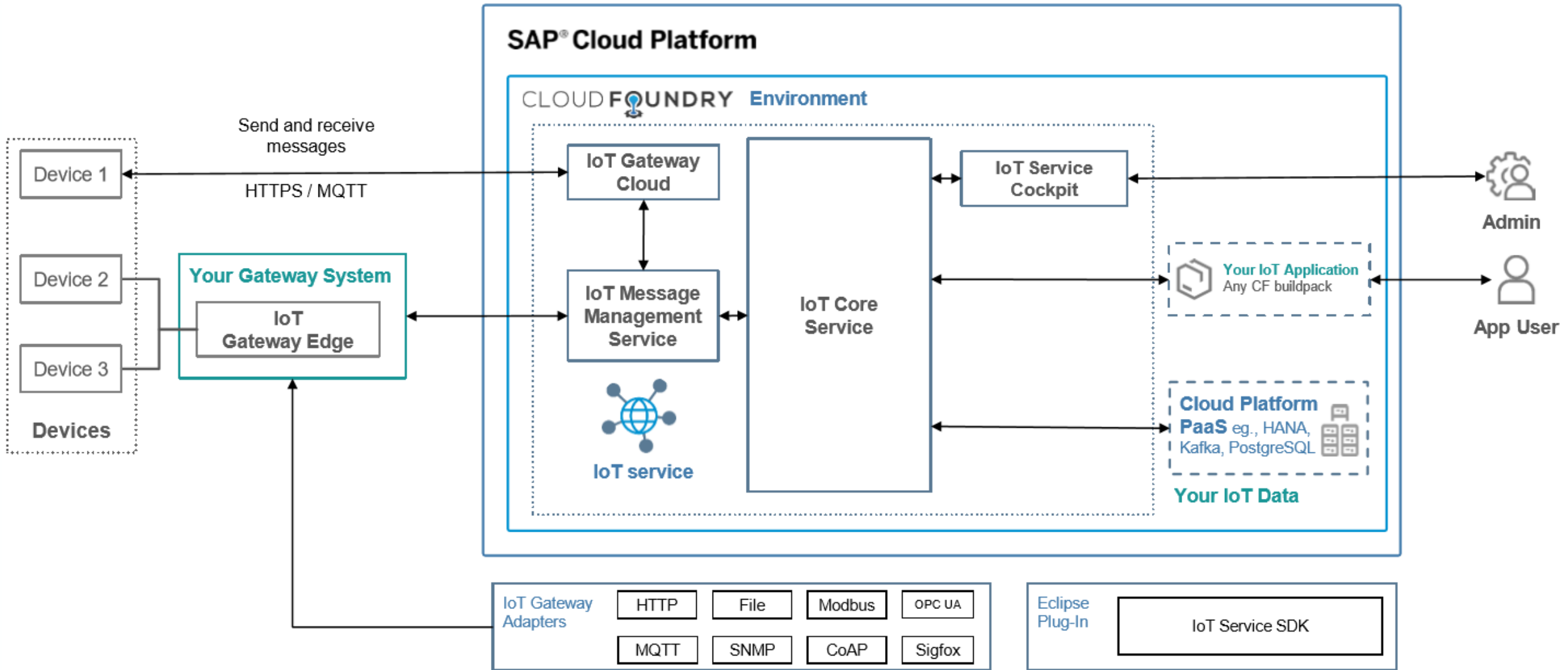
- Integration into SAP IoT Application Enablement in support of rapid development of IoT applications
- Support of SAP Edge Services for advanced processing capabilities on Gateway Edge
- Continuous delivery of further IoT protocol adapters

Key Benefits

- Flexible deployment options for gateway component
- Certificate-based onboarding and authentication of devices
- Software development kit (SDK) for development of custom protocol adapters and custom filters (interceptors)



SAP Internet of Things - Architecture Overview

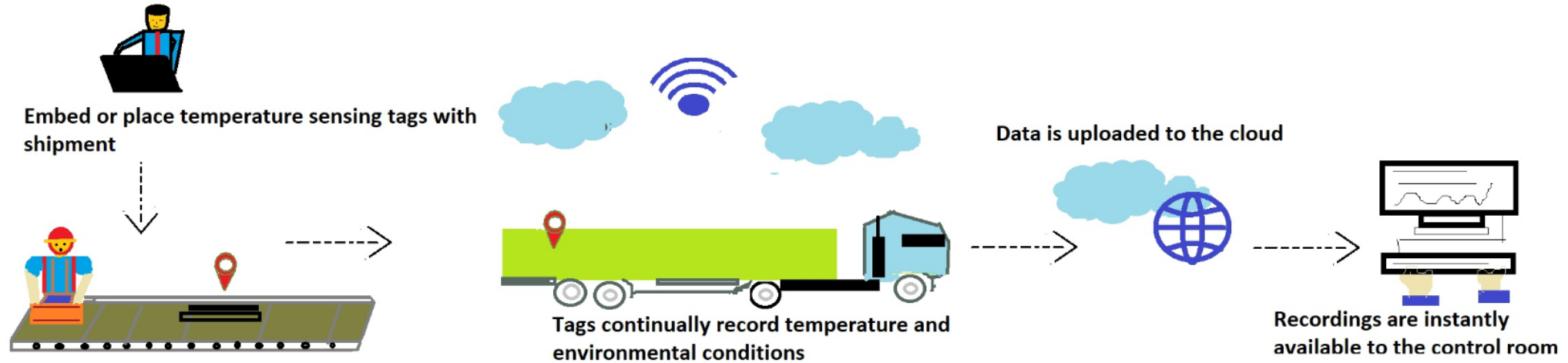


SAP IoT Drug Distribution Use Case

- ❖ Cold Chain Transport
- ❖ Distribution using Drone(Futuristic Solution)

Cold Chain – IoT offers path breaking solution

Monitoring Cold Chain Conditions on Shipping Vehicles



Business Need

Maintain Drug Quality During Transit.

Method

Track the temperature of stored drugs in transit to ensure they remain within acceptable range.

IoT Solution

Embed environmental sensors inside product packages/pallets in shipment containers to continually track the temperature of drugs. Sensors to automatically signal alerts if temperature goes out of specified range due to any reason. E.g. refrigeration malfunction.

Benefits

Reduced drug waste due to temperature excursions. Assured quality and efficacy. Ensure compliance with local, country and international regulations.

Use Case Proof Of Concept – Main Screen

AmerisourceBergen®

Cold Chain Transport

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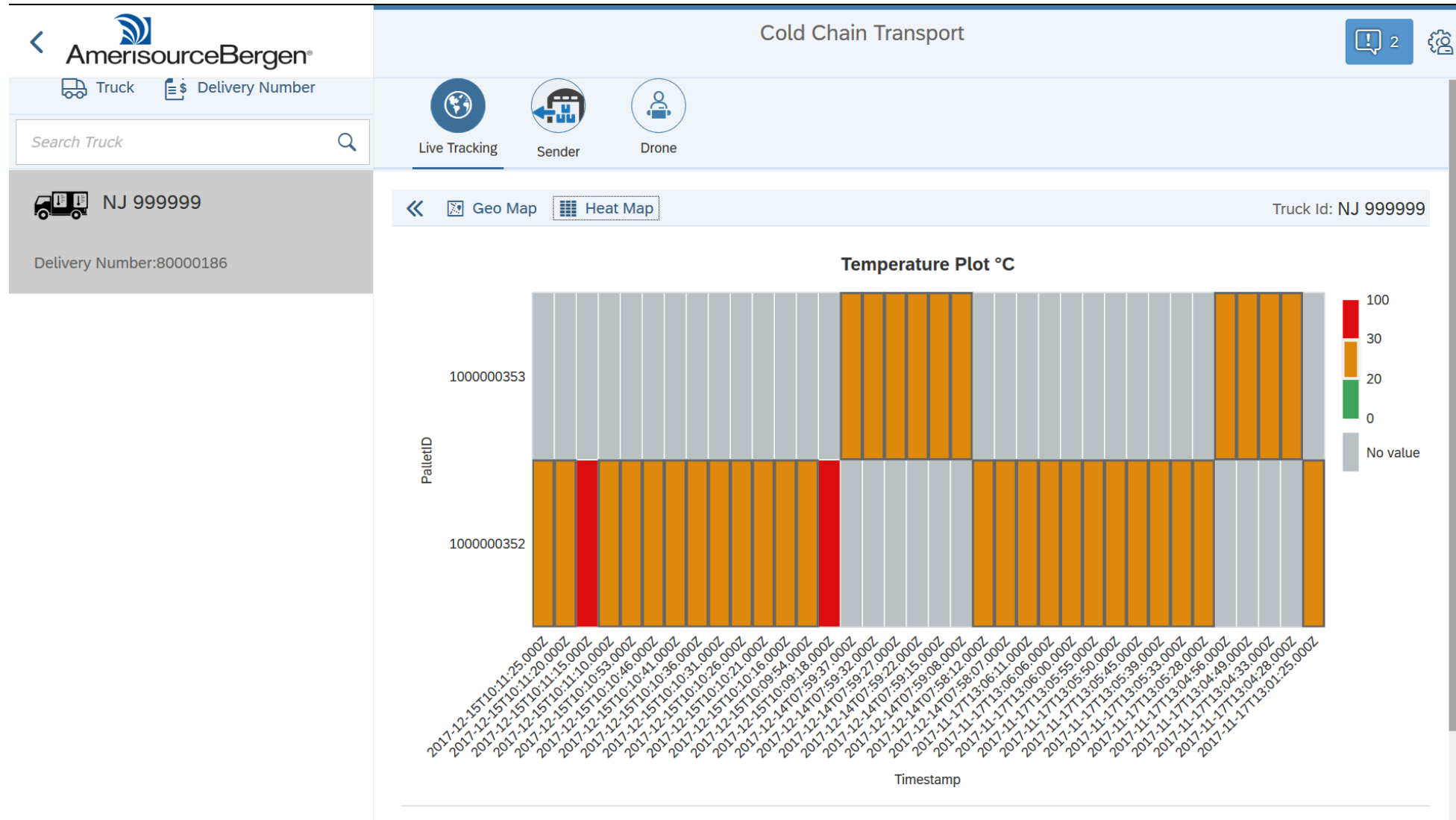
World Courier
AmerisourceBergen

| Category | Count | Description |
|------------------------------------|----------|-------------------------------|
| Delivery | | Current Deliveries |
| In Transit | 6 TRUCKS | All running trucks on the way |
| Pallets with Temperature Excursion | 1 TRUCKS | Trucks with bad pallets |

Use Case Proof Of Concept – Geo Map

The screenshot displays the AmeriSourceBergen Cold Chain Transport application interface. The top navigation bar includes the AmeriSourceBergen logo, the title "Cold Chain Transport", and notification and settings icons. Below this, a secondary navigation bar offers "Live Tracking", "Sender", and "Drone" options. The main content area is split into a left sidebar and a right main panel. The sidebar shows the selected truck "NJ 999999" and its "Delivery Number: 80000186". The main panel features a "Geo Map" view for truck "NJ 999999". The map shows a street grid with a highlighted route in green and orange. Landmarks such as "The Noguchi Museum", "Long Island City High School", and "Ravenswood Generating Station" are visible. A red location pin is placed on the map near the intersection of 34th Ave and 24th St.

Use Case Proof Of Concept – Heat Map



Drone Delivery – IoT offers path breaking solution



Business Need

Facilitate Drug Distribution in challenging situations without customer impact

Method

Take help of Drones to deliver critical life saving medicines to customers in situations like Natural calamities, epidemic condition, hilly or remote location

IoT Solution

SAP feeds customer location to Drone as destination. e.g. latitude/longitude/altitude. Drone to feed it's own location and environmental data to IoT application for taking informed decision.

Benefits

Ensure delivery of critical/life saving drugs in challenging situations

Drug distribution using Drone – Examples

- Wake County, N.C., First to See Meds-By-Drone Delivery in U.S. - California-based Matternet tested the concept for the first time by making a mock delivery to the roof of WakeMed Hospital Aug. 29 2018.
- Ghana Vice President Dr. Mahamadu Bawumia, has said the nationwide use of drones to deliver essential medical services such as drugs and blood to deprived communities, will take off in 2019. Ghana's parliament has now approved its own drone project, despite initial skepticism.
- Rwanda made headlines as the first country to pilot blood deliveries by drone.
- The HQ-40 drone, made by Tuscon, Ariz.-based Latitude Engineering, can carry samples for medical testing in a refrigerated temperature controlled container designed by Johns Hopkins researchers.

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Q&A

For questions after this session, contact us at arvinjha@in.ibm.com and neeraj.kumar@in.ibm.com.

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