



# Smart City Solution for Urban Data and Planning

productOps & VANTIQ

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# The Garage - productOps Innovation Center

Where we do research  
and build proof of  
concepts and demos for  
our clients



# The Future of Urban Landscapes & Data

Cities across the globe are undergoing rapid changes and growth.

Cities are becoming smarter, not just in the technology used, but in how city planners design the spaces where we live, work, and play.

# Future of Urban Landscape

## What does an urban area look like today and tomorrow?

- Heart of **live** human interaction
- Increasingly mixed use
- Frequently overused services even in small towns
- City planning and ordinances are complicated and often go unenforced because of legalities



# What do cities need to manage?

## Issues we face today:

- Safety (health, security)
- Mobility
- Traffic
- Gig/Shared Economy
- Urban Manners



# People living in urban areas

## United States

82% of people live in urban areas (was 70% in 1960)

## Worldwide

2050 will change from 55% to 68% - a growth of 2.5 BILLION people

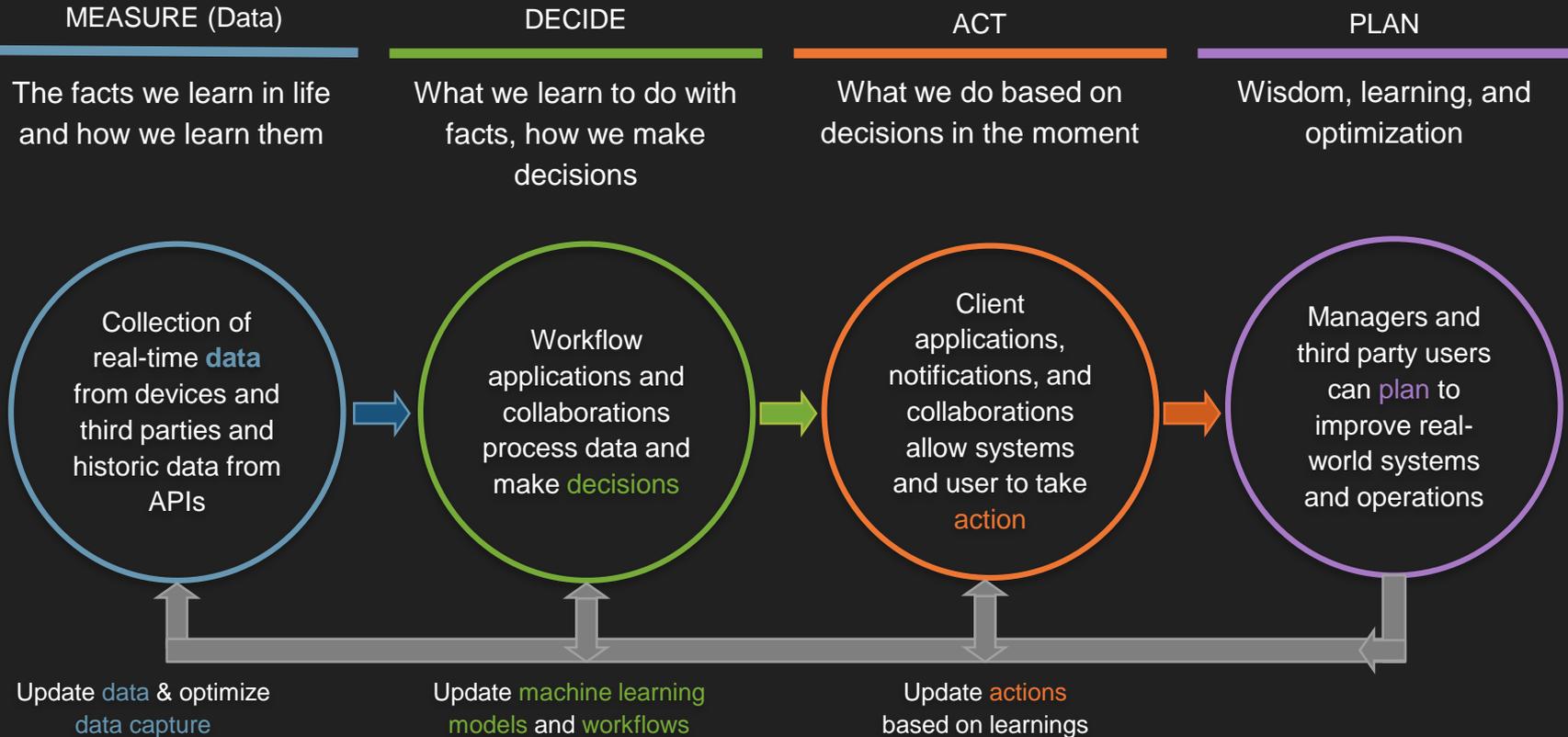
How much urban data  
do 6.25 billion people  
create?

A LOT

# Making Cities Smart

In order to properly plan a city, the rules that govern it, and the ability to enforce the laws, city managers need the right tools and **DATA**.

# Smart City Platform - what is needed?



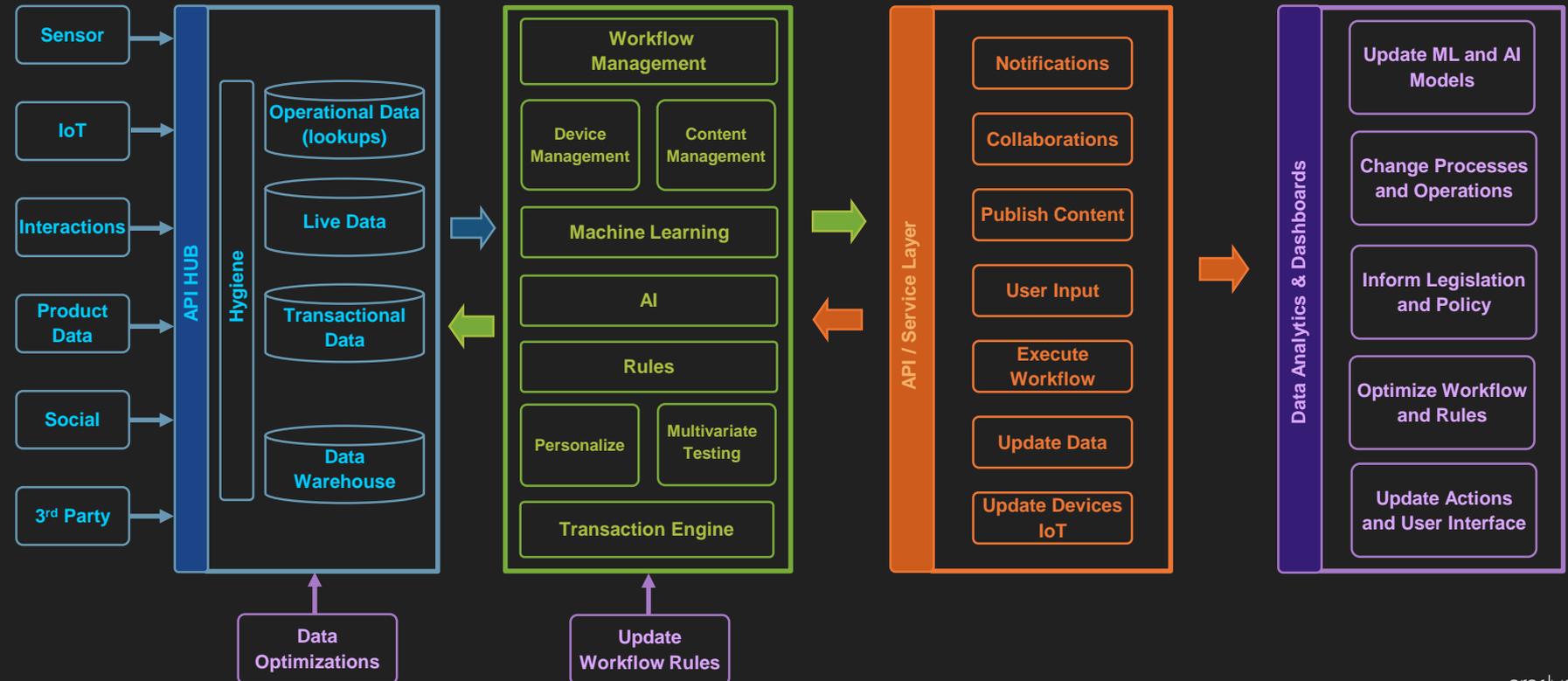
# Platform Reference Architecture

MEASURE (Data)

DECIDE

ACT

PLAN



# Working on Pacific Avenue





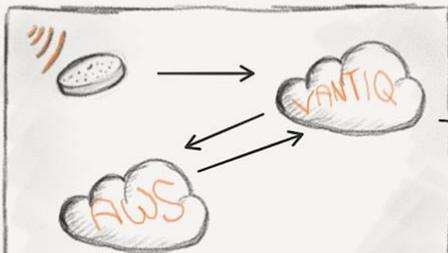
NO ONE CAN CONCENTRATE WITH THE NON-STOP LOUD MUSIC



AMPLIFIED STREET MUSIC



AUDIO SENSORS PICK UP NOISE



PLATFORM VANTIQ + AWS ML PROCESSES NOISE IN REAL-TIME



CITY AMBASSADOR GETS VIOLATION ALERT ON PHONE AND TAKES ACTIONS



HAPPY WORKERS

**Amplified music != good neighbors**

# The LOUD Solution



## MEASURE

Audio sensors collect **data** in real-time and send data to VANTIQ and AWS SageMaker.



## DECIDE

VANTIQ analyzes the data and makes **decisions** in real-time using custom workflows.



## ACT

VANTIQ sends notifications and allows users to collaborate and take **action** in the mobile app.



## PLAN

Reports allow managers and third party users to plan and improve real-world systems.

# Measure data on the edge

MEASURE (Data)

DECIDE

ACT

PLAN

Edge devices  
capture live  
noise data

We record a stream of audio from multiple audio sensor arrays

Under the hood:

- Python process audio on edge
- Sends four second recordings to AWS S3
- Sends dB levels to VANTIQ every four seconds
- ML Classifies sounds in AWS SageMaker



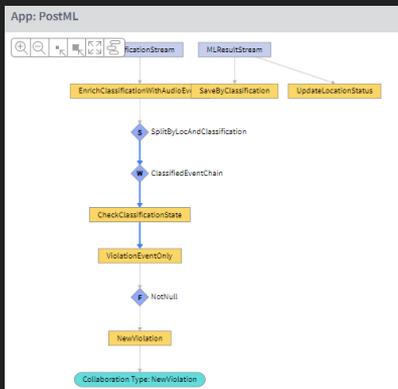
# Make decisions based on data

MEASURE (Sense)

DECIDE

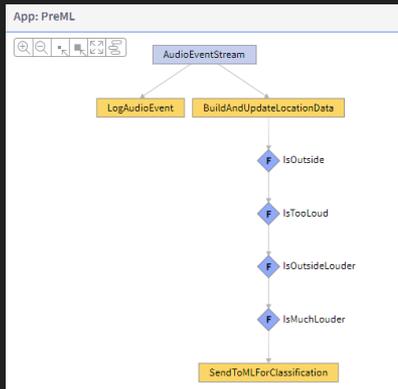
ACT

PLAN



## Workflows

- New data triggers the **PreML** app
- If data meets criteria it is sent AWS ML
- Classified noises trigger the **PostML** app
- If it meets violation criteria, start a **NewViolation** collaboration



VANTIQ



# Take action in real-time

MEASURE (Data)

DECIDE

ACT

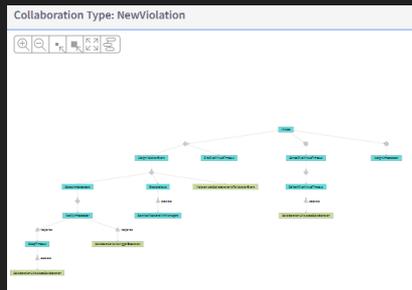
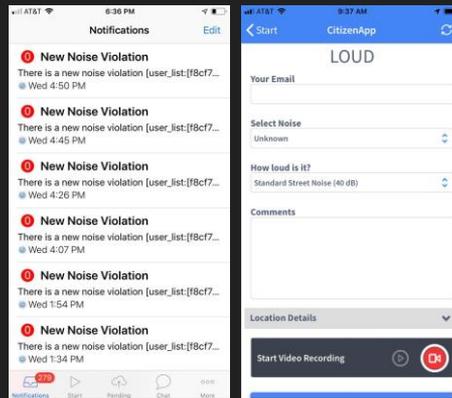
PLAN

## Collaborations and Clients

**NewViolation** creates a collaboration for city ambassadors and managers to respond, escalate, and resolve violations

**NewCitizenViolation** client and allows citizens to report violations and notify city ambassadors

Create Tickets  
for City Officials



# Plan ahead and make improvements

MEASURE (Data)

DECIDE

ACT

PLAN

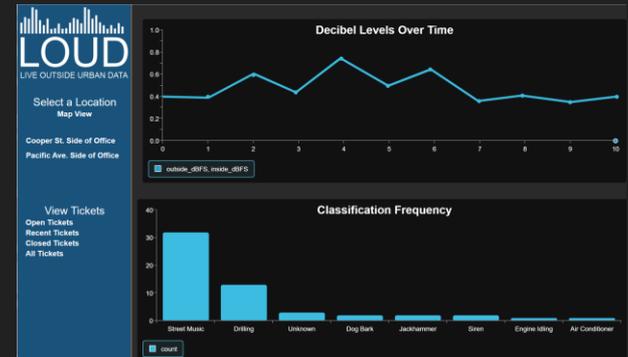
## Considerations

- What can you learning from data and experience
- How can this increase engagement and effectiveness

Understanding  
what is working  
as fast as  
possible

## Improve

- Data capture
- Workflows
- User experience
- Operations and policy



# Data for everyone

Monetization for data

# LOUD Platform

Everyone can contribute

Everyone can benefit

**City Officials  
and Planners**

**B2B  
B2C**

**Industrial**

**Citizens**

City officials can use the platform to react in real-time, enforce laws, and pass better laws regulations.

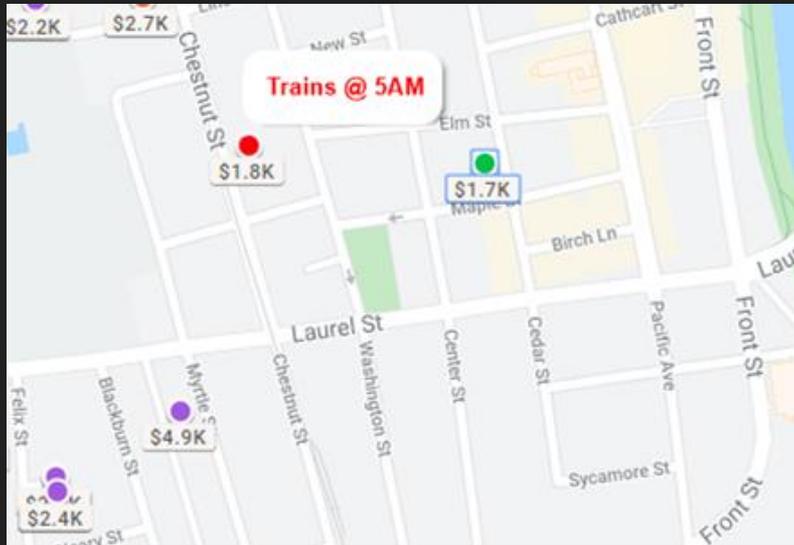
Companies such as Yelp and Zillow can use the platform to create noise profiles on real-world places.

Industries can track their noise levels and stay compliant with federal and local laws.

Citizens can report issues and help create a better and safer environment.

# Public and Commercial Data

Allow services like Zillow to use data to build an audio profile of a location



A screenshot of a Zillow listing page for an apartment. The listing includes a "Street View" image, a noise profile chart, and a list of rental facts and features. The noise profile chart shows a peak at 12:00 AM. The rental facts and features include:

Category	Value
Date available:	Available now
Type:	Apartment
Cooling:	Contact manager
Heating:	Contact manager
Pets:	No
Parking:	Off street
Laundry:	Contact manager
Deposit & fees:	\$2,000
Price/sqft:	Contact manager
Noise Profile:	Loud @5AM Train

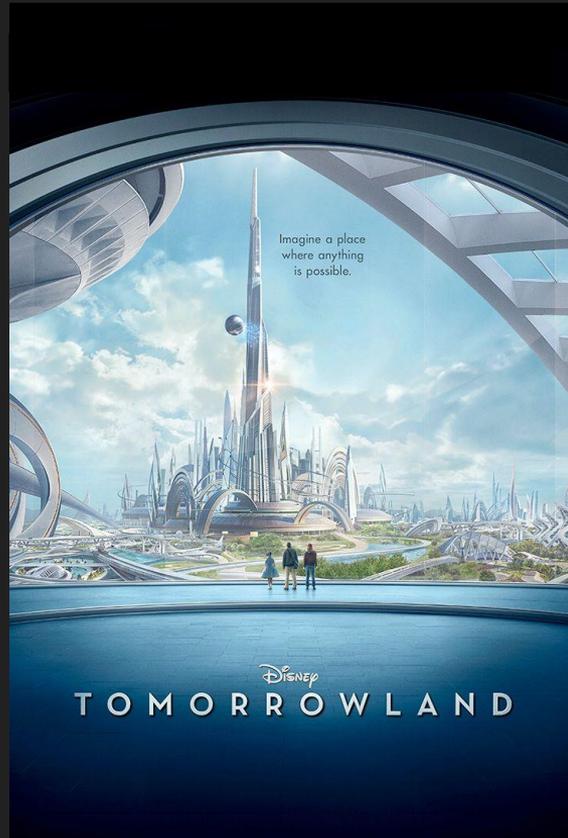
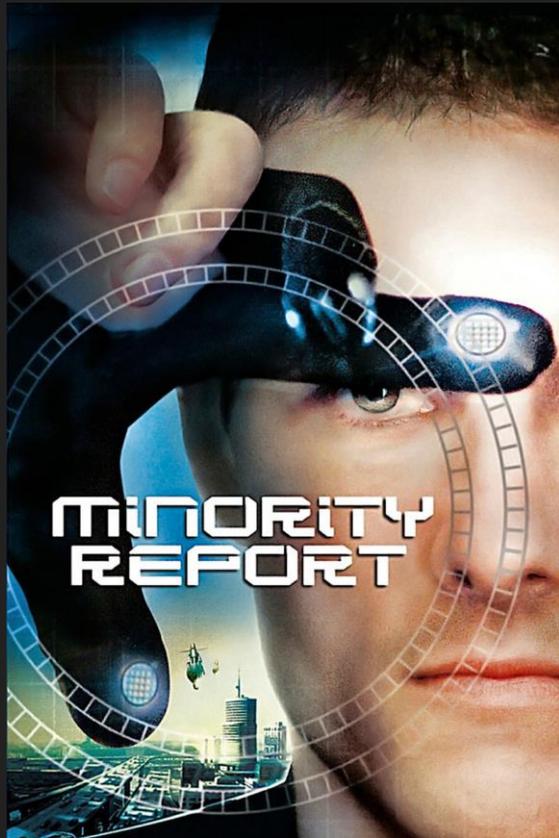
Interior details are also visible at the bottom of the listing.

# Industrial Data

Allow companies to know their sound profile before they are in violation without the use of specialized equipment and human engineers.



# What Smart Cities Will We Build?





productops

Company Profile

# About Us

Founded in 2008 productOps is an agile software development consultancy that builds impactful technology based on a firm grasp of our clients' tactical and strategic business needs. We understand, fight for, and deliver for your business as if it's our own.

We are an AWS Advanced Consulting Partner and our designers are certified by the Nielsen Norman group. We have been building AWS cloud solutions since its inception, and today other areas of specialty include IoT, ML, Big Data, Edge, EDA Rapid Prototyping.

Located in Santa Cruz, California we have an in-house team of 50 engineers, designers, solution architects, and product managers. Our business has been built on relationships and trust through timely delivery of value, working with innovative organizations from local startups to globally-distributed Fortune 50 companies including Nokia, New England Journal of Medicine, AT&T, Ithaca, California Community Colleges, and Conde Nast.

# We build technology solutions

- Rapid Prototyping and MVP
  - IoT, Data Visualization, Product prototyping
- Digital Transformation
  - Cloud Migration, Data Platforms, Event Driven Architecture
- Software for Hardware
  - Firmware, Platforms, Services, Apps

CHANGING THE GAME

# Our Services

## STRATEGY

- Whether we're instrumental in helping you develop various aspects of your overall strategy or not, our team will become intimately familiar with your desired trajectories and ultimately base solutions on fully supporting those outcomes.

## TECHNOLOGY

- Clients typically engage with us based on some small technical need and quickly realize that our value is our ability to architect and implement the most appropriate, cost effective and impactful solutions.

## TRANSFORMATION

- Modernizing business systems to facilitate more efficient and effective business practices is not easy. We can often work around many internal roadblocks and because our team consists of strategists, designers and engineers we truly offer a holistic approach that can accelerate change.

# How do we do it

- Our approach is agile with frequent and valuable client touch points in the form of daily standups, demos with every sprint, design thinking, and operational scaling.
- We are constantly aligning project progress with strategy
- We build strong lasting relationship with key stakeholders
- We live our principles of being consultants
  - Have an outside viewpoint
  - Be harsh questioners
  - Provide broad and deep expertise based on experience

# Why have we been successful?

- We are able to understand, advise, collaborate and deliver
- We house consulting, design, and development services under one roof
- We in effect become part of our your organization
- We make sure what's been delivered will be successful
- We support change management
- We care about CI - CD as it relates to operational side. We operationalize what we build



productops

We understand, fight for, and deliver for your business as if it's our own.

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