

# **Predictive Analytics for Security System Optimization**

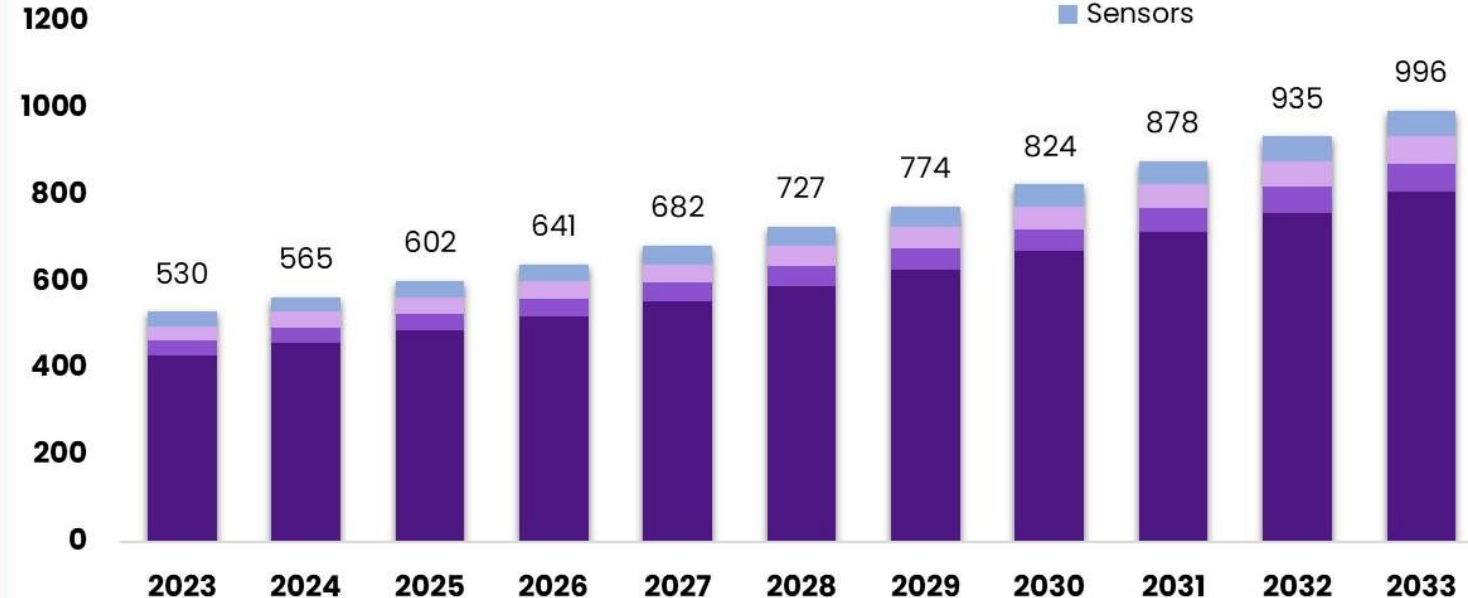
ISE534: Data Analytics Consulting

# Semiconductor Industry estimate CAGR:6.5%

High Stakes -> Risk Management

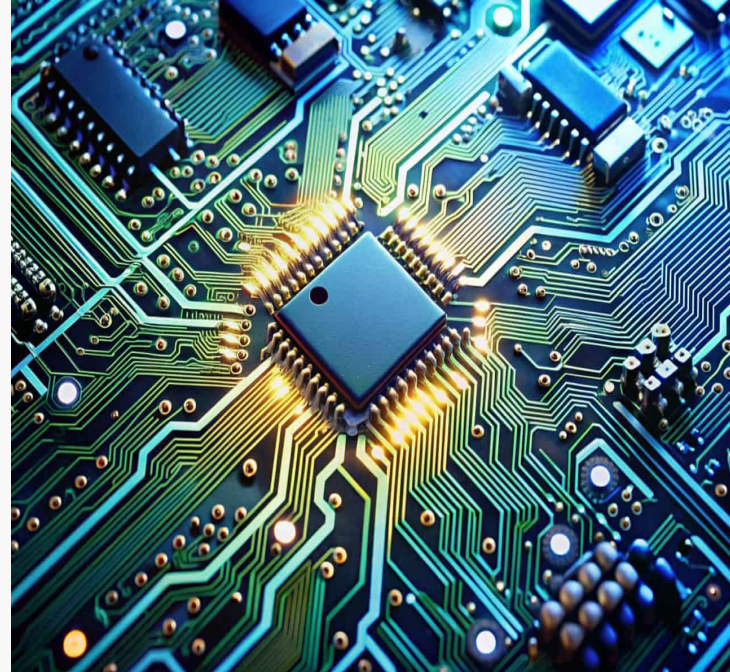
## Global Semiconductor Market

Size, by Semiconductor Device Type, 2024-2033 (USD Billion)

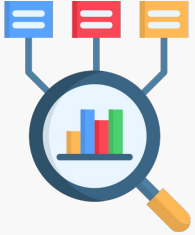


# Risk Management

- Risk Control
- Emergency Response
- Security



# Security Issues in Portable Device



## Classification Model

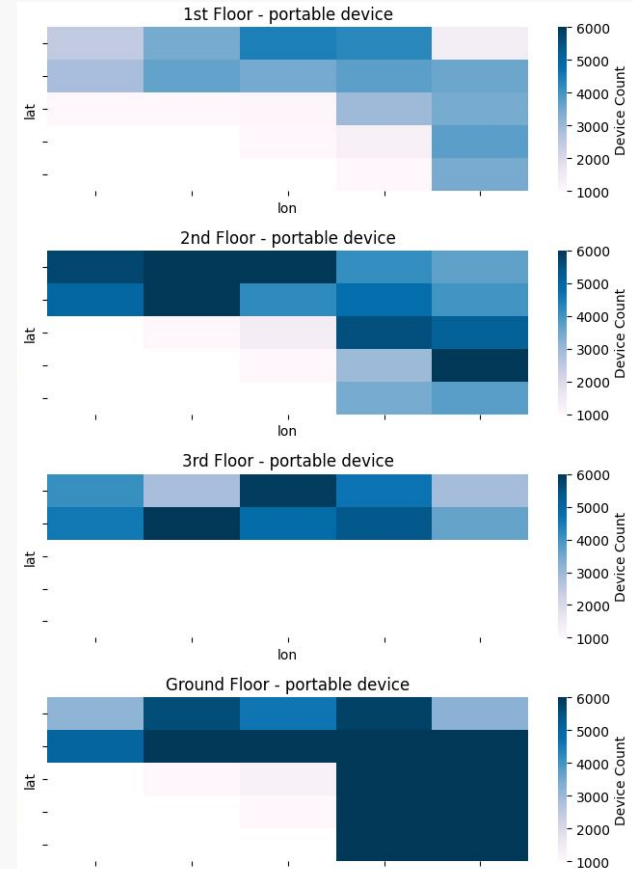
Thresholds of movement = 1



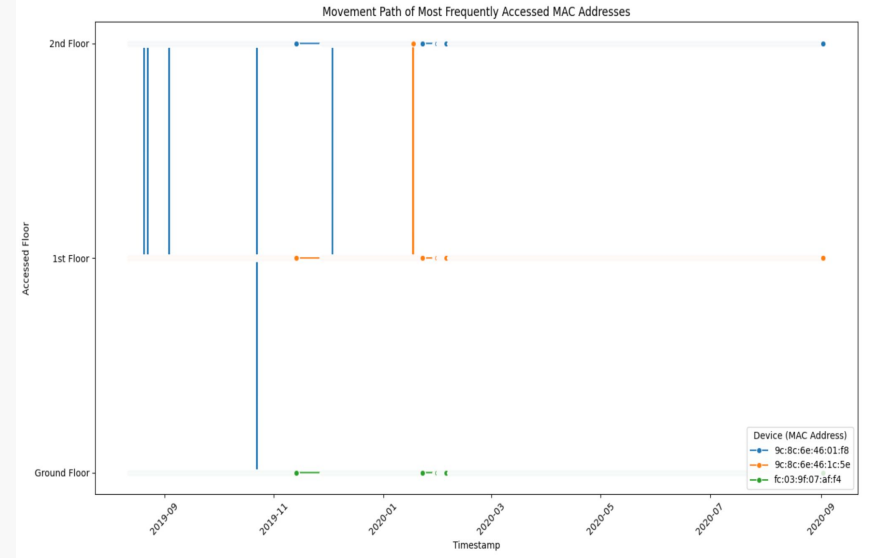
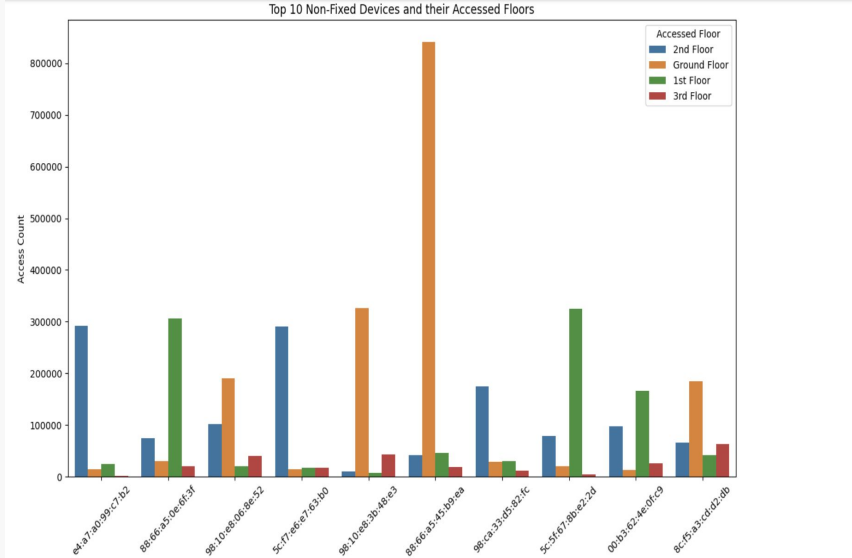
**41.3%** of portable device  
access more than one floor



**200+** of portable device  
access to building after working hour



# Suspicious Behaviors



# Problem & Solution



## Problem Definition

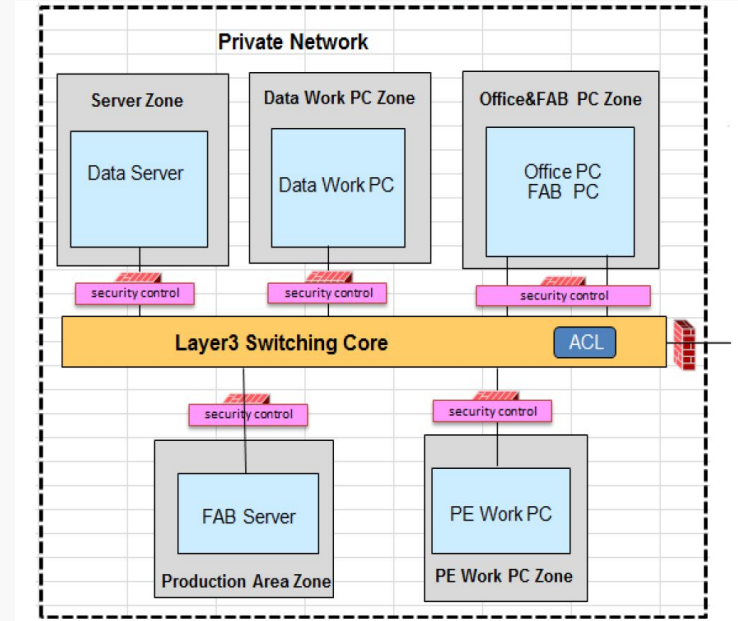
- High risk of Portable devices
- Internal data leaks & endangering intellectual property



## Security Zoning Design

### Intranet architecture

- Segmented security zones
- Dynamic access control model
- Access control lists (ACLs)



# Problem Value

**Customer:** Semiconductor manufacturing companies who need a secure and efficient method to protect their sensitive data and operations

## Value Proposition:

- Strengthened network security with robust access control and data protection
- Reduces data breach risk, ensures compliance, and supports secure communication

## Value Chain Impact:

- Add values to customers
- Secures manufacturing and design data-sharing pathways
- Minimizes potential downtime and damage, promoting operational continuity and compliance

# Solution Approach



## Dynamic access control model

Dynamically monitor and adjust user permissions

- User Access Database
- Time and location data
- Real-time adjustments

## Access Control List

A set of rules used to regulate within a network

- Implement model result into internal internet
- Controlling access in different zone
- Ensure only verified devices access

## Create recurring value

- Risk Management
- Adapt data dynamically
- Maintain and update controlling model
- Suitable in different industries





# Model

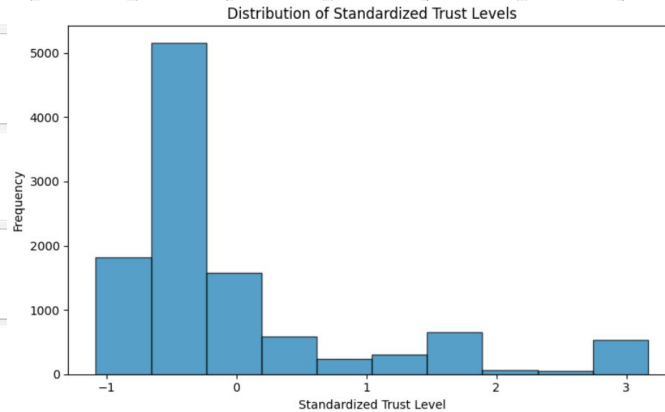
## Frequent Access Path

-> retrieve frequent access path by using Apriori's Algorithm

A	
1	Path
2	Y0 -> Y0
3	Y0 -> T0
4	T0 -> Y0
5	T0 -> T0
6	X0 -> Y0
7	Y0 -> X0
8	Y0 -> S0
9	S0 -> Y0
10	Y0 -> O0

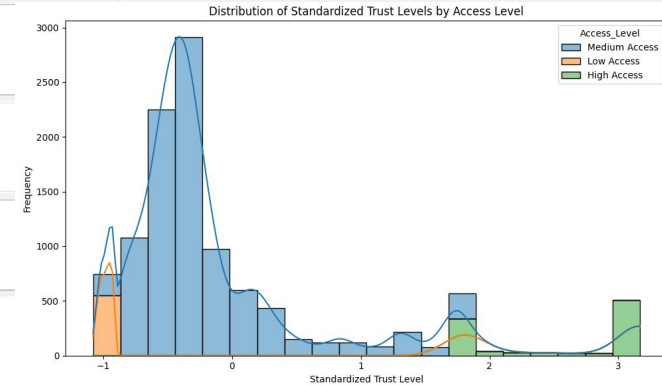
## Access Evaluation Module

-> calculate their trust level by combining time and space constraints



## Dynamic Access Control

-> combine access trust degree calculation with policy matching and authorization



# Demo

**Set Access Control Permissions**

Select access levels for each area:

Zone	High Access	Medium Access	Low Access
Data Server	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Office Zone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

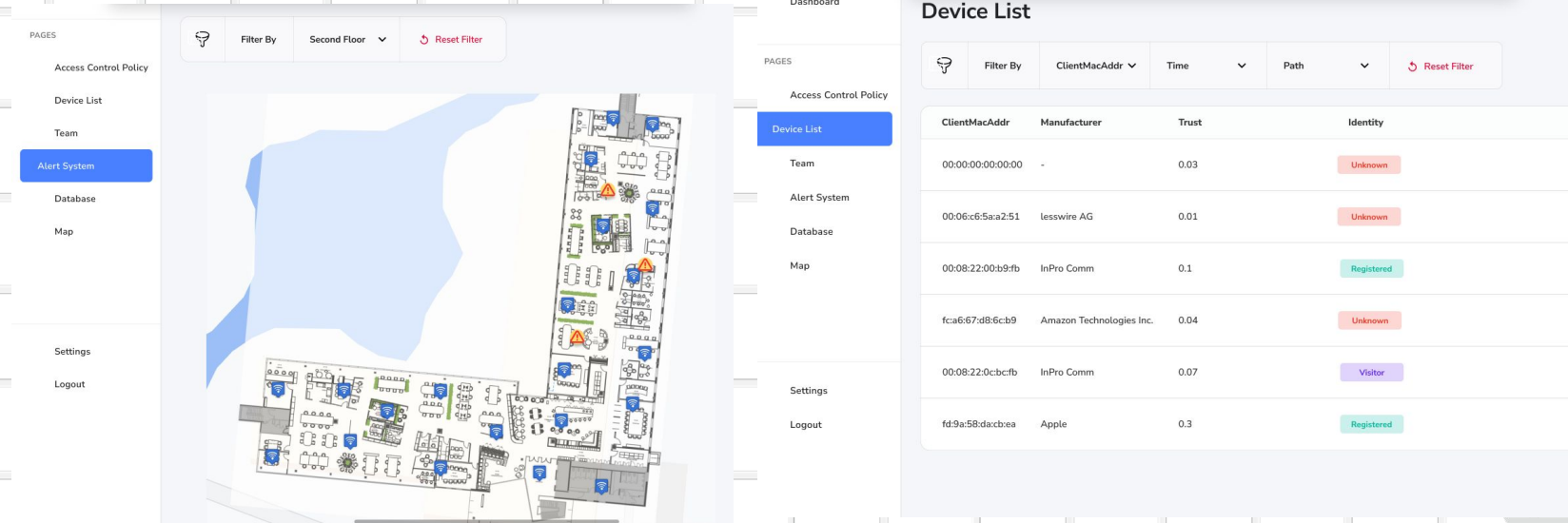
Save Settings

<https://endearing-kitten-f4175d.netlify.app/settings.html>

<https://endearing-kitten-f4175d.netlify.app/generator.html>



# Prototype Overview

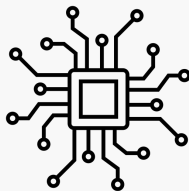


<https://www.figma.com/proto/uJbZITlKL3ZUOBKW8nfJ6t/Final-Project-prototype?page-id=5%3A70&node-id=5-399&node-type=canvas&viewport=2177%2C632%2C0.42&t=z26cYzwaOydgaDEg-1&scaling=min-zoom&content-scaling=fixed&starting-point-node-id=5%3A399>

# Replicability



Our solution can be applied on...



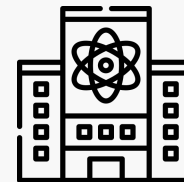
Semiconductor Industry



Data Center



Bank & Financial Firm



Research Center



# Reference

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