

5 Challenges in Multi-Site Monitoring

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VAISALA

Three Assumptions

1. You need to monitor GxP sites.
2. Your organization has multiple sites.
3. You need to monitor with a single system.

One Truth

1. Your existing system will NOT let you add the features necessary to perform efficient multi-site monitoring.

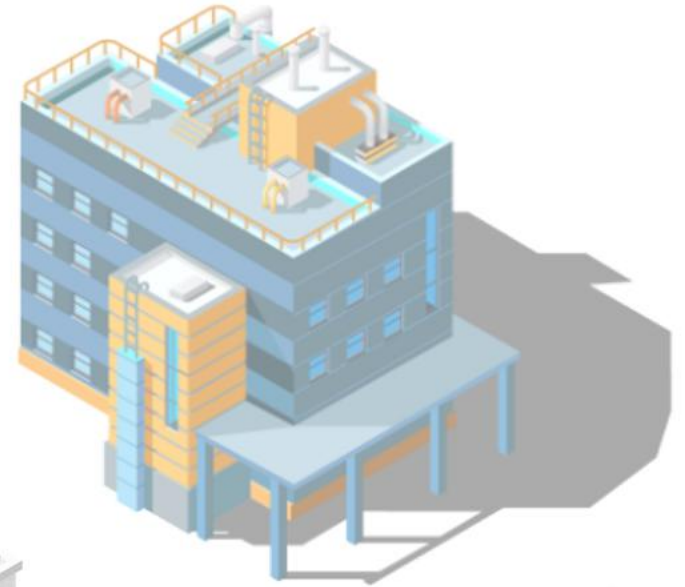
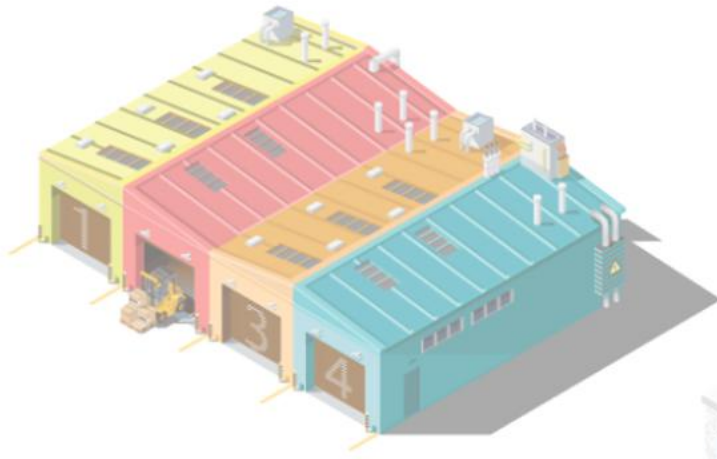
Two Solutions

1. Adapt existing monitoring system with procedural changes.
2. Select a new monitoring system which integrates the correct features and solutions.

Five Challenges

1. Multiple Site Types
2. Geographic Spread
3. IT Infrastructure
4. Inter-Site Security
5. Administrative Burden

Multiple Site Types



Multiple Sites need Multiple Parameters

■ Warehouses

- Temperature (-40°C to +40°C)
- Relative Humidity



■ Clean Rooms

- Differential Pressure
- Particles
- Door Contacts



■ Laboratories

- CO₂



■ Manufacturing Areas

- Extreme Temperature (-196°C to +250°C)
- Dew Point for Compressed Air
- Vaporized Hydrogen Peroxide
- Explosion Proof Sensors

The Multiple Parameters Solution

- Existing System Solution
 - Existing system will have only basic parameters.
 - Import unusual parameters with work-arounds.
 - Custom code needed to match different vendors
 - Increased validation effort.
 - More potential points of failure.



The Multiple Parameters Solution

■ Existing System Solution

- Pick a system with usual parameters.
- Import unusual parameters with work-arounds.
 - Custom code need to match different vendors.
 - Increased validation effort
 - More potential points of failure.



■ Ideal System Solution

- Select Vendor with Wide Range of Proprietary Sensors
 - Proprietary Sensors use proven hardware and software.
 - No custom code means less validation
 - Higher reliability
- Input any specialized measurements via universal loggers.
 - Standardized input paths reduce complexity.



Geographic Spread

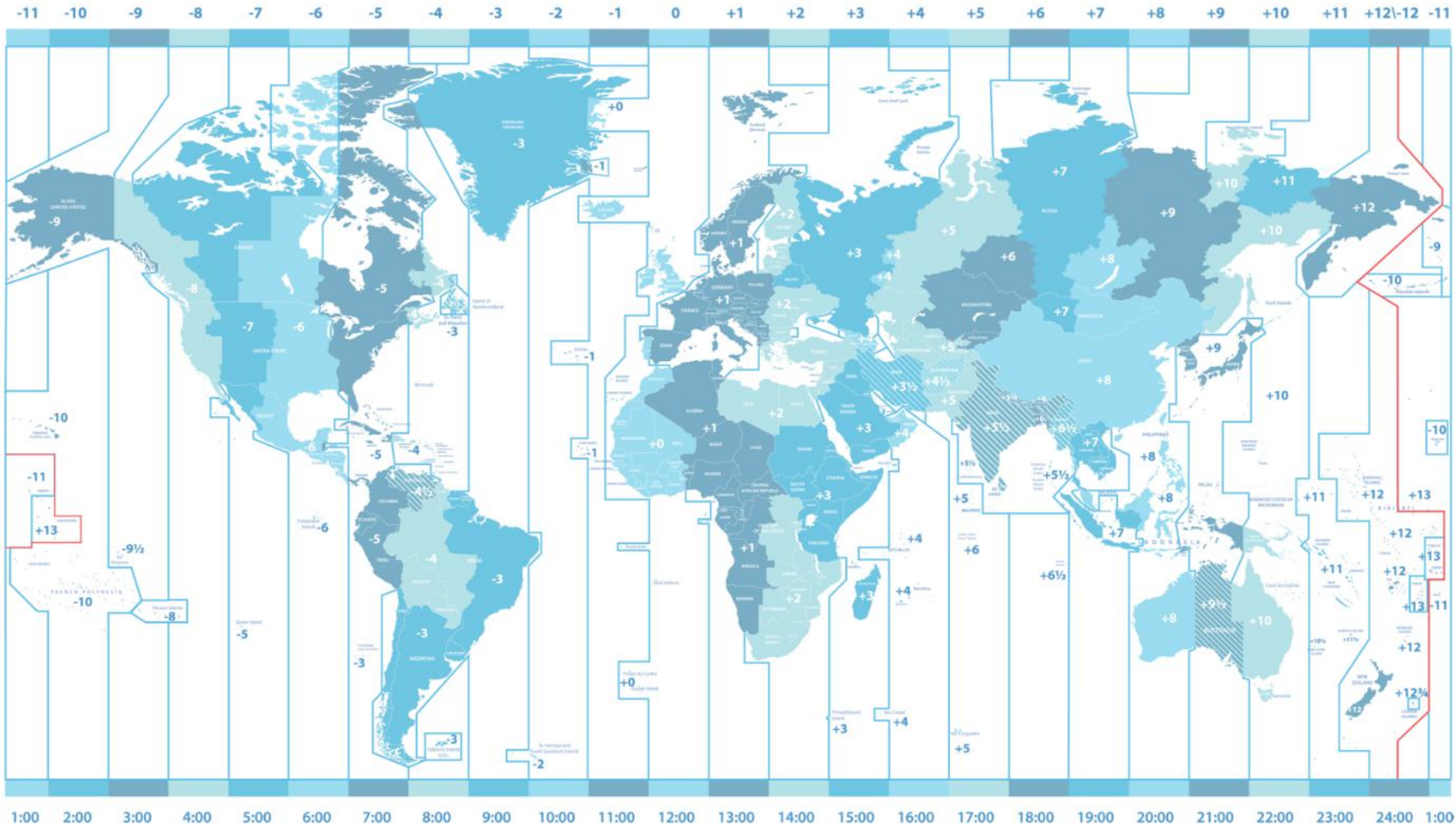


TOKYO

NEW YORK

LONDON

BERLIN



Geography Challenge Example

- London UTC +0 Corporate Headquarters
- Paris UTC +1 Research Facility
- Berlin UTC +1 Warehouse
- Helsinki UTC +2 Cleanroom



Geography Challenge Example

- London UTC +0 Corporate Headquarters
 - Paris UTC +1 Research Facility
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-
- Existing System “Procedural Fix”
 - System runs in Corporate Time / Language
 - Timestamps in Corporate Time Zone
 - Interface in Corporate Language
 - Risks
 - Time Conversion Errors
 - Language Errors
 - Lack of Local System Ownership



Geography Challenge Example

- London UTC +0 Corporate Headquarters
- Paris UTC +1 Research Facility
- Berlin UTC +1 Warehouse
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■ Ideal System Solution

- System senses local time and language.
- Users see system in local time and language.
 - Fewer Errors
 - Increased Local Ownership
- Adding Time Zones and Languages is Easy

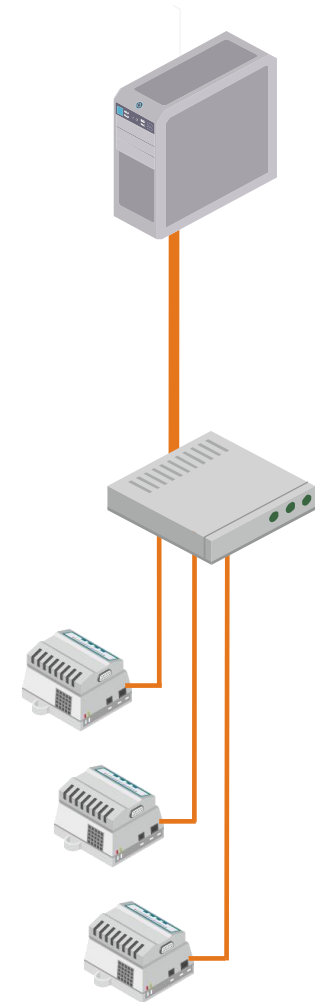


IT Infrastructure (aka “Not Enough Wires”)

- Old Buildings
 - Infrastructure is over-loaded
 - Fight for Access
- New Buildings
 - No Infrastructure in place
 - Install new infrastructure
- One Problem
 - No way to easily connect hundreds of sensors.

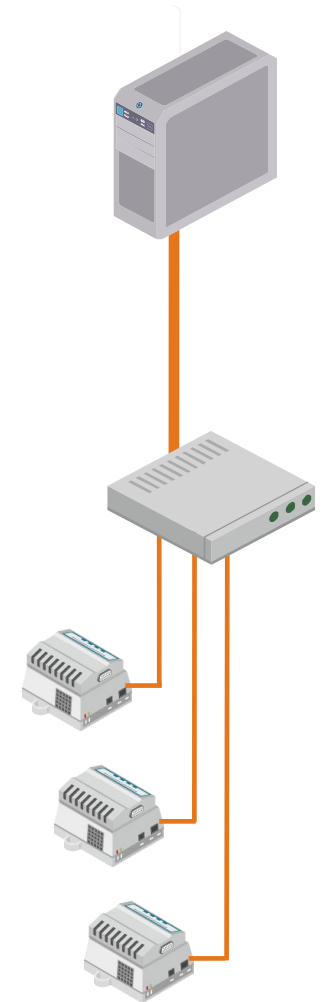
IT Infrastructure Solutions

- Existing System Solution
 - Standardize on preferred system connection type.
 - Fight for access at each site.
 - Adds time and cost to project



IT Infrastructure Solutions

- Existing System Solution
 - Standardize on one connection type.
 - Fight for access at each site.
 - Adds time and cost to project.
- Ideal System Solution
 - Provide multiple connection types.
 - Ethernet
 - WiFi
 - Long Range RF (Radio Frequency)
 - Match IT connections to the capabilities of each site.
 - Use RF when infrastructure access is limited.

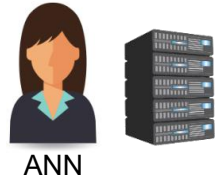


Inter-Site Security

- Protecting your site from the rest of the company...

Inter-Site Security – The Problem

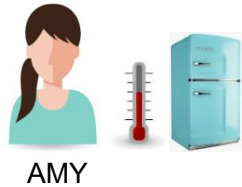
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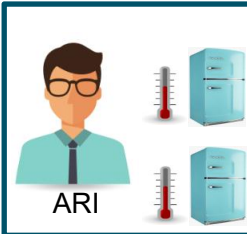
MANAGER



SUPERVISOR



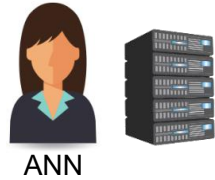
USER



SITE A

Inter-Site Security – The Problem

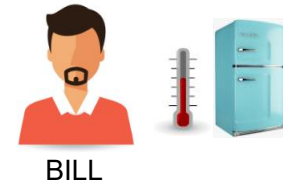
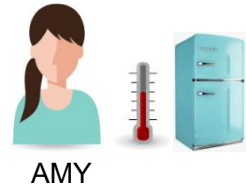
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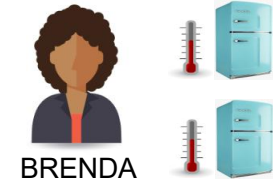
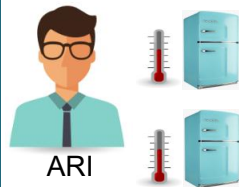
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SUPERVISOR



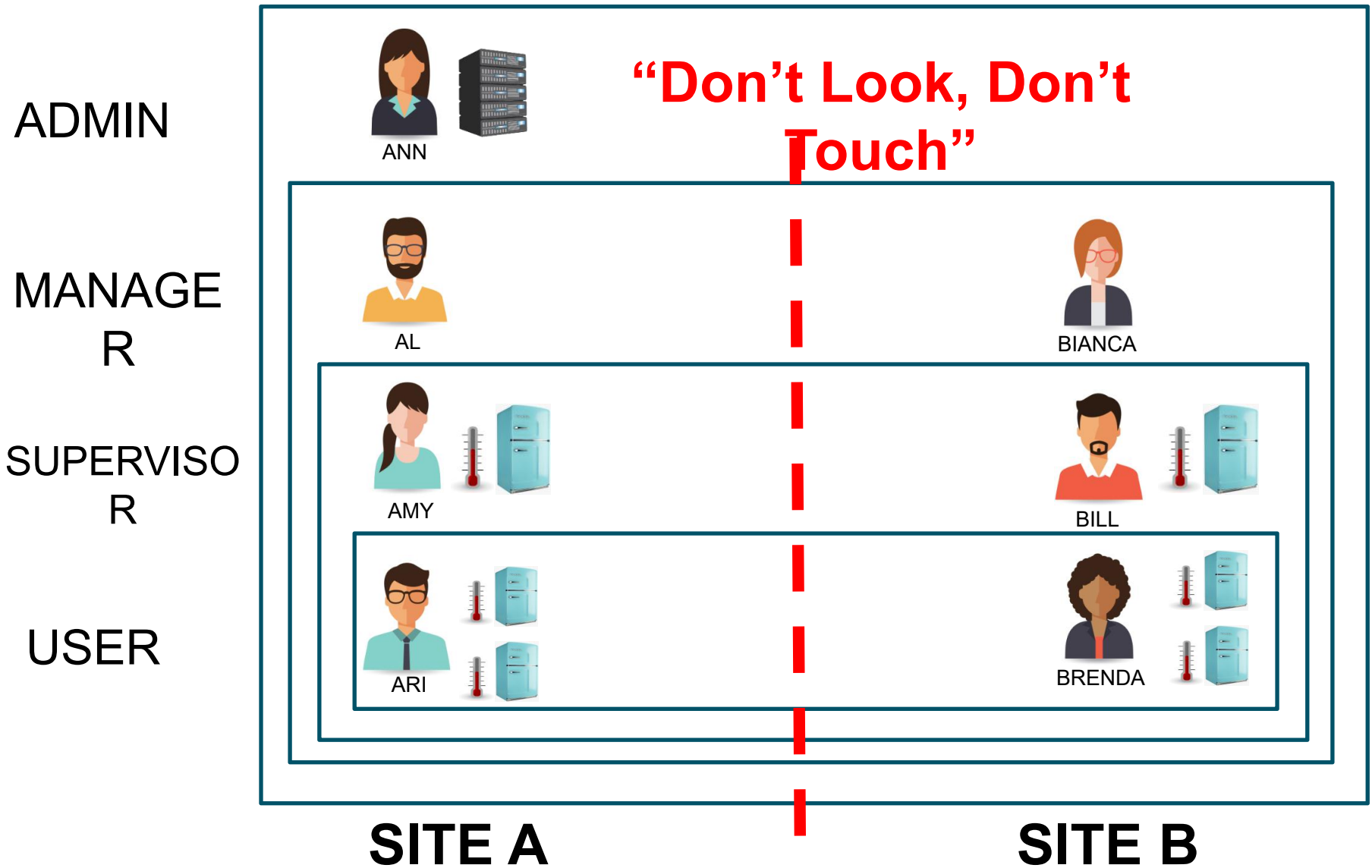
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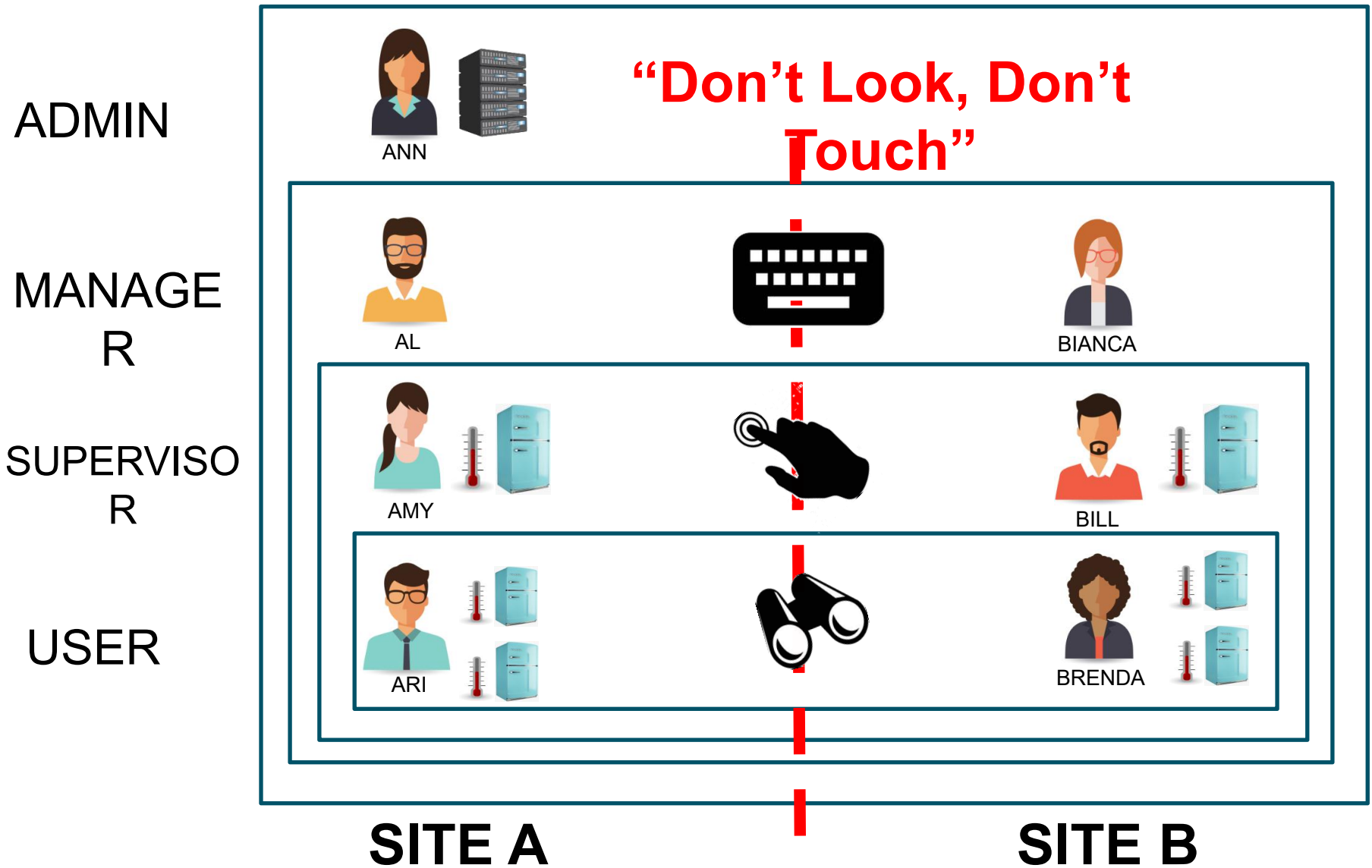
SITE A

SITE B

Inter-Site Security – Existing System Solution

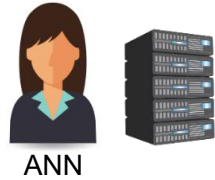


Inter-Site Security – Existing System Solution

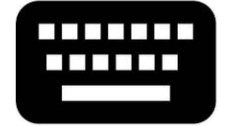


Inter-Site Security – Existing System Solution

ADMIN



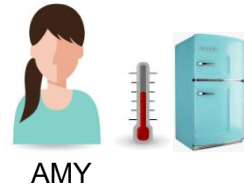
ALL
ACCESS



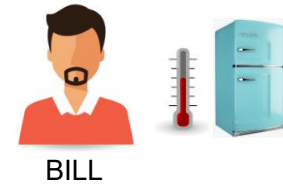
MANAGER



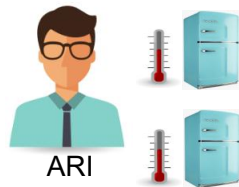
SUPERVISOR



LIMITED
ACCESS



USER

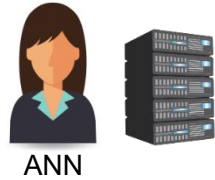


SITE A

SITE B

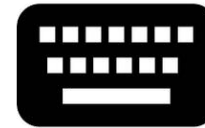
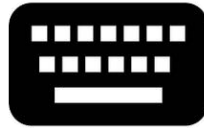
Inter-Site Security – Ideal System Solution

ADMIN



“Site Segregation”

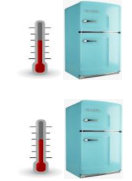
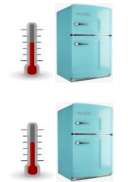
MANAGER



SUPERVISOR



USER



SITE A

SITE B

Inter-Site Security Summary



- Existing System with Procedural Solution
 - “Don’t look” privacy policy
 - This always fails.
 - Then...
 - Use standard Security to centralize administrative tasks
 - Super-users and ticket system.

- Ideal System Solution
 - Create site segregation with logical security.
 - Define which areas and sensors can be affected by each user group.
 - “Object level security”

Administrative Burden

- **One Site**
 - 10 users
 - 100 sensors
 - 400 thresholds
- **Five Sites**
 - 50 users
 - 500 sensors
 - 2000 thresholds
- **Ten Sites**
 - Noooooo!



Solution: Administration Burden

- Existing System with Procedural Solution
 - Procedural Controls
 - Centralize admin tasks with super-users.
 - Create ticket system
 - Standardize configurations for all sites
 - Decrease options to decrease workload



Solution: Administration Burden

- Existing System with Procedural Solution
 - Procedural Controls
 - Centralize admin tasks with super-users
 - Create ticket system
 - Standardize configurations for all sites
 - Decrease options to decrease workload
- Ideal System
 - Include tools that provide leverage, like templates.
 - Do a lot of work with little effort.
 - Example: Templates



Templates: An Example of Leverage

- **Example system**
 - 250 Refrigerators
 - Thresholds at 2C and 8C
 - 10 Different User Groups

Templates: An Example of Leverage

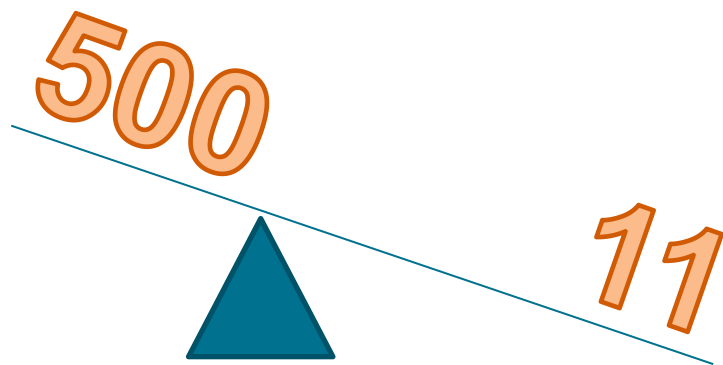
- **Example system**
 - 250 Refrigerators
 - Thresholds at 2C and 8C
 - 10 Different User Groups
- **Typical Solution**
 - 250 Low Thresholds @ 2C
 - 250 High Thresholds @ 8C
 - 500 Configured Items!

500



Templates: An Example of Leverage

- **Example system**
 - 250 Refrigerators
 - Thresholds at 2C and 8C
 - 10 Different User Groups
- **Typical Solution**
 - 250 Low Thresholds @ 2C
 - 250 High Thresholds @ 8C
 - 500 Configured Items!
- **Solution with Templates**
 - 1 Threshold Template for 2C and 8C
 - 10 Notification Templates
 - 11 Configured Items!



Five Challenges Summary



1. Multiple Site Types (Many Parameters)
2. Geography (Automatic Time and Language Sensing)
3. IT Infrastructure (Multiple Connection Modes)
4. Inter-Site Security (Site Segregation)
5. Administrative Burden (Get Some Leverage)

Two Types of Multi-Site Solutions

- Existing Systems - Cannot be Changed
 - Must Use Procedural Solutions
 - Creates new problems
 - Increase effort, risk, and cost

or...

- Ideal New Systems
 - Solutions are Integrated Features
 - Solves the problem
 - Simple and Scalable
 - Increases Adaptability
 - Decreases cost and risk

Questions?



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Thank you for your time!

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