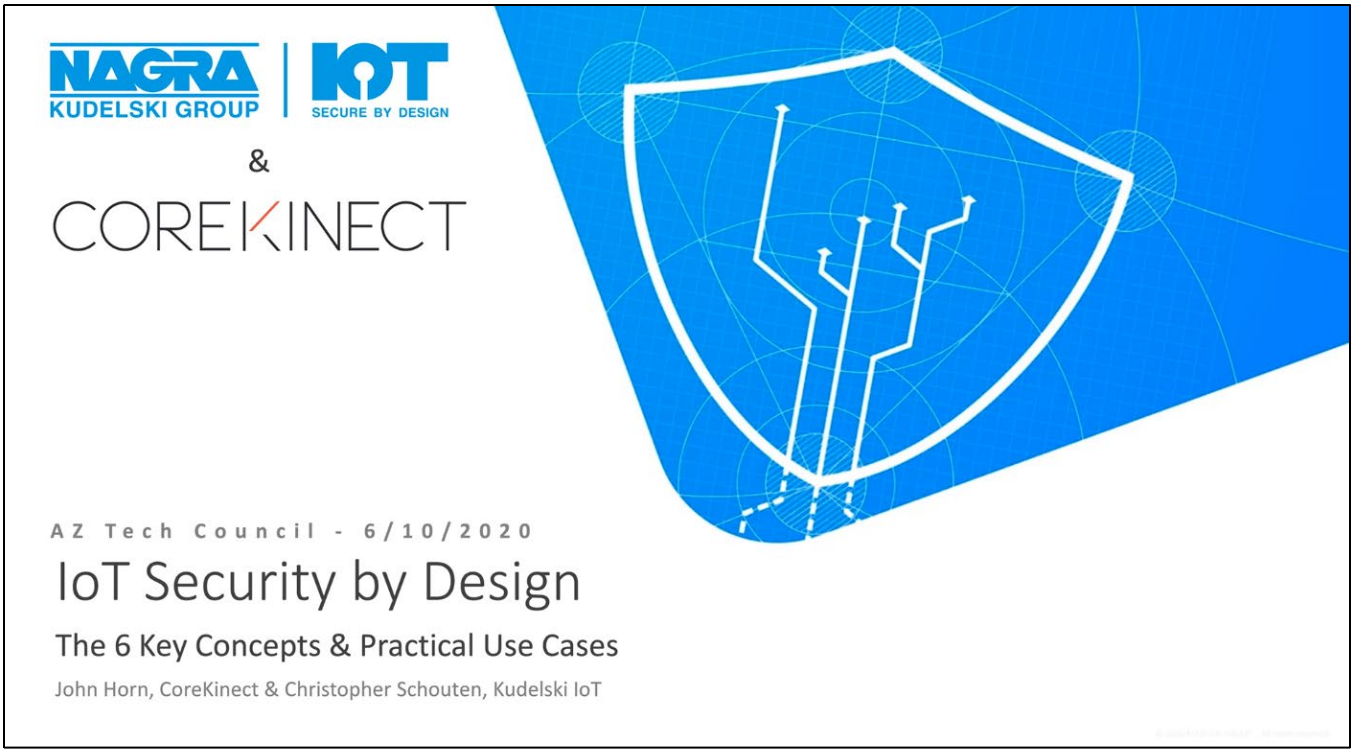

NAGRA KUDELSKI GROUP | IOT SECURE BY DESIGN

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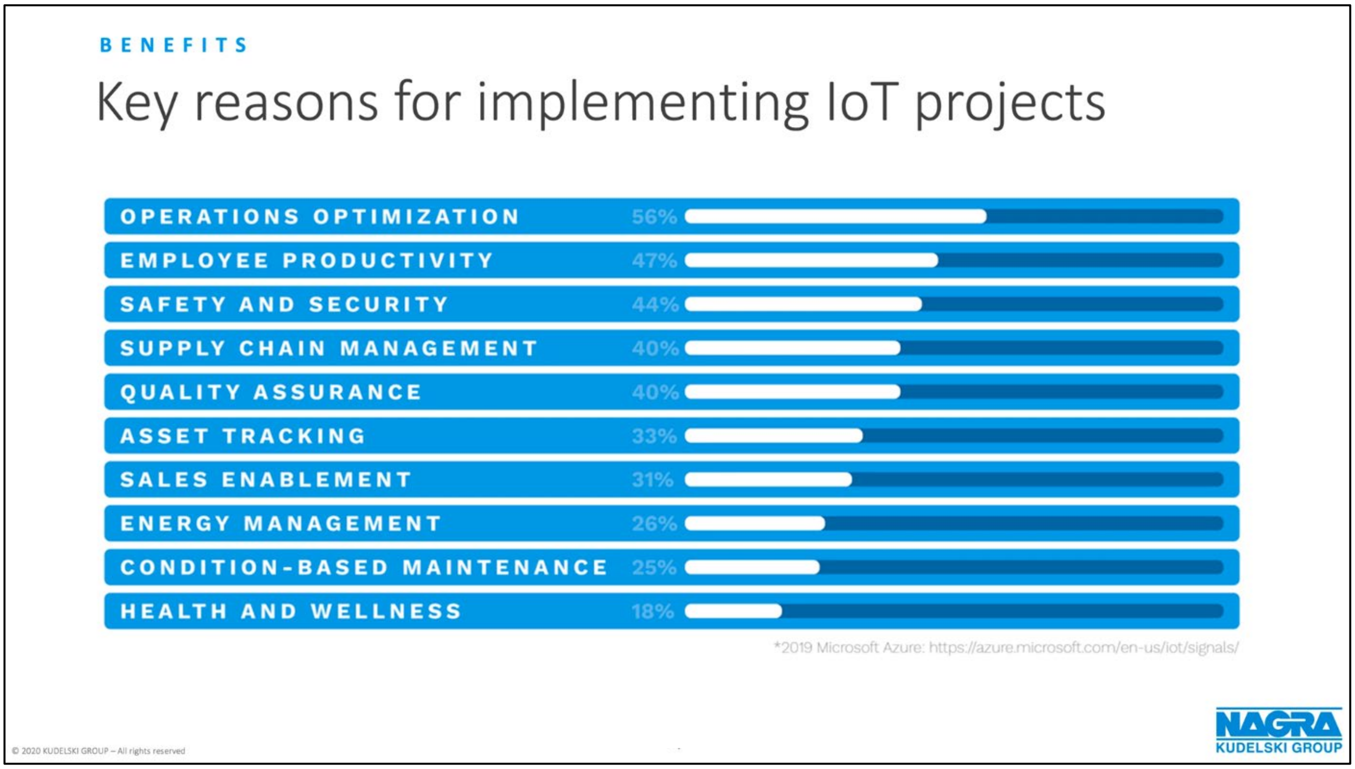
COREKINECT

AZ Tech Council - 6/10/2020

# IoT Security by Design

## The 6 Key Concepts & Practical Use Cases

John Horn, CoreKinect & Christopher Schouten, Kudelski IoT



BENEFITS

## Key reasons for implementing IoT projects

| | |
|---|---|
| OPERATIONS OPTIMIZATION | 56% |
| EMPLOYEE PRODUCTIVITY | 47% |
| SAFETY AND SECURITY | 44% |
| SUPPLY CHAIN MANAGEMENT | 40% |
| QUALITY ASSURANCE | 40% |
| ASSET TRACKING | 33% |
| SALES ENABLEMENT | 31% |
| ENERGY MANAGEMENT | 26% |
| CONDITION-BASED MAINTENANCE | 25% |
| HEALTH AND WELLNESS | 18% |

*2019 Microsoft Azure: https://azure.microsoft.com/en-us/iot/signals/

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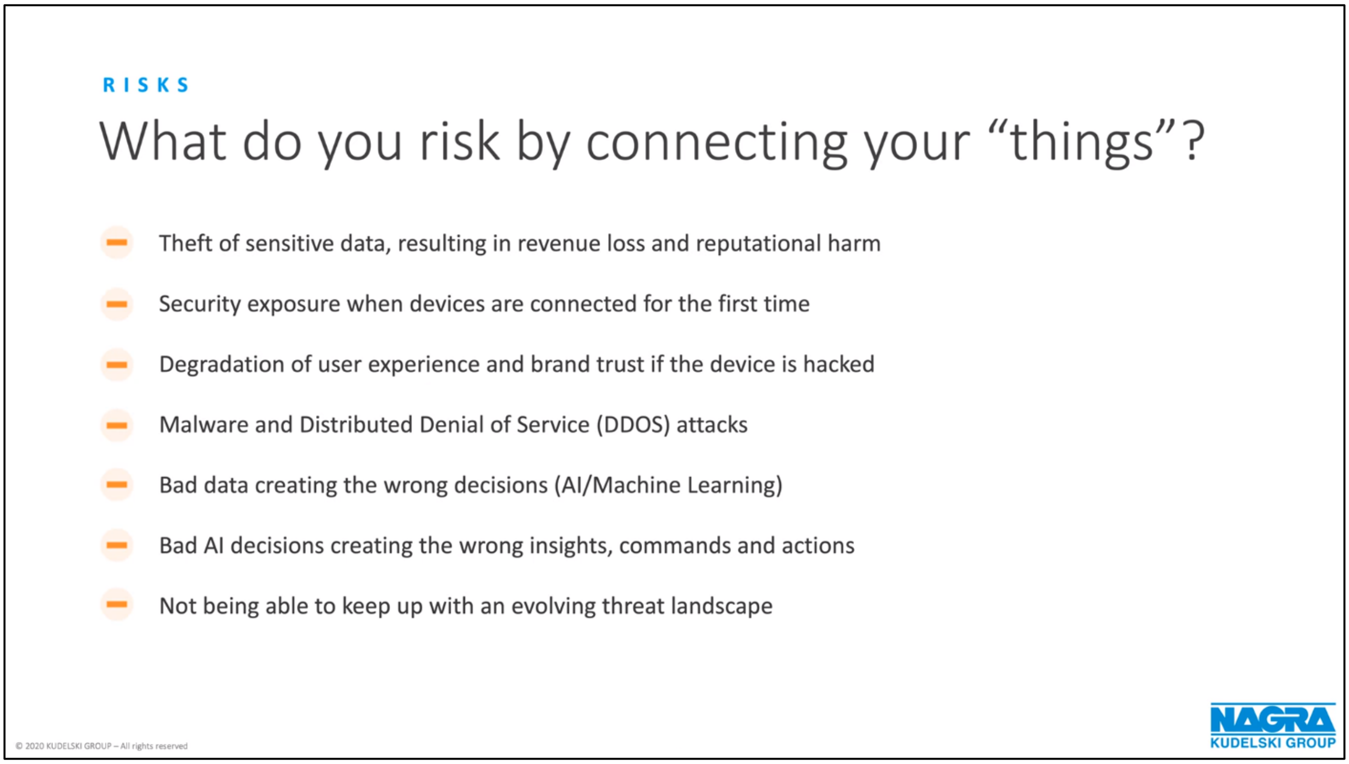

RISKS

## What do you risk by connecting your “things”?

- Theft of sensitive data, resulting in revenue loss and reputational harm
- Security exposure when devices are connected for the first time
- Degradation of user experience and brand trust if the device is hacked
- Malware and Distributed Denial of Service (DDOS) attacks
- Bad data creating the wrong decisions (AI/Machine Learning)
- Bad AI decisions creating the wrong insights, commands and actions
- Not being able to keep up with an evolving threat landscape

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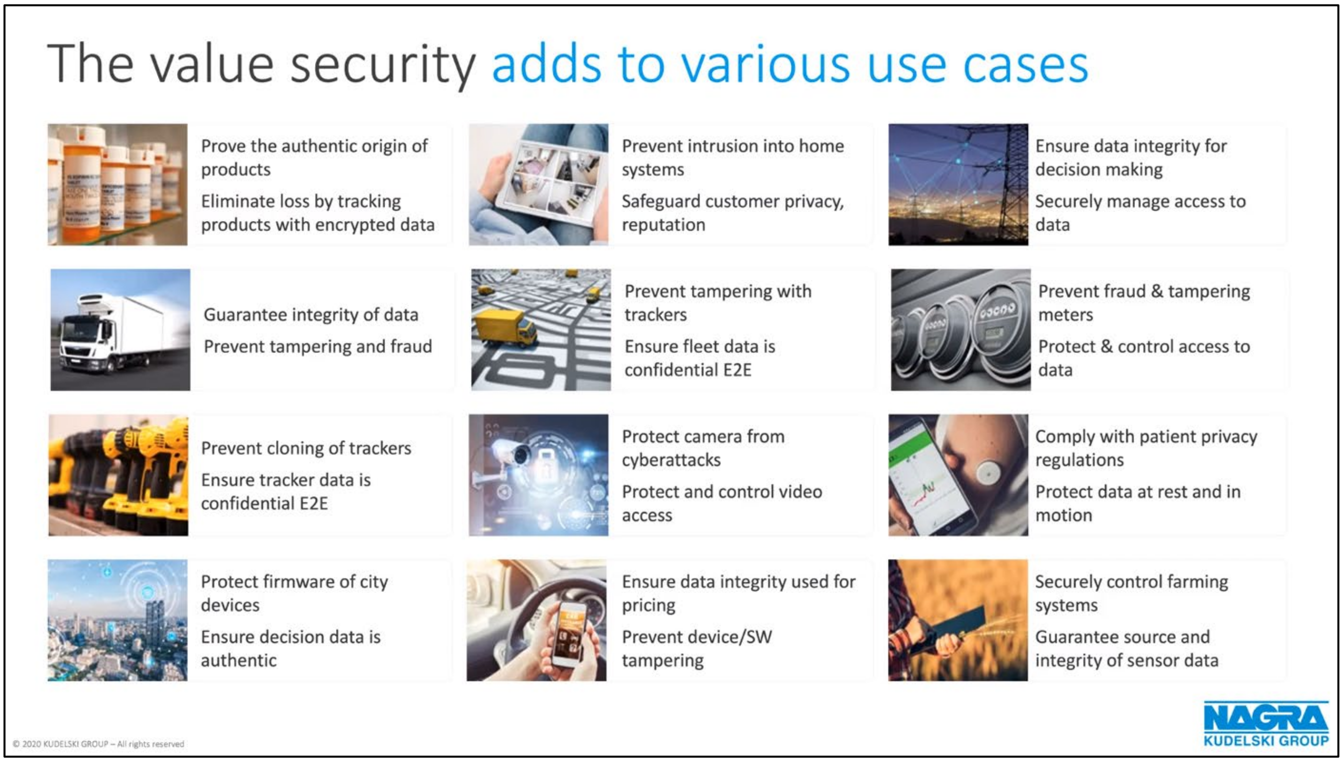

## The value security adds to various use cases

Prove the authentic origin of products

Eliminate loss by tracking products with encrypted data

Prevent intrusion into home systems

Safeguard customer privacy, reputation

Ensure data integrity for decision making

Securely manage access to data

Guarantee integrity of data

Prevent tampering and fraud

Prevent tampering with trackers

Ensure fleet data is confidential E2E

Prevent fraud & tampering meters

Protect & control access to data

Prevent cloning of trackers

Ensure tracker data is confidential E2E

Protect camera from cyberattacks

Protect and control video access

Comply with patient privacy regulations

Protect data at rest and in motion

Protect firmware of city devices

Ensure decision data is authentic

Ensure data integrity used for pricing

Prevent device/SW tampering

Securely control farming systems

Guarantee source and integrity of sensor data

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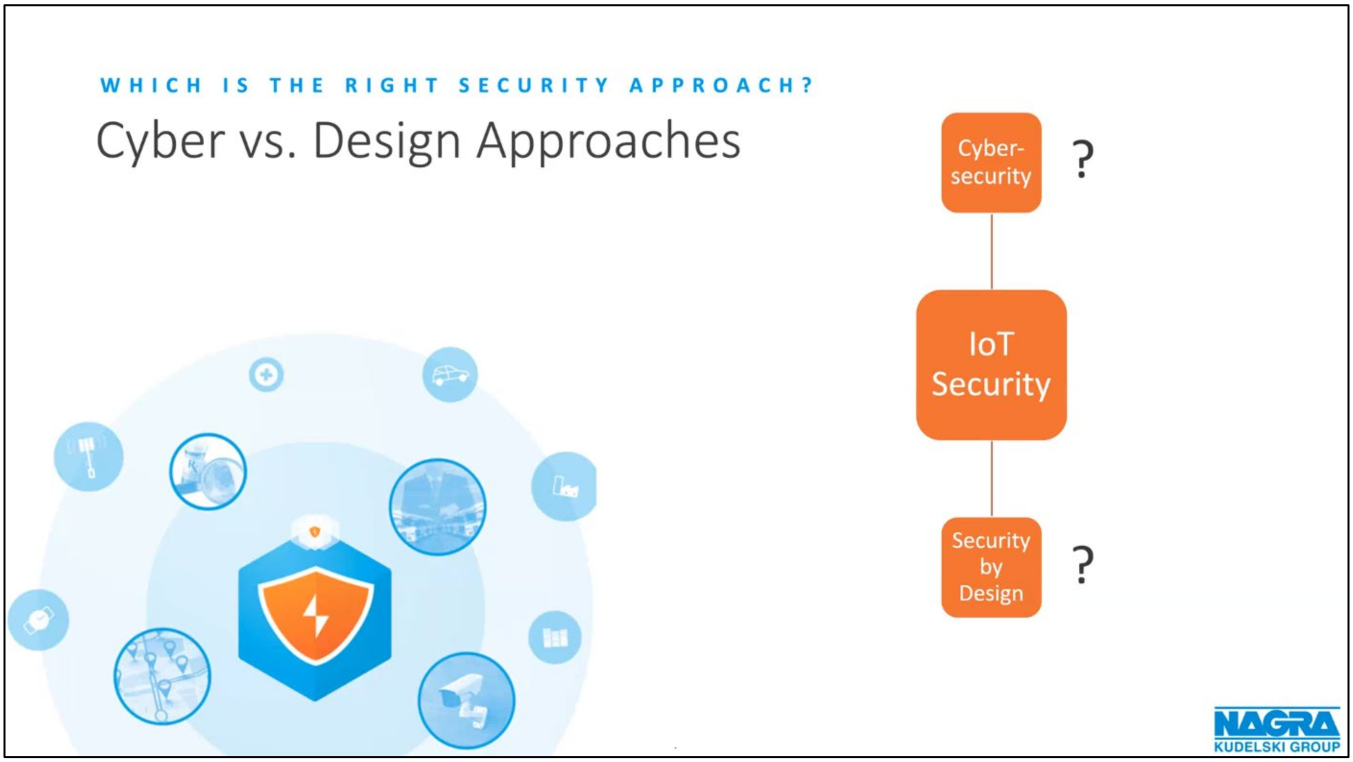
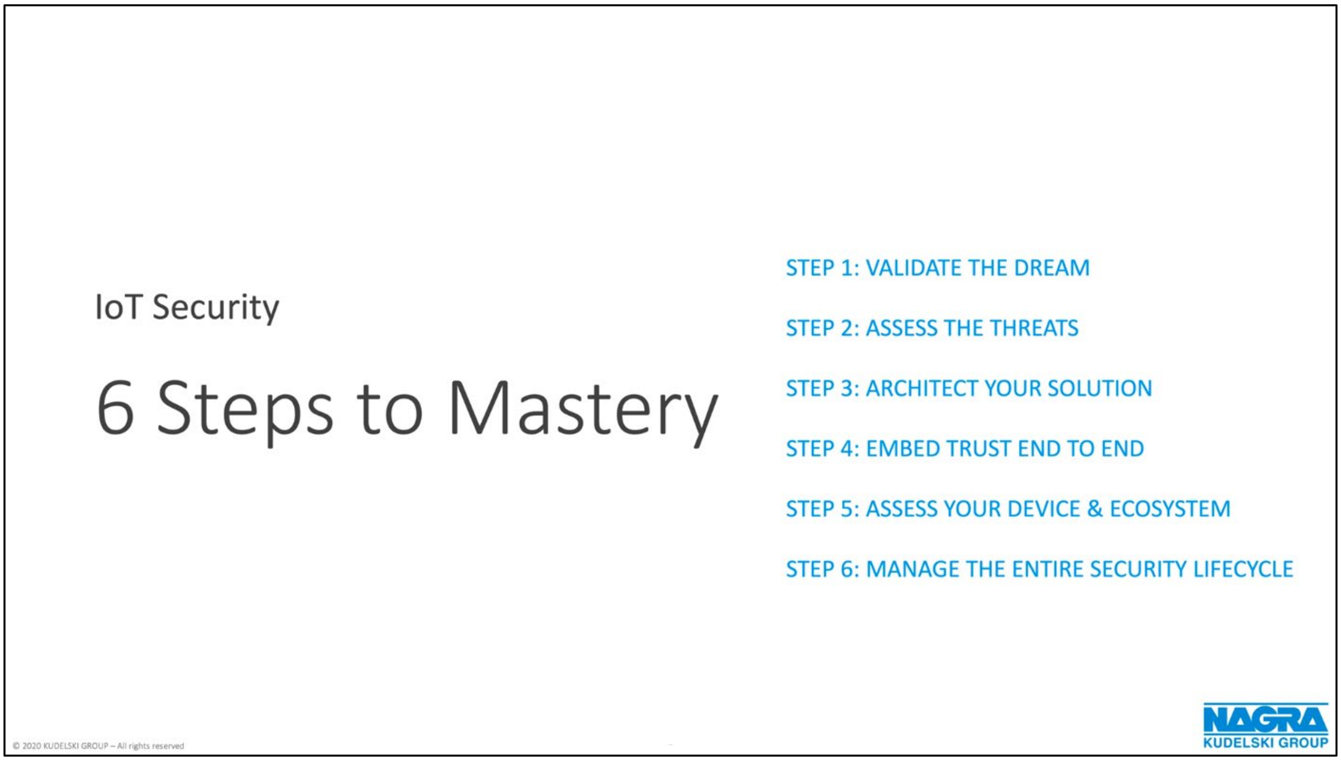


WHICH IS THE RIGHT SECURITY APPROACH?

## Cyber vs. Design Approaches



IoT Security

## 6 Steps to Mastery

STEP 1: VALIDATE THE DREAM

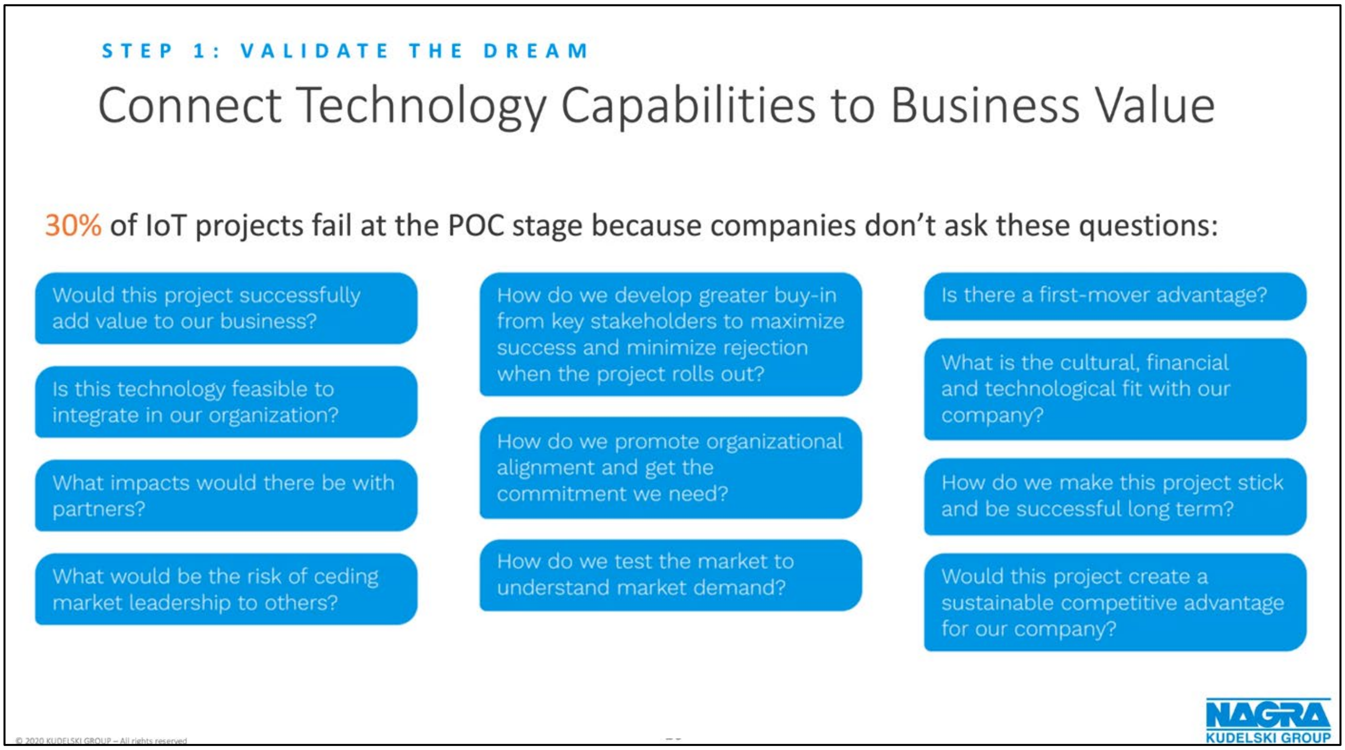
STEP 2: ASSESS THE THREATS

STEP 3: ARCHITECT YOUR SOLUTION

STEP 4: EMBED TRUST END TO END

STEP 5: ASSESS YOUR DEVICE & ECOSYSTEM

STEP 6: MANAGE THE ENTIRE SECURITY LIFECYCLE

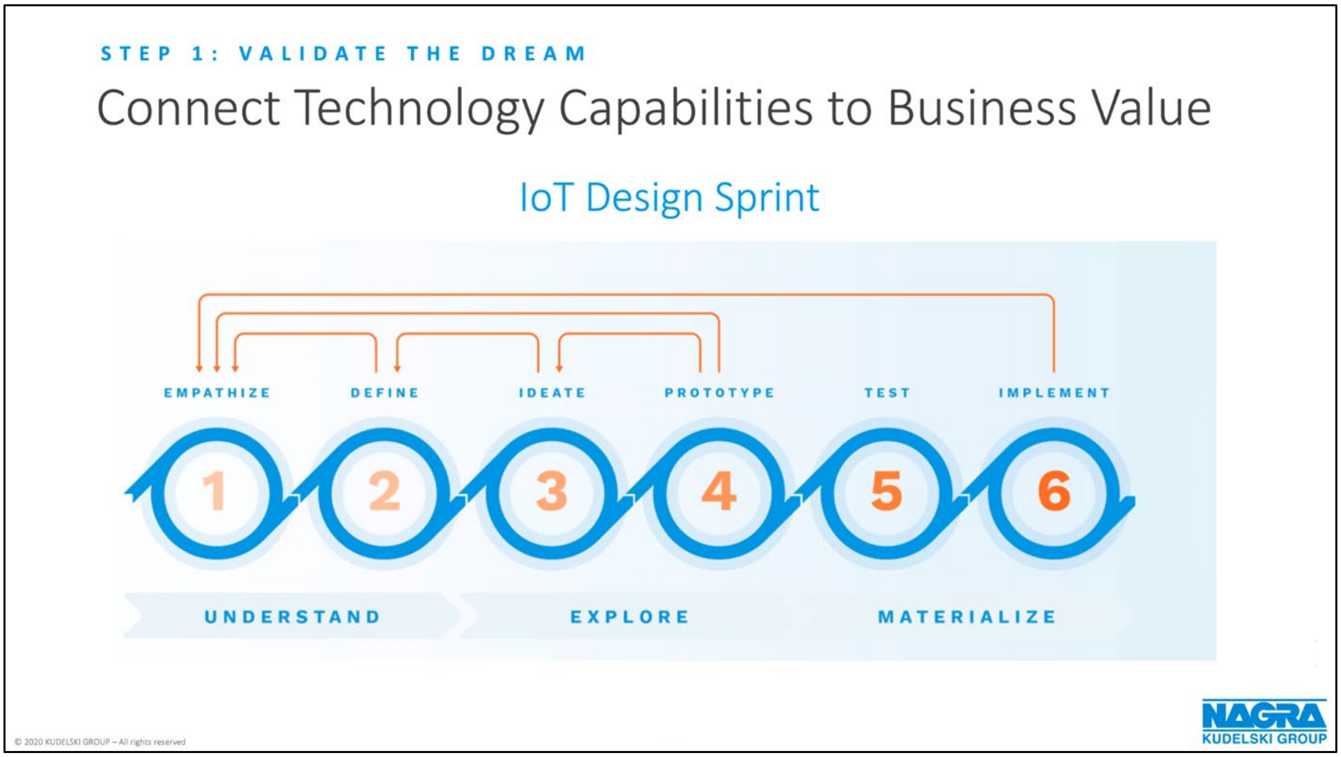


STEP 1: VALIDATE THE DREAM

## Connect Technology Capabilities to Business Value

30% of IoT projects fail at the POC stage because companies don't ask these questions:

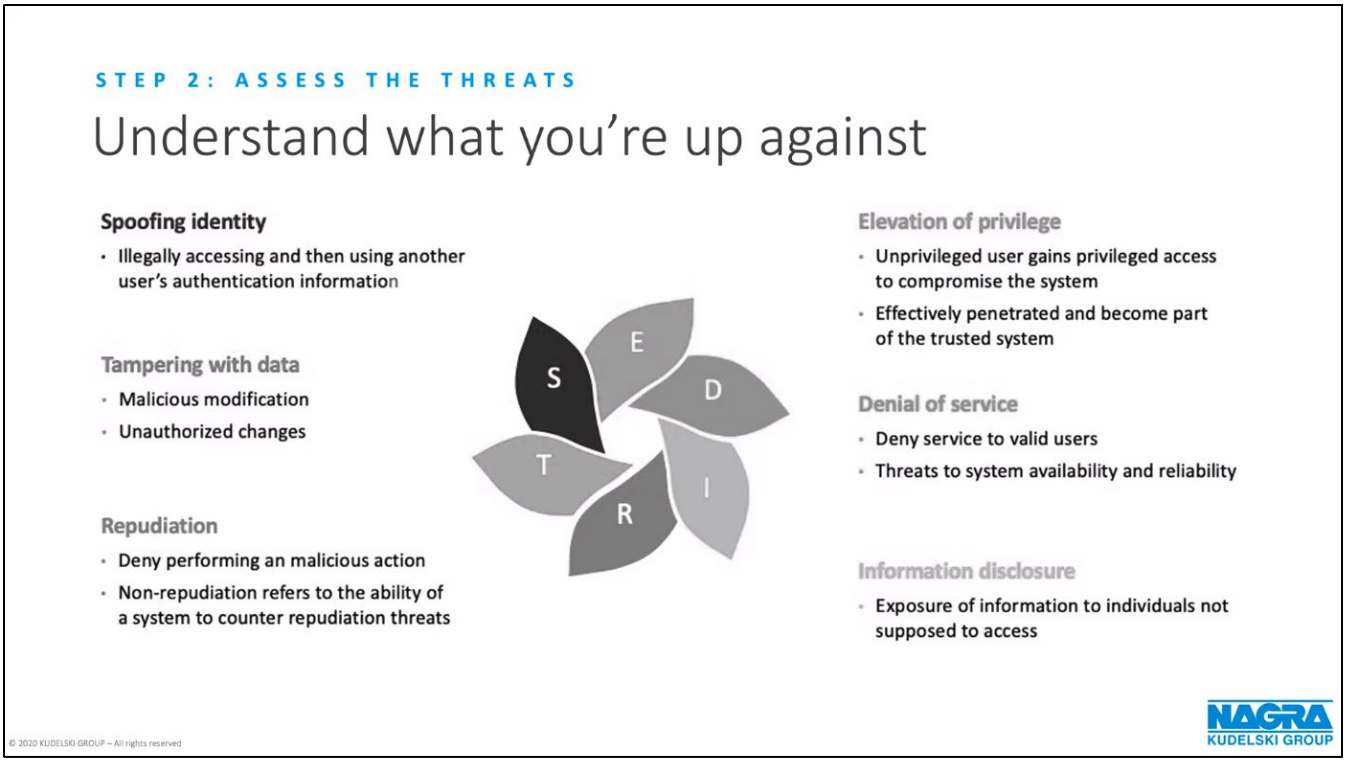
- Would this project successfully add value to our business?
- Is this technology feasible to integrate in our organization?
- What impacts would there be with partners?
- What would be the risk of ceding market leadership to others?
- How do we develop greater buy-in from key stakeholders to maximize success and minimize rejection when the project rolls out?
- How do we promote organizational alignment and get the commitment we need?
- How do we test the market to understand market demand?
- Is there a first-mover advantage?
- What is the cultural, financial and technological fit with our company?
- How do we make this project stick and be successful long term?
- Would this project create a sustainable competitive advantage for our company?



STEP 1: VALIDATE THE DREAM

## Connect Technology Capabilities to Business Value

### IoT Design Sprint



STEP 2: ASSESS THE THREATS

## Understand what you're up against

**Spoofing identity**

- Illegally accessing and then using another user's authentication information

**Tampering with data**

- Malicious modification
- Unauthorized changes

**Repudiation**

- Deny performing an malicious action
- Non-repudiation refers to the ability of a system to counter repudiation threats

**Elevation of privilege**

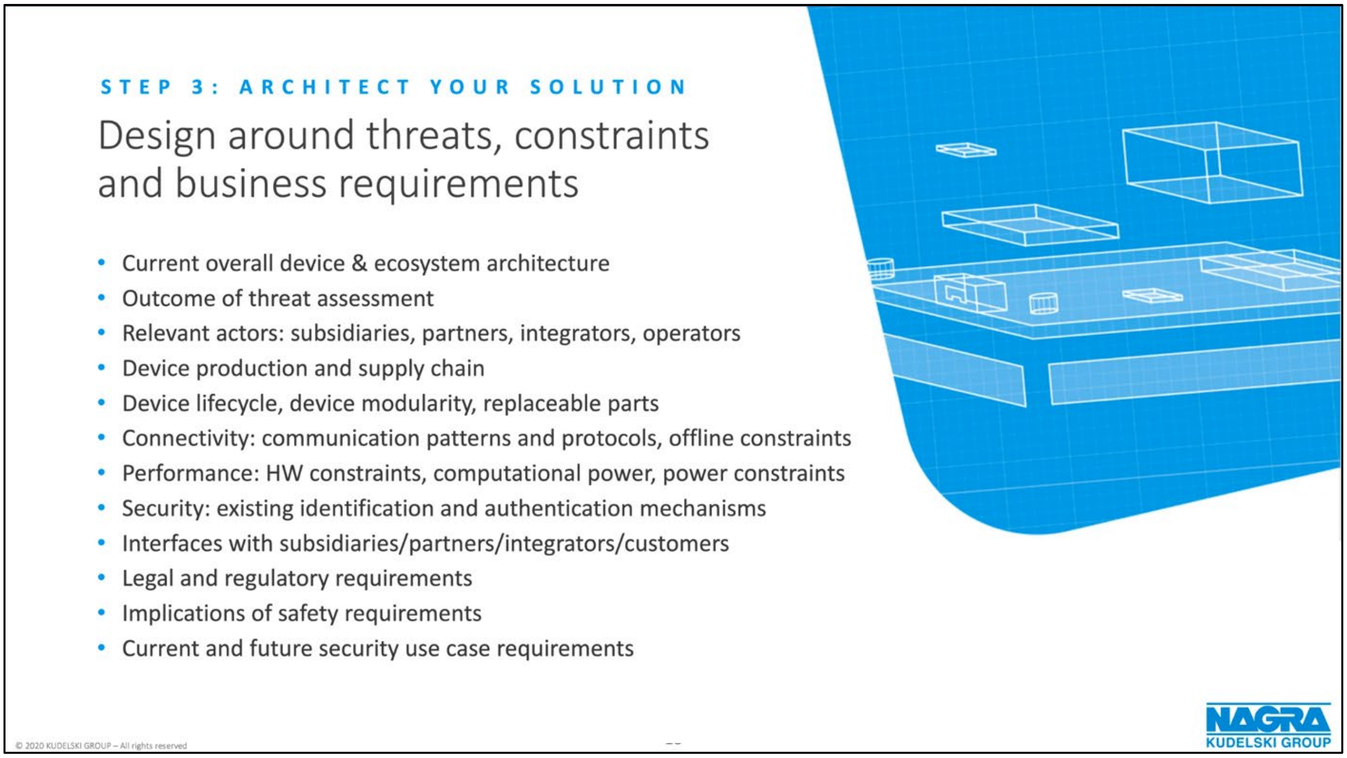
- Unprivileged user gains privileged access to compromise the system
- Effectively penetrated and become part of the trusted system

**Denial of service**

- Deny service to valid users
- Threats to system availability and reliability

**Information disclosure**

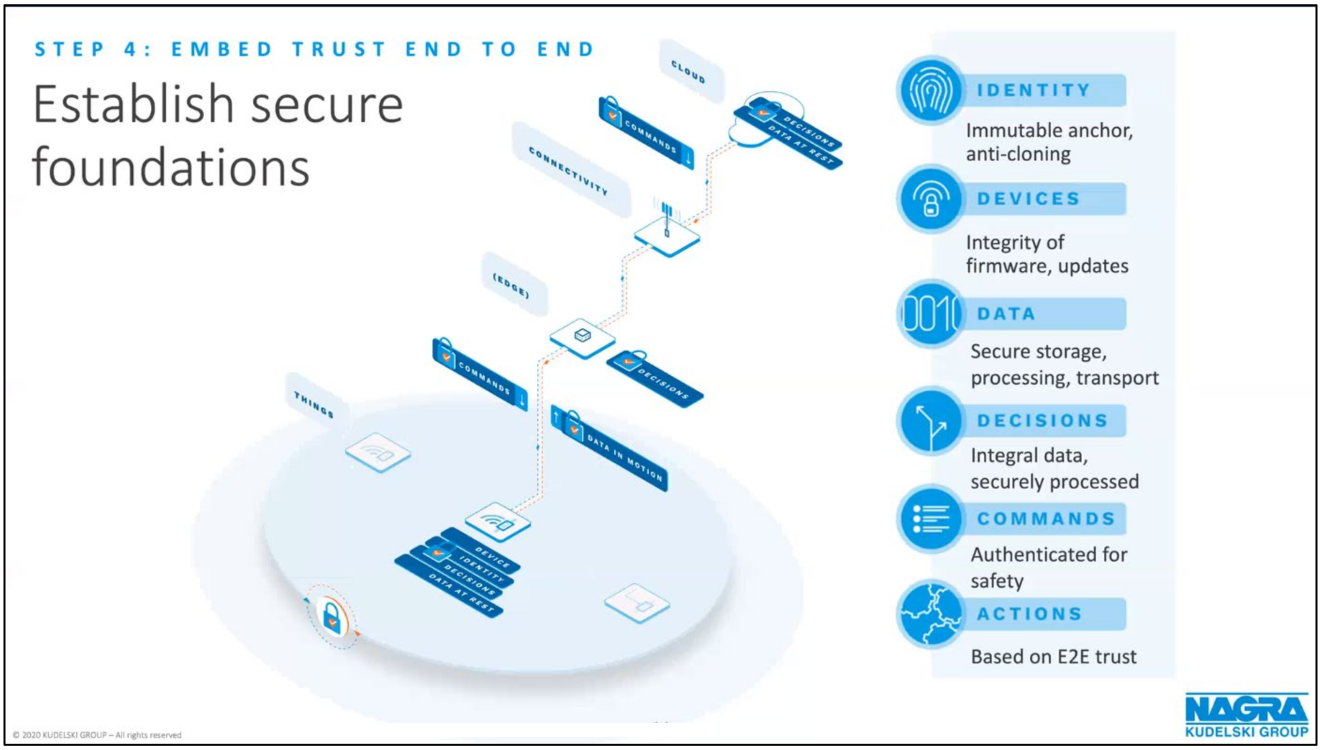
- Exposure of information to individuals not supposed to access



STEP 3: ARCHITECT YOUR SOLUTION

## Design around threats, constraints and business requirements

- Current overall device & ecosystem architecture
- Outcome of threat assessment
- Relevant actors: subsidiaries, partners, integrators, operators
- Device production and supply chain
- Device lifecycle, device modularity, replaceable parts
- Connectivity: communication patterns and protocols, offline constraints
- Performance: HW constraints, computational power, power constraints
- Security: existing identification and authentication mechanisms
- Interfaces with subsidiaries/partners/integrators/customers
- Legal and regulatory requirements
- Implications of safety requirements
- Current and future security use case requirements



STEP 4: EMBED TRUST END TO END

## Establish secure foundations

**IDENTITY**
Immutable anchor, anti-cloning

**DEVICES**
Integrity of firmware, updates

**DATA**
Secure storage, processing, transport

**DECISIONS**
Integral data, securely processed

**COMMANDS**
Authenticated for safety

**ACTIONS**
Based on E2E trust

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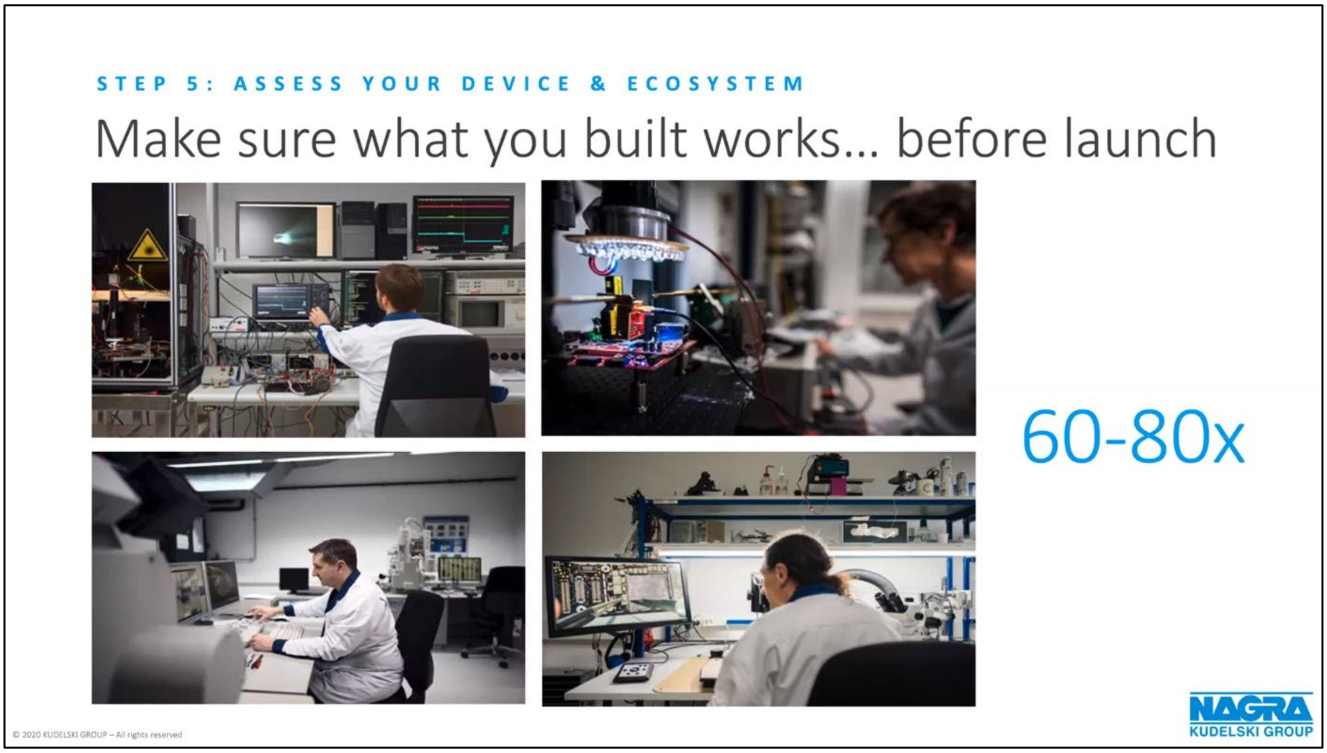

STEP 5: ASSESS YOUR DEVICE & ECOSYSTEM

## Make sure what you built works… before launch

60-80x

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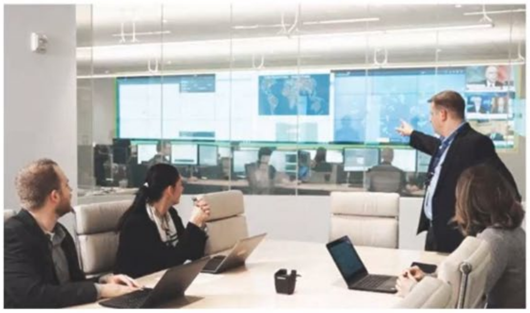
STEP 6: MANAGE THE ENTIRE SECURITY LIFECYCLE

## Don’t take your eyes off the ball

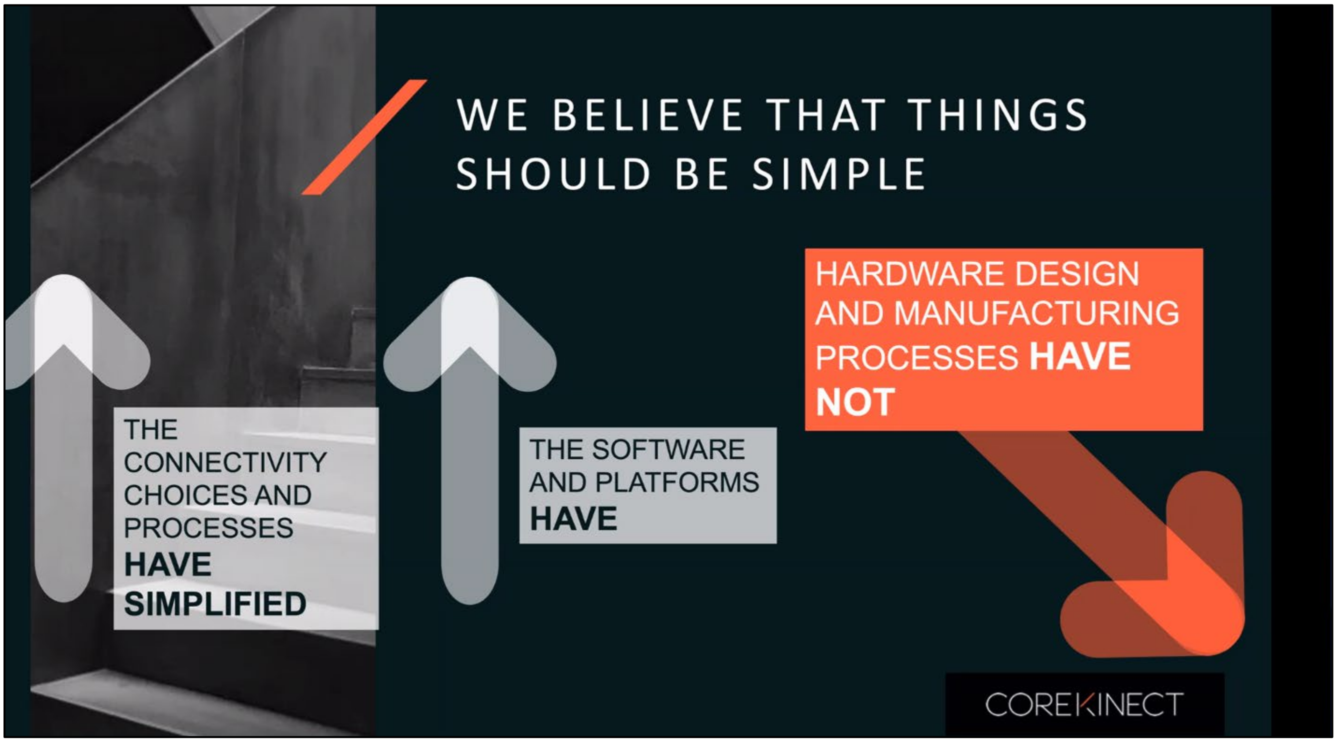
- Understand the global threat landscape and translate it to actionable intelligence
- Monitor devices for anomalous behavior and security telemetry
- Triage alerts and apply AI and human intelligence to plan response
- Regularly update device & ecosystem security using secure FOTA
- Revoke insecure and EOL devices



BONUS STEP: DON’T BE AFRAID TO GET HELP

## You don’t know what you don’t know

The number of unfilled cybersecurity jobs is expected to hit 3.5 million in 2020. This shortage of expertise is compounded for companies deploying IoT.



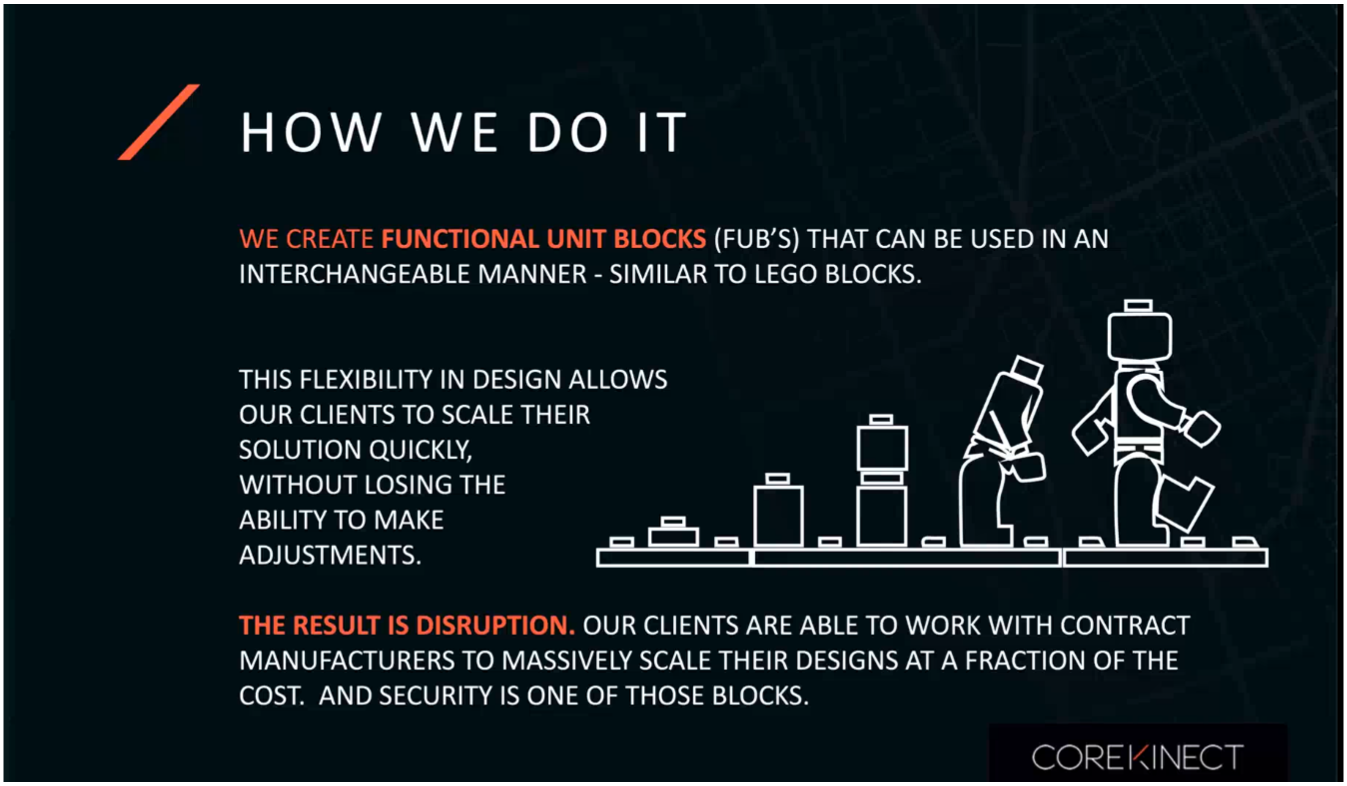
## WE BELIEVE THAT THINGS SHOULD BE SIMPLE

THE CONNECTIVITY CHOICES AND PROCESSES **HAVE SIMPLIFIED**

THE SOFTWARE AND PLATFORMS **HAVE**

HARDWARE DESIGN AND MANUFACTURING PROCESSES **HAVE NOT**

COREKINECT



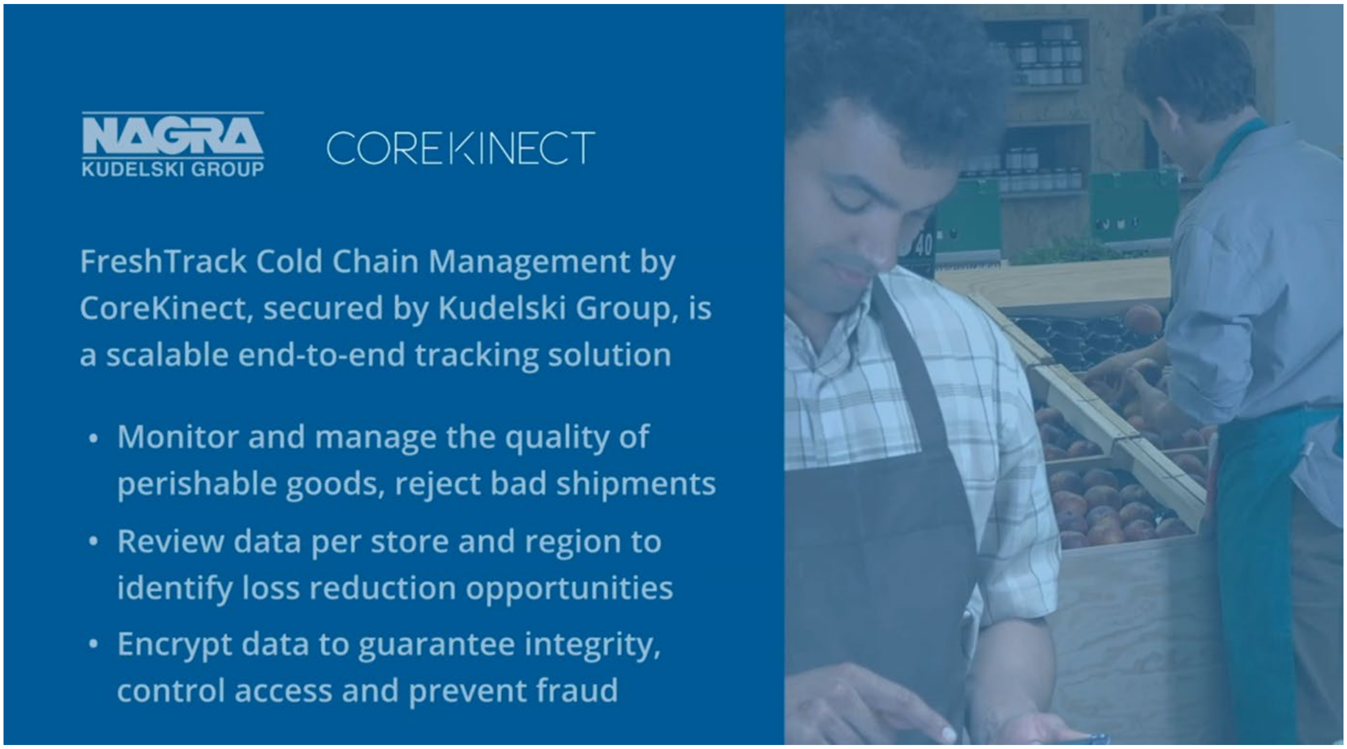
## HOW WE DO IT

WE CREATE **FUNCTIONAL UNIT BLOCKS** (FUB'S) THAT CAN BE USED IN AN INTERCHANGEABLE MANNER - SIMILAR TO LEGO BLOCKS.

THIS FLEXIBILITY IN DESIGN ALLOWS OUR CLIENTS TO SCALE THEIR SOLUTION QUICKLY, WITHOUT LOSING THE ABILITY TO MAKE ADJUSTMENTS.

**THE RESULT IS DISRUPTION.** OUR CLIENTS ARE ABLE TO WORK WITH CONTRACT MANUFACTURERS TO MASSIVELY SCALE THEIR DESIGNS AT A FRACTION OF THE COST. AND SECURITY IS ONE OF THOSE BLOCKS.

COREKINECT



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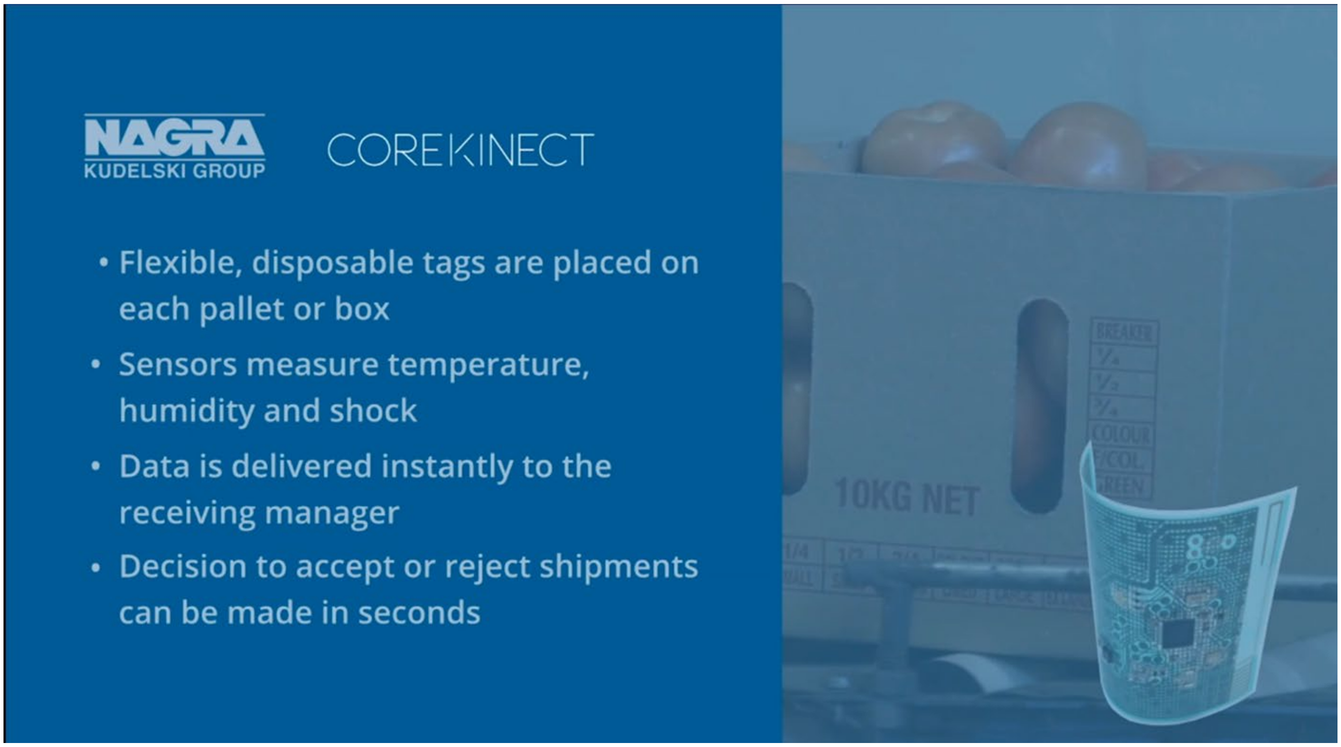
FreshTrack Cold Chain Management by CoreKinect, secured by Kudelski Group, is a scalable end-to-end tracking solution

- Monitor and manage the quality of perishable goods, reject bad shipments
- Review data per store and region to identify loss reduction opportunities
- Encrypt data to guarantee integrity, control access and prevent fraud



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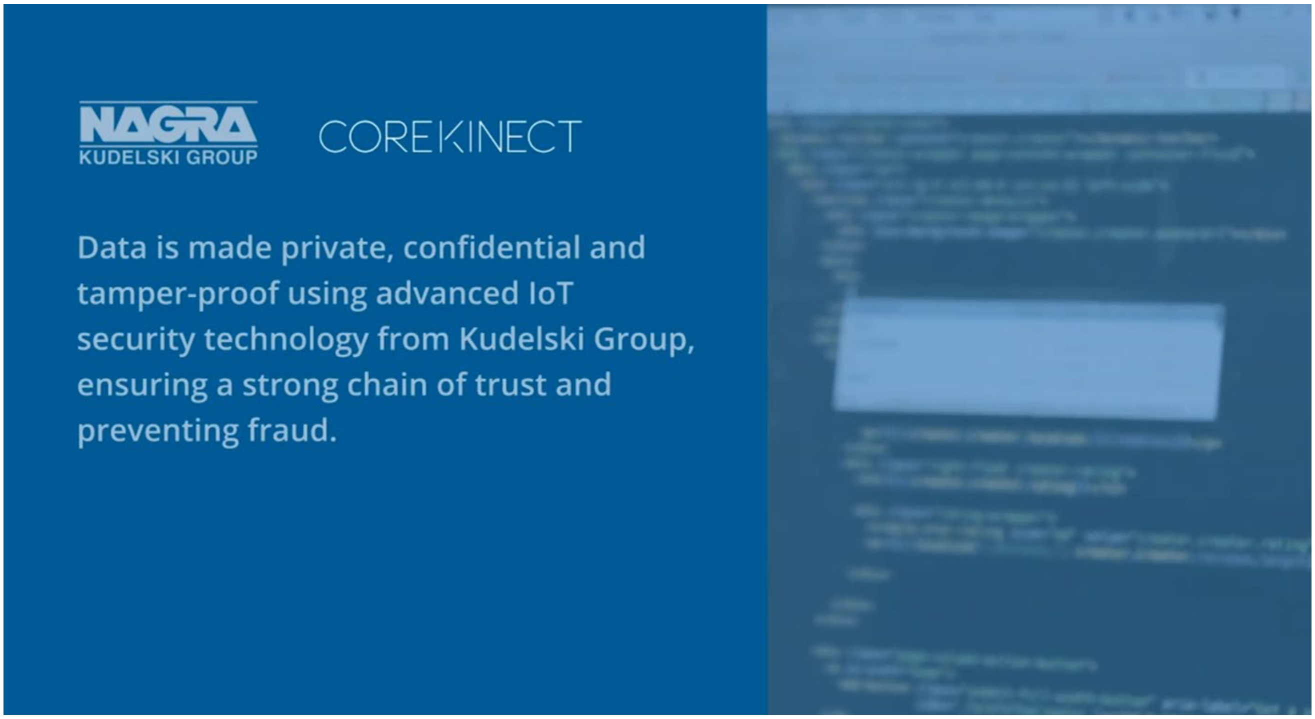
- Flexible, disposable tags are placed on each pallet or box
- Sensors measure temperature, humidity and shock
- Data is delivered instantly to the receiving manager
- Decision to accept or reject shipments can be made in seconds



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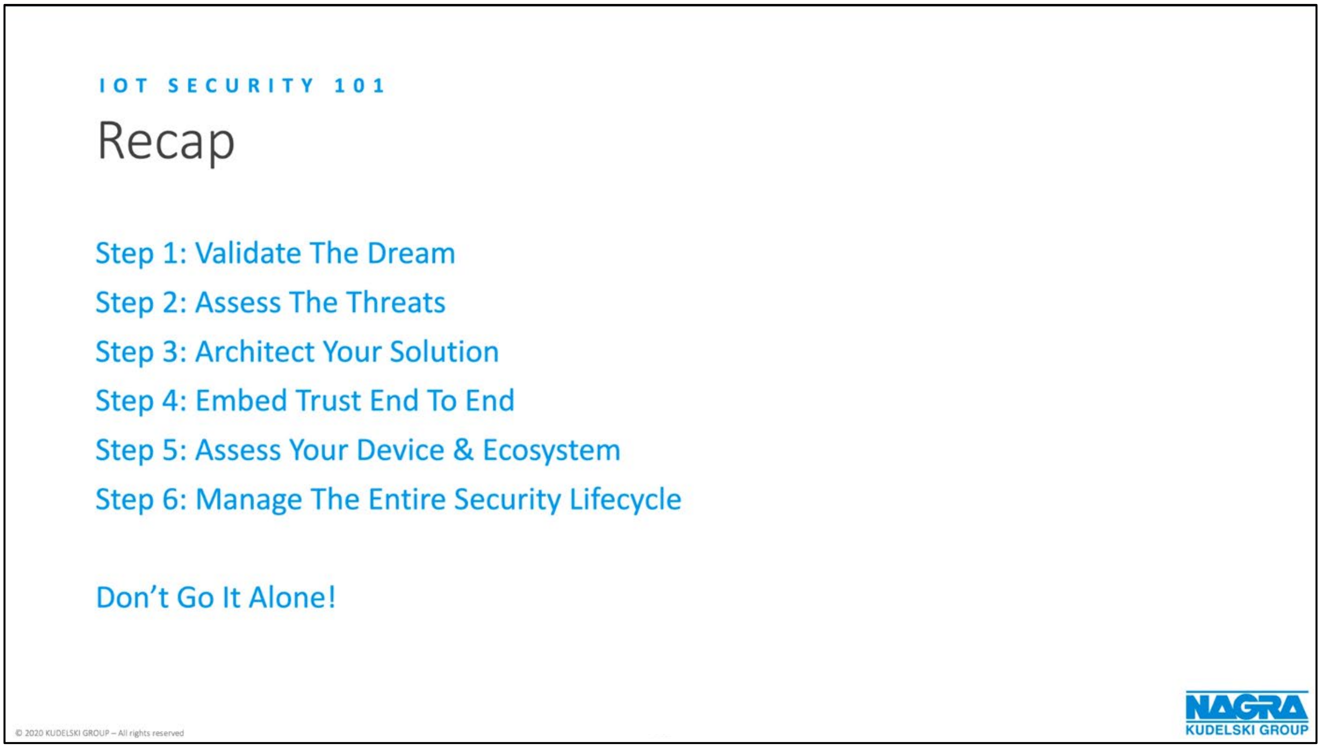
Data is made private, confidential and tamper-proof using advanced IoT security technology from Kudelski Group, ensuring a strong chain of trust and preventing fraud.



IOT SECURITY 101

## Recap

Step 1: Validate The Dream

Step 2: Assess The Threats

Step 3: Architect Your Solution

Step 4: Embed Trust End To End

Step 5: Assess Your Device & Ecosystem

Step 6: Manage The Entire Security Lifecycle

Don’t Go It Alone!

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