HACKING HOSPITALS

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About ISE


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android


Ford


DIEBOLD

RESEARCH OVERVIEW

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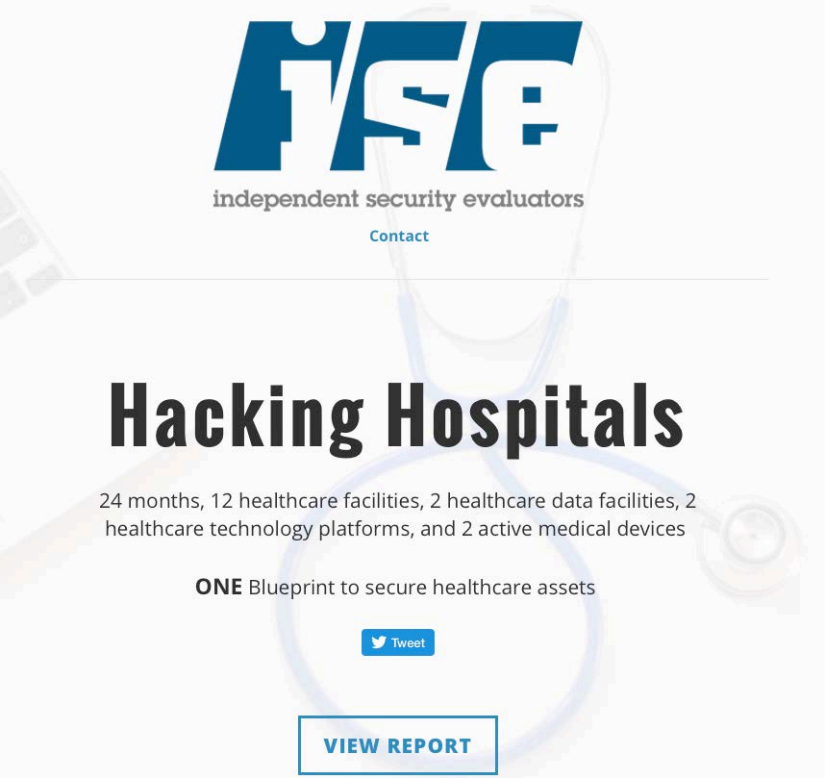

24 Months

12 Hospitals

2 Healthcare data facilities

2 Medical devices

Cyber attacks = kill patients

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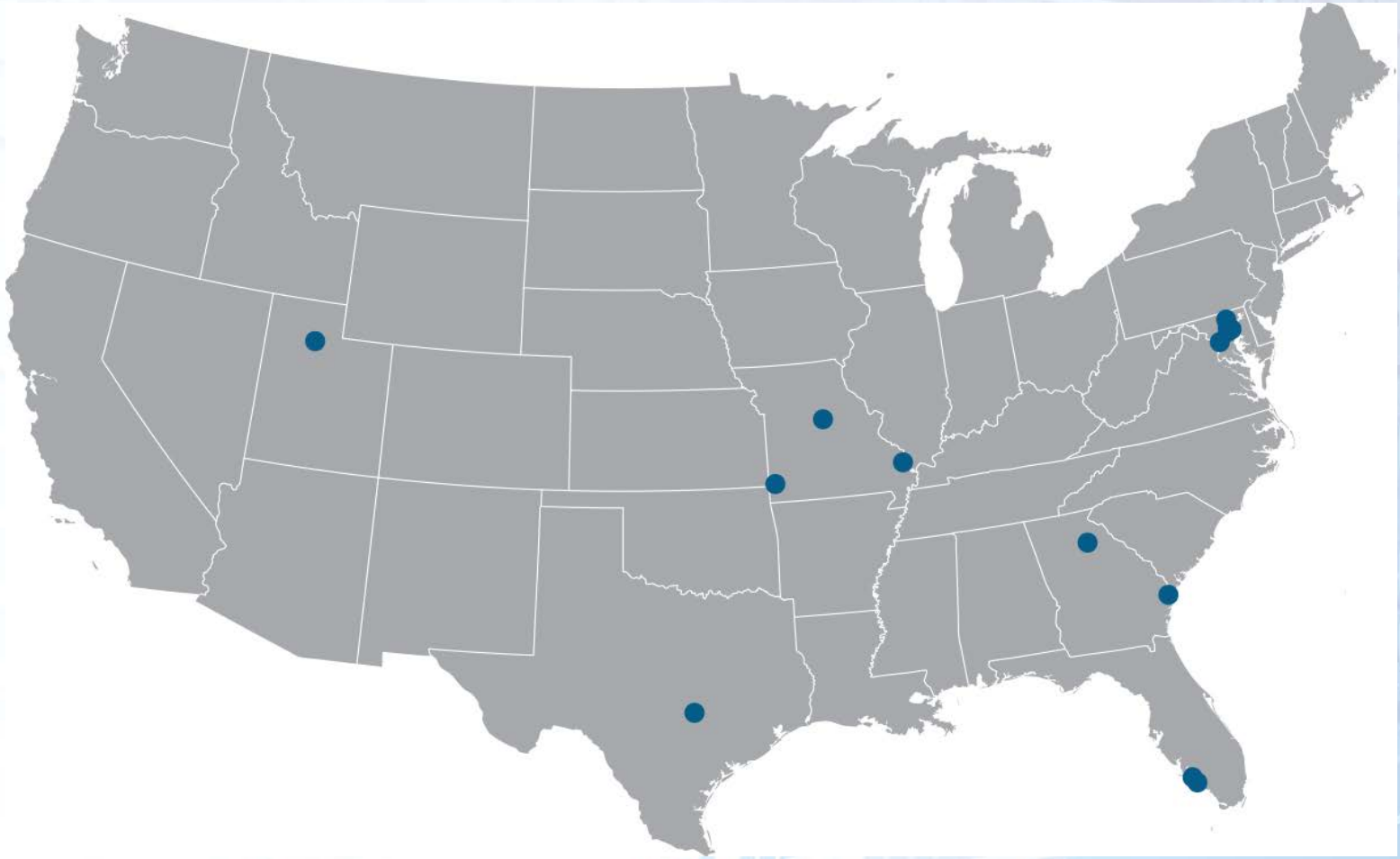

Baltimore, MD
Towson, MD
Washington, D.C.
Athens, GA
Savannah, GA
Cape Girardeau, MO
Columbia, MO
Joplin, MO
Salt Lake City, UT
Naples, FL
Bonita Springs, FL
Austin, TX

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Forbes / Security

The Little Black Book of Billiona

FEB 23, 2016 @ 12:55 PM 9,130 VIEWS

White Hat Hackers Hit 12 American Hospitals To Prove Patient Life 'Extremely Vulnerable'

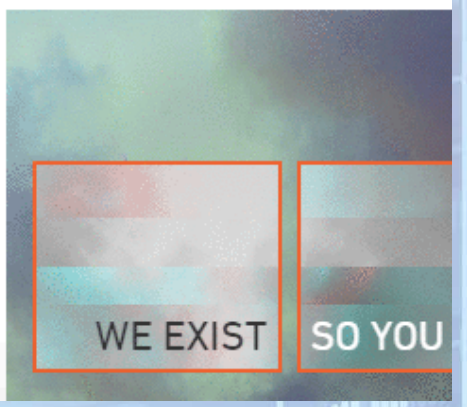
Thomas Fox-Brewster, FORBES STAFF

I cover crime, privacy and security in digital and physical forms.

FOLLOW ON FORBES (173)

FULL BIO

A two-year research project into the security of 12 hospitals and a variety of medical technologies has concluded that patient health is “extremely vulnerable” to digital



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FINDINGS

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patient data v. patient health

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Status Quo

Wrong mission x Outdated approach = Failure

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WRONG MISSION

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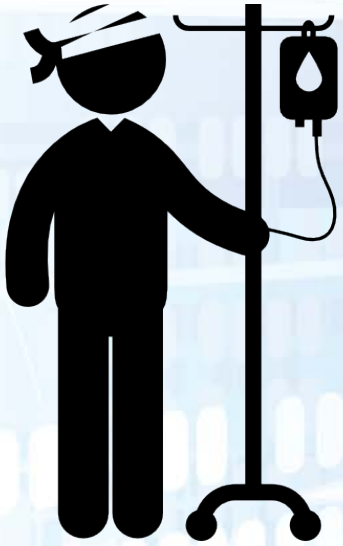
Patient Health v. Patient Data



HARM

PROFIT

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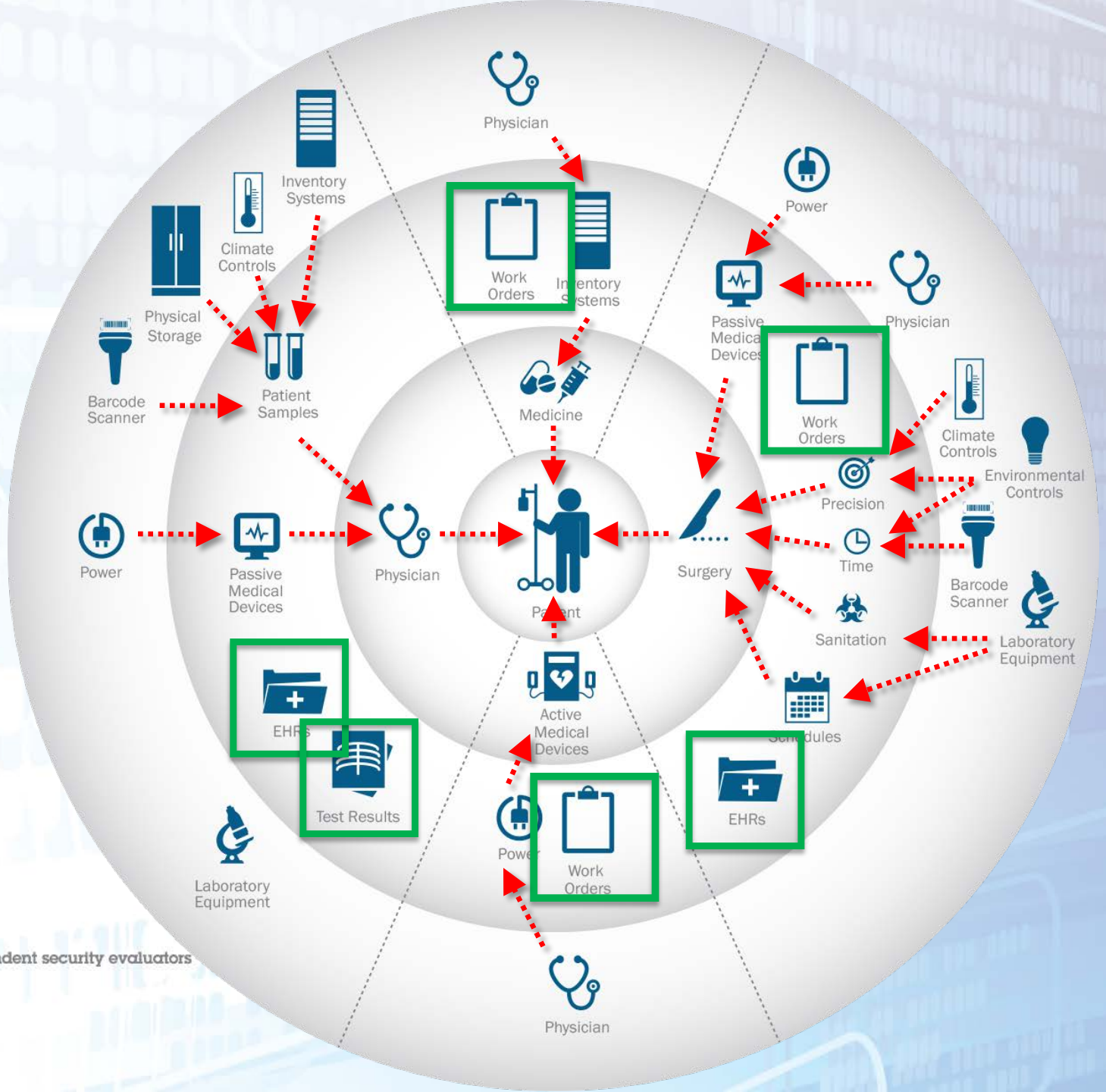

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OUTDATED APPROACH

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Untargeted v. Targeted Attacks

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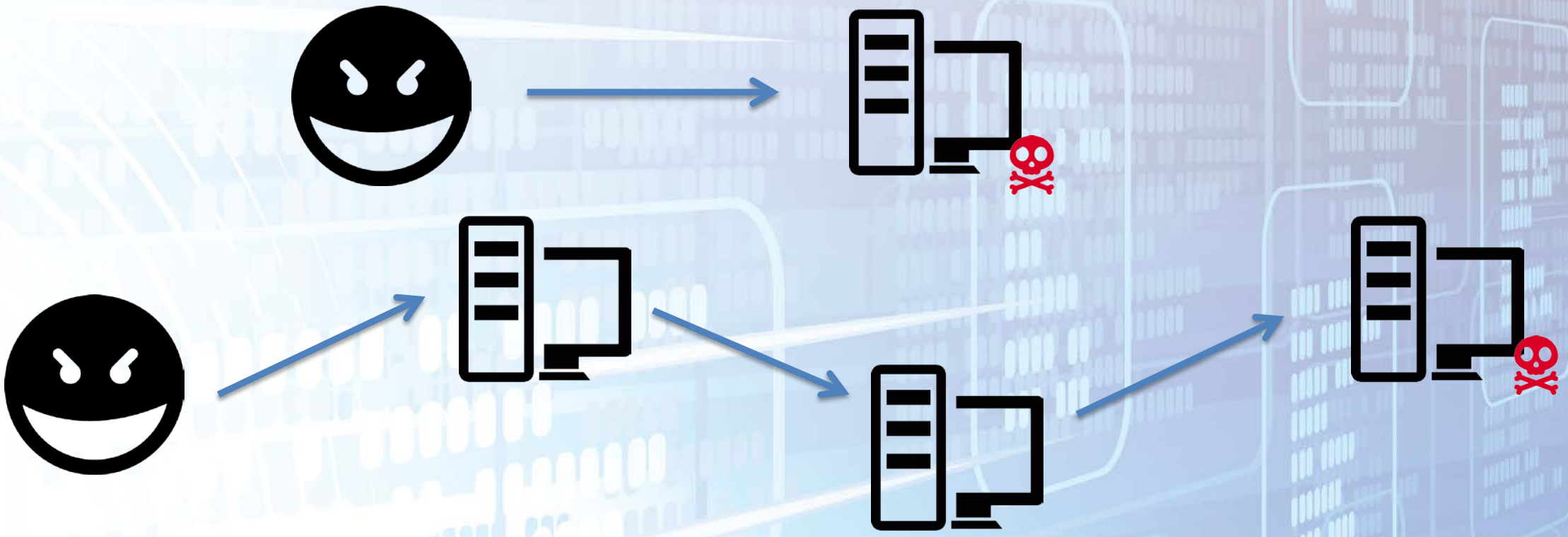
Unsophisticated v. Sophisticated Attacks



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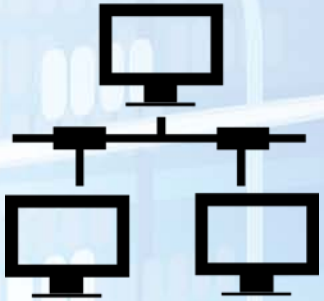
Unsophisticated v. Sophisticated Adversaries



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	Health		Data	
Adversaries	**Targeted**	**Untargeted**	**Targeted**	**Untargeted**
Small Group	X	X	X	✓
Hacktivists	X	X	X	X
Organized Crime	X	X	X	X
Terrorists	X	X	X	X
Nation States	X	X	X	X

ATTACK ANATOMIES

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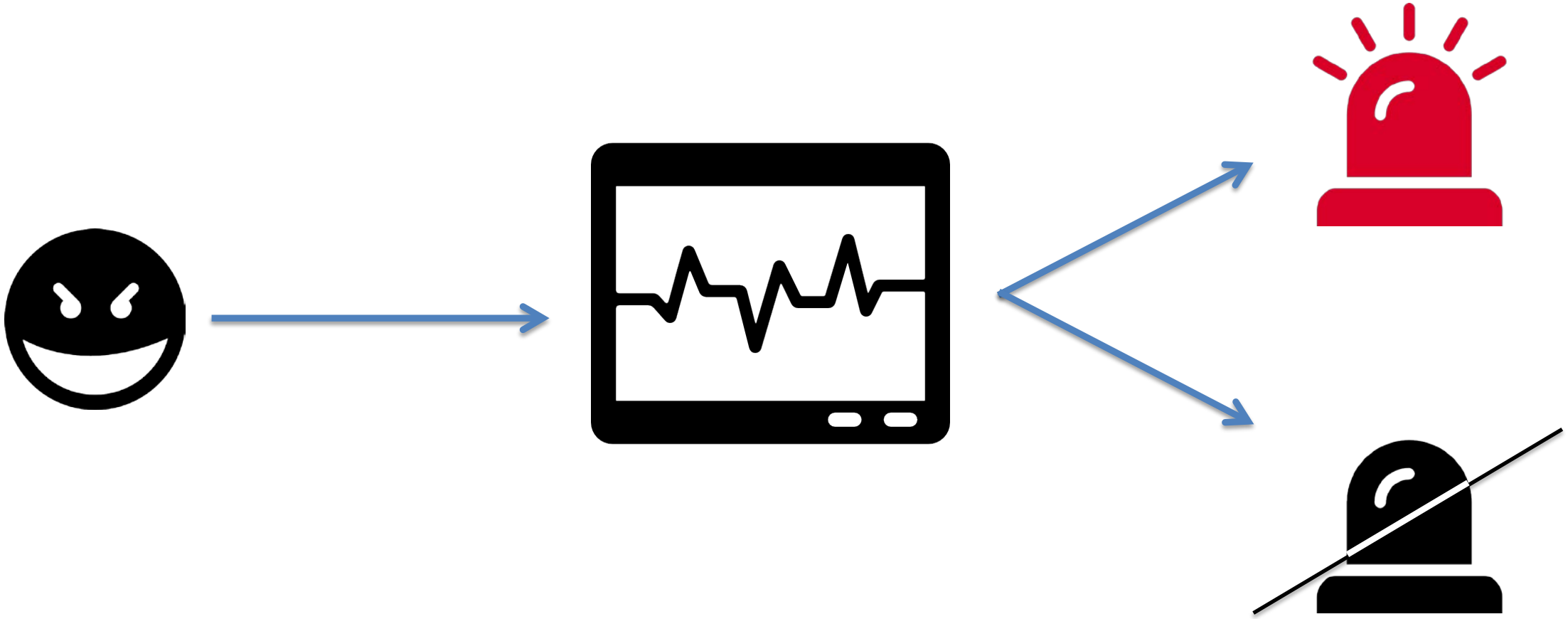
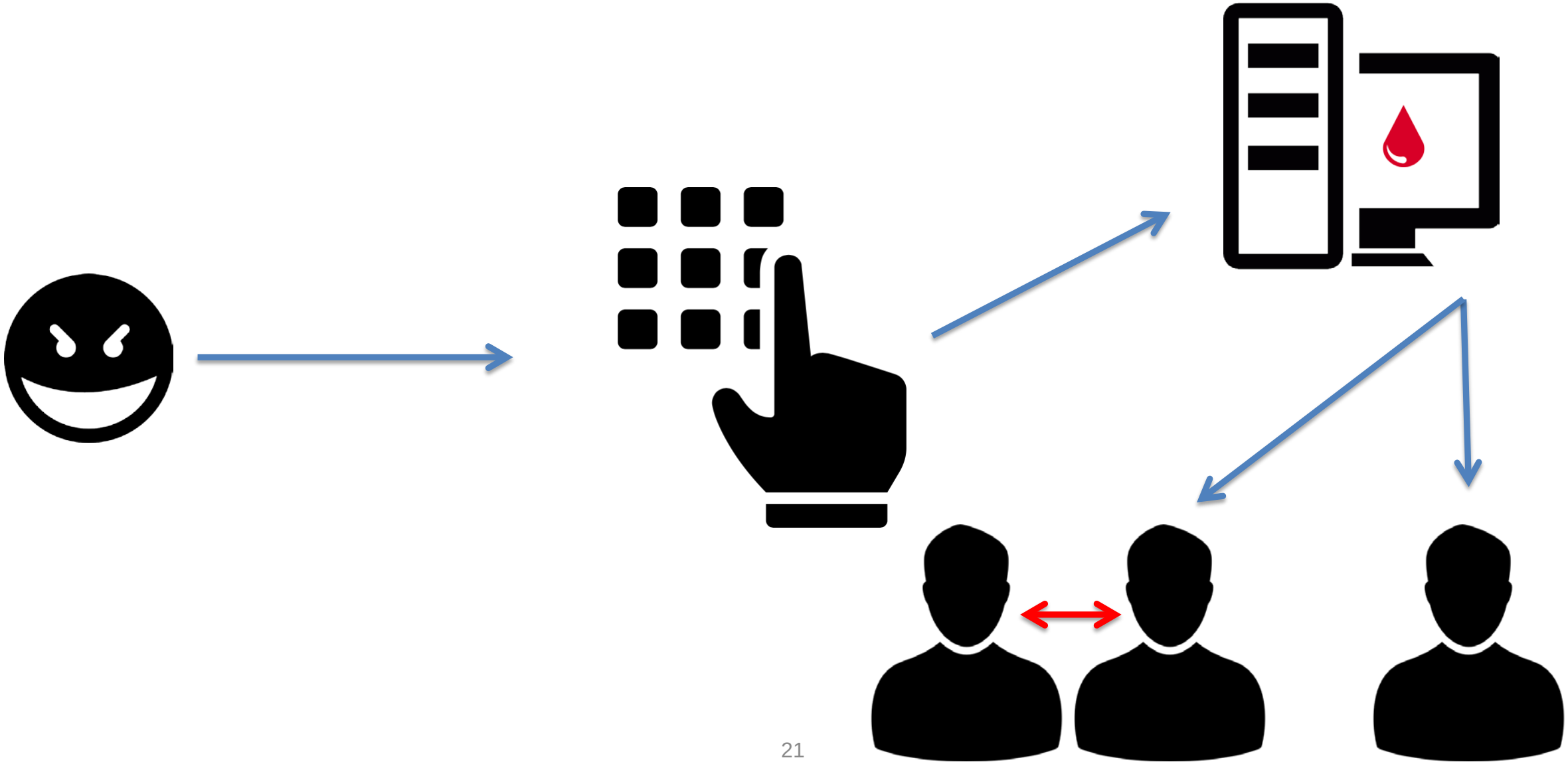
Patient Monitor



Lobby Kiosk / Bloodwork



COMMON ISSUES

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Design Issues


funding


staffing

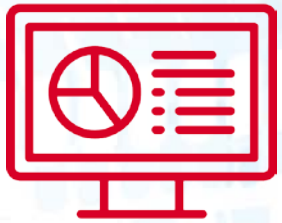

training

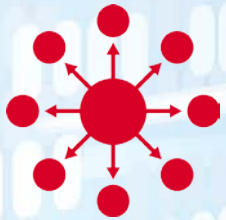

hierarchy


policy


Network awareness


audit


logging/ monitoring


architecture


access control


legacy systems


remote access

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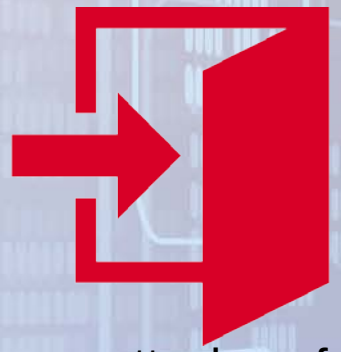
Design Issues

hospital-built,
non-assessed software

vendor-built,
non-assessed software

critical uptime
prevents security



primary attack surfaces
on non-restricted subnets

local physical access
to critical networks

local physical access
to systems & devices

credentials entered
in presence of patients

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Implementation Issues

use of
insecure services

broken
access controls

default
configurations

shared
credentials

unpatched
systems

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BLUEPRINT

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~~"Are we secure?"~~

~~"How secure are we?"~~

"How do we get there?"

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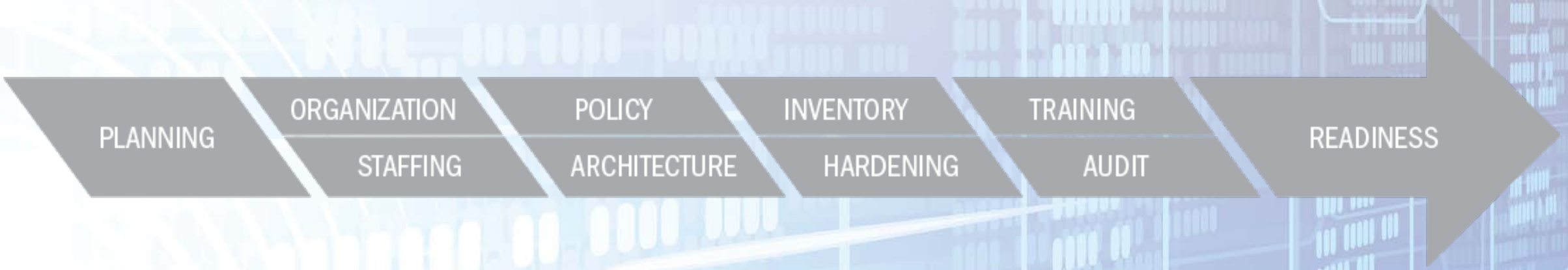

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Planning

- Understand the blueprint
- Create a threat model
- Understand the risks
- (Re)design security framework
- Perform gap analysis
- Create long term plan

Organization

- Separate IS from IT
- Biomed under IT and/or IS

Staffing

- Understand roles
- Full time vs. part time
- Determine quantity

Policy

- Formally define security
- Needed policies
- Needed procedures
- Audit preparation
- Review

Architecture

- Information workflows
- Segmentation
- Network appliances
- Security appliances
- Administration
- Remote access
- Physical access

Inventory

- Employees
- Vendors
- Systems
- Software
- Devices

Hardening

- Configuration management
- Endpoint security
- Monitoring

Training

- Security fundamentals
- Policy training
- Business training
- Subject matter training

Audit

- Internal assessment
- Outside assessment
- Internal audit

Readiness

- Incident response
- Disaster recovery
- Red teaming
- Contingency plans

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Recap

Wrong mission x Outdated approach = Failure

Correct mission x Modern approach = Success

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Recommendations

- Follow the **Blueprint**
- Distinguish between **patient health v. patient data**
- Adopt an **adversarial** mindset

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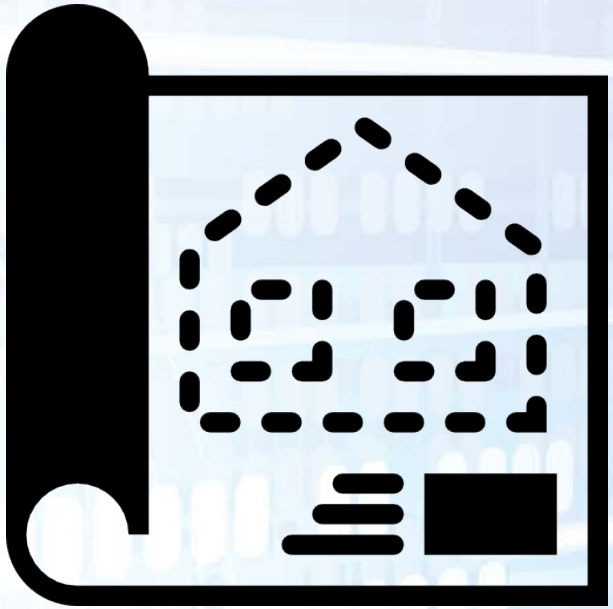
How Can ISE Help?



BLUEPRINT

vCISO

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https://www.securityevaluators.com/hospitalhack