Re-thinking penetration testing

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SDX SECURITY

Who are we?

Dr. Luka Malisa

Head Information Security

Be kind – be empathetic

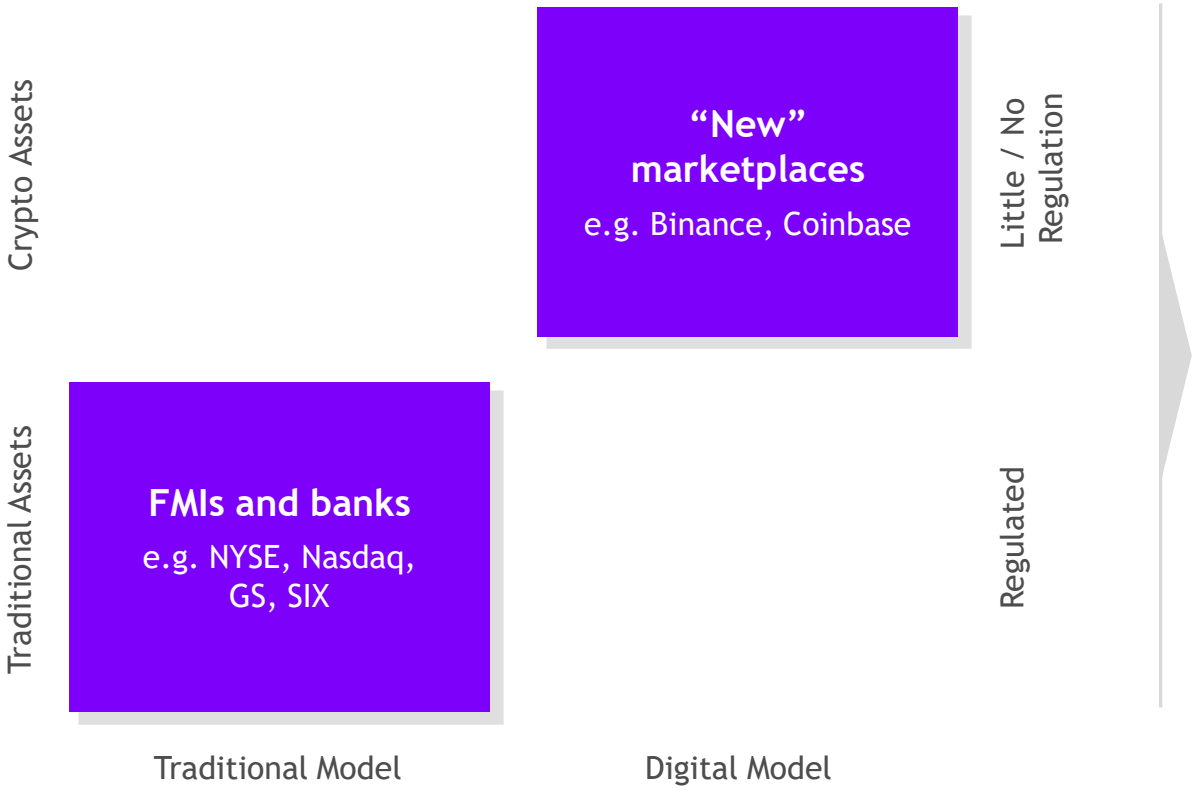
Dr. Stefan Frei

Senior Information Security Officer

Tame complexity

https://www.sdx.com

SDX will set the standard for digital assets, embedded in the existing financial market infrastructure



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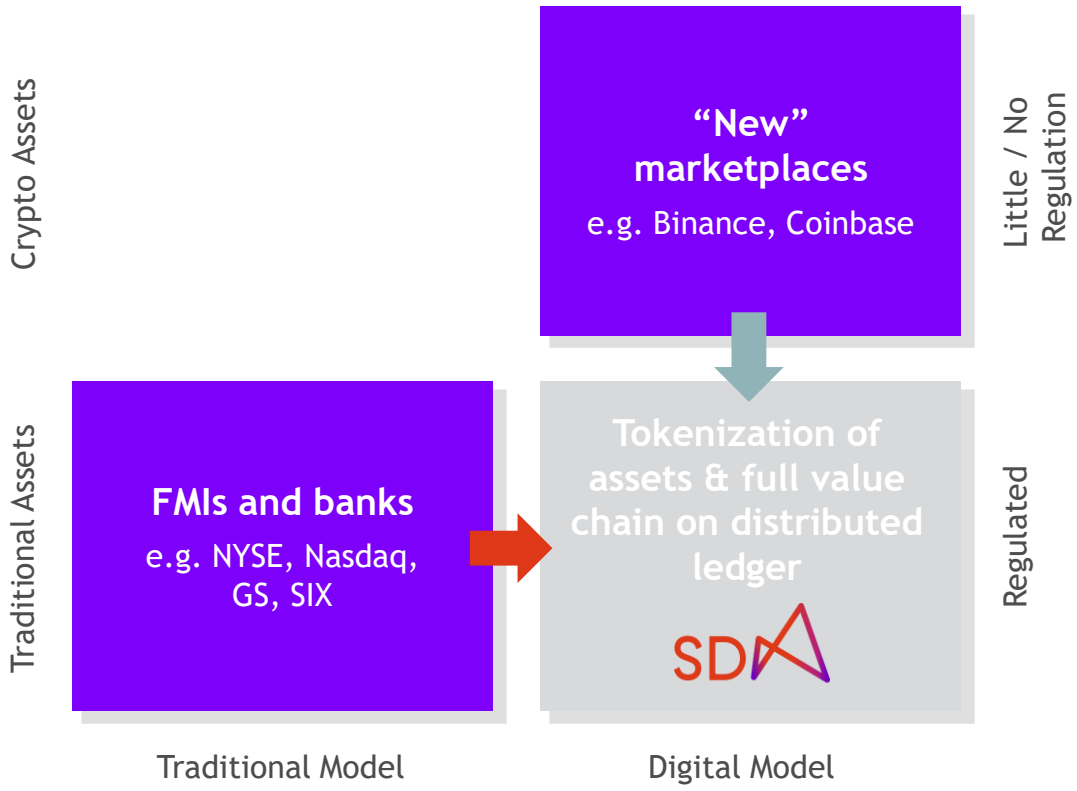


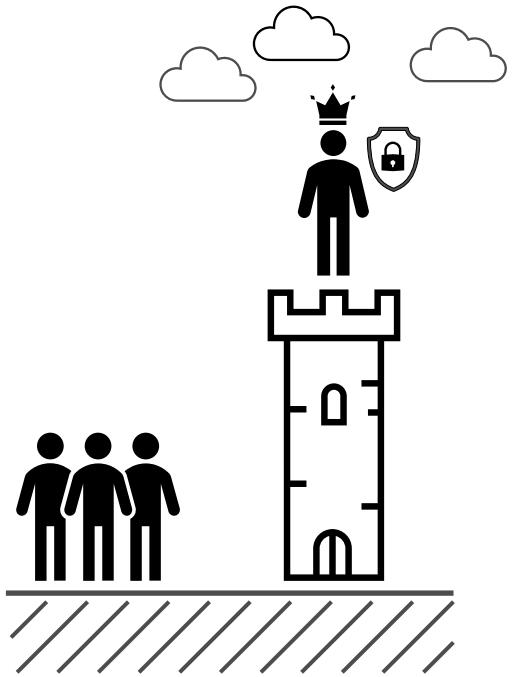
- Traditional and new **market participants try** to **disrupt** existing market **infrastructure and business models**
- SDX is creating a **regulated B2B market infrastructure solution** allowing access only to **institutional participants**
- SDX offers its members **access to new products and services** and enables the creation of new business models
- SDX is connecting banks through **existing connectivity** to SIX

SDX SECURITY

Security Stereotypes

1

Ivory Tower



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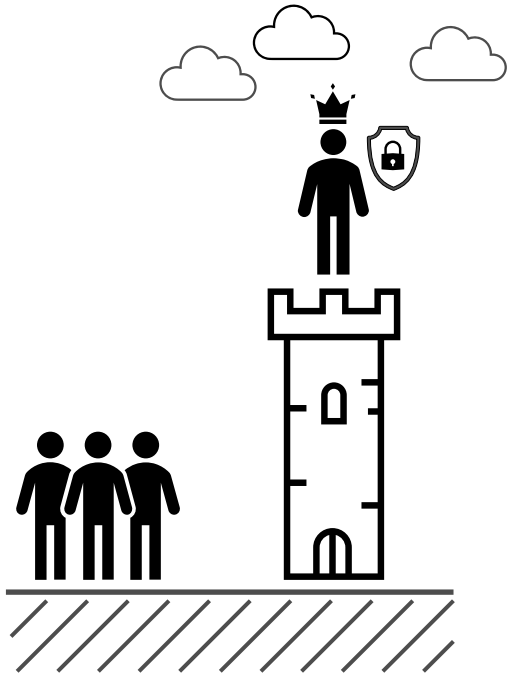
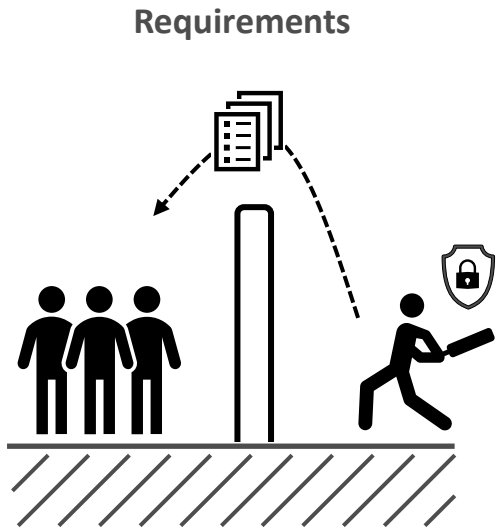


2

Silo Thinking



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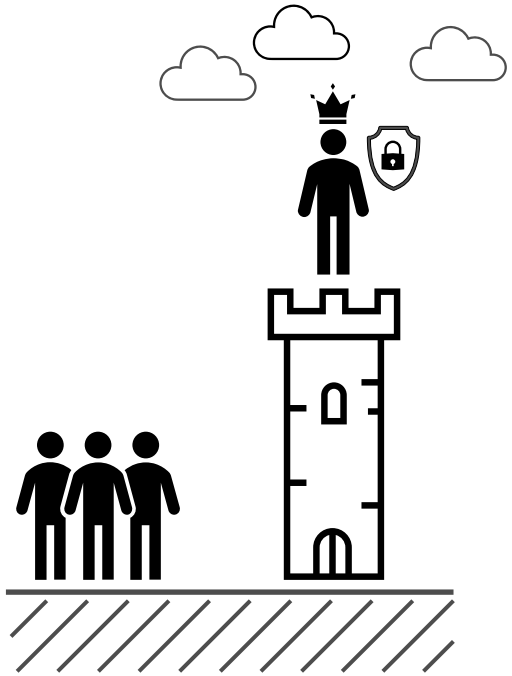

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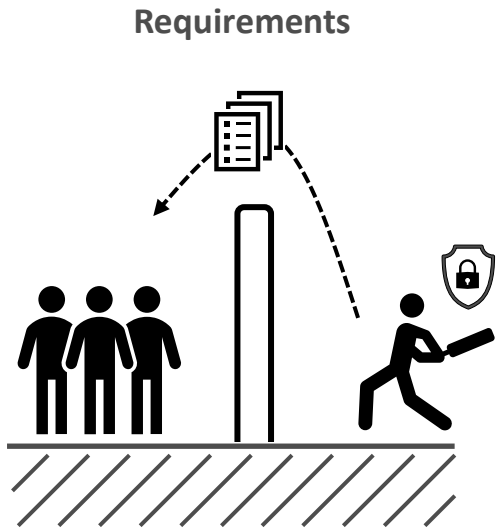

3

Non-technical

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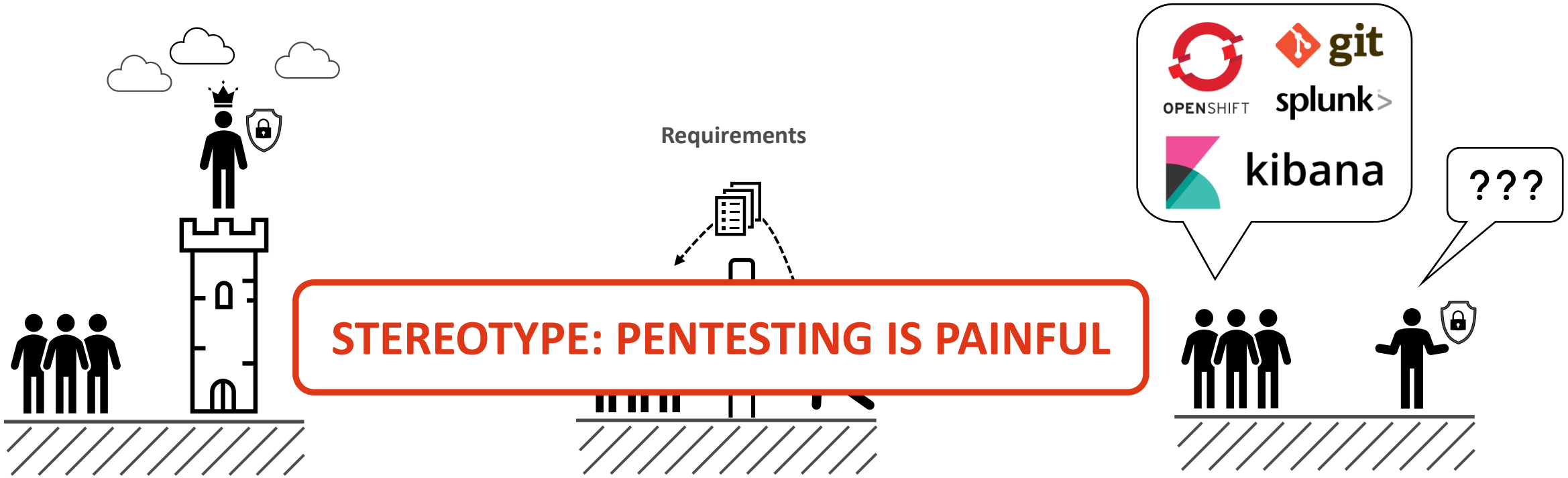

STEREOTYPE: PENTESTING IS PAINFUL

Challenges Securing SDX

SITUATION	SECURITY CHALLENGES
1. SDX at frontier of new tech	**Manual approaches** not helpful
2. High uncertainty	**Slow** security is a liability
3. Permanent change	**Spot fixes** are insufficient

Team Mission: Four STEPs

WHAT	*HOW*	*WHY*
STRATEGIC	Enabling & Scalable	• Point fixes don't work • Duct-tape is our friend • Scalability through automation

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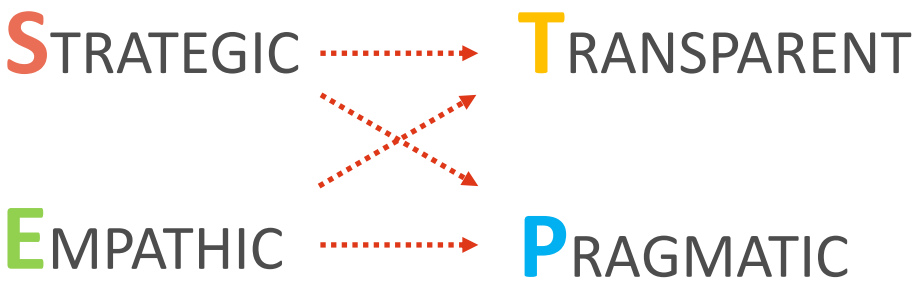
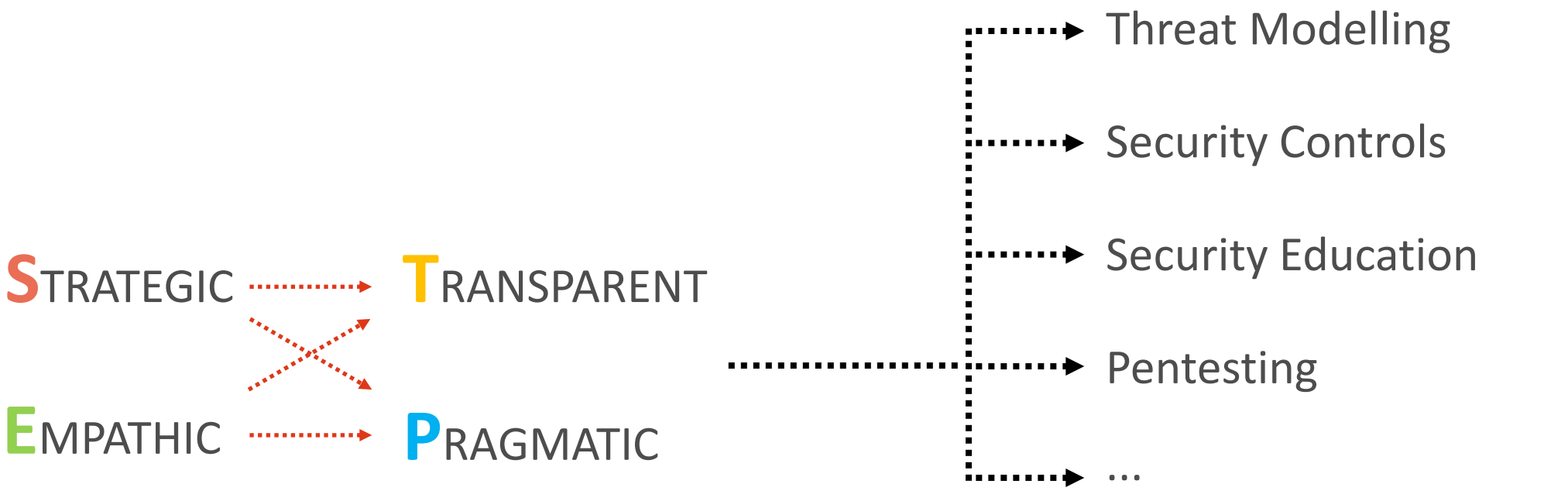
PRAGMATIC	Resourceful & Risk-based	• Approximately right today tops late precision • Get the basics right first • Know our big fires / risks

Team Mission: Four STEPs



Thinking pattern

Team Mission: Four STEPs



Thinking pattern

Results in

Our Result – Agile Penetration Testing

TRADITIONAL MODEL

- *Compliance driven security*
- *Testing monolithic artifacts*
- *Pentesting outside of development*
- *Scope defined by security team*
- *Service-oriented*

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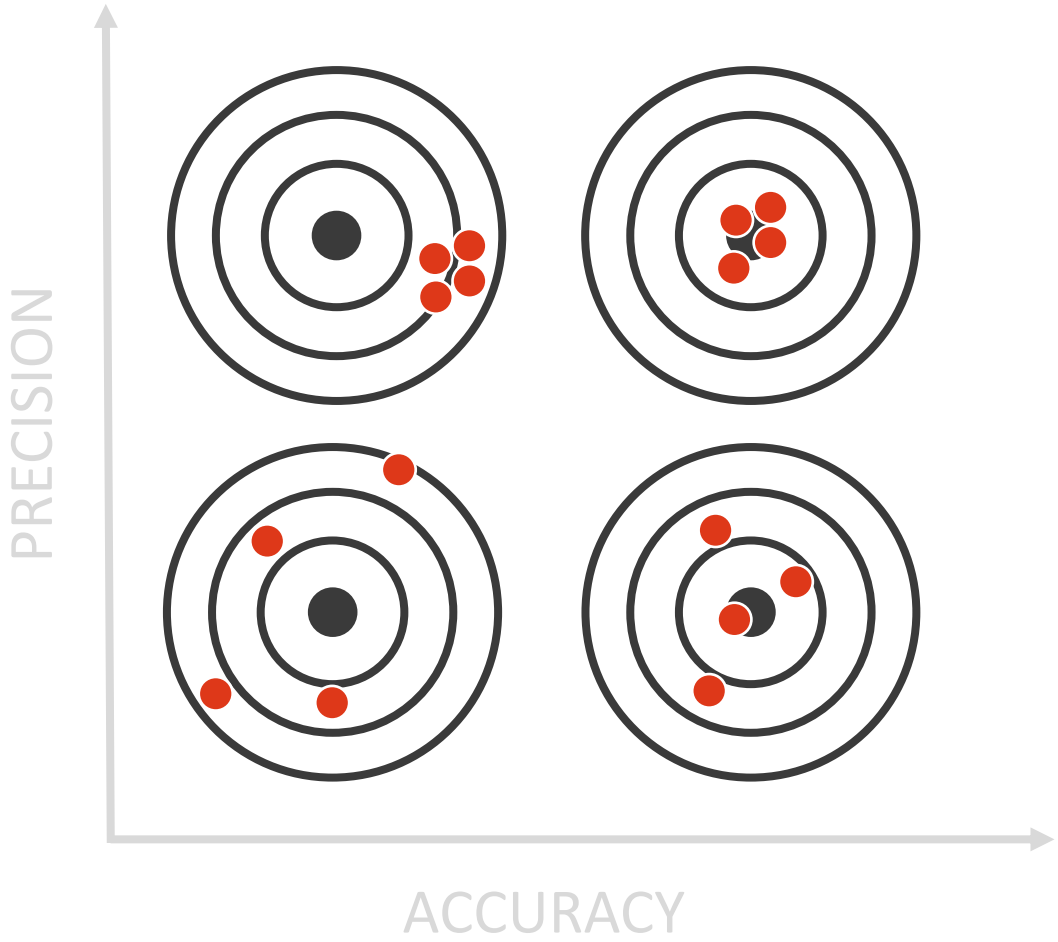
NEW MODEL

- *Agile driven development & security*
- *Continuous and step-wise testing*
- *Pentesting integrated in development*
- *Scope definition is crowd-sourced*
- *Pentest provider is a partner*

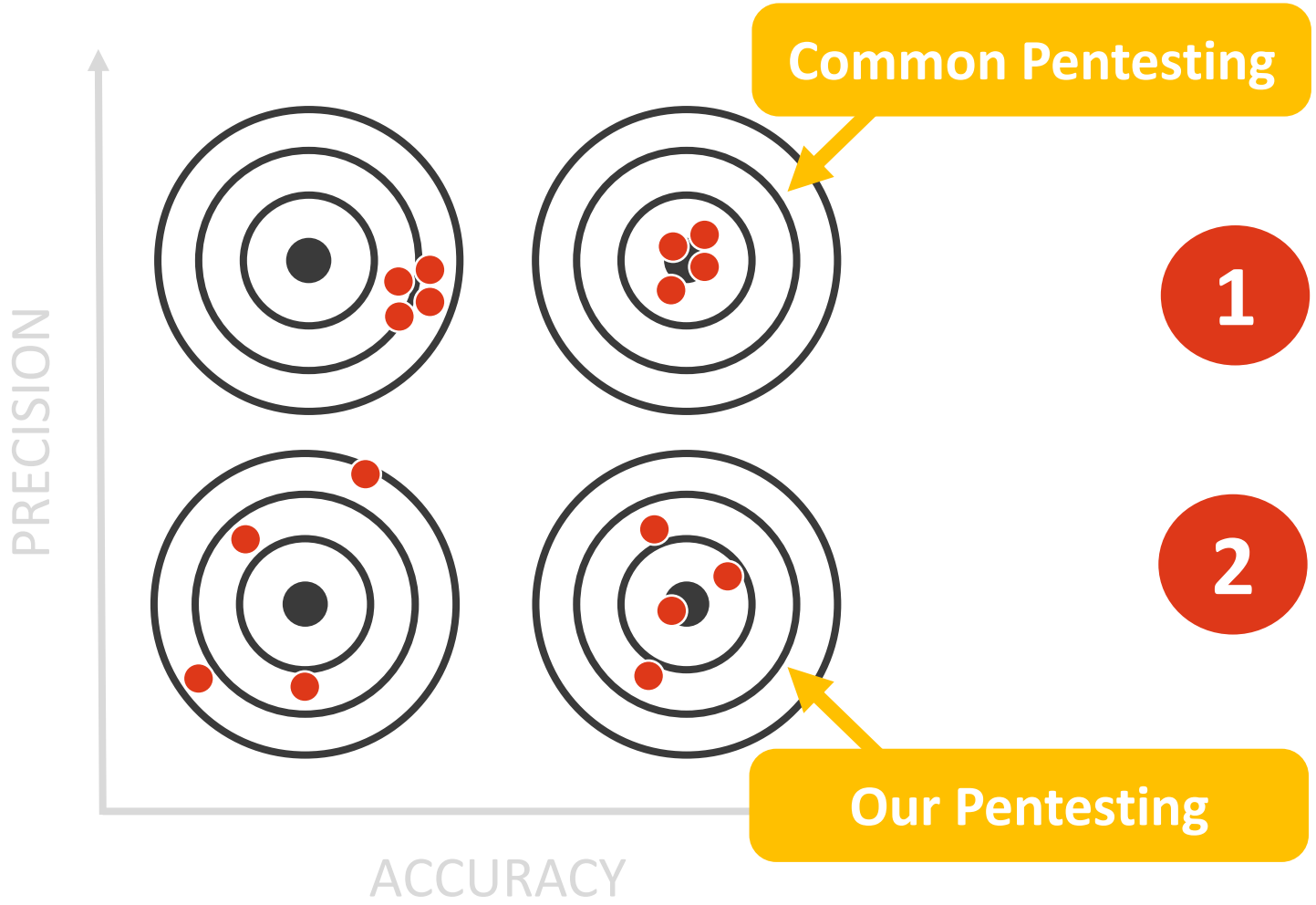
Quo Vadis Penetration Testing?



1. **Approximately right today**
   >> Precisely right tomorrow

2. **Imprecise & often**
   >> Precise & rare

Quo Vadis Penetration Testing?



1 **Approximately right today**
>> Precisely right tomorrow

2 **Imprecise & often**
>> Precise & rare

Agile Security @ SDX

PAST VIEW

- Execute one pentest per year, very detailed, give detailed feedback
- Easy on the security team, optimized for our comfort

NEW VIEW

- Create the most value for the company, event at cost of comfort for security team
- Test early test often

Paradigm shift “how to be efficient at our job” → “how to create the most value in the company”

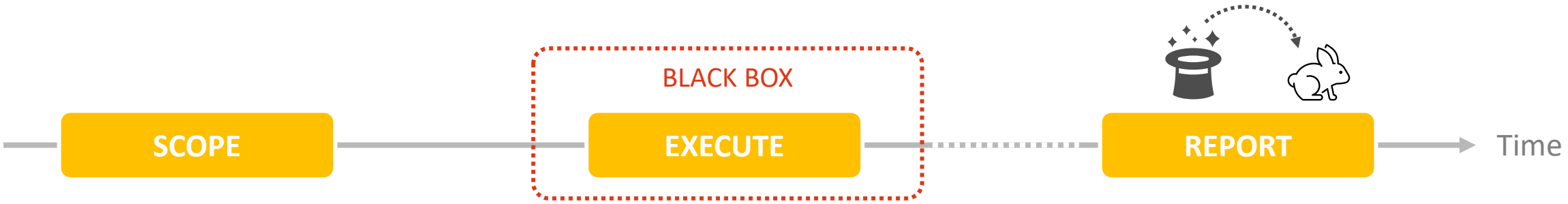
SDA SECURITY

Security Smoke Test (SST)

Or penetration testing for agile environments

Security Testing - Traditional Model

1. **PREPARE**
   Define price and time for given scope
2. **EXECUTE TEST**
   Magic happens in a black box
3. **REPORT**
   Results delivered long after test concluded



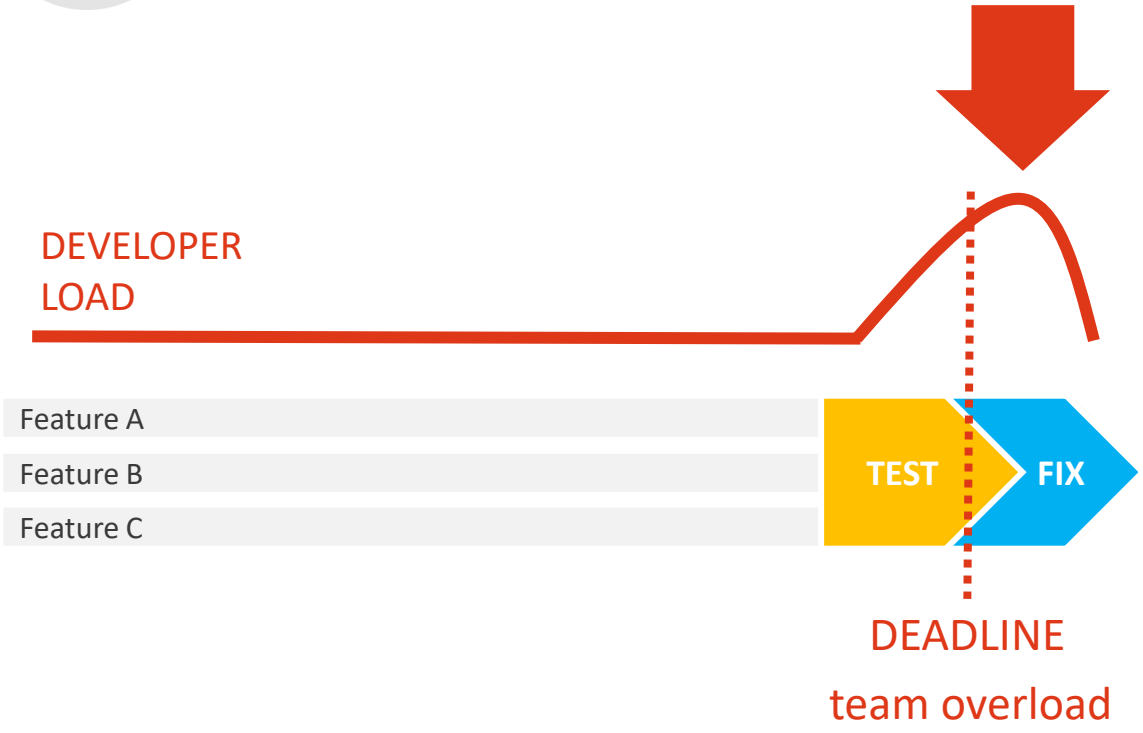
LIMITATIONS

- Test completeness or quality?
- Feedback & learnings for developers?
- Trends over a series of tests?

Security Testing - Traditional Model

LATE TESTING

- No reduction of uncertainty
- Overload to address findings
- High risk of project delay



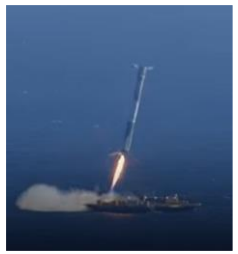
- **Compliance driven** security
- Designed for big **monolithic artifacts**
- Pentesting **disconnected** from development

Early Reduction of Uncertainty

Space-X View

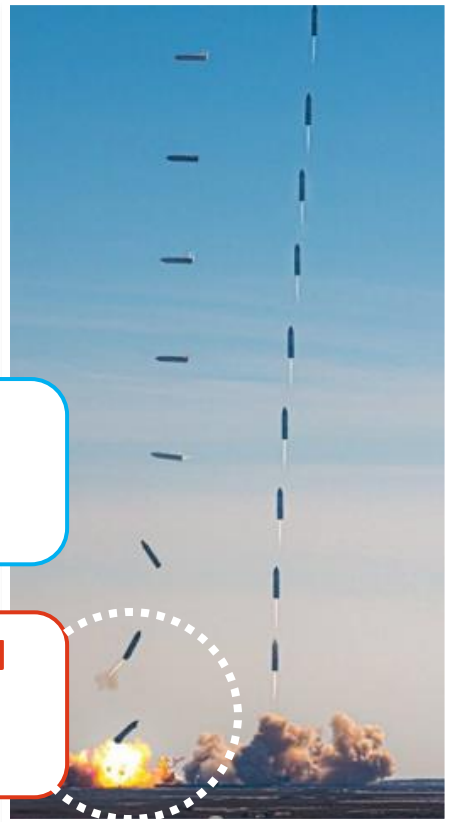
- Many failures happened simply because a new system tries to do unusual things
- No issues means no innovation (you are only optimizing)

Innovation / development


Business as usual

These are not failures, but **critical learning opportunities**



VALIDATION
*of **known** unknowns*

IDENTIFICATION
*of **unknown** unknowns*

The actual **cause of failure was not on our risk list**

PROBLEM STATEMENT

- Embrace change and unpredictability
- Reduces overhead for all: *security*, *pentesters*, and *project team*
- Executing 15+ pentests/year with 0.2 FTE?

PENETRATION TEST PHASES

Preparation time | Execution time

A PREPARATION
- Reduce repeating manual work
- Self service model

B EXECUTION
- Turn testing from a one-off event into a habit
- Facilitate know-how transfer

Traditional vs. New Model

LATE TESTING

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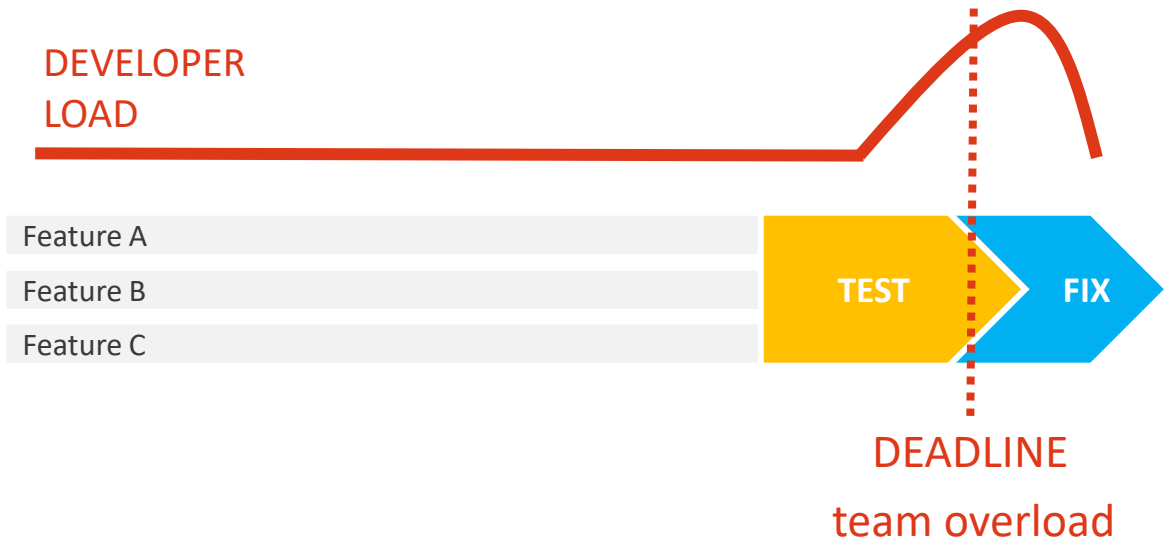
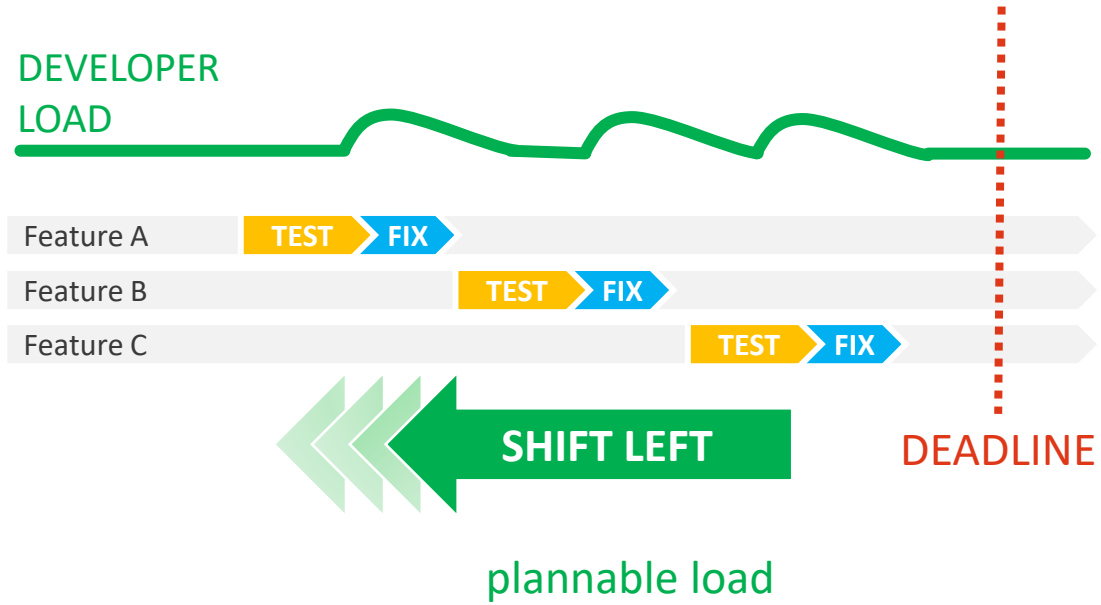


TEST EARLY & OFTEN

- Test new function when ready
- Early reduction of uncertainty
- Buy time to learn and fix

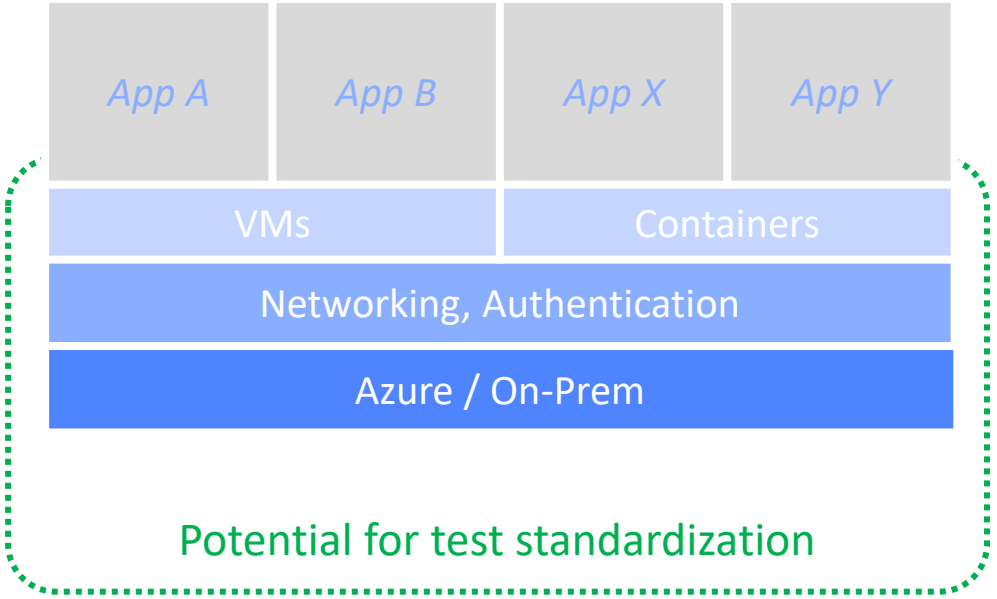


Do the basics first

- Heavy overlap of common components across projects
  e.g., access control / roles, firewalls, container orchestration, ..
- Insecure infrastructure nullifies any application security
  You build a house on sand -> the house will be eaten up by the sand

less standardized

more standardized



APPLICATIONS
Code domain

INFRASTRUCTURE
Configuration domain

PENETRATION TEST PHASES

Preparation Execution

Commoditize Pentest Scopes

SCOPE MODULES / MENUE

- Standardize and scopes with test cases
  including documentation of preparation steps required by project
- Security team guides app owner through scope modules
  .. instead of repeated and extensive communication sessions

ACCESS & PERMISSIONS
Azure roles and resources setup

INFRASTRUCTURE DEPLOYMENT
OpenShift project setup
VM & container hardening

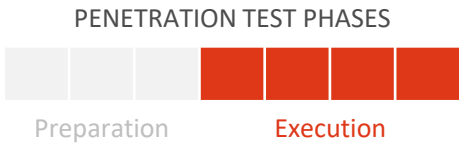
NETWORKING
Firewalling in-/egress
Exposed services
Proxies

WEB SERVICES
REST-APIs
Webapp baseline

OUTCOME

- Facilitates planning & preparation by project team
  .. and prevention of issues as engineers know the test cases

Security Smoke Tests (SST)



PREPARE

WORKFLOW & CONVENTION

- Naming convention **SST-*YYYY-NN***
- Chat-Ops with **all stakeholders**
- Permanent tester laptops & accounts

Frequent testing at scale

EXECUTE

DAILY TOUCHPOINT & REPORT

- Daily briefing with **testers** and **engineers**
- Consistent & continued **documentation**

Know how transfer

FINALIZE

RESULTS

- Positive & negative findings
- **Raw results** from tools
- Test **automation** information

Automation

GREAT, BUT…

Does it work in practice?

Results

TEST EARLY & OFTEN

Increased efficiency of testing:
15 tests with 0.2 FTE

EXPERIENCE & BENEFITS

- Know how transfer between developers & security
- Early reduction of uncertainty
- Reduced load & increased security awareness in developer community

LEARNINGS

- Testing often exerts healthy pressure on organization
- More security issues fixed faster

MENUIFICATION

We do not know yet
– test ongoing

EXPERIENCE & BENEFITS

- We report back in a year

Conclusion

"Plan for the difficult whilst it is easy – act on the large while it is minute."
– Lao Tzu

Conclusion

AGILE ENVIRONMENTS REQUIRE NEW APPROACHES

- Embrace change and unpredictability
- Timely accuracy beats late precision

SECURITY NEED NOT BE PAINFUL

- Standard security approaches CAN be challenged and changed

CYBERSECURITY IS ABOUT PEOPLE

- Be kind, be empathetic, build genuine relationships

Q & A

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