CIRI | CRITICAL INFRASTRUCTURE RESILIENCE INSTITUTE

A DEPARTMENT OF HOMELAND SECURITY CENTER OF EXCELLENCE

Understanding and Improving Cybersecurity in Manufacturing[1]

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1 – Extended to all sectors

Project Overview

- Leveraging prior funding from DoD, develop, test, and *sustainably* transition to market a cloud-based SaaS application that:
  - Operationalizes the NIST CSF, Manufacturing Profile, and DoD CMMC
  - Supports SMEs, prime contractors, and entire supply chains
  - Delivers all references, best practices guidance, assessment tools, and POA&M
  - Supports embedded training
  - Complements other DHS tools, i.e., CSET & CDM

Approach

- Capability Gap Addressed: ability of organizations (govt. & commercial) and entire supply chains to quickly and affordably achieve compliance with cybersecurity standards and best practices
  - Gather and prioritize needs of end users
  - Engage with end-user groups to identify & prioritize industry needs
  - Identify and map NIST and DoD standards and best practices
  - Develop, test, and deploy accessible, affordable, easy-to-use SaaS application
  - Pilot test with end users
  - Execute technology transition plan

Testing, Evaluation, and Validation

- Software
  - All features, enhancements, and bug fixes are developed in separate branches
  - Every branch must pass a code quality check that includes conformity to development guidelines and software best practices
  - Every branch is tested by a minimum of two reviewers for functionality and usability
  - Multiple branches are tested in a staging environment before deployment
  - All code changes are tracked in an issue tracking system
  - An automated deployment system is used to create the testing environments and deploy the product

Testing, Evaluation, and Validation (cont'd)

- Organizational/Market Need
  - Conducted one-on-one needs assessments with small and medium-sized organizations
  - Interacted with industry user groups and organizations such as MxD and NIST MEP to identify and assess organizational needs
  - Engaged IBC to conduct market and competitive analysis
  - Conducted multiple pilot projects that included surveys, user assessments, and feedback
  - Consulted with multiple cybersecurity professionals
  - Presented our approach at workshops and academic, government, and industry conferences
  - In-depth meetings with government regulatory bodies (e.g., NIST) and government offices (including CISA) responsible for reviewing and assessing contractor compliance to the standards
  - Implemented functionality that is directly linked to government-mandated cybersecurity standards and requirements

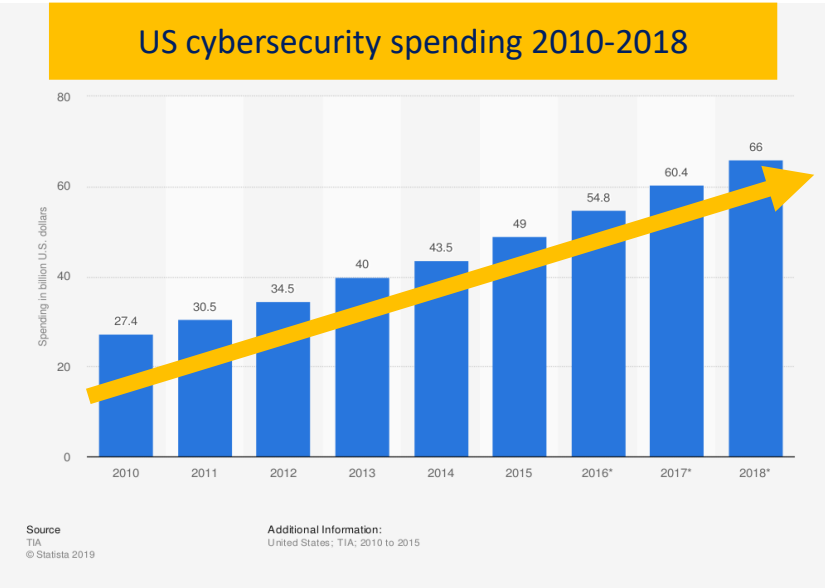
Milestones and Accomplishments

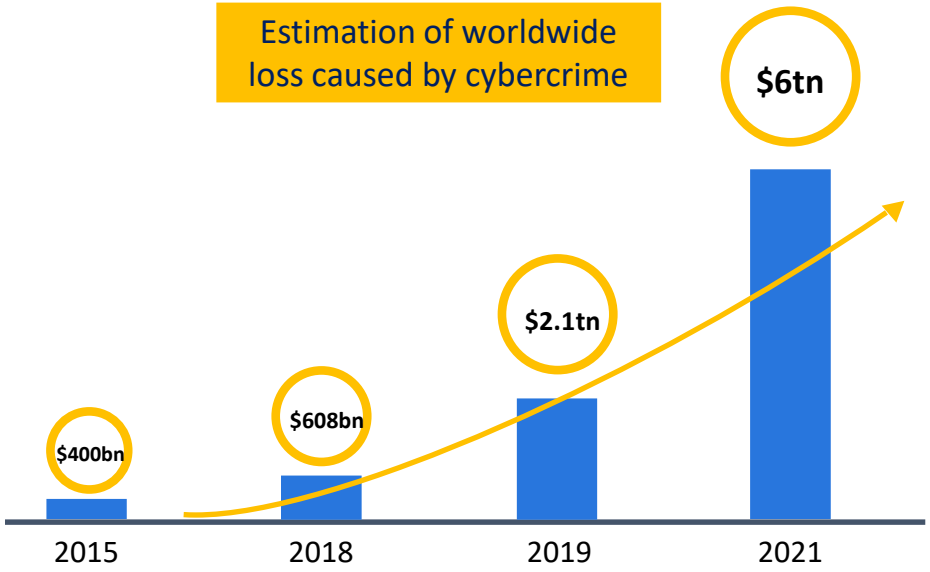
- Achieved to Date:
  - Needs analysis *completed*
  - Core design and initial development & test *completed*
  - Manufacturing Profile integration *completed*
  - Market analysis *completed*
- Milestones Remaining:
  - Integration of embedded training in process
  - Integration of CMMC requirements in process
  - Go to market strategy in process
  - Engagement with DHS CISA, DoD and private sector in process

Project Impact

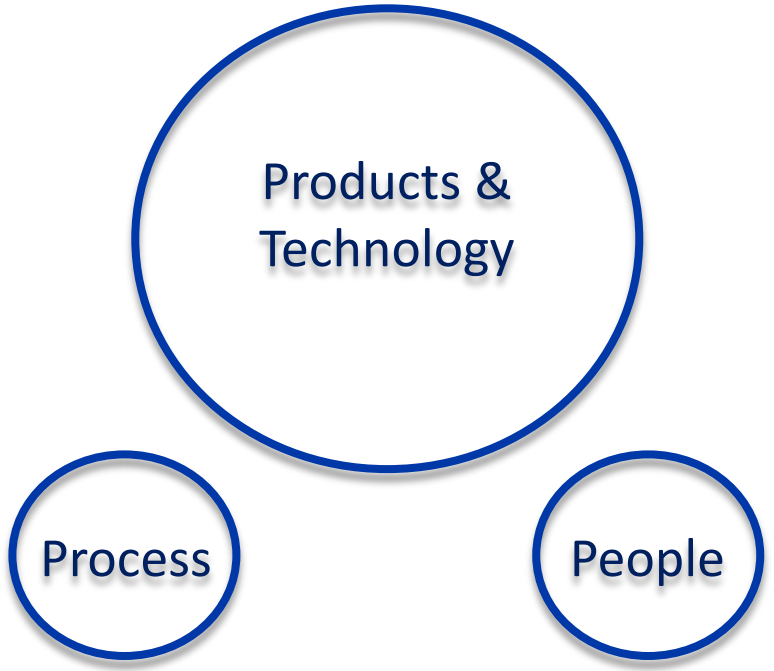
- Will improve the security and resilience of our nation's critical infrastructure by:
  - > facilitating a badly-needed shift to a more balanced approach to cybersecurity and resilience – nationwide
  - > Improving cyber security postures and growth in maturity
- Will address capability gap at DHS CISA in addressing oversight of .gov domain compliance with EO 13800 – NIST CSF
- Will ease DoD contractor compliance with CMMC mandates

Despite higher spending on cybersecurity, costs due to cyber attacks continue to grow exponentially

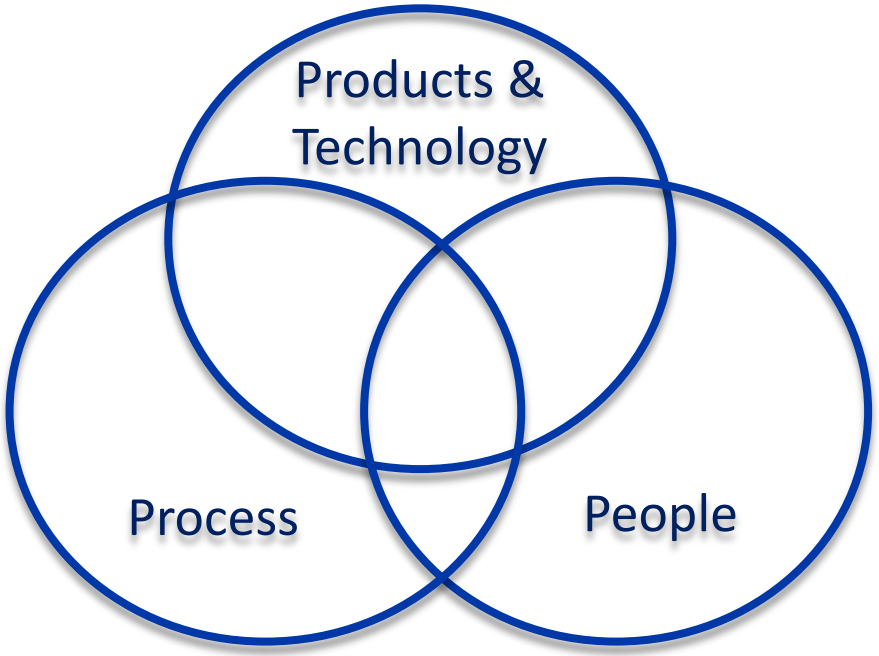




Where we are today:



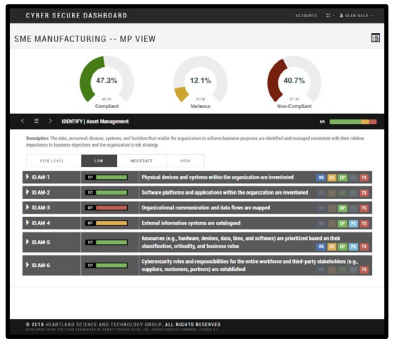
Where we need to be:

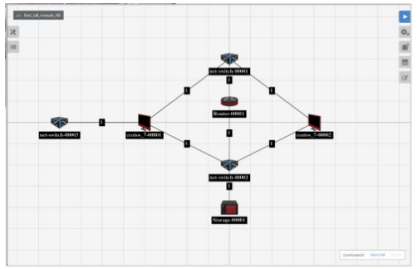


Training-Augmented Dashboard

In-Context Training

- Security Requirements
- Risk & Vulnerability Assessment
- Controls Implementation
- Monitoring & Mitigation
- Hands-on Training & Testing



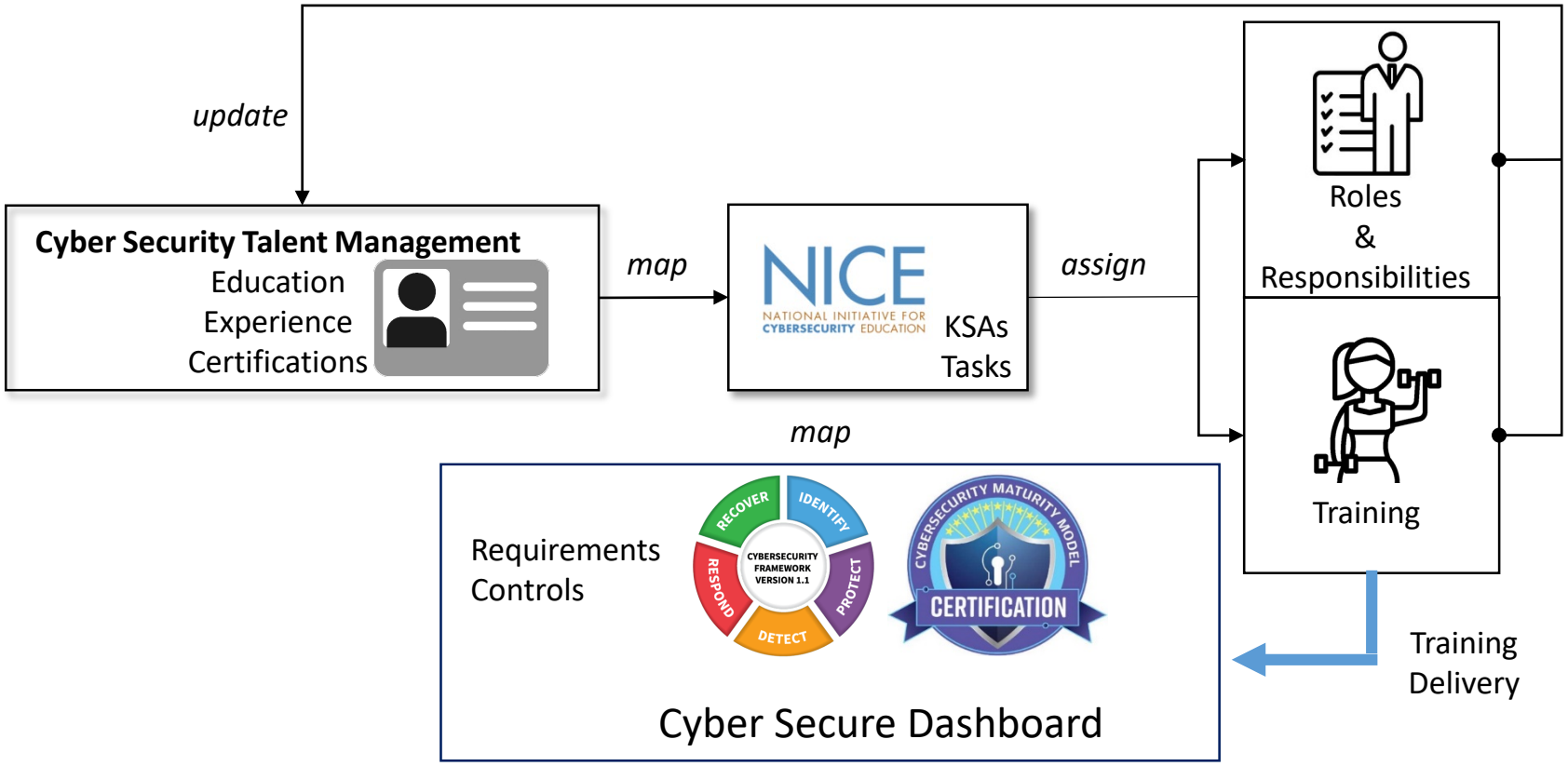


Cyber Range

In-Class Training

- Risk Awareness
- Risk Management Process
- Duties & Responsibilities
- Policies & Implementation

Process Powered by People -> Maturity:



Technology Transition

- End-Users
  - Governance, Risk Management and Compliance (GRC) tool
    - Small and Medium Enterprise
  - Educational tool
    - Via integration to a learning management systems (LMS)
- Self-Sustainability Strategy through Rangerfish, LLC
  - Independent commercialization entity
  - Consolidated IP Rights from inventors and UIUC
  - Control of future R&D in partnership with UIUC and HSTG
  - Provides continuity to project by following CIRI-developed strategy