V4I Institute Roadmap

Public Roadmap Summary

POC
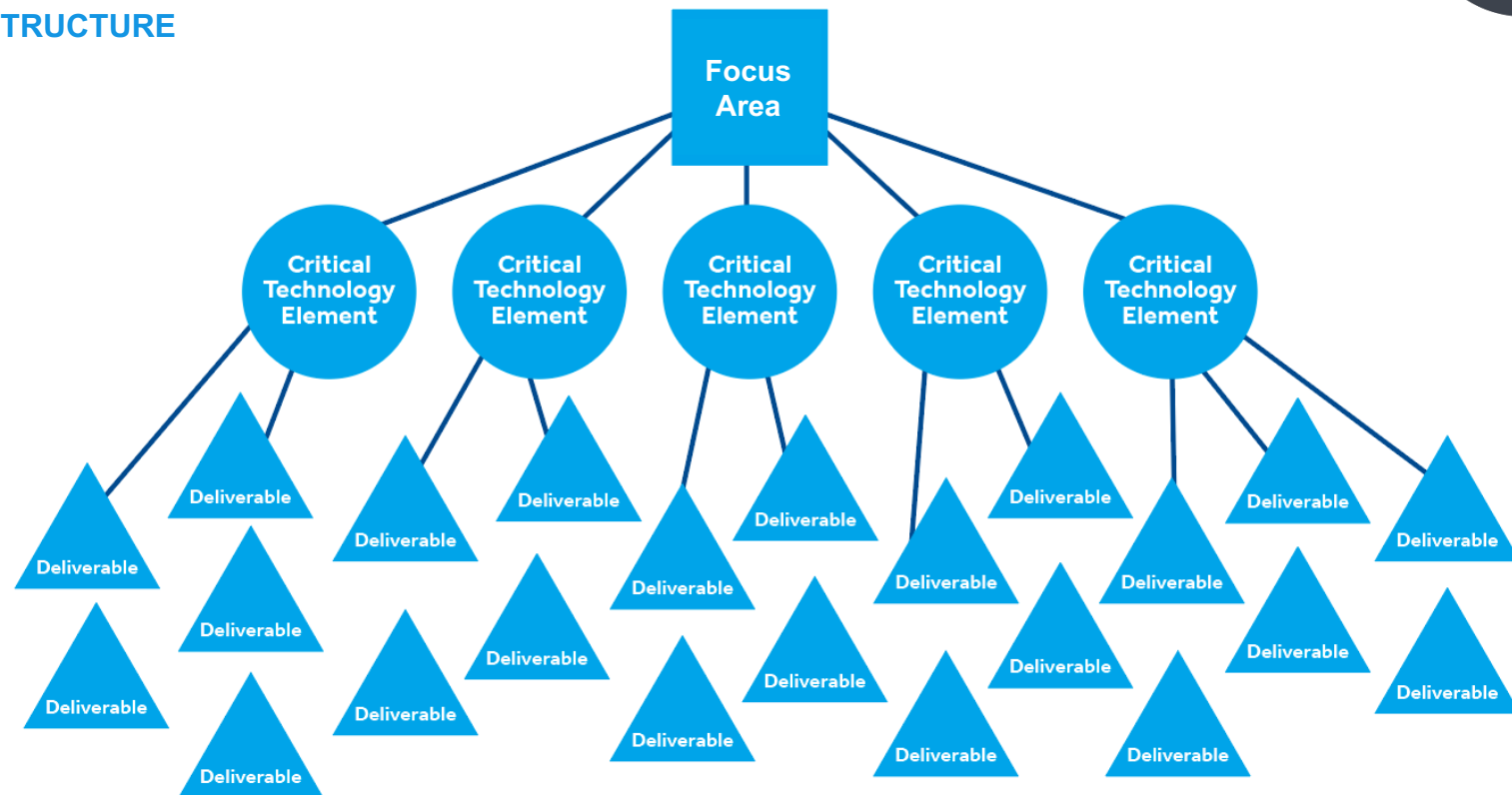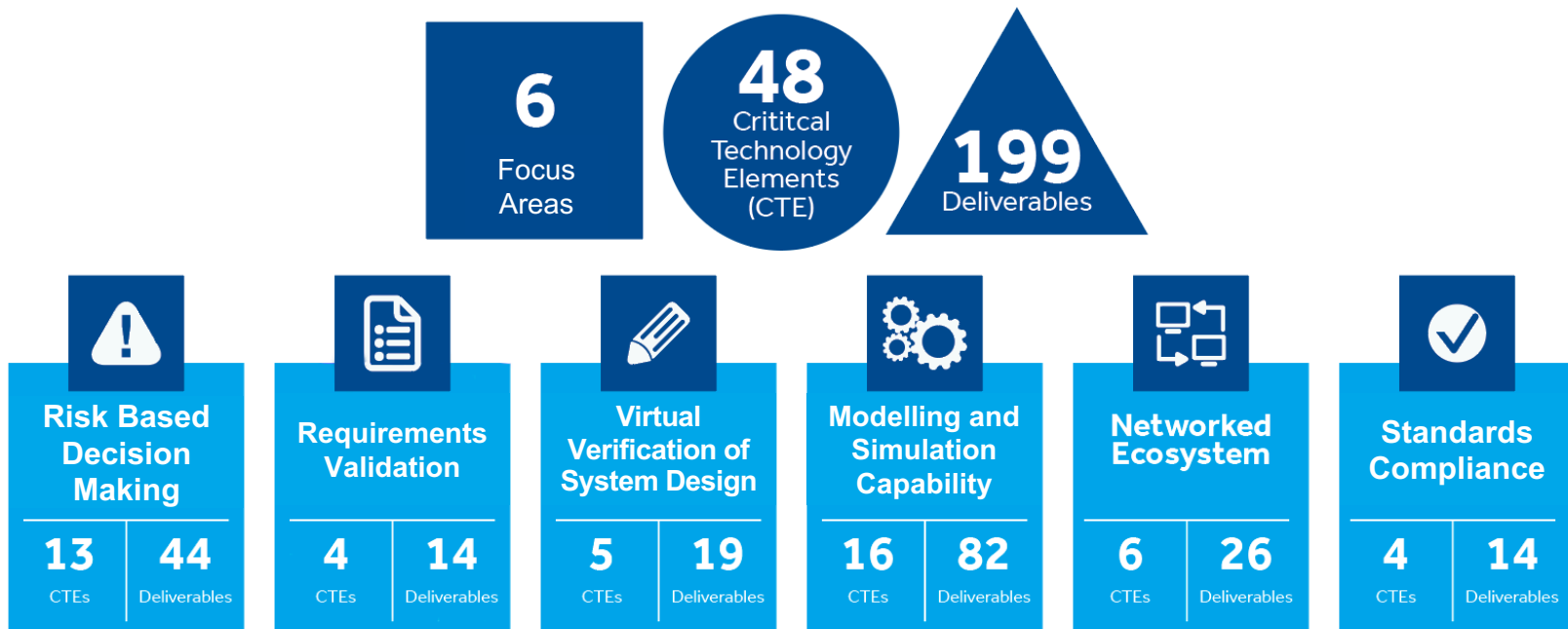Gary Fleegle
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V4I Institute Roadmap

STRUCTURE

Focus Areas are defined along with
Critical Technology Elements (CTE) and Deliverables
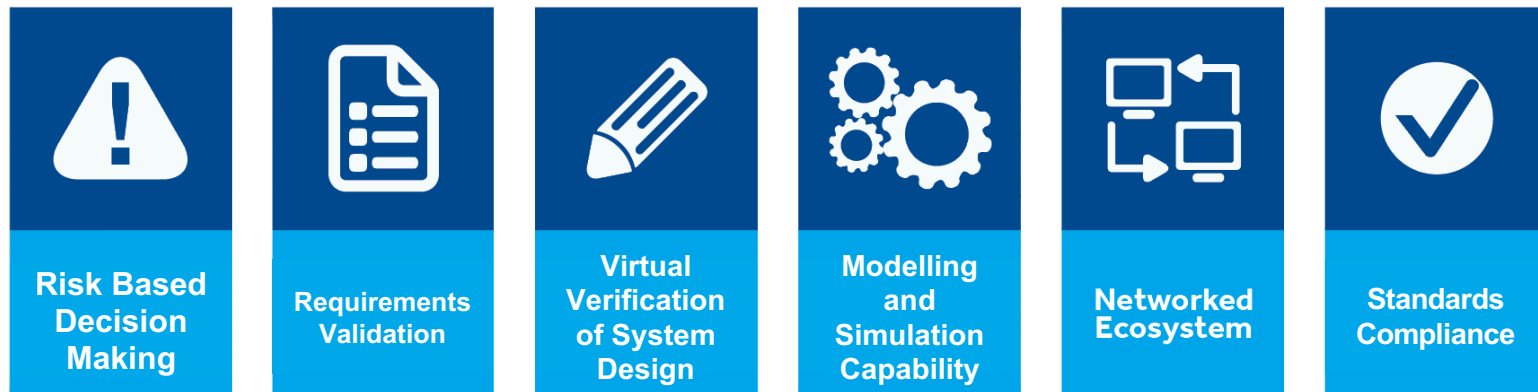
V4i Institute Roadmap

BY THE NUMBERS

6 Focus Areas

48 Crititcal Technology Elements (CTE)

199 Deliverables

Risk Based Decision Making	Requirements Validation	Virtual Verification of System Design	Modelling and Simulation Capability	Networked Ecosystem	Standards Compliance
13 CTEs / **44** Deliverables	**4** CTEs / **14** Deliverables	**5** CTEs / **19** Deliverables	**16** CTEs / **82** Deliverables	**6** CTEs / **26** Deliverables	**4** CTEs / **14** Deliverables

V4i Institute Roadmap

FOCUS AREAS

Risk Based Decision Making	Requirements Validation	Virtual Verification of System Design	Modelling and Simulation Capability	Networked Ecosystem	Standards Compliance

Six focus areas are identified and defined

FOCUS AREA 1
Risk Based Decision Making

KEY MESSAGE
The use of CM&S in the right risk framework increases transparency to inform decision making.

DESCRIPTION
V4I modelling and simulation tools and methodologies will be made available for use by industry and regulators to quantitatively assess system risk and virtual verification, validation & visualization risk.

BENEFIT
Risk management for both the system and system verification, validation, and visualization will be quantified in support of robust decision-making. This will result in better and quicker risk management design and lifecycle decision-making and in regulatory compliance of virtual verification, validation & visualization. This will lead to no unintended or unexpected risk management or regulatory compliance issues with the product or virtual verification, validation & visualization.

CRITICAL TECHNOLOGY ELEMENTS (CTE): **13**   DELIVERABLES: **44**

FOCUS AREA 2
Requirements Validation

KEY MESSAGE
Model-based requirements will be more readily validated because they are transparent and explicit.

DESCRIPTION
The capability to confirm that a specified set of requirements is fully descriptive of the needs of the stakeholders. This provides valid requirements in support of subsequent virtual verification to ensure the system meets all of the stakeholder expectations eliminating the need for redesign and additional testing.

BENEFIT
This will enable virtual verification of systems, resulting in quicker time to market and satisfaction of stakeholder expectations.

CRITICAL TECHNOLOGY ELEMENTS (CTE): **4**   DELIVERABLES: **14**

FOCUS AREA 3
Virtual Verification of System Design

KEY MESSAGE

Verification using a trustworthy model can be done earlier to accelerate product development and facilitate system learning to reduce system risk.

DESCRIPTION

This Focus Area 3 leverages valid requirements to ensure a system design meets the specified requirements for that system through virtual (modeling and simulation) means. This will address verification readiness and planning as well as modelling the product and process.

BENEFIT

Virtual verification will mean faster, less expensive, and lower risk verification of system design. This will deliver lower life cycle cost and faster speed-to-market.

CRITICAL TECHNOLOGY ELEMENTS (CTE): **5**   DELIVERABLES: **19**

FOCUS AREA 4
Modelling and Simulation Framework

KEY MESSAGE
Compliant, trustworthy framework and processes for achieving virtual validation, verification, and visualization.

DESCRIPTION
This Focus Area will develop explicit and credible models for optimizing management of the system across it's lifecycle. This capability will be utilized across enterprises, individuals, regions, supply chains, and trading segments.

BENEFIT
This will deliver model confidence and provide access to reusable, configurable libraries, while assuring model compatibility and interoperability. Trusted collaboration and communication across supply chain teams will be improved.

CRITICAL TECHNOLOGY ELEMENTS (CTE): **6**   DELIVERABLES: **26**

FOCUS AREA 5
Networked Ecosystem

KEY MESSAGE
This ecosystem creates and aligns people and enterprises to realize the model based economy.

DEFINITION
This Focus Area establishes forums or networking entities needed to enable and coordinate all stakeholders using modeling and simulation for virtual verification. An ecosystem will be developed across enterprises and institutions that is V4 capable, including developing workforce and technical resources.

BENEFIT
Industry, academia & certifying/regulatory authorities will be able to efficiently and consistently communicate to accelerate use of modeling & simulation for virtual verification - reducing redundancy in capability development, increasing quality of virtual verification analysis, and reducing product development lifecycles.

CRITICAL TECHNOLOGY ELEMENTS (CTE): **6**   DELIVERABLES: **26**

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FOCUS AREA 6
Standards Compliance

KEY MESSAGE
This will guide and influence current and emerging standards while advocating adoption across the supply chain.

DEFINITION
This Focus Area will service enterprises, individuals, regions, supply chains, and trading segments that require compliance with formal standards and regulations for alignment, efficiency, and regulatory objectives. This is specifically concerned with ISO15288 lifecycle compatibility and the identification and management of standards for use on a system or with application of virtual verification, validation & visualization.

BENEFIT
This will improve alignment and use of standards across communities for efficiency and reduction of risk in partnership with regulatory authorities.

CRITICAL TECHNOLOGY ELEMENTS (CTE): **4**   DELIVERABLES: **14**