

The Importance of Standards for Product Innovation and Development: Educating the importance of standards related to emerging technology developments

- ✓ Senior Capstone in SoET (250 mixed-discipline undergraduates)
 - ✓ Purdue's Certificate in Entrepreneurship and Innovation (400 mixed-level under/graduates)
- Soft Launch in Fall 2025
Launch in Spring 2026



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Purdue Team:

Milton Aguirre, PhD, Assistant Professor in the School of Engineering Technology (SoET)

Paul McPherson, Associate Prof. in SoET, Director of Bechtel Innovation Center

Margaret Phillips, Associate Prof. in Science & Eng. Libraries, Associate Head of Information Studies

Sukesh Jagannathan Ranganathan, Graduate Student in SoET



Milton Aguirre, PhD

Assistant Professor

Director of seed **LAB**

School of Engineering Technology

Interests: Healthcare technologies,
Human-centered Design, Startups



Paul McPherson

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Associate Prof. in Science & Eng. Libraries,

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Sukesh Ranganathan

Graduate Student

School of Engineering Technology

2023 NIST Team Members

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2016 NIST SCO Curriculum Development Grant

Standards are Everywhere: An information literacy approach to standards education



Sukesh Ranganathan

Graduate Student

School of Engineering Technology

The Motivation

- Developments in emerging technologies are transforming industries and shaping the future of skills development.
- Graduating students should understand the importance of technical standards in making these technologies viable in the global market.



The Goal

- 1) Design, create, implement, and evaluate undergraduate and graduate modules within a scalable badging platform.
- 2) Disseminate and promote our materials extensively across Purdue campuses so that any instructor can select the modules and badges for their students, à la carte, based on their specific needs.

A comprehensive course built using a badging platform for instructors and/or students to utilize the system and import badge information into their own open badge systems.

Module 1 Review of relevant industries and their standards

Module 2 Standards of emerging technologies

Module 3 Standards evolve with technologies

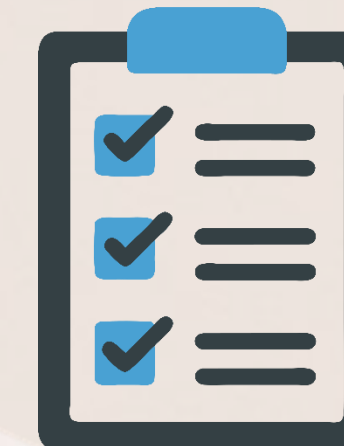
Module 4 Consumer Protection

Module 5 Locating relevant standards

Badging
Certificate



Supplement
Assignment



Module 1 - 5

3 to 4 short videos per Module (17 min)

Multiple Choice Quizzes

Critical Thinking Modules 2-5

- Multiple choice quiz
- Classroom discussion

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PURDUE
UNIVERSITY®

Developer of performance-based assessments that measure students' essential academic and career skills.

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Mobile Phone Technologies

Nova the Innovator

Stan the Standard



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Module 2 Standards of emerging technologies

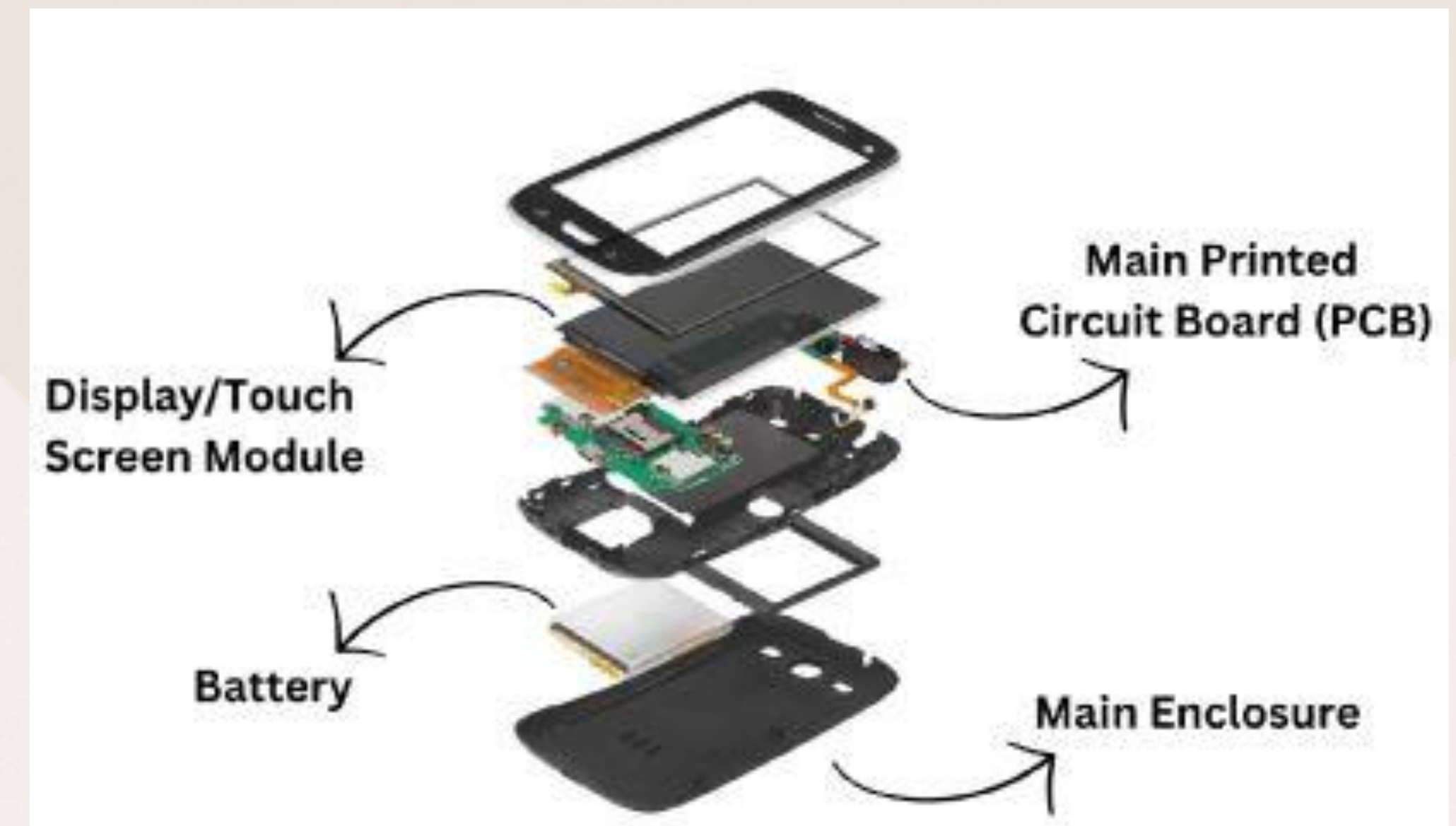
Module 3 Standards evolve with technologies

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Module 5 Locating relevant standards

List of Emerging Technologies [1, 2]

- ***Space Technologies***: Satellite-based 5G Network
- ***Semiconductors***: Evolution of Semiconductors
- ***Clean Energy Generation***: Batteries
- ***Data Privacy and Security***: ‘always listening’ devices

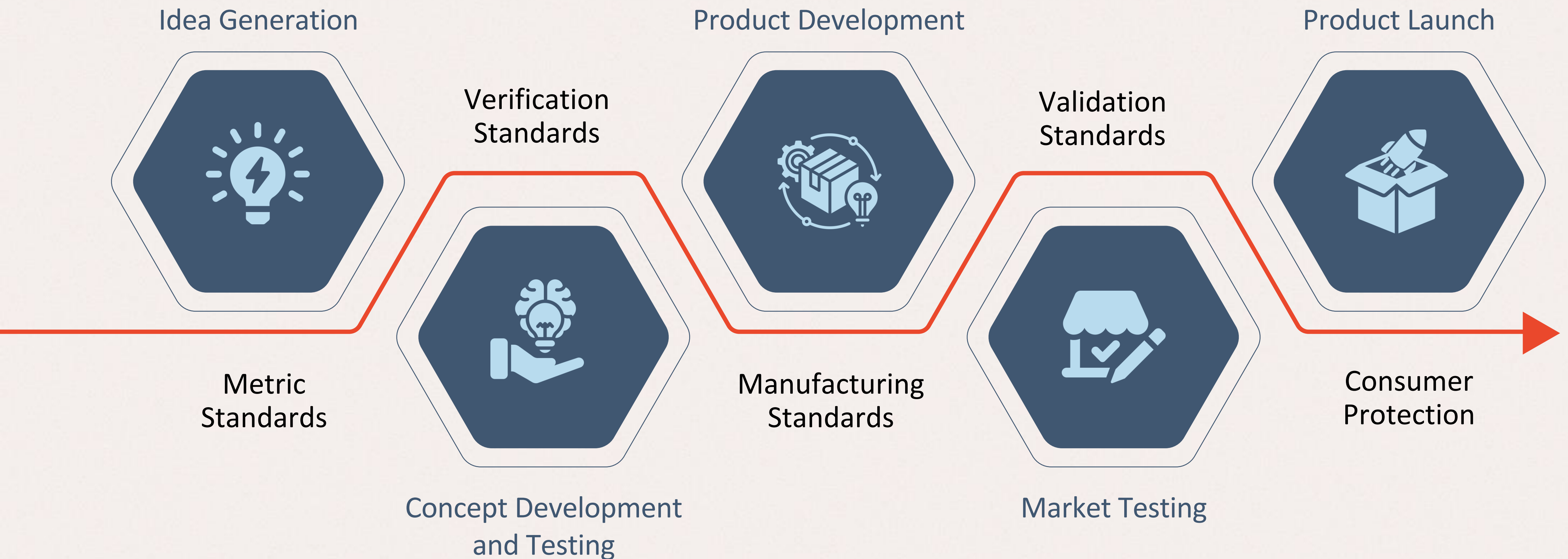


Product Dissection and Component Comparisons

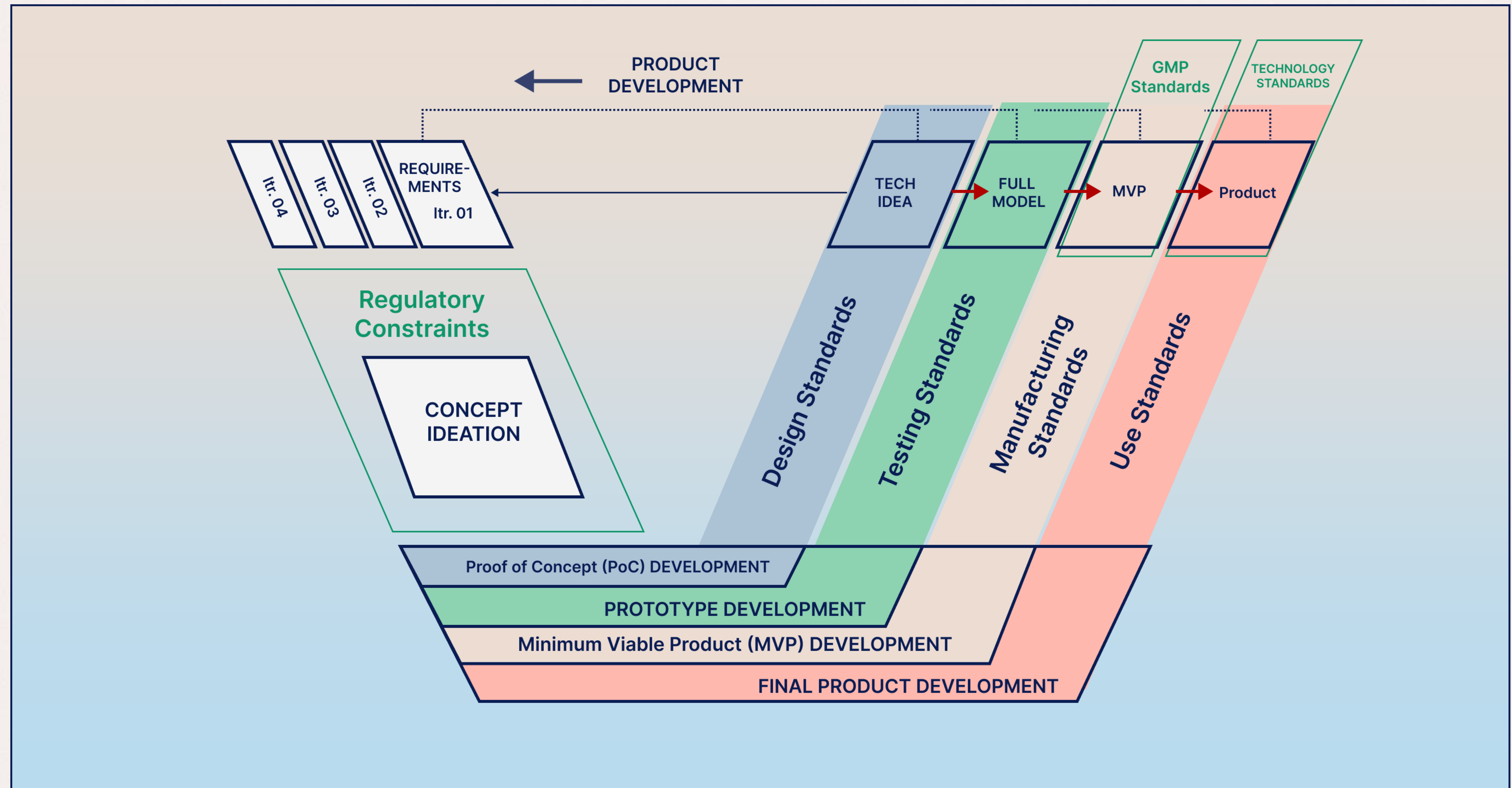
- [1] U.S. Government National Standards Strategy for Critical Emerging Technology. 2023. United States Government
- [2] Critical and Emerging Technologies List Update. 2024. National Science and Technology Council. A report by the Fast Track Action Subcommittee on the critical and emerging technologies

Product development process

A structured approach to create new products or enhance existing ones.

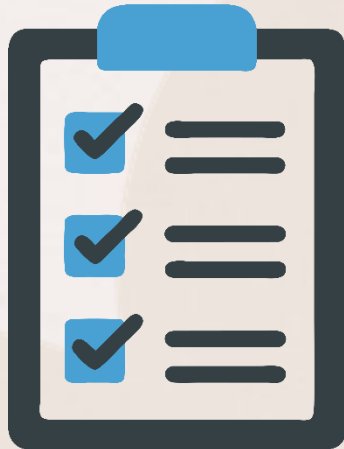


V-Model is a system development lifecycle model that connects Verification and Validation of a system



Current Status: 3 of 5 High Fidelity Modules Completed

- Module 1Review of relevant industries and their standards
- Module 2Standards of emerging technologies
- Module 3Standards evolve with technologies
- Module 4Consumer Protection
- Module 5Locating relevant standards

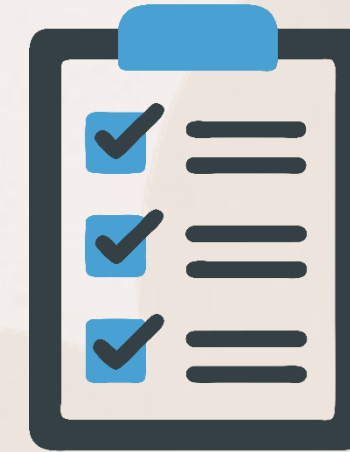


Current Status: 3 LF supplemental assignments completed

A Capstone team advises an industry client on an entrepreneurial decision

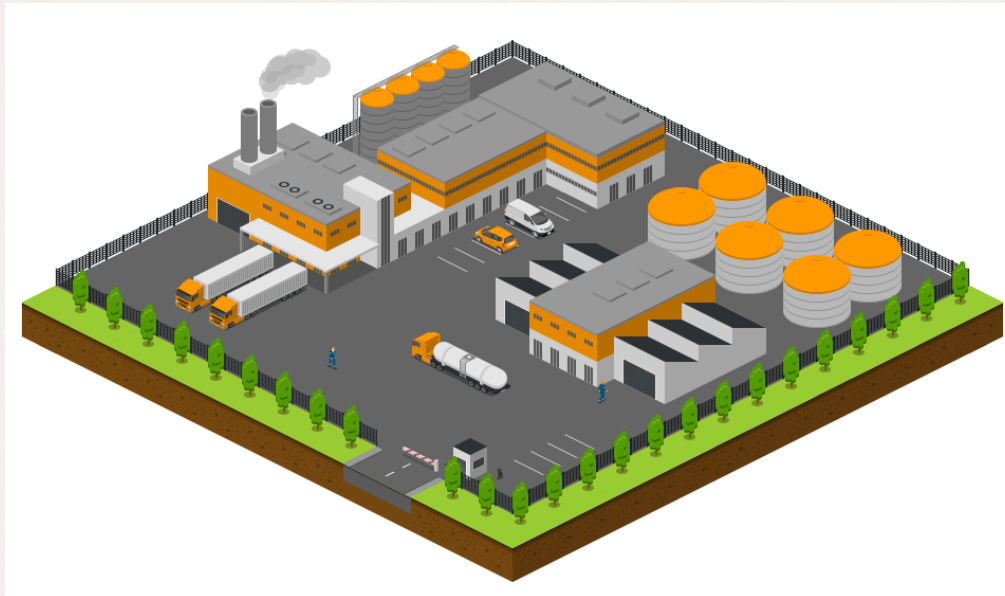
6-7 Documents	Objectives
1. Financial Assessment	7-year revenue projections
2. Gov’t Incentives Memo	2023 US Government National Standards Strategy [1]
3. Standard Compliance	Introduce technology standards
4. Site Location Summaries	Introduce facilities and resources for the technology application.
5. News Brief	Share perspective on possible impact to the community
6. Testimonials	Share perspective on the possible opinions of those in community.

[1] U.S. Government National Standards Strategy for Critical Emerging Technology. 2023. United States Government



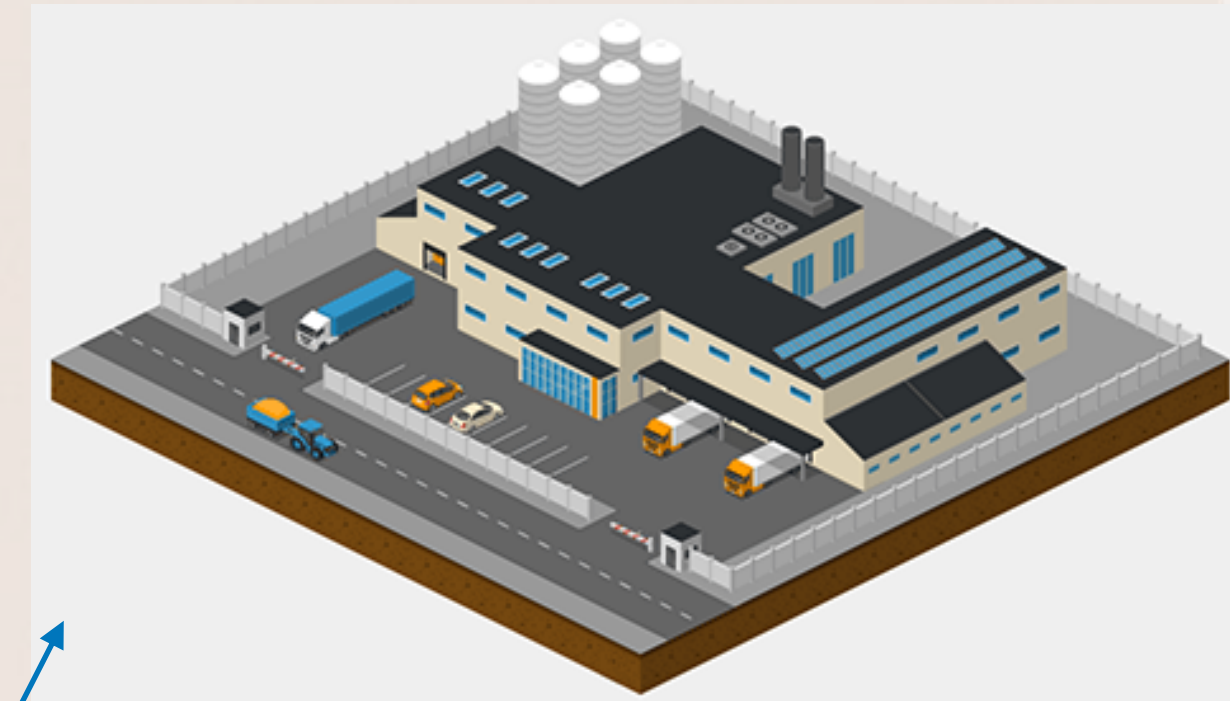
A Capstone team advises a company on acquiring an AI Chip Manufacturing Facility

Urban or Rural



Urban

- Access to Facilities & Utilities
- Greater Compliance with Standards
- Greater Sustainability
- Greater Government Incentives [2]
- Limited expansion
- Consumes utilities and facilities



Rural

- Greater Infrastructure Investment
- Greater Output
- Greater ROI
- Complies with limited # of standards
- Less friction with the community

[2] Critical and Emerging Technologies List Update. 2024. National Science and Technology Council.
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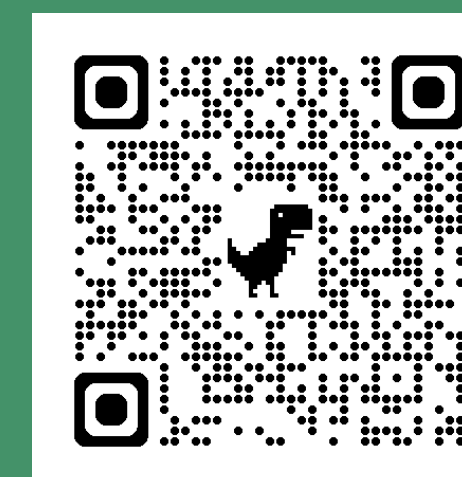
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Implementation Plan

- Soft Launch this Fall 2025 (250 students)
- Launch in Spring 2026 (650 students)
- Accepted proceedings in
Conference for Industry and Education Collaboration
February 2-6, 2016, New Orleans, LA
- Purdue Innovates Startup and Technology Expo 2026
Purdue Innovates Accelerator Program
Purdue Giant Leaps Initiative, 213 patents in 2024

Evaluation Plan: Survey Students and Instructors

- ✓ Content Relevance
- ✓ Content Quality
- ✓ Implementation





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Thank you!

