MSIE 4.0

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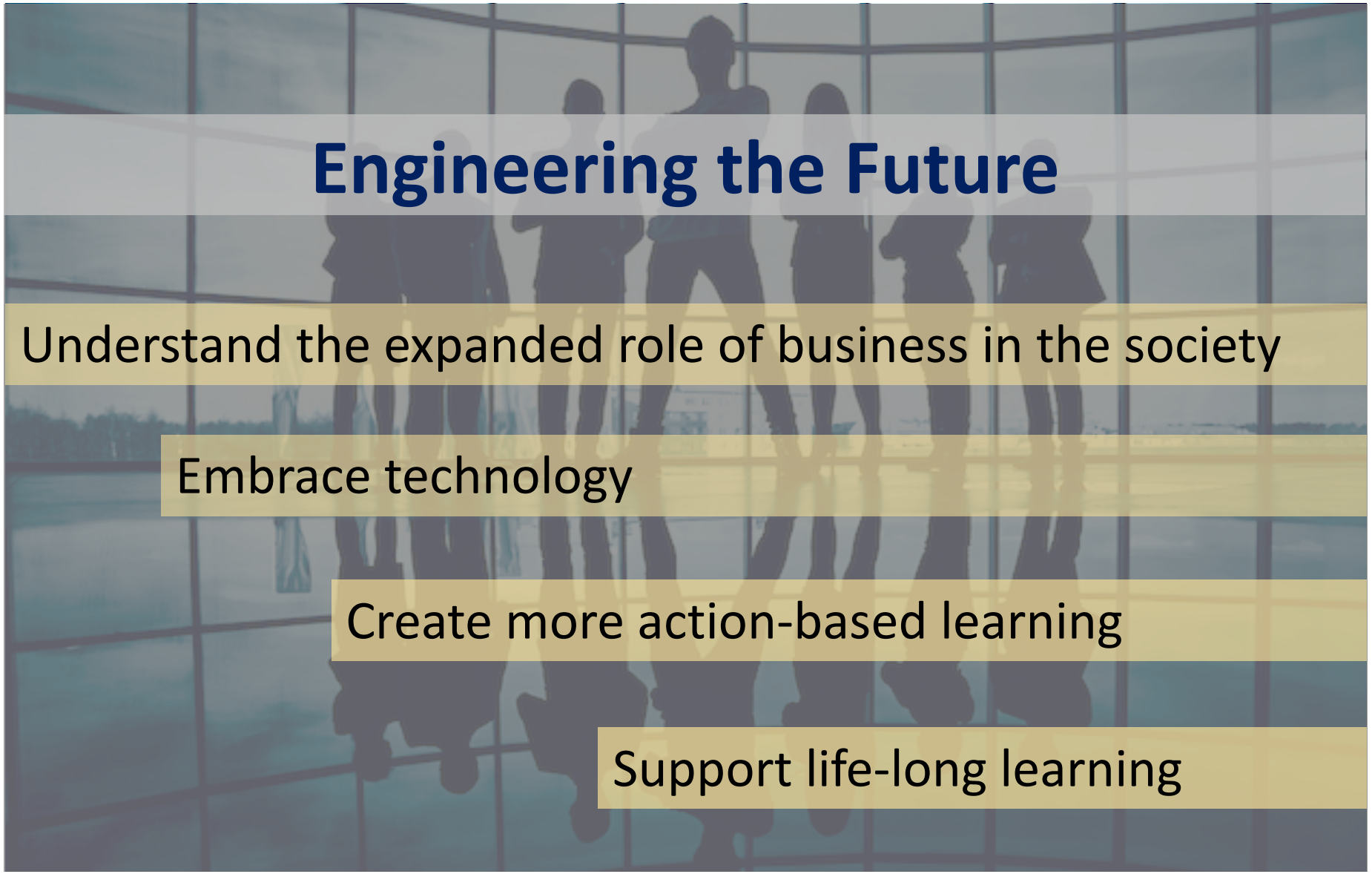
MSIE 4.0 at a Glance

Pisut Koomsap, Ph.D.

Project Coordinator

Curriculum Development
of Master's Degree Program in
Industrial Engineering for Thailand Sustainable Smart Industry



Engineering the Future

Understand the expanded role of business in the society

Embrace technology

Create more action-based learning

Support life-long learning

Source: How universities must adapt to train future leaders, World Economic Forum

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2020 Top 10 Skills to be relevant in Industry 4.0

1. Complex problem solving
2. Critical thinking
3. Creativity
4. People management
5. Coordinating with others
6. Emotional intelligence
7. Judgment and decision making
8. Service orientation
9. Negotiation
10. Cognitive flexibility

Source: Future of Jobs Report, World Economic Forum

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Profile of Typical Engineering Students & Graduates

- excels at learning structures that explain systems and disembedding complex systems into pieces for reassembly into a different structure (problem solving);
- dislikes unpredictable situations because of a lack of structure and rules to guide response; and
- has been rewarded for being competitive at an individual level in task performance.

Seat, E., Parsons, J. R., & Poppen, W. A. (2001). Enabling engineering performance skills: A program to teach communication, leadership, and teamwork. *Journal of Engineering Education, 90*(1), 7-12.

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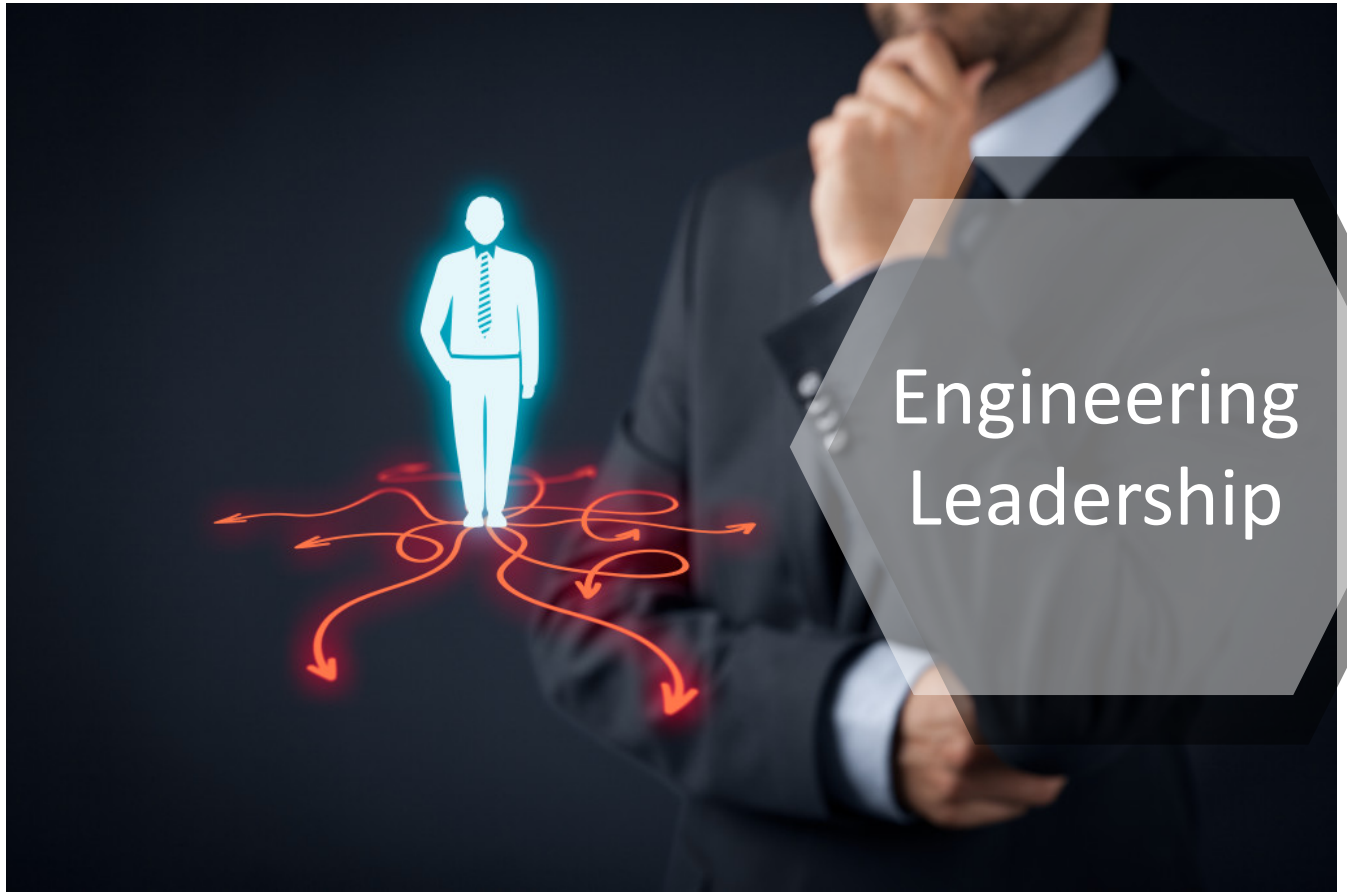
Engineering Leaders



- Technical Mastery
  - Practical Engineer
  - Innovative Engineer
- Collaborative Optimization
- Organizational Innovation

Rottmann, C., Sacks, R., & Reeve, D. (2015). Engineering leadership: Grounding leadership theory in engineers' professional identities. *Leadership*, *11*(3), 351-373.

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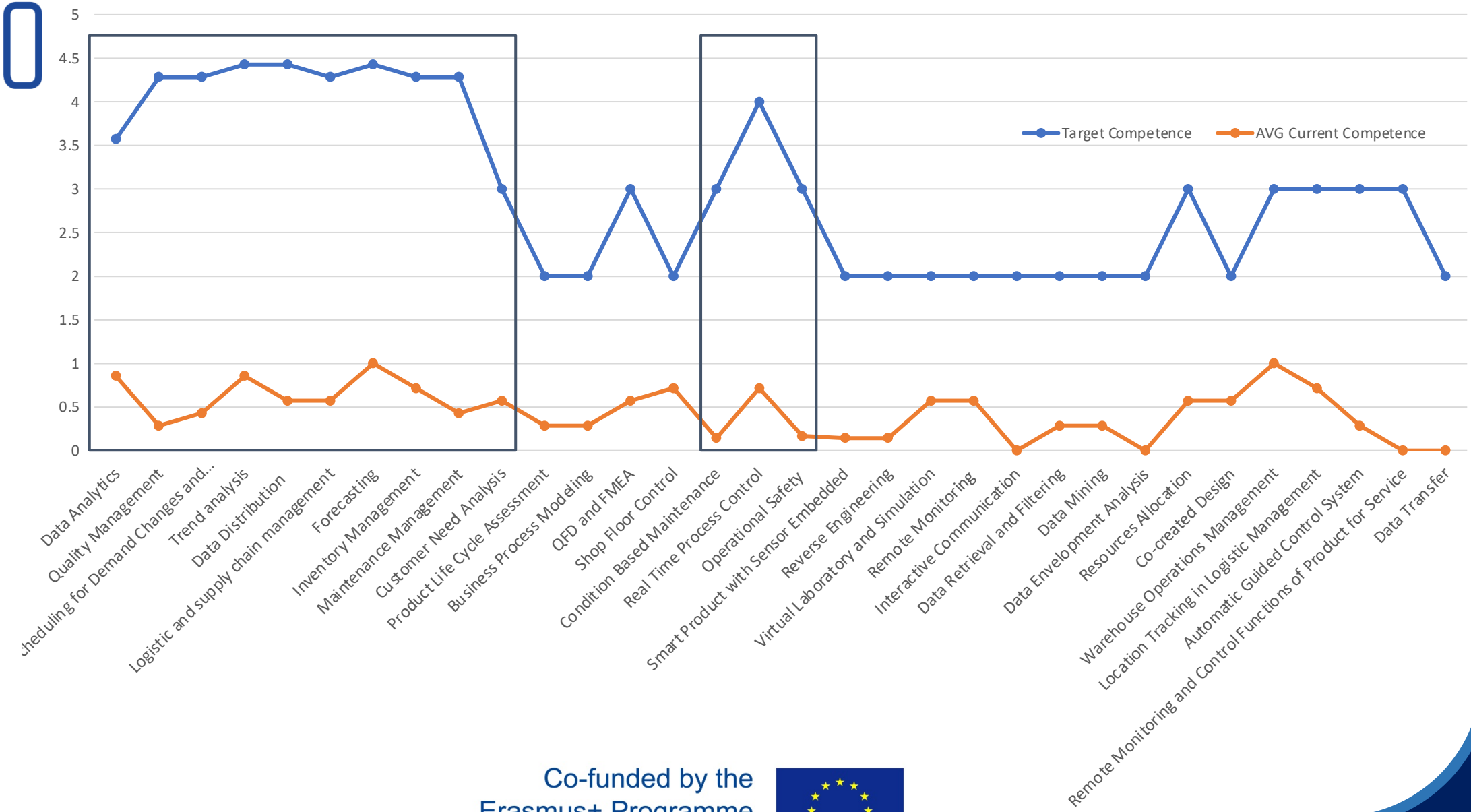
The comparison between the expected competence of MSIE 4.0 graduates and current competence



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Objectives

Enhance the capacity and ability of universities in Thailand for the delivery of a high quality competence-based curriculum for Master's degree in industrial engineering that

- supports sustainable smart industry (Industry 4.0);
- **conforms to European Qualifications Framework (EQF);**
- **is applicable to EU partner universities;**
- strengthens a partnership between participating European and Thai universities.

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Project Focus

- **Modernization** of the education of industrial engineering discipline in Thailand by the development of a **curriculum** for Master's degree in industrial engineering to support sustainable smart industry,
- **Development of courses, learning and teaching tools**, delivery processes and platform for **student-centered learning** of the curriculum,
- **Implementation of modern ICT tools** and methodologies for effective student-centered learning of the curriculum,
- **Introductions of quality assurance and of the EQF approach** for the delivery of the curriculum meeting international accepted education requirements,
- **Establishment and continuation of partnerships** among partner universities

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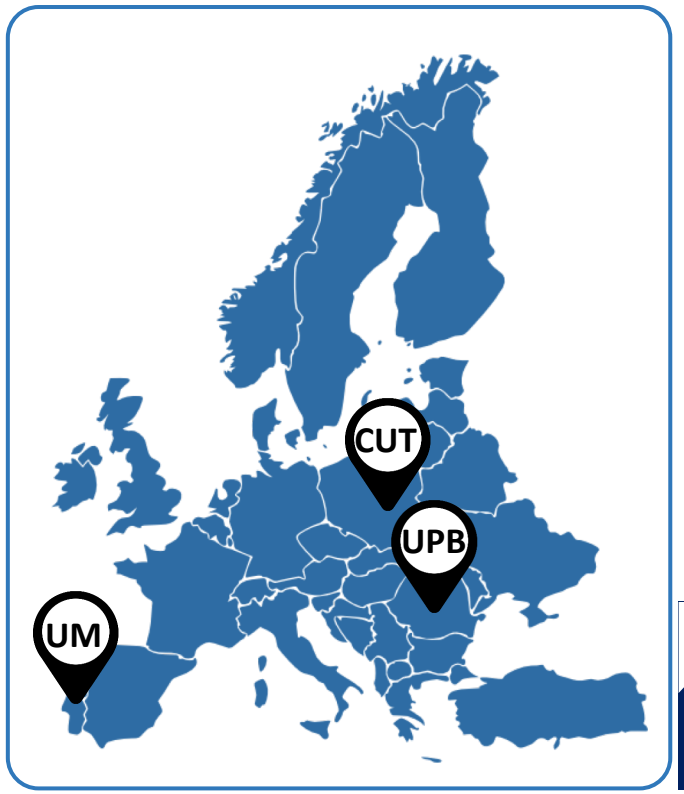
SUSTAINABLE SMART INDUSTRY

ACQUISITION
ANALYSIS
EXECUTION

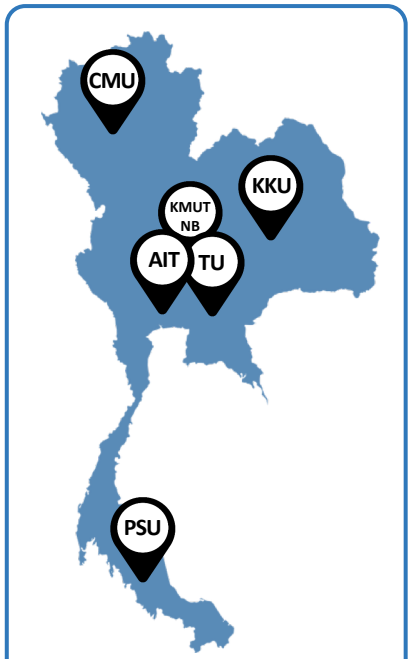
SUSTAINABILITY
STRATEGY
TECHNOLOGY



CO-CREATED PRODUCT DESIGN

ADVANCED MANUFACTURING PROCESSES

SMART PRODUCTION



THESIS CONFERENCE

STUDENT-CENTERED LEARNING

IE COLLOQUIUM

MSIE 4.0 Curriculum

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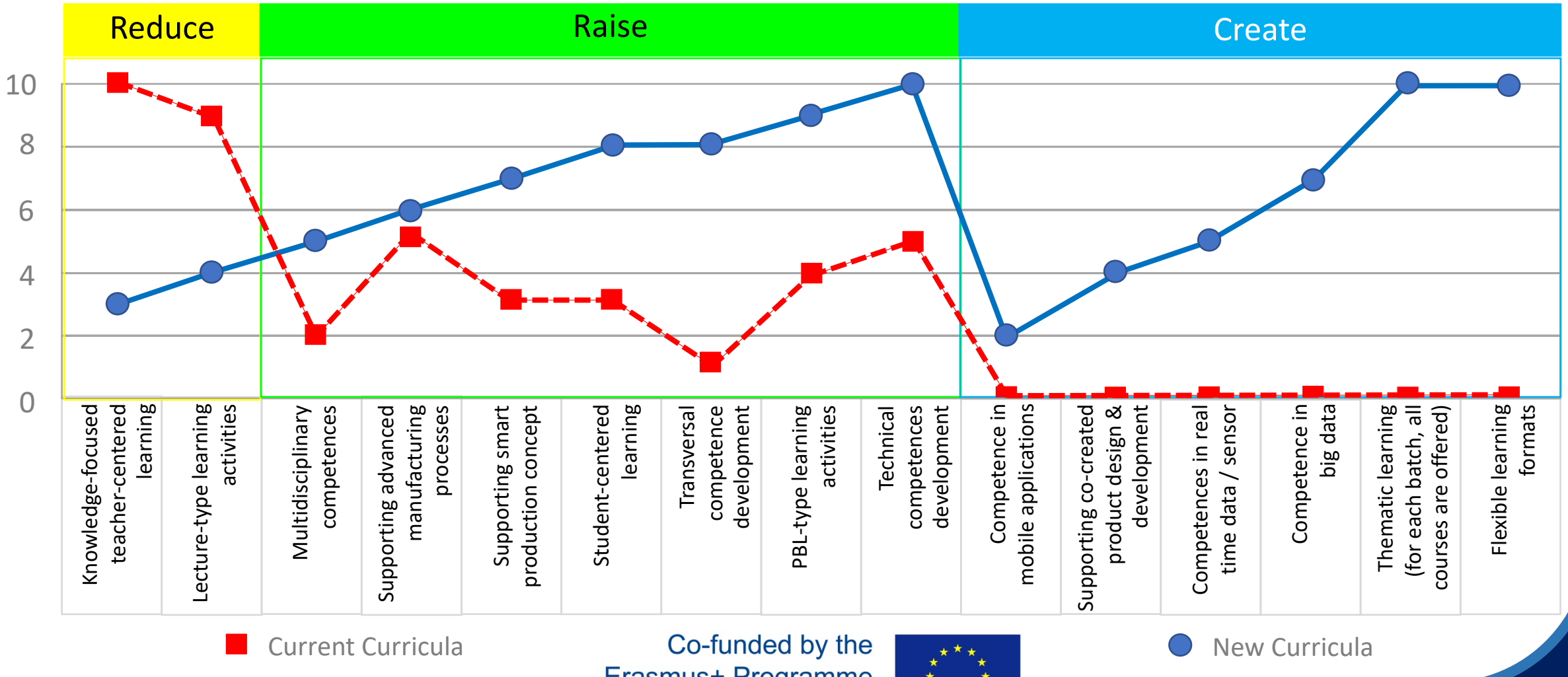
MSIE 4.0 Tag Line: Personalize Your Competence-Based Active Thematic Learning Experience to Support Sustainable Smart Industry

Strategy Canvas: MSIE 4.0



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Focuses of Our Curriculum

***Support* Sustainable Smart Industry**

- Big Data
- Real-Time Data
- Smart Production
- Co-created Product Design & Development

***Through* Competence Development**

- Technical Competence
- Transversal Competence

***with* Active Learning Experience**

- PBL-Type Learning Activities
- Student-Centered Learning

***that allows* Personalization**

- Thematic Learning
- Flexible Learning Formats

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Modernized MSIE Curriculum with 16 Courses

16 Courses

1. Enterprise Management in Digital Economy
2. Project Management for Industry 4.0
3. Smart Operations Management
4. Quality Management for Extended Enterprise
5. Sustainable Supply Chain Management
6. Digital Factory
7. Advanced Optimization: Techniques and Industrial Applications
8. Intelligent Decision Support Systems
9. Applied Data Analytics
10. Cyber-Physical Industrial Systems
11. Collaborative Manufacturing Systems
12. Additive Manufacturing for Industry 4.0
13. Innovative Product Design and Development
14. Human-Centric Design for Operator 4.0
15. Customer Experience-Driven Design
16. Communications and People Skills Development for Engineering Leaders

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Enterprise Management in Digital Economy ★

Project Management for Industry 4.0 ★ | **Smart Operations Management** | Sustainable Supply Chain Management

Quality Management for Extended Enterprise

Communications and People Skills Development for Engineeering Leaders

Applied Data Analytics

Intelligent Decision Support Systems

Advanced Optimization: Techniques and Industrial Applications

Digital Factory

Collaborative Manufacturing Systems

Cyber-Physical Industrial Systems ★

Human-Centric Design for Operator 4.0

Customer Experience-Driven Design ★

Additive Manufacturing for Industry 4.0

Innovative Product Design and Development

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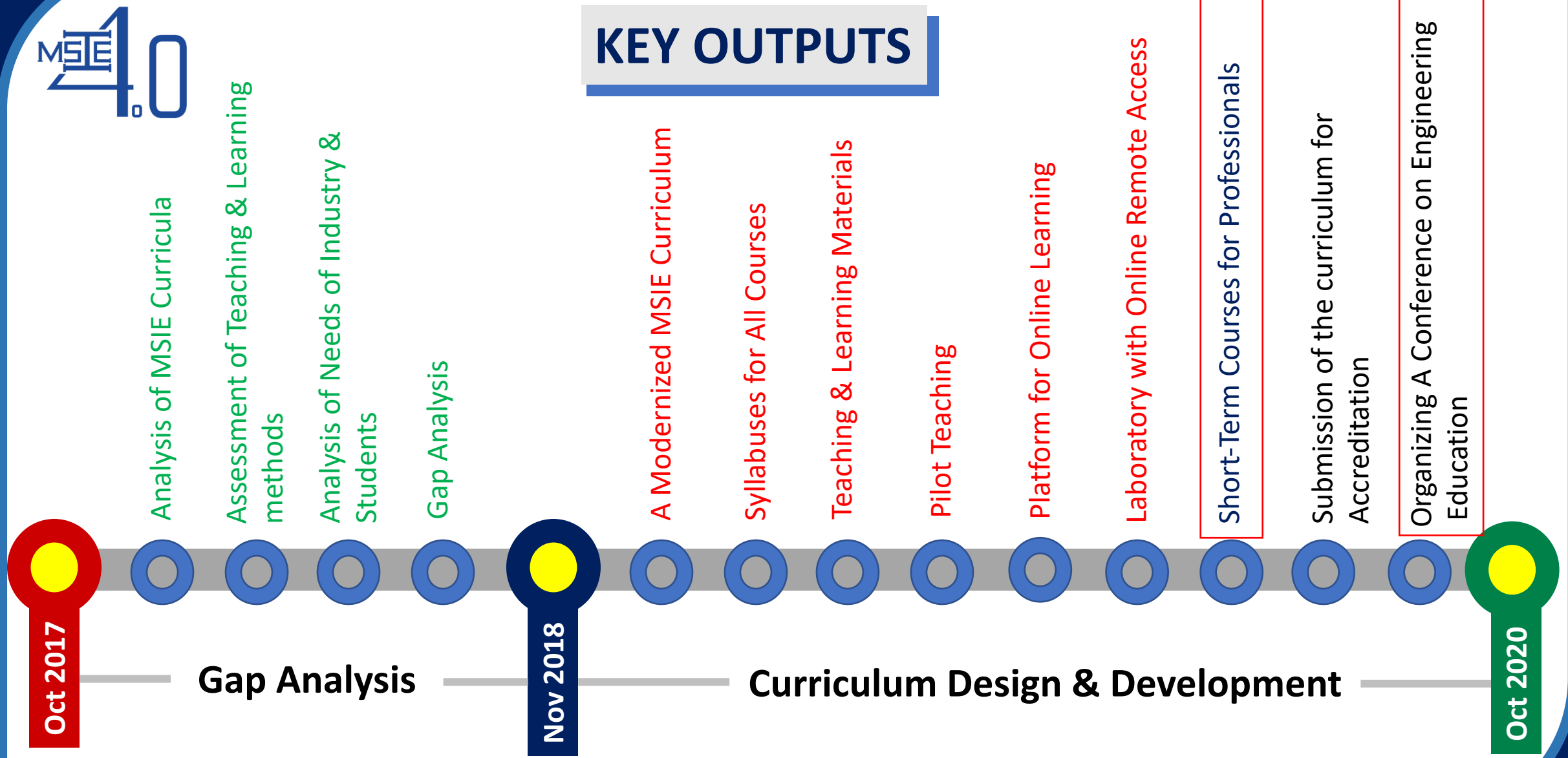
KEY OUTPUTS



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PAEE/ALE' 2020

International Conference on Active Learning in Engineering Education

"Striving Engineering Education Towards Student Competence Development"

26th - 28th of August, 2020 in Pattaya, Thailand

International Conference

www.paeeale.ait.ac.th

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Thank You

Together We Will Make Our Education Stronger

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MSIE 4.0 Channel

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