The Hungarian Industry 4.0 Platform

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President, Hungarian Industry 4.0 Platform Association

**Director, Centre of Excellence in Production Informatics and Control**

Bilateral Hungarian-German EUREKA Proposers' Day
and Matchmaking Event

7 December 2021

Industy 4.0-related programmes world-wide

- Industrie 4.0 (D)
- Advanced Manufacturing, Industrial Internet (US)
- Made in China 2025 (RC)
- Industry 4.0 → Society 5.0 (J), Robot Revolution Initiative (J)
- The Catapult Programme (UK)
- Alliance Industrie du Futur (F)
- Made in Sweden (S)
- Smart Industry (NL)
- Smart Connected Factory (Korea)
- Industrie 4.0 Österreich (A)
- Initiative Industry 4.0 Průmysl 4.0 (CZ)
- Smart Industry (SK)
- Ipar 4.0 National Technological Platform (H)

Existing National Initiatives for digitising industry across the European Union
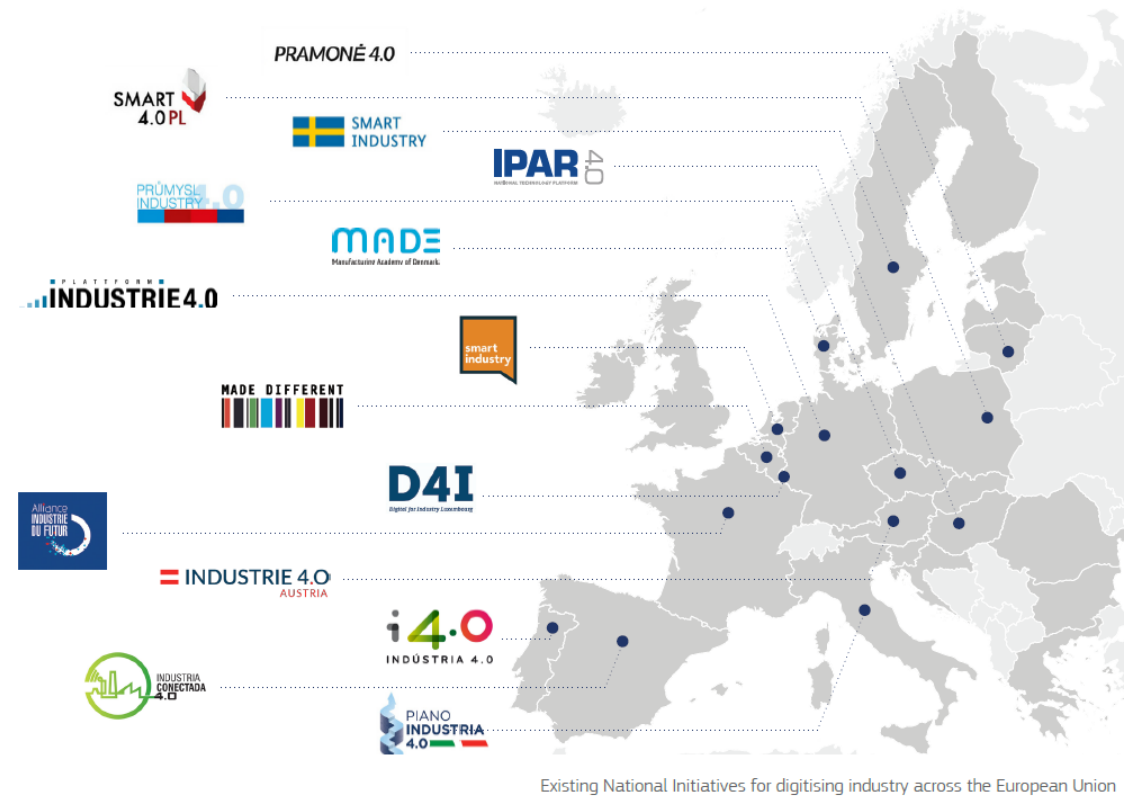
Source: EU: Digitising European Industry, 2018

Industry 4.0 National Techn. Platform Association

Membership:

- SZTAKI and the Ministry for National Economy, and 37 founding members (May 2016)
- ~100 members by the end of 2017
- Now: Legal entity

Organisation:

- Presidium headed by SZTAKI, President: László Monostori
- 7 Working Groups
  - Strategic Planning
  - Employment, Education and Training
  - Production and Logistics
  - ICT Technologies (safety, reference architectures, standards)
  - Industry 4.0 Cyber-Physical Pilot Systems
  - Innovation and Business Model
  - Legal Framework

https://www.i40platform.hu/

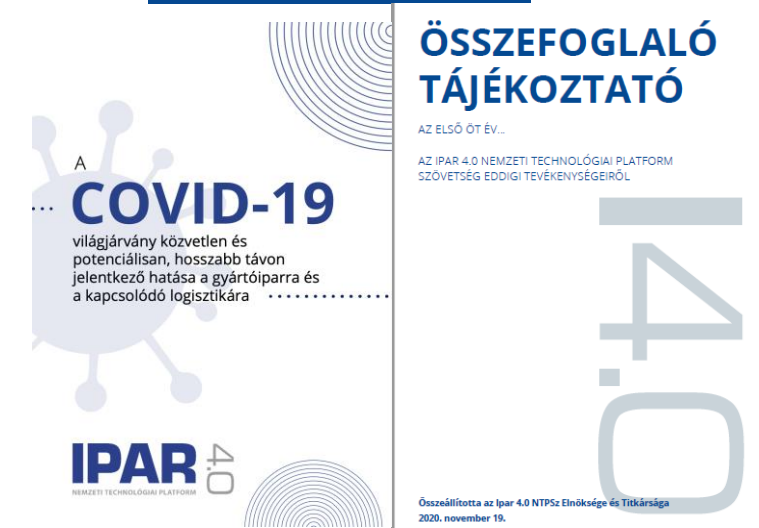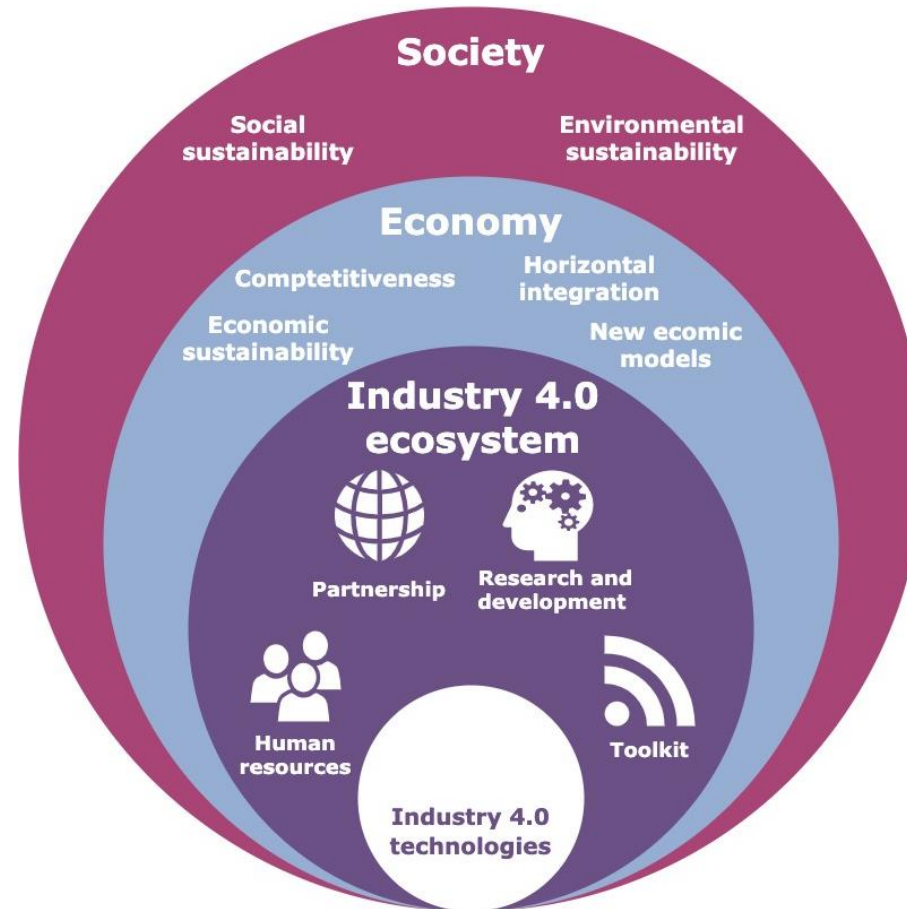# Industry 4.0 National Techn. Platform Association
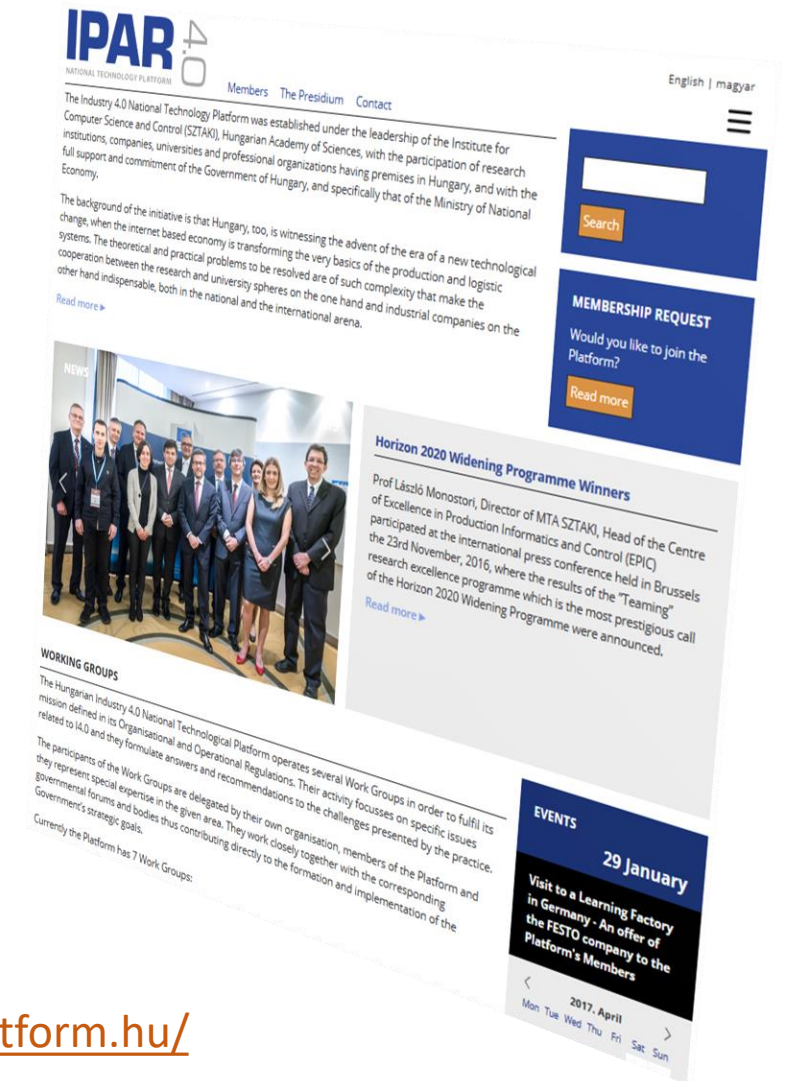
Aims

- Strengthen the ecosystem for industrial digitalisation
- Increase the industrial ratio in the Hungarian GDP
- Increase the innovation and export potential
  of the production firms situated in Hungary
- Support the R&D&I activities in manufacturing and in the related logistics
- Contribute to the education of highly qualified workforce

Organisation and activities

- Membership from the industrial and academic spheres
- Comprehensive Industry 4.0 maturity survey in Hungary
- Collection and introduction of best practices
- COVID-19 challenges and proposals for the industry
- Summary of the Platform's activities in its first 5 years
- Hungarian National Industry 4.0 Strategy for the Competitive
  and Sustainable Economy

Dimensions of the I4.0 Strategy: I4.0 ecosystem, Economy, Society

Ecosystem for supporting the industry in Hungary

- **National research Laboratories**
- **National platforms and coalitions**
  - Industry 4.0 National Technology Platform Association
  - AI Coalition
  - 5G Coalition
  - Hungarian Drone Coalition
- **Research infrastructures of excellence**
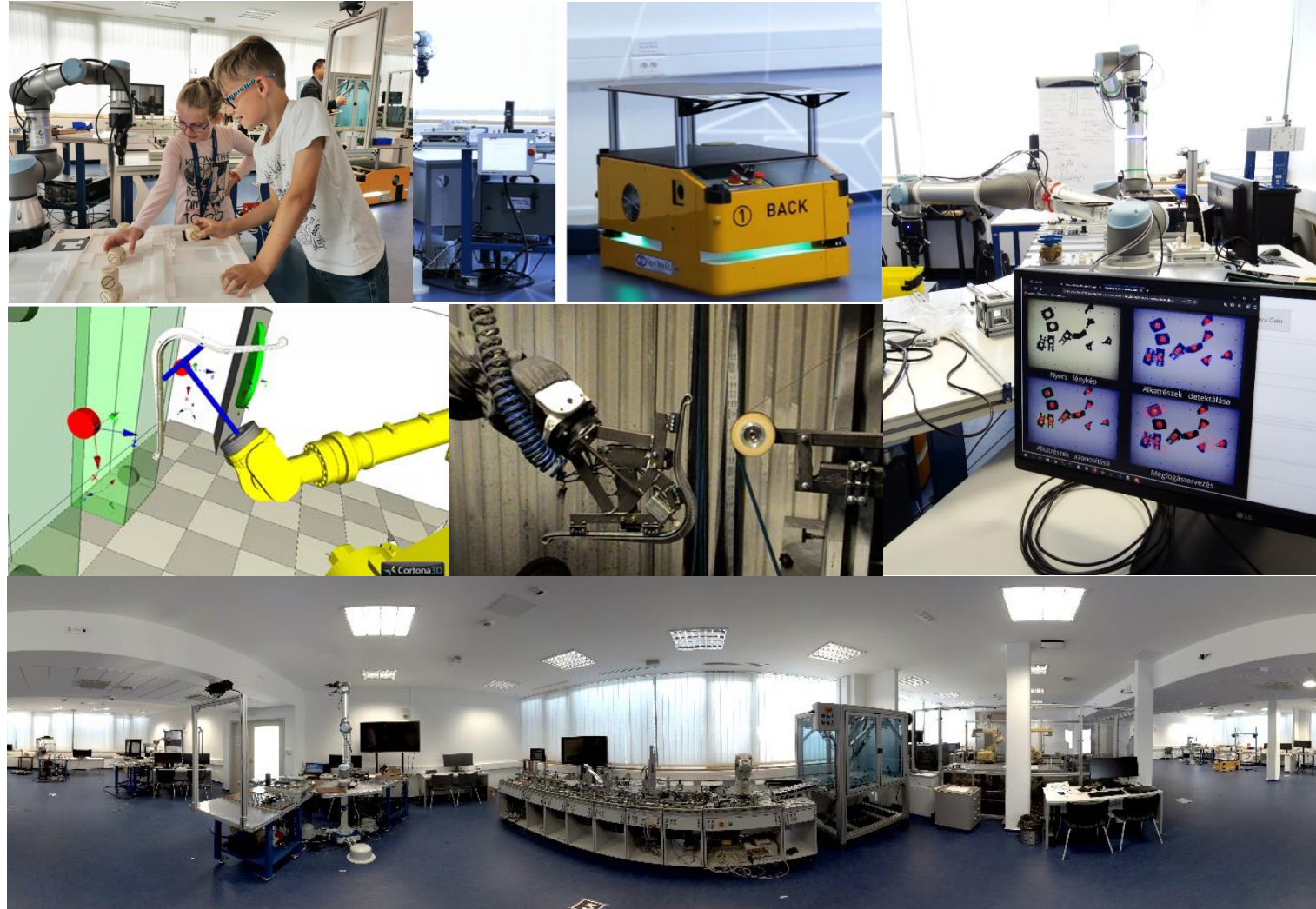- **European Centre of Excellence with the Fraunhofer Society**

Cyber-physical manufacturing and logistics R&D&I system (SZTAKI@Győr)

Technologies

- Advanced robotics
- Situation recognition, ML
- Human-robot collaboration
- „Zero-programming"
- Autonomous internal logistics
- Optimised, robust production planning and scheduling
- Digital twins
- Integration of legacy systems
- *Cloud manufacturing*

Mission: Open lab. concept

- Research, education, innovation
- In international networks: Learning factories, EPIC

IPAR 4.0
NEMZETI TECHNOLÓGIAI PLATFORM

ELKH | Eötvös Loránd Research Network   SZTAKI

Industry 4.0 Technology Centrum at BME

Technologies

- IoT, Sensors, digital twins
- Digital production planning and scheduling
- Data acquisition, analysis, and visualization
- Industrial application of AI
  - Visual process monitoring
- Augmented reality
- Industry 4.0 production
  - Robots, manipulators, additive manufacturing
- Industry 4.0 logistics
  - Autonomous vehicles, AGVs
  - Unique identification, localization

Services

- Demonstrations
- Education and training
- Industry 4.0 assessment and planning

Mission

To increase the number of enterprises active in Hungary, which are competitive on the global market with the use of Industry **4.0 technologies**.

IPAR 4.0
NEMZETI TECHNOLÓGIAI PLATFORM

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SZTAKI

CENTRE OF EXCELLENCE **EPIC**
Production Informatics and Control
Cooperating for Innovation and Excellence

Some facts from our history

- Established in 1964, as Research Institute of the Hungarian Academy of Sciences (MTA)
- EU CoE in IT, Computer Science and Control, 2001
- Virtual Inst. on Production and Business Management (PBM), 2002
- Fraunhofer Project C. for Production Management and Informatics, Fraunhofer (PMI), 2010
- EU CoE in Production Informatics and Control (EPIC), 2017
- Common legal entity: EPIC InnoLabs Ltd, 2018
- 45 FP7 projects, 22 H2020 projects, ERC advanced grant
- Eötvös Loránd Research Network (ELKH), 2019
- Autonomous Systems National Laboratory, 2020
- Artificial Intelligence National Laboratory, 2020

Basic research

- Computer science
- Systems- and control theory
- Engineering and business intelligence
- Machine perception and human-computer interaction

Applied research and innovation

- Vehicles and transportation systems
- Production informatics and logistics
- Energy and sustainable development
- Security and surveillance
- Networked systems and services, cloud and high-performance computing

Budget

- ~ 13 M Euros / year
- ~ 30 % basic funding

Staff

- ~ 280 (FTE)
- ~ 100 with scientific degree
- 6 members of the Hungarian Academy of Sciences
- 14 with DSc degree
- 73 with PhD degree
- ~ 15 members of the Hungarian Academy of Engineering

IFAC · IEEE · CIRP · WWK · acatech DEUTSCHE AKADEMIE DER TECHNIKWISSENSCHAFTEN

Main industrial partners

- Computer Science: Ericsson Hungary, OTP Bank, Bosch

- Engineering and Management Intelligence: Hitachi, Audi Motor Hungaria, GE Hungary, Jaguar LandRover, Opel, Volvo, Festo, BPW, Knorr-Bremse Fékrendszerek Kft, Aventics Hungary, Denso + significant number of SMEs

- Systems- and Control: Audi, Knorr-Bremse Fékrendszerek Kft, Paks Nuclear Power Plant

- 2015: MTA SZTAKI's subsidiary in Győr (within EPIC)

- 2016: MTA SZTAKI' subsidiary in Kecskemét

- ~30 patent applications in the past 10 years, ~20 with Hitachi

Cyber-physical lab. at the EPIC-subsidiary in Győr

- Centre of Excellence in Vehicle Technology Research (J3K)

Industrial Digitalisation Days „INDIGO" with FhG
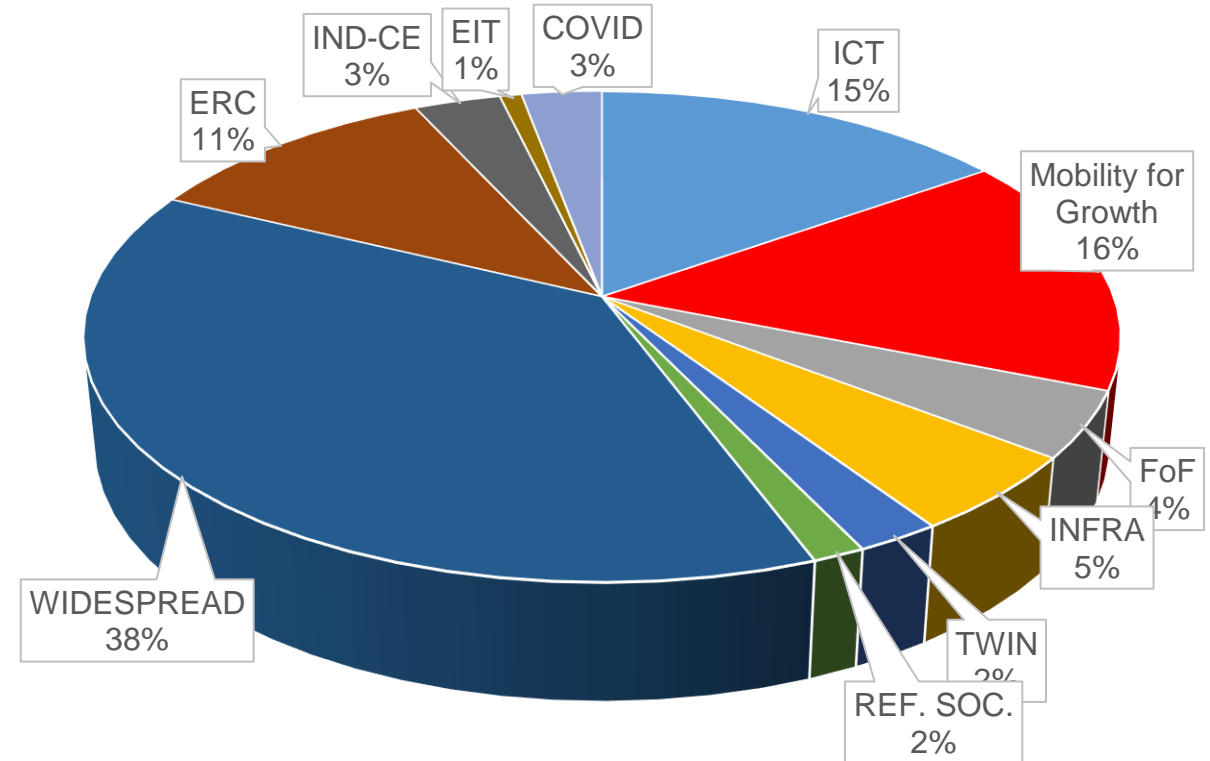

https://indigonap.hu/

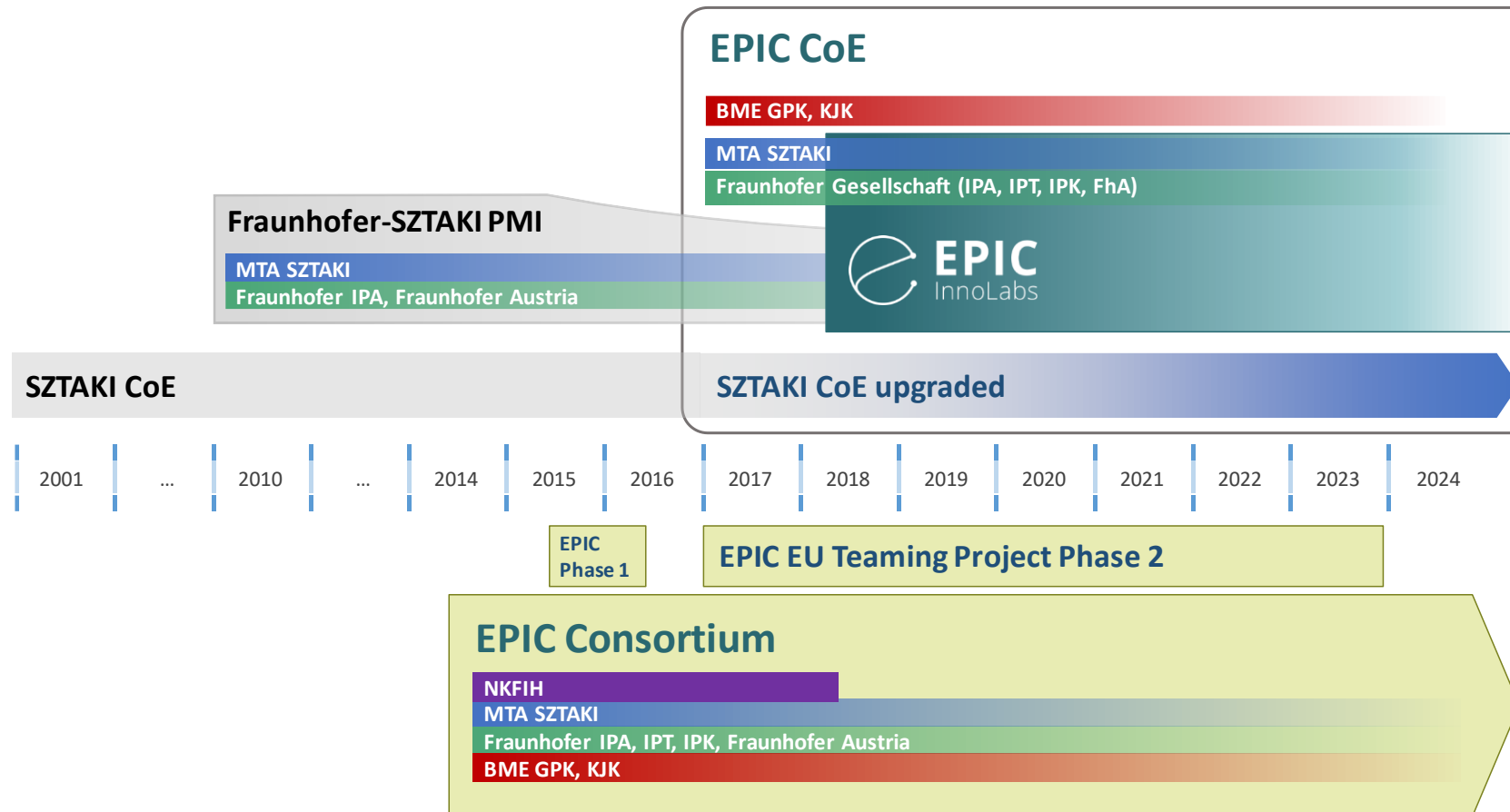# Common presence at international fairs

Research projects – EU H2020 Programme

- SZTAKI participates in 20 H2020 projects and in 2 EIT

- Roles: Participant in 16 projects, Coordinator in 6 project

- Total EC contribution: ~23 M€

- In 11 H2020 projects SZTAKI works together with 11 Fraunhofer institutes (IPA, IPK, IPT, IML, IGD, IZI, FIT, SCAI, FKIE, HHI, ISS and Fraunhofer Austria.

- SZTAKI coordinates 5 from them.

- Total support from the EU and the FFG is ~23 M€

- Common grant applications under evaluation for a total support of ~20 M€

Thematic distribution of EC contribution

IND-CE 3% | EIT 1% | COVID 3% | ICT 15% | ERC 11% | Mobility for Growth 16% | FoF 1% | INFRA 5% | WIDESPREAD 38% | TWIN 2% | REF. SOC. 2%

EPIC: European Centre of Excellence (2017-2024)

EPIC InnoLabs Nonprofit Ltd., by SZTAKI & FhG

EPIC
InnoLabs

Solutions and Services

Cutting-edge solutions and services for its customers with a well- established international expert team

| INDUSTRY 4.0 STRATEGIC CONSULTATION & TRAINING | ANALYSIS, DIGITALIZATION & OPTIMIZATION OF PRODUCTION & | ADVANCED PRODUCTION PLANNING, SCHEDULING & | INDUSTRIAL DATA ANALYTICS, MACHINE LEARNING & IoT SERVICES | NEW GENERATION ROBOTICS |

EPIC InnoLabs's main industrial partners

Thank you for your attention!

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