NORCICS

SFI Norwegian Centre for Cybersecurity in Critical Sectors

Norwegian Ecosystem for Secure IT-OT Integration (NESIOT)

NGINO Meeting, SINTEF Oslo

Habtamu Abie Norwegian Computing Center

Tuesday 29. November 2022

SFI NORCICS (Norwegian Centre for Cybersecurity in Critical Sectors) : Synopsis

- Funding: 214,519 kNOK over 8 years (2020-2028)
- Research Council of Norway under the Centres for Research-based Innovation scheme (SFI)

- 19 partners
  - **Research:** NTNU, SINTEF Energy, SINTEF Digital, NR, UiA
  - **Diverse critical sectors**: Elvia, Norsk Hydro, Kongsberg Gruppen, Yara International, Sykehuset Innlandet HF, Equinor, Lyse Elnett, Helgeland Kraft, NC-Spectrum
  - **Technology providers**: Mnemonic, Siemens, SINTEF Manufacturing
  - **Organizations for safer society**: Oslo Police District, NorSIS (?)

  - **International partners**: More than 15 partners

SFI NORCICS - https://www.ntnu.edu/norcics

Vision

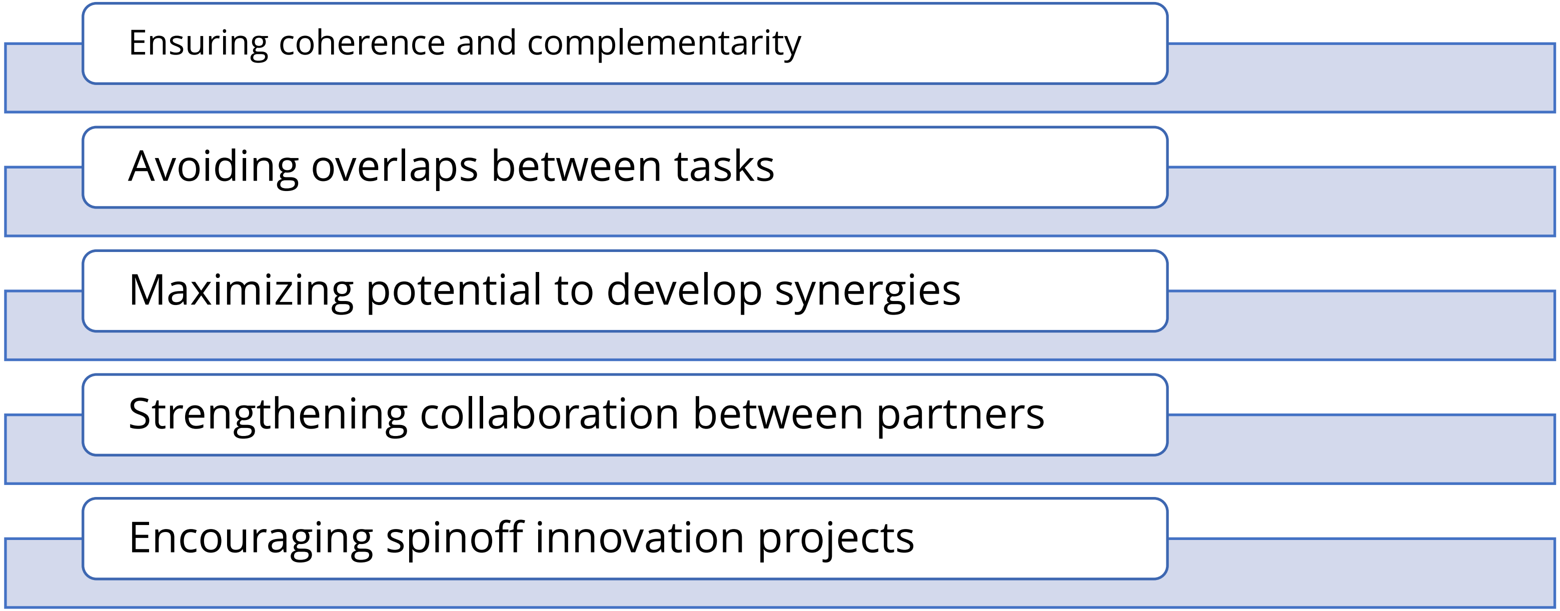
- Contribute to making Norway the most securely digitalized country in the world
  - by improving the cyber security and resilience of its critical sectors
  - through supporting research-based innovation
- Enhance the capability of private and public sector stakeholders
  - respond to the current and future cyber-security risks
  - by developing, validating, and operationalizing innovative socio-technical solutions

Objectives

- ➢ Create new knowledge
  - improve our understanding of the dynamics and interdependencies among CrSec, and of cyberattacks against CPS
- ➢ Develop, test and validate
  - novel, advanced and innovative methods for preventing cyberattacks against industrial control systems in CrSec
- ➢ Demonstrate
  - efficient cybersecurity solutions for industrial control systems in CrSec
- ➢ Develop novel methods and tools
  - cyber security training and awareness improvement
- ➢ Effectively transfer knowledge
  - among NORCICS user partners and other Norwegian businesses and stakeholders

Goals of Focus Areas

- Four focus areas: IT-OT Integration, 5G, Human Aspects, Data Analytics



Ensuring coherence and complementarity

Avoiding overlaps between tasks

Maximizing potential to develop synergies

Strengthening collaboration between partners

Encouraging spinoff innovation projects

IT-OT Integration: Introduction (1/2)

- The modern technological advancement is mainly based on new paradigms such as AI, IIoT, 5G, Digital Twins, Augmented Reality, Cognitive/Cloud/Edge computing, which involve heterogeneous networks where Information Technologies (IT) merge with the Operational Technologies (OT)

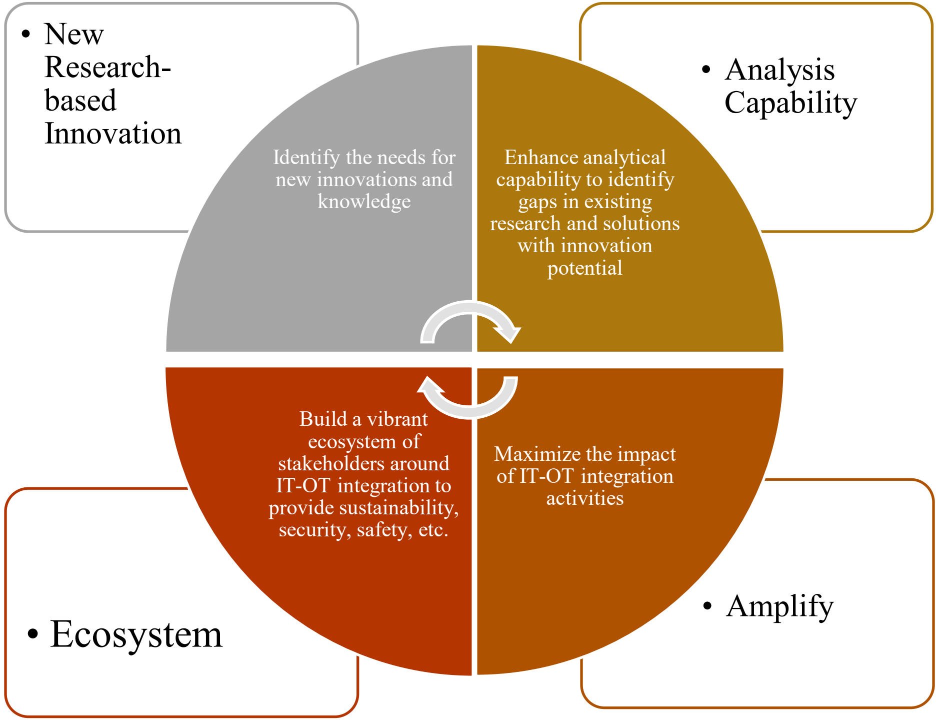
- This IT and OT integration allows maximization, optimization and customization of relevant tasks, and provides a wide range of functional services for better critical sectors, economy and society [1,2]. This convergence is however leading to new challenges in cybersecurity
  - Recent survey (Sophos, May 2022): 66% hit by ransomware in the last year, 61% attacks resulted in data encryption, 69% increase in volume of cyber attacks, highest across all sectors, 67% increase in complexity of cyber attacks, highest across all sectors, 59% increase in impact of cyber attacks, second-highest across all sectors

[1] Maleh, Y. (2021). IT/OT convergence and cyber security. Computer Fraud & Security, 2021(12), 13-16.,

[2] Alcaraz, C. (2019). Secure interconnection of IT-OT networks in industry 4.0. In Critical infrastructure security and resilience (pp. 201-217). Springer, Cham.

IT-OT Integration: Introduction (2/2)

The cybersecurity of IT-OT integration under the following 4 pillars:



- New Research-based Innovation

Identify the needs for new innovations and knowledge

- Analysis Capability

Enhance analytical capability to identify gaps in existing research and solutions with innovation potential

Build a vibrant ecosystem of stakeholders around IT-OT integration to provide sustainability, security, safety, etc.

- Ecosystem

Maximize the impact of IT-OT integration activities

- Amplify

IT-OT Integration Pillars (1/4)

Pillar I: New Research-based Innovations

- Unified modelling of IT-OT for unified visibility
- Enhanced cybersecurity decision-making automation
- Real-time automated data collection and sharing
- Secure supply chain management
- Dynamic risks, vulnerabilities and threats

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IT-OT Integration Pillars (2/4)

Pillar II: Analysis Capability

- ➢AI and Data analytics
- ➢State-of-the-art and beyond
- ➢Risks, vulnerabilities and threats
- ➢Complimentary, overlaps and synergies with other tasks

IT-OT Integration Pillars (3/4)

Pillar III: Ecosystem

- ➢Strengthening collaborative between partners and beyond
- ➢Multiple stakeholders: sensor/device manufactures, telecoms operations, cloud and data analysis solution providers, industrial system operators, etc.
- ➢Enabling technologies and the application of those technologies
- ➢Collaboration between partners through secure IT-OT Integration - Forging stronger partnerships to magnify IT-OT cybersecurity knowledge

GR Advisory & Training

IT-OT Integration Pillars (4/4)

Pillar IV: Amplify

- Maximize the innovation, analysis and ecosystem for enhancing cybersecurity in secure IT-OT integration
- Spinoff innovation projects, synergies, exploitation and dissemination
- Magnify cybersecurity knowledge circulation and innovative ideas and products, leading to even more secure and safe IT-OT environments

ADVISOR'S EDGE

NESIOT (Norwegian Ecosystem for Secure IT-OT Integration)

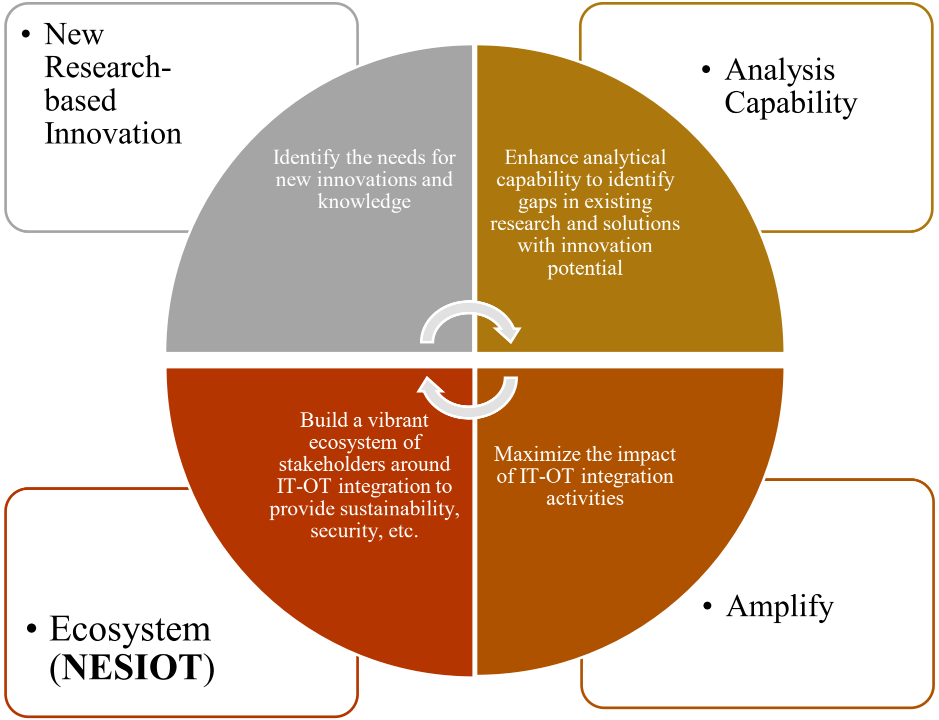
- ➢ Main goal
  - to create synergies and foster emerging solutions for secure IT-OT Integration via cross-sectors collaboration and innovation

- ➢ Objectives
  - Strengthen collaboration between NORCICS partners and beyond through secure IT-OT Integration
  - Achieve secure digitalization of industry through IT-OT integration
  - Close the IT-OT cybersecurity vulnerability gap
  - Increase unified visibility of secure IT-OT integration
  - Provide matchmaking for both national and international project spin-offs
  - Organize yearly national conference/workshop, involving both Norwegian policy makers, regulators, standard bodies, industry and academic, practitioners, and representatives from the research council of Norway
  - Organize bi-annually meetings

NESIOT Current Partners

- **NORCICS partners**
  - NTNU, NR, SINTEF, Elvia AS, Equinor ASA, Siemens AS
- **Cross-sectors**
  - Simula, IFE
  - City of Oslo
    - Agency for Improvement and Development
    - Stovner District
    - Agency for Water and Wastewater Services
    - Oslobygg
    - Department of Finance
- **Norwegian H2020 projects**
  - FINSEC (NR), CyberSec4Europe (NTNU), STOP-IT (SINTEF), CONCORDIA (OsloMet)
- **Norwegian CERTS/CSERTs**
  - KraftCERT/InfraCERT, Telenor CERT(?), Equinor CSIRT
- **Norwegian certification authorities and security evaluation facilities**
  - Nemko System Sikkerhet AS, Norconsult ITSEF
- **Norwegian Regulators, Standards and Policies**
  - Petroleumstilsynet, NVE, NVE-RME, NEK
- **Waiting for confirmation from 20 partners**

The cybersecurity of IT-OT integration under the following 4 pillars:



- New Research-based Innovation

Identify the needs for new innovations and knowledge

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- Ecosystem (**NESIOT**)

Build a vibrant ecosystem of stakeholders around IT-OT integration to provide sustainability, security, etc.

- Amplify

Maximize the impact of IT-OT integration activities

NESIOT for NGI: Moral

- NESIOT
  - forge stronger partnerships to magnify IT-OT cybersecurity knowledge circulation and innovative ideas and products, leading to even more secure and safe IT-OT environments

- Contribute to NGI
  - 5G, IoT, AI Analytics, Digital Twins, Automated Cybersecurity, Cognition

CORUZANT TECHNOLOGIES

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Thank you!

Contact: Habtamu Abie, Norwegian Computing Center
Email: abie@nr.no

NTNU | Norwegian University of Science and Technology