CELTIC Proposers Brokerage Day - Business Impact Session -



CELTIC-NEXT Seureka Cluster



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C CELTIC-NEXT Seureka Cluster

Business Impact of CELTIC Projects Moderator: Dr. David Castellas-Rufas, CELTIC GOE Member - Tenure Trac Professor at UAB Pannelists: fiQare: Prof. Enrique Alba, University of Málaga together with Manuel Giménez Medina, Chief Innovation Officer / R&D, Ayesa, Spain

UNICRINF & IMMINENCE: Victor Pascual Avila, Head of Security and Standards - CNS ET Standards Network Architecture Nokia, Spain CISSAN: Alberto Doval Iglesias, CTO, Councilbox, Spain

F4itech: Ismail Uzun, Inosense, Türkiye



Business Impact of CELTIC Project:







Business Impact of CELTIC Project:





CELTIC Proposers Day in Barcelona on 24.02.25 - Business Impact Session -

CELTIC-Project: UNICRINF







Victor Pascual Avila, Head of Security and Standards - CNS ET Standards Network Architecture Nokia, Spain

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MAIN FOCUS

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Integrate the best of our technological companies **to improve the emergency protocols** including TV emergency Support or **messaging alarms in small, medium and large areas** as well as to investigate the technology that allows supervising the communications infrastructure in emergency scenarios



MAIN FOCUS



https://youtu.be/b2wFQ6eB6Zo







ACHIEVEMENTS



We have developed the technology to Monitor the communications infrastructure in emergency scenarios

- Design of technology to detect anomalies associated with emergency
- Specification of functionalities to supervise the network and services
- Generation of network and service status measurements in real time

Main achievements

- Full development of UNICRINF prototype
- Validation of UNICRINF with REAL emergency services

Industrialization of the technology

- New module for Indra's portfolio for Fault Management
- Nokia: Integrated geo-localized system for emergencies
- Hispasat: Integrated UNICRINF sensors with satellite



ACHIEVEMENTS



We have developed the technology to Monitor the communications infrastructure in emergency scenarios

- Design of technology to detect anomalies associated with emergency
- Specification of functionalities to supervise the network and services
- Development of Smart Event Processor (SEP) for MEC Process and aggregate large amounts of data generated by sensors and probes

Generate/trigger complex events, based on a Complex Event Processor Engine, based on predefined sets of rules - data correlation

Main achievements

- Full development of SEP prototype
- Integration of SEP with remaining modules of the project Industrialization of the technology
- Ubiwhere: Integrated SEP providing geo-localized system for emergencies



Universal Critical Infrastructures

Scientific Publications: Master Theses

- Aplicación Móvil para Optimizar el Transporte por Carretera. Jonay Zebensui Herrera Santana. Advisors: Pino Caballero Gil, Jezabel Molina Gil. University of La Laguna. 24 Sept 2019
- Sistema inteligente seguro para vehículos. Noe Campos Delgado. Advisors: Pino Caballero Gil, Jonay Suárez Armas University of La Laguna. 24 Sept 2019
- Sistema de control de acceso seguro. Jairo Gonzalez Lemus. Advisors: Pino Caballero Gil, Alexandra Rivero García University of La Laguna. 24 Sept 2019
- Técnicas para mejorar la seguridad de una aplicación web. Juan Jesús Padrón Hernández. Advisors: Pino Caballero Gil, Carlos Rosa Remedios. University of La Laguna. 20 June 2019
- Bus Guide Application Ana Beatriz Gil González. Advisors: Pino Caballero Gil, José Ángel Concepción Sánchez. University of La Laguna. 20 June 2019
- Aplicación de Blockchain a situaciones de emergencias. Sergio Ferrera De Diego. Advisors: Pino Caballero Gil, Iván Santos González. University of La Laguna. 20 June 2019

DISSEMINATION

Scientific Publications: Master Theses

- Beacon-Based Fuzzy Indoor Tracking at Airports. Josué Toledo-Castro, Pino Caballero-Gil, Nayra Rodríguez-Pérez, Iván Santos-González, Candelaria Hernández-Goya. UCAml 1255 (2018)
- Monitoring Environmental Conditions in Airports with Wireless Sensor Networks. Nayra Rodríguez Pérez, Pino Caballero-Gil, Josué Toledo-Castro, Iván Santos-González. UCAml 1260 (2018)
- Priority and collision avoidance system for traffic lights. Iván Santos-González, Pino Caballero-Gil, Alexandra Rivero-García, Cándido Caballero-Gil. Ad Hoc Networks 94 (2019)
- Secure ambient intelligence prototype for airports. Nayra
 Rodríguez-Pérez, Josué Toledo-Castro, Pino Caballero-Gil, Iván
 Santos-González, Candelaria Hernández-Goya. Journal of
 Ambient Intelligence and Humanized Computing (2020)
- Detection of forest fires outbreaks by dynamic fuzzy logic controller.J Toledo-Castro, N Rodríguez-Pérez, P Caballero-Gil, I Santos-González. Logic Journal of the IGPL (2020)
- Decision Support System Based on Indoor Location for Personnel Management. Néstor Álvarez-Díaz and Pino Caballero-Gil. Remote Sensing, 13(2), 248; https://doi.org/10.3390/rs13020248 (2021)
- Building an ethereum-based decentralized vehicle rental system. García-Moreno, N., Caballero-Gil, P., Caballero-Gil, C., Molina-Gil, J. Advances in Intelligent Systems and Computing. Springer (2021)

CELTIC-NEXT Seureka Cluster

Scientific Publications: PhD Theses

- PhD theses: Protocolos para la protección de las personas y de la información. Moisés Lodeiro Santiago. Advisors: Pino Caballero Gil, Cándido Caballero Gil. University of La Laguna. 11 October 201
- PhD theses: Protocolos para la Seguridad de la Información en e-Health. Alexandra Rivero García. Advisors: Candelaria Hernández Goya, Pino Caballero Gil. University of La Laguna. 15 October 2020
- PhD theses: Aplicaciones Tecnológicas para Proteger la Seguridad Física de las Personas. Iván Santos González. Advisors: Pino Caballero Gil, Jezabel Molina Gil. University of La Laguna. 15 October 2020

I Iniversal Critical

IMPACT TABLE



Universal critical		
Type of Impact	Number	Short Description
Number of new products that have been developed based on the project results.	3	Nokia Geolocalization sensors tool, Nokia Video Supervision, Minsite Supervision Unit
Number of products that have been improved using the result of t project.	he 2	Geolocalization Unit from Nokia, SIRDEE emergencies Tool
Expected return of investment (RoI) within the next 3 years; (please give statement related to the cost of the project: 0, 1x, 10x, 100x, 1000x etc.).	se 5	5x
Number of new companies that were created commercializing pro results.	oject 0	
Number of new permanent employees hired or expected to be hir the partner organisations or spin-of companies due to activities generated by project results.	red by 7	7 in Nokia
Cross domain cooperation (example: Telecom-Power or Telecom engineering, Health)	-civil 3	Telecom-SmartCity-SecurityServices
Patents, trademarks, registered design, etc.	0	0
Prototypes / Field Trials	6	5: Malaga, Valencia, Segovia, Santiago de Compotela, Madrid
Number of contributions to standards based on results of the proj	ject. 0	
Standard implementations / Workability trials of new standards.	2	5G Rel15, RTSP
Numbers of Journal publications.	5	Detection of Forest Fires Outbreaks by Dynamic Fuzzy Logic Controller. Oxford Univ Press. 2020. Secure Ambient Intelligence Prototype for Airports. Journal of Ambient Intelligence and Humanized Computing. Springer. 2020. Secure lightweight password authenticated key exchange for heterogeneous wireless sensor networks. Elsevier. Volume 88, February 2020 Using blockchain in the follow-up of emergencies situations related to events. Alexandra Rivero-García, Iván Santos-González, Candelaria Hernández-Goya, Pino Caballero-Gil. Software: Practice and Experience. Wiley. 2019. Priority and collision avoidance system for traffic lights. Ad Hoc Networks, Elsevier. 2019.
Number of Conference papers.	1	Conferences contributions: 5G Forum 2020. UNICRINF site, including poster. https://www.5gforum.es/en/nokia-presents-in-the- virtual-5gforum-new-ways-to-connect-with-others/
Number of PhD thesis contributing to and using project results.	3	 PhD theses: Protocolos para la protección de las personas y de la información. Moisés Lodeiro Santiago. Advisors: Pino Caballero Gil, Cándido Caballero Gil. University of La Laguna. 11 October 201 PhD theses: Protocolos para la Seguridad de la Información en e-Health. Alexandra Rivero García. Advisors: Candelaria Hernández Goya, Pino Caballero Gil. University of La Laguna. 15 October 2020 PhD theses: Aplicaciones Tecnológicas para Proteger la Seguridad Física de las Personas. Iván Santos González. Advisors: Pino Caballero Gil. Jezabel Molina Gil. University of La Laguna. 15 October 2020

IMPACT TABLE



Type of Impact	Number	Short Description
Number of Conference papers	1	Conferences contributions: 5G Forum 2020. UNICRINF site, including poster. https://www.5gforum.es/en/nokia-presents-in-the-
Number of conference papers.	-	virtual-5gforum-new-ways-to-connect-with-others/
		PhD theses: Protocolos para la protección de las personas y de la información. Moisés Lodeiro Santiago. Advisors: Pino Caballero Gil, Cándido Caballero Gil. University of La Laguna. 11 October 201
Number of PhD thesis contributing to and using project results.	3	PhD theses: Protocolos para la Seguridad de la Información en e-Health. Alexandra Rivero García. Advisors: Candelaria Hernández Goya, Pino Caballero Gil. University of La Laguna. 15 October 2020
		PhD theses: Aplicaciones Tecnológicas para Proteger la Seguridad Física de las Personas. Iván Santos González. Advisors: Pino Caballero Gil, Jezabel Molina Gil. University of La Laguna. 15 October 2020
Number of Master thesis contributing to and using project results.	13	Aplicación Móvil para Optimizar el Transporte por Carretera. Jonay Zebensui Herrera Santana. Advisors: Pino Caballero Gil, Jezabel Molina Gil. University of La Laguna. 24 Sept 2019. Beacon-Based Fuzzy Indoor Tracking at Airports. Josué Toledo-Castro, Pino Caballero-Gil, Nayra Rodríguez-Pérez, Iván Santos-González, Candelaria Hernández-Goya. UCAml 1255 (2018) Monitoring Environmental Conditions in Airports with Wireless Sensor Networks. Nayra Rodríguez Pérez, Pino Caballero-Gil, Josué Toledo-Castro, Iván Santos-González. UCAml 1260 (2018) Priority and collision avoidance system for traffic lights. Iván Santos-González, Pino Caballero-Gil, Alexandra Rivero-García, Cándido Caballero-Gil. Ad Hoc Networks 94 (2019) Secure ambient intelligence prototype for airports. Nayra Rodríguez-Pérez, Josué Toledo-Castro, Pino Caballero-Gil, Iván Santos- González, Candelaria Hernández-Goya. Journal of Ambient Intelligence and Humanized Computing (2020) Detection of forest fires outbreaks by dynamic fuzzy logic controller.J Toledo-Castro, N Rodríguez-Pérez, P Caballero-Gil, I Santos- González. Logic Journal of the IGPL (2020) Decision Support System Based on Indoor Location for Personnel Management. Néstor Álvarez-Díaz and Pino Caballero-Gil. Remote Sensing, 13(2), 248; https://doi.org/10.3390/rs13020248 (2021) Building an ethereum-based decentralized vehicle rental system. García-Moreno, N., Caballero-Gil, P., Caballero-Gil, C., Molina-Gil, J. Advances in Intelligent Systems and Computing. Springer (2021) Sistema inteligente seguro para vehículos. Noe Campos Delgado. Advisors: Pino Caballero Gil, Jonay Suárez Armas University of La Laguna. 24 Sept 2019 Sistema de control de acceso seguro. Jairo Gonzalez Lemus. Advisors: Pino Caballero Gil, Alexandra Rivero García University of La Laguna. 24 Sept 2019 Técnicas para mejorar la seguridad de una aplicación web. Juan Jesús Padrón Hernández. Advisors: Pino Caballero Gil , Carlos Rosa Remedios. University of La Laguna. 20 June 2019 Bus Guide Application Ana Beatriz Gil González. Adviso
Open source Software Users – Software developed in the project	0	
Future prove Networks	3	5G NSA for emergencies
Techno-economics	2	
Home Network/gateway concepts	1	IoT Gateways
Web – Telco convergence	0	
Other	0	





This project, has been funded in Spain by the **Centro para el Desarrollo Tecnológico Industrial** E.P.E. (CDTI) and in Portugal by **Portugal 2020**.

This is also a **Eureka Celtic Next project**. Celtic-Next strengthens the competitiveness of the European industry by fostering European R&D cooperation in telecommunications, and the well-being of the society by stimulating innovative information and telecommunication services. Celtic-Plus focuses on telecommunication and ICT connecting people and businesses in a secure way.







NATIONAL FUNCING AGENCIES





Universal Critical Infrastructure

CELTIC project UNICRINF



Maria Luisa Arranz Nokia Spain





Universal Critical Infrastructures





<u>CelticNextEurekaCluster</u>





MANY THANKS FOR YOUR ATTENTION.



- <u>https://www.celticnext.eu/project-</u> <u>unicrinf/</u>
- <u>https://www.nokia.com/es_int/uni</u> <u>crinf/</u>

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CELTIC Proposers Day in Barcelona on 24.02.25 - Business Impact Session -

CELTIC-Project: IMMINENCE



CELTIC-NEXT Seureka Cluster



Victor Pascual Avila, Head of Security and Standards - CNS ET Standards Network Architecture Nokia, Spain

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PROJECT OVERVIEW

- C CELTIC-NEXT Seureka Cluster
- Celtic call: 2020-2, 19 October 2020 (Joined Celtic Eurogia)
- Keywords: Intelligent Management, AI Data Analytics, Autonomous Management, 5G, QoS/QoE
- Coverage of Research Objectives:
 - Aio Network Management and operation, C8 Artificial Intelligence
- Coordinator: Indra Minsait (IND), Spain
- Start date of Project: (month/year): June/2021
- Kick off date: 23 June 2021
- Duration: 33 months
- Project Budget: 7,2M€
- Consortium: 18 partners and 3 subcontracted from 6 countries
 - Telco (Orange Labs Poland, Turkcell)
 - Industry (Indra, Nokia, Amper, Ericsson, Epiroc, Volvo Construction Equipment, Ulak)
 - Research Centers & Academia (RISE, Warsaw U., IT Aveiro, Lund U., Cantabria U.subcontract, La Laguna U.- subcontract)
 - SMEs (Karel, Systemics-PAB, Alkit, Wavecom, BEIA, Time Critical Networkssubcontract)



MAIN FOCUS

- The main focus of IMMINENCE is to develop intelligent network management and control functions techniques for exploiting 5G use cases
- Intelligent business analytics capabilities: Development of a business intelligence analytic platform for exploiting 5G Use cases
 Intelligent network management;
- Intelligent network management: Implementation of management and monitoring capabilities to manage 5G UCs
 New mechanisms for future mobile
 - New mechanisms for future mobile networks: Related to the enhanced network technology to support innovative 5G UCs



ACHIEVEMENTS



Intelligent business analytics capabilities

- Development of a business intelligence analytic platform for exploiting 5G Use cases
- Detection of objects from video
- Modeling Quality of Experience (QoE)
- Exploitation of rest of use cases

Intelligent network management

- Implementation of management and monitoring capabilities to manage 5G UCs
- Industrial Communications and Smart Factories
- Remote control in Industrial environments
- E-Health Services in Rural Areas
- IoT Equipment Used For Routing

New mechanisms for future mobile networks

- Related to the enhanced network technology to support innovative 5G UCs
- Drones & UAV for future mobile networks
- Moving Vehicle Scenario: prioritization of flows
- Multi-homed vehicle: vehicles with different connectivity
- Data Collection and Cloud Processing in Connected Fleets

SCENARIOS





Industrial Exploitation and academia

- •ITU GSTR-5GQoE: QoE requirements for real-time multimedia services over 5G networks (VQEG)
- •Contribution on security issues from an external-to-network point of view at (European Committee for Standard) CEN/CLC/JTC 13/WG7
- •Contribution to O-RAN in the framework of standICT.eu 2026 in terms of developing evaluation tests for Open RAN
- •1 PhD theses
- 12 Master theses
- Total: 3 standard + 13 theses

DISSEMINATION

Scientific Publications

- •IEEE Transactions on Multimedia
- •IEEE Microwave and Wireless Components Letters
- •IEEE Transactions on Vehicular Technology
- •IEEE Transactions on ML in Communications and Networking
- •Multimedia Tools and Applications, Springer
- •Logic Journal of the IGPL. Oxford Univ Press
- •Elsevier Journal of Vehicular Communications
- •ACM SIGCOMM, IEEE ENERGYCON, etc.
- Total: 45 publications



Activities and events

- Inclusion of Security results realized within the project framework in the Techniki sieci mobilnych course (WUT)
- •Karel's strategies about 5G and the preparations for 6G technology in a local panel
- •Research conference KSTiT 2022 held in Warsaw with more than 300 participants
- Participation on the 9th
 FIWARE Global Summit 2023
 Dissemination within our
- •Dissemination within our companies: 5

Total: 14 activities and events

IMPACTTABLE



Type of Impact	Number	Short Description
Number of new products that have been developed based on the project results.	7	Indra (5G Analytics Platform), Nokia (5G KVIs Platform), Amper (4G eNodeB +EPC and data analytics in the edge, EPC embedded in drone; 5G gNodeB and data analytics in the edge), Wavecom (5G CPE), Systemics (5G spatial analysis) and Orange (Monitoring services using drones)
Number of products that have been improved using the result of the project.	11	Nokia (3 Private 5G Networks features), Amper (IMSI Grabber), Alkit (WICE telematic system for automotive data capture, and TCN's tool for digital twin modelling), Systemics (5G analysis profolio), Ericsson 6G research roadmap, Orange (AI platform for real time objects detections from drone), Turkcell (CEI), Karel (SDN) and ULAK (SD-WAN)
Expected return of investment (Rol) within the next 3 years; (please give statement <u>related</u> to the cost of the project: 0, 1x, 10x, 100x, 1000x etc.).	15x	The intelligent network management, control functions techniques, as well as intelligent business analytics capabilities to exploit 5G Use Cases will be commercialised in terms of different modules of the IMMINENCE ecosystem, which expected ROI is about 15 times in next 3 years
Will your organisation be able to reduce costs significantly as a result of the project?	10%	Expected reduced operational costs related to the integration of technologies to avoid duplications (10%) and by predicting customer complaints beforehand. In addition, improvements in the analysis portfolio may reduce postprocessing time by 5%.
Number of new permanent employees hired or expected to be hired by the partner organisations or spin-of companies due to activities generated by project results.	5	Nokia (2), IT (3)
Cross domain cooperation (e.g: Telecom-Power or Telecom-civil engineering, Health)	7	eHealth, Factories, Mining, Energy, Automotive, Transport and Logistics
Prototypes / Field Trials	18	Indra (1), Nokia/ULL (2), Amper/UC (2), Ericsson/RISE/LU(1), Turkcell/Ericsson (1), Volvo CE/RISE (1), Epiroc/RISE (1), IT (1), Orange (2), Systemics (3), Turkcell (1), Karel (1), Ulak (1)
Number of contributions to standards based on results of the project.	3	Please find the list in the Self-Assessment section
Standard implementations / Workability trials of new standards.	3	Nokia (1), SYS(1), WUT (1)
Numbers of Journal publications.	17	Please find the list in the Self-Assessment section
Number of Conference papers.	28	Please find the list in the Self-Assessment section
Number of PhD thesis contributing to and using project results.	1	Please find the list in the Self-Assessment section
Number of Master thesis contributing to and using project results.	12	Please find the list in the Self-Assessment section
Open source Software Users – Software developed in the project.	8	Amper/UC (1), Ericsson (1), Orange(1), Systemics (1), Turkcell(1), Karel (1), Ukak (2)
Future prove Networks	4	5G SA core, 5G mmW radio, 5G evaluation methodology, Contributed to Network Automation
Techno-economics	2	Initial and final exploitation plan of the project
Home Network/gateway concepts	2	Gateway for IoT devices (2)
Web – Telco convergence	5	Web based GUIs (5)
Other	14	Other activities and events (Please find the list in the SA section)





This project, has been funded in Spain by the **Centro para el Desarrollo Tecnológico Industrial** E.P.E. (CDTI), in Sweden by **Vinnova**, in Portugal by **Portugal 2020**, in Poland by **Narodowe Centrum Badań i Rozwoju** (National Centre for Research and Development) and in Turkey by **Tübitak**.

This is also a **Eureka Celtic Next project**. Celtic-Next strengthens the competitiveness of the European industry by fostering European R&D cooperation in telecommunications, and the well-being of the society by stimulating innovative information and telecommunication services. Celtic-Plus focuses on telecommunication and ICT connecting people and businesses in a secure way.









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http://www.imminence.eu/

CELTIC Proposers Day in Barcelona on 24.02.25 - Business Impact Session -

CELTIC-Project: CISSAN



CELTIC-NEXT Seureka Cluster



Presenter: Alberto Doval Councilbox (Project Member)

<u>www.celticnext.eu</u>

Collective intelligence supported by security aware nodes

CISSAN



Summary

CISSAN

- CISSAN is a CELTIC-NEXT project running in Austria, Finland, Spain, and Sweden <u>https://www.celticnext.eu/project-cissan</u> <u>https://www.jyu.fi/en/projects/cissan</u>
- Start date is 1 May 2023, end date is 31 May 2026
- Supported by Austrian Research Promotion Agency (FFG), Business Finland, Centre for the Development of Industrial Technology (CDTI), Swedish Agency for Innovation Systems (Vinnova)
- Coordinated by the University of Jyväskylä (FI)
- Total project budget is ~ EUR 8.5M
- Total effort is ~ 74.6 PY

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Seureka Cluster

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"When everything is connected, everything must be protected"

CISSAN

(*) Hypponen's Law: If it's smart, it's vulnerable (blog.fsecure.com/hypponens-lawsmart-vulnerable/)

- CISSAN proposes and implements algorithms and develops solutions for countering IoT security and operational threats.
- Focus: Collective Intelligence (CI) of IoT network nodes, techniques for distributed security and operational monitoring, event tracking, attack detection, and response in IoT networks.
- Expected outcome: A set of innovative algorithms, technologies, and solutions interconnected and integrated to the project Use Cases and experimental environments, evidence of value in and beyond the project Use Cases, plans and models for production use and commercial products and services.
- CISSAN contributes to CELTIC-NEXT core themes: security and trust for networks, powered by AI and distributed processing for handling large data volumes.

Important remarks and considerations

CISSAN

- IoT understood broadly, including Industrial Internet of Things (IIoT) and Operational Technologies (OT)
- IoT network nodes include edge devices and backend components (e.g., in cloud environments). CISSAN builds technologies suitable for resource-limited devices and networks
- CISSAN-powered networks networks where cybersecurity is improved via CISSAN technologies and solutions, to be presented conceptually and via examples
- Providing value for its Use Cases is a key CISSAN's objective, but our ambition is to build technologies and solutions applicable much wider
- The value we aim to bring includes facilitating security compliance and governance for the owners and operators of CISSAN-powered networks

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Key concepts and choices (I)

CISSAN

- CI for cybersecurity: sharing information about vulnerabilities, threats, and mitigations among different entities and collectively selecting and carrying out actions (e.g., detection and response)
 "CI will be the result of interoperation of the IoT devices, network side and cloud-based services" (*)
- Multiple faces of CI in CISSAN:
 - Locally run algorithms and models, the results of which are aggregated
 - Data and intelligence sharing, security task delegation, and collective decision-making at run-time
 - Optimal distribution of security functions across network nodes at design-time
 - Nodes collaboration for secure and verifiable IoT events logging

Key concepts and choices (II)

CISSAN

- Al approaches and techniques (importantly Al-based anomaly detection and generative Al) are used widely in CISSAN.
- Detection of both cyberattacks and operational threats (malfunctions, operational faults) is required in all the CISSAN Use Cases. While anomaly detection is a universal tool here, new questions arise.
- CISSAN uses generative AI to address the lack of data challenge for AI models training and validation.
- CISSAN uses blockchain-based techniques, mainly for IoT event tracking and data integrity.

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Seureka Cluster

Work Packages

CISSAN



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Timeline

CISSAN

						G	ANTT Timing	and milestone	S					
Work pack	Work packages and tasks					Year 3	Year 3							
		M1-3	M4-6	M7-9	M10-12	M13-15	M16-18	M19-21	M22-24	M25-27	M28-30	M31-33	M34-36	
WP0	Management of the project													
T0.1	Coordination													
T0.2	Organisation (Project kick-off, Mid-term review, Final Review)	M0.1					M0.3						M0.5	
T0.3	Dissemination													
T0.4	Exploitation (Workshops)				M0.2				M0.4				M0.6	
WP1	Continuous follow-up of the related research fields													
T1.1	Follow-up of the related research fields													
T1.2	Detection and analysis of weak signals				D1.1								D1.2	
WP2	Definition of the system architecture													
T2.1	Defition of the architecture blocks and interfaces			D2.1										
T2.2	Continuous risk, threat, and impact analysis				D2.2								D2.3	
WP3	Business models													
T3.1	Recognition and definition of the earning models				D3.1									
T3.2	Business impact analysis of the new earnings models						D3.2							
T3.3	Modification and update mechanisms to earning models												D3.3	
WP4	Data gathering and quality assessment													
T4.1	Data security				D4.1				D4.4				D4.5	
T4.2	Data gathering for distributed algorithms and load balancing					D4.3								
T4.3	Distributed network logging system					D4.2								
WP5	Distributed intelligent security mechanisms													
T5.1	Distributed intelligent security incident detection									D5.2				
T5.2	Distributed detection of the AI based malicious actions							D5.1						
T5.3	Blockchain based security solutions for IoT networks										D5.3			
T5.4	Al information exchange protocol											D5.4		
T5.5	Tools to optimally distribute security subfunctions												D5.5	
WP6	Proof of work													
T6.1	CISSAN platform									D6.1			D6.3	
T6.2	Interfaces for 3rd parties' applications										D6.2		D6.4	
WP7	Standardization													
T7.1	Standardization follow-up and action planning								D7.1					
T7.2	Coordination of the standardization related issues and actions in other WPs								D7.2					

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Use Case 1:

Transportation systems



- Represented by Mattersoft and Nodeon
- Public transport information systems with fleet monitoring, real-time passenger information, and traffic signal priorities. Transportation control systems, traffic flow analysis and traffic data management.
- In-vehicle and road-side devices. Highly centralized data processing, analysis and decision-making as of today.
- Cybersecurity of the systems is critical. NIS2 sets new requirements.
- The current focus in CISSAN is GPS data analysis

 to detect jamming and spoofing
 attacks, malfunction of devices, other anomalies.



Use Case 2:

Smart grids



CISSAN

- Represented by Affärsverken
- Smart grid monitoring and control
- OT use case: SCADA systems, Remote Terminal Units (RTUs). Centralized security monitoring and analytics.
- Energy grids are critical infrastructures. Critical Entities Resilience (CER) Directive, NIS2.
- Current focus in CISSAN: Local and hybrid AI-based anomaly detection in network traffic and physical sensor data to identify attacks and faults. First steps in nodes collaboration at run-time.

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Use Case 3:

Tunnelling and mining



CISSAN

• Represented by Geodata

- IoT systems for underground construction monitoring
- Geotechnical (physical measurement) sensors. Multiple stakeholders in monitoring systems. Data tampering and operational rules violation concerns.
- Monitoring systems and services are used by critical infrastructure operators must comply with NIS2.
- Current focus in CISSAN: Sensor data believability analysis to identify potential attacks, faults and abuse. Data integrity protection via blockchain-based techniques and the use of security chips for sensor data signing.





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MANY THANKS FOR YOUR ATTENTION.



Alberto Doval CTO & Co-Founder alberto.doval@councilbox.com @councilbox CELTIC Proposers Brokerage Day -Business Impact Session-

F4*j***TECH** Federated AI Platform for Industrial Technologies

CELTIC-NEXT Seureka Cluster

Dr. İsmail Uzun CEO @INOSENS

<u>www.celticnext.eu</u>



CELTIC-NEXT ∑eureka Cluster

Summary

Key Info

Project Status: running

Start Date: March 2022

End Date: February 2025

Budget (total): 2232.44K€

Effort: 49.06 PY

Project-ID: C2021/1-10

Coordinator

Name: Ismail Uzun

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F4iTECH Project – Kick-off Meeting Minutes 04/03/2022

F4iTECH Summary:

Start Date: March 2022 End Date: February 2025 Budget (total): 3304.4K€ Effort: 68.1 PY Project-ID: C2021/1-10

Attendants: All patterns attended to the Kick-off meeting:

- Korea: DLIT, HUFS and SmartCore team
- Turkey: TORUN, KocSistem, TAV Tech, SAMM and INOSENS team
- Portugal: Sistrade, ISEP (SIDONIOS not attended and presented by Sistrade)
- Romania: BEIA team



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Consortium

Inosens, Türkiye

KocSistem, Türkiye

TAV Technologies, Türkiye SAMM Teknology, Türkiye

TORUN, Türkiye

DLIT, South Korea

HUFS, South Korea

SmartCore, South Korea

ISEP/IPP, Portugal

Sistrade Software Consulting S.A., Portugal

SIDONIOS MALHAS S.A., Portugal



4 Countries,

12 organizations

2 Universities,3 Industrial Partners7 SMEs

* 1 University in Turkey is Subcontractor



		F4iTECH																															
				2022/	/1			202	2/11			2	023	3/1				202	3/11		Т		20	24/	/1	—		20	4/			20	25/1
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	WP	1: Project Management	D1.1	D1.2																													D1.3
		Task 1.1: Project Management																											4				
		Task 1.2: Risk Management																								4			⊥				
		Task 1.3: Dissemination and Exploitation																															
	WP	2: Architecture, Requirements					20	1				D2.2																	Π				
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		Task 2.3: Blockchain architecture design				_													_										4	\perp		\square	
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		Task 3.2: Blockchain Infrastructure																															
		Task 3.3: Client Cluster Management																											Π				
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		Task 3.4: Federated Learning Core																															
		Services & Components																					\perp						╧				
	WP	4: Use Cases and										D4.1																					D4.2
		Task 4.1: Business Requirement Analysis																					$ \rightarrow $						 	\perp			\square
		Task 4.2: Development and Integration																											4				
		Task 4.3: Demonstrations and																											4	4			
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Deliverables

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Responsible

month² software) level¹ INOSENS SAMM **TAV** Tech **Project Management Plan** D1.1 Document CO M1 SAMM BEIA INOSENS D1.2 Risk Management Plan CO M2 Document TAV Tech SisTrade INOSENS Analysis and performance results of airport scenario CO M36 D1.3 Document CO M6 ISEP TAV Tech SisTrade D2.1 **Requirements and specifications** Document ISEP/GTU D2.2 Infrastructure architecture Document CO M12 INOSENS HUFS Ŧ Blockchain architecture CO ISEP D2.3 Document M12 SmartCore KoçSistem M2.1 Final system architecture accepted by the consortium CO M12 Document Federated Learning Infrastructure v1.0 CO HUFS, INOSENS D3.1 Software M24 KoçSistem TAV Tech Federated Learning Infrastructure v2.0 CO HUFS, INOSENS KoçSistem TAV Tech D3.2 Software M30 TAV Tech Blockchain Infrastructure. CO İNOSENS D3.3 Software M24 SmartCore Use Case Definition and Requirements Analysis Report CO ISEP DLIT D4.1 Document M12 TAV Tech document Analysis Output of Demonstrations CO INOSENS TORUN D4.2 Document M36 SAMM Specifications and requirements of the use cases identified and CO M12 M4.1 Document described

Type (report,

Dissem.

Deliverv

Name of Deliverable (Dx.x) or Milestone (Mx.x)

Del. No.

Reviewer 2

Reviewer 1



Federated Learning (FL)



FL is a decentralized machine learning technique that enables multiple parties to collaboratively train ML models while keeping their data **securely** <u>stored on their local devices</u>.

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Idea of F4iTECH



Current AI-based industrial applications follow a linear, sequential approach to data collection, processing, and model deployment, often leading to centralized data collection challenges and potential quality issues.

To address this, F4iTECH aimed to develop a federated learning platform tailored for industrial automation.

FLaction



A **Federated Learning (FL)** platform for industrial automation that offers solutions by building AI models on decentralized data and may use blockchain approach to disseminate data allowing accuracy and privacy.







Business Impact





Business Impact





Business Impact

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INOSENS and DLIT (http://eng.dlit.co.kr/), partners in the F4iTECH project, entered into a Memorandum of Understanding (MoU) with the aim of strengthening their cooperation in the Smart Factories market across ...more



On October 4th, 2023, a seminar titled "Building a Smart Industry (AI, Federated Learning and Blockchain) - A Case Study for Turkey and South Korea Collaboration" was held at **GOSB Teknopark A.Ş.** The event was organized by the **#F4iTECH** project partners, **INOSENS**, DLIT (http://www.dlit.co.kr/), and smartcore. The seminar aimed to strengthen cooperation between South Korea and Turkey in the fields of AI, Federated Learning, and Blockchain. **#smartfactories #ai #blockchain #SouthKorea #Türkiye**



Business Impact



32	Standardizatio n activities: Submission of 2 Contributions to International Standardizatio n Organization (ITU–T SG 20)	January 2023	Contribution Title: Revised texts of Y.DPM-qm based on TD-GEN-0267 R1 Output text of draft Recommendation ITU-T Y.DPM-qm "Requirements and functional model to support data quality management in IoT" Q4/20 meeting (Geneva, 30 January - 10 February 2023) - for consent	Data engineers and Industrial data applications management group
33	Publication of International Standard: ITU-T Y.4603	May 2023	International Standard Title: "Requirements and functional model to support data quality management in Internet of things"	Data engineers and Industrial data applications management group
34	Standardizatio n activities: Submission of 1 Contributions to International Standardizatio n Organization (ITU–T SG 13)	October 2023	Contribution Title: Considerations to create data products in accordance with data ownership classification of digital assets in Web 3.0 environment	Data engineers and Industrial data applications management group

45 Dissemination activity (publication, seminar etc.)

+

Contributions to ITU-T Standards





CelticNextEurekaCluster





MANY THANKS FOR YOUR ATTENTION.



Federated AI Platform for Future Industry

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Business Impact of CELTIC Projects

Moderator: Dr. David Castellas-Rufas, CELTIC GOE Member - Tenure Trac Professor at UAB **Pannelists:** fiQare: Prof. Enrique Alba, University of Málaga together with Manuel Giménez Medina, Chief Innovation Officer / R&D, Ayesa, Spain **UNICRINF & IMMINENCE:** Victor Pascual Avila, Head of Security and Standards - CNS ET Standards

Network Architecture Nokia, Spain CISSAN: Alberto Doval Iglesias, CTO, Councilbox, Spain F4itech: Ismail Uzun, Inosense, Türkiye