

ITEA 3 Call 4 projects

ITEA's 20th Call shows ITEA has found the recipe that nourishes the whole innovation community

Introduction by Vice-Chairman
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The 4th Call of ITEA 3 delivered 24 submitted FPPs, finally resulting in 19 labelled ITEA projects. This year, the labelled projects involved 2942 PY and 15 countries, clearly showing the ongoing interest of our international community in the ITEA Programme.

Again this year, with 53% of the manpower dedicated to SMEs, ITEA appears to be the excellent tool for SMEs to push innovation, and even further, to transform it into market impact, which is the unique characteristic of our Programme. The difficulty in building relationships between large companies and SMEs is common knowledge, but our results show we have found a recipe in ITEA that has major value for the entire innovation community.

This Call again shows the impact of the international customer workshops that ITEA is organising to steer proposals around solving the actual problems of customers through ITEA R&D projects. Seven of the 19 labelled projects (MOSIM, CyberFactory#1, DayTiMe, PIANISM, SAMUEL, SMART-PDM) address the Smart Manufacturing challenges, taking into account many of the recommendations arising from customers. Besides this important topic, which was the

subject of the ITEA Customer Workshop in 2017, the other key themes we observe are:

- Software Engineering, which remains very important in ITEA as our industry is continuously under pressure of new challenges concerning efficiency and quality (CASCAdE, EMBrACE, PANORAMA, SCRATCH, VISDOM, XIVT)
- IoT is nowadays everywhere (COSIBAS, I2PANEMA, SCRATCH)
- Security is always an important theme in the digital transformation (CyberFactory#1, SCRATCH)
- Smart Cities continues to be a place for innovation in ITEA (I2PANEMA, POLDER)
- Smart Health is historically important with a smaller number of projects this year but with an incredibly high level of quality (IMPACT, VrSurgery)
- Simulation (EMBrACE)
- Digital Life (AutoDC)
- Media is back with an original project (Citystory)

Furthermore in this article, you will find a short description of each labelled project. I advise you to follow them along their project journey, you

can be sure they will deliver a set of impactful innovative results for your business!

OVERVIEW OF PROJECTS

Theme	Call 4 projects
Smart Manufacturing	MOSIM, CyberFactory#1, DayTiMe, PIANISM, SAMUEL, SMART-PDM
Software Engineering	CASCaDE, EMBrACE, PANORAMA, SCRATCH, VISDOM, XIvT
Internet of Things	COSIBAS, I2PANEMA, SCRATCH
Security	CyberFactory#1, SCRATCH
Smart Cities	I2PANEMA, POLDER
Smart Health	IMPACT, VrSurgery
Simulation	EMBrACE
Digital Life	AutoDC
Media	CityStory

I2PANEMA - 17001

Intelligent IoT-based Port Artefacts Communication, Administration & Maintenance

Project leader: Materna GmbH (Germany)

Digitalisation is still in its infancy in ports. I2PANEMA aims to deploy the power of IoT to improve port operations, making them more efficient and sustainable, paving the way towards networks of smart ports. Barriers like data security and the lack of integration of existing, heterogeneous IT systems are to be overcome. The requirements of the pilots are important stimuli for developing an IoT port reference architecture. The architectural findings are planned to be contributed to standardisation bodies such as Industry 4.0 RAMI.

AutoDC - 17002

Autonomous data centres for long term deployment

Project leader: Ericsson (Sweden)

With growth in the data centre market expected to continue, the cost of operating and maintaining the data centre footprint will increase. The aim of AutoDC is to provide an innovative design framework for autonomous data centres to enable ongoing operation and self-healing independent of contextual interference, e.g. intermittent power failure or overheating, without the need for any human intervention. Due to lower maintenance and operation costs, autonomous data centres can become key enablers of markets in developing countries.

PANORAMA - 17003

Boosting Design Efficiency for Heterogeneous Systems

Project leader: Bosch (Germany)

The goal of PANORAMA is to research model-based methods and tools to master development of heterogeneous embedded hardware/software systems in collaboration with diverse and heterogeneous parties by providing best practice, novel analysis approaches, and guidance for development. To that end, the main line of action is geared to extending the scope and interoperability of current system level analysis approaches, particularly by enhancing existing abstract performance meta-models. The enhanced meta-model and the related tool framework will be a common and open platform to support collaborative development.

EMBrACE - 17004

Environment for model-based rigorous adaptive co-design and operation of CPS

Project leader: Electricité de France (France)

The next industrial revolution is happening. This is evident in the combination of renewables, electric mobility and connected objects. The proper operation of complex systems requires cooperation between all stakeholders from the start of system design and all along the engineering lifecycle. The EMBrACE project will provide a user-friendly open environment for the co-design of CPS based on a common requirements modelling language, so that requirements can be easily understood, used to verify and optimise the system design, and ensure that the system design is robust in the face of real-life physical and economic constraints and uncertainties.

SCRATCH - 17005*SeCuRe and Agile Connected Things***Project leader: SIRRIS (Belgium)**

The development and operation of secure, large-scale IoT systems is difficult. Technological platforms providing the necessary building blocks to integrate devices and backbone logic exist, but do not address the major concerns of today's software-intensive systems: security, agility and a need for continuous deployment. SCRATCH proposes an integrative approach to IoT, security and DevOps practices through an architectural and process platform consisting of a hardware security foundation for device identity management and security metrics collection, DevOps IoT platform and DevSecOps process, promoting continuous secure operation.

CityStory - 17006*Citizen Storytelling***Project leader: VRT (Belgium)**

The project CityStory wants to innovate through a creative, intelligent, safe and social storytelling development environment. Do-it-yourself and do-it-with-others, around media and make it accessible for everyone. The project aims to stimulate collaboration with a co-creation and design platform to share ideas and get opinions heard. Through new modes of interactive storytelling, city touchpoints, interactive screens, innovative media recognition and data analysis, tools that assist while filming and intelligent and deep learning tools, the project will enable ideas to be turned into a story and valuable media output.

PIANiSM – 17008*Predictive and Prescriptive Automation in Smart Manufacturing***Project leader: KoçSistem (Turkey)**

PIANiSM aims at putting together predictive and prescriptive maintenance techniques to achieve an end-to-end automated manufacturing process and optimise end-to-end manufacturing value chains. To disrupt traditional maintenance processes in manufacturing environments, a sophisticated system is required that covers a wide range of domains such as data science, machine learning, analytics, simulation and real-time processing. PIANiSM will provide related missing analytics techniques and algorithms, introduce new generation of data identification & integration and modelling processes, and try to develop standards to enable more flexible and applicable solutions for manufacturers.

SAMUEL - 17010*Smart Additive Manufacturing – an AM Intelligent Platform***Project leader: 3DSemantix (Canada)**

Additive manufacturing (AM) is becoming more mainstream for prototyping, tooling and production. However, the industry has pointed out that there is a clear need to create an accessible expertise on “which technology for which application for AM process/technology/material”. Therefore, the major goal of the SAMUEL project is to combine the engineer's experience through data-mining and machine-learning methods and advanced analysis concepts to create an AM knowledge base that can assist an engineer or business developer in all major AM steps.

POLDER - 17020

*Urban Data Policy Lab: POLicy & Data
Exploitation & Re-use*

Project leader: Accuro Technology S.I (Spain)

Recent advances in technology, from wireless sensor networks to big data processing and analysis, are changing our cities radically. Urban policymaking is a fundamental aspect of such transformation and can benefit from these emerging technologies with new supporting tools and optimised processes. The POLDER project aims to design, develop and deploy a software tool-suite to support government, city councils and related organisations in the elicitation, design, application and validation of policymaking. POLDER proposes a hybrid policymaking model, where policy is made:

- Data-driven
- Model-driven
- Society-driven

IMPACT - 17021

*Intelligence based iMprovement of
Personalised treatment And Clinical
workflow support*

Project leader: Philips (The Netherlands)

Healthcare faces many challenges like improving patient outcome and working more cost-effectively in the face of growing demand, declining staff capacity and the rapid succession of new clinical and technological developments. The IMPACT project will address these challenges by building on preceding ITEA projects like MEDIATE and BENEFIT to add the next logical step: from evidence-based towards intelligence-based healthcare. To achieve intelligence-based healthcare the IMPACT project will promote automatic data collection and artificial intelligence throughout the complete clinical pathway.

COSIBAS - 17022

Cognitive Services for IoT-based Scenarios

Project leader: Framatome GmbH (Germany)

The Digital Transformation in the industrial domain is currently limited to the connectivity of devices, machines, tools, workers, etc. The amount of data is rising and requires a sophisticated interpretation through analytics to generate business value in terms of faster detection, better forecasts and improved decisions with overall increased flexibility. Current IoT stacks are frequently focused on handling data or data streams. The COSIBAS project targets the next step in IoT-based applications and solutions, namely the integration of semantic and cognitive AI technologies.

MOSIM - 17028

*End-to-end Digital Integration based on
Modular Simulation of Natural Human
Motions*

Project leader: Daimler AG (Germany)

Within the European economy, digital modelling activities and especially simulation of human motion have emerged during the last decades. The ability to realistically predict real-world observations is key to remain competitive. In order to introduce approaches and software solutions, which are capable to automatically simulating a rich repertoire of realistic human motions, MOSIM aims to develop and implement a generic concept, inspired by the FMI standard, transferring the idea of co-simulating models from different simulation environments to the field of human simulation by introducing the Motion Model Units.

DayTiMe - 17030

*Digital Lifecycle Twins for Predictive
Maintenance*

Project leader: Philips (The Netherlands)

The concept of digital twin can provide solutions for the challenges faced in Smart Manufacturing, e.g. for Predictive Maintenance (PdM) techniques. Even though predictive maintenance and digital twins expected to have a high impact on future Smart Manufacturing and Engineering, there are still very few functioning examples of digital twins being used for predictive maintenance in actual industrial practice. It is the gap DayTiMe is about to fill, integrating findings and solutions from 14 industrial use cases and using a generic value chain model.



CyberFactory#1 - 17032

Addressing opportunities and threats for the Factory of the Future (FoF)

Project leader: Cassidian Cybersecurity (France)

CyberFactory#1 aims at designing, developing, integrating and demonstrating a set of key enabling capabilities to foster optimisation and resilience of the Factories of the Future (FoF). It will address the needs of pilots from Transportation, Automotive, Electronics and Machine manufacturing industries around use cases such as statistical process control, real time asset tracking, distributed manufacturing and collaborative robotics. It will also propose preventive and reactive capabilities to address security and safety concerns to FoF like blended cyber-physical threats, manufacturing data theft or adversarial machine learning.

CASCAdE - 17034

Compositional Analysis and Synthesis of Critical Embedded Applications

Project leader: Robert Bosch GmbH (Germany)

New services and solutions for future mobility and Industry 4.0 introduce a new level of complexity for software systems. This challenge is addressed within CASCAdE by introducing a compositional verification approach and automatic synthesis of parallel SW for multicore. It allows individual software components to be verified separately, and then uses these results to construct overall system verification. This approach will be standardised and designed in such a way that other verification solutions can be integrated easily. CASCAdE makes the software more resilient to safety and security issues.

VISDOM - 17038

Visual diagnosis for DevOps software development

Project leader: Vincit Development Oy (Finland)

Visualisation is a powerful method for communication, especially in cross-disciplinary communication with various stakeholders, as in operations. Many software development tools already provide some visualisations, but integrated views that combine data from several sources are still at research prototype level. The VISDOM project will develop new types of visualisations that utilise and merge data from several data sources in modern DevOps development. The aim is to provide simple “health check” visualisations about the state of the development process, software and use.

XIVT - 17039

eXcellence In Variant Testing

Project leader: Bombardier (Sweden)

Within the XIVT project, a method and toolchain will be defined for testing highly configurable, variant-rich embedded systems in the automotive, rail, telecommunication and industrial production domains. This will enable a highly effective, cost-efficient quality assurance, allowing the shift to autonomous, flexible and adaptive applications. The method is founded on a knowledge-based analysis of requirements formulated in natural language, and a model-based test generation at product-line level. It is expected that XIVT methods will result in higher test coverage, more flexible processes of higher quality and better products.

SMART-PDM - 17041

A Smart Predictive Maintenance Approach based on Cyber Physical Systems

Project leader: Siemens AG (Germany)

Manufacturing is undergoing immense yet gradual Industry 4.0 transformation with the help of advancements including predictive maintenance. SMART-PDM's objective is to acquire manufacturing data to provide diagnosis and prognosis information while rendering the underlying technology financially feasible. This will result in lower costs of maintenance, waste and parts as well as improvements in quality and throughput. The technological advancements validated by the demonstrators will help enhance the know-how, technologies, solution offerings and toolsets of the partners.

VrSurgery - 17044

Virtual Reality in Surgical Training

Project leader: Simsoft (Turkey)

The project VrSurgery aims to develop a new generation, intuitive, portable and affordable simulation kit for brain surgery training based on virtual reality technology, enhancing the training of surgeons by granting broader access to simulation environments, and lowering the costs of surgical education in hospitals and medical schools. Increasing the level of skills of brain surgeons will lead to a reduction in national health and insurance costs. Moreover, the simulation approach will be easily extendible to other surgical branches as further applications and business roadmap.