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Country focus:
Sweden

ITEA Success stories:
PARTNER & VMAP

ITEA PO Days 2023
25 years anniversary & exhibition

25 years ITEA 4 1998–2023

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25 years ITEA 4 1998–2023

ITEA is the Eureka Cluster on software innovation

eureka

Dear ITEA Community,

Preparing the future is only possible by understanding the roots.

Solving a problem with a permanent solution can only be achieved by finding its root cause. Defining the formula of a success is only possible by investigating the roots where it stands. Creating impactful results is only possible by achieving outcomes that improve lives.

While celebrating 25 years of ITEA, we are diving into the deepest roots of ITEA to understand how it was established so that we may continue its success in the future by following the footsteps of predecessors and continuously adapting these steps to new conditions. And it has been a joyful and instructive journey.

In this magazine, you will find an interview with Wilbert Schaap, the Public Authority of the Netherlands for ITEA and one of the initiators of the ITEA Community, and with Ayda Kara Pektas, Public Authority of Türkiye, a relatively new member of the ITEA Public Authorities Committee. This gives a perspective on what the roots are and how things have evolved over time. The common denominators are continuously successful results, enthusiasm and trust.

It is also very important how ITEA has been human-centric while being a software innovation community. Creating happiness has been an ambition since ITEA 3 and, in ITEA 4, sustainability has been added as a new ambition when it comes to finding solutions to the urgent needs of today. In the Project benefits story of the HeKiiiiDisco project and the Success stories of PARTNER and VMAP, the impacts for the end-users are shared. And the Community Talk with Gjalt Loots shows the happiness shared by project partners in the ITEA project MOS2S.

If we may enlarge our scope from people to companies to understand the impact that has been created by ITEA, I would highly recommend that you read the article on Cape of Good Code, an SME started after an ITEA project. Not rarely, ITEA projects create start-up companies, new business lines for large industry companies or spin-off companies from large industries.

If we widen our perspectives from companies to countries, then please have a good reading on the article about Sweden and the large industry ABB. I really like the definition of software as a “Glue” given in the ABB article. As we experience that every object in our lives has some lines of software to be more integrated into our lives to make it easier, smoother and connected.

It is not only in our magazines that we are looking to the roots and the future of ITEA. On 12 and 13 September in Berlin, we will have our yearly networking event, the ITEA PO Days 2023, with an exhibition for ITEA projects as an extension to the event this year. This way, you can have a glimpse of the future during the PO Days and have a look of its successes in the near future when you join us in Berlin. I invite you!

I wish you joyful reading.

Zeynep Sarilar

25 years of ITEA

Two Public Authorities share their views of the ITEA experience

"The family feeling in ITEA, not only from the point of view of the companies and research institutions but also on the side of the Public Authorities."

In this edition, ITEA Chairwoman Zeynep Sarılar invites Wilbert Schaap (Dutch Ministry of Economic Affairs and Climate policy) and Dr. Ayda Kara Pektaş (TÜBİTAK) to look back at the past 25 years of ITEA. Welcoming both Wilbert and Ayda, Zeynep turns first to Wilbert, who has been an ITEA 'ally' since day one, and hopes that his story might be "a kind of learning process for me."

Mission impossible? Not at all!

Wilbert explains how it all began in 1998. "As account manager for Philips in the Ministry of Economic Affairs, I learned that Philips was thinking about making a proposal for a Eureka Cluster for the software industry. I thought: this is fantastic because that's what we need. We already have a hardware Cluster to reinforce the European Semicon industry, and that was doing very well. I went to my director then in the ministry and I said I was very much interested and asked if I could do this new programme. I think within an hour he said, Fine, go ahead. So that's why I got involved in ITEA. And in the beginning, we also had some new ideas that you can still see reflected in ITEA today. For example, we introduced the idea of a roadmap for software. This was completely new in the year 1999. It was all about hardware because you can talk about nanometres and measurable stuff like that. Then you can make a roadmap. But for software? Impossible. Well, it's not impossible. The last 25 years have shown it to be a good idea. In all that time I have known all five ITEA Office directors from Pieter Dekker at the start to Jan Jonker today. So far I think the Dutch government is very pleased with ITEA. After all, we have been supporting all these 25 years with an annual budget."

A labour of love

For Ayda, her involvement with ITEA is much more recent. "While I have been working for TÜBİTAK for almost ten years, I have only been working closely with ITEA for almost four years. But I can say that I really love this part of my job coordinating all the internal and external things related to ITEA. I enjoy being in touch with the people in the Cluster, and also the work that we do in ITEA is very satisfying for me, very fruitful. I really love it."

Zeynep clearly appreciates the commitment from both the Dutch and Turkish Public Authorities, and comments that getting such commitment and support is very valuable. "The Netherlands has been a real mainstay for 25 years and is an example to other countries like Türkiye to continue supporting ITEA and enabling the Cluster to flourish."

"Yes," Ayda says, "this commitment and support from Türkiye is strong because we see how ITEA contributes to the software and software-intensive sector in Türkiye. This is very important for us, certainly from the point of being a candidate country for the European Union. I mean Türkiye participates in the projects within the scope of the ITEA programme, and the Cluster helps to build networks and partnerships between Turkish and European companies as well as research institutions. It provides a collaborative environment with joint research projects carried out by Turkish companies and with European partners. This is what we want to encourage. We want Turkish companies to be active as well as interactive in the ecosystem. So, this is why we support Clusters programmes and, in addition, facilitate technology transfer and cooperation between Turkish and European companies and help to strengthen the capacity of the Turkish software industry by participating in the development of new software products and services by Turkish companies. This is what we really care about."

Family feeling and trust

Wilbert echoes the importance of this element of collaboration. "From the very start I think there was a good atmosphere of collaboration and, of course, the family feeling in ITEA, not only from the point of view of the companies and research institutions but also on the side of the Public Authorities. I think that really works well because, as you know, family feeling and trust, they're very well connected to each other. And when you can trust each other, the collaboration can also go deeper as well as easier, faster and broader. This is certainly one of the areas in which ITEA excels. It's an ITEA gem! I'm heavily involved in European Union programmes and projects and this family feeling is quite unique to ITEA. It's good to see that ITEA is maintaining that. And happiness, which is also very important as we know. Furthermore, effectiveness and the flexibility are unique to ITEA. Let's take the effectiveness: We did an evaluation three and a half years ago on Eureka programmes as a whole and there it showed that companies that participated in ITEA indicated that their participation in Eureka

Zeynep Sarılar
ITEA Chairwoman

Wilbert Schaap
Dutch Ministry of Economic Affairs and Climate policy

Ayda Kara Pektaş
TÜBİTAK

Clusters promotes and advances more and better international R&D collaboration and the acquisition of new technological knowledge leads to a faster turnaround time for innovations."

Environment for cross-border collaboration

The tangible impact of participating in collaborative ITEA projects is also felt in and by Türkiye. Ayda: "For us, the ITEA programme has contributed a lot to the development of software and software-intensive systems in programme member countries. It has helped achieve the realisation of numerous joint research projects between European companies and research institutions. So, in this way it has provided an environment for the development of advanced software technologies and thus helps to strengthen the software industry in member countries. And another important aspect is encouraging innovation. ITEA has helped to carry research projects in emerging fields such as IoT, AI, 5G communications, big data, data mining and augmented reality, and thereby keeps member countries at the forefront of those important technological developments as well as promotes cross-border collaboration. This is something that ITEA does very well, creating the environment for networks and partnerships between companies and research institutions, thereby expediating the transfer of knowledge and technology between countries. In this way, ITEA has become a facilitator of cross-border collaboration in the software industry."

Music to Zeynep's ears. "In this international environment we always emphasise that the challenges of the moment are so urgent and the problems are really big. It is not easy to solve them on your own as a company, but also not easy to do it only within your own country. So, this international collaboration is necessary for this."

High Tech Campus Eindhoven

On the subject of collaboration, Wilbert also reflects on the reason why Eindhoven came to be the venue of the ITEA Office. "Actually, in the beginning the French also wanted to have the ITEA Office in Paris but after a bit of haggling and arm wrestling, we managed to settle on the Netherlands. Eindhoven, in fact. Why Eindhoven and the High Tech Campus? Well, Amsterdam proved too expensive and looking at the whole infrastructure and value chain of software companies along with the collaborative DNA of the region, the smartest square kilometre in Europe was a perfect fit. And still is."

"It's a good campus," Zeynep agrees, "and we like to be there. I'm curious about one thing by the way. When I talked with Karlheinz Topp and Luc Desimpelaere in the previous ITEA magazine, they mentioned having monthly meetings, that from the industrial side there was a commitment to have discussions with the Public Authorities for one and a half years on the relevant procedures and aspects. Is this something you recall?"

Taking off

"At the time I thought, what's the best way of gathering information from my counterparts, from the ministries?" Wilbert replies. "And well, that's to convene a meeting of the people from government in ITEA. So, I went to Paris and there in a very small back room in the ministry I asked my colleagues to bring me into contact with their software colleagues.

And the response was quite interesting. Some of the Public Authorities had their doubts and rejected the idea while others thought this was a very good idea. Opinion was mixed on whether this software Cluster could take off. But as you have noticed, it took off quite well. And I'm very pleased with the way it worked out."

We feel this, too," says Zeynep, "also within a project when everybody just takes off their jackets and rolls up their sleeves to focus on the problem. It creates a very equal environment with open collaboration and trust among large industry, SMEs, research institutes."

Platform for SMEs

Ayda takes up this point about the mix of participants in projects, and the role of SMEs. "Thanks to the programme, small, medium and large enterprises in the software industry are encouraged to work together. This is not very easy in all platforms because some programmes are just for large companies. Some of them just focus on SMEs. But in ITEA projects we can focus on all of them, and we can bring them together to cooperate well. In this way it helps SMEs to work in the same field with large and very experienced companies and show their talents and abilities as well as pave the way for potential future collaborations and compete with them. And you know, some SMEs can work together with very big companies like Airbus or Philips, which is not very easy for SMEs to get such an opportunity most of the time. But in a Cluster, this is possible."

Another unique selling point, according to Wilbert, is the flexibility and speed with which ITEA projects come together. "If you look at the flexibility in subjects that can be put in a programme project, that is excellent, of course, but so is the speed. That is something we already started working on six or seven years ago, speeding up the time for putting projects together as well as decision-making from the Public Authority side. It is a real USP for ITEA. And why has the Dutch government been supporting it over the last 25 years?" Echoing Ayda, Wilbert confirms that "we feel that this is a unique programme that offers a lot of Dutch SMEs a very good platform to go European-wide and to make connections with other European companies. And even broader than Europe, of course, because Eureka is not only Europe, but it goes much, much further. And the fact that it's not a closed shop. We see so many new players. This is extremely important also for the Dutch government, to see that the base of companies and research institutions or universities is expanding all the time."

As Zeynep, almost unwillingly, draws this tête-à-tête to a close, she invites both Wilbert and Ayda to share a final recollection or comment. Wilbert kicks off.

Sold-out symposium and walking dinner

"Well, going back to the first ITEA symposium in Toulouse in France. It was perfect. And I must say that the French government played a very important role in the startup of ITEA. The fact that it was in Toulouse with its Centre for Aircraft Development, including software development for aircraft and beyond, was a very good showcase. The turnout was fantastic, more than 200 people for the first symposium. And that really kicked off, I think, the family feeling not only between Public Authorities but also between Public Authorities and companies, research institutions and universities. There was a good flow and this flow has been going strong for 25 years now. I must compliment you [Zeynep] because you're also very instrumental in keeping this flow going. You always have new ideas, new ways of thinking. And one more recollection, the Digital Innovation Forum in 2017 in Amsterdam. It was a wonderful event and there was a huge turnout. My director gave a speech and you introduced a new way of having dinner. Not static with everybody sitting on their chairs and only talking to the person left or right of you but a new idea of having a walking dinner going to the marketplace in Amsterdam and meeting a lot of people was fantastic. I still remember that it was also very, very warm as I recall. And one of the great meetings of the many we have had in the last 25 years."

Zeynep also recalls this walking dinner and the experience of family and friendship. "Sometimes it's just a little change like this that gives more people the opportunity to meet at dinner. It was wonderful. Maybe we'll do something new in future. After all, life is change and change is life. So this fits ITEA well."

Pleasure from results

Ayda shares that "from a personal perspective, as I stated at the beginning, I really like what we do in the environment and it is very satisfactory to see the outcomes, to see how companies collaborate together with the main pillars of the ecosystem, even with very big companies and this is very good. So, when the outcome is so clear, then this is worth getting tired for. When the outcome is so intense and visible, this is reflected in the pleasure I get from the job."

Zeynep: "Thank you both. I mean, it is really critical for us to get your feedback as the Public Authorities and also as a member of the Community because we are all shaping the future together and we are all shaping the future of ITEA. Let's do it together for the next 25 years!"

Focus on Sweden

Research and innovation are crucial for competitiveness, sustainability and resilience

As part of the Swedish Ministry of Climate and Enterprise, Vinnova is the government agency charged with promoting sustainable growth through innovation and thereby strengthening the capacity to achieve the sustainable development goals of the 2030 Agenda adopted by the United Nations. Vinnova invests around SEK 3 billion (EUR 2.7 bn) in research and innovation each year, helping to build Sweden's innovation capacity and enabling organisations to address challenges together. Its headquarters is in Stockholm with affiliate offices in Brussels, Silicon Valley and Tel Aviv. Vinnova's Susanne Liljeblad and Jessica Svennebring explain the role the Swedish agency plays in promoting international collaboration for research, development and innovation, with particular reference to market-oriented Cluster projects like ITEA.

Advanced digitalisation

The focus of Cluster projects is international collaboration between large and small companies, institutes and academies to strengthen both Swedish and European competitiveness as well as contribute to societal benefits and sustainable development in Sweden. Within this landscape, Susanne is responsible for coordinating the ITEA programme for Vinnova and Jessica is Head of Digital Transformation. Jessica explains where the land lies in terms of Sweden's current strategy: "One of the main spearheads is Advanced Digitalisation. We have asked ourselves the questions: Do we have resilience in the different parts in the value chains? Who controls the chips? Who owns the data? Where should we have the focus? For a number of years that focus has been digitalisation, and that is now being coupled with the use of AI and cybersecurity resilience. A report submitted by Vinnova and other authorities published two years ago showcased the need to invest a lot more money in digitalisation, and the Swedish government has really recently given us an assignment to increase our investments in this initiative which also involves major Swedish companies like ABB (see the partner article below), Ericsson and Saab as well as small, medium and large-sized companies in the technology and industrial component. Vinnova's spending on advanced digitalization will amount to SEK 300 million in 2023, SEK 500 million in 2024, and SEK 500 million in 2025, resulting in a total of SEK 1300 million over the three-year period, with industry investing the same amount, too."

Gender equality and lifelong skills

Vinnova's decision to co-fund participation in Cluster projects is based not only on the potential for a return on that investment in terms of potential products, economic boost, employment and so on, but also 'equality'. Vinnova follows up and assesses whether both women and men take part of the grant in an equal manner, participate in and have influence over the projects. Gender equality is found in Agenda 2030, as a goal in itself, but also as a perspective that is a prerequisite for sustainable development. "Equality is a separate criterion when assessing Swedish project proposals or applications, accounting for 10% of the final decision," says Susanne. "We would like to see how the project result can contribute to more gender equality."

"Of course, applicants also have to demonstrate what the benefits will be for Sweden as a whole and also to the competitiveness of the participating SMEs or companies in the consortium. The proposal should be industrydriven and offer the possibility of lifelong learning for the participants within the project. It's a way of connecting with other engineers and researchers in other universities in other countries and of continuing to expand your competencies."

"In the long term, participation in projects of this nature contributes to demonstrating or developing sustainable solutions to societal challenges."

"For Vinnova achieving the sustainability goals is really key," says Susanne. "We measure all projects that we invest in by how sustainable they are. At Vinnova we organise our work around different areas we consider important to create a sustainable society: sustainable industry, sustainable food systems, sustainable mobility, sustainable precision health, sustainable built environments.. The digital transformation and ecosystems for innovative companies and emerging innovations play a key role in this."

International cooperation

Government and industry are on the same page in Sweden when it comes to their collaboration on the various programmes, with industry matching the investment made by the government. This approach extends to the funding schemes in international research and innovation platforms such as Horizon and Eureka. "We participate in nearly every Eureka Cluster and ITEA is certainly one of the key areas for Vinnova in promoting and strengthening international cooperation. The feedback I hear from participating companies is that they value the support and the reviews they get from the evaluators. The ITEA PO matchmaking days are appreciated too – the open atmosphere and opportunities to talk about your project ideas with partners from many different countries."

Susanne and Jessica emphasise how strategically important international collaboration projects that focus on the needs of the industry and have a strong industry commitment are for Sweden's business community. The successful collaboration between committed innovative large and small companies and strong active universities and research institutes that is central to the ITEA Cluster's work is essential to facilitating Vinnova's effort to promote internationalisation. "In the long term, participation in projects of this nature contributes to demonstrating or developing sustainable solutions to societal challenges."

More information:

https://www.vinnova.se/en/

ABB

Provider of world-leading sustainable and automated solutions

The multinational ABB has a history of innovation excellence stretching back 140 years to 1883 when one of its predecessors, the Swedish company ASEA was founded to take advantage of the new technology called electricity. Nowadays, ABB is a leader in electrification and automation technologies, enabling a more sustainable and resource-efficient future. The company's solutions connect engineering know-how and software to optimise the way in which products are manufactured, moved, operated and controlled. ABB employs around 105,000 people and is active on a global scale.

Embedding sustainability

In the four key business areas (Electrification, Motion, Process Automation and Robotics & Discrete Automation) sustainability is a core component. ABB's purpose is to use technology leadership in electrification and automation to address the world's energy challenges and enable a more sustainable and resource-efficient future. Dawid Ziobro, who is research team manager for user experience at ABB's Swedish corporate research centre, suggests that the company's drive to provide both sustainable and also automated solutions in a very diverse industrial and technological portfolio makes it quite unique. "And we do it in a way that is both morally and ethically correct. For us, sustainability is both the right thing to do and a business opportunity. We lead by example by embedding sustainability in everything we do. Our solutions reduce harmful emissions and preserve natural resources. We champion ethical and humane behaviour to contribute to better lives for people around the world."

Focus on software and digitalisation

As part of the corporate research centre, Dawid wants to understand how ABB's customers work, what they do, what their values are, what their pain points are or what kind of processes they offer. "What we do with that information is to use that data and that knowledge to adapt our strategies. An in-depth understanding can help us in restructuring and also adapting our solutions for those specific customer needs. It shapes new business models and new ways of working that benefit our customers, partners and society." This process is supported by research and development, in which ABB invests significantly, geared towards developing and commercialising the technologies,

"Publicly funded projects, such as those in ITEA, are very important for us since within research our role is to both unite, combine and collaborate"

products and solutions that are of strategic importance to future growth. Of the approximately 7,000 employees in research and development, more than 60 percent are focused on software and digitalisation.

Glue

"Software is, quite simply, vital," Dawid stresses. "ABB provides both hardware products and software solutions. Software innovation enables us to both understand and create the connection between various objects or assets – it's the glue between various types of hardware assets. We have R&D teams that develop software solutions as well as a global digital division that focuses primarily on digitalising and creating various software solutions for our business domains. Digitalisation is becoming more important and omnipresent – it optimises the various hardware solutions we have. In the five years I have been at ABB, I have witnessed increasing investment in and a growing presence of the digital transformation here." Collaboration plays a key role in ABB's ability to research a range of topics from artificial intelligence, software and sensors to control and optimisation, mechatronics and robotics. Through collaboration, ABB can generate results to advance the state-of-the-art technologies used in its products and in common technology platforms that can be applied in multiple product lines. Moreover, ABB leverages its ecosystem to enhance innovation and invests and collaborates with start-ups worldwide via its corporate venture arm ABB Technology Ventures and start-up collaboration arm SynerLeap.

It is not surprising, therefore, given how crucial software innovation is to the work of ABB that the company should be such a strong contributor to and benefactor of collaboration within the ITEA framework, being a participant in no less than eight ITEA projects. "Publicly funded projects, such as those in ITEA, are very important for us since within research our role is to both unite, combine and collaborate. By doing this with other institutes and institutions that also have state-of-the-art knowledge, hopefully, ABB and others can gain." For example, through participation in the successful ITEA REVaMP² project ABB uses parts of the tooling that was developed to assure the source code quality of the frequency converter firmware. Additionally, the automatic build script generation for the different firmware variants of ABB's frequency converters (ABB Drives) reduces the manual effort in the development and maintenance of the firmware variants. Another example of the benefits gained by ABB comes in the shape of the acclaimed MODRIO project that led to ABB's Optimax Powerfit product using OpenModelica since August 2015 to generate optimising control code that controls and coordinates about 5000 MW (ca 7.5%) of German electricity production within seconds. This has subsequently been expanded to about 6000 MW, with up to 1500 MW produced by more than 2500 small solar and wind power generators that are coordinated to operate as a single big power plant.

Fruitful visibility

Dawid explains how ITEA projects allow for an arena to be created for different partners to share and exchange ideas and knowledge in fruitful consortia. "We actively look for such initiatives because they create an opportunity for us to be visible and also to benefit from the knowledge and various perspectives that come from the partners in these projects. We see the opportunities that are created when people are engaged in a common project and exploitation. ITEA projects also have a very good review process that really helps point the project in the right direction. Not at all critical or negative but a very constructive and positive experience aimed at making your project more accurate and maybe highlighting various perspectives and pointing out something that you might have not thought about. Furthermore, publications and becoming visible in various types of conferences, articles and journals, these are fantastic spin-offs that these types of publicly funded projects provide. All in all, ABB's research efforts, along with its business goals, are well and truly supported."

More information

https://global.abb/group/en

Project benefits story

HeKDisco

AI system and smart wristband helps prevent the elderly from falling

Which problem has been addressed?

Every year, many elderly people fall and get injured. In 2017 alone, nearly 14% of people over 70 in Western Europe fell and injured themselves to the point where medical attention was required.

It is therefore much better to give a warning in advance when a person starts to develop 'fall-driven' patterns, helping to prevent possible fall accidents by informing the user, their family or nursing staff/caregivers.

What has been developed to solve this?

The use case developed by Caretronic in the ITEA project HeKDisco offers patients an innovative solution that can both predict and detect falls thanks to advanced AI in a wristband. In addition, Caretronic has developed a web dashboard and a mobile app for family members and caregivers to make recommendations regarding the care needed for the patient. Within the project, Caretronic is assessing data from the wristband and combining this with clinical variables and AI algorithms that minimise the vulnerability and hence the risks of falling.

What are the benefits of this solution?

This innovation could support clinical decisions and ease the burden on family members. At the same time, a lot of money could be saved as 37.3 million falls per year are severe enough to require medical attention, with estimated healthcare costs of €1,000-10,000 per patient. Preventing 25% of falls would save approximately €46 billion in healthcare costs. And last but not least, the Caretronic solution could improve the level of the independence - and therefore the quality of life - of the elderly.

Success story

PARTNER

‘One patient, one team’ approach for hospitals

During a patient’s journey through the health system, his or her medical information is often stored in multiple databases focusing on specific elements of the needed care and the patient’s condition – even within one hospital. These databases generally cannot interact, which makes it impossible to draw up all information belonging to one patient at the click of a button.

Wearables and other compact devices that work with physiological sensors are creating a lot of possibilities to monitor patients when they are not in the hospital. Integrating this information with the hospital’s data could open up an information treasure chest that can stimulate better treatment and lower costs for both patients and hospitals.

The PARTNER project, gathering 20 partners from Belgium, Canada, the Netherlands and South Korea, has developed an architecture that makes it possible to let different systems, offered by multiple vendors, communicate with each other. The solution also includes these self-monitoring solutions for patients.

The system has been demonstrated using a fictitious patient’s journey through cardiac care. The demonstration clearly showed

the system's comprehensiveness: thanks to its architecture based on interoperability standards, it enabled the different partners' systems to exchange information.

Strong international collaboration for better care worldwide

Worldwide, over 40 million people suffer from heart failure. A global challenge requires a global solution, so one of PARTNER's primary achievements has been bringing together partners from three continents. In addition to providing a wider reach, such collaboration has clear commercial opportunities for the consortium; every contributor involved has released new products and services, ready to be installed in several hospitals for further trials.

iClinic, for instance, developed the iClinic Heart Failure system during the PARTNER project and has successfully implemented the system at the Heart Failure Clinic at Vancouver General Hospital, with further deployment of the system at Kelowna General Hospital expected in Q4 2023. A recent audit of the iClinic Heart Failure system by the British Columbia College of Pharmacy reviewer described the system as "the most streamlined, functional and safe e-charting system [he has] seen in all the Province." For iClinic itself, participation in the PARTNER project led to three additional full-time employees. The unique collaboration led to a greater understanding of the issues and to subsequent solutions that were more robust. In 2021, €200,000 of additional revenue was achieved and much more is expected in the future.

MEDrecord succeeded in showcasing the (semantic) interoperability with several international partners and licensed their platform as a service, enabling four additional sales in 2022 based on the developments done within the PARTNER project. MEDrecord has also become a Microsoft partner in order to sell the MEDrecord APIs via the Azure marketplace. Sopheon has brought the MS Teams integration designed in the PARTNER project to the market under the name Microsoft Connect. This application was launched as part of their Accolade 13 release and has already been sold and implemented many times at new

and existing customers as a feature component of the standard offering. In addition, Sopheon has launched a series of new 'InnovationOps' products in 2022, including AcclaimProducts and AcclaimIdeas. Like Accolade, these innovation management products contain smart analytics functionalities while running in a scalable, cloud-based environment. The PARTNER experiments impacted the nature of these products: they are being launched to the global market and already have thousands of initial users.

The successful participation of these SME partners highlights PARTNER's role in circumventing dominance by larger companies and the resulting lock-in. Nonetheless, the project has opened doors for large players too.

Barco's Synergi - a solution for meetings between multi-disciplinary healthcare professionals - has been used in a pilot in two hospitals in the UK and Australia, which represents a new business case and has allowed Barco to push further into the health domain. Synergi collects and organises the information and data to make it easily presentable and understandable. This also enables the rapid transfer of the outcome of the discussion and the decisions made to all staff involved in the patient's care. This can lead to a significant improvement in the efficiency of the multi-disciplinary team meetings, as well as a significant reduction in the time between the referral of the patient and the commencement of treatment. Barco Healthcare had two startup initiatives, one of which was Synergi. As a result of PARTNER, some Synergi components are now being used in existing products and Barco is currently working on new, innovative collaborative features for their radiology displays based on the work performed in the project.

Finally, thanks to the PARTNER Hub prototype developed by Korean partner ETRI, patients have ownership of and access to their medical data that is scattered across several hospitals. In addition, ETRI and the Korean consortium demonstrated collaboration between doctors through a medical workflow for a chronic disease patient.

Every contributor involved has released new products and services, ready to be installed in several hospitals for further trials.

In 2021, ETRI transferred the technology to DATAIZE, a Korean startup, and has been providing technical support for them to succeed in medical services based on the My Data concept. In addition, ETRI has developed a separate governance management system to be used for automating a wide variety of medical data processing by linking it with the PARTNER Hub.

'One patient, one team'

For hospitals, the benefits of PARTNER's uptake are twofold. Firstly, for healthcare professionals, it demonstrates that a patient-centric approach with an optimised collaborative care team leads to greater efficiency – up to a 10% improvement compared to traditional workflows – and a knock-on effect of lower healthcare costs. Secondly, improved transparency allows professionals to provide the best services for each individual patient.

PARTNER's maxim is 'one patient, one team'; its central philosophy is driven by dedicated, personalised patient care. When combined with the greater degree of freedom and comfort enabled by smart wearables, this should result in better health outcomes and, above all, a higher quality of life even when ill.

Project start
October 2017

Project end
December 2020

Project leader
Danny Deroo
Barco N.V., Belgium

More information
https://itea4.org/project/partner.html

Cape of Good Code

A business value metric for software leaders

After 18 years at Siemens, and several other companies before that, Egon Wuchner co-founded Cape of Good Code in 2018 to find a solution that would enable architects, lead engineers and project managers to determine, for example, how much effort they need to spend on feature development and maintenance or how easily they could add new features to their systems. The company has developed DETANGLE® Analysis Suite, a kind of Business Intelligence platform for software engineering. "This innovative analysis tool," says Egon, "allows us to expose code quality, architecture quality, team collaboration patterns and software engineering processes in a single code scan."

From gut feeling to numbers

So how did it all begin? When he was at Siemens, Egon came across the same problem time after time in different domains: despite the abundance of good tools for developers to check their code quality, there was a lack of actual support for architects and managers in making the right decisions about software quality. Egon explains: "A broader view is needed. First of all, they have to know what is the state of their development. Do I mainly spend my effort on developing features? And on which ones most? Why am I doing a lot of maintenance work? It's not only about having a gut feeling but having the numbers to back up why they are not getting features on the road. Should they spend a little more effort or a lot of effort to address this or just postpone addressing these issues? Data is essential to take the right measures and make the right decisions. That's what propelled me and my co-founder Konstantin Sokolov, a consultant at Siemens at the time, to start up the company to solve this situation."

Cape of Good Code was a beneficiary of funding support from the national programme in Bavaria/ Germany to develop its DETANGLE analysis tool together with the stakeholders – the engineering

leaders, project managers and software architects. “The funding was all well and good – and essential – but a company stands or falls by its employees,” emphasises Egon. “You have to be able to rely not only on their knowledge but also on their social skills. I feel fortunate in having the best people in place. That’s not easy. We had to reach out beyond Germany to Türkiye to recruit the right kind of software developers. It gives us a dimension that even goes beyond Europe.”

Weighing the pros and cons

The main goal of Cape of Good Code is to support customers in finding the balance between feature development and handling the technical debt of the software. In other words, weighing up the pros and cons, a kind of costs-benefits analysis. Egon: “Knowing whether you’re able to extend your system with new features to make it sustainable for the next five or ten years. This is something totally different. It’s about the architecture quality. Is it extensible with new features? So this is one of our unique selling points, this feature-based metrics that measures the technical debt of your software system, aka quality issues. And then what could be the underlying reasons, the root causes? Root cause analysis is something that’s special to us. I always see our system as business intelligence for software engineering, a way to figure out the right reason, the right level to focus on with limited effort and knowing which is the most effective course of action. That’s our main value proposition. Our next goal will be to integrate run-time data to include performance bottlenecks as KPIs and to measure Feature Usage as a business value metric of features/functions and compare them to their development effort as early as their first deployment.”

Business value

That software innovation is a key element for Cape of Good Code goes without saying. “We have to stay ahead of the curve. After all, ‘software is eating the world’ to quote Marc Andreessen (co-founder of Netscape). We eat our own dog food, actually; we apply our DETANGLE® Analysis Suite in our own development. DETANGLE® integrates different data sources, from requirements engineering to design and implementation like code repositories, the history of the code, even to DevOps processes. In fact, we have to integrate any kind of development methodologies, technical methodologies and technical tools used during software development in order to do the business intelligence for software engineering.”

Furthermore, Egon mentions that Cape of Good Code is going even further in the meantime and is starting to apply artificial intelligence with the

"Not only was it open-minded and collaborative but it also generated results that the industrial partners can exploit. So, yes, I can definitely say we will participate again in the future"

upcoming DETANGLE® Refactoring Assistant complementing the Analysis Suite: "We do not do it for the sake of using artificial intelligence; we always need to figure out the value and the business value of applying it. And that's the general point. You have to figure out the business value behind some digital services that go beyond remote maintenance that has been done for decades, for instance. In the meantime, I have seen several medium-sized companies establishing digital ecosystems platforms to integrate not only their customers, but also partially other industry partners and competitors. Look at Siemens. It wants to become the Industry Metaverse (simulation and digital twins of industry plants). This is the next kind of innovation that's already taking place."

Co-creation

Egon would like to see industry in Europe becoming partners and creating digital platforms and ecosystems, and also sees a more entrepreneurial role for academia. Funding can expedite this. "Funding initiatives can bring academia and industry together to exchange ideas to work on research and development," so Egon proposes "getting industry partners and academia to become business partners, even creating digital platforms and ecosystems together to build, for instance, a multi-mobility management platform, where the billing, routing and journey recommendations are in one place. Technically, it's feasible. The main obstacle is the willingness to share." That willingness to share is what Egon found in ITEA where he first became involved when at Siemens.

Open-minded and collaborative

Christoph Niedermeier, who is still at Siemens, introduced Egon to the ITEA BaaS project led by Franz-Josef Stewing of Materna. "Christoph was the technical coordinator of the consortium. In close collaboration with him I was heavily involved in conceiving, designing and coordinating the effort of many partners in implementing the innovative Building as a Service concepts and software architecture we had in mind," Egon explains. "That's why I have a good memory of that project and it's also how we came to be involved in the ITEA SmartDelta project." SmartDelta aimed to accurately analyse and determine the quality implications of each change and increment to a system. "We actually just joined one year ago. We benefit in many ways from this participation because we cooperate with academia to get some new ideas and product features. We also have a big opportunity there to promote our DETANGLE Shield to the industrial partners, who may be potential customers later on. In fact, our 'new' industrial partners also request new features that we were actually implementing as part of the project, validating and prototyping them, and hopefully getting into the product itself to sell later on. So, it really pays off in terms of knowledge and business networking." This productive experience is likely to spur Egon to do something similar in the future. "Not only was it open-minded and collaborative but it also generated results that the industrial partners can exploit. So, yes, I can definitely say we will participate again in the future."

More information:

https://capeofgoodcode.com

Community Talk with **Gjalt Loots**

A multifaceted connector!

At a time when personal computers began to establish their presence in family houses, Gjalt Loots grew up fascinated by the possibilities they offered for gaming and tweaking but also, and more importantly, with a yearning to find out how they worked. So electronics and digital devices led to a natural interest in studying computer science in which he gained a degree at the University of Groningen. His career began as a researcher in the field of Artificial Intelligence (AI) long before it had gained the mainstream attention that it has nowadays, and later he became a consultant and project manager at TNO. A clear progression from hobby to study to profession, with AI as a common thread.

Buckle up for the ride ahead

"It's a hot topic today. Very, very hot," Gjalt says. "I would say that if you're interested in technology, there is no news item that goes by without any mention of AI, open AI, chat bots, large language models and the like. Back in the days when I was studying, there was also AI with neural networks and those kinds of technologies that are still the key principle and drivers behind what we see today, although on a much smaller scale. We were actually teaching robot vacuum cleaners to find an automatic path through your house and developing licence plate recognition algorithms to detect speeding road users. Now, if you look at the latest AI-steered chat bots my teenage kids are using this technology at school and giving teachers a very hard time in figuring out what was written by a human and what has been generated automatically with just a few prompts. It's an amazing time right now but there's an argument to put a halt to it all. Even a few of the major forces behind the current development are not able to explain what we are seeing and how it is behaving. And it's available for free to billions of people to unlock enormous potential on the one hand but also to use for malicious purposes on the other hand. While it's nice to have witnessed this evolution from back then to where we are now, I couldn't say what the future might hold. I think you should really buckle up in that sense."

Beneficial transition

Among Gjalt's main career highlights is receiving an ITEA Award of Excellence for the ITEA project MOS2S as well as enjoying so many fruitful collaborations with partners from the Netherlands and abroad in the field of innovation. "My personal involvement in many sectors, ranging from space,

"It's about looking at how we can make cross-fertilisation work by teaming up. That's the essence of an ITEA project."

multimedia, telecommunication, AI, digital data ecosystems and the energy sector have allowed me to quickly gain not only a deep and broad experience with technological challenges and innovations, it has also provided me with a network of peers from across the world." R&D has been the central thread in Gjalt's work, beginning at KPN, the largest incumbent network operator of the Netherlands, whose research and development branch was taken over by TNO in 2003. "At that time, TNO had an IT ambition," Gjalt explains, "so I think it was a very mutually beneficial transition, especially for me since I get to work with so many different talents and can mix and match the expertise required for a project. From anywhere within our organisation I can assemble a team to do the job."

Investing with a social flavour

This capability is something that paid off handsomely in 2016 when an ITEA project came calling. This took the form of the MOS2S project aimed at developing and testing audiovisual Smart City technologies and embedding the solutions in a dedicated Smart City Playground. Gjalt led that consortium and that was the first time he became personally acquainted with ITEA. "Although I have a technical background as such, it was steering and assembling a consortium that really appealed to me. It was challenging to be successful on that front, and in submitting a proposal that was selected for funding as well as deliver on the proposals. It's about looking at how we can make cross-fertilisation work by teaming up. That's the essence of an ITEA project. It's not just like, hey, it's a great idea and here's a bag of money – good luck finding out if it works or not. No, ITEA approaches that process as an investor where it's not about making a quick buck. It has a social flavour where the industry and technology organisations work in tandem to produce real marketable products. We had the Netherlands, Belgium, Türkiye and South Korea involved – a very nice and diverse set of countries all with their own use cases and pilots. And having Samsung as a partner, for example, created a global scope, and that's a rare opportunity. As was the timing of the South Korean pilot case we set up at the Winter Olympics. The whole team got to travel to South Korea and we even took in a couple of events. We worked hard and played hard. It made for friendship and companionship that we will never forget for the rest of our lives."

Accessible, cooperative, proactive

Gjalt also appreciates the ITEA Office team. "I have met them many times over the years. What always stands out is how effective the team's approach is: very accessible, cooperative, proactive with respect to not only supporting a project's lifecycle but also in dissemination and establishing cross-fertilisation. These qualities are a constant factor and deserve recognition and appraisal. If I do have a point for improvement, it's synchronicity. The ITEA organisation relies on national Public Authorities for assessing and funding projects and each country has the freedom to implement its own process to award funding to projects. In practice, this means that the time at which countries approve or decline funding requests may differ significantly, which makes starting a project challenging. It would help if a stronger alignment would be in place. But, all in all, my advice to ITEA is: keep rocking!"

PO Days 2023

ITEA Project Preparation Days 2023 & 25 years anniversary and exhibition

Become part of ITEA's next ground-breaking innovation!

25 years anniversary & exhibition

On 12 September 2023, ITEA, the Eureka Cluster programme on software innovation, will open ITEA Call 2023 for project proposals in conjunction with the ITEA Project Outline Preparation Days (ITEA PO Days) in Berlin on 12 and 13 September. This year we will be celebrating our 25th anniversary and extend the event by highlighting ITEA's currently running and finished projects in the afternoon of 13 September.

PO Days 2023: Uniting innovation virtually and physically

The ITEA PO Days event has proved to be the perfect stepping stone to kick off your new RD&I project in the software innovation domain; generally over 70% of the submitted Project Outlines in ITEA are presented first at this lively brokerage event. And building new projects and partnerships can best be done in a physical environment. That is what we learnt in times of the pandemic, during which it was unfortunately not possible to come together physically. Like last year, the ITEA PO Days 2023 event will combine the best practices of both online and physical events of the past, in order for you to get the most out of your event participation!

Be prepared!

From experience we know that the ITEA PO Days are fully-packed days, and therefore it is highly recommended to be well prepared well before the start of the event. That is the reason why a few sessions related to the ITEA PO Days will already take place online again before the physical event in Berlin on 12-13 September. This will optimise the time for networking and consortium building during the event.

ITEA PO Days 2023 Preparation session

On Monday 19 June ITEA set up an online ITEA PO Days 2023 Preparation session to explain the process and online project idea tools for ITEA Call 2023 and the ITEA PO Days 2023, like the Project idea tool and the ITEA Partner search tool. The recording of this session is available on https://itea4.org/podays2023/preparation-session.html.

In short, the ITEA PO Days 2023, including the ITEA project exhibition, will enable you to:

- Present your project idea(s) and/or learn about other project ideas during the online project idea pitch session and the onsite poster
- Discuss and work on your project ideas in constructive, physical workgroup sessions
- Meet companies and potential partners from all over Europe and beyond
- Learn more about the specific funding rules in your country in the online country information sessions and meet Public Authorities to discuss your idea(s) personally
- See how the ITEA Office can support you during the full project lifetime
- Learn from the best during the ITEA Award of Excellence ceremony 2023
- Get inspired by the ITEA projects at the poster exhibition

300+ potential project partners · presentation of innovative project ideas · dynamic workgroup sessions constructive consortium building · best practices

Country information sessions
On 4 and 8 September different online Country information sessions will be scheduled ahead of the PO Days. These sessions will be co-organised with the Public Authorities, to inform the participants about their national priorities, eligibility criteria and funding outlook.

Project idea pitch sessions
In order to enable participants to learn about the project ideas upfront and optimise the time in Berlin for fruitful discussions and consortia building, an online Project idea pitch session will be organised on Thursday 7 September 2032, 13:00 - 15:00 CEST, in the week before the physical event. During this session, project idea proposers are able to pitch their idea and via the Project idea tool, first contacts can already be made with interested partners. This will jump-start the discussions in Berlin.

25 years of international collaboration

2023 marks the 25th year of ITEA; 25 years of ground-breaking innovation which has only been possible through the strong international collaboration within the ITEA Community. During the ITEA PO Days in Berlin, we will celebrate this international collaboration with the ITEA PO Days participants during a short highlight and informal drinks.

ITEA Award of Excellence 2023

During day two of the ITEA PO Days, on Wednesday 13 September from 13:30-14:30 CEST, the ITEA Awards of Excellence 2023 will be handed out. Project leaders from this year's outstanding ITEA projects will share their success stories as well as their recommendations on managing a project successfully. This year the awards focus mainly on Innovation. Three projects have been selected for the 2023 Award of Excellence:2023 Award of Excellence:

- IVVES will receive an **ITEA Award of Excellence 2023 for Innovation:**

The IVVES project is recognised for its innovations as verification and validation methologies for Machine Learning (ML)-based application, synthetic data creation, ML system test automation or data collection in operation. The project will foster the deployment of ML-based applications in several sectors as medical equipment, train maintenance, cybersecurity and finances. It will also increase the productivity of people developing AI applications and will deliver higher-quality ML solutions.

- SAMUEL is also a winner of the **ITEA Award of Excellence 2023 for Innovation:**

SAMUEL is recognised for its innovations as 3D part description and search, Additive Manufacturing partner search, Machine Learning (ML) solutions to predict build time or solutions to improve additive manufacturing process quality. The project will boost the business of Additive Manufacturing (AM) project companies by

improving their build time estimation and quality surveillance. Its AM provider search platform will create a more effective ecosystem and increase the size of the AM market.

- I2PANEMA is the winner of the **ITEA Award 2023 for Exceptional Excellence**, as they excelled in innovation, business impact and in standardisation:

I2PANEMA is recognised for its innovations in container localisation and active noise control, its business impact for the deployment of IoT solutions in ports and its standardisation effort on Smart Logbook Application. Some of its innovations are already in action as the container localisation solution was deployed first in Türkiye and now exported in Europe and Africa. The project has also created business impact for SMEs with one partner growing from 5 to 15 employees thanks to its new solution.

Exhibition 'Highlights of the ITEA impact'

Already for many years, ITEA projects have resulted in cutting-edge innovations that have impact on society and economy. This year we will highlight the impact of running and recently finished ITEA projects at the project exhibition on 13 September, from 14:30 - 17:00 hrs CEST. The exhibition will be open, free of charge, to all ITEA PO Days 2023 participants. Join us to learn more about their latest innovations!

Join us and register now!

Join us at the ITEA PO Preparation Days 2023 & ITEA project exhibition. The participation fee for the ITEA PO Days 2023 is 150 EUR, VAT excluded. This fee also enables you to visit the ITEA exhibition 'Highlights of the ITEA impact'.

Don't miss this great networking opportunity as availability is limited, so please make sure you register in time!

For more information and registration, visit: https://itea4.org/podays2023

We are looking forward to meeting you in Berlin!

Important dates in the ITEA Call 2023

- **4 and 8 September**
  National priorities and eligibility criteria presented by Public Authorities
- **7 September**
  Online ITEA Call 2023 Project idea pitch session
- **12-13 September**
  ITEA PO Days 2023 & 25 years anniversary and exhibition
- **13 November**
  Submission deadline for Project Outlines for the ITEA Call 2023

Smart Cities

eager to improve city living experience and to prepare new services for citizens

Insights into the 2023 Smart Cities customer workshop

On 7 June and 8 June 2023, ITEA organised its 9th international customer workshop in Antwerp and this year it focused on Smart Cities, an important challenge of ITEA. The workshop was generously hosted by Nokia in its premises in Antwerp and organised with the help of Esri Canada, Siemens and BABLE.

The event gathered around 35 representatives coming from 10 end users of Smart Cities solutions representing the point of view of the customers and 18 solutions providers - large companies, research organisations and SMEs – with expertise in the Smart Cities sector. The following organisations took part:

Smart Cities end users / Customers	Industry	SMEs - Research
City of Antwerp (BEL)	Barco (BEL)	Avans University of Applied Scences (NLD)
City of Brno (CZE)	Bosch (ROU)	BABLE.Digital (GER)
City of Ghent (BEL)	Dassault Systèmes (FRA)	Digital Ubiquity Capital (CAN)
City of Hasselt (BEL)	Esri Canada (CAN)	GIM (BEL)
City of Helmond (NLD)	Nokia Bell Labs (BEL)	Liveable Cities (CAN)
City of Rotterdam (NLD)	Royal HaskoningDHV (NLD)	Macq (BEL)
City of Tampere (FIN)	Siemens (BEL)	Public safety Innovation (NLD)
City of Tartu (EST)		SIRRIS (BEL)
City of Zaragoza (ESP)		Sorama (NLD)
Major Cities of Europe EU (GER)		ViNotion (NLD)
		VTT Technical Research Centre of Finland (FIN)

This event was the second Smart Cities customer workshop organised by ITEA, the first one being held in Istanbul in September 2015. We decided to address the Smart Cities challenge once more for several reasons.

First, cities are very important for more and more people. Today worldwide, we have more people living in cities than in rural areas. It is forecast that this will continue to grow with more than 68% of the worldwide population living in cities in 2050. Everyone is interested in the progress proposed by the Smart Cities. Even if we do not live in a city, we all visit and access some of them so would like to benefit from new digital solutions to improve these experiences.

Second, the city level has the most impact politically on the daily life of citizens. So, citizens are eager to be in the loop of new digital solution developments. This presents a benefit and a challenge at the same time to manage citizen engagement.

Third, it is the right time to discuss how some technological evolutions can impact cities. There are more and more available and affordable sensors delivering new types of data that can be exploited to better manage the city. Artificial Intelligence is also an impactful technology for Smart Cities. Since this technology has already been involved in city solutions for several years, we can assess the first lessons learnt from the use of AI.

Finally, the evolution of the city needs the involvement of a lot of stakeholders. To move forward some collaborations must be put in place. This collaborative environment is very similar to ITEA collaborative research projects for which is it very valuable to have a complete value chain working together.

Topics addressed

For these different reasons, it was anatural choice for ITEA to centre the annual customer workshop on Smart Cities. To set up this event, we benefited from discussions with Esri Canada and Siemens who helped us to select four topics for the workshop. This selection was made knowing that a two-day workshop would be too short to address the whole field of Smart Cities. However, the selected topics already covered a large spectrum of research challenges for which software innovation can be a game changer.

- **Environmental footprint:**
  How to stimulate carbon neutrality, circular economy, sustainability and adaptation to climate change?
- **Mobility:**
  How to allow everyone to move from one point of the city to another considering all the mobility modes including walking, bike, trolley, public transportation, motorbike, car etc.?
- **City evolution planning:**
  How to plan the expansion of the city or to transform it for more activities or better living experience?
- **Security and crisis management:**
  How to ensure that the people will be safe inside the city; how to prepare action plans in the case of a disaster like fire, pollution, utilities breakdown, attack, etc.?

I It was also decided to put some emphasis during the discussions on how Digital Twins can help to tackle these challenges. Nevertheless, the term ‘Digital Twin’ is not a clearly defined ‘thing’ that everyone understands in the same way. It is still surrounded by many questions regarding different aspects, from both a technological and application perspective:

- What is the best approach to design the Digital Twins?
- How can the relevant data be collected to design and to feed the Digital Twins?
- How can the Digital Twins be connected to the real systems that they represent?
- How can multiple Digital Twins be interconnected?

› How can Digital Twins be shared between different city stakeholders?

The workshop aimed to enable the different participants to exchange views on these questions and to define a shared challenge on which to collaborate and build a shared vision.

Interactive format

During the first day of the workshop, one round table was organised for each topic with end-users presenting their point of view before having a discussion between them and the other workshop participants. These round tables were an opportunity to listen to end-users who shared their insights on the key challenges and to come up with a common vision of what are the most important problems and issues to solve.
The second day of the workshop was dedicated to brainstorming sessions about potential solutions to solve the challenges that were presented during the round tables. Each group consisted of around 6-10 people with a mix of end-users and technology providers. They focused on one of the four topics of the round tables with the 'mission' to highlight the main problems, discuss potential solutions and propose ideas that could become collaborative research projects to be submitted to an ITEA Call for projects.

Workshop outcomes & online report

Once again, this international customer workshop reconciled the customers concerns and stirred the interest of technology providers (large industry, research institutes as well as innovative SMEs) in a very open manner, thanks to all participants. It was very fruitful with many challenges shared and 16 project ideas generated. The full report, including a detailed description of the challenges and proposed ideas, can be downloaded from mid-July via the ITEA Call 2023 project idea tool.

In addition to the emergence of these concrete ideas and of some collaborations, the workshop has helped to progress towards a shared vision of the research priorities to address the important transformation underway in Smart Cities. The participants developed new connections that will be important as no single player can tackle the current challenges alone. In conclusion, this workshop was very valuable to foster ITEA activities in the Smart Cities sector.

"I am glad to have taken part in this workshop due to the tremendous awareness and wonderful insights it has provided on the complex challenges faced by modern cities. The multidisciplinary nature of the workshop enabled a rich exchange of knowledge and perspectives and sparked our enthusiasm to tackle with courage the opportunities in the Smart Cities sector. I am looking forward to continue the collaboration and partnership with ITEA and the great people I met at this session."

Razvan Patcas
Technical Project Leader
Robert Bosch SRL - Romania

"I look back on an interesting and successful ITEA customer workshop. It is great to see how first matches are being made between the challenges of the cities and propositions from the market. Perhaps even more interesting is the fact that many cities struggle with the same questions. This offers opportunities for truly transferable and scalable solutions from the market. To achieve this it is important to make a clear separation between applications and the underlying data. And to align as much as possible with international standards."

Daniel de Klein
Business Development Manager Digital City
City of Helmond - the Netherlands

VMAP

Enhancing interoperability in virtual engineering workflows

Success story

A wide range of computer-aided engineering (CAE) software tools already enable virtual material and product design, virtual manufacturing and machining process parameterisation, and virtual product testing of high-tech materials. However, these tools are rarely interoperable and contain multiple native formats for storing the CAE data to be transferred between simulation codes, such as geometrical discretisation, simulation results and metadata. The ability to carry forward result data from one simulation step to another in a CAE software workflow has therefore always been dependent on customised data transfer solutions, which require a huge effort in terms of time and money.

The goal of the ITEA project VMAP, which ran from September 2017 until October 2021 with 29 industrial and academic partners from Austria, Belgium, Canada, Germany, the Netherlands and Switzerland, was to gain common understanding and interoperable definitions for the modelling of materials and manufacturing processes and to generate universal concepts and open software interface specifications for the exchange of simulation results information in CAE workflows.

Faster innovation through increased flexibility and reduced set-up times

The VMAP project has filled this gap by creating the world's first CAE workflow interface standard for integrating multi-disciplinary and multi-software simulation processes in the manufacturing industry. This standard is vendor-neutral, cost-free and completely open to any interested party, helping to maximise its uptake amongst companies of all sizes. The first public version of the standard was announced by the VMAP project on 10 January 2020, before the end of the project.

VMAP's major result is simple: setting up and adapting workflows in computer-aided engineering is now quicker, easier and more cost-effective than ever before. One clear example of this has been demonstrated by Philips, where the innovation speed of highly complex parts has increased by almost 50%. Similarly, the time spent on strength assessments in the moulding of plastic parts by RIKUTEC Richter Kunststofftechnik in Germany has been reduced by 42% and the set-up time for virtual process chains for lightweight automotive components with composites within a prominent German car manufacturer fell by 40%. This efficiency gain was also confirmed by the DLR Institute of Structures and Design, as the design of jet engines is a highly interdisciplinary process and VMAP significantly contributes to automation as it seamlessly integrates into the respective tool chains. By eliminating the need for customised solutions, delays caused by human errors are also greatly reduced.

Project start
September 2017

Project end
October 2020

Project leader
Klaus Wolf
SCAI, Germany

More information
https://itea4.org/project/vmap.html

These examples clearly show that the introduction and use of format and interface standards increases software interoperability. Consequently, VMAP leads to significant savings in the creation and adaptation of process flows in virtual engineering. These reduced time expenditures and the increased flexibility in virtual design can therefore help to increase the innovative strength of a company even in the short term.

The VMAP IO Library, which is provided free of charge, also enables software owners to adapt their own codes to this new standard with little effort and thus make them compatible with a growing number of other simulation tools.

Standards Community

As a standard is only as strong as its users, the VMAP Standards Community e.V. (VMAP SC) was created on 20 December 2022 by 16 founding members, including several partners that were attracted from outside of the consortium, with the purpose of disseminating the VMAP standard, further developing it and ensuring and maintaining a uniform interface development library. The VMAP SC is open to any interested party that wants to use or contribute to the standardisation efforts of the VMAP SC. Several VMAP Standards Community webinars and workshops were organised in 2022 to inform the sector of the progress achieved and discuss the technical extensions and industrial use cases.

The VMAP Community is a growing collection of interested users, code developers and researchers who, together with the VMAP SC, support the further spread of the VMAP standard. It currently contains more than 150 entities, including large players such as Bosch and Philips, and has good links with other standardisation groups such as Modelica/FMI, the European Material Modelling Council and the ISO STEP 242 community.

The current standardisation activities of the VMAP SC focus on the extension to support complete calculation models in the standard so that input parameters and load cases for simulation models will soon be able to be stored neutrally and uniformly for as many simulation tools as possible.

Another focus is the consideration of real data from sensors and measurements, which are needed for the evaluation and validation of the virtual calculation models. This solution to this problem is of particular interest to the manufacturing industry, which would like to use it to improve their production processes and product qualities. More information about this can be found in the follow-up ITEA project VMAP analytics.

‘String of pearls’

VMAP is the first-ever CAE workflow interface standard. One of its biggest strengths is therefore its rich potential, which the community seeks to exploit by extending the standard into technical domains beyond simulation for manufacturing parts. The VMAP SC is therefore continuing its efforts. The VMAP analytics project, coordinated by Swerim AB (Sweden) will contribute to the standardisation of data transfer for Computational Fluid Dynamics (CFD) and multi-scale simulations, test and sensor data storage, and the alignment of AI methods for data analytics to the VMAP standard. Within this project, the Swedish partners from the steel industry (Gränges, Morgardshammar, Ovako and Prevas) and the IT company Gemit will adapt VMAP to their own monitoring and simulation workflows. The ultimate goal of the VMAP analytics project is the concept development of a digital twin platform for implementing analysis tools, methods, models and process data using the standardised interfaces.

The recently started H2020 project PIONEER is developing an open innovation platform and a digital pipeline that connects various technologies towards the optimisation of the design of industrial systems through simulation and the improvement of the efficiency of production processes. VMAP will play a major role in interconnecting different simulation environments with data from design, test and machine monitoring. The Eureka project HyPerStripes is working on the development of solutions for flexible interconnects and planar hybrid foil systems. Again, VMAP has the role of an open and interoperable data format for simulation.

VMAP thus represents the tip of the iceberg: as the number of organisations involved in the community increases, so too will the number of engineering domains which can benefit from the faster processes and lower costs of CAE interoperability. ITEA is supporting the further development of this standard in future ITEA projects in the VMAP line to create a new ‘string of pearls’ – successes that have laid the foundations for ITEA to be just as, if not more, successful in the future in a number of key domains.

REGISTER NOW!

12-13 September

ITEA PO Days 2023

Berlin, Germany

25 years of ITEA Roadshow

Join the 25 years of ITEA Roadshow:

- United Kingdom: 25 July
- Finland: 25 August
- France: 31 August

Register for free via https://itea4.org/25-years-of-itea-roadshow/25-years-of-itea-roadshow.html

Calendar

19-25 AUG 2023
32nd International Joint Conference on Artificial Intelligence
Macao, S.A.R
https://ijcai-23.org/

12-13 SEPT 2023
ITEA PO Days 2023 & 25th anniversary + Exhibition
(ITEA 4 Call 2023)
https://itea4.org/podays2023

13-14 SEPT 2023
16th Graz Symposium Virtual Vehicle
Graz, Austria
https://www.gsvf.at

13-14 SEPT 2023
Intelligent Health 2023
Basel, Switzerland
https://intelligenthealth.ai/

19-21 SEPT 2023
Urbis Smart City Fair 2023
Brno, Czech Republic
https://www.bvv.cz/en/urbis/

26-27 SEPT 2023
Cyber Security & Cloud Expo
Amsterdam, Netherlands
https://cybersecuritycloudexpo.com/europe

26-27 SEPT 2023
International Cyber Expo
London, UK
https://www.internationalcyberexpo.com/

10-13 OCT 2023
41st Motek
Stuttgart, Germany
https://www.motek-messe.de/en/

11-12 OCT 2023
World Summit AI 2023
Amsterdam, Netherlands
https://worldsummit.ai/

13 NOV 2023
ITEA Call 2023
Deadline submission of Project Outlines
https://itea4.org/

By and for end users

Dynaxion aims for a safer society with AI-based Spectroscopy

Current screening technologies for parcels suffer from false alarm rates of 20-30%, requiring costly human intervention and the use of sniffer dogs to verify contents such as explosives and drugs. For this reason, Dutch SME Dynaxion trains artificial intelligence (AI) algorithms on complex spectra and uses the trained networks to classify threat materials in baggage and parcels – innovations that the company is developing further in the ongoing AI Call 2020 project Spectralligence, which stands for Spectral Analysis in life sciences and materials sciences through Artificial Intelligence.

The next step

Although there are over 20 different types of spectroscopy - which is a study of the way matter absorbs or sends out light and other radiation - and these have one thing in common: the extraction of information from a spectrum or histogram. Until recently, traditional approaches for security screening mainly utilised X-rays and computed tomography while the acquisition of spectral data and manual interpretation of the images required highly trained experts, all of which led to inadequate material recognition, false negatives and low efficiency. This can have an enormously negative impact on society: in the USA alone, some 100,000 people are estimated to die annually from opioids, many of which are transported via international mail. Fortunately, the rise of machine learning has shown that AI outperforms traditional algorithms and provides better and more accurate results, making this the logical next step in the development of spectroscopy.

Sought-after spectroscopy

For Dynaxion, the focus lies on gamma ray spectroscopy to establish the elements present in a substance and their relative atom fractions. These elements are determined from the various peak locations and the atom fractions from the relative height of the peaks. This process can be complicated by factors such as low statistics, noise and detector effects like gain shifts and variations. However, it made the company an ideal candidate for Spectralligence, which was actively searching for SMEs to join the consortium headed by Philips. After a mutual connection took note of its AI-based approach to spectroscopy, Dynaxion was contacted by a project coordinator from fellow consortium member Eindhoven University of Technology and jumped on board.

Knowledge and experience

Having begun in November 2021, the project is currently around its halfway mark and ultimately aims to demonstrate that cross-domain validated neural networks for spectral analysis can significantly reduce dependence on humans, thereby accelerating the adoption of this technology and the growth of the market. To this end, Dynaxion has contributed a wealth of knowledge on aspects such as de-noising, spectral deconvolution and explainable AI, as well as experience with certain networks or algorithms for optimal

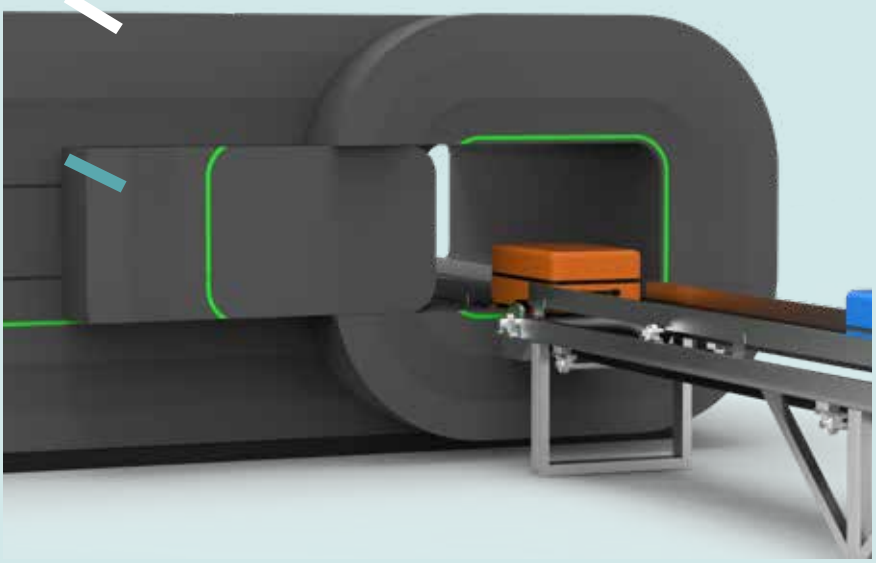
classification. So far, this has included the literature review and participation in several workshops for knowledge transfer between the partners in the Netherlands and Finland. Dynaxion is also responsible for a number of deliverables within the project, such as a report on the workflow and how Spectralligence intends to move towards one-click analysis that does not require physicists to tune various parameters.

Rising to the challenge

Such work also requires a keen understanding of the human element of technological dissemination. For successful customer installation, Spectralligence has identified a number of technical challenges that must be overcome, including an acquisition time of less than 6 seconds per screened object to allow fast logistic flows, a robust classification accuracy of over 95% and auditable, explainable results using AI. These are some of the aspects that Dynaxion is trying to address for finding illicit materials in parcels and suitcases using an accelerator-based neutron scanning system. This will utilise both real measurements and simulation data, which will be processed, augmented and fed to the AI algorithm to generate material classification with a high degree of accuracy.

The ITEA element

As for Dynaxion itself, a major appeal of ITEA participation has been the financial support that can be hard to come by as an SME. The company has also been able to benefit from the many interactions within the project, including with academic specialists and commercial companies that are active on the same topic but with very different application markets. This has allowed Dynaxion to adapt its approach and implement new techniques that may not have been accessible without the consortium. As a direct result of Spectralligence, Dynaxion expects to start selling a security screening product with a much higher performance than current methods.



A safer society

In the longer term, Dynaxion expects the Spectralligence project to be a major boost for both business and wider society. By replacing human operators in the security process, for instance, each system is expected to lower the operational costs of security screening at airports by about one million euros per year. With AI-based spectral analysis, the team is also confident that more threat materials can be uncovered with lower false alarm rates, diminishing the chances of terrorist attacks or the successful transportation of drugs and other illicit goods. Thanks to its involvement in ITEA, Dynaxion is confident of significantly improving its classification algorithm. And in the end, the more threats this system can pick up, the safer our society will be.

More information:

https://dynaxion.nl
https://itea4.org/project/spectralligence.html

25 years of ITEA

Ground-breaking innovations we're still grateful for today

This whole year, including in our ITEA Magazine, we will be celebrating 25 years of ITEA by putting the great successes that have been achieved over these past decades in the picture. In the March edition, a small selection of ground-breaking innovations from the first ITEA programme was revealed. In this Magazine edition, we will highlight a few gems from ITEA 2, which ran from 2006-2014, and in the November Magazine, we will take you to ITEA 3, so enjoy the journey!

Modelisar

2008-2011

An international standard for systems and embedded software design in vehicles

In 2008, modelling was not new in automotive systems development, but enabling interoperability between different subsystem components from various disciplines presented engineers with a big challenge. The objectives of the ITEA project MODELISAR were to boost collaboration and innovation across system and software disciplines and to test vehicle behaviour earlier, faster and more affordably in the virtual world.

During the project, the international and open Functional Mock-up Interface (FMI) standard was developed to conveniently exchange and interoperate models from different modelling and simulation environments. Thanks to the plug-and-play coupling of different existing models and embedded software components from different domains, the integrated simulation and testing of a complete mechatronic vehicle system – the functional mock-up – could be achieved at lower costs in less time.

To continue the cooperation beyond MODELISAR, the core FMI development partners founded a new Modelica Association Project, 'Functional Mock-up Interface' (FMI MAP) - https://www.fmi-standard.org.

There are already 170+ software tools supporting FMI, demonstrating the great success of the MODELISAR project. FMI is currently being exploited in many system design tools in automotive applications by OEMs and

their suppliers within a large variety of areas: engines, engine controls, powertrain and cabin applications like air conditioning. After MODELISAR, FMI gained worldwide acceptance in the automotive domain and is spreading widely in non-automotive areas like aerospace, trains, automation and energy.

Finally, many follow-up projects have continued to build on the legacy of MODELISAR, making vehicles more efficient and safer. MODELISAR laid the foundation for the digital transformation of the car industry in Europe.

https://itea4.org/project/modelisar.html

Metaverse1

2008-2011

The missing link between the real and the virtual

15 years ago, virtual worlds were already available in serious computer games and simulation models. However, they were mostly standalone and independent of each other with little or no connection to the real world. The ITEA project Metaverse1, which successfully ran from October 2008 to March 2011, set out to overcome this isolation by defining a standard to enable connectivity and interoperability between virtual worlds and the real world. The objective was to define interoperability in such a way that it would be possible to exchange information between worlds.

An important development of Metaverse1 was a standard interface between the real physical world and the ▶

virtual simulation/serious gaming world. This made it possible to attach real-world sensors, such as body parameter or environmental sensors, to provide input to simulations or, alternatively, obtain feedback from such models for the real world, such as to control lighting, temperature and ventilation or for personal wellbeing.

A key outcome was an international standard within the ISO/IEC Moving Picture Experts Group (MPEG). The first version of the ISO/IEC 23005-1:2010 (MPEG-V, media context and control) standard was published in January 2011. MPEG-V defines boundary conditions, but the real added value is in the applications – transforming the signal into something useful.

Nowadays, the metaverse is a hot topic and some of the world's biggest companies are investing billions into building technologies and experiences, promising us an entirely new way of interacting and new wave of innovation. According to Harvard Business Review in May 2023, the metaverse, while still in its early stages, will help us connect with people from all over the world in a more meaningful way and can help us be more productive and fulfilled in our personal lives. Metaverse1 contributed to this by creating the missing link between the real and the virtual 15 years ago.

https://itea4.org/project/metaverse1.html

SoRTS

2014-2016

Tumour in sight during radio treatment

Radiotherapy affects not only cancer cells but also healthy cells in the area that is being treated, so it is important that as little healthy tissue as possible is affected. The problem is that the movement of a tumour under the effect of respiration, for example, risks damaging surrounding tissue, whereas magnetic resonance imaging (MRI), the only imaging modality that can visualise tumours well, traditionally takes minutes to create the image. The goal of the SoRTS project was to develop a system of real-time systems to have the tumour in sight during radio treatment.

One of the key outcomes of the ITEA project SoRTS was the MR-LINAC (Magnetic Resonance Imaging - Linear Accelerator) system, commercially introduced as the Elekta Unity, designed to improve the targeting of tumour tissue while reducing exposure of healthy tissue to radiation. In 2020, this version of the MR-LINAC was already available in more than 60 places for patient treatment worldwide and the order intake is increasing.

The innovative MR-LINAC treatment offers clear benefits for patients, as much fewer treatments are necessary and the treatment takes less time and is less intrusive, enabling patients to continue their daily lives. Unfortunately, the project leader himself needed radio treatment during the last year of the project. The traditional treatment would have involved 20 treatments in four weeks. However, the MR-LINAC treatment, based on the SoRTS project results, offered a treatment of five sessions in 20 days. This reduced the burden of travelling to the hospital substantially and the side-effects, like fatigue, were also much less. As less tissue is damaged, the recovery time in general is also much shorter. In fact, he was even able to work about half of the time in these 20 days instead of being out of work for four weeks. Also, possible discomfort, like being partially out of action for a few months, did not occur with the MR-LINAC treatment.

Finally, there is also a strong benefit for hospitals. As fewer treatments are needed per patient, they can treat many more patients in the same amount of time. Saving costs, saving time, saving lives.

https://itea4.org/project/sorts.html

C³PO

2014-2017

C³PO democratises city planning

With almost five billion people living in cities, the urbanisation and immigration challenges posed to cities are becoming immense. City design is complex and everything impacts everything else. City planning by co-design is a solution, but it requires simple access to different sources of information, the visualisation of relevant information for decision-making, the simulation of different scenarios, stakeholder communication support and the combination of static and dynamic data.

The ITEA project C³PO has found ways for city planners and designers to consult citizens throughout the urban transformation process and thereby give citizens a better say in urban developments. The consortium of 21 partners developed a cloud platform based on existing technologies and applications, as well as new products for the smart cities market. The project was strengthened by the participation of the cities of Brussels, Kortrijk, Kouvola and Oulu and the Municipality of Pendik (a district of Istanbul), which served as test beds. A few examples of the many developed and enhanced applications and products are the 'Participation pavilion' from Studio Dott, allowing them to enter a new market with a projected revenue growth of €1.7 million within five years for them. Barco created, among other things, TCAVE, a world-first professional collaborative VR solution, and CANVAS, which addresses a new market segment for Barco in which they expect an annual growth of about 10% in the coming three to five years.

Thanks to the C³PO project, citizens can now benefit from better liveability and engagement in their city, gain new ways to participate in improving the place where they live and work and have continuous access to up-to-date city development plans that they can influence. Cities, supported by enhanced data analysis procedures, profit from improved decision-making processes and mitigated urban development risk through better planning and prediction and can actively involve their citizens.

https://itea4.org/project/c3po.html

25 years of ITEA

ITEA Call 2022 projects

Unveiling strong international projects with focus on AI

ITEA Call 2022, the second ITEA 4 Call, has generated very interesting and high-quality proposals. 20 of them were labelled by the ITEA Board in March 2023, representing an effort of more than 2,740 person-years and involving partners from 23 countries. As usual, we see a good balance between SMEs that have the agility to innovate (representing almost half of the effort), large industries that can quickly bring the outcomes of the projects to the market and research centres that provide beyond State-of-the-Art research.

It is worth noting the international reach of this Call. New European countries now support ITEA's Call, including the United Kingdom – involved in five projects – and Switzerland. We also see the participation of companies from the United States and Australia, which are interested in being part of the ITEA research programme even if they will most probably be self-funded. The main countries for this Call remain Belgium, Canada, Germany, Finland, Portugal, South Korea, Spain, Sweden, the Netherlands and Türkiye. Beyond their international dimension, the projects have well-defined objectives, high market ambitions and relevant consortia for the technical challenges and the exploitation phase.

Regarding the topics of the projects, Safety and Security is the most represented ITEA smart challenge with five projects. These projects explore different facets of this challenge, covering physical infrastructure security, fire safety, disaster prevention, connected infrastructure security and protection against cyber security fraud. Smart health is also a well-represented ITEA challenge with four projects. Three of them were discussed during last year's ITEA customer workshop dedicated to Smart health. Smart engineering is again a strong topic with four projects that aim to complete the ongoing effort of ITEA to help the design and operation of complex systems. There are three projects related to smart industry that address different industrial sectors from manufacturing to agriculture. The less represented challenges are Smart energy (two projects), Smart mobility and Smart communities (each with one project). No proposal has been submitted for the Smart cities challenge and we hope that this year's customer workshop focusing on this challenge will create new momentum.

The technology focus of the projects continues to be Artificial Intelligence (AI). Different areas of AI will be researched, such as the development of digital twins, the use of domain knowledge represented with ontologies, the exploitation of natural language recognition and the ability to explain AI system outputs. As is often the case, most of the projects have defined use cases that will help to focus the research and to prepare fast exploitation.

In summary, the ITEA 2022 Call is composed of very strong, international and AI-driven projects. We wish all of them good luck for the national applications and hope to see them kick off soon.

ARTWORK 22019

SmART and connected WORKer

Project leader: Daimler Buses - EvoBus GmbH (Germany)

ARTWORK is developing a real-time assistance system for workers in plants who still work with their hands to build customised products like trucks and machines. The solution will comprise digital twins of factory workers and equipment, smart instruction generation and a worker feedback system. The goal is to connect workers to the production line and enable automatic derivation of process instructions based on the context, allowing workers to build customised products more efficiently. The use of and contribution to standards will furthermore allow widespread deployment of the technologies and tools.

BE Faster 22046

Building Energy Flexibility at Scale for Trading and Earning of Revenues

Project leader: Consortio Limited (United Kingdom)

BE Faster brings countries closer to net zero by creating a scalable flexibility trading platform enabling a smarter use of data and controls to reduce energy wastage and support grid supply-demand balancing. The solution defines the net-zero pathway for organisations by looking at carbon grid intensity as a signal for trading. BE Faster provides novel algorithms for trading based on several parameters identified using digital twins. The ecosystem will be accessible using open-source code and templates and standards developed will be used to roll out the solution to partner countries.

CAPE 22017

Cognitively Smart Assistant in Phygital Environment

Project leader: Inosens (Türkiye)

The retail sector plays a crucial role in a country's economy but needs to undergo a transformation in order to be able to provide a seamless shopping experience, combining online and offline activities, that includes personal recommendations and the continuation of purchases initiated in one channel to the other. CAPE addresses these challenges by using various technologies, such as AI, deep learning, blockchain and IoT, to develop personal experiences, improve the performance of robots/kiosks and offer alternative opportunities and technologies not widely available in today's market. The targeted impact includes improved customer and employee satisfaction, increased sales and more efficient store operations.

CODEFILE 22012

Cross-Organisational Data Enrichment for Financial Institutions and Law Enforcement

Project leader: TNO (the Netherlands)

CODEFILE aims to enable the usage of sensitive data in such a way that no information leakage occurs by developing tools to support joint data analysis between financial institutions and law enforcement agencies. This will enable the detection of suspicious activities without compromising privacy or violating regulations. CODEFILE will deliver solutions that improve the anti-money laundering detection success rate with less effort and will additionally create a network where information can be shared securely.

FERIDE 22016

FERtigation Irrigation DEcision Support System

Project leader: ARD GROUP (Türkiye)

Increasing food demand and decreasing water resources have created an urge to find new technologies for the efficient use of water and fertiliser for agriculture. FERIDE aims to provide a technologically controlled farming environment to improve the availability and absorption of water and nutrients in the soil, resulting in a substantial increase in crop production and quality while decreasing farming costs. They will develop a European-scale network of actors to better manage logistics and implement an information system platform, allowing communication between different system actors such as farmers, fertiliser suppliers and irrigation providers.

FireBIM 22003

Accounting for fire safety engineering using Building Information Modelling

Project leader: RISE - Research institutes of Sweden (Sweden)

European national building regulations on fire safety are different from country to country, making international collaboration demanding, costly and risk-prone. FireBIM aims to harmonise and implement the fire codes of its participating countries in an open-source, web-based BIM platform for fire safety assessment that facilitates (inter)national fire safety documentation and compliance from the early design stages. This will enable collective interpretation of fire regulations and automated compliance checking of buildings against fire safety regulations. As a result, design teams will be digitally assisted to create safer and better buildings cost-effectively.

I2DT 22025

Intelligent Interoperable Digital Twins

Project leader: RISE - Research institutes of Sweden (Sweden)

The I2DT project aims to create an interoperability framework, methodology and tool support for constructing digital twins that can reflect complex systems with large-scale heterogeneous data and interactions. The project will address core technologies and application domains of interoperable digital twins and apply them to relevant areas like industrial production, smart cities, infrastructure asset management, wildfire protection and renewable energy resources. The project will also advance model-based development, integrate machine learning components, define a unified reference architecture and provide tool support for both engineering and operating digital twins.

MAST 22035

Managing Sustainability Tradeoffs

Project leader: University of Groningen (the Netherlands)

Software-intensive systems are required to be more and more sustainable in regard to the ease of making changes to the code and to the power consumption and its associated carbon emissions. Often, these aspects conflict with each other. By developing tools and methods, MAST will deal with the complex trade-offs between these two aspects of sustainability, aiming to guide development teams in optimising their design decisions according to stakeholder concerns and system/environment constraints. Organisations will benefit from the MAST results by reducing carbon footprints and technical debt, complying with sustainability regulations and being more competitive by increasing product quality and creating new business models.

MediSpeech 22032

Automated medical reporting-improved clinical efficiency to enhance the patient experience

Project leader: KnowL Solutions B.V. (the Netherlands)

Nowadays, administrative tasks can consume up to 30% of clinicians' working hours, diverting attention from patient care and contributing to physician burnout. The MediSpeech project aims to reduce administrative waste in healthcare by creating an open digital healthcare ecosystem for automated medical reporting. The proposed solution uses AI-powered speech recognition, data interoperability and harmonisation, and technology-advanced clinical decision support to transform the healthcare model into a patient/doctor-centred approach.

NADIR 22014

Natural Disaster Risk and Assessment Platform

Project leader: EarthDaily Analytics (Canada)

Climate change has a significant impact on our biosphere and is affecting people's lives, properties and health while hastening biodiversity loss through wildfires, flash floods and mega-drought events. NADIR aims to build a natural hazard/disaster risk and assessment platform to provide advanced risk assessment products and critical intelligence information to support the mitigation and management of natural hazards/disasters using (new) satellite imaging. This type of data, together with the known ground truth, will allow the extraction of significantly improved intelligence information, enabling better monitoring, management (simulation and operational planning), prediction and, in some cases, prevention of the large-scale impact of natural disasters, thereby reducing damage and saving lives.

OpenSCALING 22013

Open standards for SCALable virtual engineerING and operation

Project leader: Robert Bosch GmbH (Germany)

The European Climate Law sets the intermediate target of reducing net greenhouse gas emissions by at least 55% by 2030 and for Europe's economy and society to become climate-neutral by 2050. OpenSCALING extends open standards and established modelling and simulation tools to support large-scale systems and distributed controllers deployed in the edge-cloud continuum in order to reduce energy consumption and greenhouse gas emissions. Several industrial demonstrators will showcase how the OpenSCALING innovations and benefits can be applied in the energy, building, aviation and automotive domains through green hydrogen production, more efficient heat pumps, fuel cell propulsion and electrified vehicles.

Optimal-LOADS 22004

Optimal Logistics Operation & Analysis Data Space

Project leader: Materna Information & Communications SE (Germany)

Recent crises have demonstrated the importance of ensuring the resilience of the supply chain and its logistics processes and have reinforced the need for the logistics industry to permanently enhance these processes. Optimal-LOADS plans to optimise and digitise logistics and aims to create trust among data providers and users by developing data spaces in various sectors, ensuring data sovereignty and enabling interoperability in multi-stakeholder environments. This will contribute to improved efficiency of the multi-modal logistics supply and transport chains and the valorisation of data in the logistics sector.

PROFIT 22021

PRocedure Optimisation and data-driven eFficiency Improvement in healthcare environmenTs

Project leader: Philips Medical Systems Nederland B.V. (the Netherlands)

Hospitals are facing acute staff shortages and the prevalence of chronic diseases will only continue to increase. The PROFIT consortium plans to simplify healthcare tasks and enhance patient outcomes with novel solutions that optimise and streamline workflows in hospitals. The key targeted technical innovations are real-time tracking systems based on sensors and video data, a context-aware communication tool for nurses to handle alerts and tasks and AI-based software for the automatic interpretation of clinical images. Clinical experts will ensure user needs are met and use cases will demonstrate the clinical practice of the solutions.

RCFPEP 22010

Real-time Carbon Foot-Print at Product, Equipment, Plantwide

Project leader: LeanCost International Pte Ltd (Singapore)

The production and transportation of goods are two major contributors of greenhouse gases (GHG). For green production to move ahead, there is a basic need for unified, comparable and easy-to-use emissions data. RCFPEP aims to create a tamper-proof, real-time digitalised product carbon footprint measurement tool, covering the manufacturing processes, its first-tier suppliers' freight transportation of inbound raw materials and the transportation of outbound finished goods to customers. The developments will also reflect on ongoing improvement efforts in the circular economy and lower GHG emissions. RCFPEP will provide a digital contribution to help businesses make more sustainable decisions.

Sa4CPS 22007

Secure situational awareness for critical cyber-physical systems

Project leader: VTT Technical Research Centre of Finland (Finland)

Sa4CPS aims to develop a secure situation awareness concept for critical cyber-physical systems in the logistics, mobility, energy and security sectors, particularly in ports. The targeted innovation will arise from the application of novel solutions for situational awareness with a digital zero-trust approach with distributed ledger technologies (DLT). The aim is to enable situation-aware IoT, operating in a smart way with AI, and DLT for enabling shared digital trust for multiple stakeholders. The Sa4CPS concept is expected to improve the resiliency, security, privacy and safety of people, autonomous physical objects and company digital twins during unexpected events such as accidents and physical or virtual attacks.

SAFETE 22018

Swift Access for Emergency Triage/Treatment e-strategy

Project leader: ARD GROUP (Türkiye)

Health emergencies can happen unexpectedly to anyone at any time. If after-hours primary care services are not available or are difficult to access, patients will visit the emergency department (ED) to seek help, which results in ED congestion. The SAFETE project aims to develop digital health systems to transform after-hours urgent primary care service delivery by offering the right care at the right time. The system includes virtual care, sensing using patients' own cameras and wearables, data intelligence, and clinical intelligence. It will have a positive impact on health system operations, patients and health professionals and will optimise costs at the same time.

SINTRA 22006

Security of Critical Infrastructure by Multi-Modal Dynamic Sensing and AI

Project leader: TAV Technologies (Türkiye)

Stakeholders of critical industrial and civil infrastructure, e.g. airports, power plants and road networks, frequently suffer from disruptions caused by an overwhelming diversity of man-made physical safety and security threats, ranging from well-organised criminal activities to low-level but costly actions like vandalism. SINTRA aims to improve the resilience and protection of these critical infrastructures by developing an open data-streaming AI platform that enables interoperability, information sharing and privacy protection. Using multi-modal sensing and AI-powered data analysis, it will provide a comprehensive view of the infrastructure's safety and security and detect complex anomalies.

SmartEM 22009

Open reference architecture for engineering model spaces

Project leader: Fraunhofer SCAI (Germany)

SmartEM aims to address the limitations of current engineering models by developing a reference architecture for engineering model spaces. The architecture will enable the reuse, exchange and integration of computational engineering models, reducing the need for costly design corrections and promoting early data and model exchanges. SmartEM will use AI-assisted methods to create surrogate models from heterogeneous data sources and allow their re-combination within a given engineering domain. The project will develop use-case model spaces to manage reusable and transferable engineering models for various domains and provide solutions for IP management to enable model exploitation in an increasingly digital engineering market.

SOSIS 22029

Software product line Optimisation for Safety-/ mission-critical Industrial Systems

Project leader: Alstom Transportation (Sweden)

A major challenge for all companies working with software product lines (SPL) is to handle the variability aspects of the SPL over their complete lifecycles, especially in safety-critical and mission-critical systems. The objective of SOSIS is to develop methods and solutions to improve the management of variability and reduce certification efforts. SOSIS's approach is holistic, looking into methods and techniques related to model-based development for requirement engineering, variant development and variant management while investigating model-based and AI/ML-based techniques for variant testing and deployment phases and providing a platform for experimentation and knowledge transfer for European industry.

TREAT 22022

Transforming Healthcare Through Semantic Interoperability & Patient Self-Efficacy

Project leader: My Viva Inc. (Canada)

TREAT aims to increase patient self-efficacy in managing non-communicable diseases, including heart attacks, cancers and chronic respiratory diseases, by using an asynchronous model and integrating data from wearables, journals and medical records. In such a model, healthcare access moves from the clinic (system-centric) to the patient's daily life and health management shifts from the clinician to the patient. The project will develop software-based solutions, like semantic interoperability, automated care feedback loops with AI recommendations and novel interfaces using interactive augmented reality, to improve patient self-efficacy.

MTP implements Artificial Intelligence to detect IoT attacks

As part of the ITEA project ENTA (Encrypted Network Traffic Analysis for Cyber Security), project partner MTP from Spain has developed a solution to help discover IoT machines that are connected to a network and to observe if these devices are executing or will execute cyberattacks.

The implementation of this system involves a two-step process. Firstly, an AI model is created to identify IoT devices from among non-IoT devices based on data collected from network interactions. Once IoT communications are detected, a second AI model classifies whether these communications represent cyberattacks by verifying their potential threat levels.

After experimenting with different algorithms that were able to find attributes that indicate an attack, MTP then investigated whether there were other AI algorithms that could identify IoTs connected to the network. All communications within this work are encrypted, which serves as an additional layer of complexity.

Ultimately, the AI models that MTP has found to be useful for both the IoT communication detection problem and the IoT attack identification problem are those that operate on the basis of decision trees or that contain models based on this. This includes Decision Tree, Random Forest, AdaBoost and different variants of Gradient Boosting.

The larger goal of the project is to integrate these models into one supermodel solution that will offer several benefits. Firstly, it will enable network administrators to receive notifications when an IoT connection is found on the network, allowing them to easily see if this is known or new. They can then decide to allow or deny entry to their network flow. Secondly, the solution will alert administrators when IoT communications are detected with a high probability of bringing vulnerabilities to the system, enabling them to carry out proactive actions so that this attack does not occur.

To meet the need for tools that can detect cyberattacks within encrypted traffic, MTP will successfully continue with the implementation of this solution and the development of the ENTA project, which will continue until 2025.

To learn more about how the ENTA project is developing as well as about MTP's participation, please visit:

https://project-enta.com
https://itea4.org/project/enta.html

NautilusLog is finalising the new ISO Standard 4891: Smart Applications for Ships

The new ISO standard 4891 for smart applications in ships and marine technology was developed with a strong customer-centric approach. NautilusLog, one of the German partners in the I²PANEMA project, recognised the need for standardisation in the maritime industry and sought feedback from users through extensive interviews. This standard will establish a common framework and a set of guidelines for developing, testing and integrating smart applications that can operate together seamlessly.

Photographed by Thies Raetzke

NautilusLog had already been working on standardisation since 2017 and joined forces with other partners in the I²PANEMA project in 2018 to create this new ISO standard. After an intensive process of groundwork and discovery in 2020, a new project was approved and registered in the TC/TS work programme. The working group even embarked on international trips that spanned continents, both onshore and onboard, to experience the daily work and ensure that the standard created would be useful and efficient. In the discovery phase, the project group was aware that the market needed standardisation and that they needed to hear users' feedback. Many interviews were held to find out how smart applications can contribute to the maritime industry.

The standardisation process focused on establishing a common framework and guidelines for developing, testing and integrating smart applications to improve the interoperability of different systems. With the increasing adoption of smart technology in the maritime industry, ISO 4891 will enable efficient communication and data exchange between various smart applications, leading to enhanced safety, efficiency and sustainability of shipping operations. The project group aimed to explore new topics and models to keep the standards up to date and relevant for the market. By adopting a customer-centric approach, ISO 4891 is designed to meet the needs of users and promote digital transformation in the maritime industry.

Currently the standard is fully written and now closed for voting and awaiting approval; the final publication and review stages are the next steps in its implementation. Once approved, the new standard will provide a common framework and guidelines for the development and integration of smart applications, enabling efficient communication and data exchange between different systems. The future of digital transformation in the maritime industry looks promising with the adoption of this standard from ship to shore.

More information
https://www.i2panema.eu/
https://nautiluslog.com/
https://itea4.org/project/i2panema.html

Clusters actively engage in Eureka network meetings

ITEA actively participated in the two latest Eureka network meetings focusing on the future of Eureka and on how to ensure that the Eureka funding programmes continue to create economic and societal impact. In addition to ITEA, the other four Eureka Clusters - CELTIC-NEXT, Eurogia, Smart and Xecs - also participated.

On 28-30 March, the Eureka community gathered in Riga, Latvia. The event was attended by high-level representatives from over 28 countries that are dedicated supporters of the Eureka Association. Additionally, representatives of various programmes operating under the Eureka umbrella, like the Eureka Clusters, as well as representatives from the European Commission, contributed to the discussions and proceedings.

During the meeting, ITEA delivered a presentation about the results of the APPSTACLE project, which not only had a huge impact on the automotive sector but also created standards that are used in other sectors, such as telecommunications/ connectivity. Furthermore, it led to the start of a spin-off company from Ericsson in Finland.

The ambitions and strategic vision of the new Turkish Eureka Chair of the coming year was also presented during the Riga Days. Furthermore, a working group dedicated to Disaster Management and Natural Hazards was initiated.

The Eureka network meetings on 21 and 22 June were organised by the Eureka Secretariat in Brussels. The meeting was dedicated, among other things, to the current status of the Eureka instruments (including data analyses and mid-term assessment of the Clusters), discussions on new strategies related to the governance of Eureka and the expansion of the Eureka network.

The Eureka Clusters presented their upcoming activities and an industrial testimonial, highlighting the added value of participation in a Eureka Cluster. Within the scope of the Turkish Chairmanship, which will be carried out under the coordination of TÜBİTAK, three Eureka network meetings will be hosted by TÜBİTAK in November 2023, March 2024 and finally in June 2024, combined with a Global Innovation Summit.

Eureka Clusters Call dates

ITEA 4	12 – 13 Sept 2023	PO Days 2023	https://itea4.org/podays2023
	13 Nov 2023	Deadline for submission of Project Outlines	https://itea4.org/
Xecs	25 Sept 2023	Xecs opening Call 3 + Matchmaking event	https://eureka-xecs.com/

Colophon

An online version is available at https://itea4.org/magazine.html

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Submissions:
The ITEA Office is interested in receiving news or events linked to the ITEA programme, its projects or in general: R&D in the software innovation and Digital Transition domain.
Please submit your information to communications@itea4.org.

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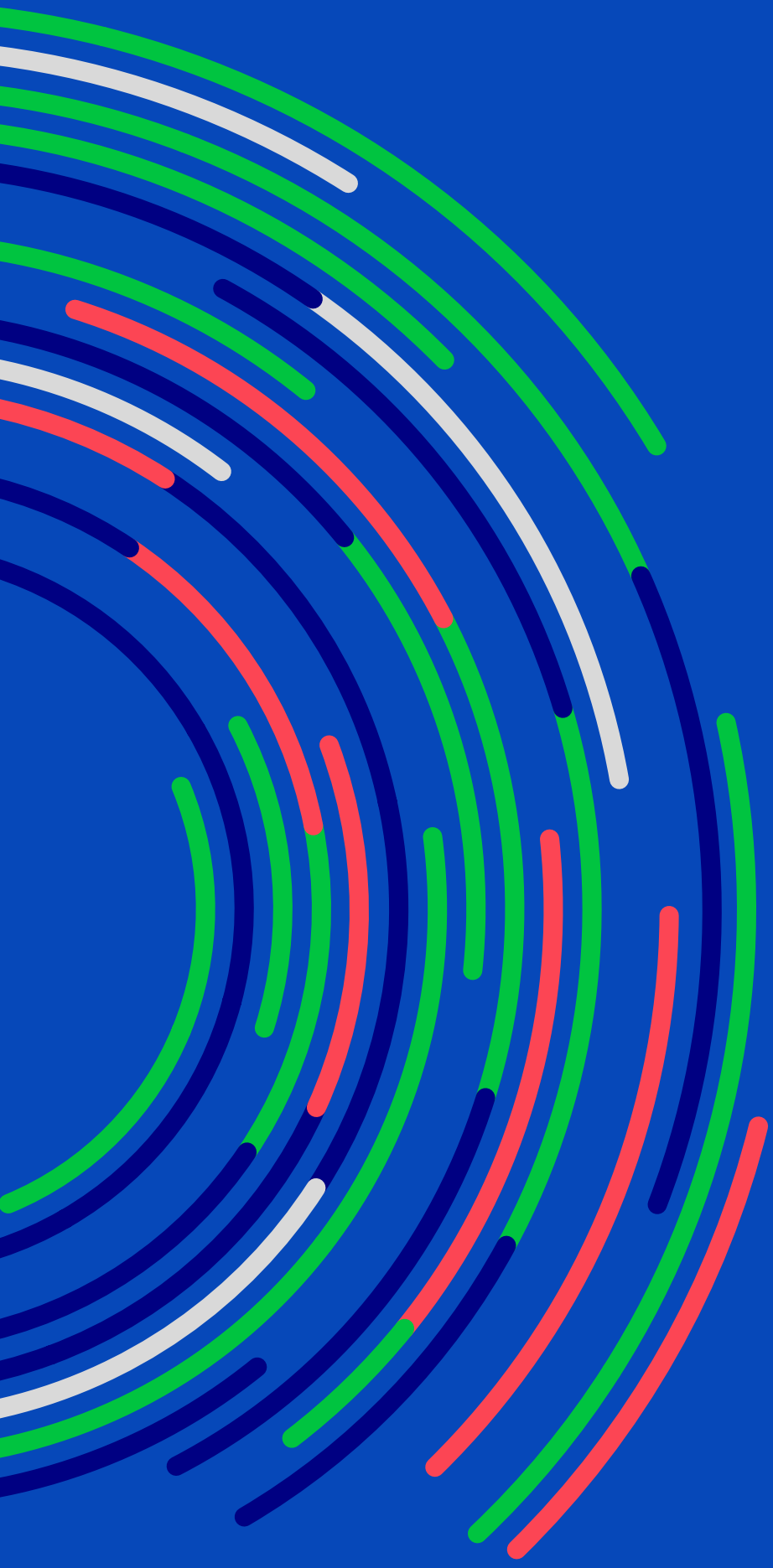
25 years ITEA 4 1998–2023



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ITEA is the Eureka Cluster
on software innovation