ITEA Magazine

November 2023 – Number 46

Country focus:
Türkiye

ITEA Success stories:
COMPACT & TESTOMAT Project

By and for end users:
Gränges and VMAP analytics

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,

This magazine is the last of 2023, ITEA's 25th anniversary year. In 1998, the idea of a Eureka Cluster dedicated to software innovation emerged, proposed by a group of industrial companies and strongly supported by the Netherlands, Germany and France. During these 25 years, the ITEA programme has been very active with almost 300 projects representing an effort of more than 30,000 person-years. The ITEA Community has grown to over 2,000 unique project partners representing large industry, SMEs, universities and research institutes in 37 countries worldwide, creating huge impact and changing businesses and lives. In the 2023 magazine issues, we have presented some discussions with leaders and a selection of the most iconic projects and how they have impacted business and society.

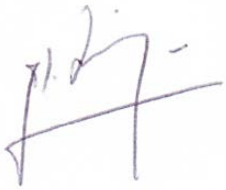
After 25 years, we can look back on the journey we have travelled and how much technology has progressed. Software innovation is even more central and crucial to our lives and developments today. The journey must continue. In this magazine, you will find an article highlighting some of the current challenges and important research directions.

To celebrate the 25th anniversary, the ITEA Community organised a full set of activities. We organised a roadshow with 11 countries with either online or physical meetings to present the ITEA programme and encourage the participation of new members. Another highlight was the live celebration of the anniversary in Berlin during the PO Days in September. It was a perfect opportunity to share the 25 years of ITEA video, cake and drinks with the 300 participants. What a difference from the first PO Days in 2000 with around 30 participants! This event showcased the lively ITEA Community with more than 80 project ideas discussed over these two days. Software innovation is really a must with the ongoing digital transformation, the adoption of AI technologies and the need to switch to a more sustainable economy and lifestyle.

In addition to articles related to the 25th anniversary, this magazine features Türkiye, which has been very active since joining ITEA in 2003. This participation has enriched the ITEA Community with very solid industrial companies and numerous innovative SMEs, leading to very successful projects. By reading this magazine, you can also learn more about ITEA Success stories of COMPACT and the TESTOMAT Project that enable us to develop more efficient software and to increase software production's productivity and quality. You will find examples of the digital transformation in industry thanks to new AI technologies and cyber security developments to increase the security and trust of digital infrastructures.

To conclude, this 25th anniversary year has demonstrated that the core values of the ITEA programme - our bottom-up approach, international cooperation, emphasis on standardisation, trans-sector Community and customer orientation - are key elements to tackle current challenges and to foster the software innovation which is the engine of our common and individual development.

I wish you a good reading of this very rich magazine issue.



Jean-François Lavignon

25 years of ITEA

The ITEA journey

A conversation between Zeynep Sarılar, Philipe Letellier and Hervé Mokrani

ITEA is celebrating its 25th birthday – as Chairwoman Zeynep Sarılar puts it, "like a young adult." And like most young adults, ITEA has been looking back on its journey so far and speculating on what lies in the future. Joining Zeynep in these reflections are former Vice-chairman Philippe Letellier and long-time ITEA participant Hervé Mokrani of Airbus Defence and Space.

Looking back

Where else to start but at the beginning? For Philippe, now retired, joining ITEA wasn't just a change in his career; it offered a change in perspective. "Before coming to ITEA, I had rather negative experiences with European projects. We had been successful in setting up projects but without unique results and with a lot of bureaucracy. So, when I was contacted by Gérard Roucairol, a trusted colleague from ITEA, I had some doubts, but then I discovered a team that is involved, not bureaucratic at all and very concerned with impact. I discovered a Community that was very open – more open than me! – with competition on the market but rather open cooperation in the projects. Step by step, I discovered a Community of friends."

Like Philippe, Hervé's experiences with European projects go back a long way: almost 30 years ago, before Eureka was composed of Clusters like ITEA. With the split to umbrellas for microelectronics and software, he sensed an opportunity. "The main benefit of ITEA for our company and our ecosystem was that we were in a position to compose topics identified by the consortium. In the EU framework, you have to propose things to answer specific questions. Sometimes, the topics do not cover all of the areas you want to work on. EU programmes are also more oriented to low TRLs, while ITEA projects are really focused and industry-driven, supporting activities to reach TRL 6 and sometimes 7. Passing this gap between 6 and 7 – the well-known valley of death – is something you need to do if you want your research and technology results to be part of real products and services."

As Hervé notes, there's more to bridging this gap than technology: the development of a spirit of trust has proven vital to ITEA by providing opportunities for partners to discuss things informally at all sorts of events and gatherings. These 'Any Other Business' parts of meetings often alert participants to problems and potential solutions further down the line, sometimes providing the seed for future projects. "Thanks for reminding me of all these good properties of ITEA!" smiles Zeynep. "Hervé, this bottom-up approach and trusting, friendly environment is critical. And Philippe, you were saying that you learned a lot. I can assure you that we learned a lot from you too!"

Zeynep Sarılar
ITEA Chairwoman

Philippe Letellier
Former ITEA Vice-chairman

Hervé Mokrani
Airbus Defence and Space

Change welcome

Of course, the culture of trust that exists at ITEA had to be cultivated over time in a variety of ways. When Zeynep probes the interviewees on notable experiences that they believe significantly influenced ITEA's journey, Philippe's mind goes straight to the flexible, back-and-forth nature of the review processes. "What was good about them was that we did not just look at a set of bullet points and say, 'you have to do that, then that, then that'. The spirit of the review is helping the consortium to keep the potential of the impact there."

"Absolutely," agrees Hervé. "There's almost one year to prepare a proposal, so it's important to spend that clearly defining who will do what and what the impact will be of which task. The world is continuously evolving in the meantime. What was true at the beginning of setting up a proposal may not still be useful. But without the reviews, there is a danger of staying too much to yourself and missing this. ITEA then offers the capability to do change requests. Of course, it's not a 180-degree switch! But 20 or 30 degrees of change is easily accepted because what is really important is that there's something at the end for a dedicated market."

"As you mention, change requests offer flexibility that makes ITEA very different to other programmes," adds Zeynep. "At one point, we said that we should maybe stop the reviews, but all of the project leaders said no, no, no. It was a big moment for me seeing how these reviews are appreciated."

Trust in the process

Another key development to ensure mutual trust between ITEA and its participants has been the fair and transparent selection process following a two-step approach. "This means clearly stating the current situation, the technical or commercial issue and how you are going to solve this with the partners' expertise," Hervé continues. "You get feedback from the reviewers with key questions. As long as you answer the questions properly, the project is often accepted, so there's a very high success rate. This high level of trust has been accepted by the Public Authorities as well because they participate in the selection process."

It's a kind of magic

Philippe nods. "I got a lot of feedback from Public Authorities saying that how we manage the final reviews is very good for them. We poke our fingers where we need to. We are not good friends with the consortia and the Public Authorities are rather impressed by how tough we are. At the same time, we try to enhance, not destroy. And I never saw somebody from one of the big players try to do something just for the good of his company in the final review. It's again part of the ITEA spirit and was high-level education for me. When I was with my old companies, I was taught to do everything for them and not for others. Through ITEA, I got over this way of thinking and found a sort of magic."

As an example of this magic, Zeynep thinks back to a particularly fond moment in Philippe's ITEA tenure. "I remember in the second review of the ACOSAR project, you challenged them to make a standard. You said that you'd bring them champagne if it was

"ITEA has been successful during these 25 years by sticking to the demands of society. It's real life."

a global standard. One year later, they had indeed created a global standard from scratch."

Looking ahead

In spite of their trip down memory lane, Hervé, Philippe and Zeynep are all aware that ITEA can never remain static in its bid to bring society forward. "I wish to carry on with all the best moments of ITEA but, as we all know, there is always the mood for new things," says Hervé. "When ITEA was created 25 years ago, it was only European countries participating. Some new opportunities here could be increasing transnational cooperation – not just European but worldwide – and taking global issues like climate change more into account."

"It's not easy, but ITEA 4 has the challenge of sustainability in it," Zeynep notes. "We don't mean just sustainable growth for companies; we mean a kind of responsibility to take care of the sustainability of human life and the planet. This means that we have been thinking about how to implement this not just at the ITEA level but at the project level too."

"It's very important to keep to the evolution of societal needs. But I'm not scared because we've managed this well for 25 years. Nevertheless, the world is exploding. I agree that a new target can be trying to work with other partners that don't have the same capabilities as us but that are trying to reach where we are," suggests Philippe. "And I'm impressed at how concerned young people are – more concerned than we were – and how they refuse to work in places where they lose a sense of the value. If we can explain to them that an ITEA project is not just in the interests of the few, we can help guarantee the security of ITEA and our goals."

Widening the scope

The interests of the many has indeed been an ongoing theme of ITEA's journey over the last 25 years, having increased from 15 countries at the start to 35 today. As Zeynep points out, the United Kingdom has most recently joined the fray and ITEA is actively courting Switzerland and Chile. "For the first time, 50% of project leaders are currently new to ITEA. All of the old friends are still here too, but we're very open. For the future, I'm thinking of places like Moldova, Kazakhstan and Georgia that have skilled engineers but lack opportunities for international collaboration."

"To prepare for the future, your daily needs like food and shelter must be met so that you can apply higher thinking to the problems in your life. Giving this opportunity to everybody in the world would mean less fighting," says Hervé. "This is where ITEA is a very strong tool because software can be developed anywhere in the world as long as you have the skills. However, the issue is that while the world is digitalising, we are consuming more and more. Global CO_2 is continuously increasing. How can we do more in terms of software capabilities while reducing global consumption? The challenge for us will be doing more with less."

"ITEA has been successful during these 25 years by sticking to the demands of society. It's real life," Philippe reflects. "When you are retired, you take a step back and look at the world. Perhaps because you're older, the world is less radiant than you dreamed. But there are always people who are open to solving dilemmas and want to look to a positive path. It's true of all developing countries, of the countries most affected by climate change. ITEA can take up the challenge to help these countries, to try to bring them into the first division of innovation. If they can put their problems on the table, we can work on a solution together. I've thought about it strongly and I think that, as ITEA, we should do something. It's a big challenge, but we are used to big challenges."

Zeynep subscribes wholeheartedly to these final remarks by Hervé and Philippe. "We have always been trying to take on societal challenges and, for global impact, we need to take a balanced position in taking care of the future. I see it as a way to place ITEA as an ambassador of peace. Thank you both for your time."


Eureka
TÜRKİYE
CHAIRMANSHIP 2023-2024

Focus on Türkiye

Investing in ICT to enhance competitiveness and international profile

The software industry is worth $2 trillion on a global scale while the market value of the sector is estimated at eight to ten times this figure. The former includes factors such as revenue, job creation and productivity gains while the latter refers to the total combined value of all companies and assets within the industry, indicating strategic importance in the economic chain effects that the world of software creates. The Turkish government has recognised the significance of this industry for the country's economic development and has taken measures to nurture its growth – something they will continue to do as Eureka President for the upcoming year. Dr. Ayda Kara Pektaş, Scientific Programmes Chief Expert and ITEA Cluster National Contact Point of Türkiye at TÜBİTAK, explains how the ICT sector is stimulated in Türkiye and the role that public-private collaborative initiatives play to support the country's policies and goals.

The figures tell a tale

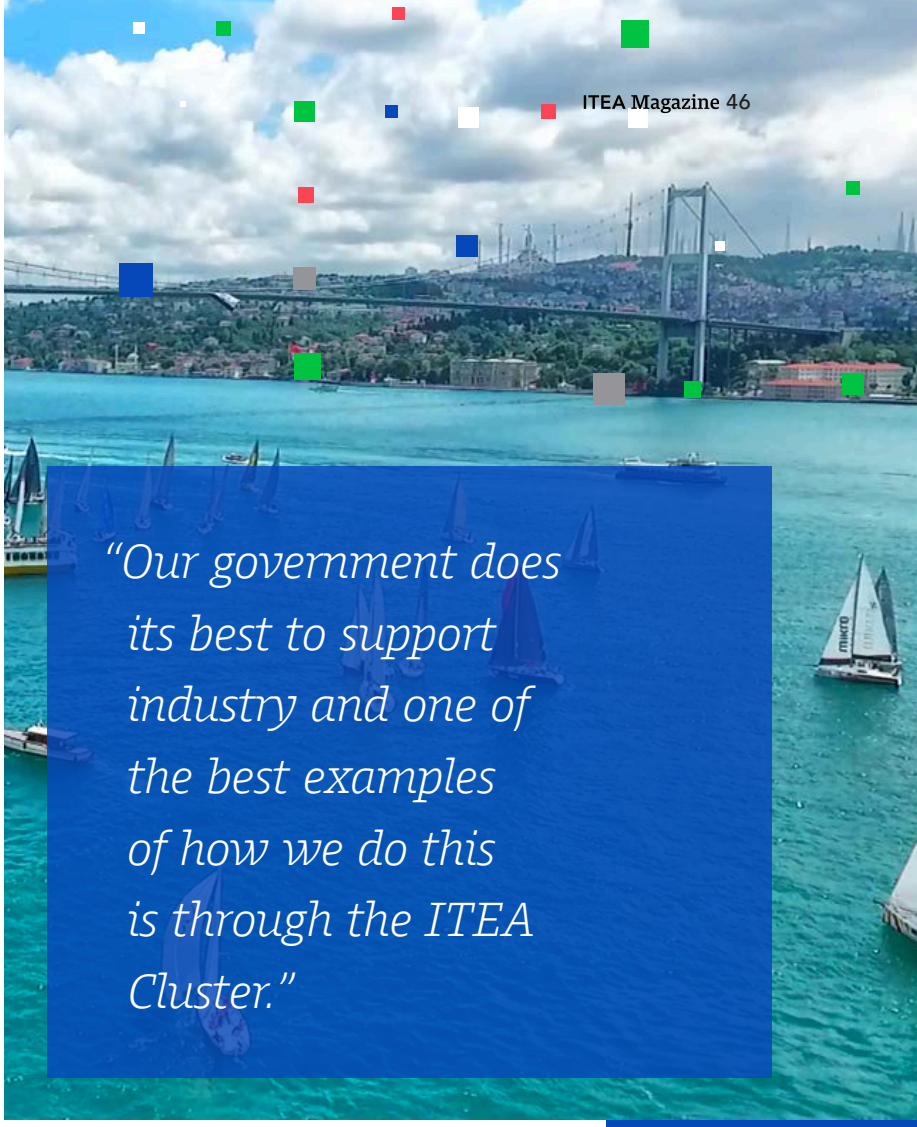
"If we look at the software industry, ecosystem and growth through to 2025," Ayda begins, "the additional employment potential is 100,000 jobs and the export potential is $10 billion. Software market revenue is projected to reach $659 billion in 2023 and, with an annual growth expected of 5.42%, this will result in a market volume of $858 billion by 2028." Impressive figures. "Today the digital transformation has an important place in the transition to a competitive production economy in all sectors," Ayda continues, "and the software sector stands out as a strategic sector in the development of the basic components of digital transformation as well as Industry 5.0 and the software industry. It is one of the most critical sectors today, certainly given the added value it provides to all vertical sectors and the export potential it brings to digital products and services."

Boosting the economy

The ICT industry, including the software and software-intensive sector, has been growing in importance in Türkiye, becoming a very significant contributor to Türkiye's economy, creating jobs, generating revenue and contributing to the country's GDP. "Not only does the ICT sector provide employment opportunities for a considerable number of people, including software developers, IT professionals, engineers, technicians and other related roles, but this has a very positive impact on reducing unemployment rates," Ayda says. "In terms of innovation and research, investment has increased in rich research and development activities, which fosters innovation, technological advancements and the development of new products and services. Furthermore, the software and software-intensive sector has the potential to be a strong contributor to Türkiye's export earnings with the export of high-quality software development and technology services to global markets, further boosting foreign exchange revenue."

Looking beyond borders

Another policy pillar is entrepreneurship and startups. "In Türkiye, we facilitate growth in this area and promote the emergence of a vibrant startup ecosystem where many young entrepreneurs and innovators focus on creating technology-driven solutions and thereby contribute to overall economic growth and job creation. Of course, the digital transformation is a kind of umbrella that covers various sectors, and the Turkish government has been actively promoting digital transformation in government services, healthcare, education and more. This emphasis on digitalisation further drives the demand for ICT services and solutions. Last, but not least, international competitiveness. As the global economy becomes more technology-driven, Türkiye has focused on developing its ICT sector to enhance the country's competitiveness and international profile. It is also one of the key reasons for supporting ITEA projects. We want companies to look beyond and be active in the ecosystem with the big players, with SMEs and other players in a wider context."



"Our government does its best to support industry and one of the best examples of how we do this is through the ITEA Cluster."

National priorities

As for Türkiye's software innovation priorities, the parallels with ITEA are evident. But, as Ayda explains, green and digital technologies are key. Ayda: "We have defined six technology roadmaps: AI, advanced materials, big data, cloud computing, motor technologies, cybersecurity and biotechnology/pharmaceuticals. Compliance with EU green digital and adaptation to climate change are not only national priorities but are, of course, global priorities. There are actually 264 national priority topics, half of which are in digital technologies and a quarter in green technologies. I think this is a very good example of how our priorities match with those of the ITEA Cluster." Innovative and groundbreaking technological solutions have been classified under five themes: (1) climate change environment and biodiversity; (2) clean and circular economy; (3) clean, accessible and secure energy supply; (4) green and sustainable agriculture;

(5) Sustainable, intelligent transportation. The last pillar of strategic and needs-oriented policy topics ranges from earthquake research, chemical and biological defence and biomedical equipment technologies to monitoring national biodiversity and value-added chemicals from purple resources. “Not specifically related to the ITEA Cluster but, nonetheless,” Ayda points out, “areas in which we want to encourage projects and address these pressing societal challenges, and indeed areas in which software and AI have their role to play.”

Incentives for innovative solutions

The Turkish government offers various incentives to encourage research and development activities in the software sector, such as tax incentives, grants and subsidies for companies engaged in software-related RD&I projects. Türkiye has been establishing technology development zones and innovation centres where companies can set up their operations and enjoy benefits such as tax exemptions, access to shared facilities and cooperation opportunities with universities and research institutions as well as the Turkish government. “Incentives are provided to support startups, which often play a very crucial role in driving innovation and the software sector as well as incubators and accelerators, with funds to nurture young technology companies,” Ayda says. “Türkiye is actively collaborating with international organisations, research institutions and technology companies to exchange knowledge, access global best practices and promote technology transfer. Collaboration between public and private sectors plays a very crucial role here. Various innovation competitions and challenges are organised to encourage individuals and teams to develop innovative software solutions. The TEKNOFEST technology festival, attended by more than 2.5 million people just in 2023, is one of the best examples of this. Also, the government push for digital transformation across various sectors creates a demand for software solutions, leading to the opportunities for software companies to develop innovative products and services.”

The collaborative mix

From large to small, companies that rely heavily on technology and innovation can play a very crucial role in meeting the country’s national priorities. “Of course, large industries often have the resources, infrastructure and expertise to drive significant advancements in technology and innovation. It’s undeniable,“ Ayda says. “And they can allocate substantial funds to research and development activities, leading to the creation of innovative products, services and technological technologies that align with Türkiye’s national priorities. They can set the pace for innovation within sectors, inspiring smaller businesses and startups to follow suit. We have seen how this formula is very successful within ITEA, where very small companies can create projects with the main players in the ecosystem, coming together when otherwise that small company would never have a chance to work with that big player. By adopting cutting-edge technologies and practices, large industries can influence the overall technology landscape of the country and encourage the adoption of advanced solutions. In addition, large industries contribute significantly to employment as they grow and innovate. They create job opportunities for skilled professionals in contributing to economic growth and social stability. Also, in project collaboration with SMEs and research organisations, they foster innovation through knowledge sharing and technology transfer.”

“SMEs, in turn, form the backbone for many economies, Türkiye being no exception. Their role in meeting national priorities is vital. They focus on niche markets and specific innovations that can have a very big impact in their areas of expertise. They are agile, able to quickly respond to changing market demands and technology trends, leading to rapid innovation. SMEs also contribute significantly to job creation, especially for local communities. Collaboration with universities, research institutes and technology centres plays a very pivotal role in driving innovation, developing practical applications of research and meeting national priorities. The role of research organisations and universities in educating the next generation of innovators, scientists and engineers contributes to a skilled workforce. Overall, I can say that a symbiotic relationship among large industries, SMEs, research organisations and government initiatives is essential in driving innovation, economic growth and technological advancements to meet national priorities.”

The ITEA ingredient

“Our government does its best to support industry and one of the best examples of how we do this is through the ITEA Cluster,” Ayda says. “If you look at the last three years or so, we have the highest number of applications taken up as projects among all the ITEA countries, putting Turkish partners top of the ranking for the last four ITEA Calls. This underlines our commitment, and we are eager to continue to support ITEA and all the work that we do together with this Cluster under the umbrella of Eureka, which we are honoured to chair as President for the year ahead.”

More information

https://www.tubitak.gov.tr/en

Turkcell

Becoming a deeper part of the ecosystem

As the Chief Information Officer of Turkcell, Serkan Ozturk is part of a rich history and an ever-evolving landscape. In 1994, the founding of this converged telecommunication and technology services provider marked the beginning of mobile communication in Türkiye; in 2000, they became the first Turkish company to be listed on the New York Stock Exchange. "But renewal never stops because new innovations should be introduced to ICT infrastructures and systems," says Serkan. "You have to follow the latest technologies and implement them into the services and products that you present to customers."

An important responsibility

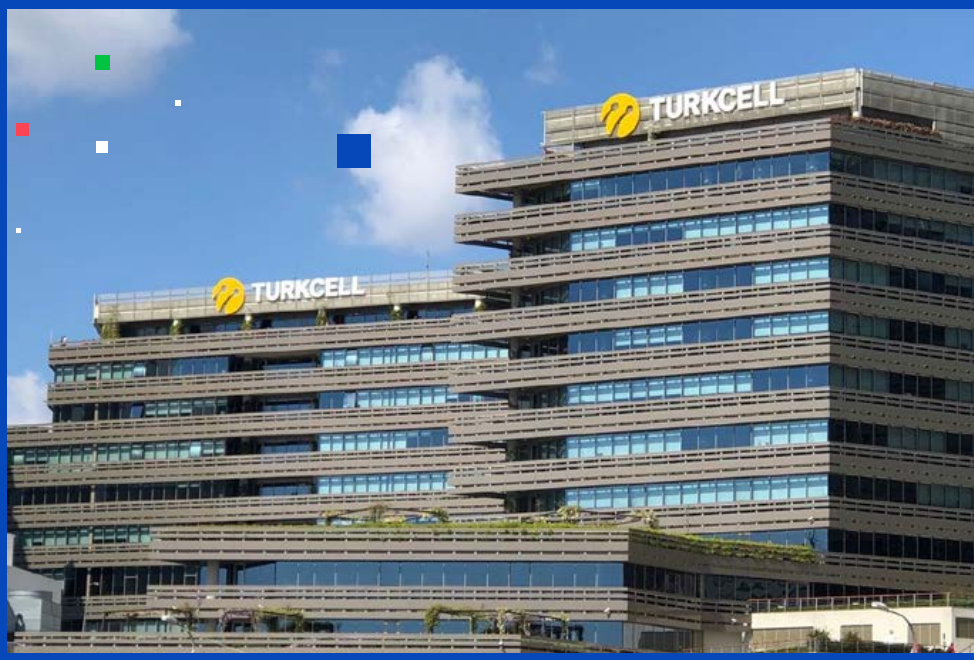
One of the most notable changes in this timeframe was the 2007 creation of Turkcell Technology, which focuses on RD&I in ICT and provides services and solutions to millions of customers worldwide. With more than 1,100 researchers, this is also one of the largest R&D centres in Türkiye. "Turkcell Technology conducts research on emerging technologies and the achievements are commercialised in novel products, services and solutions," Serkan explains. "But it also participates in international collaborative research programmes and holds Board memberships of the ITEA and CELTIC Clusters of the Eureka programme. This is an important responsibility to handle: it means supporting the Clusters' roadmaps and decisions. But it's also an opportunity to work with companies and high-level managers around Europe, to see all projects in all verticals and where Europe is heading from an industrial perspective. We can then reflect this in our company's journey. As part of the ITEA Board, we are a deeper part of the ecosystem."

Serkan Ozturk, CIO of Turkcell

Shaping the future

In Serkan's view, it can be hard for Turkish companies to get the full image of innovation in Europe, and beyond, without being part of such an ecosystem. For Turkcell, ITEA provides a platform to pool their strengths with like-minded companies, boosting each other's global competitiveness in turn. "With the help of the publicly-funded research projects, international collaboration is built and partners – from SMEs to research institutes and from universities to industries – come together, offering different skills, capabilities and competences to maintain a strong

"ITEA projects foster our journey in digitalisation – our technological and innovative transformation."



foundation for scientific, economic and social progress. When executing projects, we are trying to shape the future together, addressing the challenges of the societies and building the infrastructure that they need."

Technological and innovative transformation

This is an area in which Turkcell has a great deal of experience, having participated in 35 ITEA projects since 2009. These have also touched on a variety of different sectors and verticals, including:

- **Smart engineering** (XIVT, MEASURE, SoMeDi and BUMBLE)
- **Smart health** (DEMWatch, eWatch, INNO4HEALTH, RM4HEALTH and Food Friend)
- **Smart industry and safety** (SPEAR, PARFAIT and DayTime)
- **Smart cities** (I2PANEMA)

"With these projects, we had the chance to undertake different roles in the R&D ecosystem, putting value into the market and technology chain as a use-case provider and testbed or as a technology and solution provider," notes Serkan. "ITEA projects foster our journey in digitalisation – our technological and innovative transformation.
We gain experience in a variety of different sectors in order to expand our customer and market portfolio. This is a great way to collaborate between different countries, to brainstorm and to do projects with a very precious Community in Europe, Canada, the UK and South Korea."

Climbing higher together

On top of this, Turkcell has coordinated five projects internationally – CAP, DEMWatch, CarCode, PARFAIT and eWatch – and Serkan highlights the latter two in particular. With eWatch, they gained the opportunity to work with big industrial companies in the Netherlands and Belgium, including Barco and Philips, and applied this experience to gain further access to Smart health projects with further programmes. "This puts together the stones to climb higher," continues Serkan. "And in PARFAIT, we had the opportunity to work on data in IoT with companies from Türkiye, France and Romania. In addition to the international collaboration, this was a great way to grow our internal ecosystem in these countries: companies get to know each other and have discussions for new collaboration. Not all proceed to projects, but we always keep in touch. So, ITEA projects are a great way to strengthen our network in technology and innovation."

A shared vision and mission

"Ultimately, our vision is superior digital services for a better future and our mission is to add value along our customers' digitalisation journeys, enriching their lives – both in Türkiye and throughout the world," Serkan concludes. "Software innovation is a driving force in enabling our company to adapt to changing market dynamics as well as to improve efficiency and enhance the customer experience. As technology advances and industries become increasingly digitalised, the importance of software innovation will only grow. The bottom-up approach of Eureka programmes like ITEA therefore means a special role for industrial companies like Turkcell. ITEA presents powerful instruments for building up and realising collaborative RD&I projects and supporting the ecosystem with a strong methodology. This helps the consortia to maintain a strong baseline for the projects and enforces them for both technological and innovative progress and commercialisation and exploitation strategies. We appreciate the vision and mission of ITEA, which plays a crucial and multifaceted role in supporting industrial and economic development, advancing society, fostering innovation and addressing challenges."

More information:

http://www.turkcellteknoloji.com.tr/language/en/

Community Talk with **Frank Golatowski**

A long-lasting happiness

Beyond his activities as a senior research associate and lecturer at the University of Rostock, Dr. Frank Golatowski is among ITEA's most longstanding Community members: over the last two decades, four of his nine projects (SIRENA, LOMS, OPTIMUM and I²PANEMA) received ITEA Awards for their exceptional results. "ITEA has developed enormously. Over the years, a large, dynamically expanding Community has grown up."

Laying the foundations

Having completed his studies in Rostock shortly before the fall of the Berlin Wall, Frank's work now takes place at the university's Institute for Applied Microelectronics and Computer Engineering - an electrical engineering institute doing basic and applied research and development in the field of technical computer science. His focus lies on interoperability, communication and dependability in distributed embedded systems, looking to overcome resource limitations while maintaining real-time performance in areas like industrial automation, railways and medical technology. In 2002, this expertise led him to ITEA.

"I was made aware of the PO Days through the internet," Frank begins. "I registered and, in my naivety, presented three project ideas. When ITEA Programme coordinator Erik Rodenbach referred to my timeslot after five minutes, I was shocked! But I could partly bring in my ideas and was involved in two projects. That was exciting. SIRENA was my first collaborative project, with partners from Germany, France and Spain, and the results accompanied my scientific work for a long time. It was about service-oriented embedded systems and we laid the foundations for the Internet of Things – it just wasn't called that at the time."

A fantastic climate

Following this success, Frank has been involved in ITEA projects roughly every two years, mostly with different partners and on various themes. LOMS (2005-2008), for instance, looked at local mobile services and used mobile robots to demonstrate new maintenance services for mobile workers, including AI capabilities. Frank holds a particular fondness for OPTIMUM (2017-2021), which aimed to improve capabilities in material handling and ultimately resulted in standardisation within VDMA.

"I realised that if you have strong leaders, if they have real interests in solutions, this has a lot of influence on the later results," he says. "In OPTIMUM, we had very strong leadership by Demag. It was a fantastic climate in the groups; we met very often, including online. We had to consider corona during the runtime of the project, but ITEA mastered those difficult conditions brilliantly. I also learned a lot by getting involved in standardisation even

"The Community has benefited enormously from a lean, effective and valuable ITEA."

though this is often seen as an industry task. At the standardisation bodies, domain experts meet with specialists from IT and the embedded world. As universities, we can make an important contribution here and new research questions can arise."

Positive connections

For Frank, this organisation of effective collaboration between academia and industry is a major benefit of the ITEA platform. "In all ITEA projects, I think our university has shown that we are competent and efficient. That we are able to put ourselves in the shoes of changing industry requirements and, at the same time, not neglect real application-oriented research, which is the basis for good dissertations and high-grade publications for us. This brings in student education by opening up interesting fields of application for research." On top of this, he highlights opportunities to overcome national and cultural differences within Europe and beyond, including Türkiye, Canada and South Korea. "Most of the time, we are happy when we meet, be it at the ITEA PO Days, in organisational meetings for new projects or at the project meetings."

Always evolving

As such an established collaborator, Frank has also been able to watch these elements evolve within ITEA, including the development of the website for use in all phases of a project. "The Community has benefited enormously from a lean, effective and valuable ITEA," he explains. "With the current PO Days in particular, you can see that the experiences over this time period have been used to improve the process even more. I really like the online presentations of the project ideas and the funders as this gives us more time to prepare new project ideas. When you go to the PO Days, you have more time to talk to potential partners at the posters."

And although he concedes that the process is not always easy – the PO and FPP phases are time-consuming and countries sometimes drop out of projects due to lack of funding – Frank sees positives within this. "The projects need time, especially when new consortia have formed, and I think that flexibility is also good so that a project can still come about if a topic is not a priority in a partner country."

Reasons to be cheerful

Reflecting on his 20 years in the ITEA Community, Frank has a lot to be grateful for. "Don't forget the various social events and sitting together with a cold beer. We have organised such events ourselves, often on ships, which is obvious when you live on the coast. At the first social event I organised on the Santa Anna Barbara as part of the SIRENA project, project leader Francois Jammes said: "Frank, I don't know how this can be topped." I would say they found a great alternative: a meeting in the French Alps close to Grenoble, where we climbed a hill. That's similar to what we did in the project, getting brilliant results and later an ITEA Award."

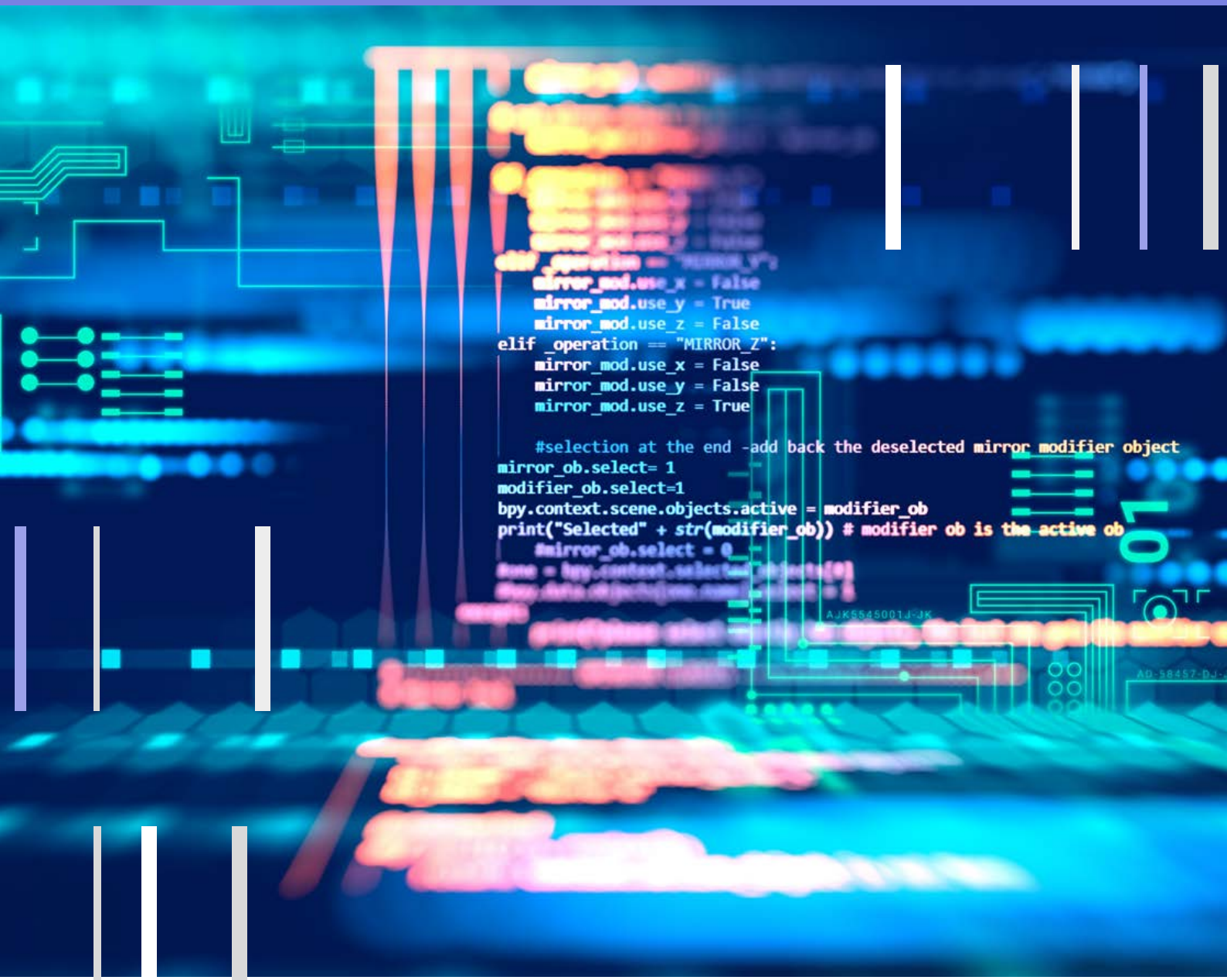
"This year, the I²PANEMA project also received the ITEA Award of Exceptional Excellence, so it's understandable that I'm happy! Speaking of happiness, I'm happy when reports are written, when the button to submit a proposal has been pressed, when powerful, innovative partners are convinced to join a consortium and when review meetings are successfully completed. I like the short, crisp ITEA evaluations and when the Steering Committee gives a positive assessment – in the best case, when the traffic light is green. So, do I have any advice or feedback for ITEA? Keep up the good work!"

TESTOMAT Project

Customised test automation, saving time and improving quality

Success story

In software development, reliability and agility often seem like opposing forces. This issue is aggravated by the increasing complexity of software and the constant drive towards faster release cycles for maximum market impact. Manual testing cannot meet these challenges, yet many safety-critical and hardware-oriented companies believed that test automation was irrelevant to them back in 2017. SMEs, meanwhile, missed out due to a lack of awareness or investments in automated agile testing. To strike the perfect balance between quality and speed, a new approach to automation was needed.



The goal of ITEA's TESTOMAT Project, which stands for 'The Next Level of Test Automation', was to allow software teams to increase development speed without sacrificing quality. To achieve this goal, the project advanced the state of the art in test automation for software teams, moving towards a more agile and automated development process. The 'next level' differs per organisation and depends on factors such as sector, size and practices. Many automation-related variables are unknown to the organisation, so the TESTOMAT Project focused on providing software teams with personalised roadmaps for improving their automated testing in a cost-efficient manner.

Through a Test Automation Maturity Survey, completed by 151 respondents in 101 organisations and 25 countries, the consortium of 34 partners from Finland, Germany, the Netherlands, Spain, Sweden and Türkiye was able to gather the status of test automation and key issues worldwide. On this basis, a Test Automation Improvement Model (TAIM) was developed to define measurable steps for improvement.

Success and diversity in test automation

Success in the TESTOMAT Project was measured in terms of test effectiveness, test optimisation and quality and standards in testing:

- Effectiveness refers to the ability to find bugs and maintain the test suites.
- Test optimisation means selecting only relevant test cases from the millions created through automation. One element of this is clone detection and similarity analysis, which enable the maintenance of much larger suites.
- Quality and standards address non-functional aspects such as security and performance testing. Here, the TESTOMAT Project worked to bring automation to standards that previously focused on manual testing and also contributed to standard extensions and to the release of a completely new standard: UML Testing Profile 2.0.

Project start
October 2017

Project end
December 2020

Project leader
Sigrid Eldh
Ericsson, Sweden

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

To demonstrate the project's versatility, its ten use cases can broadly be grouped into the following categories: trains, planes, telecoms, forestry, machines, robotics, banking, wind turbine maintenance with drones and port integration technologies.

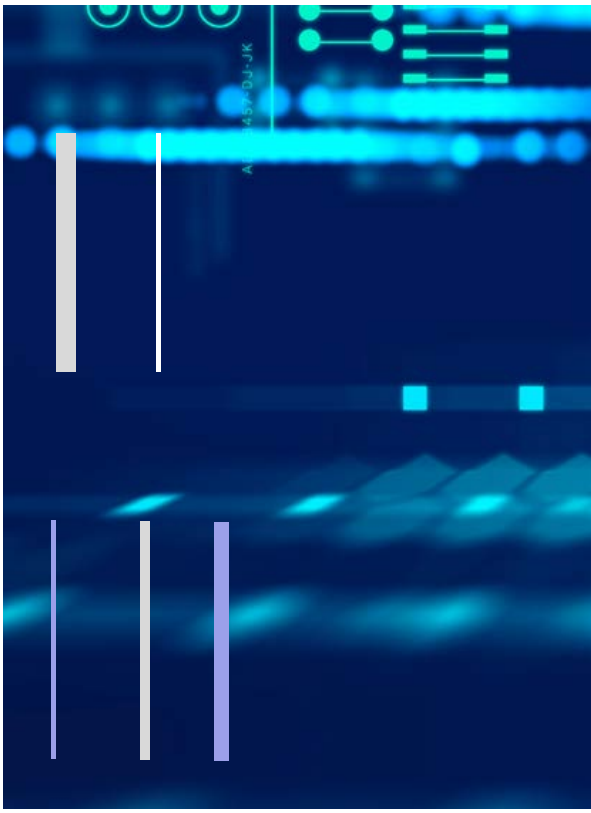
Customised nature of test automation

The TESTOMAT Project's great strength is its customised nature, which guarantees promising results regardless of the level of automation already found within a company. For those using fully manual testing, an average improvement of 60-80% can be gained in their time to market. Such improvements are highly variable due to enormous differences across companies.

To mention an example, Ponsse, one of the world's largest manufacturers of cut-to-length forest machines, renewed its test automation systems during the project and improved its unit testing and requirements coverage by 64%. Another advantage for Ponsse was that the execution of tests was 25% faster with test automation and they could execute tests automatically outside of office hours. Nowadays, Ponsse's simulators indeed run test automation outside of office hours, saving about 500 hours/week of functional testing work for testers. Alongside, Ponsse has been able to reduce defects that could have ended up in the customer's product by 20%. Finally, the time from development to testing with actual machinery has been reduced, which has also reduced the production time as a consequence. Ponsse has taken a clear step towards test-driven development as their acceptance criteria for business requirements are now linked to test automation cases. In early 2023, Ponsse even took it up a level and started an end-to-end testing project in which they began combining test automation platforms, thereby connecting the platform created for testing their machines and the platform for their digital services. In this way, they can automatically validate the data all the way from the machine end to the digital service endpoint. All in all, the TESTOMAT Project was a great starting point for Ponsse's test automation and they have plans to expand these capabilities further. In the near future, Ponsse will invest in simulators that will run test automation 24/7 and won't be shared with manual testing.

Another example is Spanish SME Prodevelop, which managed a 220% increase in test efficiency. Thanks to the project, Prodevelop has increased the type and number of tests, many of which have been automated, thereby allowing them to test more features of their application in less time, increasing the quality of their products and reducing the effort spent on testing. At the other end of the spectrum, Ericsson already carried out completely automatic testing but still saw a 29% improvement in product quality. This significantly lowered development costs and increased the speed to delivery to customers.

Likewise, Saab increased their number of product users by 440%, leading to higher quality in earlier development phases. For already-automated companies, 15-30% fewer faults are predicted. These achievements, resulting in less bugs in software, are fundamentally important as nowadays



people totally rely on and trust, for example, the use of software tools in healthcare, scientific experiments and many more domains. The tools therefore also need to be tested to make sure that a strong foundation exists.

"The immaturity of mutation testing in practical, industrial settings has held back its wider adoption. Through the TESTOMAT Project, the tooling and methodology of mutation testing has matured enough that Saab is able to use it for large-scale embedded systems consisting of hundreds of distributed components totalling millions of lines of code. The improvements in how to use mutation testing have significantly helped to reduce the cost of using mutation testing, which is a significant contributor to why mutation testing is now, through the TESTOMAT Project, usable by a wider audience for large-scale systems such as the Gripen E project at Saab. The application of the technique has, at Saab, resulted in a significant overall quality improvement of not only the source code and test suite but also the requirements, test specification and developers' understanding of how their programs work. The ripple effects of the quality improvement have led to less issues being found when performing formal activities as required by standards, which obviously lead to a shorter time to market."

- Joakim Brännström, software architect for Gripen-E / Saab Group

Another success of the TESTOMAT Project can be viewed in terms of its influence on the software community as a whole. Software is becoming increasingly complex, but widespread dissemination of the project's results can counter this. Within the project's duration, the TESTOMAT Project had already released 80 publications with over 146 presentations and demonstrations, created 24 workshops and established 23 university courses on test automation. 22 industry-academia transfers have been reported, as well as 27 new employees within the consortium. A key focus is on long-term promotion through YouTube videos, with 420 subscribers and over 55,600 views. In addition, a book on AI testing has been published by a PhD student who participated in the TESTOMAT Project – and was recruited by Ericsson afterwards – and another book will be released by Springer in the future.

Subsequent large-scale uptake of the project's innovations will have enormous knock-on effects in society. One example should be increased safety in transportation, as the project clearly demonstrates the importance of safety-critical techniques for even the biggest companies like Saab and Bombardier (now Alstrom); thanks to increased use of automation in simulation testing, many more scenarios have increased in reliability. In addition, the TESTOMAT Project also impacted the automotive industry in Germany, as well as port testing and drone maintenance.

Another aspect is quality of life as society relies on quality software, from automatic maintenance to better patient treatment through healthcare optimisation. Finally, optimised manufacturing and mobility means better resource management and fewer emissions, helping to meet the grand challenge of the energy transition. Through these combined factors, the TESTOMAT Project is likely to touch every corner of our daily lives.

In summary, the TESTOMAT Project has changed the minds of hardcore manual testers in everyday companies and automated testing is now an accepted practice in almost all companies that produce software, making the thought of automation of other aspects, like feeding it into digitalisation, a natural way to move forward. This has paved the way to the 'AI/generative' automation era.

More information

- https://itea4.org/project/testomatproject.html
- https://www.youtube.com/testomatproject

2023 marks the 25th anniversary of ITEA. Over this period, the ITEA Community as grown to over 2000 unique project partners, creating huge impact and changing businesses and lives. But also new long-lasting partnerships and friendships along the way.

Thank you for your tremendous enthusiasm and willpower to innovate and create impact and happiness together.

Let's continue for at least another 25 years!

25 years

25 years of ITEA

Ground-breaking innovations we're still grateful for today

This whole year, we have been 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 of the ITEA Magazine, a small selection of ground-breaking innovations from the first ITEA programme was revealed and in the July Magazine edition, we highlighted a few gems from ITEA 2, which ran from 2006-2014. In this November edition, we will take you to some of the pearls of the ITEA 3 programme, which ran from 2015-2021.

ACOSAR

2015-2018

An innovative solution for standardised integration of distributed simulations that saves time and money

The development of vehicles has become increasingly complex, involving over 50 different suppliers who need to ensure that all components, parts and devices work together. Modelling and simulation represent key methods for successful development. To facilitate this, the introduction of co-simulation methodologies and the interoperability of simulation tools and infrastructure had already taken root. Back in 2015, there was no standardised way of integrating distributed simulation and test environments, so there was still room to enhance the means of integration.

Within the ACOSAR project, 16 partners from Austria, France and Germany came together in order to accelerate development steps with new simulation technologies. With the aid of co-simulation, diverse simulation models can be linked together to enable overall system analysis at a very early stage of development. ACOSAR developed both a non-proprietary 'Distributed Co-simulation Protocol' (DCP) for (non) real-time system integration and a corresponding integration methodology. The DCP has the potential to simplify and accelerate integration aspects for system development by blurring the boundaries between real and purely virtual tests. International technology leaders such as AVL, Volkswagen and Boeing started to apply this solution at the end of the project. A prominent German sports car manufacturer reports that over 13,000 developer days could be saved in the next five years thanks to this protocol – which corresponds to an estimated value of around five to seven million euros.

The transfer of results into standardisation was one of the key goals of ACOSAR. In the final year of the project, the consortium members therefore decided to pursue standardisation of the DCP with the Modelica Association. Since July 2018, the DCP has been maintained and developed as a Modelica Association Project (MAP) and is available as an open-access international standard.

The results of ACOSAR foster a modular, shorter and considerably more flexible system development process for numerous industrial domains. This enables the detection of design issues in complex systems like automated vehicles, making systems safer and more acceptable for end users.

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

Reflexion

2015-2019

Nourishing high-tech manufacturing with valuable high-quality data

Thanks to the emergence of cheap sensors and affordable large-scale data storage, terabytes of data are acquired daily from complex systems that are characteristic of the high-tech industry. Whether it is about intelligent equipment in operating rooms, sensors in industrial printing systems or smart energy meters, the trick is to filter the data in such a way that only relevant, valuable information remains that can be used to create overviews and insights. In 2015, the next step forward for the high-tech systems manufacturing domain was to integrate this operational data into a product's development lifecycle.

The Reflexion project partners from the Netherlands and Belgium succeeded in the real-time and continuous conversion of operational user data from industry into information, thereby gaining better control over the production process, the use of the product and the future design. This creates a 'digital loop' in which data ▶

is fed back to the ecosystem, providing industry with a considerable time and economic gain.

For example, the project results allowed SynerScope to bring the first-time-right percentage to replace smart meters up from 90% to 99.5%, saving an effective 40 FTE. In general, SynerScope saw a 30% reduction in time spent troubleshooting performance issues at the customer site. Structured log analysis and analytics on interaction logs are now part of its user experience monitoring, reducing the time from initial problem to pinpointed bottleneck by half at least. In addition, the structured log analysis has opened up exploitation in the new verticals of energy and oil & gas, which represent a multimillion-euro market opportunity. On top of this, Canon Production Printing developed an incredible maturity on the full digital loop and a set of products and methodologies that can be useful for many other European players. Thanks to this new approach, they improved their mean time to repair by 50% for all new machines. And by exploiting data more

efficiently, Philips and Barco can now also create medical equipment with a higher uptime, allowing to diagnose or operate on more patients per day.

This clearly shows that business and society can benefit from the 'digital loop' developed in Reflexion!

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

MOS2S

2016-2020

New forms of engagement in entertainment and society

Traditional media is losing ground to personalised experiences. Today, for example, everyone can choose what they want to watch and when. And you can even produce your own content. This trend in the entertainment business can also be seen in society, where city representatives no longer make decisions on their own. Everybody wants to be involved, or at least can be.

To bring this engagement to a higher level, 17 partners from Belgium, South Korea, the Netherlands and Türkiye came together in the ITEA project MOS2S and created world-first ways to engage with citizens and audiences of live events. MOS2S was centred around two domains: e-Democracy and (sports) entertainment and focused on technologies that allow data and media streams to be orchestrated into an all-encompassing experience on various types of end-user devices. The common denominator in MOS2S is the media processing platform, which combines multimedia streams from different domains.

For e-Democracy, they created, for example, a mobile interaction booth – the BabbelBox – to easily gather the voices of citizens in multiple media campaigns. Hangouts, a video chat system, enabled listeners and absent campaigners to dial in live and bring their story to air from anywhere in the world. In the sports and entertainment domain, several unique innovations were also developed. First of all, in September 2018, MOS2S's

project leader, TNO, and a number of partners presented a world-first: the match between the Dutch and Peruvian national soccer teams was played live in the Johan Cruijff ArenA in Amsterdam and watched in real life and real time in Daejeon, South Korea, thanks to Ultra-Wide Vision technology. And through an exceptional SME collaboration, Game On and Inmotio implemented their video and sensor technologies in the Johan Cruijff ArenA, allowing visitors to get much closer to the spectacle and allowing trainers to analyse player movements for training purposes.

These innovations have created several business opportunities for the MOS2S project partners. Since the MOS2S project, Kiswe has been working with multiple sports leagues and entertainment and media companies

worldwide, while Game On's video technology has been licensed to 25 European clubs and The Inmotio Performance Centre is being rolled out for all 18 teams of the Dutch Eredivisie, potentially leading to millions of users following completion.

Thanks to the MOS2S results, citizens and audiences of (sports) events are now able to enjoy a rich and enhanced experience and involvement!

https://itea4.org/project/mos2s.html

PARTNER

2017-2020

'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 necessary 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, developed an architecture that makes it possible to let different systems, offered by multiple vendors, communicate with each other. The solution also includes 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. As a result, every contributor involved has released new products and services that are ready to be installed in several hospitals for further trials.

Alongside the business success, the benefits of the PARTNER project results for hospitals 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.

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

With the short summaries in the three ITEA Magazine editions of this celebrative year, we have shown a few examples of the impact of the ITEA programme and its projects. Many more successful examples exist, and we invite you to discover them on the ITEA website (https://itea4.org/success-stories.html) and in our recently released publication 'ITEA - The fast track to software innovation' (https://itea4.org/itea-publication/itea-the-fast-track-to-software-innovation.html).

ITEA and its Community members are ready to continue this success and shape a better future!

25 years of ITEA

Solana Networks

Looking to the horizon of network security

As a Canadian SME, Solana Networks is currently working to deliver encrypted traffic analysis solutions for cyber security and serves as a technology vendor providing intelligent software products and solutions for internet protocol (IP) networks, focusing on the area of network and security monitoring. Solana has its roots in two high-tech companies in Ottawa: Nortel Networks, a telecommunications equipment vendor and JDS Uniphase, a vendor for optical communication products. Biswajit Nandy, Chief Technology Officer at Solana Networks, gives us an insightful glimpse into the story of Solana Networks.

SME in the spotlight

Organically grown

"In the early 2000s, the available solutions for network monitoring and management for data communication were in its infancy, and sophisticated tools were missing. Monitoring and measuring took a long time and vendors provided proprietary solutions. So, my current business partners and I saw an opportunity that we could leverage by developing advanced network monitoring solutions that are generic and easy to use. What's unique about Solana Networks is that we don't have external funding. When we started, maybe we were a little bit naïve." Biswajit smiles. "We put some of our own money down but that ran out in no time once we hired a few employees. Then we started bidding for federal government IT projects and won. If we hadn't, perhaps Solana wouldn't exist. 20 years later, we are still an organically grown company and are self-sustaining."

Constant evolution

Solana's flagship product is SmartHawk, a network mapping and topology discovery tool for routed and switched IT networks that has been deployed in enterprise and service providers networks. "Over time, we saw SmartHawk being used more and more in the security domain to observe changes in inventory and connectivity in near real time," explains Biswajit. "Network security is a fast-moving area. Solana has been developing various security analytics solutions for government departments and private sector vendors. In recent years, different AI-based software analytics have changed the paradigm. A lot of analytics are currently being developed that were not possible 20 years ago."

Today, up to 90% of traffic is encrypted, presenting obstacles to ensure IT security and law enforcement. "How will you enforce your policy if you don't know what's going on in your network?" asks Biswajit. Currently, this is managed by a form of data processing called deep packet inspection (DPI), but encryption is drastically reducing its efficiency and accuracy. Within a few years, a complete alternative will be required. This is where the ITEA project ENTA steps in.

Preserving privacy

ENTA stands for Encrypted Network Traffic Analysis for Cyber Security and a key component of this involves the use of artificial intelligence. The temporal and spatial characteristics of traffic are analysed using machine learning and/or deep learning to obtain visibility into encrypted traffic. This enables predictions, such as whether certain encrypted traffic is YouTube, Netflix or Skype. Biswajit: "The interesting part is that you don't need to look inside the payload data, so you're not violating any privacy. We're addressing two use cases in the ENTA project. One is about the detection of encrypted application types. Also, by looking at the traffic characteristics, you should be able to tell what kind of IoT devices you have in your network and whether it's rogue or not. This is the second use case."

The ability to obtain visibility into encrypted traffic data for network and security monitoring already makes ENTA unique, but the consortium also expects its approach to be applied to many other use cases following the project's completion. Now at the halfway mark, the final outcome will include a platform to enable researchers to easily do their own encrypted network traffic analysis using AI, presenting the opportunity for this innovation to spread to a huge variety of domains while preserving privacy.

Longer horizons

This achievement is all the more impressive considering that this is Solana Networks' first ever experience in a RD&I project with European partners. Biswajit contrasts the ITEA experience with privately funded consortia. "You know, when a project is privately funded, your objective is shorter. You want some outcome in one or two years and then you want to productise and leverage that. But this kind of publicly funded project is extremely helpful for addressing problems with a longer time horizon. The problem we are addressing, encrypted traffic analysis, is one such problem."

Positive differences

As for the difference between Canadian projects and ENTA – which also brings in partners from Austria, Spain, Switzerland, Türkiye and the United Kingdom – Biswajit thinks for a second. "I mean, it's a little bit different in a sense. People are from different backgrounds, different languages and different cultures; so, maybe it involves a little bit more coordination for project management. Collaboration is the main thing: we have many use cases, so working with various partners essentially means that different requirements come out, which improves the quality of what we're doing. Everybody has different ideas and we pull it all together."

"Honestly, Europe has excellent programmes, particularly ITEA and Eureka. It's well-structured and has been operating for a long time. As I said earlier, these publicly funded projects can nurture long-term innovation. Canada has a good set of innovation programmes but I wish they were as broad and well-funded as in Europe. The last thing I can say is that I appreciate programs such as ITEA and IRAP in Canada and I really see the value."

More information

https://www.solananetworks.com/

COMPACT

Faster, more efficient software through automation

From industrial automation to healthcare, Internet of Things (IoT) has impacted every aspect of our lives. However, the cost pressure of making IoT devices as smart, cheap and energy efficient as possible affects both manufacturing and design costs, with software design accounting for around 45% of the overall System-on-Chip (SoC) development effort. Fast and efficient software development is thus a key enabler of future growth within the IoT domain.

Success story

Within the ITEA project COMPACT (Cost-Efficient Smart System Software Synthesis), 15 partners from Austria, Finland and Germany focused on enhancing IoT software by automating code generation from abstract models, thereby boosting productivity and reducing both manufacturing costs and performance issues. It also reduced embedded software costs in semiconductor-based products by selecting the best solution from multiple options based on system vision.

Automatic software generation based on models

COMPACT's technology focused on tiny IoT devices, like those similar to Arduino. It mainly dealt with low-level software components such as drivers and hardware

abstraction layers (HAL). The main goal was to make software for these small devices, where the hardware is limited in power and size because it has to be affordable. COMPACT sought to create a connection between how a device is modelled and how its software is developed. The solution is automatic software generation based on models, for which a complete chain of tools was developed.

Based on requirements, concepts and use cases from industrial partners, the project achieved major innovations in modelling, tooling & automation and analysis & optimisation. An IoT Platform Modelling Language (IoT-PML) defines the overall modelling approach and features various meta models for non-functional properties, specific functional behaviour and firmware configuration. This combines previously isolated modelling approaches and provides a foundation for the structuring and formalisation of the domain. For automatic code generation, various generators, libraries, plugins and tools for highly automated IoT software development were created and integrated into a framework. Static and dynamic methods can then analyse software properties (such as timing, power and memory footprint) and optimisation methods. Plugins enable software transformation to ensure that the generation overhead remains within an acceptable range.

Three demonstrators were also developed to illustrate the project's relevance to multiple applications: smart sensors (model-based code generation workflow and virtual prototype-based software analysis), vehicle detection (use of IoT-PML in the Enterprise Architect tool) and an IoT sensor device (model creation and support for system architecture and functional interface refinement). As a contribution to standardisation, a COMPACT extension to the IP-XACT standard was finalised in Accellera and submitted to the Institute of Electrical and Electronics Engineers (IEEE). About 90% of the proposals have been included in the new standard.

Faster and more compact than human-written code

In terms of results, COMPACT exceeded expectations by generating highly efficient software, up to 90% of which is faster and more compact than human-written code. This results in less memory usage, less energy consumption and lower latency. Depending on the degree of generation, a 20-70% reduction in

COMPACT exceeded expectations by generating highly efficient software, up to 90% of which is faster and more compact than human-written code.

Project start
September 2017

Project end
December 2020

Project leader
Wolfgang Ecker
Infineon Technologies AG, Germany

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

software development costs can be expected without any performance loss or memory footprint of the software code. As designers can produce around 2,000 lines of code per year and a person-year costs roughly EUR 150,000, COMPACT predicts that each line of generated code will have a value of 75 euros. Generators for a new device family therefore pay off with their first use.

As the project adopted an open software implementation for better dissemination, one of its key strengths has been broad exploitation by various channels. SME software tool companies have been able to create new tools while large semiconductor companies and system houses have created software more efficiently. This enables them to retain or expand their positions within the IoT for semiconductors market, expected to grow from USD 20 billion in 2017 (the start of COMPACT) to over USD 61 billion by 2024. SparxSystems Software GmbH, for instance, has built the base for cybersecurity modelling which is now part of the core product, enabling access to the aviation and space industry.

In addition, cybersecurity modelling is available as a separate solution, including a form of automation named ThreatGet (www.threatget.eu). This is an award-winning product: Report eAward (1st place), Constantius Award (1st place in the category of IoT) and a nomination for the State Award for IT Consultancy. Targeted customer domains include automotive, industry, critical infrastructure, space and more. SparxSystems Software GmbH has increased its workforce by five employees and two trainees and is in the process of strategically taking over another company in the IoT domain. Revenues have increased by 15% in this domain. Further strategic investments in the direction of model transformation down to Model2Code have resulted in additional research projects (Eureka Penta project ECOMAI and ITEA project GenerIoT). SparxSystems Software GmbH aims to provide a compilable, debuggable open-source Model2Code implementation for RUST (based on the MIT License) as this seems to be the next big thing in the embedded domain.

Similarly, Kasper & Oswald GmbH has presented its new COMPACT Crypto API (CCAPI) to several customers in the automotive and home automation domains and used parts of this in internal product development. Kasper & Oswald GmbH has trained two junior engineers to further extend platform support, one of whom is now moving to a full-time role in the company. The results of COMPACT also feed into two follow-up projects, DevToSCA and FreeSBee, both funded by the German BMBF.

Finally, Visy Oy's demonstrator of a vehicle model classifier and license plate recogniser is in use at four customer sites and they expect orders worth EUR 1.8 million for systems with technologies developed in COMPACT. The vehicle model recognition also led to vehicle colour recognition and is currently operational at 20+ customer checkpoints. More importantly, the newly developed computational technologies are an essential part of Visy Oy's offering to all customer sites, enabling more efficient edge computing.

The ITEA project GenerIoT and the PENTA project ECOMAI serve as vivid examples that use the research outcomes of COMPACT.

IoT to benefit our daily lives

As for the future, the project showed that automated model-based code generation works efficiently, which will encourage work to bring model-based code generation to the next abstraction levels, such as runtime systems and applications focused on digital signal processing (DSP). COMPACT also demonstrated the power of using AI for software optimisation in combination with code generation and compiler configuration.

The COMPACT project significantly benefits society by automating IoT software development, thereby reducing costs by 20-70%, enhancing energy efficiency, improving security and fostering industry growth. Its contributions to standardisation and technological advancements strengthen the IoT sector, opening new markets and research opportunities, in turn opening up new uses for IoT to benefit our daily lives.

More information

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

Internet-enabled fraud has become a bit harder

Many aspects of our daily lives have moved to the internet – including the less pleasant aspects, like forms of frauds such as phishing or criminal financial transactions. To address this, the DEFRAUDify project decided to look into new data sources and advanced analytics.

Phishing attempts are annoying, but the 'spearphishing' variety is especially dangerous: these are handcrafted emails that contain lots of specific information elements that relate to the recipient, so they are very convincing. And now, with the advent of services like 'FraudGPT', it's even easier for cyber criminals to create those emails. Companies that want to be aware of these threats, want to know what the spearphishing 'attack surface' looks like: which key employees can be targeted and which information about those potential victims can be used by criminals? The DEFRAUDify 'cyber threat monitoring dashboard' collects this information and presents it to security officials of the company when needed. This is combined with information from the dark web that indicates whether the company is being discussed there. Advanced techniques like honeytokens, dark web crawlers and natural language processing are used to do this, developed by partners Almende, TU Eindhoven, CFLW Cyber Strategies and TNO. DEFRAUDify partner Web-IQ has included this solution in their portfolio, which has already raised considerable interest from their customers, especially the functionality that identifies dark web threat levels and trends. This has already been implemented a couple of times. They now know much more precisely what types of threats they need to anticipate.

Another area of internet-enabled fraud is criminal financial transfers. Cryptocurrencies are frequently used to collect ransomware payments, to evade taxes or to launder money.

The DEFRAUDify 'cyber threat monitoring dashboard'

Lots of tools are already available to analyse cryptocurrency transactions, but some crucial points are missing. A special version of crypto transactions, known as 'Layer 2' or 'Lightning network' payments, evades normal analysis. Another crucial point is the interface between the 'normal' financial world and the crypto world: the Crypto Asset Service Providers (CASP). DEFRAUDify partners have created the CARE result: CASP Risk Estimation, whereby banks can easily assess how risky it is to accept transactions from crypto service providers. DEFRAUDify partner bunq (a fintech company) has defined the requirements for this solution, which is built upon results from partners NetSearch, CFLW Cyber Strategies and TNO. In their business, bunq is now much better able to assess risks for new customers who also use cryptocurrency transactions. The inherent explainability of the results is a distinguishing factor in the market. Partner BEIA will use the results to help the Romanian government fight tax evasion.

Besides the joint results outlined above, many more individual results were presented in the final review meeting on 18 September. The DEFRAUDify partners continue to exploit those results in the context of their product portfolio because the cyber world is constantly evolving. Any new tool that helps to detect or avoid cyber crime will create a reaction from the dark side: a new modus operandi, a new vulnerability, a new technology. So, while DEFRAUDify has taken an important step and the project is finished, the work continues.

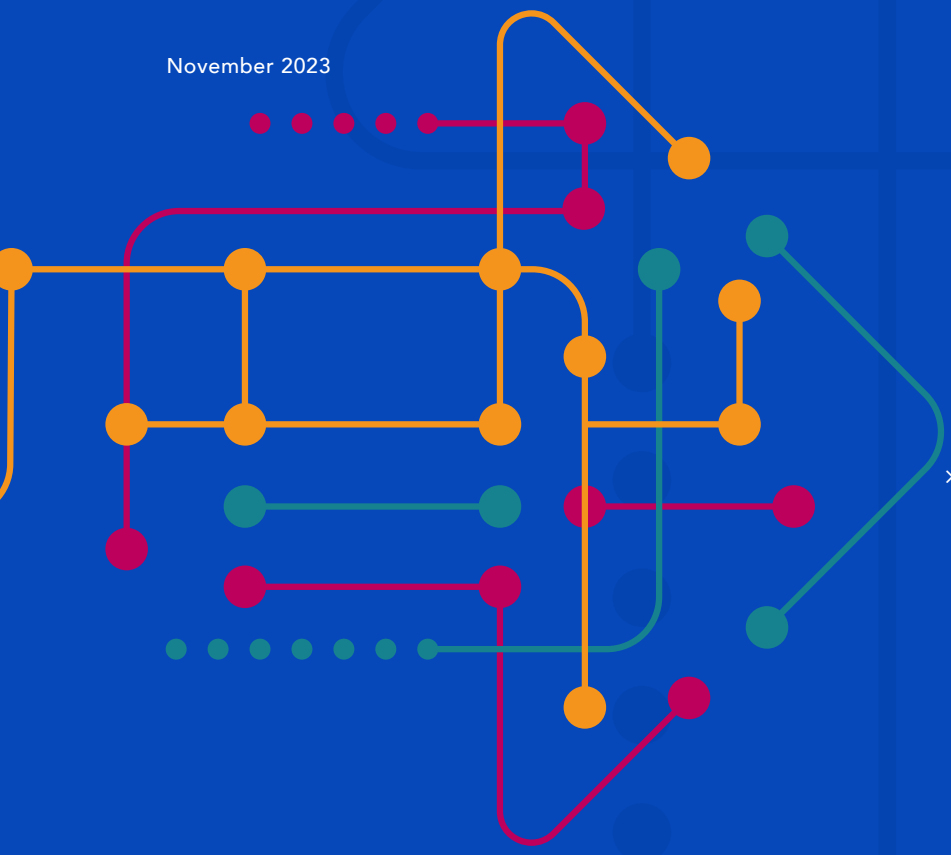
More information

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

Navigating the future of ITEA

Current challenges and future directions

Throughout this year, including in the ITEA Magazine, we celebrated 25 years of ITEA by showcasing the successes achieved over the past decades and highlighting the milestones reached and the impact made. Now, as we conclude this anniversary year, it's paramount that we shift our focus towards the future of ITEA. The software innovation process is an ongoing journey in which past innovations serve as stepping stones for future breakthroughs, reinforcing the idea that software itself is a powerful tool for developing new software solutions that solve the important emerging challenges that lie ahead.



What are the new challenges?

One of today's challenges comes from the abundance of potential solutions that have been developed up to now during this software innovation journey. When a digital transformation project starts, many options are available with different approaches based on standard methods or data models or a combination of both. It is often hard to make the right choice and many examples show that a wrong decision can lead to the failure of such a project. So far, the effort has been focused on developing digital technologies and not enough on how to select the right digital technology for a given problem. In addition to all of the IT methods and tools that have been or are currently being worked out, knowledge of how to use them must be developed. This knowledge is mandatory when it comes to limiting the failure of digital transformation projects. To build this knowledge, cooperation and the sharing of experience are a must.

A second challenge is related to the integration of new objectives within the design process of software-based systems. There are at least two dimensions that are of the upmost importance and are not yet completely well-managed: security and sustainability.

- **Security** is clearly a must as more and more critical infrastructures are software-based. The consequences of cyber security attacks are becoming more and more serious for society and the economy. At the same time, the surface of attacks has increased as these critical infrastructures are more and more connected. Both the severity of the attacks and the higher risk of attacks must be addressed. The challenge is to integrate a security-by-design approach, to develop new protection features and to offer degraded operation modes to maintain at least a minimal service level for these critical systems.
- **Sustainability** is a second objective that is now a priority when designing a system. The problem scope is large as the design process, the manufacturing process, the operation phase and potentially the recycling phase must be considered. For each of these steps, it is important to minimise the resources (human resources, energy, raw materials, etc.) needed by the system in order to reduce the environmental footprint and create a sustainable system. During the design, for example, it is important to reuse previous sub-systems to save effort or to design in a way that will allow the new system to be reused. The manufacturing process also needs to minimise the raw materials and the energy needed. For software systems, energy consumption needs to be optimised when running; this is a complex task, particularly in cloud-based infrastructures. Finally, the maintenance process needs to balance the lifespan of the system and the resources needed to repair it, while the raw material used by the system must potentially be recycled at the end of life of the system. Collectively, these objectives make the design of sustainable systems a huge challenge.

These two new objectives in the design of complex systems come in parallel with the functional objectives. The problems are therefore mainly multi-criteria optimisations in a complex and sometimes partially unknown environment. The objectives can be conflicting as security, for example, can need more resources and thus negatively impact the sustainability of the system. This shows how complex this challenge is and that cooperation and experience sharing are again mandatory to progression.

A third challenge to continue to progress in the software innovation journey is the creation of ecosystems that will be able to seize some of the new opportunities offered by digital technologies. So far, only the low-hanging fruits have been picked, mostly the ones for which a single organisation can manage the development of the software-based system. There are additional opportunities offered by digital technologies, but they will require several organisations to come together and jointly work on digital technology

solutions that will unlock new services. One example is the 'smart road' concept in which car suppliers, local authorities in charge of roads and service providers should cooperate to develop safer, smoother and more environmentally friendly usage of the roads. There are many other domains for which only cooperation between several organisations can unlock all of the opportunities offered by digital technologies. We have already experimented with cooperation that has been mutually beneficial, such as standardisation efforts. These are mainly 'horizontal' efforts, and the challenge is to go a step further and to find a win-win structure that will enable cross-organisation research and development in order to propose future digital services.

There are other challenges that could be mentioned, of course, but the three that have been presented here represent the synthesis of the concerns that ITEA has collected through its customer-oriented organisation and approach. ITEA is an association with more than 15 Board companies representing various industrial sectors that contribute to the shaping of a vision of the software innovation journey. It has also established Advisory Boards in the domains of smart cities and cyber security with members that help to identify the current needs and the real-life challenges. Regular customer workshops are organised to collect the end-users' pains and to brainstorm on how to solve concrete problems. The challenges presented in this section are the high-level expression of the feedback given by all these sources.

What are the future directions?

To continue this software innovation journey and to engage with more challenging but highly valuable software applications, some research directions can be highlighted.

- First, in the domain of data exploitation, there are opportunities in aggregating more sources to reach a new level of insights that can be built from these data. The recent success of the ChatGPT and DALL.E 2 OpenAI generative tools for text and image generation shows the power of aggregating a lot of data, organising them, training huge neural networks and developing easy-to-use interfaces. These tools would not be so powerful if they were based on a limited amount of data. The aggregation of different data sources can really make a qualitative difference in many domains. The health sector is a good example. The aggregation of patient data – of medical analysis data and treatment data – would empower the generation with new knowledge. This example also shows that the problem is not only technical but also organisational (how to federate all of the data owners) and ethical (how to protect privacy, how to control the use of such a powerful tool). There are many domains for which the aggregation of data would deliver valuable insights that would be unreachable otherwise. The question of whether the initiative to aggregate the data should be public or private is open and may have different answers depending on the domain. In any case, the aggregation to the next level of data sources can really pay off and is a good direction for research that will have to deal with technical, organisational and ethical problems.

- A second important research direction is related to the next generation of software applications that we want to develop, run and control. Most of the time, the applications are highly distributed: starting at the sensor and actuator level with modules at the edge and other components in the cloud or even in large supercomputing facilities. At each level, the IT resources are quite diverse (from very tiny microcontrollers to highly specialised hardware like graphical processing units or neural processing units). The IT infrastructure is dynamic, with nodes that can be switched off or integrated in applications. It would also be good for a software application to optimise its energy consumption and to detect potential cyber security attacks. In other words, the software application must be aware of its behaviour and be able to negotiate with the IT infrastructure and certain quality service agreements. There is a need for new technologies that will enable the dialogue and some contract agreements between the applications and the underlining infrastructures. In addition, new solutions are mandatory, not only to code the application but to develop the layer that will control the application and will give the software the ability to adapt to a dynamic environment and optimise its operation. Some progress in this direction will enable the development of highly distributed software applications that will be robust, dependable and energy efficient. This will be a way to continue the software innovation journey with a new class of

applications that are much more powerful than what is currently achievable.

- The third direction aims to address the design and the operation of complex systems. As explained earlier, we want to be able to tackle more ambitious functional specifications in the design phase and to add new objectives to them, such as dependability, security and sustainability. In most cases, we want to simultaneously co-develop the system itself and an environment that will optimise its operation (digital twins, monitoring tools, maintenance tools, etc.). All of these objectives come at a time when the workforce that is able to develop software is limited. Most of the Eureka countries have not chosen to target programming in standard educational courses. Even if the digital native generations are experts in using digital technologies, most people will not be able to actively develop them. They will know how to 'read' but will need some help to 'write'. Due to this limited workforce and the challenging targets, progress in the design tools and in the methodologies to create these complex systems is mandatory. To facilitate the involvement of non-software engineers, a priority is the development of low-code or no-code approaches. This will allow more people to actively take part in the digital transformation. The new technologies that should be developed will aim to increase the productivity in software-based system design and to decrease the failure rate of digital transformation projects.

Again, more directions for the continuation of the software innovation journey could be presented. Nevertheless, the three which have been highlighted here show that this journey is not yet at its end. As ITEA sets sail into its next chapter, these efforts and directions will serve as the compass guiding our voyage towards a brighter and more innovative software-driven future.

Calendar

28-29 NOV 2023

EUROPEAN BUSINESS SUMMIT 2023
Brussels, Belgium
https://ebsummit.eu/

30 NOV 2023

SWISS INNOVATION FORUM 2023
Basel, Switzerland
https://www.swiss-innovation.com

30 NOV - 1 DEC 2023

Cyber Security & Cloud Expo Global
London, United Kingdom
https://www.cybersecuritycloudexpo.com/global/

4-6 DEC 2023

GENERATIVE AI EUROPE 2023
Amsterdam, the Netherlands
https://www.aidataanalytics.network/events-generative-ai-europe

13 DEC 2023

Kick-off "Digital Technologies 2023"
Wien, Austria
https://www.ffg.at/auftakt-digitale-technologien-2023

19 FEB 2024

DEADLINE FPP SUBMISSION ITEA Call 2023

By and for end users

Gränges further digitalises aluminium engineering with the help of VMAP analytics

The focus of the Swedish industry partner Gränges is innovative aluminium engineering and this is a promise they lived up to in the ITEA project VMAP analytics. With roots in railways and mines, the company was founded in 1896 and first began manufacturing aluminium products in 1922. Today, Gränges is a leading supplier of rolled aluminum products in selected niches, offering production, sales, technical support and customer-driven product development in which sustainability forms a natural part of their core business and strategy. This requires the creation of circular and sustainable aluminium solutions in partnership with their customers and suppliers – a significantly more digital domain than in years gone by.

A precise process

In the manufacturing of such products, hot rolling refers to the process through which a slab of aluminium is passed back and forth through rolling mills under intense heat. This keeps it malleable, allowing it to be shaped into profiles such as sheets or coils. This may be followed by a room-temperature process called cold rolling, which further refines the material and affects its flatness. Each process is not without its difficulties: despite the precise configurations of rolling mills, variations in thickness may occur due to a variety of parameters, including the pressure and speed of the rollers. Such inconsistencies may be visible in the slitting process in which the rolled aluminium is cut into smaller forms. Detailed insights into the rolling processes can therefore provide a boost in the manufacturing of high-quality products.

This was what Gränges had in mind through participation in the ITEA project VMAP analytics, which ran from October 2020 to October 2023 and aimed to enable the realisation of smart digital twins for materials and manufacturing design tasks. For Gränges, the problem was straightforward. Existing Finite Element (FE) tools, used to simulate and analyse the behaviour of complex structures and systems, could not simulate multiple passes in the rolling mill. A custom solution would therefore need to be developed to solve this issue across the aluminium process industry. By setting up a platform for the consortium's other modelling and data analytic teams to access data from Gränges' production, they were able to create a digital twin that mimics the rolling process closely and offers data analytics to provide a deeper understanding of this.

Many sides to simulation

From a more technical perspective, several concepts were tested and evaluated to address reversibility in the FE environment. The concept that was implemented in the final FE model utilised LS-Dynas parameter functions and scaled the initial slab and roll speed depending on rolling direction. To do this, a Python script was developed to start and stop the simulation after each pass, as well as to start and stop a cooling simulation between each pass to get the thermal contributions from the time it takes to return the slab to the mill. The script also writes a parameter file to LS-Dyna that scales the initial speed of the slab and rolling direction. On top of this, it controls the roll gaps and how many passes need to be done before stopping the simulation for remeshing. In doing so, it allows the user to restart the simulation from a specific pass so that the rest of the passes can be simulated after a remeshing pause.

Sustainable processes and reduced CO_2 emissions

For Gränges, participation in this ITEA project has enabled an innovation for which no other solution currently exists: profile calculation during hot rolling. With this strong profile prediction model, visualised to the operator, more stable process control can be enabled. In turn, this can increase both the yield and the energy efficiency of the process while reducing the management of internal scrap and the amount of primary aluminium that must be bought – in other words, getting more output for the same amount of input. Collectively, this serves as an effective means of reducing Gränges' CO_2 emissions, with the dual benefit of opening up the potential for higher revenues and lower costs. This is especially vital given their commitment to create circular and sustainable aluminium solutions in partnership with their customers and suppliers.

As a simulation tool, the model can also be a great support in parameter tuning when setting up new products in the process. Finally, this technique minimises variations in the end properties of the substance, which translates into better products and more satisfied customers. In a variety of ways, their work in VMAP analytics has therefore given Gränges a predicted value for something that was formerly impossible to measure.

More information

- https://itea4.org/project/vmap-analytics.html
- https://www.granges.com/

25 years of ITEA: PO Days through

Celebrating 25 years of international collaboration

The ITEA Project Outline Preparation Days (PO Days) 2023 in Berlin marked not only another successful edition but also provided the perfect opportunity to celebrate ITEA's 25th anniversary: 25 years of international collaboration. Over this period, the ITEA Community has grown to over 2000 unique project partners, creating huge impact and changing businesses and lives - but also leading to new long-lasting partnerships and friendships along the way. On 12 and 13 September, nearly 300 representatives from organisations from 18 different countries gathered to prepare new RD&I proposals for ITEA Call 2023 and to work together towards the next innovative solutions.

time

The ITEA PO Days continued the legacy of success that has defined ITEA throughout its 25 years of history, bringing together a good mix of 'seasoned veterans' and newcomers experiencing the spirit and impact of the PO Days for the first time. This journey and what makes the PO Days special are best envisioned through their eyes.

A quarter of a century of innovation through the eyes of the ITEA Community

Experienced ITEA members share their stories, giving us a glimpse into ITEA's past. Having attended numerous PO Days throughout the years, Frans-Jozef Stewing from MATERNA shares his perspective:

"It is amazing to see that the spirit of ITEA's pioneering time 25 years ago, which I had the honor to take part in, has been maintained throughout these years regardless of the persons in charge of managing ITEA and the current ITEA family members attending these PO Days. Elements of this spirit have always been and still are voluntarism and the strong wish to deliver (the promises made) in implementing Eureka's bottom-up approach. This also has proven to be quite beneficial for the awarded I2PANEMA project following a strong end-user orientation."

Andy De Mets of Barco echoes this sentiment:

"It was good to see that attendance at the 2023 PO Days was once again high and many exciting project ideas were presented. We finally had the full ITEA family feeling again, where everyone shapes projects in an open, innovative, and trust-based spirit - as has been the case since the beginning of ITEA 25 years ago. There have been many different topics and highlights over the past 25 years, but the PO Days have always been the foundation of successful joint innovation projects, and I'm sure this year will be no exception."

It is also insightful to hear directly from PO Days veterans about the evolution, structure, setup, and historical perspective of the event. Stefan van Baelen, a committed participant in ITEA's PO Days since 2009, representing IMEC, offers his historical perspective:

"The ITEA PO Days started as a rather unstructured event but has grown into a well-oiled machine that clearly focuses on idea exchange and consortium building. A constant since the beginning is the added value for the participants. Most ITEA proposals are discussed and shaped at the ITEA PO Days, so attending this event is almost a must for parties that want to participate in an ITEA project. In addition, the PO Days are very open, so participants feel welcomed and embraced within the ITEA family. This ITEA family feeling makes the PO Days very enjoyable for the participants.

Erik Rodenbach, ITEA Programme Coordinator since 2000, who has been part of ITEA almost since its establishment, provides comprehensive insights into the origins and early development of ITEA and the early PO Days.

"My first experience with the ITEA PO Days was somewhere in 2001 for the ITEA 1 Call 4. In those days ITEA and the PO Days were focused mainly on the needs of the large industries. Since the large industries already had three successful ITEA Calls, they were not interested in having new projects in Call 4 and we had less than 10 registrations for the PO Days, resulting in a small Call. In order to balance the Calls we enlarged the focus for the PO Days to a larger audience, including SMEs and research centres. In the next two years we developed an approach of stepwise refinement for the ITEA PO Days. We started with a marketplace, the poster session, followed by the pitch sessions, brainstorming sessions and plenary feedback. This approach has been professionalised over the years and has led to a steady growth of ITEA with a strong Community."

Welcoming newcomers to the ITEA family

Having attended the ITEA PO Days for the first time, Manzoor Ahmed, CEO of HIGOE, is pleased with the outcome of his debut participation at the ITEA PO Days and looks forward to future engagements.

"HIGOE, a UK-based SME, is dedicated to creating an integrated health and social care platform for the elderly. As newcomers to ITEA, our journey of ideation, pitching, and networking across ITEA members has been remarkably streamlined, thanks to the user-friendly ITEA website and the excellent support from the ITEA Office in the Netherlands. Attending the PO Days in Berlin was a valuable experience, offering well-organised interactions with numerous individuals and organisations within ITEA. We look forward to future collaborations that will drive software innovation in partnership with ITEA."

PO Days through time: a timeless 25-year-old tradition.

Furthermore, Katelyn Petersen, COO at RUNWITHIT Synthetics, another first-time participant, shared her positive impressions of the 2023 ITEA PO Days in Berlin:

"It was a real pleasure to attend the 2023 ITEA PO Days in Berlin. The organisation was stellar and the format of the two-day event allowed us to meet many potential collaborators and partners from across Europe and around the world. We were successful in joining a consortium and we've already begun working together to define a promising project outline that will not only benefit all countries involved but will provide new product and market opportunities for our company. It's remarkable to see how many exciting possibilities can come out of just a few days!"

In this year's ITEA PO Days, Public Authorities (PAs) showed remarkable dedication once again. PAs from Austria, Belgium, Canada, Estonia, Germany, the Netherlands, Spain, Sweden, Türkiye and the United Kingdom attended the event, underscoring their unwavering commitment to the ITEA PO Days. Estonia's first presence added a fresh perspective. Tiiu Treier, head of international cooperation and funding office at Enterprise Estonia, shared her experience:

"For Estonia it was the first time to visit the ITEA PO Preparation Days. We were on an exploration trip with five selected software companies to find out if the event and the ITEA Cluster programme itself would be valuable for our companies. And we were positively surprised. The event was very well organised and participants eager to collaborate. All of our companies got valuable contacts and were accepted as partners in different project proposals. As we allocated funding to our companies to participate in Eureka ITEA Cluster Calls this year, we hope that these newly made collaborations will soon also turn into good projects."

Exploring and celebrating 25 years of impact

These PO Days were an excellent opportunity for the ITEA Community to celebrate ITEA's 25 years of ground-breaking innovation, which only has been possible through the strong international collaboration within the ITEA Community.

As ITEA would not have existed without its valuable Community and its strong projects, we invited our Community members to share consortia pictures, quotes and stories. A collage with photos demonstrating international collaboration and friendship was shown at the end of ITEA Chairwoman Zeynep Sarilar's '25 years of ITEA' speech at the end of day one. After that, we celebrated this unique international collaboration with the ITEA PO Days participants during a social gathering.

Highlights of ITEA's impact

For many years, ITEA projects have resulted in cutting-edge innovations that have impact on society and the economy. In addition to sparking new innovative ideas, the ITEA PO Days 2023 also offered a glimpse into the remarkable accomplishments of running and recently finished ITEA

projects at the exhibition 'Highlights of the ITEA impact' taking place on 13 September. Guided tours were organised to let people explore the projects during the exhibition.

ITEA Chairwoman, Zeynep Sarılar, comments:
"It is a great pleasure to celebrate the 25 Years of ITEA with the ITEA Community in Berlin. I would like to thank you for the strong contribution of industrials and Public Authorities to the ITEA PO Days 2023. As well as experienced ITEA Community members, new partners like British and Estonian companies added a new colour to this event. Additionally, the ITEA project exhibition added as an extension to the PO Days was a successful showcase for Public Authorities and joyful gathering for the ITEA Community. Thank you for making this celebrative event together."

Recognising excellence

The PO Days 2023 also provided the opportunity to have a look at the great achievements of ITEA projects that were recently completed. On Wednesday 13 September, during the ITEA Awards of Excellence ceremony, we celebrated the exceptional outcomes of ITEA's three most outstanding software innovation projects that finished between mid-2022 and mid-2023.

This year's award winners are:

- **IVVES – Industrial-grade Verification and Validation of Evolving Systems**
  The use of artificial intelligence (AI) is rapidly increasing and, in many domains, we are experiencing the strong benefits of AI, including reduction in human error, 24/7 availability, unbiased decisions and faster decision-making. On the other side, more and more questions are being raised concerning the use of AI and how to make sure it is safe and correct. This is especially the case for fields like transportation, finance, healthcare, industrial automation, and cyber security, which are strictly regulated domains as a mistake can have huge consequences. The ITEA project IVVES has developed new verification and validation methods, ensuring the trustworthiness and reliability of AI and ML in these environments. IVVES received the ITEA Award of Excellence 2023 for Innovation.

- **SAMUEL - An intelligent platform for additive manufacturing**
  Additive manufacturing (AM), also known as 3D printing in industrial production, is a rapidly progressing technology through which digital designs are directly transformed into physical objects. AM opens the door to customised products, rapid prototyping and innovative production solutions. As demand for 3D printed parts grows, it is a challenge to balance certified manufacturing with cost reduction. Many actors in the field lack awareness of new advancements, whilst reconciling data collection and reuse with intellectual property protection is difficult. The ITEA project SAMUEL has created innovative solutions to help additive manufacturing users learn more and improve their work, thereby making the whole process more consistent, reliable and trustworthy. SAMUEL is also a winner of the ITEA Award of Excellence 2023 for Innovation.

- **I²PANEMA - Bringing the value of IoT to the world of ports**
  Ports around the world face numerous challenges, from managing increased cargo demand to ensuring efficiency and sustainability in the face of urbanisation and labour management issues. The ITEA project I²PANEMA, comprising 17 partners from Germany, Spain and Türkiye, has integrated IoT solutions and new services for data handling in ports to enhance efficiency, sustainability and supply chain resilience in various port business cases. With a focus on data management and analysis, the project has achieved remarkable outcomes, including noise reduction, container localisation and logbook digitalisation. By leveraging IoT, I²PANEMA is revolutionising port operations. I²PANEMA is the winner of the ITEA Award 2023 for Exceptional Excellence as they excelled in all three categories: innovation, business impact and standardisation.

ITEA congratulates the ITEA Awards of Excellence winners for their remarkable contributions to a better society!

A bright future for ITEA

Witnessing the ITEA Community come together once again was truly inspiring, reaffirming the continious relevance and influence of the ITEA PO Days 25 years after its establishment.

ITEA looks forward to yet another successful chapter in its history. Good luck to all consortia with the submission of their proposals!

Korea Eureka Day 2023: bridging innovation between Korea and Europe

From 30 October to 1 November, the Ministry of Trade, Industry and Energy (MOTIE) of the Republic of Korea organised the Korea Eureka Day 2023 in Seoul in collaboration with the Korea Institute for Advancement of Technology (KIAT) and with the support of the Türkiye Chairmanship and the Eureka Secretariat. The primary objective of this event was to enhance and diversify the exchange of ideas and foster collaboration between the research and development stakeholders of Korea and Europe.

To this end, the Korea Eureka Day has been organised every year since 2010, after joining Eureka in 2009. This year, the event was held in Korea for the first time in eight years, inviting several European and non-European countries to Seoul.

Participants had the opportunity to learn about the latest developments in the sectors of semiconductors, future energy and mobility and connect with potential business partners. The two-day programme included a Korea-Eureka Innovation Forum, Eureka Academy, Thematic Idea Pitches, Country Seminar and 1:1 Meetings.

During the Eureka Academy, participants received a comprehensive introduction to the Eureka Clusters Programmes and the various Clusters' activities. Eureka Clusters Coordinator for Industry, Sébastien Aubron, looks back on a successful event: "The Korea Eureka days were highly successful, featuring valuable activities, full immersion in the Korean industrial ecosystem, and abundant opportunities for international networking. Throughout the event, public and private organisations shared a strong interest in the Eureka Clusters, recognising their value and impact."

More information
https://koreaeurekaday.kr/

Eureka Clusters Call dates

ITEA 4	19 Feb 2024	Submission deadline Full Project Proposals ITEA Call 2023	https://itea4.org/
Xecs	18 Jan 2024	Submission deadline Project Outlines 2022 Xecs Call 3	https://eureka-xecs.com/
smart advanced manufacturing	22 Jan 2024	Submission deadline Project Outlines SMART Call 7	https://www.smarteureka.com/

Colophon

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

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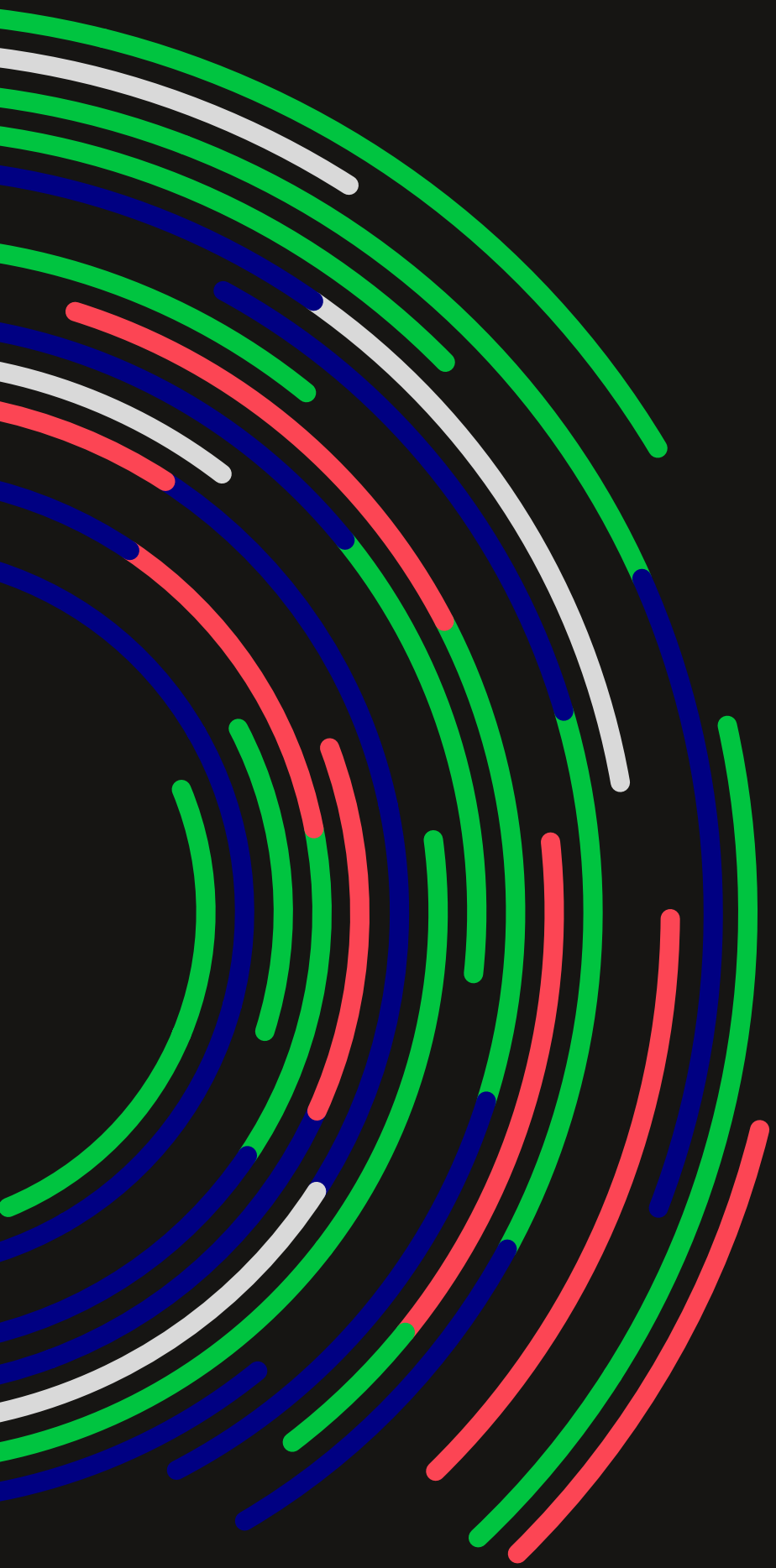
Submissions:
The ITEA Office is interested in receiving news or events linked to the ITEA programme, its projects or in general: R&D in the software innovation and Digital Transition domain.
Please submit your information to communications@itea4.org.

Subscription:
communications@itea4.org

25 years ITEA 4 1998–2023



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