SOLUTIONS | ERA

NEWSLETTER
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Fima

For those who follow the trends in intelligent engineering solutions

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Newsfeed

- Fima is halfway through work at newly-built **biofuel boiler house** in Kaunas, Lithuania. Our engineers are installing the power supply infrastructure, security systems and workflow control solutions required for its operation. The new boiler house will produce heat for the city's residents from renewable energy resources.

- Fima is completing the upgrade of **50 weather stations on roads across Lithuania**. Following a hardware update of the stations, which are integrated with a traffic information system, the system will now be more reliable and deliver more accurate data on traffic conditions and the state of roads. At present, there are nearly 100 of these stations across the Lithuanian road network. They collect data about air temperature and humidity, intensity of precipitation, visibility, wind direction and speed and the state of the road surface including the thickness of water, snow and ice as well as on the state of road adhesion.

- Representatives from Fima attended this year's "Best – RIGA" student summer camp in August. Hosted by **Riga Technical University's** Career Centre, the camp gave would-be engineers the chance to test their skills on **assignments created by Fima specialists** and in simulated business situations. Fima also sponsored the event which was being held for the third time.

Modernisation of a 110km section of railway in Lithuania nears completion

Fima is close to wrapping up one of the most ambitious projects it has ever undertaken. By the end of the year, the company will have completed the **modernisation of the Kaunas to Kybartai railway line**, which forms part of Branch IXD of the International Transport Corridor IX.

Fima's engineers, working with its partner, AŽD Praha, have installed a modern microprocessor-based rail traffic control system as well as modernising the power supply, telecommunications and security systems on the strategically important line.

A 70km section of the line and five stations – Mauručiai, Kazlų Rūda, Pilviškiai, Vilkaviškis and Kybartai – as well as their branch lines have been modernised so far and the systems installed by Fima have been commissioned.

The project includes modernisation of 94km of the Kaunas to Kybartai section and 15km of the Palemonas to Rokai to Jiesia bypass as well as eight stations. Work on the stations at Rokai, Jiesia and Kaunas is expected to be completed by late autumn.

The modernisation of railway infrastructure and the installation of modern control technology will improve safety on the section and increase its freight capacity. Following the installation of the new traffic control system, the line speed on the upgraded section will be increased to 160km/h.

Photo by A. Palionis

> *"Once this project is complete, more than 400km of rail lines across Lithuania will be run by modern traffic control systems. Similar systems have already been installed in the Kaišiadorys to Radviliškis and Šiauliai to Klaipėda sections."*

PROJECT VIDEO

Broadband network being expanded to rural areas in Lithuania

Fima is to expand broadband access to rural areas in Lithuania after signing an agreement with the Ministry of Transport and Communications and the public body, Plačiajuostis internetas, to install networking equipment.

The company's engineers will install network switching equipment, uninterruptible power supply systems and fibre optic signal converters across access points of the fibre network that is currently being developed. The work will mean that internet service providers and their clients in remote areas will get access to high-speed broadband.

The work will be undertaken at more than 1,000 locations across Lithuania and Fima will also install power metering equipment as well as an advanced centralised management and metering system.

„We are planning to complete the IT broadband project in Lithuanian rural areas next year. Fima, which has been our partner for many years, will install the necessary equipment and we are convinced that these state-of-the-art technologies will ensure the network's reliability and provide Lithuanians with services of the highest quality for years to come," said project coordinator Vytautas Tvaronavičius, the Manager for Technologies and Development at Plačiajuostis internetas.

Lithuania launched the RAIN project to develop broadband internet for rural areas in 2005. The decision to expand the existing network infrastructure was followed by the second phase of the project and Fima has been closely involved since 2010.

> *"Once the project is finished next year, Lithuania will boast a network of close to 9,000 km of fibre optic lines with almost 1,500 towns and villages enjoying high-speed internet access."*

NEW PROJECT

Fima to implement one of Lithuania's **most sophisticated scientific infrastructure projects**

Lithuania's **National Centre of Physical and Technological Sciences** is now under development in the science hub in Saulėtekis Valley, Vilnius. A complex of nearly 25,000 square meters, the centre will house Lithuania's largest and most advanced institute dedicated to research in physics, chemistry and technological sciences. It will be able to accommodate 700 researchers and students.

The centre is being designed and built by Fima and Hidrostatyba after the consortium signed a contract with Vilnius University in late August.

> *"Once complete, the new scientific centre will ensure the successfulcompetition of projects and help increase the numbers of research orders on the international science market.*

The most advanced research institute in the Baltic countries

According to Gintaras Valušis, Deputy Director for Development of the Centre of Physical and Technological Sciences and professor at the Department of Semiconductor Physics of the Faculty of Physics of Vilnius University, the centre will be the largest research institute in the Baltic and unique in central and eastern Europe.

"The centre will be home to a modern technological module designed for the creation, characterising and processing of new materials. It will contain the only laboratory in Lithuania to conform to ISO 5

Jonas Jablonskis, Director of Contractor Solutions Department at Fima: This will be the first major upgrade to Lithuania's research infrastructure since the country regained independence.

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clean room standards. The centre will provide Lithuanian scientists with the most advanced research infrastructure. Until now, scientific projects and efforts to win orders on the international science market have been hampered by a lack of sufficiently advanced infrastructure. Areas that are traditionally strong in Lithuania – including laser and light technologies, materials and nanotechnology, semiconductor physics and electronics – will benefit from new levels of research quality thanks to the centre," said Prof Valušis underlining the importance of the project for national science.

> *"The centre will be the largest technological building in Lithuania with more than 250 different laboratory facilities.*

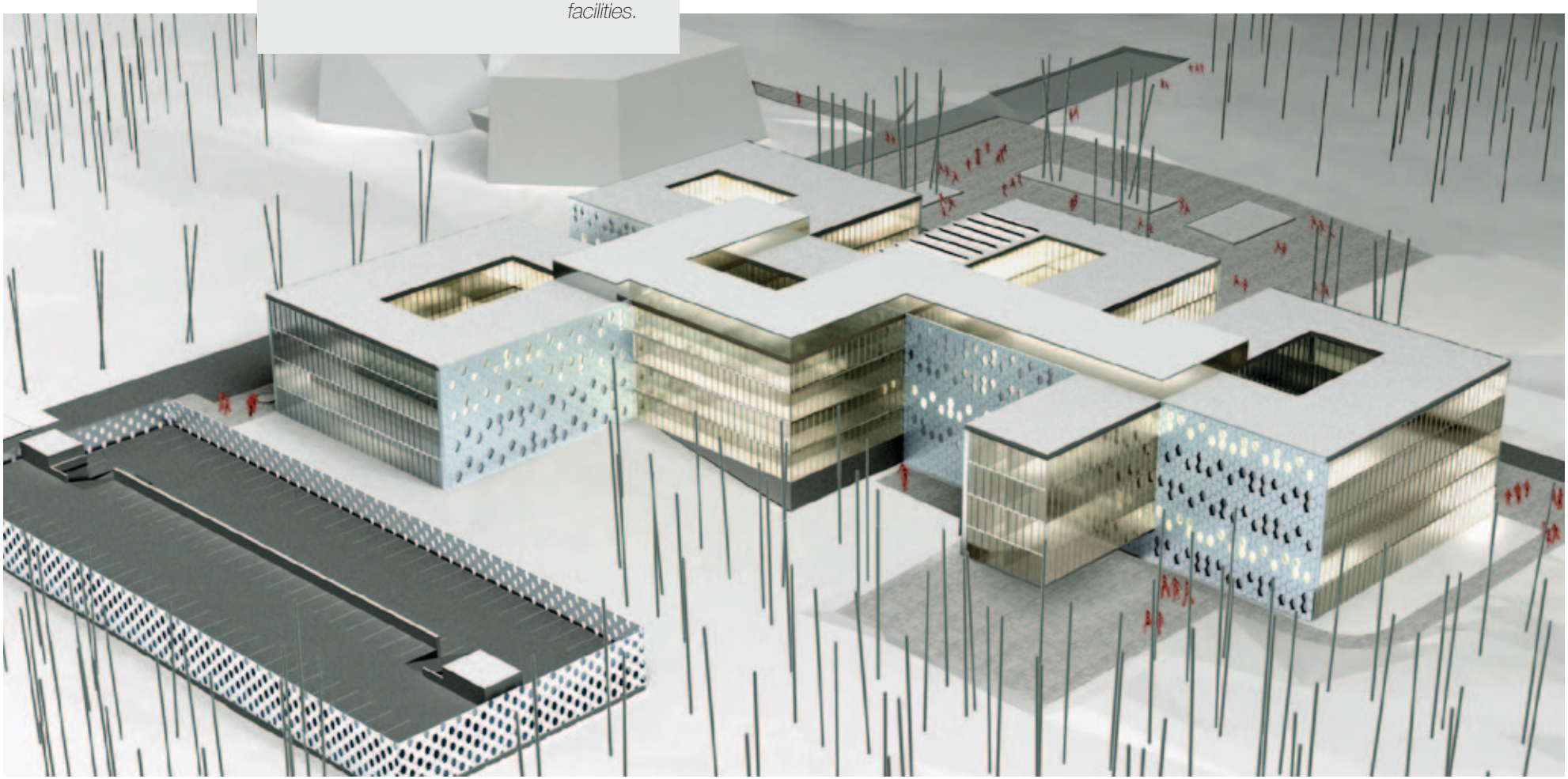
Lithuania's largest technological building

The Director of Contractor Solutions Department at Fima, Jonas Jablonskis, said that the project will stand out for its size and complexity. The Centre of Physical and Technological Sciences will be the largest technological building in Lithuania with

GOOD TO KNOW

FIMA experience in installation of infrastructure for scitentific research laboratories

Last year Fima designed and fitted out a Lithuanian National Public Healthcare Laboratory, which tests dangerous pathogens, to biosafety level 3 standards. The laboratory is designed to ensure a safe working environment and to prevent infections from spreading to the external environment.



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around half of its total floor-space dedicated to laboratories.

"We will be in charge of designing and implementing the entire engineering infrastructure of the complex and will build more than 250 laboratory facilities, some of them to the highest sterility standards. The facilities will have to be designed and fitted out in such a way as to ensure that research activities are isolated from environmental contamination – dust, microbes, radio waves, sunlight etc. In parts of the centre, we will assemble special ceilings, walls and floor coverings and will install automatic ventilation and lighting solutions along with professional laboratory infrastructure systems," said Mr Jablonskis.

Fima is also to design and install all engineering systems in the buildings including communications, power networks, security, fire extinguishing systems and a modern data centre.

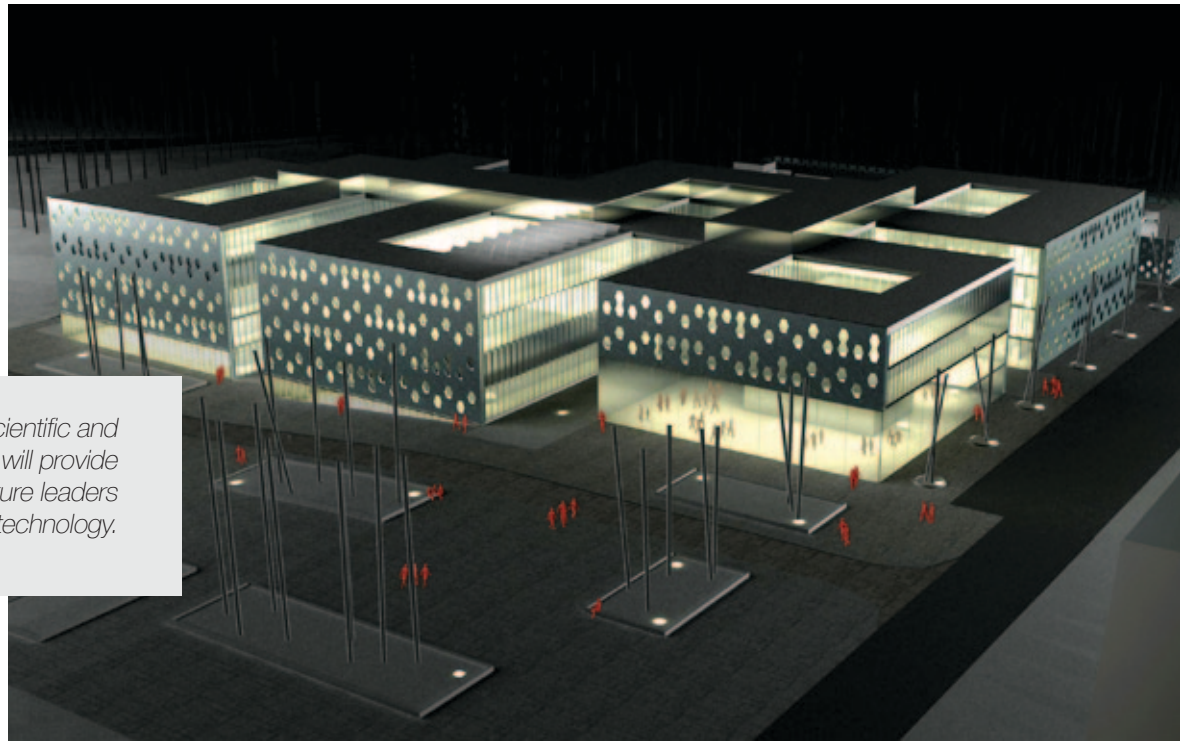
Businesses to benefit from new research centre

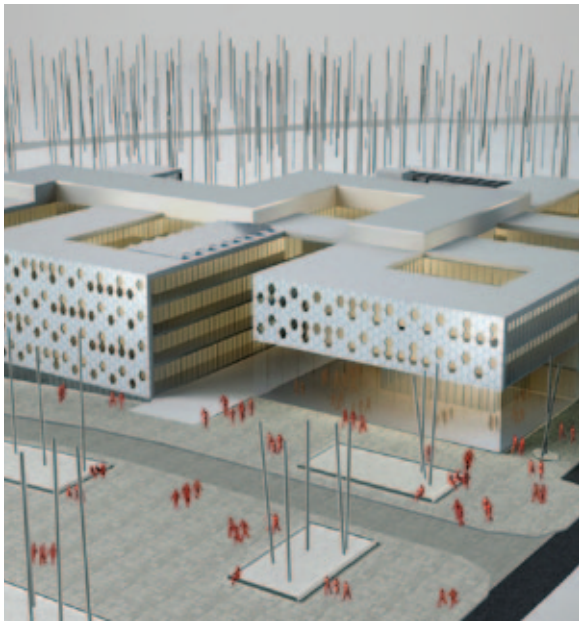
Academician Artūras Žukauskas, head of the project supervisory group and director of the Applied Sciences Institute of Vilnius University, said that centre, as well as representing a major upgrade for the Lithuanian research sector, will boost co-operation between science and business. Offering 24 open access laboratories, the centre will be available to both researchers and businesses with some research being conducted for the benefit of business.

"The important point is that the centre will be located in Saulėtekis Valley, which is already home to a number of universities. Scientists at those universities and large numbers of students are excited about its opening. It will provide work for many postgraduate and doctoral students – the people who represent Lithuania's scientific and technological future," said Prof Žukauskas.

> *"Cutting-edge scientific and technological infrastructure will provide the education for Lithuania's future leaders in science and technology.*

The National Centre of Physical and Technological Sciences is the major component in the project to develop a modern science hub in Saulėtekis Valley. It is already home to Vilnius University's Centre for Scientific Communication and Information, its newly-renovated Laser Research Centre and a while work on the Joint Centre for Life Sciences will start soon.





Now precise positioning is available indoors

GPS has become indispensable for many people but it has one notable failing: it won't work indoors where signals from the satellites that make up the system can't be received. Now, engineers have found a new solution to the problem of locating an object inside a building with the development of **mobile indoor positioning systems**. Although still in its infancy, this technology is already being used in both the public and private sectors with manufacturers excited about its other possible applications.

New solutions boost staff security

The manufacturers believe that one of the technology's most promising applications is in ensuring security for an organisation's staff. Knowing the exact location of a member of staff can be a headache for employers. Staff working with dangerous patients or criminals, fire fighters, power plant operators or staff at factories and logistics centres can be exposed to risk on a daily basis. Now, with its instantaneous warning system which precisely locates a worker who needs help within a building, mobile indoor positioning will ensure that workers receive that help in the shortest possible timeframe.

> *Indoor positioning systems have a great application potential*

Rokiškis Psychiatric Hospital pioneers the system

Rokiškis Psychiatric Hospital, Lithuania's only specialised facility that provides forced treatment to patients recognised by the courts as criminally insane, is pioneering the use of the system. The indoor positioning solution installed by Fima at the hospital will enable staff to call for help at the touch of a button using a watch-sized alarm worn on the wrist. The hospital plans to issue all staff who come into direct contact with patients with the alarms.

Sergej Bulach, Fima's manager for Šiauliai region and the man in charge of delivering the solution, said the alarm button will send an emergency signal to the closest receiver via Bluetooth. The staff member's location will then be instantly displayed on a map of the hospital on a computer screen at a security desk. Should a member of staff fall over without activating their unit, an alarm will still be broadcast to the security system. The real-time communication and positioning provided by the system will guarantee the security of staff at the hospital by ensuring extremely prompt responses to emergencies.

Bespoke systems to improve services

Indoor positioning systems can also be tailored to improve the services provided to the client. They can be used at hospitals and nursing homes where patients and residents might need to summon urgent help and in larger hospitals where patients can call for assistance if they get lost by pushing a button on their wrist, on a necklace around their neck or in a pocket.

The indoor positioning system is also used to protect items of high value. In the US, for example, it is used to monitor medical equipment by tracking and locating it in an instant.

Photo by D. Zibolienės

> *The system is easy to expand at relatively low cost, both in terms of increasing the number of users and adding more receivers in other premises*

Director of Rokiškis Psychiatric Hospital Algimantas Liausėdas: The hospital used to use fixed call buttons in some but not all rooms. Now, wherever a worker is, whether it is an office, ward or any other room, he or she can always call for help. A system like this is an absolute must for this type of institution. It greatly improves staff security.

New opportunities for business

This new technology can also provide new opportunities for retailers. Transmitters fixed to shopping bags will help record customer behaviour and analyse consumption habits. Indoor positioning devices could track customers' movements within a shopping centre, measure the time spent on different aisles and sort it by length or other variables. The collection of such information does not violate customers' privacy because it is anonymous.

Indoor positioning systems are now undergoing intensive development as mobile phone applications, which will make the technology accessible to everybody. Once installed on a smartphone, it could guide a person through a large public building as well as allowing them to receive personalised offers or other useful information about deals at a shopping centre.

Video analysis technology
finding its way into the transport sector

In the 21st century we will probably see fewer police road patrols and instead inspect vehicles remotely. The smart technologies that will perform this task will do so more efficiently and at lower cost. With record-breaking growth in traffic, the traditional approach where vehicles are stopped at random are becoming less efficient as offenders often get away without being noticed or punished. **Advanced video analysis technologies offer a completely different approach to traffic management** including remote monitoring and automated analysis of traffic flows, offence detection, identification of faulty vehicles and picking out uninsured vehicles or those on a search list.

> *Video analysis-based solutions ensure more efficient traffic control on the road network*

First steps in Lithuania

At the moment, the functionality offered by state-of-the-art cameras coupled with advanced video analysis software is rarely used on Lithuanian roads while video analysis technology is still a novelty.

"One of the first examples of video analysis-based solutions can be found in Vilnius. Small spherical cameras sited above some of the capital's crossroads detect traffic flows. These cameras do not 'see' the vehicles, instead capturing the number of vehicles at the crossroads," said Fima's Director of Solutions Department, Rokas Šlekys.

Lithuania has been slow to introduce automatic number plate recognition cameras, he added, even though the technology is the perfect tool to address a number of traffic organisation and control issues. The system is based on high-resolution video cameras coupled with special software which precisely records even the smallest details.

One tool, many tasks

Mr Šlekys believes that video analysis-based solutions coupled with existing traffic control systems can offer some integrated ways to address the road sector's problems.

"Information captured with the same video camera can be analysed and used for different purposes. For instance, the system scanning passing vehicles could read their number plates and compare them with data stored on different national registers and databases. So each passing vehicle could be checked for its technical inspection and insurance details and checked against lists of flagged vehicles. After detecting a suspicious vehicle, the system will automatically transfer data to the relevant services for further action," said Mr Šlekys.

Solutions offering remote monitoring and automated real-time analysis of traffic flows can assist the police in their task of tackling traffic offenders without having to increase manpower.

At the same time, cameras can collect statistics on how busy roads are and what average speeds are and make that information available to motorists.

Prevention

Mr Šlekys also believes that video analysis technologies will make road users more self-disciplined and will help the police in their work to prevent traffic offences.

Video analysis can also remove the temptation to break the law. If drivers know that a traffic offence is likely to be recorded, then they will be less inclined to break the law. Therefore, as well as improving road

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Rokas Šlekys, Director of Solutions Department at Fima: Solutions offering remote monitoring and automated real-time analysis of traffic flows will help the police's in the fight against traffic offenders without increasing workforce.

Video analysis technologies can be used for:

- analysis of highways and city traffic,
- section speed control,
- the search for stolen vehicles, vehicles on a watch list, those with technical faults or those without insurance coverage,
- automated vehicles' weight in motion,
- customs control,
- control of sections of road with high accident rates, public transport lanes and tolled road sections,
- car park management,
- control of protected areas, enforcement of payment at petrol stations etc.

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> *A video analysis-based system detects traffic offenders without stopping the traffic flow or disturbing other drivers.*

safety, technology-based solutions can make a huge contribution in the fight against corruption and bribery.

The new technologies can also be used for more efficient prevention of speeding with video cameras that can measure speed across different road sections reducing the overall average speed of vehicles.

But on their own, Mr Šlekys added, these new technologies are not enough to solve all traffic control problems. "Installing a network of video cameras on streets or public highways is not enough. There must be a fluently operating system to ensure that every offence detected by the cameras is dealt with promptly."

A solution for the private sector

Video analysis-based solutions can also be tailored to the needs of shopping centres, petrol stations and logistics centres.

"The solution comes in handy where recognition of the vehicle's plate number is required. For instance, at a parking lot for company staff or customers. Drivers could avoid the daily routine of searching for their remote control or card to operate the gate or to have to call security by simply approaching the gate and letting the camera compare their license plate with information on a database. It is a convenient and advanced solution," added Mr Šlekys.

INTERVIEW

LEAN to help upgrade project management processes

With a track record of successfully delivering more than 10,000 projects over two decades, Fima has proved that it keeps its commitments to its clients and is a trustworthy project manager. But the company never stops searching for ways to further improve and is now to start integration of the management system, LEAN, into its project management processes. We asked **Fima's Director of the Project Implementation Department, Giedrius Valužis**, about how the system will be applied.

Why did you decide to upgrade your project management process?

All of Fima's operations are project based. Yes, we do boast an impressive track record when it comes to project management, but we can't sit back and rely upon solutions that worked in the past if we want to guarantee continuing success. On the contrary, we constantly ask ourselves how we can improve processes to maintain our position as leaders in the electronic engineering solutions market.

Fima normally runs 100 projects simultaneously. All of them are unique in terms of complexity, scope and geography. And yet we must complete all these projects on time and on the agreed terms, regardless of complexity or difficulties that we may face – even when we run behind schedule through no fault of our own. During large-scale projects, Fima's staff is usually

> *LEAN enables a company to optimise business and helps to ensure that commitments to clients are met on time.*

Giedrius Valužis, Director of the Project Implementation Department: LEAN will initially be deployed on some of our more ambitious operations, for instance those that relate to the upgrading of railway systems.

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Founder of the LEAN school in Lithuania, **Tadas Pukšta:**

LEAN is a system for continuous improvement, a problem-solving philosophy which transforms waste into added value. LEAN finds the real causes of a problem within a process, not scapegoats. From a customer's perspective, waste is a process that creates nothing of value and as such must be weeded out. Integration of LEAN into a company's workflows helps reduce order delivery times, enhances the quality of products and services, cuts costs and hence improves the competitiveness of the organisation.

the last to join the project because we deploy engineering systems after other project partners have completed their parts of the job. If they fall behind schedule, then it is up to Fima's employees to ensure that the project is finished on time.

We hope that the LEAN system will help us to overcome such challenges to continue to keep our commitments to our clients within the agreed deadlines.

What will LEAN help to improve?

LEAN, which was originally developed within the automotive industry where manufacturing is based upon the production line, is designed to find ways to complete a task faster at the same or at a lower cost. You can find instances of linear production in any company, including Fima. Although no two projects are identical, they will nevertheless involve many similar operations.

Initially LEAN will be deployed on some of our more ambitious ongoing projects upgrading railway systems. In the future, LEAN should cover all our operations because all of our projects include many of the same standard operational processes.

How will LEAN be deployed within the company?

We have already built a team of professionals who are looking for ways to accelerate performance of recurring operations. The team is made up of representatives from all levels of the company including from supply and project management, corporate management, manufacturing and installation and external consultants.

The LEAN system combats time wasting. Not all work adds value. For instance, if your task is to tighten a screw, then you won't be efficient if you have to waste time searching for a screwdriver. But the process will be faster if you have all the required tools at hand. The special team will find processes that don't add value to a workflow and look for ways to make them more efficient.

How long will the LEAN project take?

There is no clearly defined timescale for LEAN because this is a marathon not a sprint. As soon as you solve one problem, you may find another and while you work on that, some other issues may arise. Furthermore, you might not be satisfied with the outcome a year from now and will want to look for a different solution. After all, technology is constantly changing and staff skills are always improving. LEAN is a continuous and never-ending process of improvement, a philosophy that you follow on a daily basis.

> *"Fima boasts an impressive track record when it comes to project management but we are continually searching for ways to make our operations more efficient.*

About „Fima" companies

Solutions Era is a quarterly publication covering intelligent engineering news. It has been published by Fima since 2006 and is available in Lithuanian, English, Russian and Latvian. Back issues can be downloaded at www.fima.lt.

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Fima is the leader in intelligent engineering solutions in the Baltic countries, offering telecommunications, security, automation and data center solutions as well as individually tailored solutions for transport and energy sectors.

The company implements intelligent engineering solutions for businesses and governmental organisations in the Baltic states and Belarus and is continuously involved in projects of technological innovation. In two decades of operation, Fima has carried out several thousand projects of a various scale and degree of complexity.

Fima's headquarters are based in Vilnius, Lithuania. The company has subsidiaries in Latvia, Poland, Belarus.

Do you have ideas, suggestions or comments? Email us at **solutions.era@fima.lt.**