

PROJECT INTERFRAME-LV AS A PROVIDER OF SOLUTIONS TO CURRENT PROBLEMS IN LATVIA

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INTRODUCTION

In 2018, the Cabinet approved the national research programme (NRP) “Latvian Heritage and Future Challenges for the Sustainability of the State” (2019–2021), with the main goal of developing guidelines for further sustainable development of the State of Latvia, outlining the main operational models in the context of global change-driven processes. The NRP includes five research projects, including “Challenges for the Latvian State and Society and the Solutions in International Context – INTERFRAME-LV”. As this is a report on the results of work in 2020, it should be taken into account that they reflect not only the continuation of trends, but also the impact of the COVID-19 pandemic on the economic system.

RESULTS

Information on the research results achieved in 2019 is available in the 2020 Yearbook of the Latvian Academy of Sciences (https://www.lza.lv/images/publikacijas/YearBook_2020.pdf, pp. 72–74). During 2020, research on performing the tasks of the research project having started in the previous year was continued.

First, the scientists continued their analyses of the latest statistical data for 2019 and of changes in economic processes in 2020, as well as expanded an in-depth examination of some problems and the most urgent problems researched by students (in their doctoral dissertations and master and bachelor theses).

The structural changes observed in the national economy continue confirming a conclusion that economic activity playing an increasingly important role in the segments of the economic system is expanding. An analysis of data on net turnover for 2010, 2018, and the first nine months of 2020 reveals quite significant changes in the composition of the national economy: net turnover in agriculture, forestry and fishing ((A) + 0.4 percentage points), manufacturing ((C) + 0.8%-points), wholesale and retail trade ((G) + 3.9%-points) and information and communication ((J) + 0.4%-points), which increases the proportions of these segments in the national economy. The changes were observed at regional level too, i.e. in the regions, with only a few nuances: different growth rates and different geographical locations. The economic systems of the regions that make up the country have their own specific features, which are significantly affected by the specifics of the particular region’s natural resources. Therefore, a research study “Innovative Business Opportunities for Regional Economic Growth” that analysed the processes of structural change in Kurzeme Region (D. Stefenberga, Latvia University of Life Sciences and Technologies, LULST) and a research study “Territory Competitiveness for Smart Business Development in Pierīga Region” (L. Āzena, LULST) that performed an in-depth analysis of the situation in Pierīga Region were conducted within the research programme. The structural changes largely related to expansion of digitalisation processes in the country, which is observed globally and significantly affects everything that occurs in the world.

In 2020, emphasis on the digitisation of economic activities was placed on fostering e-commerce and contributing to the development of artificial intelligence (AI). According to the 2019 indicators of the Digital Economy and Society Index (DESI) developed by the European Commission, connectivity and digital public services in Latvia were given the highest ratings among the key five dimensions (above the European average); but integration of digital technology or business digitisation, incl. Internet use for e-commerce (below the European average), as well as human capital (not enough specialists are prepared) lagged behind. High-speed and ultra-high-speed fixed and mobile broadband networks are widely available in Latvia, and an increasing number of individuals use e-services on a daily basis. However, a large segment of the Latvian population lacks basic digital skills, and the growing demand for ICT specialists in the labour market is unfortunately not satisfied – not enough ICT specialists are prepared. At the same time, companies should make more efforts to build up the digital skills of their current employees through their own participation in lifelong learning, which would provide more opportunities for the growth of e-commerce. At present, in Latvia, only 10% small and medium-sized enterprises (SMEs) sell online, compared with the EU average of 17%, and half less sell online across borders. Therefore, the following specific research studies were conducted under the national research programme regarding opportunities for e-commerce expansion for small and medium-sized businesses: “Analysis of E-commerce Utilisation Factors in the Latvian Small and Medium-sized Enterprise Sector” (I. Gudele, LULST) and “Opportunities for Blockchain Technology Adoption in the Economy of Latvia in the Context of Baltic States Region” (N. Kostrikova, LULST).

At the same time, scientists have focussed on the continuous development and application of artificial intelligence in the country. Machine translation and the extent and also the quality of its application, as well as the performance of virtual assistants that are already exploited by such important companies in Latvia as the Register of Enterprises, the State Revenue Service, the Rural Support Service, Tele2 Ltd and Tet Ltd were ana-

lysed. The current use for AI involves machine translation: 64.9% translation by the company Tilde corresponds to human translation, for Google it is 52.1%, which is a high figure in both cases; a virtual assistant (chatbots or bots) – a company should assess whether the flow of customers and incoming questions are so large that a virtual assistant is needed, yet at a certain number of questions, it saves a lot of working hours and, over time, financial savings; image analysis; robotics; an analysis of large amounts of data and forecasting based on it; decision making automation and support. Almost ten national companies already have virtual assistants, e.g. Toms for the State Revenue Service, Varis for the Rural Support Service, Ieva for Tele 2 Ltd etc. The Cultural Information Systems Centre has launched an innovative virtual assistant-sharing platform for public administrations. The project is implemented by using the initial designs and resources of the public administration language technology platform Hugo.lv. Therefore, each institution does not have to create its own virtual assistant from zero. As the importance of AI grows in Latvia, an action plan has also been developed; the plan stipulates that public sector investments in AI should reach EUR 25 million by 2030. Researchers are tasked with preparing proposals for the NRP in the field of ICT, integrating the AI component into the NRP. National or sectoral policy documents, as well as municipal development plans should include an assessment of automation and of use of AI. In the field of AI, several master and bachelor theses have been produced at LULST, e.g., on the application of deep machine learning methods for detecting wood damage, developing a prototype of a face recognition system, which is expected to have a practical application.

Second, there was an exchange of views and discussion among scientists from various institutions and countries, as the development of any country is affected not only by what occurs in the country but also by global processes – climate change, digitalisation and restructuring in society and, as a result, changes in the system of needs.

On 13 December 2019, a working meeting on all the five projects of the NRP was held at the Ministry

of Education and Science (MES) as the administrative institution of the NRP (Latvian Heritage and Future Challenges for the Sustainability of the State), including the **INTERFRAME-LV** project implemented by the Latvian Academy of Sciences (LAS). At the meeting, the project directors reported on the achievements of the first year and outlined further opportunities for cooperation between individual projects, incl. production and publication of a joint monograph during the implementation of the NRP (2019–2021). Academician Baiba Rivža presented the project “Challenges for the Latvian State and Society and the Solutions in International Context – INTERFRAME-LV” implemented by the LAS (cooperation partners: Latvia University of Life Sciences and Technologies, the main research direction – business digitisation; the University of Latvia (UL) – economic consequences of public radicalisation; the Institute of Agricultural Resources and Economics – climate change mitigation and adaptation; Rīga Stradiņš University – the influence of personality and social structure factors on capacity and perceptions of security). Overall, it was an analysis and a forecast of structural change processes in the world, the European Union, the Baltic States and an in-depth analysis of the economic and social system of Latvia. Analysis of the processes was the focus for all the scientists in order to assess Latvia’s position in these changes.

On 27 October 2020, a mid-term conference on the NRP “Latvian Heritage and Future Challenges for the Sustainability of the State” was held in the Ziedonis Hall of the National Library of Latvia (LNB) to report on the results achieved during the past year and a half and the work to be done in the remaining project period. The main idea that was expressed in all the reports and discussions was that Latvia faced the same challenges as the rest of Europe. The digital environment was relatively advanced, yet it was underused, especially in terms of integration of technologies into business operations in order to modernise them and raise productivity. Proposals were made to help SMEs that could not afford using global technology solutions with local solutions. Digital technologies need to be used more in lifelong learning. New motivations need to be considered to engage citizens in business. It is

necessary to ensure the flow of inclusive information, e.g., when administrative institutions communicate with potential service users, they need to come up with offers to the users and not only meet their demands.

CURRENT PROBLEMS IN THE PROCESS OF GLOBAL CHANGE WERE ALSO DISCUSSED FROM AN INTERNATIONAL PERSPECTIVE

On 6 May 2020, an online seminar was held by the LAS, Division of Agricultural and Forestry Sciences, and the NRP project INTERFRAME-LV in cooperation with the Nordic Association for Agricultural Science, Department of Economics. The seminar was attended by representatives from Finland, Denmark, Iceland, Sweden, Norway, Lithuania and Latvia. The association has long research traditions, it has existed for 100 years, and its main goal is to develop research in agricultural economics in the Nordic and Baltic countries. There was an exchange of views on the use of digitisation to foster economic activity in all the countries represented in the seminar and identify opportunities to learn from positive experience in order to reduce the disparities between the countries as shown by the DESI index. The second online seminar was held on 3 June. Kristina Holmström, a student from the Swedish University of Agricultural Sciences, participated in the seminar and reported on her research “From Small to Large Pastures – Improved Profitability in Swedish Mammalian Meat Production”, while Latvia was represented by a doctoral student Aija Pilvere-Javorska from Latvia University of Life Sciences and Technologies, Faculty of Economics and Social Development who reported on her research “Sustainable Economic Growth in the Baltic and Nordic Countries”.

There were discussions and exchanges of views between scientists and practitioners (entrepreneurs, businesspersons, national and municipal institution employees, stakeholders) on what was presented by scientists as well as what was observed in real life and in the particular region of the country. **Regional forums** were useful events, in which scientists had the opportunity not only to share their research results but also to get feedback on particular problems from entrepreneurs, businesspersons,

municipal employees and other interested individuals by listening to their opinions. The regional forums represented a proven way of exchange of ideas and cooperation among researchers, involvement of regional experts in discussions and dissemination of research results.

ZEMGALE FORUM

On 19 February 2020, a series of regional forums on business digitisation began in Jelgava, at the home producer shop Craftsmen House, under the project INTERFRAME-LV (NRP “Latvian Heritage and Future Challenges for the Sustainability of the State”, 2019–2021) (Fig. 1). Researchers from LULST are involved in this project, including LULST doctoral student Ina Gudele, chair of the Board of the Latvian Internet Association, and LULST Professor Pēteris Rivža. The forum provided new valuable information not only to the present representatives of small enterprises but also to LULST students being

well-represented at the forum. The exchange of opinions resulted in the main conclusion that the technological infrastructure available in Latvia should be used more effectively in business.

VIDZEME FORUM

On 16 February 2020, the forum “Smart Economy: Science, Technology and Innovation” that aimed to analyse the economic situation in Vidzeme Region in the context of the present, as well as the near and distant futures, was held at Vidzeme University of Applied Sciences (Fig. 2).

A continuation of this forum was the INTERFRAME-LV forum held on 26 February, which aimed to provide a more detailed exchange of opinions on an urgent topic entitled “Digitalisation: the Opportunities and Challenges for a Smart Economy”. The forum focused on digitalisation in education and the experience of entrepreneurs in the use of digitalisation and concluded with an innovation in the



Fig. 1. Zemgale forum. 4th from the right, Baiba Rivža



Fig. 2.

Vidzeme forum. Presentation by *Dr. hist. Gatis Krūmiņš*, Rector of Vidzeme University of Applied Sciences

“marketplace”. One of the main conclusions of the discussion was that the view on digital skills needs to be broadened. The culture of digital behaviour needs to be developed. At present, digital communication lacks immediate feedback and an opportunity to ask questions. The discussion participants suggested a combination of face-to-face and distance learning as the most optimal option for learning. The participants of the forum were introduced to a unique product created in Latvia – the first virtual economics classroom. Edgars Čerkovskis, an economist and a teacher at Rīga Distance Learning Secondary School, introduced virtual reality in distance learning. He is the author of the innovative idea of the first virtual economics classroom in Latvia. It was created in cooperation with Vidzeme University of Applied Sciences (technical developer Ēriks Līsmāns and graphic developer Armands Millers). This product will soon be available free of charge to teaching personnel and students to be used in the learning process.

LATGALE FORUM

On 29 June 2020, the third regional forum on digitalisation, “Digital Tools for Business Support in Latgale Region”, was held at Rēzekne Academy of Technologies. Opening the forum, the rector of the Academy, Professor Iveta Mietule, emphasised the great and important priorities for Latgale Region in the field of information and communication technologies (ICT) – to ensure comprehensive mobile network coverage and the transition of institutions to the digital environment. The leader of the NRP project INTERFRAME-LV, Baiba Rivža emphasised that being at the 1st stage of the 4th industrial revolution (Industry 4.0) – with drones, sensors and robots, as well as the still narrow and weak use of AI – we need to prepare for the 2nd stage, which is characterised by a wider use of smart digital tools and broader functionality of artificial intelligence, incl. its participation in decision-making. This means focusing not only on ICT

studies and research but also advanced ICT courses in any university programme as well as shifting lifelong learning towards this field. Industry 4.0 is expected to affect all groups of society and all professions, and a new type of workforce needs to be developed and trained, incl. for business and entrepreneurship.

ICT skills, as well as learning and new knowledge-gaining skills are considered to be the most necessary in the future, as the role of manual labour gradually diminishes. Digitalisation is a huge challenge for education, science and industry. In Latvia, too few ICT specialists are being trained, the growing demand for them in the labour market is not being met, and a large segment of the population lacks basic digital skills. The EU Common Agricultural Policy 2021–2027 envisages the integration of rural areas into the digital economy. In each region, attention should also be paid to the access of small and medium-sized farms and enterprises to technology. This means that rural areas also need a closer link with the development of human capital, research and support for innovation should be improved, and this should be part of overall national policy.

KURZEME FORUM

The forum was held online on 14 August 2020, together with Project reCOVerry–LV scientists. The ideas expressed in the Kurzeme forum focused on the need for digitisation not only in business but also in education. A report “Digital Environment and the Business Opportunities Therein” by the leader of the NRP project INTERFRAME-LV, *Dr. habil. oec. B. Rivža*, and a report “Artificial Intelligence in Business” by *Dr. habil. sc. ing. P. Rivža* were followed by an extensive discussion on topical issues such as whether young women’s digital skills meet today’s labour market needs, professional development courses for employees – distance learning opportunities and challenges, digital tools for remote work and training opportunities. The need for building up digital skills was also stressed by the forum participants with regard to Latvia’s rankings in the Digital Economy and Society Index in the period 2014–2019.

PIERĪGA FORUM

The forum was held online on 26 August 2020, together with Project reCOVerry–LV scientists. In the Pierīga forum, just like in the previous ones, the leader of the NRP project INTERFRAME-LV, LULST Professor, *Dr. habil. oec. Baiba Rivža*, described the

digital environment, while LULST Professor Pēteris Rivža reported on the development of artificial intelligence (AI), thereby arousing great interest among the participants and confirming that such issues need to be explained to the public. It is necessary to make more efforts to shape an understanding of an association between the use of digital opportunities and labour productivity, the advantages of business modernisation and the effects on prosperity, the need to build up digital skills for future professions etc. AI is increasingly entering business through cooperation between researchers and practitioners. For example, in wood-processing industry, a factory producing oak parquet uses the knowledge and technologies created by LULST specialists to find and prevent damage in wood; this is possible by means of convolutional neural networks. Similar examples could be found in crop farming and food industry. The more efforts are made by all generations concerning these issues, the more opportunities to use the advantages of technologies and AI and avoid disadvantages, thereby giving sustainability to these processes, which, according to President Egils Levits at the Saeima meeting on 3 September, is a force that lasts long.

Given the main objective to be achieved in 2021 – to produce and publish a monograph “Latvian Sustainability Perspectives: Challenges and Opportuni-

ties”, which would summarise both the conclusions of the research and provide further guidelines for the balanced development of the country from the perspective of scientists, a draft table of contents of the monograph that further shapes the research work to successfully implement the national research programme and achieve the goals set has been developed.

Sixty-eight reports on the INTERFRAME-LV project have already been presented at international conferences, of which 34 were presented abroad; 88 research papers have been submitted and published, of which 39 were indexed by SCOPUS and Web of Science; five doctoral dissertations are being produced, while three have been defended. There was participation in international projects (Development Opportunities for the Securities Markets in the Baltic States, Meta Cluster for Attracting the Japanese Tourism Market), and new project proposals have been submitted for transnational projects (Horizon 2020 project on rural development; Assessment of EU Agricultural Policies – Domestic and Third Country Markets etc.).

Much has been told and written about the results of the project in the mass media – TV, radio and press publications, which informed the public about the findings of the research and provided an opportunity to discuss the findings.