Summary Report – 2nd Project Workshop

Improving Demand Forecasting Education in Turbulent Times and Beyond at Industrial Environment

Visegrad Fund, Grant No. 22520049 · Project period: 1 October 2025 – 30 November 2026

Date and venue: 16 September 2026, Faculty of Materials Science and Technology, Slovak University of Technology, J. Bottu 25, 917 24 Trnava, Slovakia (hybrid event)

Workshop chaired by: prof. Ing. Peter Košťál, PhD., Slovak University of Technology

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1. Purpose and programme of the workshop

The second public workshop of the project presented the demand-forecasting curriculum developed jointly by the three partner countries (Hungary, Poland, Slovakia). Unlike the Budapest event, the Trnava workshop was attended mainly by the academic community of the host faculty and focused on the pedagogical side of the project: how the materials fit into university teaching and how they can be used in existing study programmes. The programme was identical to the first workshop; the presentations were followed by a moderated discussion.

Programme item	Speaker / organisation	Language
Project presentation: background, survey, curriculum map	János Mondovics – GTE	English
From Forecasting Challenges to Forecasting Maturity – The Polish Perspective	Robert Ulewicz, Manuela Ingaldi – Częstochowa University of Technology	English
Demand forecasting in intelligent manufacturing – educational materials and two worked problems	Peter Košťál, Vanessa Prajová – Slovak University of Technology, Trnava	Slovak
Outlook: visions of the future and the demand planner in the age of AI	János Mondovics – GTE	English
Moderated discussion, closing questionnaire	participants	Slovak

2. Project presentation – GTE (János Mondovics)

Background and survey results

The speaker traced the roots of the project to his practice in logistics planning, to the forecasting-culture surveys of the Hungarian Association of Logistics, Purchasing and Inventory Management (MLBKT) run since 2017, and to his teaching of forecasting at the MLE Advanced Logistics Management Programme since 2020.

The project survey (WP1) found almost identical average forecast accuracy in 2024 in the three countries: Hungary 74.7%, Poland 74.1%, Slovakia 72.9%. The Hungarian series stood at 75.6% already in 2017, so eight years brought no real improvement; the 2020 shock is visible everywhere, most sharply in Poland (from 83.1% to 53.1%). On the Gartner-based scale most companies in the region fall into the average and below-average bands. Respondents saw their untapped reserves mainly in AI/ML-based forecasting tools, better quality and integration of input data, predictive analytics in S&OP, and in building team competencies in data analysis and model interpretation.

Structure of the curriculum

The main product of the project is a three-module curriculum. Module 1 (A systems view of forecasting) covers the concept of forecasting, sources of inaccuracy, preparatory analyses and qualitative and quantitative

methods. Module 2 (Support for forecasting) covers links to SCM and inventory management, forecasting and evaluation algorithms, BI and CRM functions, the role of the demand planner and auditing of forecasting culture. Module 3 (Advanced forecasting environment) covers software solutions (Excel, SPSS, SAS), predictive techniques for reducing losses and machine learning in short-term forecasting. The modules come with Excel worked examples, timing plans and checklists. Alongside the Hungarian master, the Częstochowa and Trnava partners prepared locally adapted versions on the same chapter structure. The planned exploitation routes are university teaching material, training for industry and consultation on forecasting questions.

3. The Polish perspective – Częstochowa University of Technology (Robert Ulewicz, Manuela Ingaldi)

The presentation "From Forecasting Challenges to Forecasting Maturity" argued that the V4 countries share forecasting obstacles but operate in different business ecosystems, and that forecast quality depends less on method selection than on the interplay of people, processes, data and technology. The main obstacles named were volatile demand, fragmented data, departmental silos, competency gaps and slow, reactive response.

The partner proposed a five-level maturity model – reactive, structured, integrated, data-driven and intelligent (AI/ML) – which develops only when all four foundations evolve together; the aim is not to replace managerial experience but to strengthen it with data and analysis. For teaching, the partner proposed the cycle LEARN → ANALYSE → FORECAST → EVALUATE → IMPROVE: case studies on real historical data, error analysis instead of a focus on accuracy alone, scenario planning under uncertainty and hands-on work with BI and AI tools. The key message: better forecasting requires a cultural shift, not just new IT tools, and the project builds a bridge between university research and enterprise practice.

4. Forecasting in intelligent manufacturing – Slovak University of Technology, Trnava (Peter Košťál, Vanessa Prajová)

The host partner presented the curriculum from the viewpoint of intelligent manufacturing. The pandemic, the war and the energy crisis shrank planning horizons from months to weeks, and forecast errors show up physically as full storage, stopped lines and costly expedited transport. The central thesis: the gap is in education, not in tools – 85% of large manufacturers run an ERP with a forecasting module, yet fewer than one planner in five has formal forecasting training.

In automated manufacturing the forecast feeds decisions directly and an error propagates before anyone notices it; a 10% forecast error can turn into 20% excess inventory or a stock-out. The economics of accuracy are non-linear (safety factor 1.64 at 95% service level versus 3.09 at 99.9%). Method choice should follow the data pattern, and error must be read in both magnitude (MAD, MAPE, RMSE) and direction (bias, tracking signal). The five-dimension maturity audit (data, model, process, people, technology) was presented as the most actionable output of the curriculum.

Two worked problems and use of the materials

Task 1: for a trended 12-month series (from 100 to 160) with an actual value of 165, the naive method gave 160, the moving average 155 and exponential smoothing about 140 – the more smoothing, the worse the result; a trended series needs a trend model (Holt, regression). Task 2: of two items with the same turnover, improving the poorly forecast one frees two to three times more storage slots (safety stock = $z \cdot \sigma \cdot \sqrt{L}$) – effort should follow the size of the error.

The material is modular: a 14-week semester course (two hours of lectures plus a lab session per week), a six-hour block for industry, modular company training or self-study with appendices (data sets, Excel templates, code examples). The materials are open to non-partner institutions under a Creative Commons licence.

5. Outlook – the demand planner in the age of AI (János Mondovics, GTE)

The closing presentation argued that demand planning is a management function rather than a statistical task: what matters is not the number itself but the decisions derived from it – inventory, capacity, cash flow and risk. Two companies with the same MAPE may perform very differently depending on whether the forecast enters decision-making through scenarios, S&OP/IBP and management dashboards. The role of the demand planner is expected to evolve through three generations: the Forecast Producer (how large will demand be?), the Business Integrator (why will it be this large?) and the AI Orchestrator (what should we do under different futures?).

The speaker announced three initiatives: a European Roundtable on the changing role of the demand planner, accompanied by a 20-question Demand Planning Self Assessment; the European Demand Planning Observatory (EDPO), a regular international survey aiming at a long-term European benchmark, including a University Benchmark Report; and a Living Lab programme built on three linked models – AI-based forecasting and early warning, forecast-driven production and inventory optimisation, and decision support with knowledge transfer. The presentation closed with a questionnaire on the five most important demand-planner competencies for 2030.

6. Main threads of the moderated discussion

> *This summary arranges the main threads of the discussion by theme, without attributing contributions to individual participants.*

In line with the composition of the audience, the discussion centred on university teaching rather than on industrial practice. Participants pointed out that several of the presented topics are already taught at the faculty, but spread across several courses, so the subject of demand forecasting is currently covered in a fragmented and uneven way. The curriculum was seen as an opportunity to give it a coherent backbone.

The main question was whether the materials can be divided into smaller units matching the requirements of individual courses. The answer was yes: the curriculum is built from self-contained chapters with their own worked examples and Excel templates, so individual chapters or topics can be selected and combined according to the syllabus of a given course. The project partners offered their assistance in mapping the chapters onto the existing courses of the faculty.

Several participants appreciated the project as a well-structured, practically oriented and useful contribution to teaching. They highlighted the combination of theory with worked examples, the open availability of the materials and the international dimension that allows the comparison of practice across the V4 countries, and considered the materials a valuable resource for both students and lecturers when updating existing courses.

7. Conclusions and next steps

The workshop confirmed the conclusions of the first event – forecast accuracy in the V4 region has stagnated for years and the key to improvement is systematic education – and added a university perspective: the curriculum brings the most value when it can be embedded flexibly into existing study programmes.

- Finalise and publish the curriculum under a Creative Commons licence, with a chapter-level structure that allows individual units to be integrated into existing university courses.
- Map the curriculum chapters onto the relevant courses at MTF STU and the partner universities, and identify where the materials can fill gaps or unify fragmented content.
- Prepare the worked examples, data sets and Excel templates as stand-alone teaching units (lecture and lab) usable in semester courses and for self-study; use the Demand Planning Self Assessment questionnaire as a teaching tool as well.

- Involve university lecturers in the European Roundtable and the European Demand Planning Observatory, in particular in the University Benchmark Report, and develop the Living Lab concept with the participation of students.
- Evaluate the closing questionnaire (key competencies for 2030) and build the results into the second edition of the curriculum and its teaching units.