NEXTLOG

Building next generation competencies for logisticians and supply chain managers

DIGITAL, INTELLIGENT & SUSTAINABLE LOGISTICS

HANDBOOK

DISL Book

NEXTLOG PROJECT

Co-funded by
the European Union

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Erasmus+

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DISL BOOK

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FACULTY OF MANAGEMENT, UNIVERSITY OF LODZ

MESSAGE FROM **THE PROJECT MANAGER**

T. Bartosz Kalinowski, PhD, DSc

Dear readers,

In recent years the logistics market experienced rapid development and has been subject to substantive pressures and changes. Digital transformation of supply chains, rising complexity of transportation routes, uncertainties in collection and delivery times, growing interest in Industry 4.0, etc., emerged into intelligent (smart) supply chains. Furthermore, due to resource scarcity, the companies are looking for "green" solutions to integrate with their supply chains. With these observed changes, the global supply chains are currently progressing towards **digital, intelligent and sustainable logistics (DISL)**. DISL is necessary to increase safety, tackle growing emissions and congestion problems, make processes within supply chains more efficient and sustainable, and enable the proper integration of today's society in the next-generation Industry 4.0 context.

For this reason, we proposed the **NEXTLOG project**, which stands for **"Building next-generation competencies for logisticians and supply chain managers"**.

In this book, you will find who we are and what is the aim of the NEXTLOG Project.

The consortium of the project comprises academic partners from **3 European countries** and business partners that co-created the results and provided insight into the requirements of the market and external environment.

Through the publication, you will get access to research results on the competencies that, according to the research conducted in **Poland, Greece and Slovenia**, are key for next-generation logisticians and supply chain managers.

You will benefit from the interactive form of this book, thanks to numerous **QR codes and links referring to the developed resources**.

The resources developed in the project cover:

- Teaching/training materials in the three following areas:

  AREA 1: Sustainability as a service in supply chains & the manager of the future, that focuses on process and supply chain mapping toward emission minimisation, as well as improvements identification and implementation;

  AREA 2: New technologies in logistics, which covers: blockchain in logistics and Industry 4.0-related solutions;

  AREA 3: Intelligent logistics and transportation systems, that is about: systems design, stakeholders, risk management, resilience, as well as environmental and social regulations.

- Examples of **good business practices** related to the three above-mentioned areas.

- **Case studies** on implementing more sustainable operations (that were accounted with the LCA approach) with the identification of areas for improvement and proposals for improvement scenarios.

All teaching/training materials are available in **English**, however, they are also translated into the languages of the participating countries: **Polish, Greek and Slovenian**.

The learning material is accompanied by the **Virtual Learning Environment** that allows for online and **open access** to all developed materials. Additionally, we also offer you access to resources in SCORM standard, which allows to upload them to any compatible **e-learning platform** (e.g. Moodle) and use in any intended way for educational purposes at organisations beyond the project partnership.

Finally, you will gain an opportunity for **self-study and personal development** (our materials are dedicated to students, postgraduates, managers and business professionals looking for competence development opportunities) or inspiration to **teach/train** others (our materials are also dedicated to teachers, trainers and educators in the field of logistics and supply chain management).

I wish you an enjoyable reading experience!

T. BARTOSZ KALINOWSKI

NEXTLOG Project Manager

> *Don't judge a book by its cover.*
>
> GEORGE ELIOT

WHO ARE WE?

Who are we? What are we working on? What are you reading right now?

In this section you will learn about the idea of the NEXTLOG project, get to know us better and see if it's worth reading further...

LET'S START THE ADVENTURE!

WHY WE STARTED?
NEXTLOG PROJECT

THE CONTEXT

The global logistics market is rapidly progressing to digital, intelligent and sustainable solutions, amounting to more than 1000 billion EUR by 2025 (Transport Systems Catapult, 2016). Digital, intelligent and sustainable logistics (DISL) is important in order to increase safety and tackle Europe's growing emissions and congestion problems; make processes within supply chains more efficient and sustainable; enable the proper integration of nowadays society in the next-generation Industry 4.0 context.

NEXTLOG responds to market's needs by aiming to develop an innovative, transnational framework that will improve the knowledge and skills of academic institutions to produce more market/oriented DISL curricula, reducing the barriers in this field. The project consortium comprises key academics, industry related associations, public organisations and companies from diversified sectors who will co-create the envisaged DISL curriculum and will pilot it through an open innovation and co-creation virtual learning environment (VLE). This outcome is directly pertinent to quadruple helix-academia cooperation for innovation and best practices with respect to DISL, and can also support policy reform in this area, leading to more prepared graduates ready for the labour market. NEXTLOG also follows up the recent plans of the EU to promote improved, efficient and clean operations by 2050 and is also relevant to the EU2020 targets for R&D, climate change, energy efficiency, entrepreneurship and social cohesion. This makes NEXTLOG directly relevant to the current objectives of the participating organisations. The need for a transnational pan-EU approach on this matter is critical in order to overcome the pan-EU skill gaps and confirmed by: EU Commission' report on Intelligent Transportation Roadmap (2016); EU Commissions New Skill Agenda for Europe (2016); WEF Report on Graduate Skills (2016); CEDEFOP's report on Environmental & Digital Skill Promotion (2016); EU Commission's JRC Report on 2035 Sustainable Economy (2015); EU's EPALE platform report on Sustainable Business Skills (2017).

THE PROBLEM

Higher education institutions (HEIs) do not have the accurate means to tackle the existing need as the current curricula focus more on general logistics and supply chain management rather than specific DISL related issues. In addition, the Logistics Performance Index (LPI) classifies Poland (31th), Slovenia (39th) and Greece (44th) among 167 evaluated countries (https://lpi.worldbank.org/).

The biggest identified shortcoming is lack of holistic approach to the field of logistics, especially when considering the incorporation of intelligent and sustainable aspects into SCM. Weakness is also effectiveness of the implementation of these approaches in practice.
In particular, there is a need to transfer contemporary concepts into business to further enhance the effectiveness of the SCM. The latter especially emphasizes the role of HEIs in the field of SCM.

WHY DISL IS SO IMPORTANT?

a. it is essential for sustainable development
b. it responds to an unstable future
c. it esponds to the challenges of today's and tomorrow's

CLICK ON THE QUESTION...TO FIND ANSWERS

WHERE WE ARE GOING?
NEXTLOG PROJECT

THE CONTEXT

Our team responds to global needs by aiming to develop an innovative, evidence-based transnational framework that will markedly improve the knowledge and skills of HEIs to produce more labour market oriented DISL curricula, reducing the barriers in this field.

WE ACHIEVED OUR GOALS BY:

- **Establishing a transnational collaboration (via open innovation and co-creation) across EU in order to address (at a large scale) existing training needs in DISL**
- **Co-creating DISL curricula (with ECTS accreditation)**
- **Developing an innovative, evidence-based virtual learning environment (VLE) with a built-in decision support system (supporting economic, environmental and social modelling of DISL)**
- **Organising three transnational mobility sessions with DISL quadruple helix stakeholders**

NEXTLOG enhances providers' & quadruple helix stakeholders' capacity to produce more market oriented DISL curricula. This outcome is pertinent to co-operation for innovation and best practices with respect to DISL, and can support policy reform in this area, leading to more prepared workforce for the DISL market.
Also, NEXTLOG enables transnational DISL skill development/ learning mobility leading to DISL homogeneity in EU. Overall, NEXTLOG supports: EU Transport (2050); EU2020 targets for R&D, climate change and energy efficiency, E+ priorities by offering internationalized life-long-learning, quality education through industrial engagement, and promoting creative thinking via the proposed DISL curriculum with ECTS accreditation.
Key quantitative measurements include: 50 staff involved in mobility events; 350 users of the VLE, 350 registered users on the DISL e-learning courses, 170 participants in the multiplier evens, 30 000 people reached overall by the project dissemination.

Meet NEXTLOG HAND!

It will help you to find interactive content...but only at the beginnigng. Continue to search and explore on your own!

ONE OF OUR MAIN GOALS IS TO:

a. develope only national cooperation
b. design new logstic infrastructure
c. produce more labour market oriened teaching materials

> *There is nothing like a shared interest to draw people together.*
>
> **HYMAN RICKOVER**

In this section of our handbook, you you will learn who is responsible for creating the innovative project that is NEXTLOG.

Let's get to know each other!

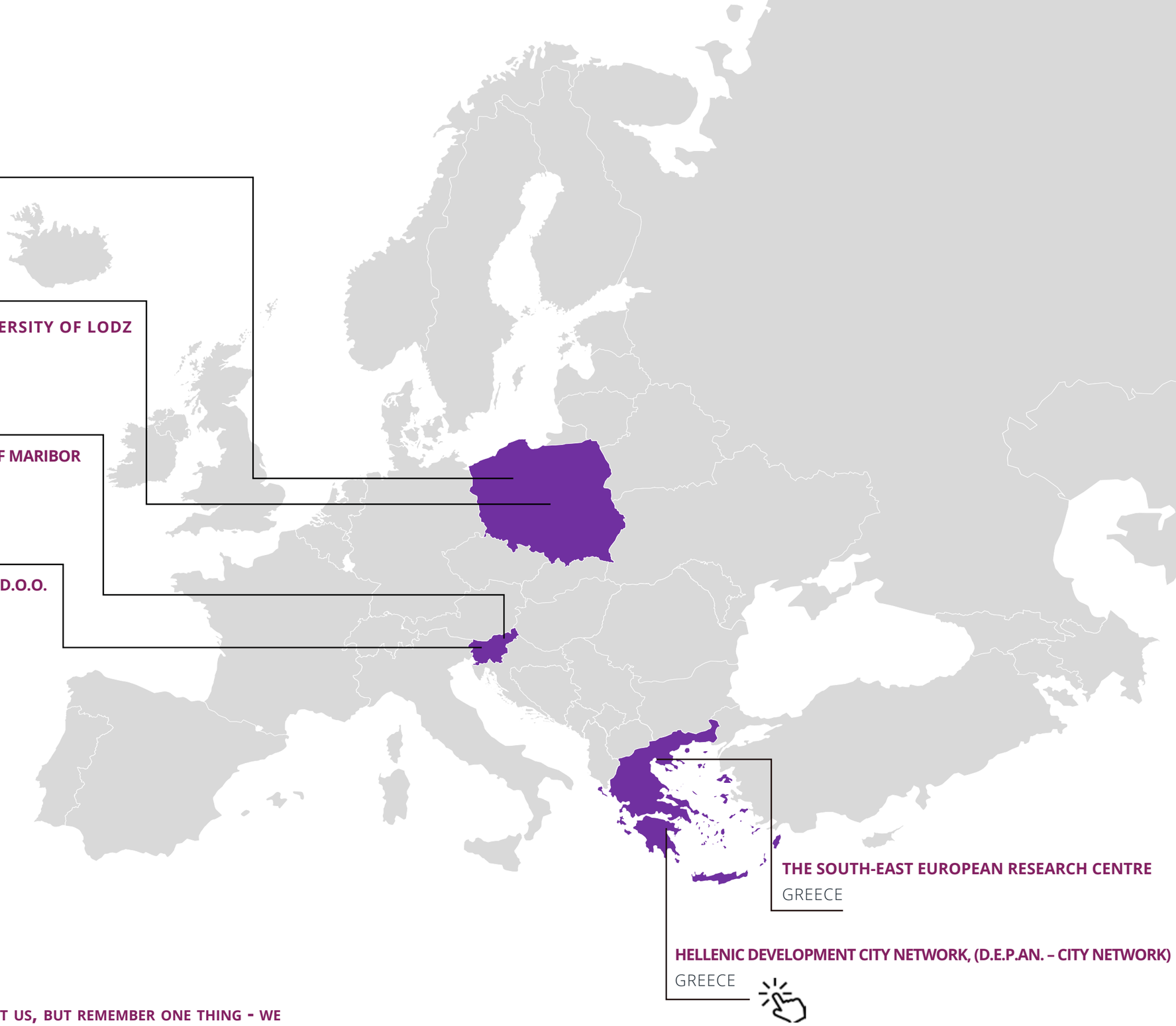
PROJECT CONSORTIUM

POZNAN SCHOOL OF LOGISTICS
POLAND

FACULTY OF MANAGEMENT, UNIVERSITY OF LODZ
POLAND

FACULTY OF ORGANIZATIONAL SCIENCES UNIVERSITY OF MARIBOR
SLOVENIA

DOMEL, ELEKTROMOTORJI IN GOSPODINJSKI APARATI, D.O.O.
SLOVENIA



THE SOUTH-EAST EUROPEAN RESEARCH CENTRE
GREECE

HELLENIC DEVELOPMENT CITY NETWORK, (D.E.P.AN. – CITY NETWORK)
GREECE

NEXTLOG
is about collaboration!

In the following pages you will learn more about us, but remember one thing - we are working for the future and we are digitizing this handbook to keep it always up to date. Check out where you will find the links and where they will lead you...

FACULTY OF MANAGEMENT, UNIVERSITY OF LODZ
POLAND

WWW.WZ.UNI.LODZ.PL

Faculty of Management at University of Lodz is one of the largest business schools in Central Europe offering wide range of courses on bachelor, master and doctoral level as well as MBA studies (currently 6500 students take part in all forms of education). The potential of the Management Faculty includes 150 staff members. The Faculty specializes in research and education in the area of e.g. supply chain management, entrepreneurship, accounting, human resources, quality management, innovation implementation, public administration, information technologies, etc.

The programs of the postgraduate studies are designed to meet the employers' requirements and focus on building the knowledge and skills needed in a particular job. Selected programs are also dedicated towards special groups such as entrepreneurs or small companies. The Faculty is an excellent partner with current active links into business practice. Constant cooperation with many companies (including SMEs)is performed trough providing advice and training through MBA and postgraduate study programs as well as joint projects.

FACULTY OF MANAGEMENT
University of Lodz

PROJECT TEAM

T. BARTOSZ KALINOWSKI

Associate professor at the Faculty of Management, University of Lodz with almost 20 years of experience in teaching and research. Head of Centre of Excellence in Research - KnowBase at the Univeristy of Lodz. Experienced project manager and researcher in 25+ externally funded projects (H2020, HEI-EIT, Erasmus+, LLP, LdV, etc.) on sustainability, supply chain management, quality management, entrepreneurship, innovation management, digitalisation, industry 4.0, business models development, responsible research and innovation and impact investment. Expert in technology transfer and commercialisation (200+ projects), certified business coach, quality auditor and business consultant. Author of 2 books and over 60 peer-reviewed journal and conference proceedings papers.

MARTA RAŹNIEWSKA

Assistant professor at the Faculty of Management, University of Lodz, Poland. PhD in the discipline of management and quality sciences, European Senior Logistician. Researcher in international projects (COSME, Erasmus+, Trans-Atlantic Platform). Her main research interests: improving strategic and operational activities of the organisation through relationship management in supply chains and the effective implementation of methods and tools. Her work is mainly focused on supporting SDGs realization, circularity, primarily in the food sector. Her goals are to create a communication platform and develop cooperation between science and business practice.

JAKUB BRZEZIŃSKI

Assistant in Department of Logistics at Faculty of Management and PhD Candidate. Graduate of logistics at the home faculty and law at the Faculty of Law and Administration. His scientific interests include contract management, purchasing processes and digital technologies in supply chains. Team member of few scientific and educational international projects.

IZABELLA SZUDROWICZ

Assistant in Department of Accounting at the University of Lodz. Associated with Faculty of Management for nearly 10 years. Lecturer in the area of financial accounting. Employed also in Centre of Excellence in Reaserach "KnowBase" were her work is focused on support for the scientific development of the Faculty's employees. Team member in several Erasmus projects. Experienced administrative of interational projects.

POZNAN SCHOOL OF LOGISTICS
POLAND

WWW.WSL.COM.PL

Poznań School of Logistics (WSL) is the first logistics college in Poland offering a professional and interdisciplinary education, established in 2001. WSL offers bachelor's degree in logistcs and management, master's degree programmes in logistics and post-graduate courses.
WSL, from its very beginning, has closely co-operated with leading enterprises and institutions. The teaching staff of WSL comprises around 140 university teachers who have great practical experience. Among our teachers there are also accomplished business practitioners – representatives of leading companies in such business areas as logistics, IT, production and trade.
WSL conducts research related to expanding knowledge and providing the business world with new tools and technological solutions in logistics. The research also covers teaching processes and is closely related with the development of teaching methods within logistics studies.
WSL has extensive experience in delivering EU-funded projects for VET and HEI sector (lot4eng, NEDLOG, DELPHI, LLOT, MLL, LLIL, NewMetro, MovetFast, AutoMobility).

POZNAN SCHOOL OF LOGISTICS

PROJECT TEAM

PhD in engineering, WSL Professor in economics in the domain of economic sciences and discipline of management sciences. Vicerector, the Head of the Chair of Logistics Systems at WSL, a lecturer in supply chain management, production management, inventory management, Logistics, business management and forecasting. Executor, supervisor or main executor of +50 projects for businesses. Assessor in the Certifications for Logistics Professionals system in compliance with ECBL (European Board for Certification in Logistics). Author of numerous publications on logistics and production management. Executor or main executor of 5 EU-funded projects under LdV oraz ERASMUS+ programmes. Supervised the lot4eng.com project delivered as part of LdV as well as LLOT project. Manager of ERASMUS+ projects (LLOT, MLL), coordinator of LLIL project

PIOTR CYPLIK

PhD in Economics, with specialization in supply chain management. Uses data analysis, statistical analysis, modelling and simulation in his research work. An author of +70 papers on logistics published in Poland and abroad. A member teams delivering of R&D projects in the field of supply chain management. Extensive hands-on experience in executing EU-funded financial projects within the framework of LdV and ERASMUS+. Delivered trainings in lot4eng.com project as part of LdV, works in the capacity of operational supervisor in LLOT, MLL and LLIL project. Reseracher in NewMetro project, tutor in AutoMobility and MovetFAST projects.

MICHAŁ ADAMCZAK

MSc, Eng. is a graduate of the Poznan University of Technology, the Faculty of Engineering Management in Logistics. Lecturer at the Poznan School of Logistics, Assistant at the Department of Operational Management of Enterprises. Lecturer in business process modelling and simulation, logistics and supply chain management on full and part-time studies at Poznan School of Logistics. Participant of EU-funded development projects under the ERASMUS+ program i.e., "NEW METRO - embeddiNg kEts and Work-based learning into MEchaTROnic profile" (600984- EPP-1-2018-1-IT-EPPKA2- SSA). Participant of the "Integrated Program of the Poznan School of Logistics" project co-financed from European Funds under the Operational Program Knowledge Education development 2014-2020. Member of Project Team of R&D project conducted to MW company - introduction robots and autonomous solutions.

ADRIANNA TOBOŁA

A graduate of master's studies in the field of Spatial Economy in the specialization Development of cities and regions and the Faculty of Management in the specialty Domestic and international Logistics at the Poznan University of Economics. In addition, she expanded her qualifications by studying Economics with a specialization in global and managerial economics at second-level studies at the Poznan University of Economics and completed post-graduate studies on the mechanisms of functioning of the euro area at the Poznan University of Economics. Employee of the Poznan School of Logistics with headquarters in Poznan as an assistant in the Chair of Transport and forwarding. She teaches first and second level and dual studies. Member of the Organizing Committees of national and internationa scientific conferences. Participant of EU-funded development projects under the ERASMUS + program.

MAGDALENA KOPEĆ

FACULTY OF ORGANIZATIONAL SCIENCES UNIVERSITY OF MARIBOR
SLOVENIA

WWW.FOV.UM.SI

The University of Maribor was established in 1975. With its 17 Faculties, the University Library Maribor and the Student Dormitories, it is the second largest and second oldest university in Slovenia with a long tradition. The Faculty of Organizational Sciences is a founding member of the University of Maribor. It has been involved in research and education about the organizational and informational sciences for more than 60 years. During this period, the Faculty has taught more than 20.000 of graduates who have pursued employment in different positions in the manufacturing and service industries as well as governmental and educational institutions. The Faculty is the leading higher education institution in Slovenia in the field of organization and management, and one of the best-equipped faculties in Slovenia. Modern infrastructure and the latest information technology provide excellent conditions for studies. The Faculty of Organizational Sciences is situated in Kranj. Today the Faculty provides Bologna programmes of Enterprise Engineering, Organization and Management of Human Resource and Educational Systems, Organization and Management of Information Systems, Management in Sport and Crisis Management – key areas of every organization. In addition, together with the Faculty of Health Sciences, the Faculty also offers a postgraduate study programme of Management in Health and Social Welfare.

PROJECT TEAM

DAMJAN MALETIČ

Damjan Maletič is an Assistant Professor at the Faculty of Organizational Sciences, University of Maribor (FOS). He is also a Vice dean for research activities at FOS, a member of Slovenian Maintenance Society (DVS), a member of working group for asset management at DVS, a member of the European Asset Management Committee (EAMC EFNMS), a member of technical committee SIST/TC VZD Maintenance and asset management at Slovenian institute for standardization. Recently he became a member of International Society of Engineering Asset Management – ISEAM. His research activities are mainly devoted to the fields of physical asset management, maintenance and quality management. Currently one main area of his research has focused on studying the relationship between physical asset management practices and organizational performance (in terms of sustainability and operational performance).

MATJAŽ MALETIČ

Matjaž Maletič is an Assistant Professor at the Faculty of Organizational Sciences, University of Maribor. His research focus can be broadly assigned to the following research areas: quality management, asset management and organizational sustainability. Apart from general research directions, he intends to link these research areas with innovation and organizational performance paradigms. He obtained his PhD degree in Quality Management from the University of Maribor, Faculty of Organizational Sciences. He has been involved in several research projects and is a member of various professional associations, including the technical committee of the Slovenian Institute for Standardization.

University of Maribor

Faculty of Organizational Sciences

DOMEL, ELEKTROMOTORJI IN GOSPODINJSKI APARATI, D.O.O.
SLOVENIA

WWW.DOMEL.COM

Domel is a global developer and supplier of advanced solutions in the field of electric motors and components based on our own innovative technologies. The range of products manufactured and sold comprises vacuum units for wet and dry vacuuming, DC motors, commutator motors, electronic commutator motors, stepping motors, blowers, ventilators, the vehicle range, components and tools and laboratory equipment. Through our network of representative offices, Domel is present on all of the world's leading markets. We are a developmental supplier with a clear vision and in-house development, through which we create trends and technical solutions at all levels of individual products and devices. Domel has received numerous awards from independent technical and consumer organizations, our laboratories are part of the national and international development network, we invest a great deal into social responsibility and enjoy long-standing collaboration with manufacturers in numerous branches of industry.

DOMEL

PROJECT TEAM

Matjaz Roblek holds a PhD from field of Operations Management. He is a Director of Supply Chain Domel and Assistant professor in Department of Business Engineering at University of Maribor, Faculty of Organizational Sciences. He has more than 20 years of experience from field of SCM, ERP, WMS, PPC.

MATJAŽ ROBLEK

Gašper Gašperšič is a theologian by education. He started his career at Domel as a production planner. He has been head of supply chain planning at Domel for five years. He is a key user for S4HANA ERP and an expert for the field of operational planning and logistics.

GASPER GASPERSIC

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Rado Lenkic, Logistic Development and Lean Methods expert

Tjaša Korpic, Specialist for Robotics and Logistic Technology

Jani Šolar, Warehouse and Transportation Manager

Vili Logonder, Warehouse and Transportation Manager

SEERC

Building up knowledge capacity in South East Europe

THE SOUTH-EAST EUROPEAN RESEARCH CENTRE
GREECE

WWW.SEERC.ORG

The South-East European Research Centre (SEERC) is a research centre of CITY College, University of York Europe Campus, established as a non-profit, legal entity in Thessaloniki, Greece in 2004. It is conducting multidisciplinary research in the fields of Enterprise, Innovation & Development, Information & Communication Technologies, and Society & Human Development. SEERC's mission is to support the stable and peaceful development of South-East Europe by conducting pure and applied research in and for the region. To accomplish this, SEERC will employ the existing research capacities of the University of York and CITY College by facilitating collaborations between their research staff and by developing multi-disciplinary networks of researchers from across South-East Europe

SOUTH-EAST EUROPEAN RESEARCH CENTRE

PROJECT TEAM

PANAYIOTIS H. KETIKIDIS

Is the Vice Principal for Research, Innovation & External Relations of CITY, and the Chairman of the Management Committee & Academic Director of the Doctoral Programme at the South East European Research Centre (SEERC). He has over 30 years of experience in management, education, research, and competitive research funding with various networks established as a result of this experience. Professor Ketikidis has been listed in the Marquis's Who´s Who, Publications Board in Science and Engineering Eleventh Edition 2011-2012. Professor Ketikidis' research interests across environmental sustainability, supply chain, health informatics, innovation and regional development, and science disciplines in an effort to understand today's and future complex supply chain problems. He has over seventy publications in the forms of journal papers, books, edited books, edited proceedings, edited special issues, book chapters, conference papers, technical papers and reports. He is Chief Editor of the International Journal of Innovation & Regional Development (IJIRD) , Associate Editor of the International Journal of Logistics Economics and Globalisation (IJLEG) , Editorial Board Member of the International Journal of Operational Research (IJOR) , European Editor of the International Journal of Enterprise Network Management (IJENM), and a member of organizing and scientific committees in various national / international conferences and workshops.

ILINA ATANASOVSKA

Ms Ilina Athanasovska, is a PhD student working on various projects funded by the European Commission at SEERC. Her main interests of research are in the fields of circular economy, energy and resource efficiency. She got her BA degree in Accounting and Finance at the International Faculty of the University of Sheffield, CITY College, Greece. Lastly, she was actively involved in the Triple Helix Association by working for the President of the association, Prof Henry Etzkowitz.

EFTHALIA KALLIA

Ms Efthalia Kallia has obtained her Master's degree in Digital Marketing and Social Media from CITY College, University of Sheffield in Thessaloniki. She is a Research Associate and a Communication and Dissemination manager in South East European Research Centre (SEERC). She is currently working in various projects funded by the European Commission (Horizon Europe, Erasmus+).

HELLENIC DEVELOPMENT CITY NETWORK, (D.E.P.AN. – CITY NETWORK)
GREECE (ATHENS)

WWW.DEPAN.GR

"Hellenic Development City Network" with acronym "D.E.P.AN. – City Network", is a non-profit organization governed by public law which was established in June 2015 on the initiative of twenty-one local government organizations from Greece which financed the network in the first year of its operation. Today, it is considered the biggest Hellenic development organisation in Greece as it counts more than 104 members, coming from all regions of Greece.
"D.E.P.AN. – City Network", includes a number of local actors who are joining forces to develop and manage public services and infrastructures more effectively and respond in the best possible way to the needs of citizens by providing better quality services and enhancing local development. "D.E.P.AN. – City Network" applies the Quad Helix Model to create a network that facilitates cooperation and has complementary action with local authorities, government, academic institutions, private sector and civil society for developing and delivering quality services to the citizens. For that reason, "D.E.P.AN. – City Network" as a reliable partner from Greece, considers international cooperation a very important issue for the development of its members and aims to mobilize stakeholders towards the establishment of an International Cooperation Platform according to the Quadruple Helix Model.

PROJECT TEAM

Vassilios Koutsioris, studied Civil Engineering at the University of Hertfordshire and continued his studies at City University of London from where he obtained his master's degree. He is currently General Director of the Hellenic Development City Network (DEPAN), which aims to support local authorities in implementing their development projects and actions. Over the past 10 years he has been working with local and regional development issues. He has been an external collaborator consultant for local public authorities and the Municipality of Levadea between 2011-2013.cipality. In the past, he worked in managerial positions both in technical companies and consultancies. He has considerable experience in combining all available means to achieve the objectives of each business.

VASSILIOS E. KOUTSIORIS

He graduated from the Department of Economics and Regional Development (Panteion University of Athens, Social and Political Sciences) and holds a Master's in Business Administration (Saarland University – Europa Insitute, Germany). At this moment he is a PhD Candidate at Panteion University. He has more than ten years of experience in managing European and National funded programmes (ERASMUS+, ESPA, INTERREG, EEA GRANTS, etc.) as well as organizing vocational educational training programmes, seminars and other complementary services for SMEs, NEETs, and youth.

ATHANASIOS K. POLITIS

He graduated from the Department of Civil Engineering of the Aristotle University of Athens. He has over 20 years of experience in companies and organizations, in which he developed studies for works, managed, supervised and delivered both public and private constructions and infrastructures for several clients. He is familiar and competent with many IT technical softwares and tools that are required on his field.

VASILIOS DOUZAS

Research is creating new knowledge.

NEIL ARMSTRONG

In this section you will find out what results our research has revealed. We examined what DISL competencies are most relevant today...and tomorrow!

RESEARCH RESULTS

FIRST STAGE
IDENTIFICATION OF DISL COMPETENCIES

COMPETENCIES GROUPS

In the first stage of the research, the NEXTLOG team addressed the identification of DISL competencies. To this end, numerous articles on the topic were reviewed, of which 126 were qualified for in-depth analysis. At the same time, business partners analyzed industry reports and studies. Based on this, the team compiled a list of 53 competencies, which are grouped below.

FUNCTIONAL SKILLS

Functional skills deals with competence relating to capacity issues and the range of logistical offers, along with inventory management. They also deal with competence in delivery and returns management, including fast and correct deliveries to customers, and a systematic returns-flow process.

- Ability to establish contracts with stakeholders (contract formation and administration)
- Ability to develop and manage procurement/ purchasing/ sourcing processes
- Ability to manage all aspects of new product introduction (NPI) process from start to finish
- Ability to lead and manage daily operations, including delivery, price/cost analysis, contract negotiation, policies and procedures compliance, logistical coordination etc.
- Ability to handle warehouse management
- Ability to master inventory planning, control, delivery, management etc.
- Ability to develop, implement, streamline and execute supply chain processes
- Ability to utilize contemporary SCM principles, practice and tools

DIGITAL SKILLS

Digital skills are intrinsically linked to DISL and relate to the use of the opportunities offered by modern information technology tools. As digital technologies radically change the conditions of supply chain management, skills in mastering and leveraging them are becoming critical for modern organizations.

- Information processing (seeking, verifying, organizing and summarizing online information)
- Network and information security (understanding the basic security risks associated with viruses, unsecured sites, phishing and information theft)
- Digital communication (using wide range of applications to communicate with team members)
- Digital collaboration (using cloud-based platforms for document and content sharing, project management, product lifecycle management etc.)
- eLearning (using a learning management system (LMS) to engage in training)

COMPETENCE COMPETITION

In this section you will find 3 quotes about competencies.
Try to find who said that!

Everybody's got a different circle of competence. The important thing is not how big the circle is. The important thing is staying inside the circle.

a. Henry Ford
b. Warren Buffett
c. Steve Jobs

COMPETENCE COMPETITION

One of the best uses of your time is to increase your competence in your key result areas.

a. Brian Tracy
b. Peter Drucker
c. Jon Stewart

MANAGERIAL SKILLS

Managers operating in DISL face many challenges due to the dynamics of the environment. In challenging environments, they must set goals, develop and implement long-term strategies while focusing on the operational level.

- Ability to develop and lead strategic business planning regarding SC and logistics
- Ability to manage cost-effectiveness of supply chain
- Ability to develop and lead business transformation process
- Ability to implement quality standards and /improvement initiatives
- Ability to lead risk assessment and management (identify, highlight and eliminate the risks)
- Ability to recognize, analyze, and solve a variety of problems
- Ability to establish/ use/manage KPIs for teams or supply chain management
- Ability to supervise/ monitor inventory, delivery, production, sales, supply chain process
- Ability to acquire the appropriate people, technology, equipment and financial resources to meet customer expectations
- Ability to understand financial statements

RELATIONAL SKILLS

Proper communication within and outside the organization is key to sharing knowledge and understanding company goals and challenges. Intelligent and sustainable development requires cultural and cross-functional awareness that comes from relational skills.

- Ability to communicate effectively within an organization (within and across departments
- Ability to communicate effectively with vendors/suppliers
- Ability to collaborate with cross-functional personnel
- Ability to effectively work in teams and in matrix organisation structure
- Ability to share knowledge between departments

ANALYTICAL SKILLS

Analytical skills refer to the ability to collect and analyze information, problem-solve, and make decisions. Employees who possess these skills can help solve a company's problems and improve its overall productivity and success.

- Ability to collect and analyse complex data
- Ability to deal with data processing and analysing
- Ability to utilize demand forecasting process
- Ability to evaluate/ assess/ review the operations, budget, suppliers, performance, etc.
- Ability to generate business reports and report status to stakeholders

BEHAVIORAL SKILLS

Skills such as time management, integrity, confidence, multitasking, and stress-resistance characterize good managers, coping under all conditions. Creative, innovative thinking and problem-solving ability are skills that foster recognizing threats and turning them into opportunities.

- Ability to embrace innovative and creative thinking
- Self-driven; take initiative; work without supervision
- Ability to think strategically
- Willingness to experiment with new digital technology
- Ability to present oneself with confidence
- Ability to empathize with others
- Ability to handle job-related stress

ADVANCED DIGITAL AND ANALYTICS CAPABILITIES

Proper communication within and outside the organization is key to sharing knowledge and understanding company goals and challenges. Intelligent and sustainable development requires cultural and cross-functional awareness that comes from relational skills.

- Real-time business intelligence
- Control tower-enabled visibility
- Strategic sourcing and optimization
- Real-time manufacturing asset intelligence
- Dynamic demand and supply synchronization
- Inventory visibility and optimization
- Blockchain in supply chain
- AI (artificial Intelligence) and ML (machine learning) techniques
- Predictive and advanced analytics
- Big Data analytics in supply chain management
- Virtual reality and spatial analytics
- Robotics

It seems like a lot?

That's why we have identified key competencies in the next steps...

COMPETENCE
COMPETITION

To be a manager requires more than a title, a big office, and other outward symbols of rank. It requires competence and performance of a high order.

a. Peter Drucker
b. Mark Twain
c. Jeff Bezos

SECOND STAGE
LARGE SCALE SKILL GAP IDENTIFICATION

COMPETENCIES IMPORTANCE

Once DISL's competencies were identified, we had to see which were most relevant in the partner countries. The skill gap confirmation was produced firstly by developing a survey aimed at assessing quadruple helix stakeholders' needs in terms of employee skills related to DISL. In addition, we looked at what competencies are important for academics and our students. Finally, we compared the list of all **53 competencies** with our curricula and learning outcomes.

RESEARCH - DISL COMPETENCIES IMPORTANCE

In each partner country (Poland, Greece, Slovenia), we surveyed 3 key groups for the project - entrepreneurs, students, academics. In the questionnaire they were asked to rate each competency in terms of its importance. They gave their answers on a 7-point scale.
After obtaining the average of the indications, we had comparative material for further analysis. Technically, it looked like this (an example of one of the competencies):

Example:

Functional skills	Proficiency/Importance (scale: 1-7)				Coverage (scale: 1-7)			Difference
	Market [M] (n=50)	Students [S] (n=55)	Teachers [T] (n=10)		Teachers [T] (n=10)	Curriculum [C]		
	4,76	5,40	5,81	Average	5,48	3,38	Average	
Ability to establish contracts with stakeholders (contract formation and administration)	5,53	5,38	5,50	5,47	4,93	3,00	3,97	1,50
Ability to develop and manage procurement/ purchasing/ sourcing processes	5,16	5,42	5,93	5,50	5,73	3,00	4,37	1,14
Ability to manage all aspects of new product introduction (NPI) process from start to finish	4,95	5,58	5,63	5,39	5,03	4,00	4,52	0,87
Ability to lead and manage daily operations, including delivery, price/cost analysis, contract negotiation, policies and procedures compliance, logistical coordination etc.	5,05	5,71	6,03	5,60	5,67	4,00	4,83	0,76
Ability to handle warehouse management	4,92	5,04	5,60	5,19	5,50	3,00	4,25	0,94
Ability to master inventory planning, control, delivery, management etc.	4,18	5,54	5,80	5,18	5,57	3,00	4,28	0,89
Ability to develop, implement, streamline and execute supply chain processes	4,18	5,25	6,00	5,14	5,73	3,00	4,37	0,78
Ability to utilize contemporary SCM principles, practice and tools	4,11	5,25	6,00	5,12	5,63	4,00	4,82	0,30

Next, we examined which competencies are most demanded by stakeholders and at the same time least represented in the curricula. Thus, we distinguished key competencies, which became the subject of our further work. In the following steps, the selected competencies were assigned to 3 content areas:
Area 1 - Sustainability as a service in supply chains & the manager of future
Area 2 - New technologies in logistics
Area 3 - Intelligent logistics and transportation systems

The decision to select the competencies for further work was based on the largest gaps. According to the color coding, the project focused on red selections.

competences with the calculated greatest difference between the actual and the desired state

competences with an intermediate level of development in the curricula

competences covered in the curriculum in a way that exceeds expectations

THIRD STAGE
CONSOLIDATION OF COMPETENCE AREAS

COMPETENCIES AREAS

The final milestone in the development of learning materials was the assignment of relevant competencies to subject areas. In a desk research procedure, the NEXTLOG team assigned skills and competencies according to their fundamental essence to the DISL components.

AREA 1 - SUSTAINABILITY AS A SERVICE IN SUPPLY CHAINS & THE MANAGER OF FUTURE

Ability to establish contracts with stakeholders (contract formation and administration)
Ability to communicate effectively within an organization (within and across departments)
Ability to share knowledge between departments
Ability to develop and lead strategic business planning regarding SC and logistics
Ability to develop and lead business transformation process
Ability to generate business reports and report status to stakeholders
Ability to implement quality standards and /improvement initiatives
Ability to manage all aspects of new product introduction (NPI) process from start to finish
Ability to develop and manage procurement/ purchasing/ sourcing processes

Check out our introductory video for Area 1!

AREA 2 - NEW TECHNOLOGIES IN LOGISTICS

Network and information security (understanding the basic security risks associated with viruses, unsecured sites, phishing and information theft)
Real-time manufacturing asset intelligence
Digital communication (using wide range of applications to communicate with team members)
Digital collaboration (using cloud-based platforms for document and content sharing, project management, product lifecycle management etc.)
Ability to develop and lead strategic business planning regarding SC and logistics
Ability to develop and lead business transformation process
Real-time business intelligence
Blockchain in supply chain
Big Data analytics in supply chain management

Robotics
Dynamic demand and supply synchronization
AI (artificial Intelligence) and ML (machine learning) techniques
Predictive and advanced analytics
Inventory visibility and optimization

Check out our introductory video for Area 2!

AREA 3 - INTELLIGENT LOGISTICS AND TRANSPORTATION SYSTEMS

Ability to develop and lead strategic business planning regarding SC and logistics
Ability to develop and lead business transformation process
Real-time business intelligence
Blockchain in supply chain
Big Data analytics in supply chain management
Control tower-enabled visibility
Ability to implement quality standards and /improvement initiatives
Ability to manage cost-effectiveness of supply chain

Check out our introductory video for Area 3!

COMPETENCIES NOT INCLUDED IN THE CONTENT OF THE TRAINING MATERIALS BUT INCLUDED IN HOW THEY ARE DELIVERED

eLearning (using a learning management system (LMS) to engage in training)
Ability to empathize with others
Ability to handle job-related stress
Ability to think strategically
Ability to embrace innovative and creative thinking
Ability to present oneself with confidence

IT'S TIME TO KNOW THE EFFECTS OF OUR WORK
DEDICATED TO YOU!

> *Try to learn something about everything and everything about something.*
>
> THOMAS HUXLEY

LEARNING MATERIALS

This is a key part of the handbook. The place where you will find DISL teaching materials. Based on research results, touching on areas relevant to the future of logistics and supply chain. The interactive handbook will guide you to your destination.

You can choose from 4 languages!

VLE - VIRTUAL LEARNING ENVIRONMENT
LEARING MATERIALS

AREAS 1-3

A virtual learning environment (VLE) is a set of teaching and learning tools designed to enhance a student's learning experience by including computers and the Internet in the learning process. The principal components of a VLE package include curriculum mapping (breaking curriculum into sections that can be assigned and assessed), student tracking, online support for both teacher and student, electronic communication (e-mail, threaded discussions, chat, Web publishing), and Internet links to outside curriculum resources.

NEXTLOG VLE - INNOVATIONS

FIRST INNOVATION consists in the provision of the first VLE in the field of DISL which offers an integrated decision support system which will enable the users to practice (hands-on) the gained knowledge and get a better experience from this market-oriented tool. However, the main goal of the VLE (during the project lifecycle) is to enable all primary quadruple helix stakeholders to co-create by evaluating the applicability of the DISL curriculum for the proposed scenarios/models. This public input from stakeholders is critical for enabling an open innovation approach for enhancing the quality and comprehensiveness of the DISL curriculum for wider targets. Such an open approach (VLE) is deemed to make a greater impact of NEXTLOG's findings on the desired target groups and to enable a sustainable outreach of the project leading to innovation outburst through open innovation and knowledge collection, management and improvement (cocreation).
SECOND INNOVATION is sustained by the quadruple helix co-creation feature which is embedded in the VLE. Such co-creation together with the built-in decision support system comprises an innovative approach to DISL.

NEXTLOG VLE - IMPACT

The open-access VLE will positively impact HEIs and industry partners involved in the project to produce human resources better acquainted with market-oriented DISL topics by helping them to develop suitable market skills. Similarly, the industry targets will gain a positive impact by having a globally confirmed tool that will enable them to asses DISL strategies prior to their implementation and to better model DISL systems tailored for their companies. The transferability of the VLE to other contexts is one of the key priorities of this IO as the VLE can be used by any industrial and learning context which aims at assessing economic, environmental and social impact of industrial systems.

NEXTLOG VLE - MATERIALS

Below you will find our teaching materials for each area. We have prepared training content for you in several alternative formats:

- traditional PowerPoint presentations that you can learn from at any pace,
- automated presentations in the form of video recordings (mp4)
- SCORM-type files that you can directly link to elearning platforms such as Moodle.

Learning materials are prepared in **4 language versions**: English, Polish, Greek and Slovenian. When you click the appropriate flag, you will be redirected to the content in the selected language.
Enjoy learning!

AREA 1
SUSTAINABILITY AS A SERVICE IN SUPPLY CHAINS & THE MANAGER OF THE FUTURE

CONTENT

CURRICULUM

LECTURES

1. Sustainability in supply chain strategies - Importance and conditions of SDG
2. Sustainability in supply chain strategies - Selected supply chain startegies
3. Sustainability in supply chain strategies - Green purchasing strategy
4. Formation and administration of contracts with stakeholders
5. Business transformation processes - toward sustainable supply chain

WORKSHOPS

1. Technologies for achiving sustainable goals
2. Generating business reports for stakeholders - Sustainable objectives and KPIs
3. Generating business reports for stakeholders - Code of conducts
4. Digital communication tools

TEST: MULTIPLE CHOICE QUESTIONS

AREA 2

NEW TECHNOLOGIES IN LOGISTICS

CONTENT

CURRICULUM

LECTURES

1. AI (artificial intelligence) and ML (machine learning) techniques
2. Robotics
3. Network and information security
4. Blockchain in supply chain
5. Real-time manufacturing asset intelligence
6. Predictive and advanced analytics
7. Dynamic demand and supply synchronization

WORKSHOPS

1. Digital communication (using wide range of applications to communicate with team members)
2. Digital collaboration
3. Strategic business planning
4. Business transformation process
5. Big Data analytics in supply chain management
6. Real-time business intelligence
7. Inventory visability and optimization

TEST: MULTIPLE CHOICE QUESTIONS

AREA 3

INTELLIGENT LOGISTICS AND TRANSPORTATION SYSTEMS

CONTENT

CURRICULUM

LECTURES

1. Digital transformation of the transportation & logistics systems
2. Intelligent transportation solutions
3. KPIs

WORKSHOPS

1. Digital Twin (BPR)
2. Business Intelligence
3. Circular economy & DISL

TEST: MULTIPLE CHOICE QUESTIONS

ACCESS

LEARNING MATERIALS

DOWNLOAD

USEFUL RESOURCES

USE

FOR TEACHING AND SELF-LEARNING

> ***Good ideas are not adopted automatically. They must be driven into practice with courageous patience.***
>
> **HYMAN RICKOVER**

In this section of our handbook, you will find a selection of 16 DISL good practices developed within the project. After studying the abstracts, you can move to the full version by following the link or QR code.

GOOD PRACTICES

AREA 1

SUSTAINABILITY AS A SERVICE IN SUPPLY CHAINS & THE MANAGER OF FUTURE

AUTHOR

AGATA RUDNICKA-REICHEL

1

LINK

IMPROVING SOCIAL CONDITIONS WITHIN SUPPLY CHAINS

The aim of the good practice is to get an overview of the possibilities for improving social conditions within supply chains. The idea of sustainable supply chain management is crucial for minimising the negative effects which are the results of each industry's activities. Study presents the efforts that the company from any type of industry can take to manage social risks in their suppliers' relationships. The material can be supportive to understanding the concept of sustainable supply chain management and discovering the responsibility that specialists responsible for logistics, supply chain management or purchasing processes may have when managing the networks. The main attention will be put on social aspects related to human rights issues. The social context of sustainable supply chain management seems to be underestimated in the business debate whereas it is a critical factor for sustainability in the longer perspective and in everyday activities.

AUTHOR

IZABELLA SZUDROWICZ

2

LINK

REDUCING CO2 CONSUMPTION IN PASSENGER TRANSPORTATION

The aim of this study is to present an idea of technical and organizational activities in the company aimed at reducing CO2 consumption in passenger transportation.

Good practice will be conducted on the example of the Polpharma Group, the largest manufacturer of pharmaceutical substances in Poland. It's one of the largest pharmaceutical groups in Central and Eastern Europe and a leader of the Polish pharmaceutical market in terms of sales. This good practice - reducing CO2 consumption in passenger transport- could be implemented as a part of organization's sustainability strategy. It should be underline that passenger transportation as a part of sustainable transportation should be an important part in eco-friendly behaviours building among employees. What is more, in large organizations with several locations, reducing CO2 emissions in passenger transportation is as important as reducing emissions in the supply chain.

AUTHOR

PIOTR SOSNOWSKI

3

LINK

REDUCING CO2 CONSUMPTION IN PASSENGER TRANSPORTATION

The purpose of this document is to describe a green supplier selection as a service in the supply chain. Green supplier selection is a supplier selection considering the requirements related with limiting negative environmental impacts by suppliers. Such requirements can be applied, among others, as environmental supplier criteria or areas for initial evaluation of suppliers. The company would use the practice when there will be a need to start a cooperation with a new supplier, considering the issues related to limiting negative environmental impacts. This kind of situation might result from the environmental policy and/or the supplier selection policy of a company. The timeframe for carrying out the green supplier selection depends on the scope of the supplier selection process and the criteria used and the urgency of the supplier need. The aim of green supplier selection is starting a cooperation with supplier that limits its negative environmental impacts according to the environmental policy of a focal company.

AUTHOR

ATHANASIOS BALOUKAS

4

LINK

GREEN WAREHOUSING

The aim of this study is to accent the importance of the Industrial Ecology and the Green Supply Chain Management (GSCM), through the breakdown of Green Warehousing. What is expected is that the final results and the conclusion of the following research, would reject those statements that sustainability within the worldwide logistics have a negative effect on the companies, thus it sets restrictions and limitations to their standard operations and disturbs global equilibriums.

AREA 2

NEW TECHNOLOGIES IN LOGISTICS

AUTHORS

MICHAŁ ADAMCZAK
ADRIANNA TOBOŁA

5

LINK

BIG DATA

The aim of the Good Practice is to present a group of solutions operating within Big Data concept. Big Data is solution that enable the acquisition, collection and processing of large data sets that change dynamically. The use of this practice enables achieving results that will allow you to extract from the analyzed data facts and dependencies that are not visible at first glance. Big Data is used in many areas, mainly in the business area, e.g. to forecast the development of phenomena, mainly demand, and to identify the relationship between various (often considered

unrelated) phenomena. Very often, Big Data solutions are also used for inventory management. Enterprises using it can identify new phenomena and trends faster than their competitors, and thus have more time to prepare for them.

AUTHOR

MAGDALENA KOPEĆ

6

LINK

REDUCING CO2 CONSUMPTION IN PASSENGER TRANSPORTATION

The purpose of this good practice is primarily to present basic information, tools, but also challenges related to the use of telematics in business. This good practice aims to familiarize companies that have not used telematics so far with the details of the tool itself, indicating the target group and the value that the company can achieve when implementing.

AUTHOR

MATJAŽ MALETIČ

7

LINK

PRODUCT LIFECYCLE MANAGEMENT SYSTEM AND SUPPLY CHAIN MANAGEMENT

The goal of good practice is to demonstrate the potential of product lifecycle management (PLM) systems for supply chain management. Manufacturers are increasingly faced with the challenge of improving product quality, tightening delivery terms to customers, and increasing profitability for shareholders. As a result, effective collaboration between customers, developers, suppliers and manufacturers throughout the product lifecycle is becoming increasingly important to increase competitiveness. As a result, all members of a given supply chain must work together to respond quickly to changes in market demands. The result of these best practices would be an in-depth look at PLM requirements and their connection to supply chain management. By adopting a PLM approach, each

member of the chain will contribute to product development. This improves their relationships with each other and seamlessly integrates their business processes and information systems for product lifecycle activities. PLM enables all activities in the supply chain to work more efficiently and coherently.

AUTHOR

DAMJAN MALETIČ

8

LINK

ASSET MANAGEMENT AND DIGITAL TWINS: THE USE IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT

The digital transformation is currently accelerated by exponentially growing availability of various technologies and solutions in the field of asset management. Thus, the opportunity for companies in capital-intensive industries to renew their business and operating models through application of digital technologies has become evident. As such, the digital transformation of physical assets has been receiving increased attention in the last few years. In this regard, Digital Twins (DTs) have been widely applied in many industry settings. The goal of this good practice is therefore to provide an overview of potential applications of DTs in the logistics and transportation industry. For this purpose, asset management as a main concept is presented with a focus on DTs and their applications to supply chain management.

AUTHORS

ATHANASIOS POLITIS
LOUKAS PAPACHARALABOUS

9

LINK

DATA ANALYSIS LEADING TO BUSINESS ADVANTAGES

The aim of this document is to present how a medium Greek company called "ELLIKON transport & Logistics Papacharalampous", with the use of technologies

and with its owner's entrepreneurial management decisions decided to minimize costs and make his business model "greener". The company with the proper use of new technologies in logistics together with the appropriate skilled people presents their way on how they lead to Minimization of operational costs and reach a point to offer "Green" alternative solutions on their everyday business.

AUTHORS

MATJAZ ROBLEK
GASPER GASPERSIC
IZTOK COLJA

10

LINK

THE USE OF AI IN PRODUCTION SCHEDULING IN DOMEL

Artificial intelligence (AI) technology is recognised in supporting the production planning process, which is one of the key processes in supply chain processes. Production planning aims to achieve reliable, responsive and flexible supply to the customer at minimum costs and with high utilisation of the production resources used. Because of the complex and mutually exclusive objectives, there are many parameters of uncertainty in the process of operational production planning: what happens if the material is late, if a work tool fails, if the customer changes his mind, if we receive defective material, if our employees fall ill, if the technical documentation for a new project is delayed, etc., and what will be the consequences of the uncertainty, such as over- or under-stocking, increased labour costs, unreturned work tools. With these events and their consequences predicted with more or less certainty, we have a lot of data in business and production information systems. And where there is data, AI offers us opportunity to make smart decisions based on the knowledge identified from the data. This includes both predictable and less predictable events and consequently allows production planning to be less sensitive (more robust) to business unfavourable events.

AREA 3

INTELLIGENT LOGISTICS AND TRANSPORTATION SYSTEMS

AUTHOR

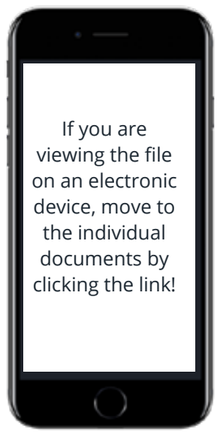
MARIUSZ SZUSTER

11

LINK

INTELLIGENT LOGISTICS AND TRANSPORTATION SYSTEMS

The target of this document is to present track and trace system. It is based on four key enablers: technology, process, organization and knowledge. Track and trace is a fast efficient online system providing up-to-the-minute information for all shipment collected and delivered within the particular country or region. Track and trace systems increase the work efficiency of drivers and back office. For example, planners can modify plans based on up-to-date information. Additionally, the track and trace system facilitates precise settlements. The data collected and sent to the back office can be made available to customers, thanks to which they know exactly what is happening with their goods. The track and trace system increases the efficiency and effectiveness of the entire supply chain. Manufacturers can know exactly when standardized processes deviate from the norm. This knowledge empowers the factory to quickly identify the source of problems. All these aspects contribute to the improvement of sustainability standards.



TEXT

If you are viewing the printed version, move to the individual documents by scanning QR code with your smartphone.

AUTHOR

MARJAN SENEGAČNIK

12

LINK

INTELLIGENT SYSTEMS AND NEW TECHNOLOGIES USE FOR ASSESSMENT OF ENVIRONMENTAL ASPECTS IN THE ROAD TRANSPORTATION OF GOODS

The aim of this good practice is to present the use of modern technologies and intelligent measuring systems to assess air pollutant and greenhouse gas emissions generated in logistics and especially in transportation. This is particularly important for the correct calculation of the company's carbon footprint. Transportation represents an activity that is significantly associated with negative environmental impacts. It is becoming increasingly important for companies to be able to make an accurate assessment of the environmental impacts caused by their transportation activities, as well as to calculate the carbon footprint or assess the emissions of air pollutants. In this context, this good practice highlights some of the challenges, such as the collection of accurate and credible data, the possibility of using environmental assessment tools with the aim of developing more efficient pollution control and carbon footprint reduction.

AUTHOR

ATHANSIOS BALOUKAS

13

LINK

EXPLORING THE ADOPTION OF INTELLIGENT TRANSPORTATION SYSTEM IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT

As one of the biggest drivers of the country’s economic growth and company’s competitiveness, the transportation and logistics sector is facing setbacks due to complex supply chains, high labour, logistics and transportation costs. The high costs are negatively affecting the efficiency of the global supply chains, therefore are having a direct negative impact over the economy of the countries. On the other hand, the increased number of vehicles and mobility leads to high negative

impacts especially in the urban areas, such as congestion, pollution, accidents, and delays in transportation, which also negatively impacts the general logistics systems. Consequently, both industry and academia are continuously working on identifying and developing smart approaches and solutions that will both improve the efficiency of the transportation and logistics systems, as well as it will help in reducing costs. One solution to the issue is the adaptation of Intelligent Transportation System (ITS) in the logistics and supply chain sector. ITS can be either technologies, applications or platforms that are improving the overall quality of the transportation systems and are considered as one of the key tools that could increase the operational efficiency of logistics and supply chain management. Therefore, the aim of this good practice report is to showcase the importance and usefulness of the adoption of Intelligent Transportation Systems (ITS) in the logistics sector, in order to improve performance, reduce costs, pollution, congestions, as well as improve the safety of transportation.

AUTHOR

ATHANSIOS BALOUKAS

14

LINK

INTERNET OF THINGS

This research aims at highlighting the importance of IoT within the modern-day logistics and transportation systems and the benefits that such solutions are accompanied from. However, the biggest challenge is the Data Security and the fact that Top Managers hesitate at creating a system, where vulnerable information about their companies will be shared. The terrifying increase of daily cyber-attacks restrain firms from adopting such solutions. This paper has a target to point out a dozen of other reasons for logistics services to be enhanced with IoT tools.

AUTHORS

ATHANASIOS POLITIS
LOUKAS PAPACHARALABOUS

15

LINK

INTERNET-OF-CONTAINERS

The Internet-of-Things (IoT) as technology in the Shipping and Port industry can literally transform itself, offering value-added services to its customers. Smart" containers help in recording important information such as container location, temperature and humidity fluctuations, vibration detection, door opening/ closing status, any unusual activity that requires immediate action by port agency managers. The aim of this practice is to present the idea behind the implementation of the Internet of Containers (IoC) Project which takes place in Thessaloniki's Port together with the International University - Department of Supply Chain Management.

AUTHORS

MATJAZ ROBLEK
RADO LENKIC
EDO POHLEVEN

16

LINK

RE-ENGINEERING THE MATERIAL SUPPLY PROCESS FOR PRODUCTION IN DOMEL

Products can be manufactured on a Make to Stock basis, which means that we anticipate the customer's specific demand and sell the product to them from stock. Another way of production is Make to order, where the customer's order triggers production. In an internal supply chain, it is the Lead Time of the customer's order that determines how much production we will be able to do Make to Order. This is determined by the Customer Order Decupling point. If we cannot do the whole process by Make to Order, we say that the model is Assemble to Order. The Make To Order model is interesting because we actually operate without any stocks of finished products. As much is produced as the customer requires with a purchase order or a recall resulting from an EDI Term Agreement. This good practice example describes the production of a water pump for cooling battery packs in electric vehicles.

> *Data are just summaries of thousands of stories—tell a few of those stories to help make the data meaningful.*
>
> DAN HEATH

In this section of our handbook, you will find a selection of 8 DISL case studies developed within the project. After studying the abstracts, you can move to the full version by following the link or QR code.

CASE STUDIES

AUTHORS

MATJAZ ROBLEK
GASPER GASPERSIC
BLAŽ DEBELJAK

1 **LINK**

SUPPLY CHAIN OPTIMISATION: REPLACEMENT OF SUPPLIER OF ELECTRICAL STEEL CONSIDERING C02 FOOTPRINT

Many companies have aim to become carbon neutral. Being carbon neutral means the company has a zero-carbon footprint over a certain period. It achieves this aim through carbon offsetting. The company must neutralise a certain amount of greenhouse gas emissions either by financing internal projects or by financing projects that could achieve an equivalent reduction in greenhouse gas emissions somewhere else, like tree planting. The choice of supplier is also a key element in achieving carbon neutrality. This case shows how the knowledge of sustainability in logistics can be used in a modern digital logistic decision support system as an additional decision parameter in the choice of supplier. The example is based on a change of supplier of electrical steel from global to local supplier.

AUTHORS

MATJAZ ROBLEK
GASPER GASPERSIC
BARBARA BERTONCELJ

2 **LINK**

PRODUCT OPTIMISATION: REPLACEMENT OF MATERIAL FOR ELECTRIC MOTOR BODY CONSIDERING C02 FOOTPRINT

For every production company the choice of a material is a key element in achieving carbon neutrality. This case shows how the knowledge on sustainability in production process and logistics (CO2 emissions) can be used in a design phase of a product. This makes the company more sustainable and less damaging to the environment. This is an example of how material replacement reduces CO2 emissions that contributes to sustainability in logistic processes. The old version

of electric motor is designed and produced in Domel location in China and has a steel body, the new version of electric motor is designed and produced in Domel location in Slovenia and has a BMC body (Bulk molding compound). Basically, the two motors are identical, the only difference is the material for the body.

AUTHORS

MATJAZ ROBLEK
GASPER GASPERSIC

3 **LINK**

PROCESS OPTIMISATION: IMPLEMENTING CLOUD BASED LOGISTIC PORTAL FOR SMALL SUPPLIERS

The logistic administrative work reduction is an activity in achieving carbon neutrality for modern companies. This case shows how the knowledge of sustainability in the production process and logistics can be used in a design phase of a logistic administrative process, especially when we design administrative work for purchase and warehouse personnel. That makes the company more sustainable and less damaging to the environment. In this example, we show how the implementation of modern technology, such as a cloud-based logistics portal, means in terms of reducing administrative work and consequently it reduces CO2 emissions caused by employees as operators.

AUTHORS

MATJAZ ROBLEK
GASPER GASPERSIC

4 **LINK**

INTERNAL TRANSPORT: CHANGING THE PRIORITY POLICY FOR FLEXIBILITY OF INTERNAL TRANSPORT

The choice of policy for internal transport is an element in achieving carbon neutrality. This case shows that knowledge of sustainability in logistics (CO2 emissions) is noticeable in implementing transport optimisation solutions or sales decision support solutions. From long experience, Domel logistic management

has established a fixed timetable between production sites. Timetable demands adjustability of all inter-turn shipments of material. However, as Domel is a market-oriented company, it also allows internal transport to take place outside the schedule rules, which means a lot of unplanned internal transport runs. Extra runs do not only lead to poor utilisation of scheduled runs, but they also lead to additional costs and emissions. Under the current sales policy, we operate with no finished goods inventory, so internal transport is expected to adapt to sales and production at all production sites. In line with its long-term policy of becoming a CO2-neutral company, Domel is looking at the potential for reducing environmental emissions from extraordinary transport runs. This example shows a solution to allow increased safety stocks of semi-finished products at all production sites.

AUTHORS

VASILIOS KOUTSIORIS
ATHANASIOS POLITIS
TANYA KYRIAKIDOU

5 **LINK**

AN ALGORITHMIC APPROACH FOR SUSTAINABLE AND COLLABORATIVE LOGISTICS

Horizontal collaboration is one of the most effective strategies applied to address issues related to sustainability and the adverse effects of commodity distribution. Although it has received increased attention in recent years, no synthesis has been conducted to present the main practices and sustainability indicators used to assess the performance of horizontal collaboration. In addition, the factors that can further improve the performance of horizontal collaboration in terms of sustainability have not been presented in any literature review. Thus, we expose, in this paper, a review dealing with horizontal collaboration, and we define the key indicators used to measure its performance. The main objectives of the present study are to highlight the impact on the success of collaboration and to propose and identify several guidelines for companies wishing to implement horizontal collaboration.

AUTHORS

ILINA ATANASOVSKA
NIKOS ZAHARIS
EFTHALIA KALLIA

6 **LINK**

A SCENARIO TO THE FORKLIFT MOVEMENT PROCESS, USING LEAN PROCESS TO RE-DESIGN THE PRODUCT BE MORE SUSTAINABLE

This report describes the analysis of a forklift movement process for a metal producer company. The chosen company is a well-established Greek firm called Alumil. The forklift movement process was analysed through the tool SCEnAT, which aims to calculate the emission of the product's process in order to make some recommendation concerning the CO2 emissions, the water consumption, cartoons waste, etc. In that manner, this report proposes a scenario to the forklift movement process, which is using lean process in order to re-design the product in order to be more sustainable.

AUTHORS

ILINA ATANASOVSKA
NIKOS ZAHARIS
EFTHALIA KALLIA

7 **LINK**

THE INTEGRATION OF CROSS DOCKING TRANSPORTATION TO REDUCE WASTE, IMPROVE SUPPLY CHAIN EFFECTIVENESS AND TO APPLY NEW TECHNOLOGIES AND TECHNIQUES

The implication of green external operations management in order to reduce electricity and fuel consumption through cross docking optimization and logistics efficiency is significant in today's business environment. More specifically, the integration of cross docking transportation in order to reduce waste, improve supply chain effectiveness and to apply new technologies and techniques aiming for company improvements, has been a game-changing process innovation for large corporations. This report describes the analysis of the integration of cross docking optimisation technique within the supermarket's operations.

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8 **LINK**

IOT SUSTAINABILITY IN OLTH PORT OF THESSALONIKI SMART CONTAINERS

Smart Containers are taking the digital age of shipping one step further beyond paperless processes by embracing the Internet of Things (IoT) to support enhanced decision-making by the various sectoral stakeholders. This technology can be combined with other innovations such as blockchain, big data or data pipelines to provide even more facilitation to the trading community. Smart devices unlock the potential to provide accurate real-time data as they are permanently fixed to the transport equipment, provide coverage for the whole journey and are not restricted to reaching physical locations to report events. This case study provides an almost detailed look into the various benefits of using IoT - Smart Containers as well as the various potential use cases for this technology.

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9 **LINK**

MANUFACTURING 1 - POLYSTYRENE BLOCK

The main goal of the project is to evaluate the total lifecycle carbon emissions, identify carbon hot spots and suggest possible low carbon intervention measures to address the hot spots in the supply chain of polystyrene brick produced by polish company IZODOM. The company's objective is to offer a complete system for building low-energy and passive houses - from foundations, through walls, all the way to the roof. It produces construction elements from polystyrene using

only steam and power. They do not add any chemicals in the production process (poisonous adhesives, solvents, preservatives, paints). The company operates in the Chemical Sector. The most important advantage of the analysis is to improve the production of polystyrene bricks to reduce CO2 emission.

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10 **LINK**

MANUFACTURING 2 - ALUMINIUM WINDOW (1)

The main objective of the analysis is to assess the total lifecycle carbon emissions, recognize carbon hot spots and suggest possible interventions to reduce CO2 emission in the supply chain of an aluminium window. All factories of analysing manufacturer are located in Poland. The company offers a wide portfolio of aluminium windows and doors, PVC windows and doors, aluminium facades, winter gardens, windowsills, roller blinds and louvre blinds as well as various accessories. The production is make to order. This case study refers to the replacing aluminium frame with fiberglass frame during window production since this input causes greatest harm to the environment. Moreover, gas during glass production process is marked as a hotspot &, electricity in both glass production and window production appears to be vastly influential when it comes to the harmful emissions. Firstly, gas during glass production process is marked as a hotspot. Secondly, electricity in both glass production and window production appears to be vastly influential when it comes to the harmful emissions.

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LINK

MANUFACTURING 3 - ALUMINIUM WINDOW (2)

This case study concerns the production process of a single chamber which is in general quite simple, but it is very harmful to the environment. The main objective of the analysis is to assess the total lifecycle carbon emissions, recognize carbon hot spots and suggest possible interventions to reduce CO2 emission in the supply chain of an aluminium window.
Innovations proposed let reduce total emissions of CO2 significantly. It concerns changing aluminium frame to wooden frame. It can seem to be not very eco-friendly because of deforestation but the company can try to find some possibilities to use remains from wood processing in different companies. The changes of raw material let reduce not only the direct emission of CO2 but also the influence of the transport. Other ideas in the majority are dedicated to replacement standard source of energy with modern, alternative ones as solar panels. This kind of solutions can help to protect the environment with a rule of sustainable development and let the company achieve high profits and great position to compete on the international market.

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LINK

THE GARMENT ACCESORIES - SHOULDER PADS

The subject of an analysis is 1 package of 100 pairs of stitched shoulder pads which consists of two layers: polyester nonwoven fabrics (made from virgin fibres and processed fibres such as PET bottles) and polyester foam connected during the production processes.
The main objective of the analysis is to assess the total lifecycle of carbon emissions, recognize carbon hot spots and suggest two possible scenarios to reduce CO2 emission in the supply chain of the stitched shoulder pads. Nonwoven fabric transport, foam transport and nonwoven fabric are the major sources of carbon emissions. The analysis based on the changing of suppliers' raw materials for a local one and more ecology engines.

Answers

WHY DISL IS SO IMPORTANT? - correct: a, b, c BACK TO THE PAGE NO 9

ONE OF OUR MAIN GOALS IS: - correct: c BACK TO THE PAGE NO 11

Everybody's got a different circle of competence. The important thing is not how big the circle is. The important thing is staying inside the circle.
- correct: Warren Buffet BACK TO THE PAGE NO 31

Everybody's got a different circle of competence. The important thing is not how big the circle is. The important thing is staying inside the circle.
- correct: Brian Tracy BACK TO THE PAGE NO 32

To be a manager requires more than a title, a big office, and other outward symbols of rank. It requires competence and performance of a high order.
- correct: Peter Drucker BACK TO THE PAGE NO 35