

COMPANY BROCHURE



INTERNATIONAL RESEARCH PROJECT 2022



INTRODUCTION

The foundation Stichting Study Tour Industria (SSTI) annually organizes the International Research Project (IRP). The International Research Project consists of two parts: the research projects and the study tour. The research projects will be conducted prior to the study tour and are based on a predetermined theme. After finishing these projects, the study tour takes place. The study tour is organized around the same theme. During the tour, companies and universities in the country of destination will be visited.

The International Research Project is an initiative of students of the department of Industrial Engineering & Innovation Sciences at Eindhoven University of Technology. Students of the Master programs Operations Management and Logistics, Innovation Management, Data Science and Entrepreneurship, and Manufacturing Systems Engineering are allowed to participate. The participants will conduct the mentioned research projects. For the participants, the International Research Project is a great opportunity to apply their academic knowledge within an international business setting. Furthermore, IRP provides students the opportunity to gain in-depth knowledge about a subject of research that suits their interests and education.

This brochure provides information for companies that are interested in the International Research Project. The participation options are elaborated and the capabilities of the students involved are described. Contact details are listed at the end of this brochure.

In this brochure we aim to provide a clear overview of the set up and scope of the International Research Project. Together with all the students involved, we are looking forward to welcome your company as a participant in the International Research Project 2022, and we hope for a pleasant and educational cooperation.

On behalf of the SSTI,

Kobi Delahay
Coordinator Contract Research
International Research Project 2022



Real-time economy

Today's reality of digital connectivity

► Real time economy

In recent years, our economy has undergone a rapid transformation toward an on-demand model. With the introduction of smartphones and apps like Airbnb and Uber, people have been granted unprecedented access to giving feedback on products and services. As a result, consumers have been brought upstream into the product development life cycle and now expect businesses to bend to their needs.

This consumer shift has set the stage for what is to come in the enterprise. New technologies are radically transforming the workplace. In the near future, we'll see the demand for instant gratification and access to information intensify even more. On-demand is no longer just a gimmick; it's a reality. As the dust on these changes settles, a new real-time economy will emerge.

Real-time economy (RTE) is a digital ecosystem where transactions between diverse economic actors take place in or near real time. This means replacing paper-based business transactions and administrative procedures by automatic exchange of digital, structured and machine-readable data in standardized formats.

When we talk about real-time economy we mean many things but obviously mainly today's reality of digital connectivity creating the conditions for it. Real-time covers all aspects of business and society, from product development and go-to-market to HR, decision making

and customer service. From a technology perspective we're talking about fast data, artificial intelligence and the algorithm economy, big data analytics, the cloud, mobility (with mobile being the driver of the real-time consumer) and more.

This results in faster and automated data exchange, better access to information and widespread adoption of RTE solutions, which should reduce process delays, save resources and transaction costs, increase organizational efficiency and business competitiveness, reduce bureaucracy in business, increase the speed and quality of decision-making processes, improve transparency, and stimulate economic and social innovation. In addition, a strong partnership, cross-border cooperation and interoperability will make it easier for companies to extend their business in the region and help increase export capacity.

There are multiple ways in which people, organizations, and countries can participate in the real-time economy. Real-time economy can be classified into the following 4 components:

- Real-time Society
- Real-time Innovation
- Real-Time Supply Chain
- The algorithm economy

THEME

The different components of real-time economy entail the following:

► Real-time society

There is an acceleration of almost every societal process, triggered by digitization. The digital society has become a real-time society, since smart, networked devices allow to permanently update the data base as well as the situation picture and to communicate relevant information to all participants – almost in real-time. In the real-time society process of planning and acting no longer take place sequentially, but rather simultaneously.

“The goal of real-time economy is to make life simpler.” -

Nordic Smart Government

► Real-time innovation

Real-Time Innovations has a proven product suite that enables hundreds of applications to securely share information in real time and work as one integrated system. Real-time innovation processes deal with ad hoc network collaboration for innovation in unplanned and unpredictable environments. Today, they represent a growing challenge for many industries and societal actors. Successful real-time innovation processes do not only require expert knowledge and strategic management expertise but do strongly rely on implicit and tacit knowledge and intuitive, entrepreneurial mindsets. Often, this mindset is not vital in industries and innovation management fails.

► The algorithm economy

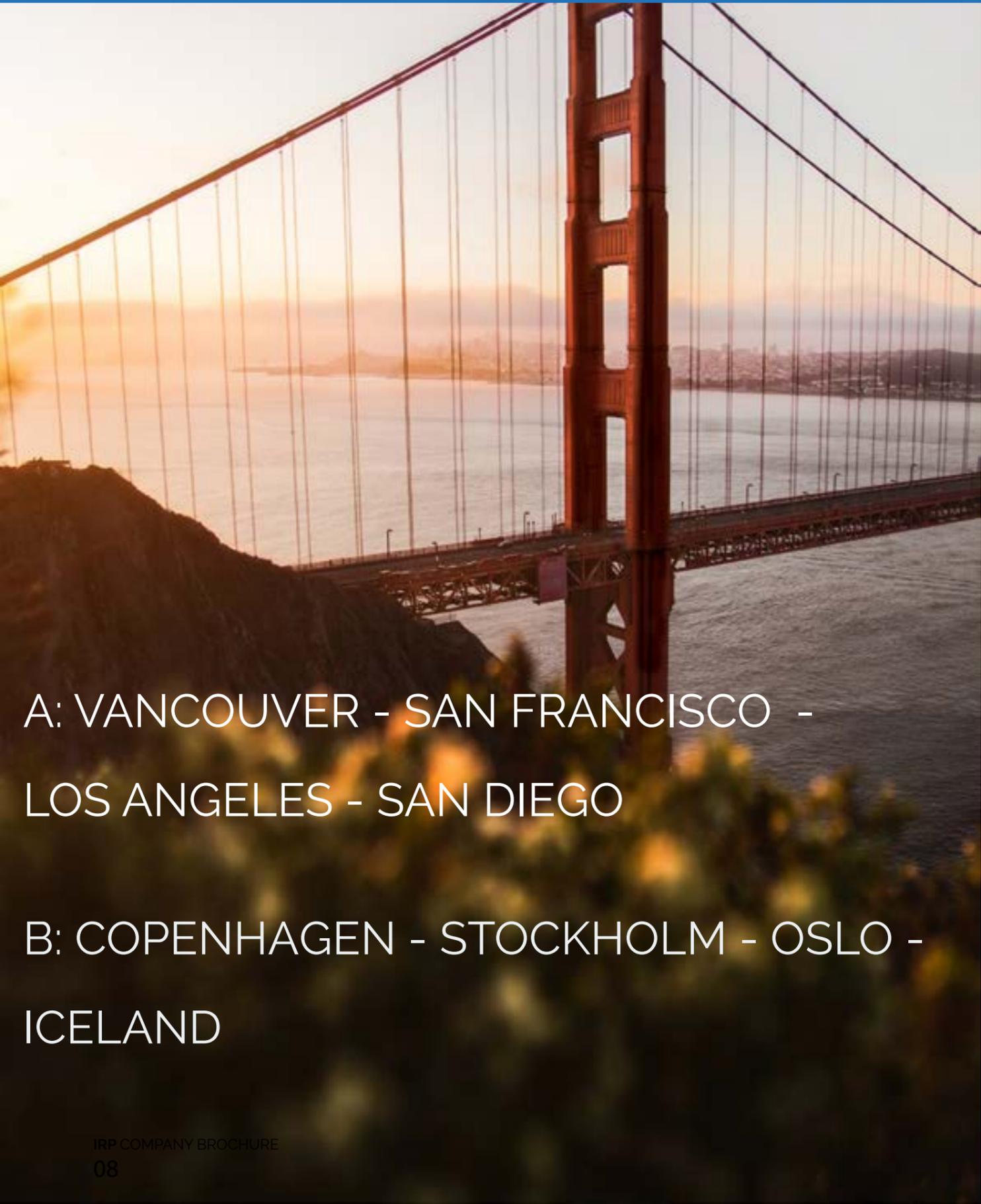
Algorithms are nothing new. But as information technology has developed, algorithms have become more affordable and thus almost ubiquitous. Algorithmic tools are quietly but persistently being implemented around the world. They are everywhere from law enforcement to healthcare, making decisions that influence our lives. The algorithm economy is an innovative movement where companies buy, sell or trade algorithms to create smarter apps.

► Real-time supply chain

The combined innovations in telecommunication and applications have allowed the emergence of real-time supply chains. The motivation behind the real-time supply chain is to let the supply chain serve the customer. In the real-time supply chain, all parties (e.g. warehouse, production factory and supplier) are informed in parallel after the customer submits the order. Due to integrated information systems and high-speed communication infrastructure, the inefficiencies will be addressed. The parallel access to the order data allows collaboration and coordination of supply chain activities: manufacturing and production systems will automatically trigger to inventories, and a prediction is made when the product can be ready. The direct communication goes beyond the focal company to suppliers for automatic reordering and possible alternative suppliers are contacted. The forecasts are adjusted immediately on the actual orders. The customer is provided with up-to-date information about the status of the order.



DESTINATION



A: VANCOUVER - SAN FRANCISCO -
LOS ANGELES - SAN DIEGO

B: COPENHAGEN - STOCKHOLM - OSLO -
ICELAND

INTERNATIONAL RESEARCH PROJECT 2022

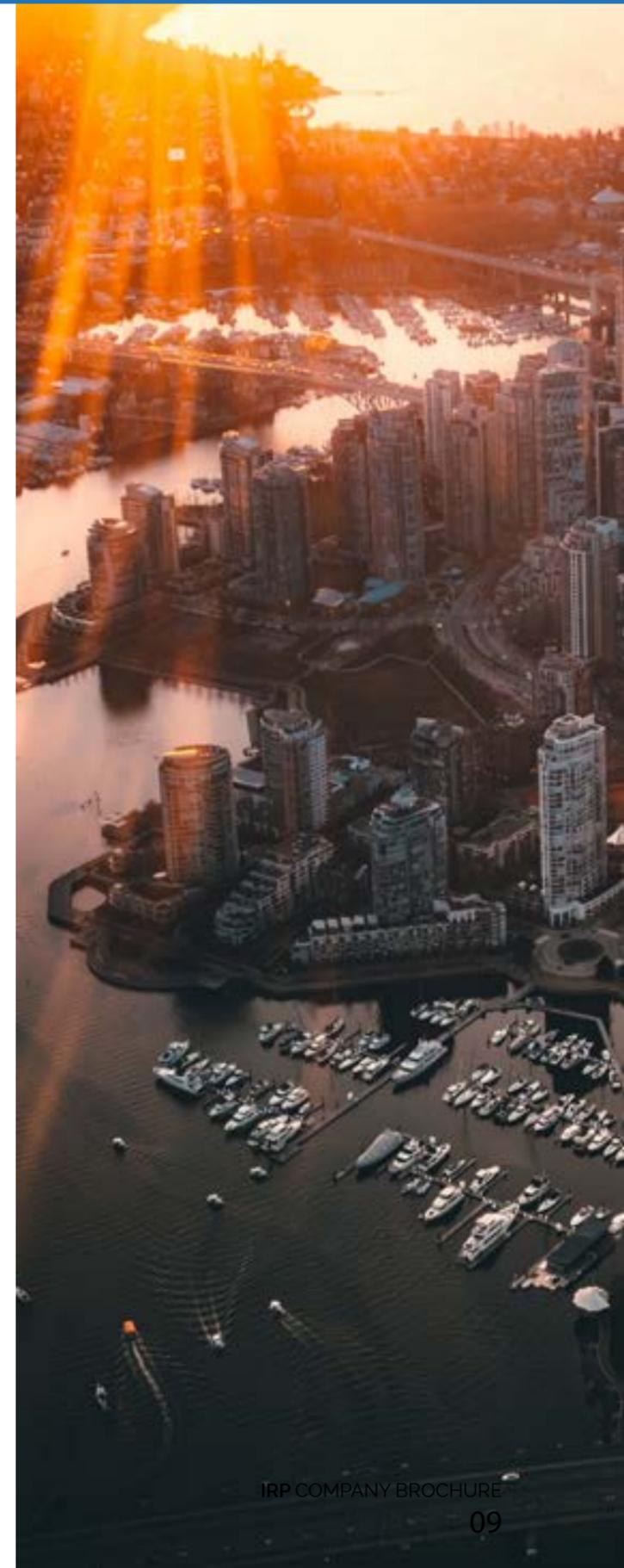
This year the International Research Project will head to Canada and the USA. The journey will commence in Canada in the city Vancouver. Thereafter, the trip will head to the sunny state of California. Our first visit in California is to the Golden City, San Francisco. After visiting San Francisco we will take a beautiful road trip along the coast to our next stop, Los Angeles. Lastly, after visiting the City of Angels, we will head to our final destination: San Diego.

However, due to the uncertain nature of COVID-19, a second trip is considered. If we are not able to travel outside of Europe the trip will head to the beautiful Scandinavia. The trip will start in Copenhagen. After that Stockholm and Oslo are visited, before flying to our final destination: Iceland.

During this study tour we will visit several companies that have a connection to the theme 'Real-time economy'. Furthermore, to get a more diverse impression of the local culture, we also intend to visit a number of universities and consulates.

The goal of the study tour is to observe and explore how the 'Real-time economy' evolves in these destinations. Each city is chosen based on its fascinating culture and interesting economy, companies and universities. The diverse nature of its activities (economy and culture) is what makes this study tour an enjoyable and educative journey.

Once this knowledge has been obtained we can use it to complement the research



PARTICIPATION

▶ The research projects are work assignments that will be executed by our participating students. The assignments will have a business-related framework and are carried out at companies that have something to do with the theme. With help of these research projects, the International Research Project 2022 will be financed.

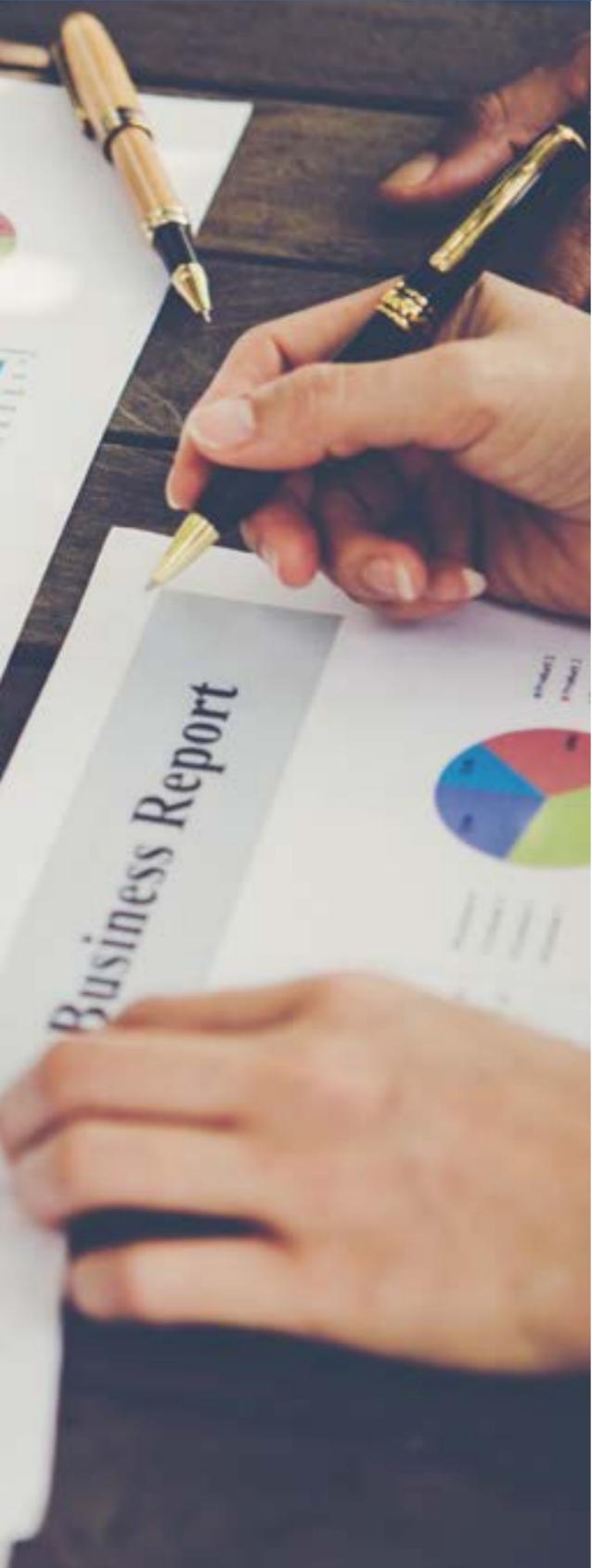
▶ Research projects can be carried out between November 2021 and June 2022. The students will work several hours a week on the project (the exact amount of time will be agreed upon later). When the project is too large for one student, it is possible to have more students working on one project. Each student is available for 100 hours per project, and the costs are € 3,000,- per student.

ADVANTAGES OF RESEARCH BY THE IRP

The top 5 reasons why your company should do a research assignment for the International Research Project 2022 are as follows:

- ▶ 100 Hours of research conducted by master students and supervised by experienced researchers of the department of Industrial Engineering & Innovation Sciences at Eindhoven University of Technology.
- ▶ A research project related to the theme is a good opportunity to become acquainted with a challenging business topic and the accompanying options for your organization.
- ▶ An invitation for a masterclass about several topics related to the theme. All participating companies and students will be invited (note: all participating students are selected based on study results and motivation, and belong to the best Industrial Engineering students).
- ▶ An invitation for the end-event where results of the study trip will be presented.
- ▶ Excellent company exposure opportunities through the website of Industria and social media.

RESEARCH EXAMPLES



Some research examples master students can do within a timeframe of 100 hours:

▶ **Business network analysis**

The complexity of the network of relationships in which the firm is embedded can be brought to the surface.

▶ **Benchmark analysis**

Comparison of the application of the intelligent automation concept to other companies.

▶ **Market research**

Investigation regarding the value of customer needs for your company.

▶ **Process improvement**

Identification of process improvement opportunities by conducting a scan of the process (e.g. identification of non-value adding activities).

▶ **Risk management**

Identification of the risks in your business environment.

Of course any other ideas for research projects within Industrial Engineering are welcome as well. Companies that recently have been involved in the IRP include for example Philips, Maastricht UMC, NS, Vanderlande and VodafoneZiggo. On the next page, some research examples are given.

In the past years, students who participated in the International Research Project did various research projects. Below some research examples are shown. Company names have not been listed due to privacy concerns.

▶ One company in the high-tech industry experienced troubles with their sales and operations tool, as employees have to write a report every month. The assignment was to design a tool that automatically checked and processed files. The monthly report can then be generated automatically.

▶ A chemical company had a need for a consistent sourcing model for plant maintenance stops ('turnarounds'). Their production plants are divers, as well as their requirements for outsourced services during, after, and in preparation for these stops. The assignment was to define the substantially different maintenance stop types. Secondly, the student developed a purchasing price model per maintenance stop type.

▶ A transportation company observed the information demand from its customers is increasing rapidly. At this moment the company is automating its information supply, in order to supply information to its clients more accurately and rapidly, like locations of trucks and expected delivery

times. The assignment started with a literature study to examine how other transportation companies inform their clients and how this information is useful internally. Furthermore, the company liked to develop a unique selling point in a few years and work more efficiently using their own data.

▶ A medical institute uses SAP system to store all kinds of parameters, like number of surgeries and average waiting times of clients. However, doctors find it difficult to extract these parameters from the system. The assignment was to discuss with different stakeholders and built a dashboard in Excel, which indicates the required parameters and is easy to use for all stakeholders.

CAPABILITIES

The students involved in this project are students of the Master's program 'Operations Management and Logistics', 'Innovation Management', 'Data Science and Entrepreneurship', or 'Manufacturing Systems Engineering'. All students have knowledge in Industrial Engineering, but also capabilities specific to their Master's program. These capabilities will be discussed on the next page.

The majority of the selected students completed their Bachelor of Industrial Engineering at Eindhoven University of Technology. Topics the students covered during their Bachelor's program include accounting, goods flow management, human performance management, stock control, organization science and information systems. The students of Industrial Engineering are focused on making improvements in companies and are ready to apply the methods and tools they have learned during their courses. The study program at Eindhoven University of Technology regularly involves group assignments. These group assignments enable students to train their analytical skills, their social skills and their presentation and cooperation skills.

OPERATIONS MANAGEMENT AND LOGISTICS

Operations Management & Logistics is a multidisciplinary field that covers such disciplines as supply chain management, manufacturing systems, information systems, business process management, human performance management, health care engineering, transportation, reliability engineering, maintenance, and operational finance. The program trains student in quantitative analyses. In all courses, the theory is related to existing research and students are shown how to apply theory in practice. For example, an alternative design of a control concept for a supply chain or a workflow process in an insurance company are investigated. They also learn how efficiency improvement or cost reduction can be obtained by advanced concepts.

INNOVATION MANAGEMENT

Innovation Management studies the management of innovation processes and develops theories, tools and techniques to make businesses more innovative. Key aspects of this discipline are knowledge management, strategic alliances, entrepreneurship, new product development, supplier partnerships, marketing management, quality management and technology management. Students learn how to use the knowledge that they gain in carrying out research into innovation management and in industrial applications. They also learn how to analyze the current innovative performance of a company, explain it in terms of quality, cost and time, and improve this performance by re-engineering innovation processes.

DATA SCIENCE AND ENTREPRENEURSHIP

The Master's program Data Science and Entrepreneurship is a joint master by Tilburg University and Eindhoven University of Technology. This program brings data science into effective use in business. Data science aims at deriving actionable insights from large amounts of data, such as theories and methods for data integration, data cleaning, data mining, process mining and business analytics. Entrepreneurial expertise of these students involves the successful development of new business models and entrepreneurial ventures by exploiting new algorithms, models, theories, tools, and project solutions including data entrepreneurship, defining business models, fueling creativity and fostering open innovation.

MANUFACTURING SYSTEMS ENGINEERING

Because of digitization and automation, the manufacturing industry is now rapidly changing. The whole chain of products, machines, factories, warehouses and customers, or the Internet of Things, is able to share and exchange information. To fully exploit this network of information for more effective and efficient production, the Manufacturing Systems Engineering Master program provides students with knowledge of the whole chain: from the technology inside the machine up to the level of supply chains. The program offers this combination of technological knowledge of high-tech production systems and knowledge of production processes and supply chains, and shows how to apply this knowledge effectively at both system and network level.

BOARD OF RECOMMENDATION

The IRP 2022 is supported by the following people:



Prof. dr. ir. F.P.T (Frank) Baaijens
Rector Magnificus
Eindhoven University of Technology



Prof. dr. ir. P.W.P.J. (Paul) Grefen
Research Director School of Industrial Engineering
Eindhoven University of Technology



Prof. dr. A.G. (Ton) de Kok
Innovation Director European Supply Chain Forum (ESCF)
Eindhoven University of Technology



Prof. dr. T. (Tom) van Woensel
Program Chair of the Bachelor Industrial Engineering
Eindhoven University of Technology



J.A. (John) Jorritsma
Mayor of Eindhoven
Municipality of Eindhoven



P. (Paul) van Nunen
Director of Brainport Eindhoven
Brainport Development



E. (Erik) van Wunnik
Director Product Development
DSV Solutions Nederland BV

ORGANIZATION

The following executive committee is responsible for the organization of the IRP 2022:



Gwen van Leeuwen
Chairman
chairman.irp@industria.tue.nl



Juul van der Vorst
Financial Manager
financial.irp@industria.tue.nl



Kobi Delahay
Coordinator Contract Research
contracting.irp@industria.tue.nl



Dave Delnoije
Coordinator External Relations & Program
external.irp@industria.tue.nl



Tim Kujstermans
Coordinator Culture, Accomodation & Transportation
c.a.t.irp@industria.tue.nl

CONTACT INFORMATION

Eindhoven University of Technology
P.O. box 513, Atlas 2.238
5600 MB Eindhoven

Phone: +31 (0)6 - 42567557
E-mail: contracting.irp@industria.tue.nl
Website: industria.tue.nl/irp



SSTI
Stichting StudyTour Industrie