2018 INTERNATIONAL RESEARCH PROJECT
INTRODUCTION

When I started with the International Research Project Committee in the summer of 2017, there were several things that I wanted to do and learn. I wanted to get in touch with companies and gain more experience in acquisition. I wanted to conduct a research project at a specific company that would provide me with valuable working experience. But most of all I wanted to organise an incredible three week experience for a group of enthusiastic students, which would be the journey of their lifetime. Together with four other students, I was really excited to achieve all these goals during our board year.

Looking back now, the only conclusion can be that we have succeeded to achieve all of this as a committee. First, the destinations for the trip needed to be selected. We made the challenging and exciting choice to go to Dubai, Shanghai and South Korea. This selection didn’t make it very hard to find an enthusiastic group of participating students to join us on our trajectory. By supporting us with different parts of the organisation, such as acquisition, journey planning and the organisation of a masterclass in March, everybody contributed actively. The participants deserve a big compliment for that.

I also would like to thank all our company contacts from the Netherlands as well as from Dubai, Shanghai and South Korea. The projects and the visits were really valuable for us. Furthermore, we want to thank our board of recommendation, our collaboration with study association Industria, and of course our supervisors, Mark van Someren and Sjors Jansen.

In this magazine you can find everything about the International Research Project 2018. Information about the projects in the Netherlands, our theme: ‘The New Work Future; A technology driven revolution.’

On behalf of Study Association Industria,
Jan Kleinlugtenbeld
Educational Officer

On behalf of the IRP-Board 2018,
Frank Hoepel
Chairman IRP 2018
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THE NEW WORK FUTURE
A TECHNOLOGY DRIVEN REVOLUTION

TEXT FRANK HOEPEL

The fourth industrial revolution is mainly driven by the upcoming robotization and automation of machines. Technology becomes more intelligent and drives companies towards new ways to deal with employment. It may seem as if humans are simply being replaced by machines, but the only thing that changes is the role of humans in the production process. Where machines take over some roles and jobs from humans, new jobs, knowledge and skills emerge that have to be filled in order to make this new cyber-physical system work. Humans will be more focused on the programming, calibrating and maintenance of automated processes. The changing work environment has its influence on many levels, which will be illustrated as follows.

Digitalisation vs human expertise
First, there is the ongoing discussion about whether it is more likely to automate processes, or to keep investing in human resources. Elements such as expertise, experience, costs and the nature of work play a huge part here. Secondly, digital platforms like Uber and Airbnb enable independent workers to offer their services online. This movement challenges conventional ideas about how and where work is undertaken.

Labour polarisation
As an effect, there is a growing polarisation on the labour market. Growing income differences, fear of unemployment and underemployment and different market opportunities between high- and low skilled jobs. New jobs are being born while others disappear. For example, there is a growing need for programmers and craftsmen, while jobs like accountant can be taken over by machines more and more. The way companies deal with that is an interesting thing to investigate.

Dark analytics
Big data enables us more and more to quantify theories and complex developments. This can be used to measure human performance as well. For example, cameras can nowadays monitor perfectly how employees work, which can be quantified in order to measure the effectivity of employees.

Labour flexibility
Another part of the new work future, is the growing trend of flexibility in many industries. Due to the expanding digital world, employees are no longer stuck to their desk at the office, but they are able to work from home. This trend is caused by the evolution of the internet, growing digitalisation and the ability of companies to innovate. The expectation is that this trend won't stagnate, due to the improvement of for example virtual reality.

Feminization & Migration
Besides the effects illustrated earlier, which are mainly technology and digitalisation, there is another more cultural side path of the new work future. Slowly, but significantly, more women make their way to the top of business. Due to differences in the way men and women think and act, this ‘female shift’ causes significant influence on the cultural aspects within companies. In the current work force around the world are women one of the largest pools of untapped labour. This is an important and interesting trend. Besides the feminization, the participation of migrated people in the labour market also has its influence on the way businesses work and cultural aspects within a company.

Behavioural operations management
There are more aspects than the ones illustrated above that has its influence on the future of work. First, there is the influence of human behaviour on operations management. The way people work influences the optimization processes in many industries. The cause of this is related to Human Performance, the results are related to optimization processes. The research that is done here shows a good collaboration between those research directions.

Technological change has reshaped the workplace continually over the past two centuries since the Industrial Revolution, but the speed with which automation technologies are developing today, and the scale at which they could disrupt the world of work, are largely without precedent. (McKinsey, 2017)
Here the full 100 hours of the project are spent on helping the company exactly how it wants to be aided. Also it is a great opportunity for the company to put itself in the spotlight among master students, the master class and end activity help to achieve this.

During the project, the student is monitored by me to make sure the project is finished before the actual trip. Furthermore, a teacher from the university can be asked for help by the student if the project does not go as planned.

When all of the above sounds interesting and you or your company would like to participate in the 2019 International Research Project, IRP is organised every year, please contact: contracting.irp@industria.tue.nl

The first part of the International Research Project is the research projects, conducted by the students at a company. My job during the board year was to organise the projects for the students and to monitor them. Before a project starts, the company and I design a project proposal. This proposal contains a problem statement, objective, method and planning. The duration of a project is 100 hours and it depends on the company whether the student works at their office or at the university.

During an orientation meeting with a company and two IRP board members, a problem(s) will be explained by the company. Example of such a problem or challenge can be standardisation of the customer support, improvement of the spare part link in a BI environment, literature study about the motives to implement blockchain.

After the orientation meeting, the first version of the project proposal is created by the board members of the IRP. The company then checks if the proposal satisfies their needs. If both parties agree with the proposal, a contract is drawn up to formalize the cooperation between the IRP and the company.

The project is very useful for both the student and the company. For the student it is an extra possibility to familiarise with working in a company and gaining experience in real-life problem solving. This is good for the student’s CV and as a bonus it helps to finance the fantastic IRP trip. For the company it is valuable because the project can be tailored exactly to the needs of the company. In a thesis situation the university always demands certain elements to be conducted and influences the project in ways that are not always ideal for the company.
AME develops and manufactures electronic products. All steps within their flow of products are monitored and managed with an ERP system from SAP. SAP consists of many modules that cooperate to cover the whole production process of a company. These modules are continuously developed by SAP to suit a higher diversity of processes. Within the warehousing process of AME, the SAP Warehouse Management (WM) module is currently used. It was my job to compare the WM module to the newly developed Extended WM (EWM) module of SAP and determine the best fit for AME.

SAP modules consist of many functionalities which can be turned on and off. This enables companies to adapt the module to their processes. Within the project, first all possible functionalities were determined and then the modules were compared to the processes within AME. Not all built-in functionalities were relevant for AME and some functionalities were missing in the current module. This lack in functionality has been customized by AME to fulfil the needs within the process. The Extended WM module, however, contains many more functionalities and can easily be adapted with its variable settings.

To determine which SAP module would be a better fit for AME, a lot of research was conducted on both modules. My knowledge on the AME warehouse processes, due to my previous working experience there, has helped a lot in the definition of the WM module and its correspondence to the AME processes. The EWM module was defined in comparison to the WM modules, since all WM functionalities were also included in the EWM module.

Eventually it was concluded that the EWM module would currently provide only a few improvements in the functionality. However, keeping the growth of AME into account, EWM will become more and more appropriate in the future. As a result, AME is currently investigating how to make the transition from the WM module to the EWM module and in what time span this is accomplishable.

AME extended warehouse management

PROJECT BY SANNE HENDRIKS

For me personally, I am excited that my work on the project has been recognised and that it is being used to make new steps in the processes within AME.

ATOS

BRINGING HUMAN BACK INTO THE CENTRE OF WORKPLACE INTERACTION

PROJECT BY SASKIA THUS

Atos is a big IT-company which specializes among others in high-tech transactional services, unified communications, cloud, big data and cybersecurity services. A field Atos is also active in, but not that famous for (anymore), is human performance. The project I conducted was in this specific field and focused on the employee experience of employees within a company.

Atos signaled as one of the first companies that the race towards digital transformation has led to a rapid change in the type of services companies deliver to their customers. The demand for more sophisticated, intuitive and easy-to-use solutions with immediate response times has increased. To answer to this need, companies are putting their customers at the heart of production innovation. However, in order for the customer to love the product, the employee should love it first. Therefore, Atos has identified the need for a high employee experience within organizations in order for them to accelerate their digital transformation, attract and retain talent and maintain a competitive advantage.

The project I did mainly focused on how to define the employee experience, what the KPIs are of employee experience and how to translate this into a substantiated earning model (the experience level agreement). I looked into research that was already conducted on this topic by IBM, a world leader in IT, and by Jacob Morgan, number two on the list of The Future of Work top 100 influencers. I could perform a lot of the research from home, but I received a lot of support from the leading edge team of Atos, developing an innovative digital workplace solution on employee experience. I had a meeting with them every other week, but I could call them whenever I had questions.

I really enjoyed the project and learned a lot about the employee experience and how important this is within an organization, something I never realized before. It is an honour to hear that Atos will publish a white paper in their name containing my research.
Berco develops and produces car carpets and truck components and is divided into two departments. Berco Truck Components is a leading supplier of sleeping and storage systems for the European truck manufacturers, such as: DAF, Mercedes and Scania. Berco produces with the help of several employees with disabilities (or how they prefer to call them; people with hidden talents).

DAF, one of the customers, produces the cabins of trucks in Westerlo, Belgium, after which they are transported to the Netherlands where the engines are developed, and the truck is completed. Berco delivers sleeping and storage systems for these cabins, which are produced in Schijndel. Currently, the truck components are transported to a warehouse in Westerlo, next to the factory of DAF. DAF is interested in a direct supply from Berco to DAF, so the warehouse in Westerlo can be cut from the supply chain.

My project was about this direct supply from Berco to DAF. The goal of the study was to see if it would be profitable to have direct supply, what are the challenges are and what consequences the direct supply would have, both for DAF and Berco. Both situations were analyzed, and a simulation experiment was conducted. In this experiment, several risks were investigated, such as the consequences of delay of transport, malfunctions of one of the two factories or strikes. This was of great importance, since with a direct supply there would be little room for inconveniences or stagnation. Furthermore, several scenarios were analyzed to see whether a direct supply would be profitable. If a direct supply would be implemented, both DAF and Berco need to change.

The result of the research project was that in the current situation a direct supply would not be profitable and there would be major risks if a direct supply is implemented.

I learned a lot during my time at Berco, especially since I had to take in mind the different interests of everybody involved in the project. The welcoming environment at Berco and the support of Harold and Tom were greatly appreciated.

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BSU
IMPROVING PROBLEM IDENTIFICATION AT THE SERVICE DESK

PROJECT BY KARLIJN CANJELS

BSU is a company that provides IT solutions for many different companies. At BSU a transition is being made from the old way of working, where IT-management and IT-services are being done ‘ad hoc’, towards a more standardized, automated way of working. Currently, they are in the middle of this transition, where one half of the customer orders are being tackled the old way, while the other half is being tackled by a more standardized procedure. Whenever clients have urgent problems like system failure or a breach, the service desk is contacted for help. BSU would like to know how they could help the employees at the service desk with this transition and how the high work pressure could be reduced.

During this project, the problems faced at the service desk were explored and recommendations were given for the redesign of the process to a more standardized way of working. This project started with investigating the problems in the service desk. This was done by speaking to different employees in the company. It could be concluded that the service desk employees used an ad-hoc approach to solve every single problem. Which means that every time they will start from scratch when searching for a solution.

Afterwards, solutions to these problems were suggested. One solution was to standardize the work, such that they do not have to start from scratch with each problem. A second improvement is to improve the way they get information from the client. For every problem they need a certain amount of information. A process was developed to get the information in a proper way, such that the employee can start tackling a problem with all the required information. These solutions were discussed with the stakeholders, and small refinements were made.

It was clear that an increase in automation of the service desk would decrease the high work pressure they currently face. A standard solution should be developed to get all needed information of a problem and a standard procedure should be developed to solve the different types of problems. This way the efficiency of the service desk can be improved.

DELA
IDENTIFYING AND MAPPING PROCESSES TO AUTOMATE SPECIFIC TASKS.

PROJECT BY STIJN VERPUTTEN

For the International Research Project 2018, one of the projects was conducted at the company Dela. Dela is a company in funeral services and funeral insurances, of which the headquarters are located in Eindhoven. The project was conducted for the funeral services department. Dela is curious if there are tasks within the supporting services of the funeral attendants which could be automated.

The project started with identifying high potential processes where tasks could be automated. These high potentials were identified and ranked by several employees of Dela. After which one process, the invoice handling process, was chosen to be investigated further. Dela has an automated invoice handling system, which scans, checks and pays the invoice automatically. However if some information on the invoice is incorrect or missing then the invoice will drop out of the system and needs manual help. All the tasks in this process are identified by doing interviews with employees and the complete process was mapped using BPMN 2.0. This complete process was evaluated and redesigned.

During the evaluation of the invoice handling process we noticed that the automated invoice handling system also could be used to scan, check and reclaim VAT amounts, which was still done manually. However the VAT reclaiming process for a funeral attendants is quite difficult. The reason for this is that several goods & services from funeral attendant are exempt from VAT and others are not. This makes it difficult to know which VAT amounts you can reclaim and which ones you are not allowed to reclaim. However the information about goods/service can be retrieved from the funeral file, where the funeral attendant indicates what kind of service it is. The result is an invoice handling process which also automatically scans, checks and indicates the amount of VAT that can be reclaimed.
Within DLL, a leasing company, it was believed that blockchain will change their business. However, they struggled with the persuasion of the senior management to invest in blockchain. Therefore, a group of blockchain believers asked me to investigate the possibilities of blockchain for DLL and the motives of other companies to implement blockchain.

I tried to contact several companies whether they were interested to talk with me. Only the Rabobank, the mother company of DLL, responded positively to my request. Rob and Marc, members of the Blockchain Group of the Rabobank, explained that I need to figure out how processes of DLL are influenced by blockchain. Since I had no other lead, I took their advice and focused totally on two financial products of DLL in combination with blockchain.

Around the same time, another student worked on a blockchain demo for DLL. I teamed up with him to maximize the outcome. I was responsible for the theoretical part and he was responsible for the demo. During the final presentation of our work, we convinced the CIO to further explore the possibilities of blockchain around asset awareness. Asset awareness was only one of the six benefits of using blockchain as a system behind leases. I also explained my view on how DLL could change their business model into a more sustainable one with blockchain. Everybody agreed on the changing business model, however, it was decided to first start small on blockchain before the world was captured.

Personally, this project was an eye opener for me. It was my first time working in a financial oriented company, which was sometimes challenging. Documentation was minimal and many employees gave me contradictive information. With some persistence and confidence, I continued to work on my report which was regularly checked by my supervisor. I am very pleased with the positive reactions of my study. This is typical for DLL, I think, because it is really friendly environment to work. In my opinion, this has to do with the fact that many employees are Brabanders.
RESEARCH PROJECTS

**Modelling IoT-aware Business Processes**

**PROJECT BY NADJA BROUNS**

The European Supply Chain Forum (ESCF) is the leading Operations and Supply Chain Competence Centre in Europe. It is therefore not an ordinary company, it strives to connect academia and business to exchange supply chain solutions and create maximum value for their business partners.

As the ESCF is always interested in innovative solutions in the area of Operations and Supply Chain Management, this project fitted perfectly with both the goals of the ESCF as well as the IRP theme. The Internet of Things is a disruptive technology that with its smart devices can change the future of work, in different areas. The logistics area was one of the focal points for IoT development, as it was expected to be very beneficiary here.

A lot of research has been conducted on the topic of IoT, however hardly any of it focused on the integration of IoT with business processes. Therefore, this research looked on the topic of IoT, its smart devices can change the future of work, in different areas. The logistics area was one of the focal points for IoT development, as it was expected to be very beneficiary here.

The next step was to conduct a thorough literature study on business process modelling languages, the Internet of Things concepts for business processes and IoT application domains. As a result of the literature research a state of the art report was written, structuring the different concepts necessary to model an IoT-aware business process. While constructing the state of the art report it became quite clear that there are still important concepts missing to enable the modelling of IoT-aware business processes.

Therefore, the next step focused on the creation of new concepts, such that time and location can be incorporated in IoT-aware business processes for example. When looking at a logistic process it is important that the smart lock of a container only opens at the end destination, such that nothing can happen to the freight in the meantime. This can be done using only IoT principles, however the location is of great importance and should be taken into consideration. Defining and clarifying the role of time and location will lead to a better and more complete way of modelling IoT-aware business processes. This will make the application of IoT in organizations easier and more accessible.

For me the biggest learning experience was to structure my research, such that the research gaps could be identified. Because of the limited research that was done on the subject, it was difficult to scope these research gaps and find solutions for the most relevant subjects.

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**Building an Online Communication Platform for Members**

**PROJECT BY SASKIA KEET**

The European Supply Chain Forum is powered by the Industrial Engineering and Innovation Sciences Department at the Eindhoven University of Technology (TU/e) and TIAS, the school for business and society. ESCF works with 30 leading global players, like ASML, Philips and DOW, sharing problems and insights related to supply chain management and has become an eco-system of multi-disciplinary professionals interested in operations and supply chain management. The access to talent, knowledge and network is the key advantage of ESCF.

Since the ESCF is not only an offline eco-system, having an online platform where members can interact is important. Before, offline interactions with additional communication via email or website existed. The focus is to connect talent, knowledge and network by providing a global, interactive platform for the members to exchange key supply chain and operations management solutions and best-in-class operating practices. The goal of the IRP project for ESCF is to design the website and the corresponding platform it should facilitate.

Designing a website is not a specific skill in Industrial Engineering. However, working in a team and being innovative is. In a team of two Industrial Engineering students and one ESCF High Tech Community (EHTC) we worked together on how the new website should look like and what should be published on it. Therefore it was important to understand the transition the ESCF is making.

Community building is not only about the technology, which of course makes it easier, but...
FEI
AUTOMATING THE ORDERING PROCESS FOR MISSING SPARE PARTS IN MICROSCOPES

PROJECT BY STAN VAN KLINK

For the Internal Research Project of 2018, FEI Company joined in and offered a student a project place at the Global Supply Chain department in Eindhoven. FEI Company, acquired by Thermo Fisher Scientific in 2016, produces electron microscopes. Under the flag of Thermo Fisher, the manufacturer now operates in the Materials & Structural Analysis division.

Microscopes which are sold, are installed at the customer location by a field support engineer originating from any of the three factories of FEI (Eindhoven, Brno or Hillsboro). When an issue is encountered during this installation, such as a missing or broken part, the engineer requests an ‘install part’. This request is then linked to the factory responsible for delivering this particular microscope. In order to gain insight into the install part requests made during the installation of microscopes, every factory has to maintain a log in Excel, which are combined into a monthly KPI report. Collecting the data locally, and then combining them into a global report, is troublesome, labor-intensive and very time consuming.

This opened up the opportunity to investigate the possibility of introducing a more automated reporting system for the install part requests. The goal of this project was therefore to investigate which data is necessary to create such an automatic KPI report, collect the actual data and create a dashboard.

During the first phase, several stakeholders of all factories were interviewed to understand the involved data, how it is collected and where it is stored. From here, phase two focused on finding the actual data in FEI’s databases and combining it to create a new database table containing all the necessary KPI data. Based on this, phase three was initiated, which involved creating the actual dashboard in FEI’s BI environment.

Finally, this resulted in a first version of an automatic monthly global report on the install part requests of FEI’s microscope install base, replacing the labor-intensive report.

For me, the project was a real challenge, which is immediately what I liked about it. I had to contact stakeholders from all over the world, learn the ins- and outs of the install part requests process, and combine this into a custom tool using SQL and PowerPivot. Learning these new skills, together with the great support of the department itself, made it a very nice experience.

ThermoFisher SCIENTIFIC

GEODIS
OPTIMIZING PACKING AREA FOR SUPPLY CHAIN OPERATOR

PROJECT BY MARJOLEIN DE BEEN

Geodis is a supply chain operator with different locations over the world. This project was performed at one of the locations near Venlo. This new location had one client and during the project another client was settled in the same warehouse. Geodis processes are all based on client wishes, a client has a contract with Geodis to outsource the warehousing for a ‘short’ time, mostly 3-5 years. In the project performed at Geodis, the packing process in one location is analyzed and optimized. This has evolved in a recommendation report for a new layout of the packing area and packing tables.

The client who used the part of the warehouse the project was taking place, has spare parts for worldwide delivery stored at Geodis. The parts all have different sizes and weights and are shipped in different combinations, varying from 1 by 1 pieces to more than 1000 pieces per shipment. Next to the variations in parcel size, most requested parcels come in during the day and cannot be forecasted, this brings another difficulty. The location was only operational for 10 months when the project started. This first period has been harder than expected, because of the low season during winter, there was time to revise the processes and improve them, this has been the aim of the project.

To get familiar with the process, I worked on orders together with the employees. This was a good way to experience difficulties. Next to that observations, interviews and timings were performed, which were used as input for the recommendations on the process procedures. Another part of the project was to see whether the packing area and tables could be improved themselves. In that part I searched for possibilities on the market what could also be useful for the packing area at Geodis.

I enjoyed working at Geodis, I felt very welcome. The people were willing to help and always open for questions. It was a nice experience to turn my knowledge into real solutions and improvements for a company. After I presented my recommendations, items were ordered to improve the packing area, partly according to my ideas.
HOLLANDER  
Transportation planning support

**PROJECT BY FRANK HOEPHEL**

Hollander Barendrecht, or just Hollander, is a logistics company from Barendrecht, specialized in the transportation of fruit and vegetable products between supplier and supermarket throughout the Netherlands. It is a subsidiary from the Greenery, which is an international sales company in fruit and vegetables. All the transportation is done from their headquarters at Barendrecht.

The project itself was about the planning of the drivers. The logistics market as a whole has a shortage in drivers currently. This creates the situation that many drivers work relatively long hours. This should be kept to a certain maximum as stated in the law and most of the time this works fine. In order to maintain this, Hollander would like to have a supporting tool to give more in-depth knowledge about the number of worked hours both on long and short term.

In order to come to this supporting tool, a few steps needed to be conducted in the first phase of the project. Interviews at different departments of Hollander were held in order to get more in-depth knowledge about the company itself, the current planning methodology and the time registration system. Besides, the laws itself needed to be analyzed for the specific requirements.

The second phase was mostly about creating the supporting tool. This took a long time, both learning about the programming language and translating the requirements and thoughts about the project into the tool.

The final version of the tool appeared to be both a useful help for the transportation planning department as a system providing more detailed insight in the long term planning for the management team. Therefore, the project has been quite a success. The fact that the final result of my project was not an abstract report, but a specific planning support tool which can be directly implemented at the department has been very satisfactory and a great motivation to work on the project. Personally, I have gained useful insight in the daily practices at a logistics company and the problems they are facing. Besides, I have improved my programming skills significantly which is very useful for the rest of my study and career. I am very pleased to have done this project here at Hollander.

MEDTRONIC  
Designing the ideal Patient Tracking System

**PROJECT BY THOMAS RELOU**

Medtronic, situated in Eindhoven, is a leading company in the field of medical technology, services and solutions. One more specific area of focus is on consulting and designing IT services in hospitals. It is this area that the research project for the IRP is conducted in.

Due to a global increase in the amount of available data many companies deliver track and trace to customers in order for them to follow their goods wherever they are. Medtronic want to investigate and enhance this new technology and apply it to patients. This is called a patient tracking system (PTS). It tracks the location and status of the patient in hospital processes, ideally also when a patient is transferred from one hospital to another.

First of all some desk research was done by investigating which patient tracking systems currently exist and what features are important for an ideal PTS according to Medtronic. Also there was some internal contact with Medtronic employees about their views on PTS and the possibilities. After the initial phase a series of interviews was planned with different key players in the current PTS market as well as with hospitals to get insight in their requirements when it comes to patient tracking systems.

Based on the interviews and the desk research a list of features and requirements was made to illustrate what a desirable PTS looks like. The whole project was eventually translated into a report as a form of documentation.

From this project I learned that working with third-parties on a project and requiring information from them is a difficult objective to achieve. Besides that I enjoyed to opportunity to get a taste of the company culture and atmosphere and I would like to thank Medtronic for this opportunity.
MEGABORN
DATA DRIVEN PERFORMANCE INDICATORS

PROJECT BY RIO GROOT

Megaborn is a consultancy agency that provides sustainable solutions for traffic, infrastructure and mobility. Megaborn combines knowledge in engineering and politics in order to help its customers with many different problems. Although Megaborn is a small to medium sized enterprise, it has offices in Waardenburg, Apeldoorn, Leiderdorp and Made. As their offices are spread across the country, the company is always close to its customers.

A few years ago, Megaborn introduced AFAS Profit as a business supporting information system. The company stores a lot of data in this system about its customers, projects and working hours of employees. Since Megaborn has the ambition to make the transition to a data driven company, it is essential to use the data to improve their operations.

The first goal of this International Research Project was to redesign the key performance indicators (KPIs) of Megaborn based on data in AFAS. Most KPIs were measured monthly or once per quartile, but the available data provided the opportunity to monitor the KPIs real-time. The second goal was related to visualizing the most relevant performance indicators in dashboards. AFAS already has a variety of built-in dashboards, which can be opened directly to check the KPIs. However, AFAS has a limited flexibility in modifying these dashboards to a specific business. As a result, multiple analyses are created in Excel and some VBA code is written to retrieve data directly from AFAS with macros. Megaborn can now measure a large part of its KPIs in clear dashboards. In addition, some useful recommendations were given to the company to further improve its processes.

I started this project in the beginning of February 2018. Although the project could be carried out from home, I preferred working at their office in Waardenburg. My desk was connected to the desk of my supervisor, so I had the possibility to frequently ask questions. This was truly beneficial for the execution of the project, which I already completed at the end of April of that year. I really liked working with data and creating valuable dashboards for Megaborn. Besides, it was interesting to conduct a project in a business to government (B2G) environment because the bachelor Industrial Engineering focusses on B2C and B2B.

MSXI
COMBINING CURRENT DATABASES FOR EASIER ACCESS AND BETTER OVERVIEW

PROJECT BY THOMAS VAN GAAL

MSX International (MSXI) is a business process outsourcing company with more than 6,000 employees providing technology-based services in more than 80 countries. Together with the Sewells Group, a wholly-owned subsidiary, MSXI is the world’s largest provider of retail solutions to automotive OEMs and their dealers. Together they create value by enhancing customer engagement, increasing brand market share, improving dealer and brand profitability, and improving employee productivity. MSXI’s Human Capital Management division, including wholly-owned subsidiary Geometric Results Inc. (GRI), is the world’s largest independent managed services provider. GRI maximizes the benefits of a contingent workforce on organizational performance by maintaining a conflict free position relative to staffing suppliers and technology platforms.

For one of the customers of MSXI a coaching trajectory was set up to improve the brand dealer’s warranty performance. During the trajectory several performance measurements were executed to evaluate the improvement of the dealer. The main goal of the project was to combine the individual dealer performance data to a central point to make it possible to calculate the overall performance of the coaching trajectory on national and European level.

At the beginning, it was a challenge to combine and clean the data. The individual dealer performance measurements were saved in over 300 files including duplicates and incomplete ones. It was important to import and restructure the data in a way that the performance calculations could be done. Building a hierarchy was important too, so the results could be traced back to national and individual dealer level. The second part of the project consisted of calculating the results on different levels and relating the coaching trajectory to the existing KPIs of the customer to evaluate the effectiveness of the coaching. It was a pleasure to work for MSXI and close together with Geert, which made it possible to provide the right data for the business and the customer.
Koninklijke Nedschroef Holding B.V. is a company headquartered in Helmond, the Netherlands. They are European leader in automotive fasteners. For over one hundred years the company is engaged in the development, manufacturing and supply of fasteners and special parts for the automotive industry. In the 21st century they have grown to 26 locations in 14 countries and around 2,000 employees. In May 2014 Nedschroef was bought by Shanghai Prime Machinery Group, however they maintained their company name and the HQ in Helmond.

The project for Nedschroef was an in-depth technological project focusing on the life-time expectancy of the shaker. The shaker is a component in the process of the head treatment of the fasteners. Here fasteners are heated for a certain time to increase their strength. The shaker is the device that helps to put the fasteners into the furnace, while spreading them evenly over the conveyor belt located in the furnace. The full oven and its components are inspected every 6 months. However, the shaker breaks down approximately every 3 months. Because the oven needs to be shut-down and cooled down for repairs, this leads to large costs. The aim of this project is to limit the down-times by altering the design.

First it had to be evaluated what aspect leads to the mechanical failure of the shaker. It seemed at first that the current system design fell well in the boundary conditions of the system, therefore it was concluded that there must be something else in place. Current literature shows the relation of temperature and maximal stresses for a large temperature range, but it is all for specific materials. The material used in the shaker was not found in literature, therefore no hard conclusions could be made.

The new design was focused on lowering stresses and lowering temperature, however no conclusions could be made on how long the material would hold under the new conditions.

Although challenging, I enjoyed working on the project at Nedschroef and developed a lot of my skills in the process.

Romijnders is an installation and service company for all kinds of installations which contribute to professional and private work and living comfort. With the main focus on central heating, Romijnders is an experienced and stable installation company operating throughout the whole country.

Currently a trend in the Dutch installation market is occurring for the private as well as the professional sector. This trend shows a shift from the supply of heating installations to the supply of a heating service. Supplying heat in the form of a service, bounded by an energy service contract, instead of a physical product is commonly done by an Energy Service Company (ESCo). This shift in needs got supported last year by new Dutch climate targets which say that in 2023 all office buildings larger than 100m2 must have an energy label C. This means that roughly the half of the office buildings in the Netherlands have to improve their energy label before 2023. This is a huge enlargement for the installation market since an energy label C can easily be obtained by relatively simple installation improvements.

Romijnders has the ambition to lead this market as an ESCo, but Romijnders does not have any knowledge of the ESCO market in the Netherlands and how to transform itself to an ESCo. For my project, I performed an explorative research to the external aspects of the Dutch ESCo market which apply to the transition of Romijnders to an ESCo. The research’s output contained an insight in all the financial and legal strengths, weaknesses, opportunities and threats for the Dutch ESCo market.

The thing I most liked is that this explorative research made me a small expert in a topic very unknown in the Netherlands. Performing a literature research on a topic which is very developed in many other countries is very educational and interesting. Romijnders made the project possible and provided perfect support which made it a nice experience!
I fully understood the concept First of all, it was important that to apply #payperuse to. and look for new product groups about the success of the concept a way to convince customers #payperuse. I had to find out printers. My project was about trucks, and tools, such as equipment, such as forklift implemented #payperuse on the product. TOPINC has already customer only pays when using with the supplier and the ownership of a product remains for the use of a product. The principle that you only pay #Payperuse is about the first implemented in 2015. #payperuse, which was One of these concepts is #payperuse, which was first implemented in 2015. #Payperuse is about the principle that you only pay for the use of a product. The ownership of a product remains with the supplier and the customer only pays when using the product. TOPINC has already implemented #payperuse on equipment, such as forklift trucks, and tools, such as printers. My project was about #payperuse. I had to find out a way to convince customers about the success of the concept and look for new product groups to apply #payperuse to.

First of all, it was important that I fully understood the concept #payperuse. Therefore, I visited several customers of TOPINC who already implemented #payperuse. I interviewed these customers and also the suppliers of forklifts and printers. Using the information gathered during the interviews, I investigated the advantages and disadvantages of #payperuse. These results gave me ideas about how to convince customers about the success of #payperuse. Furthermore, I examined the characteristics of products which are suitable for #payperuse using the insights gained from the interviews and some desk research. The advantages and disadvantages and the characteristics of suitable products lead to recommendations about how to convince customers. An important advantage of #payperuse is that customers don’t have to worry about their forklift fleet for example, because the supplier will provide enough products, so that the customer can fully focus on his real business. Additionally, it seems to be important to emphasize the advantages using current trends. One example is that #payperuse has the advantages of reuse and sharing of products. These advantages conform with the current trend to be sustainable.

I really enjoyed working together with the team of TOPINC. They really made me feel I was doing useful research and they taught me a lot about purchasing within a supply chain. They already used my recommendations in different offers to customers. Furthermore, the team listened to my arguments during meetings and used these to improve. Conducting the project within TOPINC gave me new insights about the need for a new circular economy and gave me the opportunity to see some interesting companies.

TOPINC supplies innovative supply chain solutions for the industry. With innovative concepts for selection, supply chain collaboration and agility, TOPINC strengthens the supply chain of the manufacturing industry. TOPINC is experienced in improving and managing the supply chain from supplier to customer. They have developed six concepts that can make the difference.

One of these concepts is #payperuse, which was first implemented in 2015. #Payperuse is about the own principle that you only pay for the use of a product. The ownership of a product remains with the supplier and the customer only pays when using the product. TOPINC has already implemented #payperuse on equipment, such as forklift trucks, and tools, such as printers. My project was about #payperuse. I had to find out a way to convince customers about the success of the concept and look for new product groups to apply #payperuse to.

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I enjoyed working for V.O. Patents and Trademarks and liked the fact that I was challenged every now and then with problems different from things I have done before during my study. I would like to thank the company for this opportunity.
INTRODUCTION OF THE IRP TRIP

Dubai, Shanghai, Busan, Ulsan and Seoul

TEXT THOMAS RELOU

After finishing all the research projects, the long-awaited trip of the International Research Project took place. Departing on the 7th of July and starting in Dubai, the three-week long trip offered many opportunities to not only visit many companies but also learn from them about different industrial engineering topics. The main topic of course being the theme of the IRP: the new work future. However, many other aspects of the broad field of industrial engineering were covered.

Regarding company visits, Dubai was the most warm-welcome we experienced during the entire trip. Not because of the heat in the desert but because of the openness of the companies that hosted our group. For example, at both Hira-Walraven, Patchi and Dubai Wholesale City the managing director of the facility hosted us and held a presentation. For the group of students that we are, this was a great honour and it really brought these company visits to a higher level. Besides having top-ranked presenters in each company and providing high quality information adjusted to industrial engineering interests, the UAE companies exceeded all expectations in terms of welcoming visiting students with gifts such as an elaborate lunch buffet or a richly filled goody bag. Contradictory to this impressive façade the differences in working conditions are high. Not much of the new-work future is visible for the majority of workers in Dubai, due to the cheap labour from eastern immigrants. Also, automation is next-to absent because manufacturing in an old-fashioned labour-intensive way is cheaper here.

China showed us a different company culture and view on the new work future. A fun fact about the company visits is that they all have a Dutch influence. Three companies are headquartered in the Eindhoven region (VDL, Philips and Vanderlande) and the last was the container terminal of the Shanghai Port, a visit that was set up by contacting the port of Rotterdam. The most interesting part about visiting Dutch companies is meeting people that are very similar to us, yet they work in Shanghai. At both Vanderlande and Philips we met a recent graduate from the industrial engineering faculty in Eindhoven. That shows that once you have finished your master program, almost anything is possible. For those of us who already had ambitions to work abroad after their graduation this was an excellent opportunity to ask questions.

Some aspects of the new work future were more visible in China than in Dubai, for example the port was fully automated and controlled in a single monitoring room overlooking the entire terminal; the newly built port therefore does not create a large number of jobs. The presentations at the other companies confirmed this, for example, a chart showed that more and more Chinese people start to work in the service sector rather than the industrial sector. We saw a similar shift in Europe a few years ago. Other aspects of the new work future like working more individually at flexible working locations including working from home, will likely be less visible in China due to leadership styles present. Philips prepared a compelling case for us where we learned that Chinese employees only work when they are specifically instructed to do something by their superior. Working independently is barely present in their culture.

The company visits in South-Korea were more formal than in the former countries. The Koreans planned everything precisely, and some companies even had a designated employee to give tours during visits like ours. That was the case at Doosan, which was interesting to see because it turned the visit into one big commercial as opposed to an explanatory get together with specialists in industrial engineering. Samsung had more international employees, which was very interesting because it provided a mixture of both a Korean-style tour through the Samsung museum and a European style openness in the shape of a meeting where we could ask various expats about their life in Korea. Samsung was the last company visit of the trip, but definitely one of the most impressive ones because of the size of its plant, resembling more of a city, with most of the employees residing on the company property, and because of the size of the brand and the number of high-tech products that we saw and tried.

Thanks to the openness and hospitality of the visited companies, we really saw lots of relevant things for industrial engineer students. Without this, we would have learned a lot less. Besides all the above-mentioned company visits, a lot of cultural activities were planned during the trip as well. Visiting three radically different countries in Asia also means there is a large variety in activities. From a desert safari to a temple visit in South Korea, and from a bike tour in Shanghai to a peek into the demilitarised zone near Seoul. In the next section of the magazine you can read the day-to-day experiences of the students during all the company visits and cultural and leisure activities.
TEXT SJORS JANSEN

A few years ago, as a student, I once missed a study trip because I didn’t pass the ECTS requirement by only one point. So if you’re asked to join a three week trip as a supervisor, it is more or less a no-brainer. Add to that three countries I never visited before and you can count me in.

And what a trip it was! The trip was really well organized. Of course we all want to make the most out of it, which results in a very tight schedule. I think I never visited so many different places in only three weeks.

TRAVELING EXPERIENCE

And why not right? Relaxing is something you can do at home. Of course, a schedule never works out as planned, but as a group we were able to adapt the schedule and last minute cancellations were replaced by last minute extra activities. For example attending the darts tournament in Shanghai, which was even broadcasted in The Netherlands, was great.

One of the most important parts of the study trip is of course visiting companies. Overall, these visits were of very high quality. Almost each company we visited had a Dutch connection, for example via a Dutch expat, a Dutch headquarters or a joint-venture with a Dutch company. Thanks to these connections, the company visits were well-structured and highly educational. We had many in-depth discussions, even about ‘delicate’ topics like the relation between North and South Korea. It probably also helped that for the people of these companies it wasn’t the first time to encounter our Dutch directness.

For us it was interesting to see the differences between these companies and the ones we experienced in the Netherlands. Sometimes differences are big: High cost of labour in the Netherlands require a high level of automation, while in other countries these costs are lower, which leads to different decisions. Sometimes differences are small: Also in Suzhou, China, Willem van der Leegte’s portrait is the first thing you see when you enter a building of the VDL company.

Besides the companies, we also visited 2 universities in Korea. As a researcher, I really enjoyed the seminar at the university of Busan. Many students presented interesting problems they are working on. Also, I got to share my research as well, which for most of the students from Eindhoven was also the first time they saw my work.

A highlight for me personally was the hike to Mount Gajisan in South Korea. Only a part of the group dared to beat this mountain. It was a tough hike, but eventually everyone in the group reached the top. Of course the view was breathtaking and worth the effort. And of course, we also managed to get back down together as well.

This trip was a unique experience for me and also for the students. This would not have been possible without the help of the companies, universities, expats, local guides and of course the organizing committee. Thank you very much!

TEXT MARK VAN SOMEREN

A friend and colleague of me joined the IRP study trip last year. After hearing all his exciting stories about the US and Mexico, I volunteered to join the IRP trip this year. The destination for the trip was the Middle-East and Asia.

We started our journey towards the East and arrived in Dubai first. The summer season in Dubai has day and night temperatures of at least 40 degrees. All tourists were gone and therefore, we were able to stay in large apartments for an affordable price. The majority of the hotels was unoccupied during our visit. However, since Dubai hosts the world exposition in 2020, more hotels and skyscrapers still have to be built before the expo starts. All expats told us they really appreciate the quick decision making in the business culture in Dubai. European countries could learn a lot from this quick decision making. China also has quick and efficient decision making, compared to the “polder model” from The Netherlands. Cycling through Shanghai was a good way to explore the city and it felt like being a real tourist.

During our trip, the FIFA world cup 2018 was hosted in Russia which was broadcasted worldwide. In every country we were confronted with our absence during the world cup. But on the other hand, it was amazing to see that many foreigners also wanted to see the Dutch national team participate in the world cup.

Next stop was South-Korea, where we travelled from Southern Korea to North Korea. The Korean peninsula was arranged to provide us with more insights about the relationship between North-Korea and South-Korea.

It was an amazing IRP trip and we learned a lot about other cultures! The IRP board organized an excellent trip together with all the students. I really enjoyed the variety between company visits and culture activities in the schedule.
Yes the international research project 2018 has started! It was clear that everybody did their homework and knew that the United Arab Emirates have a zero alcohol policy. Therefore, all the available organs were filled as much as possible with alcohol in the evening before. With positive mood and vibes the first obstacle had to be overcome, the NS intercity bus from Eindhoven to Den Bosch. Apparently the – always well prepared – NS hired a bus driver with the same sense of direction as a potato since he drove to the city centre of Rosmalen. The same goes for some over anxious parents who think Schiphol is located somewhere around Groningen and dropped their children an hour too early. Eventually everybody luckily arrived on time at the Schiphol plaza where we made a casual team picture for the PR and enjoyed a motivating briefing by Thomas.

It is 12:30 and well on time we started our hike to Gate G. Luckily Schiphol was quite empty and the Baggage Drop and security check were passed without any problem. After a quick chat with the security guy – who was quite interested in our purpose of the journey and how we could afford all the traveling – we were ready to board but we had an hour and a half left to do so. The group split up and enjoyed themselves with some quick shopping or Tour de France viewing. When arrived at the gate everybody mentioned the enormous Airbus A380 plane we had to fly with, a special occasion for the most of us! We arrived 6 hours later in Dubai with a well filled stomach with food and some last alcoholic beverages for the coming days. At the enormous airport of Dubai we were very curious about how the outside temperature actually felt. We can promise, it is hot! A well informed bus driver drove us in a fully filled minivan to the amazing hotel building where everybody instantaneously fell in sleep for the next day.
Dubai can be summarized in three words: hot, skyscrapers, and hot again. Today we would be going on a city tour through Dubai. We arranged a local guide and a bus driver that would take us to all the highlights and explain a little bit about the city. Our first stop is at the Dubai Marina. The Marina is packed with beautiful buildings and, when it is not that hot, it is possible to walk around Dubai Marina and have a drink or dinner in one of its various restaurants that are next to the walking area and canals. Our guide also explained that the big yachts were too big to enter the Marina area, so the owners needed to take the "smaller boats", which were still unaffordable for probably almost everyone in The Netherlands.

The second stop of the day was on the Palm Islands at the Atlantis hotel. A big and impressive hotel. After we made some quick pictures in the heat, we got on the bus again and travelled to our third destination of the day: a reconstructed Arabic market inside a hotel. The market was a representation of what an old market would look like in Dubai in the past. Now it was a place where there were a lot of fragrance shops and other typical tourist shops, and everything was fully airconditioned. From the market it is possible to see the only seven star hotel in the world: The Burj Al Arab, consisting only of suites, without any normal bedrooms for an overnight stay.

After our visit to the market it was time to go to the beach. The next stop was at a beautiful white beach with a beautiful view just near the Burj Al Arab. The sea was almost as warm as if you were taking a bath. After spending some time at the beach we went on the bus again and drove to the Dubai museum. Here we could see the life of the Bedouin before the oil was discovered. Interesting fact: the leaders of the Bedouin are from the same family as the sheiks of this era.

Proceeding the Dubai Museum was another market, which was more authentic than the market we went to earlier in the day. At the market there were various products, from spices to very expensive watches. Even though some of the shops were packed with many solid golden objects, security was almost absent. This is because punishments in Dubai are so severe no-one dares to attempt shop theft.

Another interesting fact about Dubai is their taxes. Before a couple of years ago, the people of the Emirate Dubai never heard of taxes. But the government needed to fund their goals for 2020, when the world expo will be held in Dubai. This was so expensive that they introduced a 5% tax, which is still peanuts compared to most of Europe. The last stop of the day was in one of the biggest malls in the world. A place where everything is possible: from buying ordinary clothes to skiing from the biggest indoor ski slope in the world, in Mall of the Emirates it is all possible.
DAY REPORTS

TEXT RIO GROOT

The alarm rang early this morning due to a company visit at Hira Walraven. The dress code for this visit was business casual, so it was the first day that everybody had to dress up decently. Surprisingly, everybody showed up on time for the briefing scheduled at 7:30. After the announcements some of us had to quickly search for their badge. The bus arrived around 7:45 and took us outside the city of Dubai. Where we initially doubted about the amount of sand in the country, we now figured out that it has loads of it. A 30-minute drive led us to Hira-Walraven, which is a joint venture between Hira from the UAE and Walraven from the Netherlands. The company operates in the building and construction industry and provides supporting parts such as pipe clamps and fixing rails. Mr. Khalid Khalifa welcomed us and explained that Hira sells high quality products. For instance, it is important to use rubber for preventing damage and noise. In addition, different standards should be met for products related to fire fighting. After the introduction we were allowed to take a look at sample products in the WOW box as well as various complete installations.

Subsequently, a tour was organized in their production hall. Supply chain, production and sales were addressed by different employees. At supply chain, we heard many familiar terms from our study Industrial Engineering. A large partition of their products are made-to-stock as they have a lot of fast movers. According to the explanation, their inventory policy seems to make sense as well. The production tour was interesting, although it was quite noisy and warm. The production hall appeared to be operating far from its capacity, but this is going to change in the future when new machines are installed. The contrast with the fancy office (where we could play darts) within the same building was substantial. The fact that the brand-new office had been opened in February obviously played a role.

Furthermore, a sales presentation was given in which we discussed the difference between indoor and outdoor sales. We also went upstairs to the other employees in the office. The lamps in the office were attached to their own Hira Walraven clamps. After that, two guys from the technical team gave a presentation about Building Information Modelling. They used a nice tool called Revit to visualize their products in an existing architectural design. We talked about one of their success stories. Hira currently does multiple projects for metro stations. However, it should be noted that the construction market is quite tough due to the relatively short time to complete projects. After a good lunch including traditional snacks we continued with a case about prefabrication and modular systems. Whereas prefabrication indicates that pipes are added at the site, a modular system already has the pipes assembled in the factory. Mr. Khalid Khalifa led the discussion and explained Hira’s plans related to selling modular systems. The company visit ended with a group picture on which each IRP participant wore a funny Hira Walraven cap.

Back at the hotel, we had 15 minutes to change ourselves and to get ready for the Dubai mall. We already heard stories about the size of the mall, but we were still amazed when we entered. Firstly, we saw a scale-model of the Creek Tower, which will be the highest tower in the world by the time it is finished in 2020. Secondly, an immense aquarium with sharks and beautiful other fishes took our attention. In smaller groups we could find an ice-skating court, theme park for kids and cinema in the mall.

Every participant had the opportunity to get some food in one of the many restaurants. We met at 21:00 at the huge pond to see the fountain show. The Burj Khalifa, reaching 829 meters, was located just besides the mall, so we took a lot of typical touristic pictures. The day ended with a taxi ride to the hotel. Only few people knew the name of the hotel (Suha), but we all got there. Although some groups accidentally selected an expensive Lexus taxi, everybody managed to get back to the apartments safely.
Our day started with a visit to the chocolate company Patchi. This is a large brand in the UAE, they see chocolate as: “something that can bring joy into people’s lives.” The visit started with an interesting presentation by their general manager, Aline Ashkarian, about the strategy of the company and they told about their strategy to keep customers loyal to their brand. They have chocolate for occasions throughout your whole life, from birth until marriage.

After the visit to Patchi, we went to the terrain of Dubai industrial park. In this park a lot of different companies are situated. The park is focused on medium and light industry and logistic sectors. In total 4 presentation were given.

The first one was about China Lesso Group Holdings Ltd. It is a manufacturer of materials related to building materials, such as plastic pipes and fittings. Their major focus is on developing countries, because there exists a higher need. They are now establishing a B2B online platform and they have plans for building up their own Lesso mall in Dubai.

The second presentation was given by the co-founder and general manager of the Dubai industrial park, Mr. Saud Abu Al Shawareb. He told us about the development of the park, which was established in 2004. Besides the lease of industrial land to the companies there are also commercial warehouses, labor villages and open yards. In the park different zones are separated, there are zones for machines & equipment, chemicals, food etc.. Currently, 69% of the land is occupied, and they are still growing really fast.

Then it was time for lunch, a nice buffet was prepared. We could choose between different types of meat and fish. The buffet was finished with a nice cake.

After the lunch, Jos van Lent told us about life in Dubai for a Dutch resident. He has lived abroad for almost 21 years. He discussed the differences and gave us some nice tips for working or studying abroad. In addition to this, Robert Schraven, alumnus from our university and the one who arranged all these visits, shared his experiences of working abroad.

Our last presentation was given by the CEO, Yasser Baaj. Dubox is a company, which builds houses using its prefabricated boxes. This makes the process more flexible, because it allows you to build different floors on the same time next to each other. This way the lead time can be decreased enormously. The most expensive part of this project is the design, because it is really important that they have the right design in the beginning. At the end of the presentation we went to the site to see some examples and the production of these houses.

In the evening we went to Sheikh Mohammed Cultural Centre University Dinner, where we could enjoy a traditional dinner. This centre is based in a traditional Arabic villa with a wind mill. Their motto is “Open Doors. Open Minds”, and has the goal to share the local culture and religion of the UAE with their visitors. During the dinner they told us about the Emirati culture. For example, the white traditional dresses are for the desert, where they protect them against sand storms. In the end the girls could try the traditional clothes, afterwards he explained more about the different type of dresses. The dinner was the end of a long, but exciting day.
And yet another early morning in the UAE. After breakfast, the entire group was waiting outside for our loyal, but tardy, bus driver. Leaving somewhat past 8:30, we were on our way to Emirates SkyCargo. We drove to the Dubai Cargo Village and passed behind some security checks. Once we sat down in the conference room, Bert Jorritsma started to portray his company. He started off with some general information regarding the entire Emirates Group. Emirates is one of the world’s fastest growing airlines and is based in Dubai.

A variety of different subsidiaries are part of the Emirates Group, for example; Emirates Holidays, Dnata, Emirates Flight Training Academy, Emirates SkyCargo, etc. After introducing the more general concept of Emirates, Bert directed his (and our) attention to Emirates SkyCargo and the available products/services. Furthermore, he introduced us to some of the details/specifications for preparation of cargo to be loaded in the airplanes, the PCHS for the storage for units ready to be loaded and the AS/RS (Automated Storage and Retrieval System) used for storing of loose shipments.

In addition, Bert told us about the second facility of SkyCargo located in Dubai: the Dubai World Central (DWC), which is located in a free zone. This location has a capacity of 850,000 tons, has 12 aircraft stands, 40 airside gates, 45 acceptance and delivery docks and 80 truck parking spaces. Finally, Bert placed special emphasis on one of their new products: Emirates SkyPharma. This service is dedicated exclusively to the timely and secure transport of temperature-sensitive pharmaceutical shipments.

After Bert’s presentation, we were invited to take a look at the business process and check the warehouse. We again passed multiple security checks and the acceptance docks before eventually entering the warehouse. The warehouse seemed quite empty considering the enormous volume transferred every week according to Bert’s presentation. Bert explains to us that the lion’s share of the cargo movements take place during the nighttime. He showed us around the facility, which is divided into multiple different areas. These areas are each dedicated for specific flow of cargo types. One part is designated for the pharmaceutical products, one for the perishable products offering temperature control, another part, the larger section is dedicated for general cargo.

Running a bit late on schedule, we only got a few minutes to prepare ourselves for the Desert Safari. After changing from our business casual outfit into more casual outfits, we stepped inside a handful of Toyota SUVs. During the ride one of the locals described the traffic control system which is based on AI technology. When drifting over several monstrous sand dunes our driver jokes about a scorched car bodywork lying in a ditch “That was me on my first day!”, he jokes.

We drove to a remote hangout in the desert where we had an Arabic barbeque, enjoyed some camel riding, and a belly-dance performance. The evening concluded with a fire-eater. After performing some astonishing moves, he dared members of the public to participate in his show. Which almost resulted in one of the male IRP members getting hit in the crotch with a fireball.
Day 6 has arrived, meaning the time has come to leave Dubai behind. Dreaming about the belly dancer and the Arabic barbeque of the previous night, the alarm went off after a few hours of sleep. After breakfast at 6 AM, we headed outside to catch our transfer to the airport. Around this time, the temperature outside was quite doable, luckily for us and our 20KG of luggage.

Arrived at the airport, we found the check-in desks to be fairly quiet. The group was divided into the correct sub-groups for the check-in procedure, and everybody seemed to think this would not take more than 5 minutes. We could not have been wrong more... The strict Chinese employees at the Dubai airport could not grasp the idea that we were planning to visit Shanghai for 6 days, without a visa. Every rulebook and colleague was consulted, but no one listened to our travel guide, Thomas, who tried to explain that we do not need a visa, as we would leave Shanghai within 6 days. After what felt like an eternity, the check-in employees were convinced we did our homework the past year and let us through. After this first adventure, a 9 hour flight was in prospect in the luxurious Emirates A388 aircraft. The entertainment system was set up to watch movies and a 10 mile high poker game was played.

Arrived at the gate, we were friendly welcomed by a shouting airport employee, who instructed us to ‘move along!’ to the fingerprint scanners where we would be added to the Chinese system. The arrival and proof of departure cards were filled in, after which we were taken to a remote hall of the arrival terminal. Here again several sheets of paper had to be filled in with personal information, after which we were allowed to enter China. After a short walk we stood outside, breathing Chinese air for the first time this trip. In the chaos of cars, busses and employees with whistles, our luggage was loaded into mini-vans, which headed to our hotel. Once arrived, our beds became our best friends where we applied for a well-deserved night of sleep.
Today we had quite a full program. As it was our first day in Shanghai we wanted to do a lot of things but wanted to minimize the culture shock a bit as well. Our morning therefore started off with a company visit to VDL ETG, a familiar company to most of us. After this visit we went back to the hotel to quickly change because tonight would be a really special night (at least for Jorg). We were going to visit the Shanghai Darts Masters! Which would star many of our heroes, among which: Mighty Michael van Gerwen.

In the morning we were picked up by a touring car that took us to the headquarters of VDL ETG China, in the neighboring city of Suzhou. After a drive of about an hour we arrived and were welcomed by a fellow Dutchman, Jurriaan Knobel, who had worked in Suzhou for 4 years. It was quite funny to see the whole lobby of the company full of pictures of Dutch people, Dutch landscapes and Dutch industry. For a moment, it felt like coming home even though we were on the other side of the world.

The day started off with a small lecture about VDL as a company and more specifically VDL ETG Suzhou. We learned that VDL is a company which attaches a lot of value to being and remaining a family run and family owned business. We also learned that VDL ETG used to be part of Philips but was acquired by VDL and turned into VDL ETG. After this introduction we went into the factory and most of us were surprised how high-tech it was. It was not really what we had expected a factory in China would look like, but it was a nice experience. After the tour through the factory we were very hungry, so luckily lunch was waiting for us inside. As a Dutch company they knew what we as Dutch students like: sandwiches! When we had finished our sandwiches we got some more presentations by other employees that shed some light on the supply chain operations and general global operations of the company. In the end we said goodbye to the people at VDL ETG with a group picture in front of their logo.

When we got back to the hotel we did not have a lot of time to spare, as we had to leave for the big evening event. And because it was quite far from our hotel, the way there would take us quite some time. After about 2 hours of traveling we finally arrived at the Pullman hotel, where the event would take place!

The night started off a bit different than we had expected. We expected the event to be like a darts event would be back home, but it was very different. Instead of a really big crowd sitting close to each other on wooden benches, it was like a fancy hotel banquet setup. And instead of people drinking beer and yelling, the crowd was like the crowd in a tennis stadium. So those things were kind of different, which made it a bit awkward in the beginning. But after a while we found out that they did not care if we created some atmosphere for ourselves. So that’s exactly what we did. In the end it even turned out that the cameras were pointed at us during almost all of the match! So after the games our friends and family could even see us on Dutch television. Finally, we also got to take a couple of nice photographs with our idols after which we all went home happy and satisfied.
JULY 14
Visit Zhujiajiao Water Town

TEXT MAARTEN MONHEMIES

After the late-night experience of the day before at the Shanghai Dart Masters, it was another early morning. At 8:30 our tour operator Sanne was waiting for us with a coach to bring us to Zhujiajiao Water Town. Sanne is a Dutch business woman living in Shanghai who helped us get around and show us the beautiful and fascinating sights that the Shanghai area has to offer. Zhujiajiao is a traditional Chinese village just an hour drive outside of the Shanghai city center. It was established about 1700 years ago, however there are archeological findings dating back over 5,000 years. The village is referred to by the Chinese as Venice of China, however Sanne warned us not to expect too much.

Arriving in the city we first had to pass a narrow street that gave no indication that we were about to enter a city with beautiful canals and picturesque buildings. The group was given enough time to explore the city until lunch time, and Sanne encouraged us to explore the narrow streets as well and taste the local food served all around town. One of the foods being served was so-called stinky tofu, which had such a stinging odour that you could smell it all around town. But there was also a large choice of food that was less daring and nauseating to try.

In the town there were besides the large number of bridges a couple of sights that could be visited. One of them being the Kezhi Garden, this was a garden built in 1912. The architecture of the garden is a combination of the traditional Chinese garden and the western garden, which is rarely found in China. After wandering the streets for a couple of hours, the group gathered at the main bridge of the city. From there on, our tour guide Sanne accompanied us to a local restaurant where local Chinese food was served. Many local dishes were ordered by Sanne in Chinese, some more popular in the group than others, they were put on turning tables on the middle of the table and everybody got a small plate for themselves. Every dish was shared with the group; hence all the dishes could be tried.

When everyone was finished with the elaborate dinner, the group set off on little boats over the canals. These boats were just like in Venice manually driven with punting sticks. In groups of six, we all experienced the city from the water, which was a very calming and relaxing experience on this extremely warm summer day.

When we disembarked from the boats, the group was given yet another opportunity to explore the parts of town that were not explored yet. Like the pharmacy, the large yellow Buddhist temple or the small museum about the history of post in the region. When all of the group had had the opportunity to see what they wanted to see, we all went back to the bus and the bus trip was made back to Shanghai city centre during the city’s rush hour.

In the evening we were brought to a little restaurant where dinner from the Yunnan province was served. Spread over two tables a total of 19 different dishes, not including rice, were served. Yunnan is a province located in the south of China, on the border with Myanmar and Vietnam. After the after-dinner dip caused by this delicious meal everyone went back to the hotel to explore the night-life that Shanghai has to offer.

The main club visited during the night was club M1nt, one of the most famous clubs of the city. The club is located on the 24th floor of a large office building, and well-known for its aquarium with sharks in it.
Tuesday, July 15th was the day of our big cycling tour through the city of Shanghai. We gathered around 10:00 AM in the lobby of our hotel. From there, we went to the Okuro Garden hotel by taxi where we started our city tour. Two locals introduced themselves as the guides for that day. They would bring us to all the different highlights, both famous and less famous. As soon as everybody had picked a bike, we started our tour around 11:00 AM, cycling through the busy streets of Shanghai.

After a bit of cycling through both the main roads and smaller local alleys, we came at our first stop: The Fuxing Park. It was a beautiful park, where local people gathered to relax and enjoy a bit of nature in the middle of one of the biggest urban areas in the world. Besides the regular relaxing, there were also many street artists, performing different skills such as singing and calligraphy. Local people were even dancing on the street. It was a very peaceful place to be. An excellent choice for our first stop!

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After we had some lunch at a local noodle café, we continued our journey through the town. Since Shanghai is an enormous city, the different highlights are really far away from each other. This meant we had to cycle quite a lot. But that was not so bad. Besides the fact that we got some nice exercise, we also got to interact with traffic in Shanghai, which is really chaotic from time to time. People walking on the street, cars driving at the wrong side of the road, scooters and other vehicles trying to pass each other the whole time: it was quite exciting to maneuver through all of that with a group of 26 cyclists.

Our guide brought us to a big local market in the middle of the city. Different from normal markets, it was not fish and vegetables that were sold there, but live animals. Turtles, fishes, cats, birds and a lot of very noisy crickets. They were all put in way too small cages, in which they were not able to move at all. It was a really strange experience. We continued our tour and took the ferry to get to the other side of the river flowing all through Shanghai. From there, we got a first glimpse of the famous skyline of Shanghai, including the famous Pearl Tower, the Shanghai Tower, the biggest tower of China and the second biggest tower in the world after the Burj Khalifa, and the Shanghai World Financial Centre, which is popularly called “The Bottle Opener” because it looks exactly like it.

Not only did we see the beautiful skyline from ground perspective, we also saw it from above. Our guide had arranged tickets for the Shanghai Tower, which gave us the opportunity to watch over Shanghai 632 meters above the ground: the highest observation deck in the world. In order to get to the deck, we had to take the elevator. This elevator is the fastest elevator in the world, reaching a maximum speed of 20.5 meter/second. Once at the top, the view was astonishing. You could see all over Shanghai. All the big buildings looked much smaller from such a perspective. It was visible that the river serves as the vein of the city, when you see all the container ships moving slowly over it. It was very impressive.

After an hour, we went back down and took our bikes back to the Okuro Garden Hotel, where we enjoyed a drink before we were brought to a restaurant to have dinner. This restaurant was one of the most recognized restaurants of China specialized in spicy food. Most of the food we got was delicious, although some of the dishes were way too spicy. All in all, it was a wonderful day.
This day started a little bit later than the others which gave us the opportunity to enjoy the luxurious nightlife of Shanghai the day before. The program started at 12 noon with a bus drive to the port of Shanghai. Due to some language difficulties, the bus driver had a different opinion about what the destination should be than we had. So after half an hour the bus stopped at a totally different place than the place we had planned to visit. Finally we explained that we would like to go to the Yangshan Deep-Water Port. The 2 hour journey continued in a drive style which could be inspired by Kamikaze. The port is situated on an Island which is connected to the main land by a 32.5 km long bridge, the longest cross-sea bridge in the world. The only purpose of the bridge is to make it able for trucks to get to the port and back. On the Island, we were invited to visit the control centre of the port which controlled the docks that needed human guidance. In the building also an exhibition about how the port was originated was situated. Before the port was built on the island the island functioned as a residence for fishers and their families. The employee who gave the tour told us that the original residents of the Island ‘moved’ to make place for the development of the container port around the year 2004. The port opened in 2005 and had a capacity of 2 Million TEU’s a year. Currently the Yangsan Deep-Water Port is responsible for 40% (16.5 Million TEU’s) of the total TEU’s handled by the Yangsan port. The port is still in development. New plans are made to flatten out a nearby island and build a train connection from the mainland to the island. The train station on the mainland is already finished. The stay at the control centre of the Yangsan deep-water port was very short due to the travel difficulties. At last we had a short stop at the top of the mountain on the island where we had a great view over the port.

After taking some pictures we continued the journey back to the city centre of Shanghai where we went to a typical ‘Hot-pot’ restaurant. The concept is to boil the meat and vegetables in a hot pot which is filled with some kind of broth. It was a great closing of the day. It was also the last day of ‘Shanghai Sanne’ (our guide in Shanghai) to be with us in Shanghai. So after dinner we said goodbye and thanked her for her excellent effort to make our visit to Shanghai a great and memorable experience.
This day we visited two companies in the centre of Shanghai. We started with a visit to Vanderlande. To get there, the group was split into the public transport teams again and with those teams everyone went by metro and by foot to Vanderlande. Unfortunately, the weather was 33 degrees outside and therefore everyone was sweaty when entering the building of Vanderlande. Luckily, inside the temperature was better.

The company visit to Vanderlande started with a presentation by the HR manager of the office in Shanghai, Joyce Du. This presentation was followed by Linda Brands, a sales engineer, who told us a little more about her function within Vanderlande and why she moved to Shanghai for two years. She also showed a short movie about a warehousing project as well as an airport project she worked on in the last years. The rest of the morning was filled with more presentations from people working in the Shanghai office, but all had also worked in the Veghel office before. The question asked was what all of them experienced to be the biggest difference between working in the Netherlands and in Shanghai. The employees indicated that Dutch people tend to plan meetings weeks in advance, where Chinese people still change their schedules during the day and therefore don’t like to plan so far upfront. When working in Shanghai you must be flexible. Another difference was the way of communicating. Dutch people make a lot of small talk before bringing the actual subject of the conversation to the table, where Chinese people start the conversation by bringing the subject to the table immediately.

The morning was closed off with a short movie about a fully automated warehouse of the Albert Heijn in Zaandam, which was designed and implemented by Vanderlande. The movie was really impressive and of course very applicable to our study.

In the afternoon a visit was planned to the office of Philips in Shanghai. Again, the presentation was given by Thomas Prevoo, who had studied Innovation Management at the TU/e and joined the IRP nine years ago. He started the afternoon with a movie about the health department within Philips. Philips is mostly oriented on homecare and medical technologies in hospitals. After the presentation, the group was split into six teams in which a case had to be solved. Within each team, a leader was pointed out, and a leadership style was given to this leader. These styles were either the Dutch style, the Chinese style or a style by their own choice. The Dutch leadership style focuses more on consensus where the Chinese style focuses more on a single leader. Afterwards, a few groups presented their solution to the case and their view on the leadership style within their team. There wasn’t really a relation between the solutions of the different teams and the leadership style they picked, but many groups indicated that the leadership style worked well for their group.

The day was ended with a tour on a boat over the Huangpu river in Shanghai. On the boat we had a beautiful view on the skyline of Shanghai. When entering, we were a little nervous about the number of people that were waiting because we were the last people in line and scared there would be no room left. However, most Chinese people stayed on the lower levels of the boat, which left plenty of room to make pictures of everyone on the top deck. After the boat trip, some people went to bar Rouge to drink a beer before going back, where other people went back straight away and packed their bags to leave the next day.
This day could be categorized as a classic transfer day. However, it was not boring at all. We first took the subway to Longroad station, which is one of the two stations for the Mag lev train. The Mag lev train is a high-speed train between downtown Shanghai and Shanghai airport. Unfortunately, the train reached only 300 km/h during our ride due to speed limitations caused by noise production. The maximum speed of the Mag lev train usually is 420 km/h and a trip takes about 8 minutes, so we got quickly to the airport. Once we arrived at the airport, we played cards and one of the supervisors lost every round, which was of course really funny! The flight to Busan took only 80 minutes after which we picked up the rental cars. In the evening, the group had some free time for dinner and to relax. I went for a Korean barbeque with four other guys which was absolutely awesome. A Korean barbeque is a mix between gourmet and barbeque. If you ever have an opportunity to eat a Korean barbeque, you should do it!

Looking back at our stay in Shanghai, we noticed several things: Shanghai (and China) focuses mainly on Chinese tourists. Everybody uses WeChat and Alipay to chat, pay, order a cab and play games. Many people in China do not carry cash anymore. Every store has their own QR code for customers, even the local pet shop. It is a nice system and one of the good things about China. On the other hand, many Chinese can not speak English and do not like foreigners. Since we had no WeChat, we could not order a cab and on the streets the taxi drivers sometimes ignored us because of our ethnicity. In general, Shanghai is changed from a traditional Chinese city to an international city with great potential for big companies. It will take many years before foreign tourists will see Shanghai as a holiday destination.
On day 13 of the trip the planning consisted of a visit to the university of Busan and a company visit to Doosan Heavy Industries & Construction. This meant that we would have a busy day, so we had to get up relatively early. We already noticed that the Korean summer can be very hot, so we knew at forehand that it would be a sweaty day with our business casual dress code. After the breakfast the participants of the IRP divided over the cars we rented the day before. After a drive of around 10 kilometers we arrived at the university. The drive to the university gave a good impression of what the city of Busan looked like. Today was only our second day in Korea, so we did not see a lot of the country.

When we arrived at the university of Busan we had a warm welcome by Chanseok Park, a professor at the local industrial engineering department, with drinks, sweets and biscuits. After that we got some general information about the university itself, followed by presentations by Korean students. After the Korean presentations there were presentations from our side. Directly, it stood out in the Korean presentations that they pay a lot of attention to hierarchy and who their supervisor is. Every presentation stated which department someone worked for, who their supervisor was and what contributions their supervisor had made in his career to literature. This was something very different from what we are used to in terms of presentation. Dutch presentations usually start with a very short introduction about the presenter and after that the main topic of the presentation starts right away. Nonetheless, the presentations were very interesting covering the subjects of efficient loading and unloading of container vessels and statistics. Our presentations covered information about our university, the IRP projects, the study trip and the findings of the research of our supervising PhD student. Next, the faculty organized a lunch for us in the form of pizzas. The lunch was followed by a group picture and a tour over the campus of the university of Busan. The tour over the campus was probably the most difficult part of the day due to the hot weather. After that we got back in our cars to drive for an hour to Doosan Heavy Industries & Construction.

The hour drive to Doosan was again a very good opportunity to get a view of the beautiful Korean landscape. Just before we arrived at Doosan we drove by an amazing piece of architecture in the form of a huge bridge. When we arrived at Doosan we first had to find the right building on the enormous manufacturing site. After we found the right building we had some time to look at models of the products of Doosan. Doosan builds all sorts of energy plants from wind turbines to nuclear plants. Next, we had a presentation of the corporate structure of the company and site. Then we had a tour over the manufacturing site. Here we visited a workshop where they were welding huge blocks of steel and a workshop where they were assembling a turbine for an energy plant. During the tour we had a lot of opportunities to ask how the process was working. After the tour we stepped again in our cars and returned to the hotel.

In the evening we went for dinner at a traditional Korean restaurant, where we tried all sorts of Korean food and Korean rice wine. After dinner we decided to go for a drink in a bar in the Seomyeon district of Busan. In short we can conclude that it was a very long, but successful day of the study trip.
JULY 20
Hike at Igidae Park and relaxing at the beach

TEXT SASKIA KEET

The weekend came early in Busan. After a day full of listening, it was time for some recreation. What a lot of people don’t know is that South-Korea has really beautiful nature. To explore this nature we went on a little hike to Igidae Park. The nature was breath-taking and the view on the city was stunning. Our hike consisted mostly of an interesting coastal path made up of lots of different narrow sections and metal bridges, with a beautiful view on Busan. Despite the beauty of the park, the history of the park is more serious. When the Japanese invaded Joseon in the late 16th century, they conquered Suyeongseong Fortress and held a feast to celebrate their victory at a high, open spot that commanded pleasant scenery. Two Korean gisaeng (female professional entertainers) were taken to the feast. They seized a drunken Japanese commander and jumped into the sea as a reprisal against the Japanese invasion of their homeland. Thus, the name Igidae, which means two gisaeng, was given to this place.

After experiencing the heat at the Park, we looked for some cooling at Haeundae Beach, the most famous beach of Busan. If I say beach, I don’t mean swimming. Even though Korea is a peninsula, almost none of the Koreans can swim. Going over the line to go in the deep is really not tolerated by the lifeguards. Everyone needed the rest and enjoyed the sunbathing and the sea. Sunburned and satisfied the group left the beach to the hotel.

After this relaxing day we dined at a traditional Korean BBQ restaurant. Korean BBQ means a lot of meat at a BBQ in the middle of the table, which we would call a gourmet. When the meat is done, it will be folded up in a lettuce leaf with a couple of side dishes like Kimchi, which is Chinese cabbage in a Korean marinade including ginger, garlic, fish sauce and chili pepper. After this traditional diner, it was time for some drinks at our favorite hotspot, the ‘Thursday Party’ once again.

Fun fact: just like the Dutch say ‘cheese’ when making a picture, the Koreans say ‘kimchi’.
Saturday the 21st was another day filled with cultural activities. We drove to Gamcheon Cultural Village, which is known for its small streets and colourful, mostly blue painted houses. The village is located on a mountain, which results in a beautiful view from the many viewpoints in the village. The village has been restored to attract more tourists, which we immediately noted because of all the little tourist shops. We mainly wandered around the village, enjoyed the views, bought some souvenirs for home and took some lovely pictures of the houses. The weather was still beautiful, although a bit hot, so the way back up the hill was exhausting. Some of us still had to get used to the hot and humid weather, which resulted in red and sweaty faces and the birth of Stan’s nickname ‘Gieter’ (watering can). Because of his exceptional volume of sweat, it is possible to water plants just by holding him, hence the nickname.

After the visit to Gamcheon Cultural Village we visited the Jagalchi Fishmarket, the largest seafood market of Busan. On the first floor of the market there were many different shops, selling live fish, crabs and other seafood. When one would buy a fish at one of the stores, one could let the fish be prepared on the second floor as a meal, which some of us tried. We tried for example San-Nakji, which consists of raw octopus arms. The octopus is killed and cut into small pieces and then served with some seasoning, but there is still nerve activity in the octopus’ tentacles, which results in moving pieces whilst being served. Not everybody enjoyed the seafood, some just went off to a bakery, because of the very strange dishes. At the end of the day, we had some free time for dinner, and afterwards we went to the Thursday Party again for some drinks and had a nice and fun evening there.
JULY 22
FREE TIME: HIKING, SIGHTSEEING OR A DAY AT THE SPA

TEXT NADJA BROUNS

For today there was no fixed program that all the participants had to follow. Instead, there were several options to choose from and everyone could choose his or her best fit. At the end of the day we would all meet again in the lobby of the hotel, so we could travel to our next destination: Ulsan.

First of all there was the opportunity to do a workout and go for a hike in the beautiful mountains surrounding Bulsan, also known as the Yeongnam Alps. The group left early in the morning around 7:30, which was not easy for everyone, however they did manage to leave on time. After a strenuous hike the top at 1241 meters was reached and there was time to enjoy the breathtaking view. It turned out that the hike took a bit longer than expected and they had to hurry, to get back to the hotel in time.

Another part of the group decided to explore the Korean culture on a whole different level and took a spa day. This turned out to be a bit of a different from a Dutch spa. First of all the men and women were separated from each other in the bathing and sauna areas. The only place where they were allowed to stay together was the restaurant and relaxing area. In this mixed gender area, everyone had to wear both pants and a t-shirt, which was a bit unusual and definitely a different experience. Even though we already experienced the heat and humidity in both Dubai and Shanghai the spa surpassed both. Nevertheless, it was very relaxing and welcome after the busy days in Shanghai.

The last group decided to see a bit more of the city Busan and went on a stroll through the city. One of the stops was the Busan 'Walk of Fame' which was established because of the Busan International Film Festival. Furthermore, the Busan tower was visited for a nice view of the city.

Early in the evening we took the train to our new destination Ulsan. Once arrived in the hotel, we gathered for a drink in the hotel bar. However, the hike had been quite exhausting so many went to bed early.
In the morning we had an extraordinary breakfast. Unfortunately, we couldn’t start the day with everyone because some had fallen ill.

The plan was to visit Hyundai Motors and Hyundai Heavy Industries. Unfortunately, both of the company visits were cancelled. Hyundai Motors was cancelled because most of their production line was completely secured and not opened for visitors. Therefore, there was very little to see. Hyundai Heavy Industries was cancelled because of strikes, their production process was completely shut down. However, an alternative program was organized. The trip would go to an historical city named Gyeongju where we could see many temples, museums and more.

The day started by travelling in a Korean Party Bus which was equipped with many disco lights and a decent subwoofer. When we arrived everybody was awake and we started off by visiting an old temple. The temple was made in typical traditional Korean architecture and with traditional Korean colours, which is mostly a special type of green resembling turquoise. There was the possibility to buy a lantern that would be attached to the temple. When buying such a lamp you make sure that you live in good health and happiness. Unfortunately, we didn’t buy one and are still exposed to uncertainty. The thousands and thousands of lanterns however did give an amazing effect.

The next stop was at another part of the cultural city, which was only a 15 minute drive. There was a lake on which you could jet ski, wakeboard or float around in a water cycle. Unfortunately, everything was closed and there was no option other than continue to the next stop. At the next stop lunch was planned. After the lunch you could go to all the museums which were mainly about the religion and culture of the dynasties reigning Gyeongju in the past. The museums had many different statues, stone vases and other artefacts. There was also the possibility to walk around the park with some well persevered palace walls and gardens. While making the walk there were a lot of signs making you aware of the snakes, something you wouldn’t see in The Netherlands.

In the evening we had some spare time which gave us the opportunity to visit a steak house. Everybody was more than satisfied with decent pieces of meat, and perhaps most of all, eating with a knife and fork. After we had dinner we moved back to the hotel lobby in which we enjoyed the beer which was at a 60% discount because of the hotel’s anniversary. Many of us didn’t take the maximum profit and went to bed after 1 or 2 beers, since the next day we would move to Seoul early in the morning.
Day Reports

JULY 24
Travelling to Seoul and exploring the city

In the morning, we traveled from Ulsan to Seoul by train. This train is called the KTX, standing for Korea Train Express, and is part of South Korea’s high-speed rail system, which travels from Ulsan to Seoul in about 2 hours. Arrived in Seoul, we went to our last hotel of the IRP trip and dropped our luggage.

After that, a visit to the Gyeongbokgung Palace was planned. This was the main royal palace of the Joseon dynasty and was built in 1395. It is the largest palace of the five grand palaces built by the Joseon dynasty and served as the home of Kings of the Joseon dynasty, the Kings’ household as well as the government of Joseon. Unfortunately, the palace was closed on Tuesdays, so we only visited the National Palace Museum of Korea. This museum houses a magnificent collection of art and archival materials representing the over 500-year long history from the Joseon dynasty to the Korean Empire. The museum collects, studies, preserves, and presents the art and culture of the Joseon royal and the Korean imperial courts through research, conservation, exhibitions, and educational programs. The museum also showed the history, structure and adornments of the five palaces. Furthermore, a collection of royal costumes and porcelains can be seen in the museum. Originally, the plan was to walk around the palace in original Korean costumes called Han Bok, just like many of the Korean girls do. Because of the hot and sweaty weather, it was decided not to dress like traditional Korean people in the Joseon dynasty.

After dinner, we went to a show called the Cookin’ Nanta. This show has been one of the most popular shows in Korea ever since it premiered in October 1997, drawing the largest number of spectators in Korean theatre history. The show is situated in a kitchen. Knives and other kitchen utensils are transformed into musical instruments in the hands of the performers. The show starts with washing vegetables, carrying meat loafs, setting fire, the daily routine of chefs at NANTA kitchen. Then, the unpleasant manager brings his incompetent nephew and lets him work as a chef. The manager leaves with a harsh order that the chefs have to prepare a wedding reception, which was not a part of the chefs’ schedule. None of the chefs are happy with the situation, but they begin to solve a whole array of difficulties with laughter and humor. During the show, we were entertained with acrobatic cooking, a surprise wedding ceremony, and a dumpling challenge. The last two were assisted by people out of the audience. As example, one of the chefs was stuck in a garbage bin and Saskia Keet was asked to help him. Of course, Saskia couldn’t help him, which was really funny. The highlight of the show was the drum sequence where the chefs beat on drums.
This was the day of the big hop-on hop-off experience! It was a day full of traditional markets, century old palaces and beautiful views from up above.

The first stop of the bus-tour through the city was Changdeokgung Palace, with as its primary sight, the secret garden. When we arrived, we were told that the tour would start within minutes on the other side of the palace. Maarten was so enthusiastic that he ran ahead and luckily we were just in time to join the tour through the secret garden. The garden was a place where the Korean king would withdraw himself and enjoy the water lilies from a boat that would float on the pond. The peninsula pond was the second pond we encountered in the garden, it had received its name due to its shape which is similar to the South-Korean perimeter. There was a lot to see in the garden and it was a nice first stop of the tour. Everybody was free to take the bus-tour at their own, which eventually led to the group being split in half. Coincidentally both halves made approximately the same stops.

On our way to Hanok village we stopped at the Namdaemun Market. This market sells almost everything, from food to clothes to souvenirs. After a short walk we arrived at Hanok village, which represents the old style of Korea with some houses, a pavilion, and a traditional garden. This village was formed only in 1998 and is a collection of the buildings restored from the Joseon era.

The destination of our city tour was at the N-Seoul Tower, where the two groups met again. The N-Seoul tower is located on a hill in the middle of the city, therefore providing a wonderful view. The tower also provides the location for couples to immortalise their love with locks to a gate. This time not on a bridge like in Paris, but on a platform next to the N-Seoul Tower. We hope we have not ruined any relationships by opening the locks of couples that were too lazy to change the number combination from 000 to anything else, but of course we helped them by changing it for them afterwards. The love for the IRP ‘18 trip has also been immortalised on the platform forever!

Lastly, this day was also the day of the famous hotel rooftop party! Karsten and Aswin were the organisers of this amazing event and provided cooling boxes and music to get the party started which made a perfect ending of the day!
On the 26th of July, the last company visit of our study tour was planned. A visit to the most famous Korean company worldwide known as Samsung. The Samsung Group is South Korea's largest business conglomerate, in Korean called a chaebol. Samsung Group produces almost 20% of South Korea's total export. This chaebol is split in four business groups: Samsung Heavy Industries, Samsung Engineering, Samsung C&T and Samsung Electronics. We were invited to visit Samsung Electronics.

Samsung Electronics consists of five divisions, namely: Digital Media, Telecommunication Network, Digital Appliance, Semiconductors, LDC. Since our hotel is in Seoul, but the Headquarters of Samsung Electronics located in Samsung Digital city in Suwon, approximately 30 km south of Seoul, a pick-up at our hotel was arranged.

The Samsung team welcomed us at the Samsung Innovation Museum. First a presentation was given about the history of Samsung, their products, mission and vision and the campus. Afterwards, we got an overview over Digital City from the roof terrace. On the campus housing, healthcare, restaurants and sports are facilitated for Samsung employees, as well as schools for children of the employees. After the presentation we had the opportunity to talk to employees of different departments. We could ask questions to the expats about their work at Samsung and life in South Korea. The employees came from India, France and The Netherlands, none of them were Koreans, so they recognized our astonishments about the Korean way of living. After a short lunchbreak, in which we enjoyed the small restaurants and shops on campus, we had a tour in the Samsung Innovation Museum.

In the Innovation Museum the development in technology is shown in a very interesting and interactive way. From the development of the radio to the display and from phone to smartphone. All aspects of Samsung Digital Electronics are visualized and shown. In the end there was a sort of playground in which all products could be used. From the newest televisions and smartphones, to vacuum cleaners and an Internet of Things fridge.

After the Samsung Innovation Museum, our guide took us to the Suwon Hwaseong Fortress, this fortress was recommended to visit by our contact person at Samsung. Suwon Hwaseong Fortress is a structure build in the Joseon Dynasty, from 1794 until 1796. The fortress consists of a 5.5km long wall, a variety of military facilities and four gates. Although the fortress was built in the Joseon Dynasty, on the first day of the Korean war on 25 June 1950 the facilities were heavily damaged. Currently not every part damaged that day is restored yet. We walked over a part of the fortress wall with our guide. It gave a nice view from an old part of the town over the modern part. Because of the temperature it was quite a tough walk, in the middle of the day in the sun. So, after a while the group was split. One part went for a shorter route to the market, in direction of the restaurant and the other part went up a hill, for another part of the fortress. Some of us had some spare time at Hwaseong Market, while the others were still walking. At the end of the afternoon we met each other to have dinner. The guide brought us to a restaurant near Hwaseong Market where we enjoyed a meal of fried chicken and beer.
On the 27th of July all participants teamed up in their blue shirts one last time to conduct two visits. The first visit of the day was a visit to the Dutch embassy, and the second visit of the day to KAIST business school. The visits were relatively short in comparison to most of the other visits during the IRP but they were surprisingly interesting nevertheless.

The embassy of the Netherlands in Seoul has around twenty Dutch expats to organize all political and economic relations with South Korea. One of them, Peter Wijlhuizen, welcomed us with a thorough presentation about Korean history, culture and current situation. For many of us, Korea has been the most different and most ungraspable country visited during the IRP but they were surprisingly interesting nevertheless.

The second half of the day consisted of a visit to KAIST business school as mentioned. After a metro-ride and a walk to the campus, we arrived in their air-conditioned restaurant where we enjoyed a Korean lunch. Bulgogi, a typical Korean dish was a popular choice, as well as the fried-chicken. Afterwards everyone tried an iced-coffee, a very popular drink among students in Korea, but a little too bitter compared to hot coffee for most of us. There was a chance to get to know the Korean students and their field of study. Many of the students that joined us for lunch already started their PhD degree, and only some of the students actually researched topics that are similar to the Industrial Engineering we know, most had more finance oriented topics.

Nevertheless it was interesting to compare the Korean and Dutch university system and talk about life as a student in Seoul. The afternoon was finished off with a lecture by KAIST professor Bowon Kim on the Korean history and economic and political system. Although this resembles the embassy visit a lot, it was still very interesting. The professor told us many new things and showed us a lot of new views, with an added touch of humor.

The evening was our very last in Seoul together, because everyone heading for the Philippines would leave on the evening afterwards. This meant one last drink with all of us together, to end a wonderful three weeks and to celebrate Saskia’s birthday, who turned 23 at midnight.
This is the last day of our trip, the journey is almost over. But before we say goodbye to each other and leave Korea there is still one place we must visit, namely the Demilitarized zone (DMZ). The DMZ is the border between South and North Korea, which was temporarily created in 1953 until a peace settlement would be achieved. However this peace settlement has never been achieved and North and South Korea are still in a cease-fire. To learn more about the Korean War and what the cause is of such a long conflict between two nations, we went on a trip to the border.

During the one hour drive we already noticed several signs of war: look-out posts, meters long barbed wire and big concrete construction against tanks. After going through the first of the many passport checks we arrived at the Advance camp, which houses the United Nations Command Security Battalion. In this camp we got an official briefing in the JSA Visitor Centre on how to behave in the Joint Security Area (JSA), which is the only place where South and North Korean forces actually stand face-to-face. You might know the place from the television or from the James Bond movie: Die Another Day.

After the tour guide was 100 percent sure we understood the safety rules and confident enough no crazy things were going to happen we finally went to the JSA. After another passport check we arrived in perhaps the best known place of Korea. The South Korean soldier told use for one last time that we only were allowed to take pictures towards North-Korea and at his command. After everyone had the time to make a picture we were allowed to go in the Mac Conference Room, the blue houses where most of the military meetings between the two countries take place). In the Mac Conference Room you could cross the border and set foot on North Korean territory. After just a few minutes we were asked to follow the soldier in lines of two back to the bus.

There was a bit of a relief when entering the bus and we headed back to visit the final destination of the tour, which was the bridge of no return. The bridge that South Koreans could use to go to North Korea in the past, but with consequence that they could never go back to the south. None of us was willing to do so and therefore we left the DMZ.

After this adventure we went back into South Korea to eat some lunch with special rice grown in the DMZ. In my honest opinion it tasted the same as any other kind of rice, but still it was delicious. After the lunch it was already time to head back to the hotel and pack our bags before leaving Korea. All in all this might be one of the more interesting and scariest moments of the IRP to be in a place of so much conflict and history.
CONCLUSION

The International Research Project consisted of many different parts to get a better view of the New Work Future. Through robotics and automation, everybody will experience a changing future whether it is because of a changing work environment, feminization or changing work teams. The New Work Future will influence everybody. Through the masterclass, research projects, and finally the study trip we got a better understanding of the impact of the changing work future.

The masterclass gave us different views on these changes; what is the view of researchers, companies and independent research organizations on these changes? Besides these views, they provided us with interesting insights and differences between theoretical research and real life. Finally, TNO provided us with insights on how theoretical research applies to real life, and how companies and researchers can work together and benefit from each other.

Through the research projects, each student executed a project at a company in the Netherlands. Comparing these company projects, it is clear that each company is in different phases and working on different aspects of the New Work Future. Knowing how the changing work future influences coworkers can help to sustain a healthy work environment and happy workplace. It is interesting to see how such different companies react to similar changes.

The last part was, of course, the study trip to Dubai, Shanghai, and South Korea, which all have an entirely different working culture and view on the New Work Future. For example, in Dubai, collaborations in the building industry were improved by using integral systems with which all involved companies could work to design a new building. From architects to companies who support pipe systems, all could work together at the same time on the same building. Another great example is prefab houses — a company in the dessert builds prefab parts of a building as boxes. This method significantly decreases the time to build an entire building since they built several floors at the same time. All these boxes are later put together to create the finished building. That is certainly a change in work since instead of building at the construction site the majority of the workload is done elsewhere. It might also increase safety and other work conditions since the construction site can be designed in the most beneficial way possible since many buildings can use the technique. At one of the company visits in Shanghai, we learned more about internationalization, another aspect of the new work future. Through a case study, we tried to work with cultural difference, especially differences in leadership style. We, Dutch people, are known for our compromises and flat leadership style, while other countries might experience a more authoritarian leadership style. Internationalization will lead to a mix of work cultures, and it is essential to recognize the differences. Besides these differences, we also learned more about working and living abroad at an international company and what it is like to work with people from different backgrounds. We also learned more about Korea and Koreans in particular at the Dutch embassy and why you should or shouldn’t go work abroad.

All these visits had the same goal, preparing us for our future. Whether we learned more about working abroad, cultural differences, gained more practical insights about the change in working, or figured out at what type of company you would or wouldn’t like to work for, we all learned a lot from the trip. Besides these visits, of course, we also had time to engage in cultural activities. These ranged from a jeep safari in Dubai, the Shanghai Dart Masters with of course Michael van Gerwen, a visit to the demilitarized zone between North and South Korea, to a bike tour through Shanghai. Luckily, we Dutch people know how to cycle, since traffic in Shanghai can be extremely chaotic.

Looking back, all I can say is that this was the best trip of my life. However, none of this would have been possible without all the support we got. We want to thank all the participating companies in the Netherlands, all the companies we visited abroad, our contact abroad for the help in arranging all the cultural activities, the supervisors from our university and of course all the participants for making this trip so successful. We hope you enjoyed and learned as much from the International Research Project as we did.

Best regards,

On behalf of the IRP Board 2018,

Renate Maresch
Coordinator External Relations & Program