



4TU.Centre for Engineering Education



Future Engineering in Asia
Honours Research
11-20 July 2017 | Tokyo

Tour Report 2017

TU Delft Delft University of Technology

TU/e Technische Universiteit Eindhoven University of Technology

UNIVERSITY OF TWENTE.

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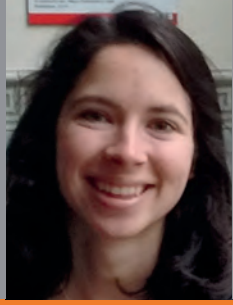
4TU. CENTRE FOR
ENGINEERING EDUCATION



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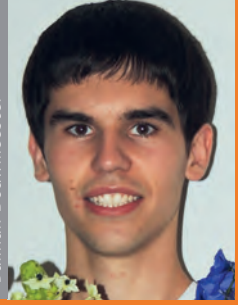
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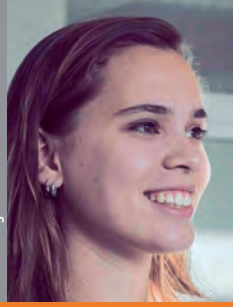
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Introduction

Dear reader, in front of you lies the final report of the Honours Tokyo Tour 2017, containing the research reports and all the adventures and memories of this amazing trip. On the 11th of July 2017, twenty honours students from TU Delft left for Japan. The goal: to gain insight in the academic and professional world of engineering in Japan. The students visited Tokyo, the capital of this beautiful country, and the biggest city in the world.

For this tour, we set up a research plan with Aldert Kamp, Director of Education of the TU Delft Faculty of Aerospace Engineering, project leader for the 4TU.Centre for Engineering Education and Council Member of the worldwide CDIO initiative. In his book 'Engineering education in a rapidly changing world', Aldert Kamp provides a lens through which the reader can reflect on the future of engineering and its potential impact on engineering education. Kamp discovered that, over the past two decades, engineering education in the west hasn't kept up with the rapidly changing world we live in. But does the same apply to Asia? To make a small start in figuring this out, we wanted to identify if this problem is relevant in Japan. The aim was to get an overview of (1) what technical companies are looking for in today's engineers and (2) how technical universities look at their engineering education and how they want to improve it.

To carry out our explorative research in Tokyo, we divided the group of students in five subgroups of four. Each group took on one of five aspects the future world of engineering should focus on more. The first one is **BIG DATA ANALYSIS**, which is becoming increasingly important. The five largest companies in the world all have access to enormous amounts of big data, the right analysis of which can lead to increased revenue, for example through targeted internet advertising. A **GLOBAL MINDSET** is becoming another key feature. In an increasingly interconnected world, more and more nationalities with different cultural backgrounds are working together. **INTERDISCIPLINARY SYSTEMS THINKING** is critical also. As Aldert Kamp explains in the 'Interdisciplinary and Systems Thinking' chapter of his book, today's engineers can no longer simply oversee or guide engineering projects. They require leadership skills as well. **INTRAPRENEURSHIP** stands for taking initiative and being creative within a large company, both important skills for future leaders. And lastly, there is **PERSONAL LEADERSHIP**. It requires initiative and creativity to choose the career path that leads to a future that is best for you.

We visited various cutting-edge companies and non-profit organisations in Tokyo, all within or connected to the field of engineering. Our aim was to conduct thirty-minute interviews during each visit, although this did not always happen.

We hope that this final report will provide you with some insight into the future of engineering education in Japan. We also hope that you will experience some of the joy and happiness we felt during this amazing journey.

The Honours Tour Committee 2017

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List of participants

The following students participated in the Honours Tokyo Tour 2017

Name	Year of Study	Discipline
Aleksandar Petrov	3rd BSc	Aerospace Engineering
Bruis van Vlijmen	3rd BSc	Mechanical Engineering
Carolien Arensman	1st MSc	Systems Engineering, Policy Analysis and Management
Christian Sabater Campomanes	2nd MSc	Aerospace Engineering - Flight Performance and Propulsion
Damian Bouwmeester	3rd BSc	Engineering Physics
Dominique van Cuilenborg	2nd BSc	Computer Engineering
Elise Groen	3rd BSc	Engineering Physics
Frank van der Klift	2nd MSc	Material Science and Engineering
Gabriele Kockelkoren	3rd BSc	Nanobiology
Jamie Ongkiehong	3rd BSc	Industrial Design
Kristian Blom	3rd BSc	Nanobiology
Laura Arkesteijn	2nd BSc	Industrial Design
Mees Poppe	3rd BSc	Civil Engineering
Roline Montijn	3rd BSc	Civil Engineering
Sander Leussink	1st MSc	Engineering and Policy Analysis
Sanne Beckers	2nd MSc	Architecture, Urbanism and Building Science
Simon Verkleij	2nd BSc	Electrical Engineering
Kasper Spoelstra	1st MSc	Nanobiology
Willemijn van der Elst	3rd BSc	Technology, Policy & Management
Yi Jun Feng	3rd BSc	Electrical Engineering

An aerial photograph of a city, likely Tokyo, showing a wide river (the Arakawa River) flowing through a dense urban area. A large bridge spans the river, and the city is filled with numerous buildings and structures. The sky is clear and blue.

Research reports

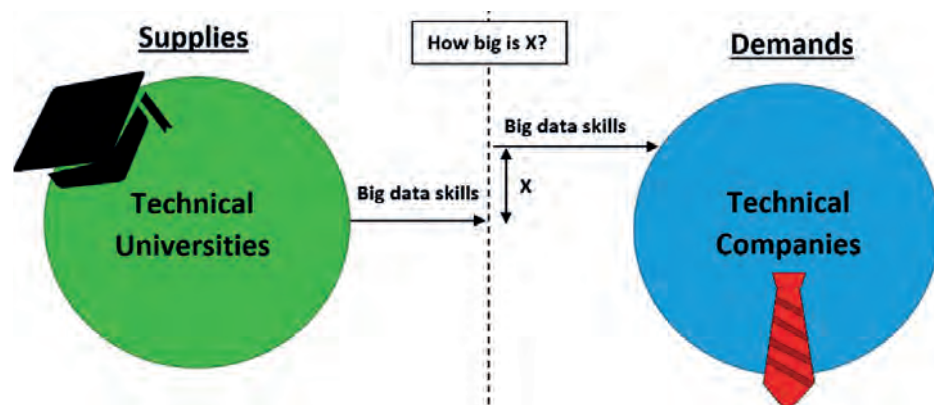
A decorative graphic consisting of three horizontal bars, with the top two being orange and the bottom one being white, located on the right side of the page.

Big data analysis

*By Christian Sabater Campomanes, Mees Poppe,
Dominique van Cuilenborg, and Kristian Blom*

Big data analysis is the process of examining large and varied data sets to uncover hidden patterns, unknown correlations, market trends, customer preferences and other useful information. The analysis of big data mainly involves analytical methods, analytical architecture, and software used for mining and analysis. Big data analysis has exploded in the past two decades, and it continues to expand. Companies are therefore in need of employees with a varied skill set in this field. The question is whether technical universities are aware of the importance of big data analytics, and whether they offer the appropriate courses for students to acquire these skills. In this report we present a gap analysis where we compare the supply of skills within the field of big data analytics that students acquire at technical universities with the demands of companies by answering the following question:

Does the supply of skills within the field of big data at technical universities meet the demand of (technical) companies in Japan?



In this chapter we present the results from interviews with different institutes/companies. Since our sample size was small, we were not able to produce any quantitative results, nor can we say that our results are reliable enough to draw conclusions for a wider range of companies and universities. Please note that the results do not include all companies that we visited during the tour, since some of them had absolutely no relation with (big) data analysis.

Tokyo Institute of Technology

Tokyo Tech is the largest institution for higher education in Japan dedicated to science and technology, and is generally considered as one of the most prestigious universities in Japan. Tokyo Tech was the only technical university that we visited during the tour. We conducted an interview with Dr Daniel Berrar, Associate Professor in the Department of Information and Communications Engineering.

Before the first question was asked, Dr Berrar pointed out a hidden assumption in our main research question, namely that a gap between the demand of technical companies and the supply of technical universities should not exist. But should a university's aim be to provide employees for (technical) companies in the first place? Dr Berrar tends to disagree. *"You have to get a broad education. When you study Physics in Germany, you don't learn how to become a perfect employee, you learn how to become a physicist. After you finish university, one can choose to focus more on companies."* Although this comment does not directly relate to our main question, it is interesting to ask whether a gap between the supply by universities and the demand of companies is to be avoided in general.

More within the framework of our main question, Dr Berrar mentioned that collaborating with people from other fields is very important when one wants to carry out successful big data analytics within a company (unless the company solely focusses on big data analytics to begin with). Often, big data analytics is used as a tool to improve the success of a company. Hence, a big data analyst has to communicate with people from different fields and with different academic backgrounds, which can easily lead to misunderstandings. As an example, Dr Berrar told us a story about his time as a PhD student when he had to collaborate with a biologist. At some point they were discussing a topic related to 'vectors'. Where Dr Berrar (the computer scientist) was talking about a mathematical object with a magnitude and direction, the biologist was referring to a virus (viral vector). Unsurprisingly, it took a while for them to get on the same page.

The most important skill for a big data analyst is related to Bayesian statistics. Although most engineering students will take a course in statistics, Bayesian statistics are often omitted. Secondly, it is of fundamental importance to be familiar with programming languages R and Python, with a bias towards the former. R is an open source programming language and software environment for statistical computing and graphics, nowadays the biggest tool for (big) data analyst. And finally, it is vital to have good presentation skills, as big data analysts have to present to others the conclusions that can be drawn from an analysis.

Dr Berrar stressed that (big) data analysis will become ever more important for companies in the future, as more and more of them are making use of it, resulting in a more competitive market. The question remains whether (technical) universities are aware of this development and if and how they will respond.

EY Japan

EY (Ernst & Young), a multinational professional services firm, is one of the largest of its kind in the world. It provides assurance, tax, consulting and advisory services to companies. At the EY Japan facility located in Tokyo, we had the opportunity to conduct an interview with Kevin Hensel, senior manager of the Financial Services Office.

As not every department (e.g. Accountancy) is able to use big data, EY Japan does not have one general department for them, but rather big data specialists within some departments. One department that uses big data is Fraud, which deals with insurances. EY Japan's overall view on big data is that they will become more important. It was, however, pointed out that Japan is very risk averse in terms of adopting new strategies or techniques, as the Japanese are, generally speaking, rather averse to change. This observation was corroborated at other companies we visited.

EY Japan sometimes struggles to find employees with the required skills. A background in statistical analysis is especially rare. Another skill that is hard to find is the ability to focus on details, but to also see the broader picture. New employees at EY Japan get a general internal training that takes 6 to 9 months, but the brightest university students, most of whom have a PhD, are not really interested in EY Japan as it has no real expertise in big data and can therefore not internally develop people in this field. EY Japan does not have a relationship with universities in Japan.

In future, data analytics will become more important and EY Japan plans to focus more on this topic. Not only internally, but also externally with clients.

The biggest problem facing EY Japan with regards to big data is that data science courses are mostly taught as part of a Master's degree at university, graduates of which are in high demand. In conclusion, according to EY Japan there is a quantitative gap between the demand for students with a statistical background and the supply universities currently offer.

Rakuten

At Rakuten, we interviewed Dr Xuebin Ma, who is a specialist in speed processing and has been a senior manager of Rakuten's Data Science department for the last six years.

Since Rakuten is a company that focuses mostly on electronic commerce, it has a lot of user behaviour big data readily available for analysis. Rakuten has multiple departments working on data analysis with the aim of improving their electronic commerce. Combined, these departments have over 100 employees and Rakuten plans to expand these departments even further. The more data analysis, the better.

At Rakuten, a very important aspect of big data use is that data, analysed for one service, should also be usable in other services, e.g. when you book a hotel using one Rakuten service, another Rakuten service should be offering you products which might be useful for your trip. This means that the big data departments are very horizontal; they try to work across all the different services Rakuten offers. It is therefore very important for a big data analyst at Rakuten to have interdisciplinary skills, as there is a lot of collaboration with other services within the company.

The skills necessary for a new employee differ for each department. The big data departments are split up into platform engineers, data engineers, and data scientists. Platform engineers focus mostly on performance and other very technical aspects of big data, data engineers focus on handling the data and fitting the data to the department, and data scientists focus on applying statistics and machine learning to the data.

The goal of this research was to analyse whether new graduates actually had the required skills necessary to join the workforce. We noticed that Rakuten prefers to have analysts which, besides their excellent skills in data analysis, also have good soft skills, since those analysts are best able to present their findings in an understandable manner. For data engineers, Rakuten does not specifically look for soft skills, and focuses on technical skills instead. As an example of technical skills, it was mentioned that experience with Python is considered a big positive in the selection process.

Rakuten has no issue whatsoever in finding the required skillsets. However, there is some hidden bias in this observation: Rakuten is a very well-known company and a lot of new graduates are eager to work for them. Therefore, Rakuten has a lot of choice when it comes to picking their new employees and does not necessarily notice a gap between supply and demand. A difficult and competitive selection procedure ensures that only the best get in. With some minor exceptions, this means that most employees in the field of (big) data analysis at Rakuten come from top universities.

Conclusion

The aim of this research project was to find out whether a gap exists between the supply of technical universities and the demand of (technical) companies with regard to big data analytics skills. Based on the results of the interviews conducted with the Tokyo Institute of Technology, EY and Rakuten we can conclude that a gap does exist, although we cannot say how 'big' this gap is. When we focus on Rakuten specifically, we can moreover argue that the gap is less obvious with students coming from top universities, since this company virtually only employs graduates from top universities and doesn't observe any gap.

We would like to emphasise that this conclusion is based on three interviews, so we are unable to extend it outside the scope of the two companies that were interviewed. However, as one company (of the two) did point towards the existence of a gap, it is highly probably that more big data analytics related companies are dealing with the same issue. Future research should point out whether this is the case, and if so, how to improve engineering education in order to minimise the gap.

Although our aim was to identify a gap, the interviews provided us with some very interesting information related to future engineering education in general:

- Although statistics are an integral part of most engineering studies, there is a necessity for a greater emphasis on Bayesian statistics where (big) data analysis is the main focus.
- To be successful in (big) data analytics, the programming language R must be part of a student's vocabulary. Therefore, any study related to data analysis, independent of country, should include a course on programming in R.

- Interdisciplinary skills are important for a (big) data analyst when the analyst is working for a company. To gain some interdisciplinary skills as a student, it would be useful to have at least one project involving students from other programmes so that interdisciplinary communication is triggered (and trained). This is not only essential for those who aim to work for a company, but also for those students who are planning to do a PhD, since research is becoming increasingly more interdisciplinary.

Finally, we would like to point out that during our interview at Tokyo Tech it came to light that a gap between supply and demand isn't necessarily considered a problem, as universities do not see it as their task to provide the perfect employees. A university should provide graduates who have specialized knowledge in their field of study. There are, however, university programmes that specifically train students to work for companies. We therefore think it is important to make a distinction between studies that aim to provide experts in the field of study, and studies that aim to provide graduates with more all-round skills.

Research reports



Global Mindset

*By Bruis van Vlijmen, Frank van der Kluft, Roline Montijn
and Elise Groen*

To be globally minded is to be able to see opportunities beyond borders, and to interact effortlessly with people from different countries, with different backgrounds, different native languages and different opinions. Global mindedness, or having a global mindset, is one of the key skills to become successful in this ever more connected world. In order to find out how important a global mindset is in Japan, several interviews with Japanese universities and companies were conducted.

University Mindsets

For our research project, only one university was visited and willing to engage in an interview. The interview was conducted with Professor Nobuyuki Iwatsuki, Dean of the School of Engineering of the Tokyo Institute of Technology. During the interview, it came to light that the Tokyo Institute of Technology (Tokyo Tech) has only recently been focusing more on being globally minded by changing its curriculum and making all its MSc studies available in English. Tokyo Tech has set its sights on attracting a lot of foreign students with exchange programmes like the ACAP (Academic Cooperation Agreement Program), YSEP (Young Scientist Exchange Program) and the IGP (International Graduate Program). Foreign students can also take cultural and language courses to better understand Japanese culture and thus become more globally minded. However, these options are not available to Japanese students, who often lack a global mindset according to the interviewee. Changing the MSc courses to English helps a lot already, as (Japanese) students will have to keep studying English if they want to attend a graduate school.

Nearly all students graduating from secondary school have had several years of English education. However, only a small portion of them can actually hold a conversation with foreigners in English. One of the issues here maybe the fundamentally different grammar and syntax of both languages. The Japanese education system furthermore fails to get the notion across that learning English is important. Therefore, students pass the tests but rarely make an effort to maintain a standard of speaking.

Going abroad is a good way to improve language skills, but sadly Tokyo Tech has not been promoting this too much yet. Having said that, Tokyo Tech has recently made it possible for students to go abroad for a two-month period without having to delay their study. With the new quartile system (from April 2016), Tokyo Tech encourages its students to study abroad in June and July. However, at TU Delft for example, not many courses start in June, as the summer holidays commence at the start of July. According to Professor Iwatsuki, Japanese students that do go abroad tend to seek out other Japanese students, meaning they are less engaged with different cultures and languages, a vital aspect of global mindedness.

The relationships with companies and other universities, both Japanese and non-Japanese, are very important for Tokyo Tech and, although most of the companies that have partnerships with the university are Japanese, they try to expand their relationships with foreign universities, as well as foreign companies. For the time being it is still hard for foreigners in Tokyo to find a job after graduation. Japanese companies select their new employees when they are in their final year at university. As this selection process is carried out in Japanese and most Japanese companies only hire people via this recruitment process, it is very difficult for foreigners to get a foot in the door.

Company Mindsets

For our research, interviews were conducted with several companies and organisations. Among these are Rakuten, Kengo Kuma Architects, Ernst & Young, Cartivator and the Earth Life Science Institute (ELSI). When asked whether a gap existed between what universities offer students and what companies desire of their new employees, the answer was, without fail, affirmative. However, as we gleaned from interviews with Rakuten and ELSI, the problem might be less of an issue in Japan than in the rest of the world. When recruiting, Japanese companies usually make their new employees work in a field they did not graduate in. It is not seen as a task for universities to train people up, they are only required to teach the basics. Companies themselves will train and shape people to their liking.

Professor George Helffrich, our interviewee at ELSI, mentioned that, as a lecturer at the university of Bristol, he once had an interesting talk with a recruiter from Shell. In the recruiter's opinion, it is the task of the university to select people and make sure their grades reflect their capabilities. A university can obviously provide opportunities for acquiring general skills such as a global mindset by encouraging students to go abroad and offer them courses on, say, presentation skills. It is, however, the task of the recruiting company to teach graduates the skills they need. After all, every company is different and therefore requires different soft skills. This shows that there is a gap, but that this gap is not necessarily perceived as a problem by companies.

Ernst & Young (EY) also indicated that, in order to work there, you do not necessarily have to be trained as an accountant. Although they prefer a candidate to have some interest in finance, it is no longer a requirement. EY might, for example, hire hotel managers because they are experienced in managing finances for a small company, even though this is very different from the advisory, assurance, tax and transaction services of EY.

As expected, a global mindset is very important when working at these companies. Not only because the companies have assets abroad, but also because many of their employees are not originally from Japan. Employees who speak multiple languages can moreover be assigned to international projects. More and more emphasis is therefore put on hiring globally minded employees.

However, there is a big difference between traditional Japanese companies and the more international oriented ones. Most of the companies we visited were already internationally oriented, as witnessed by the fact that they welcomed students from outside Japan. A lack of English speaking people in traditional companies formed an obstacle to us visiting. We therefore only partially experienced the traditionally Japanese business culture.

¹ http://www.titech.ac.jp/english/graduate_school/international/exchange/acap.html , 1-8-2017

² http://www.titech.ac.jp/english/graduate_school/international/exchange/ysep.html , 1-8-2017

The following two companies both have a Japanese origin.

Kengo Kuma Architects was founded about 20 years ago in Japan. However, with two offices in China and one in Paris, it is now very internationally oriented. Obviously, the company had to, and did, implement a global mindset in its company culture. There is no hierarchy in the Japanese office these days and every idea or project is presented to Kengo Kuma himself, whether the idea comes from an intern or a senior. Furthermore, employees from all over the world work together with Japanese employees at companies both inside and outside Japan.

Rakuten is the other company with Japanese origins; the translation of the Japanese word Rakuten is optimism. English is the number one language on the work floor and the company has many international employees. Rakuten creates a Google-like atmosphere, with three free meals a day and a gym for employees. Employees are encouraged to be individualistic, using the 5 principles of success, one of which is 'Always improve, always advance'.

Rakuten is one example of many Japanese companies that have expanded overseas, with currently over 100 subsidiaries across the globe. Rakuten still has its main market in Japan, whilst many other companies like Sony and Panasonic gain their main revenue from the US and Europe, as the internal market in Japan slowed down significantly after the 1980s due to a shrinking workforce and declining birth rates.

Until the 1980s, employees were hired for life, which was deemed necessary to rebuild Japan after World War 2. At the time, Japanese companies gained international fame with their quality control and high standard of electronics. As a consequence, they did not need to develop a global mindset. And when many baby boomers got into senior positions in the 80s, the companies were still led by people who considered a global mindset unnecessary.

Employees are hired for life, start to work directly after graduating and go from job to job inside the company. As a senior, they know everything there is to know about the company. This is different to western society, where people are hired for their specialism, work at a company for a few years and then go on to another one to learn more about their specific area of interest. In that sense, Japanese employees are educated much broader inside the company, as they work in different fields, thus making their original field of study less important for their working career. This also makes it hard for traditional Japanese companies to hire international employees long after graduation - they are more specialised and it is harder to go through all the different aspects of the company due to language and cultural barriers.

Japanese employees in line for management positions nowadays get placements abroad in other offices, to gain a more global mindset and improve their English. And as the work force decreases, companies have had to expand to other countries, which means global mindedness is becoming increasingly important. In addition, immigrants are let in to take up jobs that Japanese people do not do. This can also contribute to the development of a more global mindset in Japan.

³ <https://global.rakuten.com/corp/about/philosophy/success.html> , 1-8-2017

Conclusion


As, generally speaking, senior management of companies tend to hold on to traditions and do not dare to stand out, the mindset of traditional Japanese companies is only changing very slowly. However, it does need to change because of a decreasing work force.

Seemingly, universities in Japan are catching up and seemingly, a global mindset is considered more important in Japan in general. However, as (traditional) companies in Japan are still used to train their employees for specific positions, any gap between supply and demand with regards to global mindedness seems to be less important to them. In international oriented companies, on the other hand, being globally minded is increasingly important for students, as employees are only hired for a few years and are therefore not trained within the company itself all that much. Also, a lot of companies have already become more internationally oriented, with more international employees and English as the number one language on the work floor, which requires a more global mindset from Japanese employees.

Therefore, there is an increasing gap in Japan between less globally minded graduates delivered by universities and the demand for more and more globally minded graduates by the larger numbers of globally oriented companies.



Research reports



Inter- disciplinary Systems Thinking

*By Jamie Ongkiehong, Damian Bouwmeester, Jun Feng
and Sander Leussink*

Around the 1950s, the concept of systems thinking started to gain more traction in engineering. Examining engineering specifically, Systems thinking is supposed to have started at Bell laboratories around the 1940s. Systems thinking, or systems engineering, can be described as an approach to engineering that considers a whole system through an interdisciplinary perspective, where the connection between different parts of a system and the whole system are examined. Both engineering and engineering management perspectives are combined in order to find major problems in designing a complex product. This approach differs fundamentally from a pure engineering approach, as in systems engineering both technical and human-centred disciplines are considered.

As a result, all aspects of a problem are considered and integrated into a whole. This unique way to approach problems could make systems thinking an important tool for engineers in the future. Even in the past, systems thinking was important. The Apollo project, for instance, was a prime example of a project where systems thinking was applied to a complex problem. In general, when considering complex problems, where engineers of different disciplines are required, systems thinking could provide powerful tools to analyse problems.

There are several clues that systems thinking may already be important in Japanese companies today. The 19th International Conference on Systems Thinking and Systems Approach, for example, is hosted in Tokyo this year. And at least 6 major universities in Japan, among which Keio university, offer systems engineering as a major. So in this chapter we will explore how important Japanese companies consider interdisciplinarity and systems thinking to be.

Interdisciplinary Systems Thinking at Japanese Universities

An extensive interview with professors and programme coordinators conducted at the Tokyo Institute of Technology (Tokyo Tech) was the primary source of material to gain insight into the attitudes of Japanese universities towards future engineering education and the gap. Visits to labs and start-ups at Tokyo Tech and Keio University and conversations with former students provided supplementary information.

Japanese universities do not feel an urgent need for Interdisciplinary Systems Thinking (IST) from the gap, but do see recent global challenges such as climate change and the energy transition as a call for new ways of solving problems that includes IST. They also see that large Japanese companies want to expand their domain in the coming years. This call for a new approach to problem solving has already resulted in the reorganisation of departments, on top of an already existing interdisciplinary department (ACEEES) at Tokyo Tech.

At present however, distinct dedication to IST in the education of the regular engineer at Japanese universities is not in place. There are no default courses for the development of tools required for IST like communication and presentation skill improvement or broad-domain case studies. An often-heard argument is that money and time are limited, but a deeper root-cause can be found in the traditional way of employing engineers in Japan.

It is expected that an engineer in Japan joins a large company and stays there until retirement. During their early career, engineers are educated and shaped inside the company to the company's liking. For this reason, the most important aspect companies looked for in engineers was flexibility and the potential to grow. Thus, lacking skills

required for IST has been no problem and as a result IST skill forming is not heavily pursued by Japanese education.

Moreover, it is uncommon for Japanese engineers to go abroad during their studies, especially to Europe or the United States. Often, as mentioned by (former) university students, Japanese students are relatively close-minded, which is in stark contrast to the broad IST approach. However, all Japanese students who either have been abroad or are now working at an English-based company in Japan were very open-minded and able to convey their message very well during the visits in Tokyo. This observation indicates that a good command of the English language, allowing for extra exposure to the more direct Western culture, can, especially for current Japanese students, be a fundamental tool in applying IST approaches necessary for future engineering.

IST approaches or IST tool-development are currently not widely-integrated in the education of Japanese engineers. Changes are in progress, but these do not affect the base engineering education and are primarily introduced when large global issues demand IST. Strong and flexible communication skills required for IST are lacking in Japanese engineers in part due to the traditional in-house education. This should definitely be addressed by university education. Finally, it is recommended that Japanese students become more open-minded by encouraging them to go abroad and acquire a better command of English during their engineering studies.

Interdisciplinary Systems Thinking at Japanese Companies

To fully understand the possible gap between the needs of companies and the skills of university graduates, the students visited a diverse set of technical companies in Tokyo. At these companies, group discussions and interviews with employees took place. In the companies visited, interdisciplinarity was valued up to a certain point. People agreed that interdisciplinary system thinking was necessary, but not for every employee, as specialized engineers are also of great value. EY believes that if you want to make people from different disciplines work together, you need someone who speaks the 'languages' from both disciplines: a sommelier who knows both the food and the wine.

However, not everyone needs to have both skills, that would threaten the level of specialism of engineers. Similarly, the most valuable employees at Rakuten are the people who have a deep understanding of technology, but who can also communicate with different levels of management, learn how to work in teams, how to present and how to discuss their ideas. These people can drive change and good development. These so-called 'technical leaders' are rare, but extremely valuable.

Some employees at the companies visited see certain aspects of Japanese culture as a hindrance to the Japanese labour market evolving. One example is the focus on perfection, which is very good when designing a bridge or a building in an earthquake zone. Software on the other hand has a very short lifecycle, so perfection is not possible. This is presented as an example why Japan is struggling with producing good software.

A strong sense of hierarchy in the culture is another difficulty: even the most skilled graduates start at the bottom of the ladder. Because of this, Japanese companies don't employ the best students as these students start working abroad for better salaries and working conditions.

According to the employees interviewed at the different companies, graduates from Japanese universities are almost always mono disciplinary. They are more trained to follow orders than to take their own initiative. The current Japanese educational system is not so focused on building an environment where several disciplines are combined in one person.

If graduating engineers already have soft skills, they will get promoted easier since they are rarer. Different interviewees highlight the trade-off between learning the hardcore engineering skills versus obtaining soft skills. They think that a strong focus on soft skills lowers the level of technical skills of students because of the limited time available.

It can be concluded that interdisciplinary system thinking is a concept that is valued at most companies, but not something employees are deliberately trained in. The visited companies do not offer courses or lessons on this matter. However, in the application process it is taken into account whether applicants can communicate their ideas well, for instance to people from different disciplines. Especially in the more international companies, there is an increased demand for such engineers. However, other companies state that finding good engineers is a challenge already. In these cases, the company cannot afford the luxury of demanding good engineers who also have good communication skills.

Conclusion

The aim of this research is to investigate to what extent Japanese technical universities and companies value the ability to apply interdisciplinary systems thinking in their engineering areas of expertise. Based on visits to and interviews with several technological companies and a university of technology in Tokyo, the following conclusions could be derived:

- There is a limited understanding of the concept System Thinking. The term interdisciplinarity is more widely known, but mostly understood as applying multiple disciplines simultaneously. We define this as multidisciplinary, not interdisciplinarity. If interdisciplinarity really takes place, new disciplines would emerge as a result of the combining of different disciplines.
- Discussions of interdisciplinary system thinking often result in a discussion about soft skills of engineers. There is a need for these more broadly skilled engineers. However, Japan already has a large deficit of engineers, since the most skilled ones go abroad where payments and other working conditions are better. Consecutively, most companies are not in the luxury position to select engineers who have both engineering and soft skills. This situation is likely to persist because of the ageing Japanese population and the resulting shrinking volume of the workforce.
- There is a need for so-called Technical Leaders: engineers with both technical and leadership skills. In the more international companies, internationals are starting to fill those functions. This is pushed by the (relatively slow) internationalisation of the Japanese businesses. The more traditional Japanese companies are more focused on the technical perfection of their product, instead of innovative pro-

cesses. This is not effective in some markets. An example is software development, where a flexible, effective product is more valuable than a product overdesigned into perfection.

- The university tries to adapt its curriculum to the changing demands of companies, for instance by offering a programme aimed at delivering 'global leaders' with technical knowledge. However, this programme only started recently and it is still unclear what the results will be. There is a trade-off between obtaining engineering skills and soft skills, with strongly divergent opinions of the relative importance of the two.



Research reports



Intra- preneurship

*By Simon Verkleij, Gabriele Kockelkoren, Laura Arkesteijn
and Aleksandar Petrov*

Intrapreneurship is a form of innovation that happens in small teams that bear the responsibility for turning an idea into a finished product or service within a bigger organisation. We use entrepreneurship as a broader term for all innovation activities which includes intrapreneurship in itself.

Prior to the start of the trip, the Intrapreneurship group defined its research question as “Looking at Japan, is intrapreneurship a better platform for entrepreneurial behaviour than the general mindset/behaviour required for a start-up?” Nevertheless, as discussed below, the more general question of the state of entrepreneurship in industry and education proved to be even more relevant for Japan.

A number of different questions were prepared to match the type of institution visited: university, established company or start-up. Nevertheless, these questions served only as a starting point of the interviews. The actual course of action during the interviewing process was much more dominated by the background, experience and views of the interviewee. This allowed the group to discover various new aspects and questions regarding the issues at hand.

Tokyo Institute of Technology

The only university visited for this research trip was the Tokyo Institute of Technology where we interviewed Jaehyun Park, an assistant professor who teaches a course on entrepreneurship and design thinking. According to Park, the main difference between entre- and intrapreneurship is the difference in markets: a start-up has a very small market, a major company a large one, with regular customers. He also stated that, in Japan, it is very rare that an innovation project succeeds.

Furthermore, according to Park, projects started in an intrapreneurial context have a bigger chance of failure than entrepreneurial projects (e.g. start-ups). This can be explained by the fact that companies that start intrapreneurial projects have more resources to rely on. They take more risks than start-ups, which results in them being less critical in selecting a new project, which in turn increases the risk of failure.

Generally speaking, Park was quite pessimistic about professors teaching students entrepreneurial skills. His opinion is that universities can teach case studies, theory and methodology, but that lecturers have no practical experience in start-ups. The following quote illustrates his thoughts best: “No-one here (e.g. professors) can teach entrepreneurship because they aren’t entrepreneurs themselves”.

Moreover, he supports the idea that engineering students should focus on the technical details and that there is not much value in them studying soft skills or taking classes in entrepreneurship, management and business. The differences between TU Delft’s educational focus on the T-shaped engineer and the narrowly focused technical education in Japan was a recurring theme throughout the interviews conducted by the group.

This raised the question whether students could do an internship at a company to get acquainted with entrepreneurial actions. Park answered that the holidays in Japan are too short (1.5 month spread over the year) to do a full-blown internship. Nevertheless, short term internships from a few days to two weeks take place with the purpose of acquainting students with a host company.

Earth-Life Science Institute

At the Earth-Life Science Institute (ELSI), part of the Tokyo Institute of Technology, the group interviewed its Vice Director, Professor John Hernlund, an American with international experience. He stated that the educational system in Japan is different from the ones found in the United States and Europe, and that the students are not challenged and motivated to get the most out of their study. Mr Hernlund expressed the opinion that the universities are the most conservative institutions in Japan, while they should, in fact, be leaders in innovation.

Moreover, it is very common that Japanese students are assigned to a professor in the latter years of their bachelor education and stay with them until they themselves become a professor. This leads to a very limited educational experience. Sometimes students are even used by professors to do the chores they do not want to do themselves.

John Hernlund furthermore mentioned that due to the ongoing demographic crisis, the number of PhD students in Japan is declining, which means they need to look for people from abroad. However, this requires an internationalisation of university programmes (e.g. available in English). Even though this process has been put in place, it is met with resistance from some of the academic staff and progress seems to be rather slow.

Generally speaking, large companies in Japan are run by older men, who often make decisions based on methods that proved to be successful in the past. There is not much interest in future changes and often major international trends and competitions are missed. According to Mr Hernlund, this is one of the major factors behind the current poor performance of Japanese corporations. He also predicts that some big companies (for example Rakuten and Toshiba) will go bankrupt in the near future because they struggle to be competitive on the international market.

John Hernlund agreed that there is a widespread conviction that Japanese engineers should just be very good at their job, and that other skills, like communicating in English, are irrelevant. He thinks this originates from the notion of Japanese craftsmanship, which only focusses on one specific field. Interestingly enough, that is also the major positive point of the Japanese working philosophy Mr Hernlund mentioned. Precisely because of this attention to detail and quality, Japan is often the place to find the 'best quality' product. For this reason, some technologies that are believed to be technically unfeasible elsewhere can be found in Japan.

Mr Hernlund also referred to the principle of 'form follows function' which means that the design of a product is the result of the intended function or use. However, in Japan the main focus is on form and not on function. Most things look good on the outside, but on closer inspection may turn out to be inefficient. This can also be illustrated by the fact that it is more important for one to show they work very hard rather than to get things done efficiently and reach a goal. Japanese people do not want to stand out, which is also represented by the Japanese proverb: 'The nail that sticks out shall be hammered down'.

It can be concluded that John Hernlund is not very positive about the current state of Japanese education and business. The Japanese are specialised in some very specific aspects, but are not educated very broadly. Nevertheless, he expressed a strong belief that changes are underway and that we will soon witness an educational, societal, technological and business renaissance in Japan.

Rakuten

At Rakuten an interview was conducted with Danny GwanHwee, Chief Executive of the Innovation Office, and Hirotaka Yoshioka, an infrastructure architect.

Every employee at Rakuten can come up with new ideas. This employee can be anyone, ranging from engineer to businessman. This idea has to be worked out to include a business plan, a budget, the break-even point and the human resource planning. This project proposal needs to be approved by the CEO of the company before the project starts. Once approved, the project is checked by a supervisor every day. This supervisor is almost exclusively from a business background.

Every new project needs a team. At Rakuten this team preferably consists of people who already work at the company. If a specific person is needed, they will be hired specially to join the intrapreneurial team, but only if they have experience in the required field. New graduates are not chosen for these functions, since there is no time for an in-house training at Rakuten. The team that focuses on the development of the new service usually consists of people with a business background. The engineering department is common for the whole company. In this sense there is some distance between the two. This seems to result in a rather one-sided relationship: input flows almost exclusively from the new service development team to the engineers.

It is not necessary that the instigator of the idea becomes team leader. Not many leaders have an engineering background, but it is possible to become the leader if you are experienced in the subject of that project. When an engineer becomes team leader, he or she needs to be able to demonstrate business skills. These skills can be trained at Rakuten. It is however useful if the basics have been learned at university and if some formal recognition of these skills exists already. Therefore, engineers who are interested in business positions are advised to do a master in business administration (MBA) to broaden their knowledge.

At this moment Rakuten has 12 or 13 intrapreneurial projects going, or 'new services' as they refer to them. These new services cover a wide variety of subjects, ranging from the agricultural market to shared economies. When a new service fails, the company is not severely affected. For the employees managing it however, failure has significant negative effects as it is reflected in their personal evaluation.

The professional environment at Rakuten offers a number of advantages for intrapreneurial teams. The company already has a lot of contacts in the market and with other companies. Rakuten also offers a supervisor to advise the intrapreneurial team. In conclusion, it can be said that Rakuten provides a good environment and adequate resources for establishing intrapreneurial teams.

EY (Ernst and Young) Japan

Japanese society can be characterised by collectivism. In other words, diversity can often not be found. At EY Japan, almost 15% of the staff is international. The company consists of various groups that research specific topics. Usually, a group consists of 8 people. Most projects are worked on by EY staff. If specific skills are required for a certain project, new people with those competencies are recruited.

EY Japan needs people who are detailed, understand facts and are able to present data.

These soft skills are therefore a prerequisite for employment. In contrast to most other companies and organisations visited, the hiring and HR teams at EY Japan believe that as long as a person has intellectual potential (typically expressed by graduating from a top university), they are suited for any job. As such, they are very open to new employees working in areas significantly different from their educational field. After the successful recruitment of employees, the company trains you to do the job. The trainee programme is especially big on soft skills.

Every year, an innovation competition is organised at EY Japan, where each employee can propose an innovative idea within the company. A special committee from the EY Innovation Centre picks the top 5 most promising ideas. The winning ideas are awarded with financial resources and pilots are started and evaluated. The inventors of the idea can either give it to headquarters and get back to their regular work or they can work on the idea themselves. The risks associated with the pilots are shared within the company and are not borne by a single person. During the interview it became clear that in Japanese culture, innovation progresses very slowly and that it is difficult to incorporate a new idea into the existing culture.

Engineers have the skills to work on a technical problem, but they lack the ability to understand the problem side. At EY Japan an intrapreneurial mindset is highly appreciated. Usually, a person with this asset will have a higher position within the company. Additionally, it was discussed that mindset, rather than the amount of experience, is important at EY Japan.

Axelspace

Axelspace started as a collaborative initiative of 6 engineers and businessmen. A wide variety of skills was brought together to create the currently so successful company. At Axelspace, the recruitment process focuses on finding specialised engineers with specific knowledge and skills. A broad range of skills is not required. Due to the small size of the company, the formation of intrapreneurial teams is not relevant.

Conclusions

With regards to the main question about intrapreneurship, the group could not gather enough information as it seems not to be very relevant in Japan. Only Rakuten had a clear form of intrapreneurship. There, Mr GwanHwee particularly stressed the importance of the connections and the markets of the parent company when starting a new venture, as Japan is a country of relations. Being introduced by the correct person or coming from a top university can be the much-needed foot in the door. Despite this lack of information about intrapreneurship, we touched upon a much more serious question: what is Japan's current state of entrepreneurship and innovation in industry and education? Several main conclusions can be made:

- The overall impression is that innovation is happening, albeit at a very slow rate. Overall, the interviewees agreed that Japan needs to change and is, in fact, currently changing. Nevertheless, almost everyone also agreed that the rate of these changes might be too slow. Furthermore, no one committed to make a prediction when and what radical changes might be expected in the (near) future.

- It also seems that universities, in contrast to the trends in other developed countries, are amongst the most change-adverse institutions in Japan. It also became evident that there are strong differences in opinion amongst staff members as to how education should develop. Therefore, consistent and continuing education innovation efforts seem particularly difficult to establish. A major indicator is the relatively low rate of internationalisation of education and research.
- Another big point of difference between engineering education and job expectation in the Netherlands and Japan is the notion of what skills an engineering graduate should have. In the Netherlands, the focus lies on forming T-shaped engineers who have a number of social and business skills alongside a strong technical background. In Japan, on the other hand, there is a much stronger distinction between engineers and business people. On one or two occasions during the interviews engineering students were described as 'otaku' ('nerds'). Engineers are expected to focus on a very narrow field and to become specialists. Presentation, marketing, project management, product feasibility, etc, is considered to be beyond the scope of their work and is delegated to the 'business and managing people'. Most of the interviewees seemed to support this model and did not agree with the idea that engineers can or should possess a broader skill set.
- Finally, a similar trend extends to forming innovation teams. Typically, the older, more experienced employees from the same company are transferred to the new team. Knowledge, experience and superiority within the company are greatly valued. That, again, is in contrast with the more western approach of praising the 'young blood and spirit'. This could also be one of the reasons for the slow rate of innovation in Japan.
- Despite these issues, however, Japan seems to be the place where excellence in a very narrow field or craft is found. It could precisely be this ability to deliver the highest quality solutions and products that still keeps the economy and the manufacturing sector together. And this might also be the main learning point for western companies and educational institutions. It might be that in Europe and the US, there is a need for very narrowly specialised but highly skilled engineers and workers. The big question, which is still to be answered, is whether this needs to happen at the expense of developing broader entrepreneurial skills.



Research reports

Personal leadership

*By Willemijn van der Elst, Carolien Arensman, Sanne Beckers
and Kasper Spoelstra*

For this report, we were given the task to do research on how personal leadership plays a role in the education and profession of the Japanese. Here we report our findings regarding this subject, mostly based on literature research, interviews with Japanese employees and our own experience. Although the evidence in this study is fairly anecdotal and based on only a small subset of Japanese institutions, we hope to provide a fruitful breeding ground for further research into the improvement of Dutch-Japanese collaboration projects.

Introduction to the Japanese work culture

To provide some background regarding the research that has already been done in the context of differences in work culture between Japan and the Netherlands we refer to the work of Professor Geert Hofstede. He compared work cultures on six aspects: (1) power distance, (2) individualism, (3) masculinity, (4) uncertainty avoidance, (5) long term orientation and (6) indulgence (Fig. 1).

According to Hofstede, the power distance is the extent to which the less powerful members of institutions and organisations within a country expect and accept that power is distributed unequally. With a score of 54 Japan is not as hierarchical as other Asian cultures. However, the Japanese are always conscious of their hierarchical position. In companies, all decisions must be confirmed by each hierarchical layer, which is why foreigners will experience Japan as hierarchical. It must be noted that in Japanese schools, it is taught that everyone is equal and if you work hard enough, you can be everything (Hofstede, 2017).

Individualism is the degree of interdependence a society maintains among its members. Japanese society shows many characteristics of a collectivist society, by for example, putting the harmony of the group above expression of individual opinions. Japanese people have a strong sense of shame for losing face. Also on this point, Japan is not as collectivist as some other Asian countries (see research of Hofstede). Japanese people are company loyal, but this is a choice of the individual. They are loyal to their inner group by birth, such as their extended family and local community. By Western standards, Japan is collectivist, but by Asian standards Japan is experienced as individualistic, because they are more private and reserved (Hofstede, 2017).

Hofstede defines masculinity as the will to be the best, and the opposite (feminine) as liking what you do. Japan is one of the most masculine societies in the world. However, because of their mild collectivism, very little assertive and competitive individual behaviour is observed, but in contrast, severe competition between groups takes place. Employees get motivated by fighting on a winning team against their competitors.

The drive for excellence and perfection is another expression of masculinity. With the masculine norm of hard and long working hours, it is still difficult for women to climb the corporate ladder in Japan (Hofstede, 2017). In 2013, only 11% of the executive positions in businesses were filled by women in the Netherlands. However, Japan had even less women in these positions (Grant Thornton, 2017). Japan had the goal of having 30% women in leadership roles in 2020, however this goal has just been adjusted to a more realistic one of 7% (Mollman, 2017).

Uncertainty Avoidance has to do with the fact that the future is unknown. The question is, should we try to control the future or just let it happen. Japan is one of the most

uncertainty avoiding countries on earth. According to Hofstede, this is often attributed to the fact that Japan is constantly threatened by natural disasters (e.g. earthquakes, tsunamis and volcanic eruptions). With these threats, Japanese people learned to prepare themselves for any uncertainty. You could say that anything you do in Japan is based on maximum predictability. This is even reflected in the many ceremonies, in which it is prescribed what to wear and how to behave. A lot of time and effort is put in the analysis of risk factors before any project really takes off. The high demand for stability is one of the main contributing factors to an adversity to change in Japanese organisations. (Hofstede, 2017).

Long-term orientation is how a society has to maintain links with its own past while dealing with the challenges of the present and future. Japan is one of the most long-term orientated societies and the Japanese see their life as a very short moment in a long history of mankind, in which they feel obliged to do their best during their lifetime. In corporate Japan, companies are not there to make money every quarter for the shareholders, but to serve the shareholders and society for many generations to come (Hofstede, 2017).

Indulgence is the extent to which people try to control their desires and impulses. With a low score, Japan has a reserved society. Not much emphasis is put on leisure time and, generally speaking, control over their desires is highly valued. Japanese people feel that their actions are restrained by social norms and they feel that indulging themselves is somewhat wrong (Hofstede, 2017).

From our own experience we can confirm many of the abovementioned aspects. For us, the most prominent aspect was uncertainty avoidance. After the nuclear disaster in Fukushima caused by an earthquake, the Japanese government ordered to close all nuclear power plants in Japan.

With regards to the masculinity aspect, we did indeed encounter mostly men in the top positions of businesses. Most lectures were held by men, and if it was a woman she was often still a student.

The degree to which we saw Japanese people enjoying leisure time was very limited. Karaoke and public arcades were found to be very popular compared to the Netherlands. We hypothesize this is locally perceived as an escape from the real world and daily struggles.

Personal Leadership from two perspectives

To conduct our research, some common ground as to what Personal Leadership actually is, needs to be established. To get a better view on how Personal Leadership is perceived in Dutch culture, we interviewed Glenn Weisz, teacher of the "Personal Leadership Module", which is part of the Honours Programme at Delft University of Technology. When asked what personal leadership really is, he responded: "When one thinks of leadership, usually one thinks about leading others. However, leadership may actually begin with personal leadership, which means gaining self-awareness, knowing who you are, what you stand for, what you want, why you want it and sometimes even how you want it and what you are capable of. Where do you want to make an impact and why there? All in all, I would say that personal leadership is about gaining self-awareness, and is therefore not limited to behaviour but also encompasses mentality, vulnerability (..), with the eventual goal to inspire others to show leadership themselves".

We were obviously curious to see how this compares to how Japanese people understand the term Personal Leadership. For one of our first visits, to the Tokyo Institute of Technology, an interview was set up between our research group and two senior professors who were also both deans of Tokyo Tech faculties. When we asked them about personal leadership, the response almost exclusively focussed on the word “leadership” in the classical sense, and included no reference to the word “personal”. This observation led us to change our terminology to some extent. We decided not to mention the term Personal Leadership in the later interviews, but rather terms like Personal Development and soft skill development, and found that by using those words, we were better able to get our questions across, resulting in more useful answers.

Company interviews: the demand for soft skills in corporate Japan

From multiple sides we learnt that in Japanese education, very little time is dedicated to soft skills. This does not mean that Japanese corporate executives do not value these skills. In fact, soft skills are deemed important, but are not seen as a critical part of education. Kyle Yee, a senior executive at Rakuten, explained why training engineers in soft skills is important. Most employees at Rakuten have never gone through a deliberate training during their education; within Rakuten there are employees from different nationalities as well as from different generations.

The training programme within Rakuten is aimed at creating a better understanding of the different cultures within the company and to improve communication between all employees. Pure scientists do not learn to work in a community during their studies. Scientists tend to focus on their core knowledge base and not on their communication to the outside. The training programme at Rakuten tries to improve their communication skills.

The training programme starts on the first level: language. All employees must possess a minimum level of English. Rakuten changed its main company language in 2012 from Japanese to English to make the company more international. The second part of the training is about cross-cultural management, creating an understanding of different cultures and how to effectively work together by acknowledging these differences. The third level is about global leadership and how to lead a team with people from different nationalities. After having passed the first two levels of common language (English) and cross-cultural management, employees must be able to lead people in the other levels.

This language switch is a rather big change for the company. It makes it more attractive for non-Japanese employees in the company and attracts Japanese people with more of an open mindset. Due to the conflict-averse nature of the Japanese, innovation is carried out in tiny steps. To speed up the process of internationalisation, the board of Rakuten has decided to use its foreign employees to make Rakuten a more competitive player outside Japan.

At Kengo Kuma Architects, an old Japanese structure is used for training employees, senpai. The employees are led by a senpai (a more senior employee), who serves as a mentor. You can inform this mentor of the areas you want to develop yourself in. Most other soft skills are learnt on the job, mostly in meetings with clients together with Kengo Kuma. Every product needs the final approval of Professor Kengo Kuma himself.

⁴ Paraphrased and translated from interview with Glenn Weisz

The criteria to hire new employees at EY Tokyo were slightly different from other companies or institutes. First of all, the regular competencies are expected; a mathematical skillset and critical thinking. But at EY, some soft skills are required on top of that as well; leadership, team building and 'the willingness to be outstanding'. According to some interviewees, this willingness to be outstanding becomes apparent from a prospective employee's non-academic experience. Extracurricular activities are an important way to show your eagerness to work for EY. A soft skills set is necessary to stand out from other applicants at EY. It is essential that employees can build a relationship with clients, but also with colleagues, as a lot of projects require teamwork. EY also offers training programmes such as coaching or presentation skills to improve their employees' soft skills. Soft skills have furthermore become an important part of the curriculum at universities.

EY tends to focus on the development of the individual. The aim of EY is to make employees proactive in society: "Being the same is not bad but also not good enough to define yourself", as one of the interviewees pointed out. Technical skill alone is not going to make you stand out at EY, soft skills are.

Conclusion

In conclusion, we claim to have observed a clear difference between the Dutch and Japanese working culture, both in respect of demands for personal leadership and soft skill development. Our experience unanimously shows that in the Dutch working culture, soft skills are more valued and demanded than in the Japanese. We hypothesized that this has to do with what may be the most apparent contrast between the Dutch and Japanese work cultures: the fact that in Dutch culture individualism dominates, whereas the Japanese culture is dominated by collectivism. This latter point is beautifully illustrated by an ancient Japanese saying, that was mentioned by multiple interviewees: (deru kui wa utareru), which translates to "The nail that sticks out gets hammered down".

A second major finding of this research is that in the Japanese working culture, more and more emphasis is being put on soft skills, which is attributed to internationalisation. Being in an international environment requires knowledge and know-how on intercultural communication, presentation and understanding. From this trend, it can be inferred that this demand opens up a market, and that there are substantial opportunities for businesses in the soft skill training branch.

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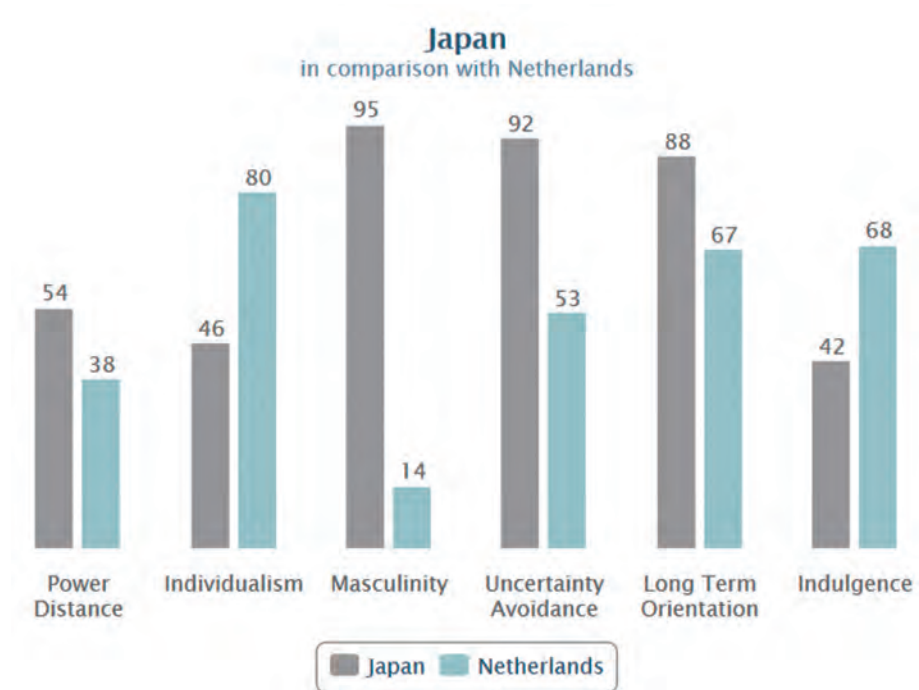


Figure 1: Japan and the Netherlands, a comparison of working cultures. Six different aspects were taken into account: power distance, individualism, masculinity, uncertainty avoidance, long term orientation and indulgence. (Hofstede 2017, Japan in comparison with Netherlands)



Daily Reports



Daily reports

The Kick Off 20-05-2017

By Kristian Blom

On Saturday, the 20th of May, the Honours Tour Committee organised a Kick Off Day. The aim of this day was to let tour participants get to know each other and to make a start with the research that was integrated within the tour. The Kick Off Day was held at Tjip, a company that aims to optimise organisational processes using personalised software. Their main building is ideally located near the TU Delft campus, and as such, a perfect place to organise the Kick Off Day. We are very grateful to Tjip for making it such a successful day, with offering both accommodation and catering!

Doors were open from 10am and participants started to come in one by one. After a warm welcome by our master of ceremonies Reindert, the participants had the opportunity to get to know their fellow travel companions in the main entrance hall. At 10.30am, the day was officially kicked off by Aldert Kamp who held a very interesting presentation about the problems engineering education faces in today's world. During his presentation, Aldert showed some interesting statistics about Japan. Japan is, for instance, the number one country where employers have the most difficulty filling roles. This made it even more interesting for us to get started with the research.

After Aldert Kamp's presentation, the day proceeded with a short workshop given by Maarten van der Sanden, faculty member of the Science Education & Communication Department. During the workshop, Maarten gave us an idea about the best way to optimise a research question in terms of result. As the research groups had to prepare questions for their interviews with various Japanese companies and institutes, the workshop proved to be extremely valuable.

After sitting down for over 90 minutes, it was time for a small break after which the group split up into their designated research groups. In the following 45 minutes, each group started working on interview questions for their visits in Tokyo. Each group also had some private time (15 minutes) with Maarten van der Sanden to discuss some of the interview questions they had come up with or the strategies they would use to get to them at a later stage.

At 1pm it was time for lunch, arranged by Tjip. During lunch we had an interesting talk from Radboud Molijn, member of the Supervisory Board of Mitsubishi Caterpillar Forklift Europe B.V. (MCFE). Radboud Molijn had been bestowed the honour of the 'Order of the Rising Sun, Gold Rays with Rosette' by the Japanese Government in recognition of his "significant contributions to strengthening the economic relations and the



The tour participants paying attention to a talk held by Aldert Kamp. In this picture you can see me (Kristian) doing on of my James Bond style poses.



*The lunch offered by Tjip.
It was delicious!*

promotion of the mutual understanding between Japan and the Kingdom of the Netherlands". The talk was very refreshing since Radboud Molijn shared a lot of his personal stories from Japan. One story was about the Tohoku earthquake on the 11th of March 2011. On that day Japan was hit by a 9.1 magnitude earthquake. Radboud was enjoying a cup of Japanese coffee in a restaurant when the ground started shaking fiercely. Everyone fled to the streets for safety. Remarkably, most visitors of the restaurant came back the next day to settle their bill, an indication of how nice Japanese people are.

After lunch, the Tour Committee held a planning-related presentation about the tour to Tokyo. During the presentation, it became clear that the flight agency we would fly to Tokyo and back with was facing a financial crisis, so there was some uncertainty whether our flight would actually hold. At the time of writing this report, I can reassure the reader that, luckily, it did.

As a final speaker, we had the honour to meet a Japanese artist who was in the Netherlands for a temporarily project in Delft. After showing us some of his finest work (which was quite amazing, especially the bike sculpture made from old bike parts), the artist ended the talk by showing us how to accept someone's personal business card. In the Netherlands it doesn't really matter how you do it (as long as you don't throw it away), however in Japan it really does. After accepting the card with both hands whilst making a bow (where the angle of bowing depends on the relative status of the person who presents you with the card), you have to check both sides extensively. Only then it is safe to put the card in your pocket without offending.

Once the final talk was done, it was time for some drinks. In the main hall, our master of ceremonies awaited us with some cold beer, wine (not cold) and some nice snacks. While everybody was enjoying a drink, I seized the opportunity to do some of my magic tricks (yes, I'm a magician) for the small group of people I was talking with. Pulling a string of more than 4 metres out of my mouth was quite strange in this setting, but in the end the audience enjoyed it. At 5pm everyone went home, while the committee made sure the building was left in the same state as at the start of the day.

And with that, the Kick Off Day came to an end, which, according to many tour participants, was a roaring success!

Hal Investments

22-05-2017

By Elise Groen

On Monday, May the 22nd, fourteen participants of the Honours Tokyo Tour 2017 went to Hal Investments, a private equity company with an office near Rotterdam Central station. The visit was intended to get some insight into the world of private equity, while also getting to know more about the company itself.

At the start of the visit, each student had to name a company in which he/she would like to invest money. As expected from technical students, most of them chose a technical start-up. It was explained that Hal Investments rarely invest in small companies like that, but mostly opt for long-term investments in companies that already have an outstanding reputation as a market leader. The market they are in is not that important, their stability and top position all the more.

After a short presentation, we were divided in groups of 2 to 3 people and the private equity game started. In a game consisting of 3 rounds, we experienced how hard it can be to decide which company to invest in. The first round was about finding the right pieces of text to describe the company's position and stability. The second round was interesting, as this part was based on the decision to put their company GrandVision on the stock market for 20% in February 2015. We had to estimate the selling price per stock when it went on the market, applying the theory Hal Investments explained. The third round was the most challenging, as each group was given a budget and market share we wanted to have of GrandVision. Each group had to buy stocks by offering a buying price and an amount of stocks to the bookmakers. Once every group had done so, not knowing what the other groups had agreed on, the bookmakers came with the set market price. The groups who bid below this price didn't get any stocks, and therefore had to buy more in the next round. It was like supply and demand in an economics class.

After the private equity game, we went for some drinks in a bar close by. Over drinks we had the opportunity to talk with some of the employees of Hal Investments. It was very interesting to see that most employees had totally different backgrounds, unrelated to economics. As the drinks went on, the tour participants went home one by one, back to the beautiful city of Delft.



*On our way to
Hal Investments*

Day 1&2

11 & 12-07-2017

By Sander Leussink, Bruis van Vlijmen, Elise Groen and Kasper Spoelstra

Departure to Tokyo

Gathering at Schiphol

Tuesday the 11th of July was the day that the twenty selected TU Delft Honours students embarked on their trip to Tokyo. The research regarding Future Engineering in Japan had already commenced at the kick-off day, a couple of months before. After preparatory research in the Netherlands and the sharpening of our research and interview questions, it was finally time to start the field work and visit the land of the rising sun.



The group of 20 TU Delft Honours students embarking on their adventure to Tokyo

For the majority of the group, the tour started at Delft station at three o'clock in the morning. For some this turned out to be a very early start, for others, a very late end, depending on one's the decision to take a nap beforehand or to save their sleep for the long flight. The entire group was united at Schiphol Airport, and it was time to take a group picture, the first of many.

From Schiphol to Rome

The first leg of our journey brought us to Rome, as the airline of choice had been Alitalia – which filed for bankruptcy just after the booking was made and is most probably defunct by the time you're reading this. Luckily, this had no effect on the flight operations, apart from the slightly grumpy airline

crew. Upon arrival in Rome, the group had a generous six hours to catch the connecting flight. They were filled with playing card games, solving puzzles in the programme book, watching Kris the magician and shopping for a replacement for already torn trousers.

From Rome to Tokyo

At 1.15pm it was time for the twelve-hour flight that would take us to Tokyo. Ample opportunity for the 20 chosen ones to catch a couple of movies, play Tetris and get to know one another. Upon arrival at Narita Airport in Tokyo in the morning (of the following day), the risen sun welcomed us with some pretty intense morning rays. After picking up our luggage (which unfortunately was not possible for Sander) and buying travel cards, some of the group tried their first Japanese food for lunch - nigiri, a triangular shaped lump of rice stuffed with different kinds of fillings, wrapped in sheets of nori (samgak-gimbap). It turned out to be such a convenient kind of sushi that nigiri were consumed many more times for lunch that week. After this we took the train to our hotel. The walk from Nippori station to our hotel was the first time we got confronted with the overwhelming heat and humidity, a heat that most of us took several days to get used to.

Neighbourhood of Nippori

After a total travel time of two hours, we arrived at our hotel. The Sakura Hotel Nippori was truly brand new - it had only opened one week before our arrival. It is situated conveniently in between Nippori Central Station and Sendagi metro station in a very nice and quiet neighbourhood with convenience stores on every street corner. After some time at the hotel, the group spread out and made its first acquaintance with the Japanese city. The area surrounding our hotel was very traditional. In the main street between our hotel and Nippori station, called the Yanaka Ginza Shopping Street, many traditional Japanese street food and souvenir shops create an indescribable ambience.

The flavours of yakitori (skewered chicken), takoyaki (octopus balls), yaki onigiri (fried riceball) and fried chicken snacks can be savoured here. In the surrounding area, some of the many temples with their cemeteries and Japanese gardens were visited. Then there was a restaurant where they served ice straight from the mountains. After shaving the ice, it is served with milk and a syrup of choice. Whilst walking these streets, we noticed that many people cycle or walk. When we blocked the entire footpath by walking next to each other, a Japanese cyclist waited patiently behind us, until we noticed him and moved out of the way. It was one of the many occasions that showed us how polite, kind and calm Japanese people are.

The first dinner in Tokyo

The group met again for dinner at a nice little restaurant next to Sendagi station. This restaurant is a so-called izakaya, which can be described as something in between a bar and a restaurant, serving different kinds of alcoholic drinks and small plates. As it was the first day in Japan, learning to eat with chopsticks was an adventure in itself for some. Also, some dishes turned out unexpectedly different, as the 'omelette rice' had Italian spaghetti in it and the presumed 'chicken nuggets' turned out to be fried bread-crumbed chicken bones. It was also the night that some discovered sake and good sushi. A great start to everything yet to come!

⁵ <https://www.sakura-hotel.co.jp/nippori>

*The first dinner in Tokyo.
It was a great success!*



Day 3

13-07-2017

By Frank van der Klift and Jun Feng



Left: Christian synchronizing with the WALKMATE-LAB exoskeleton.

Right: Brave Bruis having his brain activity scanned in real time.

WALK-MATE LAB, Tokyo Tech, and Cartivator

WALK-MATE LAB

We started this busy day with a long, early commute to the Tokyo Institute of Technology (Tokyo Tech) Suzukakedai Campus for a visit to WALK-MATE LAB. We bravely endured our first packed rush hour subway and were welcomed very warmly (especially considering our formal dress code and Tokyo's hot summer) by the WALK-MATE LAB staff.

At WALK-MATE LAB we were introduced to professor Miyake and his students. Through several presentations with interactive elements we got a greater understanding and even first-hand experience of the purpose of the WALK-MATE LAB. The main objective is the development of an exoskeleton that assists disabled patients (e.g. with Parkinson's) in a fast and autonomous recovery by supporting their stroll. The exoskeleton exerts little force and tries to synchronize the patient to a fixed pace. Being able to try this out ourselves was a unique experience!

Another project we were presented with was the mapping of walking patterns by measuring ankle and hip motion with wireless ankle sensors that determine the state of health and/or age. Also, research on the interaction between humans and robots was demonstrated. Finally, one of the assistant professors was working on a device that is able to read frontal lobe activity, which is subsequently translated into sound (it's a feature). Only one Honours student was brave enough to try out the scanning device.

Tokyo Institute of Technology

After a tasty bento box lunch, we headed to the Ookayama Campus of Tokyo Tech. We were welcomed by a very impressive number of professors and deans, who introduced us to Tokyo Tech and its international programs. We then conducted some very fruitful interviews on our research topic.

A great article on our visit, in Japanese, can be found on <http://www.titech.ac.jp/news/2017/038873.html> (Translated with the ever puzzling Google translate: “The party, is composed by talented students who hit the top 5% of the Delft University of Technology, visited Japan for academic institutions and leading edge companies [...] as one of them, and the University of 3 Academy I hoped for a discussion on.”). We ended the visit with a tour of the Tokyo Tech Library, nicknamed the Cheesecake.



Cartivator

Our last visit of the day was to Cartivator, a Dreamteam-like project at Keio University aiming to realize the “world’s smallest flying car SkyDrive”, which will possibly be exhibited at the Tokyo Olympics in 2020. The founder of Cartivator, Mr Nakamura (whose birthday it happened to be that day), welcomed us warmly and showed us around the campus, pointing out the statue of the founding father of the university, who is portrayed on the current 10000-yen banknotes.



The presentation about Cartivator was very informative and focused firstly on the team, after which several of the prototypes and the design process were covered.

The discussion that followed gave us a lot of insight into startups in Japan, with many questions from our side about future plans, drone/car regulations, and manufacturing. We ended our tour with a nice dinner at the British Pub, located on the Keio campus.

*Top of the page:
Having fun with our confident Keio student guide at the British Pub.*

Shibuya Crossing

Despite the exhausting day, most of us managed to switch into tourist-mode and went to see the famous Shibuya Crossing in the evening. The crossing was busy as always but fortunately the shiny advertisement displays looked even prettier by night. We all split up to enjoy the flashy streets and we tried to get back to the hotel before the last subway. Our two (adventurous) electrical engineers (Jun and Simon) managed, by accident, to miss the subway and had to walk 45 minutes back in the warm Tokyo night breeze.

Below: The Tokyo Tech library.

*Bottom left:
A group photo taken during our visit to Tokyo Tech*

Bottom right: Long-exposure shot of Shibuya’s Crossing



Day 4

14-07-2017

By Damian Bouwmeester and Kristian Blom



KEK and the alumni dinner

The Nezu shrine

There it was, the second day of our stay in Japan. Most of the group decided to sleep off their jet lag and get some well-deserved rest before our 9.30am wake-up call. Some people however decided to wake up a little earlier to visit the nearby Nezu shrine, one of the most important Shinto shrines in Tokyo. The atmosphere was serene and distinctly different from bustle of the surrounding city district.

KEK

The day program started at 10.45am. Everybody gathered in the hotel lobby on time and we departed for KEK, a high energy particle accelerator research organisation. This institute is the largest particle physics laboratory in Japan. The journey to KEK marked the longest trip of our tour. We departed to Tsukuba by train, leaving Tokyo behind for half a day. Once we arrived there we took the appropriately named 'Tsukubus' to KEK. We received a warm welcome at KEK and were shown an impressive promotional video of the facility. Next, we got to see two of KEK's research facilities. The first was the synchrotron radiation research facility, called the Photon Factory. Here, (pulsed) X-ray radiation, derived from accelerated protons using a particle accelerator, is used to study all kinds of materials and structures, in particular metals, crystals and biological material.



Top: Some torii gates near the Nezu shrine

Bottom: The Belle II detector which is currently under construction

We were shown the hall where multiple experiments are done. The rooms in which the experiments take place are insulated by metal, with robots performing many experimental procedures. After the Photon Factory we visited the Belle detector, where KEK's best-known project takes place, the Belle experiment. The Belle detector is a typical particle detector, consisting of multiple layers of separate detectors that allow researchers to determine exactly what kinds of particles travel through it.

In the experiment performed at this facility, electrons and positrons are collided in the detector, whereby many new particles are created. The Belle experiment was designed to create certain particles, called B-mesons. These B-mesons are able to oscillate between their matter and antimatter forms and are used to study CP violation, the violation of the symmetry between matter and antimatter. After witnessing the impressive Belle II detector that is currently being constructed, we went on to an exhibition of particle accelerator components. A group picture concluded our visit to KEK.

The University of Tsukuba

After this interesting visit to KEK, we went to Tsukuba station and made our way back to Tokyo. Since we had some free time, everyone went their own way; some people decided to go back to the hotel for a nap, others went sightseeing in Tokyo. Gabriele, Aleksandar and I (Kristian) visited the Tokyo branch of the University of Tsukuba as a friend of Aleksandar (Takuma) was doing his master in neuroscience there. The University of Tsukuba is one of the oldest national universities with the main campus in Tsukuba covering an area of 258 hectares, making it the second largest single campus in Japan. After a short bus trip, we arrived at the campus where Takuma was waiting for us. We went to the lab where he was doing his experiments for his final master project. Before entering the chaotic but remarkable lab, we had to take off our shoes, a common practice in Japan, and put on a pair of sandals (mine were pink). After the lab visit we went for a walk in the beautiful university grounds.



A Japanese dinner would not be complete without some Japanese Sake

The alumni dinner

After our university visit it was time to go to Ueno station to meet six alumni from TU Delft and TU Twente. It took some time before the group was complete as Ueno station is very big. After twenty minutes we went to the restaurant where the dinner party took place. During our meal we had some interesting discussions with the alumni, ranging from 'doing a PhD' to Japanese culture. Afterwards some people decided to go out for karaoke. We found a bar nearby, and within no time, a nice drink in hand, we were singing 'Baby' by Justin Bieber. After the karaoke, Sander, Aleksandar, Laura and I decided to be healthy and walk back to the hotel, which took us 30 minutes. Back at the hotel, I had a usual late-night chat with Christian and Gabriele in our room. Then it was time to get some sleep and dream about high energetic synchrotron photons and karaoke songs.

Day 5 15-07-2017

By Jamie Ongkiehong and Willemijn van der Elst

Our first free day - Sightseeing in Tokyo

Saturday was our first day off and the students were free to spend it as they wished. Although this report focuses on the activities of a group of seven students, the rest spent their time only slightly differently.

The fish market

We started our day at the very busy and impressive fish market in Chuo Tsukiji. We wandered around the streets and looked at the different kinds of food, some of which we didn't recognize at all. We also witnessed a tuna filleting show. There is almost no criminality in Japan, which made for the strange experience of walking



around in extremely busy streets, but still not feeling the need to worry about your wallet or your bag.

In the same neighbourhood, we discovered the Tsukiji Hongan-ji, a Jodo Shinshu Buddhist temple. We decided to pay it a visit just as a ceremony with song and prayer was going on - a very special experience.

Visiting other districts – Cat café, the golden gai, and the government building

After visiting the temple, we took the metro to visit other neighbourhoods. First, we went to Shibuya, a shopping district with a cat café, another unique and fun experience. Cats were wandering around and climbing over your head as you were drinking your coffee. The best part, however, was the fact that everyone had to wear kitty ears!

Afterwards we visited Shinjuku, a neighbourhood with more eccentric shops and a lot of ice cream and sweet shops. Part of the area is called the Golden Gai, composed of a network of six narrow alleys, connected by even narrower passageways which are just about wide enough for a single person to pass through. Over 200 tiny shanty-style bars, clubs and eateries are squeezed into Golden Gai.

The metropolitan government building is also located in Shinjuku. We went up to the 45th floor where we had an amazing view over Tokyo. We then visited the South tower, which provided a slightly different view at Tokyo compared to the government building.

After a considerable amount of walking we took the metro to Asakusa and visited its famous red Senso-ji temple. This temple has one of the most famous shrines of Tokyo. A Japanese tradition at this temple is to 'shake your faith'. Willemijn used the opportunity to do just that. With a question in mind, she had to shake a box of numbered wooden sticks, take one out, and get an answer from the corresponding drawer.

Dinner and the electric district

We took a little break in the heart of Asakusa, after which we decided to have dinner in Akihabara, the electric district. We went to a typical Japanese restaurant, with the menus entirely in Japanese. Choosing the right food was therefore more difficult than expected, so we decided to go with dishes recommended by the waitress, some very interesting and unusual.



Top: A tuna filleting show at the fish market. Look how big that tuna is!

Middle: Visiting a cat cafe in the Shibuya district, meow!

Bottom: Brui, Sander, and Roline taking a picture from the 45th floor of the Japanese government building



After dinner we decided to go for a wander. The electric district is well-known for its game halls and manga anime. The halls are very big, with around six differently themed floors, where during our visit mainly Japanese men played games at unbelievable speeds. Unfortunately, a lot of manga arcades were closed already, so we have yet to find out why the Japanese are so fascinated by this particular style of animation. After a visit to one of the gaming halls, we went back to the hotel to get some sleep.

Day 6 16-07-2017

By Roline Montijn and Mees Poppe

A visit to Kamakura, swimming in the Pacific, and karaoke

The city Kamakura

Having enjoyed our first day off, everyone more or less agreed on visiting Kamakura, a small city west of Tokyo known for its temples and the Giant Buddha. Half of the group was led by our lovely couple Damian & Elise, who should consider pursuing a career in tourism: "If you want to travel fast, go alone. If you want to travel superfast, go with Damian and Elise!" - Christian Sabater Campomanes. Lone ranger Alexander decided to climb Mt. Fuji instead. Reportedly it was very cold and exhausting, but with an amazing view at sunrise!

Kamakura has a lot of must-sees. The biggest attraction is the Giant Buddha, with a height of 13.35 meters and an admission fee of 200 yen. The small city is surrounded by about 15 temples. The group's favourite was the Hokokuji Temple, set in an impressive bamboo forest with heights of up to 25 metres! Other temples we visited were the Hasedera Temple with a beautiful garden, Engaku-ji Temple, Kenchoji Temple, the biggest zen temple of the district, Tsurugaoka hachimangu, and the Shinto Temple.

Swimming in the Pacific

Like every day, it was about 35 degrees, so everyone's forehead was dripping with sweat. After visiting the highlights of Kamakura, we ended up on the beach where we went for a delightful swimming party in the Pacific Ocean, after which Kristian participated in a relaxing yoga session with some local Japanese.

Karaoke time

Even though the group was a little scattered around Tokyo and its surroundings during the day, at dinner the group was back together again. The tour committee had arranged for a nice dinner followed by some classic karaoke. Who Run The World?



Having dinner in the electric district. Although the food was a bit hard to order, the drinks were easy as usual (beer = beeru)



Top: Daibatsu - 'the great Buddha'

Bottom: Daily report crew (Mees and Roline) on the beach

Left / right: A nice dinner with the group, followed by some sweet karaoke



Day 7 17-07-2017

By Carolien Arensman and Sanne Beckers

Kengo Kuma Architectures, the Dutch Embassy, and the lantern festival

Kengo Kuma Architectures

After a weekend of sightseeing, it was time to get back to business. We arrived early at our destination so we had a chance to start our day at Starbucks. This chain can be found in many places in Tokyo, which made us think the Japanese must like more than green tea alone!

We started the day at Kengo Kuma Architects on their rooftop with great views over the city. Then we were shown around the office by two of the architects, Adrian and Kevin, who told us a lot about the way things work at Kengo Kuma. For example, they explained that the company works a lot with miniature models of the buildings they design. This helps architects to envision how a building can be constructed at an early stage and whether it looks good from all angles. Kengo Kuma sometimes also uses more than one design (notably in the concept phase), to better understand the wishes of the client. This way the client can indicate more clearly in what direction he or she prefers the final design to evolve.

Furthermore, we got a better idea about the day to day business of the company. Most architects work in small teams on around nine projects at the same time. The office has an international vibe (not very common for Japanese companies), with architects from all over the world. The reason behind this is that Kengo Kuma likes to get a lot of different ideas to present to clients. Kengo Kuma has their own style they want to protect, yet at the same time they are keen to keep developing.

Dutch Embassy

In the afternoon we visited the Dutch Embassy in Tokyo. This little sanctuary with a lane of old trees constitutes a little piece of the Netherlands in Tokyo. So how did the Dutch get hold of this fantastic place? We need to go back in history a bit for the answer to this question.

From 1642, Japan was closed off from the rest of the world for more than 200 years. Until 1853 only some Asian and Dutch merchants were allowed to trade with Japan in designated areas. As sole traders from the western world, the Netherlands managed to form a special bond with Japan, which is one of the reasons it has such a beautiful embassy in Tokyo.

At the Embassy we got a short lecture on how the Dutch Embassy helps with trade relationships between Japanese and Dutch companies. As an example, in 2011 Japan was struck by an earthquake, which caused the nuclear disaster in Fukushima. As a result, all nuclear power plants were closed. The Embassy focussed on how to fill in the energy gap with more reusable energy options, and how the Dutch energy industry could assist. Solar energy was one of the options discussed.

Although we have this very old, very special connection, Japan is not a popular place for the Dutch to go and work. We were greatly surprised that there are only 500 Dutch people who live in Japan. It meant that we probably met 5% of the Dutch population in Japan during our trip.

Lantern Festival

This year, Marine Day, a Japanese national holiday to celebrate the ocean's bounty, fell on the 17th of July. To honour the ocean, a beach in Tokyo was filled with hundreds of lights. This beautiful event is called the Lantern Festival, and we decided to give it a try. Getting there was an experience on its own, as we had to take one of Tokyo's monorails. The monorail has no driver, so we were all fighting for the front seats, which provided beautiful views over the city.

Once at the beach we saw a whole different side of Tokyo. There was no noise, no flashing lights or people in suits. Instead the atmosphere was relaxed, with children running around and people enjoying their drinks on the beach. It didn't feel like the big city anymore.

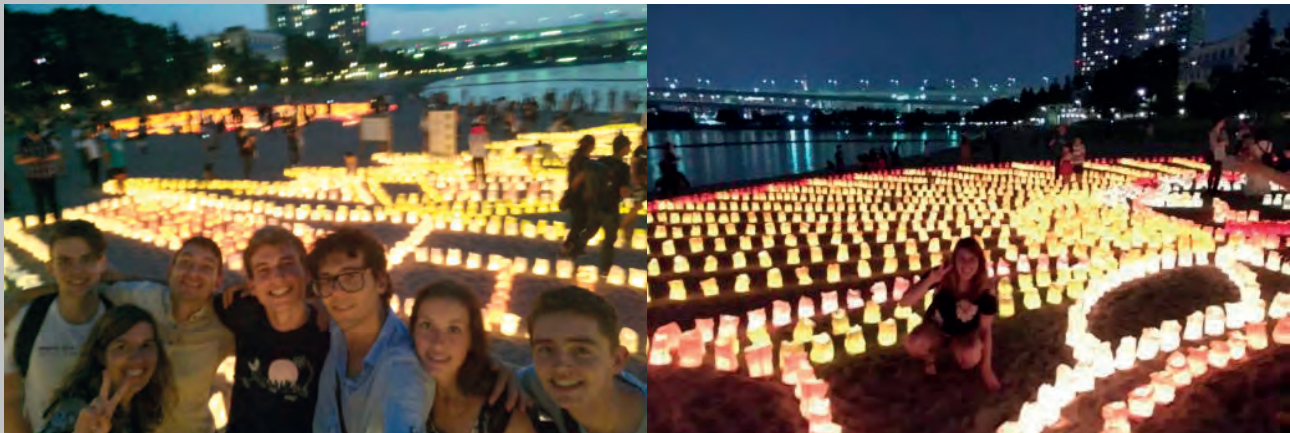
The lanterns were coloured (red, blue, white and yellow) paper bags with a candle inside. Sometimes children played with the lights and the bags would go up in flames, but they were easily put out with the sand. The lights formed different symbols, which were captured and projected by a drone. We recognised a lady with a crown, a temple and symbols for luck. All in all, it was a beautiful and very photogenic spectacle.



Top: Starting of the day at Starbucks

Middle: Group picture at Kengo Kuma Architects

Bottom: The green lane of the Dutch Embassy



*Beautiful lantern figures
at the lantern festival*

Day 8 18-08-2017

By Dominique van Cuilenborg and Gabriele Kockelkoren

Rakuten and the Earth-Life Science Institute (ELSI)

Rakuten

The 8th day of our tour was a very busy one. We started our day with something we had grown accustomed to - playing real-life Tetris in the Tokyo metro. It took us about an hour to arrive at our designated location, Rakuten HQ.

Rakuten is a very well-known company, especially in Japan. Recently, however, they have been trying to expand into the western market. One way to become known in the west is to become the shirt sponsor of one of the most famous football teams in the world, FC Barcelona. At Rakuten, we were first given a short presentation about the company and its goals. Rakuten tries to provide its customers with a wide variety of services, all accessible through a single account.

Then we conducted some very interesting interviews with a few of the company's leading employees, which provided quite some food for thought.

To conclude our visit, we were shown around the offices of Rakuten, where they have a gym, a huge cafeteria and even a hairdresser. A group picture in the lobby of Rakuten HQ was, obviously, a must.

Earth-Life Science Institute

After the amazing visit at Rakuten, we went on to the Earth-Life Science Institute (ELSI), which is part of the Tokyo Tech Institute of Technology. At ELSI we had a typical Japanese bento consisting of rice, tofu and fish.

As honours students, we obviously had to leave some complicated calculations on the chalkboard! After lunch we split up into our research groups and conducted our interviews with one of the leading professors at ELSI.

On our way back, we were greeted by a pretty big storm with heavy downpour and a lot of lightning. As it was the rainy season, we were actually surprised that we had not seen much rain before.

Dinner in Ikebukuro and the Akihabara district

After getting back to the Sakura Hotel in Nippori, the group split up and different neighbourhoods of Tokyo were explored. In our case, Ikebukuro. It is one of the many city centres of Tokyo, offering plenty of entertainment, shopping and dining opportunities. We decided to enjoy a typical Japanese dish called Sukiyaki. This exquisite dish is prepared and served in a nabemono (a Japanese hot pot). In this hot pot, thin sliced meat is cooked and simmered at the table in combination with vegetables and tofu. The hotpot contains a mixture of soy sauce, sugar and mirin that can be refilled endlessly. An open buffet provides all of the vegetables you desire. Our dinner was concluded with a delicious peach and milky banana ice cream.

After dinner, we dove into the gaming arcades of the Akihabara district and got an insight into the nightlife of Tokyo. Apart from karaoke bars, entertainment in Japan is characterised by arcades, where skilful players expertly navigate the many games with dexterous hand movements. Kristian and Christian played a game of Pokémon for a mere 100 yen.

One of the gaming arcades we visited was a 7- storey building, with each floor specialising in a specific type of game. One of the floors, for example, consisted solely of music games, another of racing games. The top floor was dedicated to manga and cosplay. Here, Jamie fulfilled a dream to dress-up as a manga character and take some memorable pictures in a photo booth.



Top: Group picture at Rakuten HQ

Middle: Calculations and impressive drawings on the chalkboard of ELSI

Bottom: A typical Sukiyaki dinner

Left: Christian and Kristian playing Pokémon in one of the numerous game arcades of Tokyo

Day 9

19-07-2017

By Christian Sabater Campomanes and Aleksandar Petrov

Axelspace and EY

Axelspace

The day started with a visit to Axelspace, a start-up company that builds microsatellites for Earth observation. Our host there was Yoshihiro Ohta, an employee at Axelspace. This aerospace engineering related company not only deals with the design, manufacture and production of spacecraft, it also handles the launch arrangement and operations.

Although currently Axelspace mainly focuses on building the hardware, the team envisions data processing and analysis to become an important aspect of their future activities.

An example of an already existing satellite system built by Axelspace is WNISAT, commissioned by Weathernews Inc. The main mission of this satellite is to monitor sea ice in the Arctic, so new ship routes can be reliably utilised. For example, going through the Arctic sea reduces the distance from Yokohama to Rotterdam by one third: from 20000 km to 13000 km.

Their flagship project, however, is Axelglobe. It consists of a proposed system build-up of 50 microsatellites providing daily coverage of the whole Earth. Axelglobe will be used in fields like precision agriculture, optimal harvesting, illegal deforestation, marketing, ports management and disaster prevention.

EY

In the afternoon, we visited the Tokyo office of EY (Ernst & Young), where we were presented with some insights into EY and the working culture and environment in Japan, which were in line with observations we had made in previous days.

Interestingly, EY Tokyo comprises a relatively international community. Thanks to cooperation agreements, resulting from EY's global structure, a number of employees from EY offices outside Japan temporarily join the Tokyo office from time to time. Furthermore, a number of international projects are handled there, mainly by international staff. These projects deal with foreign companies in Japan and Japanese companies on the foreign market.

We then had the opportunity to interview several EY staff members. Divided into smaller groups, we had a chance to get yet another point of view on our research questions. The feedback about the interview seemed to be very positive from both sides, with the interviews running well over the scheduled coffee break.

Finally, we were shown around the offices of EY, an exciting opportunity to see a typical corporate working environment in Japan for the first time. A curious fact was their recently implemented "green office" initiative, consisting of buying artificial plants to



Top: The group waiting in the Axelspace conference room, ready for an interesting presentation of the company

Bottom: Having some informal conversations with the EY employees

give “life” to the office. Our hosts were more than welcoming and readily answered all of our questions.

The final evening in Tokyo

Our last evening in Tokyo involved all of us having dinner. As we had come to know each other so well by this point, lots of jokes and stories accompanied the meal, making it an especially funny evening. There were a few closing speeches and several of the group members had brought some gifts for the organising committee. There was also a small intercultural exchange with a group of Japanese girls at the neighbouring table when Kristian performed some magic tricks on them.

For most people the night ended in the karaoke bar located in the same building as the restaurant, where they sang their hearts out till dusk. Others decided to spend their last night in Tokyo outside in Ueno park, where karaoke was had as well, this time under the starry skies. Both parties made sure they made the most of the night.



Top: Our final dinner in Tokyo

Bottom: Ending the day with some karaoke. Here we see Kristian and Willemijn putting some emotion in the song that they are singing

Day 10 20-07-2017

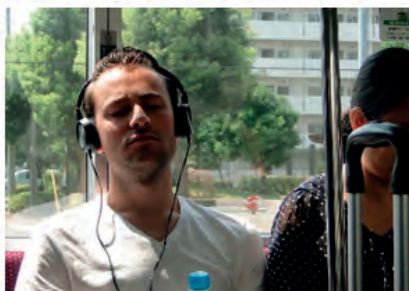
By Laura Arkestijn and Simon Verkleij

Back to the Netherlands

Not enough sleep

The first five hours of the longest day of this trip were spent singing in the karaoke bar. As we knew by now how to get the best deal for an excellent karaoke night, we decided to make this session the longest and most memorable of all. We learned the lyrics to many songs and had tons of fun with the awesome friends we had made during this trip

After the shortest of sleeps, we woke up at 7am when, unfortunately, it was time to leave this beautiful country. As we had already packed the day before, we quickly left the hotel for an (approximately) 24-hour trip home. The metro provided us with a nice opportunity to get some more sleep and to safely store the innumerable impressions of Tokyo in our minds.



The flight back

We still needed to check in at the airport, which resulted in the group being scattered over the entire plane. Miraculously, Gabriele and Simon managed, via a complicated telephone system (on the backs of the chairs) that involved some calculated guessing, to miraculously connect with everyone so nobody felt all too lonely.

After a 12-hour flight, we arrived in Rome where we caught our connecting flight to Amsterdam with time to spare as everyone had made contingency plans to get to the plane on time. At Schiphol, it turned out that all our suitcases had made it safely home as well, so from my point of view, this travel day could not have gone any better.

We said our goodbyes to those who were being picked up, and travelled to Delft with those who were taking a train. As it was already midnight, we wished each other a goodnight, knowing we would see each other at the soon to be organised reunion.

*Left page:
Tired people on the way
to the airport, more tired
people in the metro*

*Bottom: Getting some more
sleep in the airplane*





Large billboard advertisement for H&M featuring models in black outfits. The H&M logo is visible at the bottom of the ad.

Vertical billboard for GENERATE featuring a woman's face. Below it are signs for CONTACT and Café. At the bottom, an AEON sign is visible with the text "英会話イオン".

Small H&M logo sign.

Large square billboard for UC (United Card) featuring the UC logo, Mastercard, and VISA logos.

Billboard advertisement showing a woman in a white coat, possibly a medical or healthcare ad.

Vertical billboard for Hisamichi Salon (Hisamichi サロン).

Yellow billboard advertisement for "女子が青春" (Girls' Youth) with the text "LIVE WITH US" and "2013.10.15 RELEASE".

Vertical sign for "もんじり" (Monjiri).

Vertical sign for DH Channel with a "No Pedestrian" symbol.

Vertical sign for "essential" with a colorful logo.

Vertical sign for "本" (Hon) with "11時" and "地下" (Underground).

Billboard for "西村" (Nishimura) featuring a green logo and fruit illustrations.

Billboard for "Euphoria" with a woman's face and the text "Euphoria".

Vertical sign for "777" (Seven Seven Seven).

Large billboard advertisement featuring a man's face and the text "大盛" (Daisho).



Epilogue

*By Kristian Blom, president of the
Honours Tokyo Tour 2017 Committee*

Dear reader, perhaps you have read this report from cover to cover, or maybe you simply flicked through and saw some of the pictures. Either way, I am glad that you have experienced something of our unforgettable nine day-trip to Japan. The Honours Tour Committee put in a lot of preparation and hard work, and I can safely say that the Tokyo Tour 2017 was a great success!

Although it is impossible to capture all of our experiences and the many memorable moments in this final report, I can say that we shared this journey with a fantastic group of people, ranging from second year bachelor students to near-graduates. Their interests wildly varied, from elementary particle physics to start-up companies in the aerospace industry. This variety made for many interesting conversations and questions (perhaps a little too many at times, but all out of enthusiasm of course) during our company visits.

I would like to thank everyone who contributed to the success of the Honours Tokyo Tour 2017, with a special thanks to my fellow committee members. They showed me that no matter how many setbacks you encounter (and I can't lie, there were quite a lot in our case), as long as you feel responsible and stay dedicated, you can succeed. With that in mind, I would like to end this report with a reflection that I hope will be helpful to others one day:

Responsibility is not a feeling that comes naturally. You have to decide to take responsibility and, even when things don't always go the way you want them to and spirits are low, keep yourself motivated.

Colophon

This final report has been put together entirely by the Honours Tokyo Tour 2017 committee and contains reports written and pictures taken by the tour participants. We would like to thank everyone for their effort and contributions.

Acknowledgments

Honours Tokyo Tour 2017 Committee

Kristian Blom - *President*

Elise Groen - *Treasurer*

Reindert de Reuver - *Secretary*

Bart Duisterhof - *Acquisition*

Sander Leussink - *Qualitate Qua*

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