Internship Report

atp=

Emil A. Overbeck [1]

Contents

1 The Company

ATP was introduced by the Danish Parliament in 1964 with the purpose of providing Danes with a state pension supplement. Today, ATP covers most of the Danish population who put money aside for their pension via ATP Livslang Pension.

– ATP 2020 annual report introduction

1.1 Overview

Today, the ATP Group is Denmark's largest pension company and Europe's fourth largest.[1] It is based in Hillerød and has around 3 000 employees, most of which currently work from home because of the pandemic. ATP has since its creation expanded into a private financial processing and investment enterprise which conducts billion-krone long term investments in Danish companies through its 26 subsidiaries. The company recorded its second best financial results ever in 2020, sustaining the Danish economy despite the effects of COVID-19.[2]

In 1973, ATP began its processing business, which would eventually expand to a variety of labour market schemes. From 1990, the Danish Parliament began a series of amendments to the ATP Act which included improved benefits to ATP members, and the addition of more groups not in the labour market to ATP schemes. In 2011, the Parliament selected ATP as the manager of the welfare state's core benefits and it now handles state pensions, disability pensions, rent subsidies, maternity/paternity benefits and family benefits. The company is now Denmark's largest provider and administrator of welfare and social security schemes.[3]
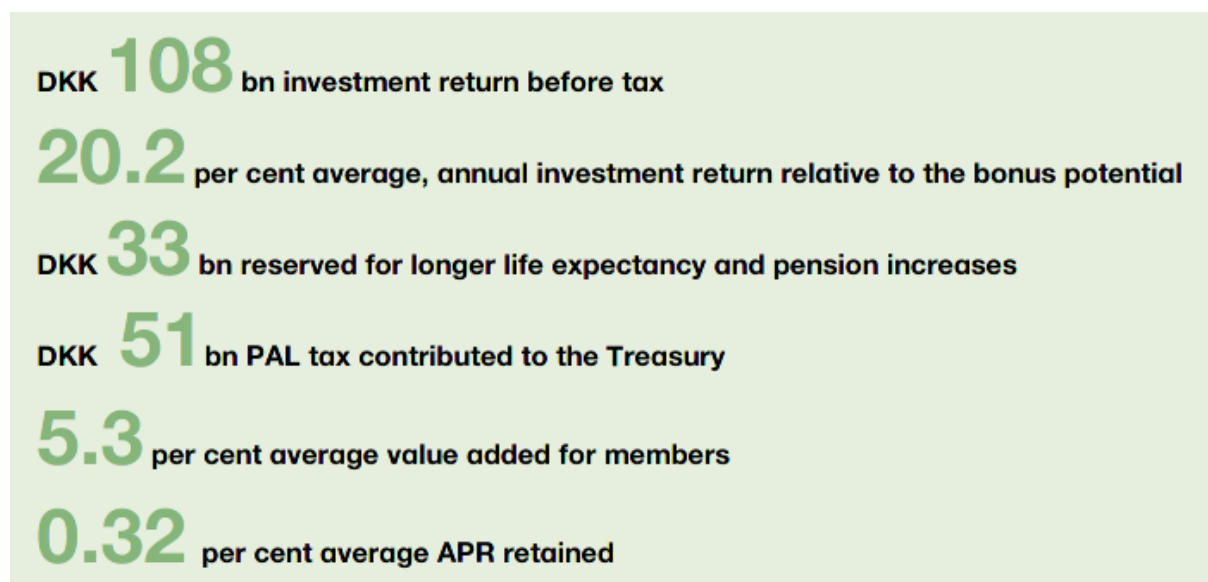
1.2 Structure & Organisation
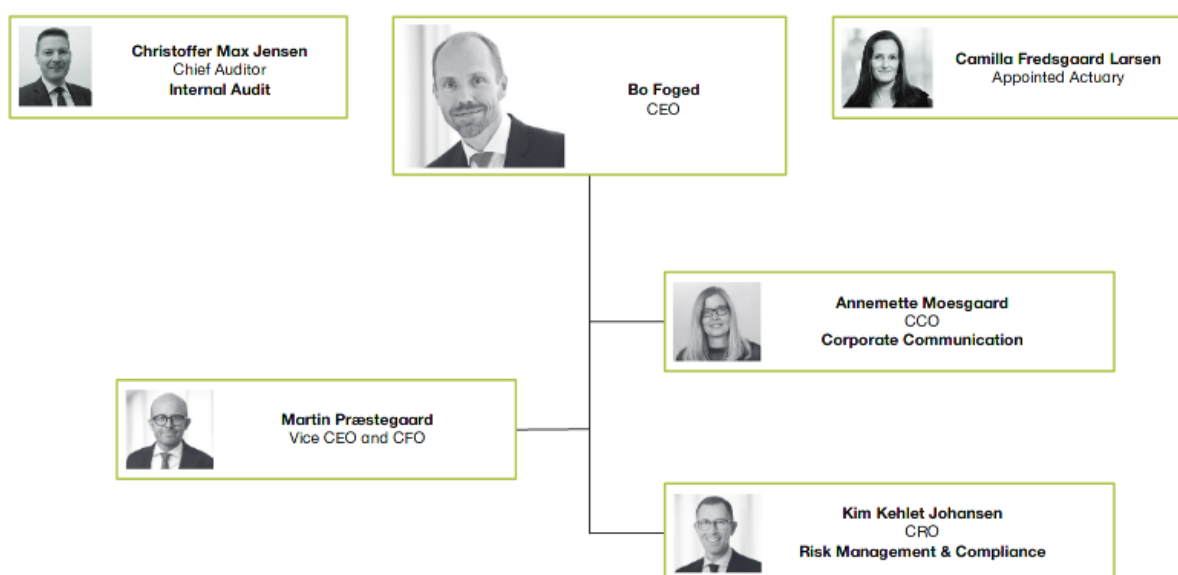
ATP's executive structure[2]

The company is divided into two business areas: Pensions & Investments and the Processing Business. Both ultimately report to ATP's Supervisory Board. There exists a number of general departments similar to those present in most companies: Legal, Communication & External Relations, HR, Finance, IT, Sourcing & Contract Management and Risk Management & Compliance. The Internal Audit and Actuarial Department are completely separate from this structure and report directly to the Supervisory Board.[2]

ATP Livslang Pension (Lifelong Pension) is simultaneously managed by a Board of Representatives, the Supervisory Board and a CEO because of the critical nature of this department as a mandatory and lifelong service for all Danish citizens.[2,4]

Within the Processing Business, there is a "Systems Architecture" team of seven people into which I was admitted during my internship. To understand the purpose of this activity, we must consider the entirety of the company's structure and organisation. In essence, the stakeholders set the overall goals and requirements to be implemented by the technically competent divisions. However, in the realm of IT and communications, an intermediary step may be required to translate and divide these goals into practical schemes which can be directly implemented by developpers, designers and others. In simpler terms, systems architects determine and describe the requirements and course of action to be taken in order to achieve an overall goal. They may also abstract and break down the functions and interactions of a system into an "architecture", which allows these systems to be assessed and optimised.[5] Hence, this profession is of crucial importance to a large and complex enterprise such as ATP. These concepts will be further illustrated and detailed via my experience in subsection 2.1.

1.3   Financial Overview

DKK **108** bn investment return before tax

20.2 per cent average, annual investment return relative to the bonus potential

DKK **33** bn reserved for longer life expectancy and pension increases

DKK **51** bn PAL tax contributed to the Treasury

5.3 per cent average value added for members

0.32 per cent average APR retained

Financial summary of ATP's past 5 years[4]

Analysis of these statistics, especially the DKK 108 billion[0] return on investment before tax, shows that ATP has exhibited considerable growth in these past five years. Furthermore, they report having exceeded the Supervisory Board's expectations in 2020

---

[0]1€ = DKK 7.44

for investment activities with a result of DKK 17.6 billion.[4] During the COVID-19 pandemic, the Danish government triggered a number of measures to support the economy. These measures include a recovery fund to invest in large Danish companies threatened by the crisis and a one-time payment of DKK 1 000 to over 2.2 million residents. The ATP Group was selected to manage both of these efforts, which renders apparent the close relationship between it and Danish society, within which it primarily operates.[6] In the words of CEO Bo Foged:

> *ATP has been entrusted to solve important societal tasks for the benefit of all of Denmark*

2 The Internship

ATP headquarters at Hillerød[2]

As the company operates in Denmark, I travelled there and resided near Hillerød with my relatives during the internship. My activities at ATP can be divided into two major parts: my experience with the Systems Architecture team and my work at the Help Desk, which will be detailed in the rest of this section. I was additionally given the opportunity to attend the Gartner Application Innovation & Business Solutions summit. The following is a summary of the week of the internship by day, some of which was spent at home because of COVID-19 restrictions.

1. First visit and tour of ATP headquarters, obtaining and understanding tools.

2. Assisting meetings, briefing on systems architecture and working on system diagrams.

3. (Remote) Attending the Gartner business summit.

4. Making inventory of over 150 computers and monitors at Help Desk.

5. Cancelled because of a COVID-19 outbreak, intended to be at Help Desk.

Unfortunately, events on the fifth day were cancelled because of an outbreak of the COVID-19 Delta variant in Hillerød which prompted the closure of a school.[7] Indeed, a floorball[0] game with ATP workers (to which I invited) was scheduled to occur on that date at the school gymnasium.

---

[0]A type of floor hockey with five players and a goalkeeper in each team

2.1 Systems Architecture

On monday, I was given a company laptop and a set of over 20 "system diagrams" to analyse and work on by my supervisor, Johan Overbeck. I learnt that Systems Architects create and make great use of these diagrams in order to visually break down a certain process into its component parts, and that they can be very diverse in scale and contents. They also serve to keep track of a system in its entirety and all its intricacies.
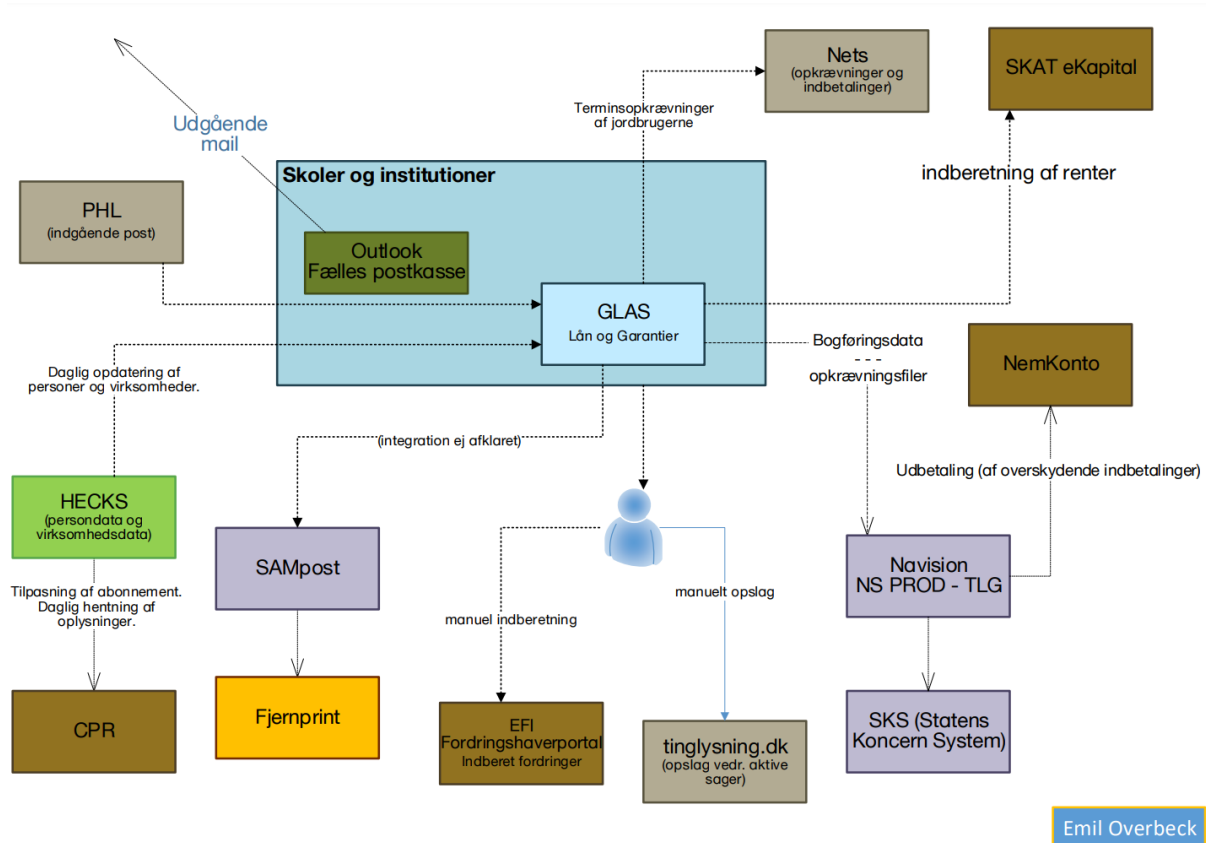

Processing diagram for schools and institutions

The above image is an example of one such diagram that I was instructed to complete while keeping it clear and consistent. It describes the financial processing service that ATP may provide to equation institutions, which involves a multitude individual modules such as Microsoft Outlook and Skat eKapital, a financial reporting service. Moreover, it describes the interactions between these services. As an example, we can see that data must be manually registered to tinglysning.dk in order for that subsystem to function, as is meant by "manuelt opslag".

The following day, I was offered the opportunity to be individually briefed by a (french) member of the team. During this one hour session, I learnt several crucial elements concerning the profession, which have been summarised below.

- At ATP, the systems architecture division consists of seven people, all of which originally worked as some form software engineer before being considered experienced enough to reach their current position. Thus, Systems Architecture requires technical expertise and experience.

- Systems architects are also responsible for determining whether a certain technology is ready for use at the company without compromising security, efficiency or practicality. This has been especially important with the advent of the Cloud and the movement to outsource enterprise computing to it.

- Communication, as in explaining the nature and effects of projects to other departments, is one of the most important aspects of the profession. The reason for this is that plans for improving company systems may "never leave the drawing board" if said departments do not see its potential benefits.
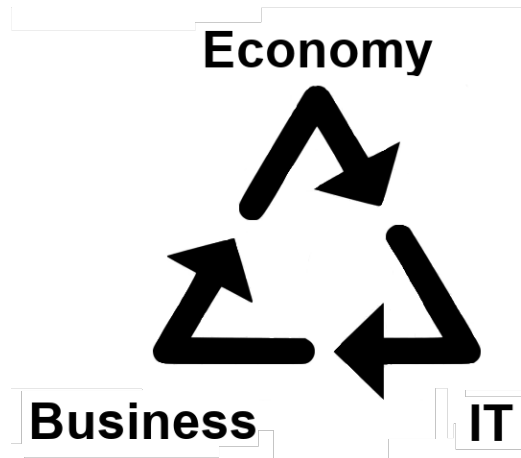
Systems Architecture triangle

- All systems are constrained by the elements above: Business, Economy and IT. I chose to present this relationship as a triangle because all of these concerns are interdependent. To illustrate, a new technology is only viable if it is useful to the business while remaining cost-effective and being practical to implement, so systems architects must take these elements into account and balance them according to the goals set by company leadership.

- To plan for possible improvement, systems architects must document where and how various technologies are used. Systems used for HR, documentation, finance etc. may consist of technologies like, Oracle Java, SAP ERP, Ruby, SQL (for database management) and much more. Many of these may be in need of replacement or streamlining so as to benefit the Systems Architecture triangle.
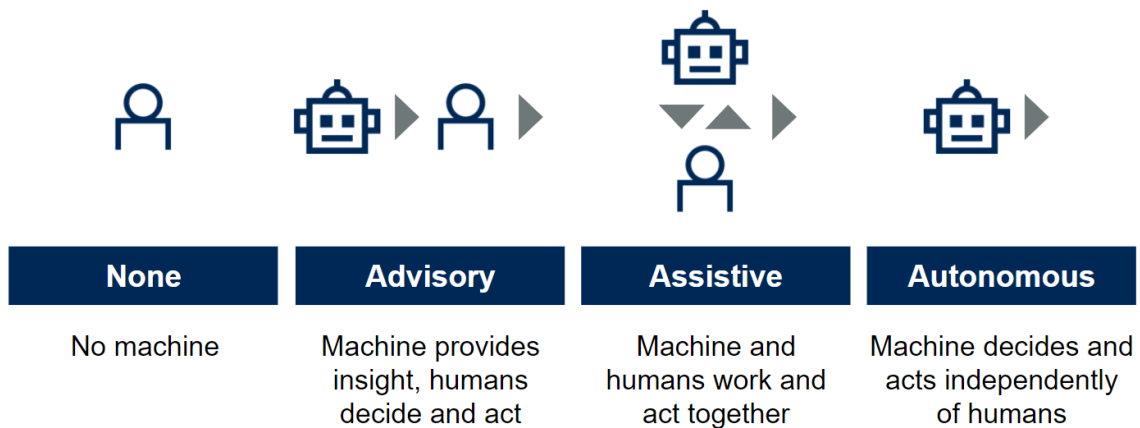
2.2   Gartner Summit

The Gartner Application Innovation & Business Solutions summit of 2021 is a series of presentations by industry experts intended to help business take full advantage of modern technologies and frameworks, like agile development and composable business architectures. This year's subject matter was "Building a Resilient Enterprise with Composable, Adaptable Applications". Thanks to ATP, I was able to attend four of these presentations on Wednesday, which have been summarised below.

1. *Delivering Resilience Through a Composability Fitness Routine*

COVID-19 proved that disruption can and will happen to all companies and illustrated that the most successful ones adapted to become more resilient and adaptable. But many were not as fortunate because they could not adapt based on rigid architectures, technologies and culture. This keynote discussed a composability fitness routine (an analogy to the human body) that can make any organization more resilient and fit for change, using elements like modularity, reusability, and autonomy.

2. *AI Engineering: How to Propel AI From Prototypes to Scalable Value Generators*

None	Advisory	Assistive	Autonomous
No machine	Machine provides insight, humans decide and act	Machine and humans work and act together	Machine decides and acts independently of humans

Degrees of machine autonomy - Gartner

AI engineering brings together various disciplines from across organizations, while providing a path to generating value by deploying the combination of multiple AI techniques. AI engineering also includes responsible AI, dealing with risk, trust, transparency, ethics, fairness and accountability. An effective AI engineering practice will increase organizations' ability to move AI projects beyond theory and into real-world applications. NASA is one such organisation: the Perseverance rover is an example of Generative AI, which can act autonomously by determining its own instructions. Indeed, the communication delay between Earth and Mars is 50 minutes, rendering necessary a machine that can react to events without human intervention.

3. *Eggplant, part of Keysight Technologies: Modernizing an 80-Year-Old Tech Company*

Modernizing the application architecture of an 80-year-old multinational company is a daunting and complex task. Eggplant is ironically a tech company at the forefront of quantum computing and 6G Wireless, so speed was of utmost urgency. The host explained the importance of iteration and automation to transform the underlying application architecture and introduce new ways of working to strengthen the IT-Business relationship, like application diversification.

4. Top 5 Priorities for Managing AI Risk Within Gartner's MOST Framework

| Top 5 priorities - Gartner | MOST solutions - Gartner |

The host presented Gartner's MOST framework for managing risk concerning AI and a roadmap on the top five priorities therein. The framework covers model operations, security and trustworthiness for AI and adresses the following concerns: What are the various components of an AI risk management program? Who should manage our AI risk management program? What are the top five priorities for AI risk management and what existing tools can help us? In the example of BNP Paribas, a risk reporting and compliance team was formed to address the above concerns and mimise possible negative effects of AI technologies. In fact, by 2024, there will be twice the chance of negative outcomes for companies that don't have those security controls than for those that do. These consequences may include: hiring discrimination because of AI bias, susceptibility to data "poisoning" by bad actors, data and intellectual property theft through inference, and "Black box" scenarios where the actions of a model cannot be explained (e.g. why an interest rate is excessively high or why a loan got denied).

5. API Security: How to Protect Your Organization From "Leaky APIs"
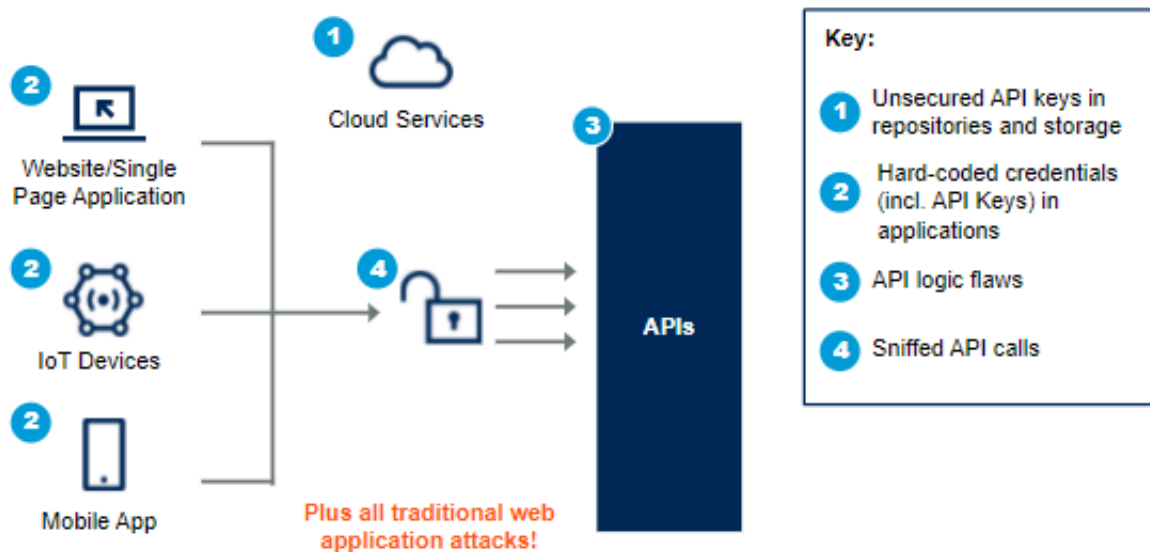
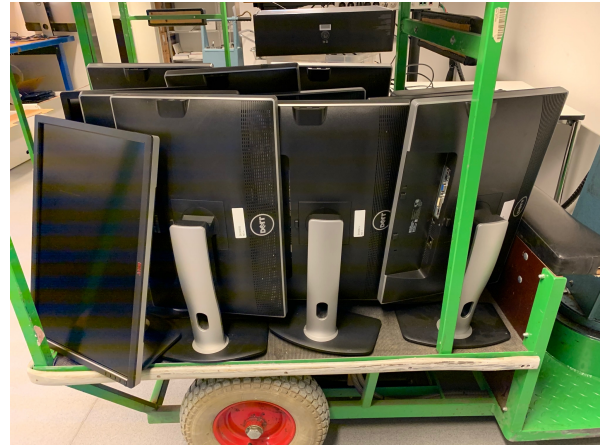*Possible API vulnerabilities - Gartner*

APIs are the ubiquitous protocols that allow different technologies to function and interface together. As such, they are required by everything from browsing the internet to enterprise datacentres. However, attacks and data breaches involving poorly secured APIs are increasing in frequency. API protection strategies include the use of API gateways, web application firewalls, access management, as well as specialist API security tools. As well as runtime protection, security should be applied to APIs at design time, including API security testing. This session covered API security best practices.

2.3   Hardware Inventory

On Thursday, I was assigned to the ATP Help Desk and placed under its supervision. My task there was to unpack and inventory over 150 Lenovo ThinkCentre M715q computers and a few office monitors. This was necessary because they were in the process of being discarded, so they were also to be moved out of the storage facilities and organised together. I registered each computer by its device identifier on an Excel spreadsheet.[8] This was intended to continue the next day but was unfortunately cancelled as mentionned in section 2.

Unpacked computers	Unpacked monitors

This was the first time I had experienced the physically demanding work of moving large amounts of hardware from one dusty place to another, while having to keep track of their identifiers, and I had expected a much more bureaucratic type of labour. The computers themselves were deceptively heavy, and it was difficult to carry more than three at a time. Despite its simplicity, I learned that this kind of work is of utmost importance in most companies, as they tend to rely on it for the successful and efficient deployment of hardware on a large scale.

On an unrelated note, lunch at the canteen was of very high quality from my experience.

2.4 Employee Life

I noted a significant degree of informal and friendly interaction between employees. In fact, one of them even bought cakes to a meeting. In both divisions in which I worked (Systems Architecture and Help Desk), the employees were typically apparent friends with each other and the overall atmosphere was devoid of antagonism. This is further detailed in subsection 3.1.

I also participated in a meeting among members of the team in which they discussed how the COVID-19 epidemic and the lockdown it caused affected their work lives and how they could use that to potentially improve their work experience regardless of the epidemic. The following is a non-exhaustive list of the issues they expressed.

- A lack of interaction due to lockdown caused a general lack of collective creativity, due to which they found it difficult to think of innovative projects or ideas.

- The loss of informal interaction between employees removed a source of relaxation from the stress generated by work.

- A feeling of disconnection from the purpose of their work, and thus a severe lack of motivation to start or work on projects.

Despite this, they also listed a number of benefits to the lockdown. They discussed how such advantages could be adapted to improve their working conditions and efficiency outside of lockdown, for example by dedicating a few days per week to working from home so as to save time on commuting. Below are the primary positive effects mentioned during the meeting.

- Improved efficiency when working because of a lack of distractions.

- A reduction of the time wasted on commuting to and from work.

I added that many of the effects that they experienced, especially those pertaining to communication and motivation difficulties, were similar or identical to those I felt as a student during the lockdown. As such, I learned that the difference between school and work life in relation to lockdown is more minimal than I expected.

3 Conclusion

3.1 Employee Life - Comparison

As mentionned in section 2.4, work life at ATP was generally pleasant and friendly. I sought to compare this experience to the french analogue by asking fellow student Arthur Bourdeaut how the work environment was during his internship. Below is his reply when he was asked asked.

> they [the employees] were nice, [...] and the other stagiaires[0] (approximately 25 years old) helped me
>
> – Arthur Bourdeaut

Thus, from my limited information, the work environments in France and Denmark are comparable in terms of the previously mentionned qualities (atmosphere, employee relations etc.).

3.2 General Observations

I made a multitude of observations (listed below) and gained much knowledge that would have otherwise been impossible to learn without practical experience.

- That the administrative complexity and inflexibility of large companies sometimes renders them unable to modernise or modify old and complex systems despite the possible benefits.

- How practical implementations are very different from the theoretical visions, as real world circumstances can completely change the circumstances and methods of putting into action the plans of systems architects.

- The multitude of completely different systems interacting with each other that sustain large and diverse companies as mentionned in subsection 2.1. For example, SQL may be used to manage a MariaDB database containing data collected from a front end (website) using javascript and running on Windows Server 2019. This kind of chain can be a part of a larger web of dependencies and tools, which systems architects keep track of so as to potentially improve or maintain them.

- How the simple physical yet highly physical task of managing and organising hardware is much more active and complicated than it may seem, as computer hardware in itself is a complicated realm.

- How to most efficiently move a Lenovo ThinkCentre M715q Ryzen 3 2200GE 4GB 500GB Windows 10 Home Desktop PC from the storage room to a cart.

Thanks to this type of knowledge, I generally have a more accurate perception of how large companies are structures, of how IT functions and can function in companies and how employees interact with each other and adapt to problems. Of course, I am now relatively familiar with the profession of Systems Architecture, which was nearly completely unknown to me previously and is a consideration for my career.

---

[0]French for "interns"

Acknowledgements

I received significant help and guidance during my internship at ATP, which allowed me to gain invaluable knowledge and experience.

I am grateful to all the employees at ATP who were overwhelmingly kind and helpful, especially those at the Systems Architecture and Help Desk teams who helped me learn about their occupations in an interesting and participatory way.

I would also draw special mention to my supervisor Johan Overbeck, who spent considerable time and effort enabling me to carry out various diverse activities despite several problems.

References

[1] IPE. Top 1000 European Pension Funds.
`https://www.ipe.com/Uploads/v/a/k/Top-1000-European-Pension-Funds.pdf`.

[2] ATP. About ATP. `https://www.atp.dk/en/about-us`.

[3] ATP. ATP's history. `https://www.atp.dk/en/about-us/atps-history`.

[4] ATP. Annual Report 2020. `https://www.atp.dk/en/aarsrapport-2020`.

[5] Stephen Watts. What Exactly Does a System Architect Do?
`https://www.bmc.com/blogs/system-architect/`.

[6] ATP. Responsibility during the covid-19 pandemic. `https://www.atp.dk/en/we-have-been-given-major-responsibility-during-covid-19-pandemic`.

[7] Christian Krabbe Barfoed. 848 børn og voksne sendt hjem i Hillerød - skole og vuggestue ramt af indisk variant. `https://www.berlingske.dk/danmark/saerlig-smitsom-delta-variant-fundet-i-hilleroed-og-aarhus`.

[8] Emil Overbeck. Lenovo ThinkCentre M715q ATP inventory. `https://drive.google.com/file/d/1jKqlZoFVTySQRf3qFnwhO6pp8u0eAvjr/view?usp=sharing`.