Kandidatnummer: 50

Question 1) UPS is an American shipping and supply chain management company that intends to use digital tools to synchronize its operations and logistics strategy to better meet customer needs. They ran interviews with a portion of their customers and concluded that there are two major customer experience challenges UPS need to deal with: 1) fast delivery and 2) real-time package tracking. As a chief innovation officer (CIO) at UPS:

A) Can you propose a solution that can significantly improve the customer and stakeholder experiences and enhance efficiencies of the company operations?
For increasing speed in delivery, one could employ robotic technology such as drones, that could be remotely or automatically controlled. Using GPS in the drones one could plot in a course and send it on its way.

To achieve real-time package tracking one needs to always maintain the position of the package. This could, yet again, be achieved through GPS. By placing a GPS tracker in a package, it is easy to monitor its position along with other interesting data such as pressure, temperature, and light exposure.

B) Describe what emerging technology you will use to implement that solution?
I would apply robotics to develop the drones and IoT-sensors for the GPS tracking device.

C) Define your role as a CIO within UPS?
My role as a CIO within UPS is to identify new opportunities for digital transformation and to innovate our business model to increase productivity, efficiency, and effectiveness.

D) If your business has a gap in the skills required to implement your innovative solution, how would you help your business to bridge that gap?
I would try to enhance their digital talent by introducing certain fitting measures. This could be training classes for teams where all members need to learn something, cross-training where new staff exchange their knowledge for organizational knowledge from existing staff, specialized training for certain team members that may require it, and formal education and degree programs.

E) The Sustainable Development Goals (SDGs) are a collection of 17 interlinked global goals designed to be a blueprint to achieve a better and more sustainable future for all. The SDGs were setup in 2015 by the United Nations and are intended to be achieved by 2030. Which SDGs your digital transformation solution will positively impact and how?
Industry, innovation, and infrastructure.

Question 2) The COVID-19 pandemic has affected the education industry and nearly all institutions have been adopted to digital education approaches that make it safer for both students and teachers to meet social distancing constraints while keeping the academic standard unaffected. Major problems with remote learning are the limited access to labs and lab equipment and inability to monitor suspicious activities such as opening tabs, chat boxing in the background, picture exchange and more while students are taking home exams.

A) Propose a digital solution to help students to collaboratively run lab experiments from their own locations while enhancing the real feeling of objects and their learning experience?

By creating a digital lab where one replicates the functions of a real-life lab with equipment. This could be a simulator either in VR or AR, or through an interactive website. By using digital twins, one could accurately recreate the environment and the operations done in a lab. Digital twins are a virtual representation of an entity and could be used within different subjects. Health oriented subjects could have a representation of a human body and how it works, or science subjects could monitor developments in a simulated nature setting.

B) Propose a solution that can monitor students' activities during home exams such that it can provide real-time feedback to prohibit suspicious actions and enhance credibility and fairness of such exams in the future?

I would suggest turning webcams on for the duration of the exam and enable eye tracking so that one can monitor where the eyes are looking at any given time during the exam. By creating a set of values for the eye tracker to stay within, one could get notifications if the values stray from them for too long. With the notification, one can bring up the webcam and check where they are looking.

C) Describe the emerging technologies you will use to develop these solutions?

I would use IoT eye sensors that could monitor eye movement and send the data back to a responsible party.

D) What are the challenges that might impact online learning?

The challenge with online learning is how casual it is. This means that by accessing a online lecture one is far removed from an actual classroom, often at home, meaning that it is easy to drift off and be distracted by other things one would like to do. If you are physically in a classroom, it is easier to pay attention as most of the sensory input comes from the classroom. It creates a big demand for discipline to stay in the lecture.

Another thing that could impact online learning is that communication with teachers is made a lot harder for some people. Not everybody will unmute in the middle of a lecture and ask a question in front of everybody. And you can't show up to their office if you are studying remotely. This creates a demand for the teachers to be available online for direct messaging, and if this does not happen it is not a long road for students to fall off and quit the course.

E) Refer to 1e), which SDGs your digital transformation solution will positively impact and how?

Quality Education:

By preventing cheating on exams, one could ensure that students will participate in courses to prepare for exams. It will also enable them to use their own thoughts and opinions on the subject so that they can learn on their own.

Reduced inequality:

It will also bridge the gap between those students looking for an easy way out and those that work hard to learn. This means that the value of grades increases and is not easily accessible without putting in the work.

Question 3) As hospitals strive to provide the right care to the right patient at the right time, healthcare providers need to do two things: evaluate patients' needs accurately and manage hospital resources effectively. Shortage in healthcare staff can lead to overworking, crowding and hence more medical errors, and patients feel neglected.

a) Propose a digital transformation strategy to mitigate healthcare personnel staffing shortages in hospitals to lower operating costs and enhance services?

Using IoT to make interactions virtual can be a way to make sure that patients always can be consulted, no matter the situation. This would make it easier for patients to get the help they need, no matter their location. It would work around crowding in a hospital as it would enable patients to contact medical personnel remotely without having to show up to the hospital unless necessary. It also allows health workers to manage their time better and can help with overworking and allowing a better workplace. IoT can also be used to monitor patients remotely.

b) What emerging technologies you will use to accelerate the proposed transformation?

Internet of Things (IoT) to connect to sensors already existing in a hospital for monitoring data. This data can be computed in central hub and allow for remote monitoring. Doctor-patient interactions can happen over the phone with remote monitoring devices providing medical data through connectivity.

c) State advantages and disadvantages of implementing this solution on the cloud. State the four different cloud models?

The obvious advantage to implementing this on the cloud is that we can gather data in one place, and it could be accessible from anywhere. Connectivity with devices will be easy and data could flow in from many places and gather in a hub in the cloud for easy management.

Security and privacy would be key points to address as this data is extremely sensitive. By gathering a lot of data in one place, unwanted access becomes a huge stress item.

Public cloud:

The cloud provider offers access to their cloud services through the internet, removing the need for users to purchase, install or maintain any hardware, software or supporting infrastructure on their devices.

Private cloud:
It is cloud infrastructure that is operated exclusively for one company. Often managed by the company or a third party and allows the company to have greater control resources.

Hybrid cloud:
Hybrid cloud integrates public and private clouds. This will allow for private cloud features such as companies can control their own sensitive data, and public cloud features such as the cloud provider's applications available for users.
Multicloud:
As the name suggests this cloud model uses services from two or more major cloud providers and/or a SaaS software vendor. This allows flexibility whilst fulfilling security requirements.

d) Hospitals and healthcare providers as non-profit/public organizations does not have the skills and resources to finance, develop and run such projects. Can you propose a way to accelerate and complete this solution so expected services are delivered to the public on the right time?

e) Refer to 1e), which SDGs your digital transformation solution will positively impact and how?

Good health and well-being:
By introducing IoT in health services, one can reach a bigger area of impact with a smaller number of resources, meaning that more people can get access to consultations and advice that they require. This would in turn lead to an increased level of health and well-being.

Decent work and economic growth:
This would also allow for better work terms for health workers. Increased flexibility in their work time by making consultations virtual instead of physical, less people at the hospital would make for a better work environment with less stress and increased better utilization of time instead of running from patients room to patients room.

Question 4)

a) In the commercial sector, industrial digital transformation is driven by two kinds of strategies: defensive and offensive strategies. Define and compare between the two strategies with examples?

Defensive strategies can be defined as protecting the business from competitors and disrupters. One example of this is how most car manufacturers started producing electrical vehicles, they do it to follow along with what the trend of the market is and will be so that they will not be falling behind other competitors.

Offensive strategies can be defined as trying to disrupt the rest of the industry. By introducing new ideas and new thinking one hopes to blaze their own trail in a market and

risk short term profits to create business ideas that can influence markets and reshape how we think about whatever industry this is applied to. One example of an offensive strategy is Tesla. They have been aggressively innovating technology for cars and created a computer on wheels. This was not normal until Tesla supplied it, and now every manufacturer produces the same kind of idea. Tesla was not a profitable company for a long time, but it seems with the acceptance of their vehicles that this will be changed soon.

b) Crisis has always helped industries to identify an opportunity for transformation. A new survey finds that responses to COVID-19 have speeded up the adoption of digital technologies by several years ahead. Explain that with examples?

COVID-19 forced industries to work around the crisis. Using location data, voluntarily, from phones to track infections and whether one was at risk of being infected. Using 3D-printers to help in producing essential materials and equipment that were suddenly needed in extreme amounts. With the infection danger of COVID-19, technologies that allowed remote work arose. In the health department, IoT-based patient data monitoring technology has been utilized to allow health workers to monitor patients remotely. In addition to avoiding infection, it will save a lot of time and make work time more efficient as it can tell what is going on with a patient from afar.

c) Define technical debit?

Technical debt can be defined as how far behind an organization is technologically. Businesses that existed before the digital age that we are in today would have to transform their internal architecture and implement new technologies into their existing processes. This costs money and time, and because of this many public sector organizations have struggled to adapt. Therefore, they are carrying a lot of technical debt. The digital evolution also happens extremely fast, and the number of new technologies is massive, making it even tougher for trailing organizations to catch up.

d) What are some of the leading indicators of failure in an industrial digital transformation?

Lack of strategy:
One needs a clear framework that can evolve with time to be able to implement a digital transformation.

Lack of top-down support:
The board leaves the effort of transformation to management and does not participate or provide oversight for the process.

Inward focus:
By not accessing the customers point of view one would miss industry trends.

Mismatch of planning vs doing:
Using time and efforts to plan a final product, rather than producing MVPs and learn from fail-fast.

Too much emphasis on technology and not culture:
Focusing too much on implementing technologies could leave an organization lacking, as it is equally, if not more, important to transform the culture along with the technology to be able to make the best use of the technology.

e) What is lights-out manufacturing? How is industrial digital transformation driving lights-out manufacturing?

Lights-out manufacturing is a digitalized manufacturing process where automation is at the centre. The entire production line should be fully automated, and people only serve for maintenance or repair purposes.

Moore's law is essential to understand why industries are reaching for this sort of automation. Predictions arose that the number of transistors in a device would roughly double every 2 years. In doing whatever it takes to stay on this trajectory the move towards lights-outs manufacturing was started.