13.05.2022

Industrial digital transformation

Exam

Kandidatnr 58.

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?

I would propose an automated process for shipping with a robot who packs up the package and gets it ready for shipping. This would make it possible for multiple packages to be processed at the same time, but also making sure the process is faster and reliable. Instead of having one staff member process 30 packages in an hour, they could have one robot processing 300 in the hour. Calculating the best routes to ensure faster deliveries.

Tracking a package is important for the customer experience, how fast they get the tracking number and getting updates about the package. Making this process faster and more secure would increase the customer's experience. Digitalizing these documents into secure smart bills of lading would speed up the shipping approval process and at the same time reduce the risk of fraud.

b) Describe what emerging technology you will use to implement that solution?

Implementing AI for the automated robots in the process of shipping to speed up the process of shipping packing packages and shipping them. This would improve the efficiency of transportation and optimizing the warehouse process. The AI would be able to predict inventory, material flow, demand and supply etc. by collecting and analyzing data. The AI use of big data will improve the performance. AI could also be used for calculating the best routes for faster deliveries.

Enabling digitalization of documents to secure smart bills of lading to be able to speed up the shipping of approval process and at the same time reducing the risk of fraud by using blockchain in the shipping process. The use of blockchain would allow real time tracking of the shipment. By making this shipment process more automated with blockchain it solves the shipping delays issues which is often caused by slow manual processes.

c) Define your role as a CIO within UPS?

As a CIO your role is to manage and implement computer and information technology systems. Focused on the impact of IT in the UPS. Maintain and improve UPS's technology and maximizing the productivity through automation of processes.

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 make an analysis of where the skill gap is, identifying what skills are important, measure current skills, deciding for how to fix it. I could organize special training to be able to bridge the skill gap, hire professional training firms that can arrange workshops or seminars for the staff. If the skill gap is too wide, I would hire new staff by modifying the hiring process to fill in with knowledge into the business.

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?

Goal 8, decent work and economic growth. Goal 11, sustainable cities and communities, with this technology the usage of fuel would decrease. Goal 17, partnerships to achieve the goals, different partnership between IT industry and delivery services.

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?

Introducing Virtual reality and artificial virtuality (VR/AR) allowing the students to be at home, but at the same time feel like they are in a lab doing an experiment. Making a digital twin of the school's lab and implementing it in the virtual reality would help the students get the real feeling of objects and getting a good learning experience.

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?

With digital tools we could monitor student's computers, phones and record screens.

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

Virtual reality and artificial virtuality (VR/AR) to create a virtual twin of their school's lab. Using 3D virtual labs to simulate lab work. Examiti to track and monitor student's activities during home exams.

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

Students not attending, falling off the subject, not feeling connected to other students, difficulties unmuting microphone to speak up or turning on the web camera.

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

Goal 4, quality education. It gives quality of education remotely by using these technological tools. Goal 10, reduce inequality as education can be given to those who can't attend physically.

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?

I would suggest a tech-enabled automated process which would resulting in shortening patients stay, freeing resources and decompressing the bottleneck. This could be accomplished with a robust access and orchestration strategy. This access would make it easier because if you needed to transfer a patient, all you would have to do is tell the computer. If you don't have a bed for a new patient, the computer would tell you and you would know to transfer the patient elsewhere. The staff would know the capacity and staff for each patient to see if they can admit another patient. Looking at organization culture.

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

I would use AI, Information Technology and Big data.

Information technology is an electronic health care system, a healthcare software. Implementing this would give the staff a better overview of staff, capacity, bed etc. including all patient's information. Giving the staff the possibility of prescribing medicine electronic, which would result in faster and more accurate prescriptions. Having a software like this would make sure of rapid information sharing, reducing paperwork and unnecessary test, better follow-up, and secure access to information.

Introducing Big Data would help with collecting, analyzing, and leveraging data. This would help the illness detection, disease prediction and streamline patient data-sharing. This would also help prevent unnecessary doctor's visit and up the hospitals administrative process automation. Big data is important for hospitals and its staff to make correct judgment, obtain the correct information at the right time to make the best decision and at the same time providing accurate care for patients.

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

Private clouds, public clouds, hybrid clouds and multiclouds.

The advantages of implementing on a cloud is reduced costs since a cloud would get rid of an in-house server. It's a faster way of getting access to data. A cloud is dependable and consistent. Offers a better security and minimalizing the possibility of getting data stolen.

The disadvantage with a cloud is data security. Storing information on a external server comes with risks. A cloud is managed by the provider, giving the organizations minimal control over the infrastructure. There is guarantee for having the same information if the power shuts down. Where do you get patients information then? Another discussed problem is HIPPA, the security of sensitive information.

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?

Enter a partnership with a company that have that kind of skills and resources to be able to develop and run this project. This way they could focus on what their job at the hospital and their knowledge while another part is getting the job done with the project.

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

This digital transformation solution will positively impact goal 3, good health and well-being since every patient will get the care they need, hospitals won't be over booked and good information flow. Goal 11, sustainable cities and communities. Goal 17, partnerships to achieve the goals.

4) Industrial digital transformation can be defined as the minimum effort to stay in business.

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 strategy is focusing on protecting the business from its competitors and disrupters while the offensive strategy is trying to disrupt the rest of the industry. In a business with defensive strategy, they try to protect their competitive advantages, but not creating any competitive advantages. The offensive strategy is more risky than defensive.

Most of the car manufacturers today who started producing electric vehicles went with a defensive strategy. Since the market is expected to grow and producing costs are expected to go down, they continue to invest in electric cars even when they are losing money. Tesla on the other hand went with an offensive strategy and try to interrupt the rest of the industry. By

brining new technology into the table, it showed the industry what could be done. Another example is the mobile phone industry. The marked stayed safe, not developing something revolutionary and stayed the same. Then apple came in with a touch phone with new technology to revolutionize the whole industry. This led to out phones today. Taking a risk with something new.

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?

In crisis the need for transformation is greater than normally which naturally speeds up the process. A crisis removed a barrier. During the covid-19 we approached a more digital business management to make it possible to stay connected and get remote working. Digital education tools and online platform for inclusiveness happened and will most likely be a part of our daily life in the future. Our phones turned into a beacon for possible covid-19 infection by using developing an app who would use Bluetooth. 3D printing masks. Basically, it made everything more digitally. Education and workdays where digital by using the right tools, allowing people to stay at home and still getting education/work done. Meetings happened over apps, allowing people to stay connected.

c) Define technical debit?

Technical debit is defined as the cost of having to rework a solution because you chose the easy solution at first instead of using a better approach over time.

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

Projects not getting finished and must be restarted because of lack of strategy. Too much focus on technological tools instead of culture. Lack of customer perspective.

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

Lights-out manufacturing is a fully automated production where the humans only have to stay on top of maintenance and repair. Digital transformation is all about automatization and reducing cost, making it more efficient by using technologies for automation. In summary, industrial digital transformation develops and facilitates the use of automation and in effect drives the lights-out manufacturing concept.