Exam industrial digitalization

Task 1

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?
Answer:
To make the delivery to the customer fast it is possible to automate the packaging and the ordering of the package.
The customer will order the package on the internet, and immediately a robot will pick up the package and make it ready for delivery.
In the future it might be possible to have the packages delivered by robots using artificial intelligence, but this is not yet feasible.

To make the tracking of the package better, it is possible to deploy the usage of GPS on the delivery vehicle and make the viewing of the GPS available to the customers.

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

Robotic Process Automation

This will be used to Automate the packaging and the preparation of the package.

Artificial Intelligence (In the future)

Can be used to deliver the packages, after this technology is developed more. This will drastically improve the delivery of the packages because the driver will never need to take a break from driving and can just drive until the destination is reached.

GPS

This will be used to track the delivery vehicle and deliver its location data to the customer. Alternatively, the GPS could be used to specifically track the package, but this would possibly drive up the cost, since you would need a tracker for each individual package.

c) Define your role as a CIO within UPS?
Answer:
CIO (Chief Information Officer) A CIO's responsibility is mainly to maintain technology and to deploy these technologies to support the current business operations.
(Industrial Digital transformation Book CIO versus CDO)

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?
Answer:
There are 2 main ways to solve this issue:
1) The first way is to hire someone who has the required skills, this can often be a challenge.
2) The second way is to train your existing staff in the required technologies, this way will allow you to get all your current workers accustomed to and knowledgeable about the technologies they are required to work with.

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?
Answer:

Industry, innovation, and infrastructure

This transformation will allow UPS to become more reliable, sustainable and help with the economic development.

Decent work and economic growth

This transformation will allow Ups to replace jobs that are not well paid, and possibly, not healthy for the workers that are preforming them, with jobs that require more knowledge, and thus will give the workers that are able to preform them, more job security and better working conditions to make them stay with the company for longer.

Task 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?
Answer:
One good way to help students have experiments from their own locations, is the use of Virtual reality. Virtual reality will allow students to be in the same virtual room and preform the same experiments they would normally do in the lab, even if their physical locations are far apart.

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?
Answer:

One way to do this, is to make all exam takers go on a zoom call, where they must have their camera and screenshare on and a professor that can check the students to see what they are doing.

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

Answer:

The technologies required for the experiments:

Virtual reality:

Virtual reality will be used to let the students visualize and try to do the experiments themselves, to make it more interactive than if the student was only watching it on a video.

Movement-Sensors:

For the students to be able to react to the virtual environment they would need sensors to track their movements.

The technologies required for the exam:

Web-camera

A camera connected to the computer, that would allow the professor to see what the student is doing.

Screensharing

A tool that will allow the professors to see the screens of the students to check what I s student is doing on the computer.

Internet access

A tool required for the connection between the student and the professor.

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

Answer:

Online learning will not allow the professor to see what students need more attention and help, this would make it more difficult for students that learn slower than the average speed. The opposite is also true, where students that learn faster than others end up not being challenged enough due to everything being accustomed to the average student.

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

Answer:

Quality Education

This will allow the students to be able to try different experiments in the lab, it will also allow students to be able to have experiments that require tools they do not have so it could possibly allow them to run more experiments than they would normally.

Good health and well being

Allowing the students to have a safe distance from each other during the pandemic while still being able to learn. During experiments students often have to handle toxic substances doing such experiments in a VR setting will allow students to be safe from such substances and could possibly save someone from future health issues, if the substances are handled poorly.

Reduced inequalities

Technologies like this will allow schools that normally could not afford to hold experiments to have many different experiments. This would decrease the inequality caused by lacking equipment or workspace for such experiments.

Task 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?
Answer:
Hospitals could implement a sort of artificial intelligence, that will use some tests to find out what is wrong with the patients, what their level of pain is and who needs help first. By doing this the time needed to diagnose a patient and the responsibility of deciding who to help first is lifted from the hospital workers and onto a computer, making it easier to focus on what they need to do.

b) What emerging technologies you will use to accelerate the proposed transformation?
Answer:
Artificial Intelligence
The transformation is mostly based on the usage of artificial intelligence, where the AI can handle most of the diagnosing and the danger level of the patients.

c) State advantages and disadvantages of implementing this solution on the cloud. State the four different cloud models?
Answer:
The four different cloud models are:
1) Public Cloud
2) Private Cloud
3) Hybrid Clous
4) Multi Cloud

The advantages of implementing this solution on the cloud is that during a natural disaster or a power failure the data will still be backed up and protected in a secure location.

Source

The disadvantage of implementing the solution on the cloud is that you are more vulnerable to attacks and data leaks, for example someone could attack with a denial-of-service attack and make you unable to access the data. In a situation where the data is required to help a patient this could be a disaster.

Source

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?
Answer:
A project like this would be a good candidate for government funding. Seeing as this will be available for other countries as well it could be a possibility that multiple governments go together to fund the research for the project, thus accelerating the progress.

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

Good health and well being

This transformation will allow doctors to help more patients more easily and as early as necessary, therefore leading to better health and well-being. A system like this could also become more accurate than a doctor and catch illnesses like cancer before they are able to become dangerous.

Reduced inequalities

If a transformation like this becomes publicly available, people who have less money or less access to hospitals will still be able to use the program to check if they are sick, therefore reducing the inequalities.

Task 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?

Answer:

Defensive Strategy:

The defensive strategy is where the business is trying to protect itself from disrupters. If a business fails to protect itself from the disruptors, they might lose the ability to be competitive in the market. An example of this is Nokia, where they thought smart phones would not be popular, and thus decided to keep making their original phones.

Offensive Strategy:

The offensive strategy is when your business is trying to disrupt the rest of the industry, often using a new kind of technology that other companies must follow if they want to stay competitive.

Source: (Industrial digitalization book: Business drivers in the commercial sector)

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?

Answer:

Covid has sped up the adoptions of digital technologies, by forcing people to use online solutions instead of using the solutions they were already used to, an example of this is the usage of Zoom meetings where for. Example students have lectures online.

People who possibly would be against digitalization have now been forces to try it and many are not as against as they would have been before.

Covid has also allowed the government an exception for equipment purchasing, due to the number of required items. This has allowed the government to purchase more computers and IT systems cheaper and easier than normal, thus making the digital transformation speed up.

Source

c) Define technical debit?

Answer:

Technical debt is the implied cost that comes from choosing an easy solution instead if a good solution, this will often cost a lot of money because it has to be reworked and fixed. Usually, governments get this because of budgeting issues.

Source: (Canvas – Sample Exam questions.pdf)

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

Answer:

Some of the leading indicators of failure are:

1. Lack of an Industrial information transformation strategy
2. Lack of top-down support
3. Not focusing enough on the trends in the industry or the customer's wants.
4. Execution different too much from the plan.
5. Poorly planned budgeting

Source: (Canvas – Sample Exam questions.pdf)

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

Answer:

Lights out manufacturing is when the entire production line is automated and the only reason to have employees there is to be able to repair or provide maintenance.

Lights-out manufacturing is being driven by industrial digital transformations because new technologies are making it easier and cheaper to be able to make the production lines automatic. This will also increase the productivity, drive down the costs and improve customer satisfaction.

Source:

Source 2: (Industrial digitalization book: Digitization and lights-out manufacturing)