Exam

1)

a) One solution to transform UPS could be to use Artificial intelligence. This could be used for self-driving trucks for delivery. Self-driving trucks could help with getting the delivery time down since they do not need to stop for breaks and sleep. Although it probably would have a higher initial cost to buy and implement in the long run it would save money since there is no salary that needs to be paid. The first stage of the solution is to have the self-driving trucks deliver packages when there are long distances such as between cities. The second stage would involve actually delivering the packages to the customer but this step will probably take a longer time to implement as a system for autonomous customer delivery needs to be created. As for real-time package tracking delivery trucks could be fitted with GPS that way the package will be registered to its delivery truck and then the truck itself is what's actually tracked.

Another use of AI is to optimize warehouse operations. AI could be used to find more effective ways to know when to replenish items, inventory movement, pick and package process and optimize path planning.

b) The emerging technology needed to implement this solution is artificial intelligence. For truck delivery self-driving is needed and for warehouse operations it is dynamic optimization.

c) As a CIO it is my responsibility is the digital transformation of UPS. This includes management, implementation, and finding the usability of new technologies.

d) If the business has a gap in skills required I would help the organization by becoming a learning organization. A learning organization has the following characteristics:

- Systematic problem solving
- Experimentation
- Learning from past experiences
- Learning from others
- Transferring knowledge

(Shyam Varan Nath et al. 2020)

The characteristics above are what I would focus on to bridge the gap in the skills the business lacks.

e) The SDGs that will be positively impacted are

8. Decent work and economic growth

9. Industry innovation and infrastructure

First decent work and economic growth will be impacted because the solution will help with automating the package delivery industry. This will make it more effective which leads to economic growth. It will also lead to better working conditions for workers such as truckers don't need to spend days on the road delivering packages over long distances between cities.

2)

a) A solution to run lab experiments from their own location could be with the use of virtual reality and mixed reality headsets provided to the students. A virtual reality headset is a fully immersive virtual world that covers the entire user's field of view. Mixed reality headsets augment holographic objects into the physical world. With such devices, a student could have an artificial lab environment based on real physics and do experiments alone or with other people without the need for actual equipment.

b) A solution that can cover the student's activities could be to require them to have a camera attached to their head that sends the camera feed live to the teacher while they are having the exam. That way what the student looking at is being monitored. Alternatively, a program that locks the computer while doing the exam could be used and a webcam to monitor that the student is not using other devices while doing the exam. One problem with this solution is that it requires the student with a stable internet connection, this could be solved by also having the webcam record.

c) The emerging technologies to be used for these solutions are Virtual reality/Augmented reality/mixed reality. Virtual reality is a fully immersive experience, augmented reality is overlaying digitally generated objects in the real world, and mixed reality allows for a way to interact with these digitally generated objects in the real world.

d) Some challenges that might impact online learning are technical issues. Some students might not have stable internet access or some don't have good hardware. It becomes harder for the teacher to keep track of if someone is being left behind. There also are a lot of distractions in a home environment which makes the student unable to focus properly. Finally, it becomes harder for students to socialize with each other.

e) The SDGs that will be positively impacted are:

4. Quality education

By assuring that students get access to equipment and a better learning experience the students will be able to for example do lab experiments even from home which will give them a better understanding of the subjects they are learning.

3)

a) Since the problem is staffing shortage and lowering operating costs while enhancing services I would focus the strategy to find solutions based on automation. Once again making sure that the organization is a learning organization is key. I would make sure that the digital transformation strategy has certain milestones we are aiming to achieve. The more that can be automated the less manual type of work the staff has to do also the staff will make less mistakes. By doing this the staff can get more time to focus on rehabilitating the patients and doctors can make better decisions on what care the patient needs.

b) The technologies I would use to accelerate the proposed transformation would be medical robots, Artificial intelligence, and Augmented Reality. Robots could help with tasks such as distributing medicine and other medical tools. They could also help in surgery with an arm that has a camera and is controlled by a surgeon. One way AI could help a doctor is by using it to help identify for example cancer based on images. AI could be trained with image recognition and with the use of Machine Learning be able to accurately identify cancer. That way cancer and tumors would be detected much quicker which will

overall bring costs down because less is required from the doctor and less cost of treatment of the patient since it was discovered quicker. Finally, AR could help a surgeon in a remote location by getting assistance from an expert surgeon from somewhere else in the world.

c) Some advantages of using the cloud are cost reduction. By using the cloud you do not need to invest money into buying computers and servers and maintaining them. They also need to be set up and kept in a secure location with data security. By using the cloud it might also be much more secure since a business that has very high data security is in control. Some disadvantage of the cloud is that you have to be connected to the internet if you want to access it. Also if for some reason the service stops providing or is the target of a data breach.

The four different cloud models are:

1. Public cloud

2. Private cloud

3. Hybrid cloud

4. Multicloud

d) If we do not have skills and resources to run such a project it might be a good idea to make a third party that has expertise in running such projects do it. That way the organization does not need to get the skills and cost associated with it just the cost of having the third party doing it.

e) The SDGs that will be positively impacted are:

3. good health and well-being

8. Decent work and economic growth

Good health and well-being are impacted by being able to provide better healthcare service to patients by implementing new technologies and becoming more effective such as assisting doctors with diagnosing patients. Decent work and economic growth get positively impacted by reducing staffing shortages which in turn reduces the stress on nurses and doctors. Also being able to provide better healthcare means an overall healthier society which brings economic growth thanks to more people can stay in the workforce longer.

4)

a) A defensive strategy refers to protecting the business from competitors and disruption. An offensive strategy is the opposite in that they are trying to disrupt the industry. An example of a business using an offensive strategy is Netflix. They disrupted the DVD buying/renting industry by providing a new service that was more appealing to the customers. Another example is Tesla which by portraying itself as a status symbol, using clean energy for fuel and also now self driving has disrupted the automobile industry. An example of a defensive strategy being used is most car manufactures switching to also start producing electric vehicles.

b) One way that covid a helped speed run the adoption of digital technologies is with working from home becoming a norm. This has happened with the use of collaboration tools such as Microsoft teams and zoom. Also, healthcare is more digitalized by instead of having to call the doctor to get an appointment it can be done over the internet instead. If you need the doctor to renew a prescription you only need to send a message through their website and they will renew it.

c) Technical debt is the cost of choosing the easy solution due to having to do rework at a later stage instead of a solution taking a longer time but being more sound.

d) Some of the leading indicators of failure are lack of an industrial digital transformation strategy, and digital transformation failures. Three causes of failure are a misalignment between vision and expectations, economic failures, and technical failures.

e) Lights-out manufacturing refers to a situation where the entire production line is fully automated and the only role of people in the factory is for maintenance or repair purposes. (Shyam Varan Nath et al. 2020) Industrial digital transformation is driving this by increasingly finding ways to automate all production and processes. This is done thanks to all the new technologies such as AI and sensors collecting data.

Sources:

Shyam Varan Nath, Ann Dunkin, Mahesh Chowdhary, and Nital Patel. 2020. *Industrial Digital Transformation : Accelerate Digital Transformation with Business Optimization, AI, and Industry 4.0*. Birmingham: Packt Publishing Ltd.