IBE505 Exam

1)

a) I would implement or improve a current implementation of real time tracking of packages to improve real-time package tracking both for customers and for UPS. By using RFID-technology for tracking instead of barcodes one can achieve faster and more efficient real-time tracking that often does not even require a person to scan every code by hand. It can be done automatically by RFID-readers in key locations, storage containers, trucks and vehicles. It will make the "journey" of every package visible to UPS which can let them identify challenges around delivery time.

b) The emerging technology required for my solution is the Internet of Things (IoT). We want the packages to always be connected through the tracking solution with 5G technology while in transit and in places where an internet connection can be hard to get. The technology behind the reading and writing of the packages unique identifiers will be RFID.

c) My role as CIO at UPS will be to oversee the people, technologies and processes within the organization to ensure that we deliver outcomes that satisfy the needs and expectations of both the stakeholders and customers.

d) To ensure that every person in the business can keep up with the skills required for our technology I will use education and positive affirmation. We also need to be aware of the skill gap when implementing our solution, and how it will be used day-to-day, so we must ensure a good user experience through a user-friendly interface.

e) My solution will positively impact the following UN Sustainable Development Goals:
   i. 9: Industry, innovation and infrastructure. This is our main goal to impact positively as we make use of emerging technologies to improve our production processes.
   ii. 11: Sustainable cities and communities. This will be positively impacted through our work to implement the tracking solution by making problems of transit and transportation visible to us. We can then work on complementing solutions that improve transit efficiency and time spent for a better customer experience.
   iii. 12: Responsible consumption and production. Through the implementation of our solution we will have to take care of a small increase in electronic waste. This is a great way for us to ensure a positive impact for this goal: It will be our responsibility to ensure sustainability through recycling and re-using the e-waste we produce.

2)

a) We will use the technology of virtual desktops to enable lab participation specifically in the digital fields, where the lab exercises are primarily on the computer. Through virtual desktops one can set up an environment for the students to access through the internet that has all the tools and exercises ready for the students.

For physical lab students one might use the technology of virtual reality to ensure that students can have the feeling of participation even from their homes.

b) It is hard to implement a solution in this field that will be received positively by the students as no-one likes to be spied on or micro-managed. Browser activity tracking exists, but will only let managers make assumptions of the students' activity at most. Therefore we will require the use of a webcam while taking exams.
c) The emerging technologies relevant to us are the technologies of IoT and AR/VR.
d) Challenges are among other things distractions, work discipline, technical issues, students being left behind and a lack of the social aspect of a classroom.
   It is very easy to be distracted while studying or working from home. Other people or pets might distract the users, every student may not have a quiet place to study from home, and they might even distract themselves by reading the news or browsing other websites on their computer or responding to chat messages on their phone. This also counts for work discipline.
   Technical issues may always happen, more at risk are students with poor internet connectivity in their homes or less reliable computers to participate with.
   It is critical for students to not feel like they get left behind in the learning process. It is hard to read body language through a virtual learning setting, and students may feel more ashamed to ask questions than when in a physical classroom. Students will also have less of a community feeling in virtual learning, which can cause social issues among students.
e) The most obvious goal for us to positively impact is number 4: Quality education. We will also positively impact goal 10: Reduced inequalities.
   Through our solutions to improve student experience and reduce cheating opportunities we will improve our students' chances of having a good learning and make quality education available for all students. We will also positively impact goal 10 by improving the feeling of inclusion in and around the classroom. Our students will have equal opportunities in education regardless what age, gender, disability, ethnicity or economic status.

3)

a) My solution is to reduce process costs and improve time efficiency and responsiveness by digitally transforming the supply chain. This will also have the benefits of improving time spent by the healthcare staff in several tedious tasks and processes, reducing operating costs and enhancing services.
b) We will use IoT to introduce real-time tracking of medical supplies with RFID.
c) The four different types of cloud models are Public Cloud, Private Cloud, Hybrid Cloud and Multicloud.
   Advantages of implementing the solution to the cloud is an improvement of connectivity, multi-platform usability through interconnectivity, and scalability.
   Disadvantages are the increasing risk of data loss, theft or leakage and other cyber-attacks, and difficulties around changing cloud providers.
d) Through the state, charity or by allowing another party to take the cost of financing, development and implementation of the solution by giving them the rights to collect analytical data from the solution in exchange.

e) Our digital transformation solution will positively impact SDG 3: Good health and well-being and 9: Industry, innovation and infrastructure.
More time and cost-efficient processes will improve the delivery of health coverage, improve the well-being of staff, and increase capacity.

4)

a) Offensive industrial digital transformation is when you use digital transformation as an investment to grow your business and to cause disruption. This is an opportunistic attempt to gain on the disruption caused.
Defensive industrial digital transformation is when you use digital transformation as an investment to protect your business and avoid disruption. It can be seen as a defensive attempt to avoid losses caused by disruption instead.
b) Covid-19 has sped up the adoption of digital technologies in ways such as remote work, online shopping, the use of advanced technology in business operations and decisions, customer needs and expectations, and increasing the migration of assets into the cloud.
c) Technical debt, also called design debt or code debt refers to the implied cost of additional rework required by choosing an easy solution in the beginning instead of using a "harder" solution that will prove better in the long run. If one fails to pay technical debt, it will accumulate "interest" in the form of making it even harder with time to implement mending changes.
d) Failure occurs when individual projects do not achieve expected business value or never reach completion, requiring one to start over. Critical indicators of the health of transformation such as the lack of IDT strategy, top-down support, having an inward focus over using industry sector trends and having a poor customer perspective, planning-doing mismatch, and forgetting the cultural shift in digital transformation. Causes can be bad vision or economic and technological factors.
e) Lights-out manufacturing (or dark factories) is when the entire production line is fully automated and people only play a role in maintenance or repair. The lights can therefore be "shut off" as a result of industry 4.0, the 4th industrial revolution. Industrial digital transformation lies not only in the automation of existing processes using new technologies (automation is in fact part of Industry 3.0), but instead the re-working of existing processes and products to make processes that are suited for automation. Lights-out manufacturing drivers from industrial digital transformation is among others cyber-physical systems, IoT and networking.

References:

Shyam Varan Nath, Ann Dunkin, Mahesh Chowdhary, Nital Patel. 2020. *Industrial Digital Transformation*. Livery Place, 35 Livery Street, Birmingham U.K. Packt Publishing Ltd.

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