Exam Industrial Digital Transformation 13.05.22 – Candidate: 43

Task 1

A) **Tracking (Mostly users would care about this):**
If UPS could either use their IT department and software engineers, or have external people help them develop a new type of tracking software which takes in account usual travel time from warehouse => to the package recipients area code and then include these considerations in the logic which their current equipment already, then the tracking could be a lot smoother and more accurate, since the tracking software would then have more parameters to use in order to approximate location.

Another angle is using machine learning using supervised algorithms in order to estimate the amount of time, or its current location compared to the known checkpoints it would have to cross in the journey from the warehouse to the customer/recipient.

Speed (Both users and shareholders would care about this):
One of my first actions would be to attempt to remove almost all usage of paper, and bring us onto a digital solution and providing our employees the necessities coming from this. Warehouse workers would likely benefit from being able to do their work on their cellphone, leading to less potential physical information losses. In other words, it would help avoid misplacing, losing and stop delaying information from getting out from the warehouse to wherever it needs to go.

Digital Twin
We could also attempt to use a digital twin approach to our warehouse as a whole, which also would help in swiftly locating where our packages are in the warehouse, and getting them out to the customers faster.

Drones for transport
Another way is attempting to replicate the way Amazon is starting to use their drones and creating a similar sort of transporting system, which would speed up in-city package delivery as it could be done by air, and avoids common bottlenecks like trailers being locked in traffic. This however would only be effective for smaller packages, and for bigger packages we would benefit from improving on capabilities of current shipping means such as better freight trains, shipping boats and the trucks themselves.

B) As mentioned above machine learning would likely make our current means of tracking even better and using exciting new technologies could be used as a marketing tool to separate ourselves from our competitors, and drive excitement among our users, and grow our brands reputation not only as a shipping company, but also one that innovates and is cutting-edge

compared to others.

C) As CIO or Chief Information Officer my role would be being one leaders and one of the driving forces for transformation in our company and attempting to bring its services and tech to an even more modernized standard. So, my job would be to provide a better vision for how our company could move forwards in an ever-evolving market.

D) If we lacked the necessary skills to implement my solutions, then I would as a first order of business attempt to run the necessary courses for relevant personnel, such as teaching warehouse workers and office workers how to use our new app, intended to remove paper usage. And make a general assessment where we lie regarding skills in comparison to our goal, for example: Do we have the technical capabilities in house required to implement the machine learning package tracking system? If not, we would need to look at cooperating with businesses which are expert in that field and borrow knowledge from them.

   We could also allow our employees to go to relevant schooling and pay for the knowledge needed ourselves. Sending the employees on conferences in order to keep up with current knowledge and get intel from experts is also a valid way to bridge a perceived gap in skills.

E) As one of my first order would be to cut paper usage as much as possible, with a company as large as UPS it would greatly reduce the amount of paper required, and to that end also reduce the number of trees that need to be cut down.
   This could go under any of these points:
   - number 13: Climate action, as we would cut a ton of wastage by merit of not using them from the start. Which seems better than using and then recycling.
   - number 12: Responsible consumption and production.

Task 2

A) One such solution could be to setup a digital twin of the classroom and make a “game” world or digital which students can join along with their teacher in avatars.

   I believe one would have to do is limit freedom of movement a little, so the focus would be on learning, and not the novelty of playing around with the new classroom. One example of how this could be used would be for healthcare students, which could let them see what types of equipment there is, which they could be required to use when they graduate and get a job in the field. This type of learning would be a lot more interactive for both teacher and student.

   If used in this manner, it would reduce budget requirements for the school as well as the need for physical copies of the tools would not be as stringent. The students could get an initial feel what the tools are and their names / use cases in the start, and only when they have a decent understanding of them could they get to use the real deal.

B) Require the exam to be done through a platform which has screen sharing capabilities, such as for example Teams or some similar software. Then require that student have cameras enabled to see what they are doing.

My idea here would be to allow teachers/guards to see what the students are doing only between the start and end of the testing period. So, if they see something which is suspicious, they could for example see; “oh okay this student has a messenger open on their computer”.

I don’t really know about the laws regarding this, but this seems like a case where you’d likely need to get the students signatures to allow the monitoring during the exam to participate in it with regards to privacy laws(personvernsloven, GDPR) and such.

Another issue I could see is: Would going to the bathroom for a student seem suspicious? They could also use their phones, which would be a difficult issue to tackle as well. You could perhaps require students that take the exam to login with their phone, which locks its usage during the examination.

C) Making a digital twin of the classroom would be the solution for Task 2.1 as mentioned. With regards to the anti-cheating solution, I would probably go for the solution which allows for examinators to remote access to the students’ computer to check for any suspicious activities.
We could also require students to remote into a computer which is under the control of the college, which also allows them to monitor stuff that is done on that computer as they are the owners. This would make it a lot more difficult for student to cheat in my opinion.

D) Reduced interactivity between students and teachers seems to be a bigger issue. It appears as if less students are inclined to take an active role in the discussion in the course material.

On more issue, which is social is the increased difficulty of getting to know your classmates. This is a problem with regards to learning because colloquium groups (Groups that students form of their own volition) are a powerful tool in order to drive interest and learning in a given course. It shouldn’t be underestimated how much easier it is to work on at times dry material with friends/students as opposed to doing it alone.

E) The obvious point to put here would be point 4: Quality Education. As it allows the students to get a more inclusive education while also being exposed to cool technologies which the college otherwise might not have a budget to allow for everyone to test.

Task 3

A) We could attempt to cut a lot of the paper usage, and use interconnected systems within the hospitals I personally know of and have experience from two hospitals (Molde, Kristiansund) which both still use a lot of internal mail to send lists and such to doctors, and this could be a prime area to start doing transformations in.

We would benefit from getting all employees on a new solution which has role driven management. Where depending on your role (doctor, nurse, secretary) you have access to different archives or functions in this new system. This would also reduce time spend delivering and fetching internal mail in paper format, and incentivize people into using our new system, which during the concept phase we would have to get input from the people who would be using this system in their day-to-day work, so as not to completely miss the target, or deliver something which no one wants to use. Failing in delivering this would lead

to devastating number of losses in the economic department.

B) To create this program, I would choose to utilize machine learning in order to improve and continuously refine the dataset with for example combinations of coworkers which work well together based on data on incidents, amount of patients treated during each shift, and in this way optimize how our hospital uses data to increase productivity.
The idea is to use Machine learning in order to supplement the core functionality of the application, and through a continuously growing dataset adjust how shifts of workers are set up.

C) Implementing this solution on the cloud seems to be an effective way to solve the problem of where to host the software and could reduce the amount each hospital would need to spend on having a server park inside it.

An issue with placing this solution on the cloud seems to be cybersecurity. Since this would involve critical patient and healthcare personnel data, it would need to have very tight security measures, and likely would have to be approved by the state as this regards critical infrastructure.

D) On way would be to list your requirements and have people bid to create the software on your behalf. This way the hospital would be able to evaluate whether or not a company delivers what they need in time, and right price or not. Likely the initial scope of the program would have to be reduced in the first round, as requirements on paper could be unrealistic to achieve in the timeframe the bidding companies are given. At this point it becomes several rounds limiting the available companies according to given requirements that can deliver what you want. In the end it will be narrowed down to what is hopefully the right fit for the job.

Some of the criteria such an external company might be judged on by order of importance to the directors of the hospital:
1. Which company can do the job the cheapest, as we have limited funds?
2. Companies' earlier products, and experience in delivering similar products
3. Which company offers the most functionality within the timeframe, as we have limited time to have the complete software?

E) This solution would help with regards to point 3: Good Health and Well-being by virtue of it attempting to increase effectivity in the health sector. If the health sector gets faster at treating patients and delivering data regarding patients to the relevant departments faster, then society as a whole would surely benefit from this.

Task 4

A) **Offensive strategy:**
- Focuses on disrupting competitors, trying to carve a market share for themselves with no regard for competitors, seems to be the more active and exciting of the two strategies, with a higher chance of actually getting more of the market share
Defensive strategy: Focuses on defending the business from competition and disruptors, seemingly more focused on keeping the status quo while also attempting to dissuade firms using more aggressive strategies of targeting them.

As mentioned during our lectures and in the courses' book a striking example of using an offensive strategy would be Tesla in the car market, and forcing other manufacturers to use a more defensive strategy, making them enter the market of electric vehicles making a loss of between 7.000-10.000$ per electric vehicle they make. The prognosis however seems positive as innovations in battery efficiency is likely to make profits increase by almost 20% in the next ten years.

B) During covid millions of workers were kept home instead of going to the office, which necessitated a solution for the companies in order to stay productive. And example of this is how fast the new remote access work solutions took off. Almost everyone started doing their work remotely, and as a result when covid is not as big of a disruptor to our society a lot of workers prefer working from home instead of showing up to a workplace

   Video call software took off as well an example is Zoom which became wildly popular during the pandemic and is now used as a means to hold meetings remotely or classes remotely as well.

   Contact tracing has also been huge in helping combat spread of the virus by tracking close associates and so on.

C) An example of a technical debt would be choosing a simpler solution in the moment, but later being limited by the choice to go with the easier way early on. If you made a program in a poor manner, it could be more difficult to implement upgrades or additions to it.

D) Reasons for failure in digital transformations usually have 3 categories:
   1. Difference between what is possible, and what is wished for in the transformation,
   2. Economic Failure
   3. Technical Failure

   List of common issues:
   - Not knowing your market
   - Not knowing the trends in your field
   - Tons of technical debt
   - Differing vision inside company between departments
   - Big vision, but lack of technical knowledge to execute it
   - Big vision, but lack of resources monetary or personnel to execute it
   - Failure to convince employees why you need to transform

E) Lights-out manufacturing is when your entire production line is automated and you only need to keep maintenance personnel on payroll, instead of operators which are more common and required in regular factories.