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Kandidat 20

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Høgskolen i Molde
Vitenskapelig høgskole i logistikk

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1.0 Assignment 1

1.1 a)

To improve the customer and stakeholder experiences we first must really understand the challenges. Fast delivery and real-time tracking are subjective to some extent, and there can be a big difference in return of investment if the solution is over engineered. An expensive solution would probably affect shipping prices, and I guess there is a magical number for what a customer is willing to pay for these kinds of services. Product price, shipping price rate.

And of course, we need to study the competitors. How fast is their deliveries? What tracking system do they use? What are their prices? How is their infrastructure? Etc. I will not answer these questions since they are out of scope for this assignment.

For the solution its important to identify the bottle necks in the supply chain. Let's assume that UPS has good infrastructure and that it is redistribution of packages and optimization of driving routes and parallel delivery that are part of the problem.

Full automation of distribution centers, so that sorting and forwarding of packages can be performed 24/7. Autonomous drones and vehicles for delivery of packages. Tracking using sensors. The solution is described in more detail in the next subtask.

1.2 b)

For the distribution centers they would need to use robots for automated sorting. Sensors scanning the packages and sorting the packages accordingly. For small packages drones can be used, avoiding traffic jams, road work, etc. For the medium packages, autonomous vehicles are used combined with robotics for automated drop off.
The advantage of using autonomous vehicles and drones is that they can work 24/7 when needed. You can scale up the number without having to employ more drivers.

As the autonomous drones and vehicles take care of the majority of the packages, the drivers can focus on the largest and more obsolete packages, which in turn will lead to a shorter delivery time on these packages.

What becomes important for tracking and optimization is data. Data from drones, vehicles, sorting machines, drivers, etc.
These can be location sensors, speed, weight, camera, etc. Data from these sensors can be combined with traffic data, weather data, capacity data, perhaps you can even combine these with data campaign data from large consumer stores and seasonal data / holidays.

The goal of collecting all this data is to be able to use it to optimize and train AI technology. Whether it is optimization of driving route based on destinations and traffic data, or to prepare more vehicles in areas using predictive analytics. Purchasing patterns, offers, holidays, etc.

When they come to tracking, the same data can be used to give the customer direct information about where the package is and estimated time of arrival (ETA). This is

information that can be calculated in the field using edge devices, which can then make calculations in real time using sensor data combined with ambient data (weather, traffic, location, route).

The customer can then know with relatively high accuracy when the package will arrive, and can then be ready to receive, if desired.

1.3 c)

My role as a Chef Innovation officer would be to support the company and the company's business strategy by identifying areas in the company that can be improved through innovation and the use of digital technology. This can be towards existing business areas, but perhaps most towards new business areas and digital services. Pursue to give customers a better customer experience, how can customers get more out of the current product, how can digital technology solve the customer's challenges, conscious and unconscious.

Konkret for UPS og case

1.4 d)

If there is a distance between the company's competence and the competence necessary to implement the solution, a strategy must be created to eliminate the distance.
This can be done by training your own employees, hiring the skills needed or hiring consultants who have the right skills. Or a combination of these. Naturally, a number of acquisitions of digital technology, robots, etc. must be made. It is important that the procurement team is interdisciplinary to ensure that the technology purchased is correct.

1.5 e)

Goal 9 Industry, innovations, and infrastructure. Because in large scale the infrastructure might be company independent, and it also can provide products and services to a larger proportion of the general public.

Goal 11 Sustainable cities and communities, and Goal 17 Partnerships to achieve the Goal, because the use of electric drones and vehicles will make a positive contribution to air pollution in cities. And optimizing driving routes and using drones will ease the pressure on roads. The fact that customers can order goods directly home and have them delivered quickly will reduce the need to drive out yourself. By cooperating with public authorities, the effect of this can be increased considerably, roads and future development can be regulated so that the transport of goods can be made even more efficient and environmentally friendly.

2.0 Assignment 2

2.1 a)

The solution will vary slightly depending on which subject or study, but the technology can be essentially the same.
If we take medical students as an example. A large part of medical school is being able to exercise or do physical things with humans or animals. At home in the room, in front of a laptop, it becomes difficult to perform dissection of frogs through Zoom. To achieve this, Zoom is not the right technology, but Zoom is a great tool for voice and video communication, which can then be combined with other technology.

To solve the challenge in my example, students must be able to participate in labs through a virtual world. The technology used in Zoom can be continued, but one must add a 3D representation of an operating room, and that each student can, through an avatar of his own accord, be inside the operating room. Alone, with a lecturer, or in a group. The advantage of being able to dissect digitally is that you do not have to kill hundreds of frogs to practice and learn. If you make a mistake, you can easily start over. Inside the virtual room, you can get guidance on screen or directly by having others participate in the same room and give instructions along the way. The solution is based on creating a realistic representation of the real world within the solution.

2.2 b)

Students who cheat on exams ruin for fellow students, the school and the entire school system.
When it comes to monitoring students at home exams, I think you have to be very careful about which monitoring you use, and keep in mind that those who want to cheat will be able to fool every system. A good system will help, but the system alone is not enough. You have to create exam assignments that make it difficult for students to collaborate / cheat.

One might think that video and audio transmission from the home exam is the perfect solution, but such solutions can easily be falsified. And it possibly causes extra stress for the student, that you know that someone is sitting and watching and hearing you.

Another approach is to create software that locks down the computer and prevents digital communication. But it also prevents the student from using digital sources in his / her exam answer. And a digital lock can easily be bypassed if you have the right skills.

One could create software that tracked all activity on the machine, and used AI to analyze the data, but again this can be bypassed by students who have the right skills. And one must consider the privacy of the student.

What I think can be the best solution is to create randomly generated exam assignments. That is, more questions are made than what is to be answered by the student and that the assignments are distributed randomly to the students, without too much overlap and in random order. The exam paper must then be answered inside a platform on the browser, which can then also track the students' behavior inside the platform. Does the student jump to a specific task, or does the student solve the tasks chronologically. If the assignments are asked as open-ended questions, you can also easily compare the students who have been given the same assignment, to look at the use of words, things that are wrong, which points are correct, at what time it was written in this assignment, etc.

This will not make it impossible to cheat, but extremely difficult and it will increase the likelihood of being caught.

2.3 c)

For 2.1 a) it is the use of extended reality technology, such as VR. One can build a twin of an operating room and collaborate with other students inside the virtual room. Where to use equipment to perform operations. In addition, one can create digital twins of physical equipment to provide an even more realistic experience. So that the student holds the equipment that is physically used in the hand and with the help of sensors, it is reflected in the virtual representation.

For 2.1 b) it is probably common web technology combined with data collection that can be analyzed in real time by an AI. And give real-time notification to the exam office at least, and that you can then see what the student is doing in real time inside the exam platform. The most important thing here is probably to make it so cumbersome to cheat that it will not pay off.

2.4 d)

The challenge with online learning is that we are very different as human beings. These are the same challenges for online learning as for traditional teaching, some students master it better than others.

But online learning requires that you have access to the internet and that requires the school to make arrangements to collaborate / meet other students digitally. Just like it was physically on campus.

Another challenge is that the digital competence among the lecturers is often very varied, and in many cases lower than among the students. If the lecturers do not convey the subject matter as well digitally as physically, then this is a big problem.

2.5 e)

SDG

3.0

3.1 a)

En digital transformasjonsstrategi som kan redusere bemanningsmangel i helsepersonell på sykehus vil være bygge god insfrastruktur mellom sykehusene og ikke låse fast personell, pasienter og utstyr til ett sykehus. Ved å bruke data kan man optimalisere behandling ved å sette inn ressurser der de trengs. Alstå ha en flytende kapasitet fordelt utover flere sykehus. I tillegg til et effektivt varsling og bestillingssystem ved sykdom av personell eller at pasienter avbestiller en time.

3.2 b)

Here, resource allocation and processing management would be made much more efficient by using AI and Big data.

3.3 c)

The advantage of using the cloud is that the solution can be easily scaled and easily made available. The disadvantage is the security associated with the storage of sensitive information and in the event of an attack, against e.g. internet connection. Then systems in the cloud will be unavailable.

Public Cloud is typically SaaS solutions, where all customers work towards the same service, but are separated by the use of access.

Private cloud is that you rent infrastructure from a provider, and set up the environments yourself. Then only the one customer who has access to the service or the environment is running in the cloud. Typically moving an on-prem environment in the cloud.

Hybrid cloud is a combination of private and public cloud.

Multicloud is that you use SaaS services from several cloud providers.

3.4 d)

For large and complex challenges or projects, public organizations can collaborate with private business to carry out successful transformations. That is, public-private partnerships.

3.5 e)

SDG

4.0

4.1 a)

Defencive strategy
When you have a defensive strategy, you follow your competitors and adopt the competitors' development and innovation, so that the competitors do not have a competitive advantage.

Offencive strategy
In an offensive strategy, one constantly seeks to use disruptive technology to innovate and create new business models and revenues. And not least to gain a competitive advantage.

One example of this is Tesla. They developed electric cars, but the cars are crammed full of extra services that were not normal for the traditional car industry. Tesla's offensive strategy has forced the other car manufacturers to follow Tesla so as not to lose too large market shares.

4.2 b)

During covid-19, everyone was forced to social distance. There was a need to be able to use the home office and home school in an efficient way.

What happened was that everyone was forced to use technology they would not otherwise use. Zoom, Teams, etc. for digital collaboration and digital teaching. And when these services are used on such a large scale, the further development and improvement of these services will also be faster. Faster because you get more needs from the customers, and you want to solve the customers' actual challenges.

Artists could no longer perform in concert venues, but started with live streaming and had to recreate the concert feeling at home in the living room for people.

When the whole world suddenly has the same needs and everyone can work towards a common goal, the pace of innovation picks up.

Many companies have almost stopped using physical meetings, as they have learned to use digital technology that allows meetings to be conducted more efficiently.

4.3 c)

Technical debt is a typical obstacle to innovation and security breaches.

When large organizations need to innovate and adopt new digital technology, technical debt is often a problem. This may be a legacy system that is not scalable, or does not speak well with new technology. It can be expensive to replace old systems, and you must have a clear gain (ROI) to get financing at all.
If you want to replace a system that works, it is often not replaced just because it is old.

An example is banking systems built in the programming language COBOL. The language is so prevalent that it will be an extremely large and expensive job to replace it. Fortunately, today's developers manage to build modern applications on top of COBOL applications, but COBOL expertise is becoming rarer and rarer.

4.4 d)

Some leading indicators of failure is:
The different actors in a company have different visions and the goal of the digital transformation.
That one jumps straight to the transformation without streamlining the processes, and documenting this.
That one does not take into account the cultural change that is to take place.

4.5 e)

Lights out manufacturing is fully automated manufacturing without aid from humans. The lights in the factory can be turned off. The use of different sensors and AI is making this possible. Because we can train and improve manufacturing in a way that a human cannot be trained.
Organizations drives toward this type of manufacturing to cut cost, scale production, reduce errors, increase quality, and so on. Machines can work 24/7 while humans cannot.

5.0 References

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