Dave Wetzel had thoroughly explained design thinking in his presentation videos with techniques that can be used and examples of those techniques to develop viable solutions in a different, arguably better, process. He started the lecture on developing solutions from end-to-end meaning from the very basic starting question to the full-fledged solution that can be deployed. He talked about what he does at Microsoft, particularly helping clients develop solutions that first address the problem and then works to solve their problem. From this he went into solutions like building neural networks. He talked about how he pulled already built models that can roughly address the problem and then modify them to develop the solution. By doing this it cuts down the work that is required to actually solve the problem and at this point he starts to pivot into addressing design thinking.

He continued with the neural network models and talked about how a Kootenay service of Microsoft can scale up the capacity of a model if there is an increase in frequency of users or inputs into the model and then can be ramped down. This is essentially a type of feed-back loop which takes an output of say a neural network model that predicts if users are going to be using a service and then tells the Kootenay to scale the capabilities of the software as needed. This is especially useful for companies or websites that can be seasonality or have specific spikes like Wimbledon’s spike in users around the time of the championship and Amazon during big sale events like Cyber Monday or Prime Day. The goal with using feed-back loops is to increase the effectiveness of the mode. Wetzel talked about a manual rating system of an output by a neural network that a person says the suggestion was accurate or not which is fed back into the model and can help it adjust. This can be very useful in models that are designed to help with solution suggestions for internal IT issues. The issues with this are, because people are typically the ones providing feedback to the model, there is often bias. Bias should always be looked at regardless if a regulator is looking for it or not because a biased model can not only create legal issues but can also be detrimental to the effectiveness of the model itself. At the end of the feedback loops, he mentioned that although random numbers might create what seems like a trend, in the end numbers typically regress to the mean. Although a change in direct might seem like a bad thing, it could simply be that regression and companies should take that into consideration. He mentioned about Simpson’s paradox in which there might appear to be a trend between two groups of data but when they are combined the trend disappears.

Getting further into design thinking, Wetzel talked about the issues of REST APIs. Sure, they are useful for designing models electronically. But he pointed out one critical flaw which is that the API significantly limits the thinking process. He views the software as constricting people to having to design a solution within the API, which restricts thinking about the solution in ways beyond what an API can solve. Instead of the API, he prefers having people come together as a team and talk face to face without working with technology to avoid those constrictions. Beyond these constrictions, he compared the difficulty vs value provided when it came to developing solutions. With this, he primarily criticized the star schema which takes too long to populate and evaluate. He mentions that because the ROI can go down with more time and energy spent on developing the “perfect” solution that fits a particular model or API, it could be solved much more effectively by rapidly designing effective solutions for a business.

With this, Wetzel talks about rapid prototyping, which is designing solutions in a short period of time. He used the example of a project he worked on where he designed a model that would identify swimming pools in a city in Spain using an algorithm with the idea of finding customers to sell pool supplies. The model was built in just a few minutes, and although there were some clear errors in identifying some pools, it was still a very accurate model for what was built in just minutes. This rapid prototype can be shown to clients or a business and used to show how a solution can be developed. If this prototype is seen as a good solution, then it can be adopted and refined to be implemented. By developing prototypes with this speed allows people to present ideas and solutions quickly without having to spend a ton of time and energy and money on simply developing prototypes that fit into the current systems. It requires intuition and being able to communicate effectively to be able to not only design the prototype but to also describe how it could aid the business process.

ML OPs is essentially just another term for IT. It is the process of streamlining machine learning models and neural networks from design to development to implement. It uses the process that has been used for IT and even supply chain management which focuses first on identifying the problem that needs to be solved, then prototypes and ideas are presented, and then its developed and implemented. Wetzel went further into this in that after a model is implemented, it has to have feed-back loops and adjusted if needed to fit the needs of the users. He took the example of a law firm which had partners not really using the feedback portion of the model that had a thumbs up or down if the outcome was desired. Because they were not responding to it, they had to re-work it into a game system that encouraged the partners to actually respond. By understanding the issue and knowing the reasons why, the team was able to implement a solution to the system that would have failed otherwise. Being adaptive and intuitive to the problem at hand and coming up with an effective solution rather than simply giving up is what is key to the solution of this issue. ML OPs combines several aspects of design thinking throughout the entire process that helps software engineers and designers develop usable and effective systems for businesses.