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Describing Design Thinking

1. Submit a .docx or .pdf file with your explanation of Design Thinking, based on Dave Wentzel's presentations.

   Include/explain the following as well: End-to-End solutions, REST APIs, Feedback Loops, Rapid Prototyping, MLOps

   2-3 pages in length, double-spaced, due Monday, Dec. 5, at midnight.

Design Thinking or Empathetic Design Thinking as its often called is a better way of approaching projects before using data analytics and may even augment the use of data analytics in my view. As Mr. Wentzel pointed out in videos I and II, many managers across varying industries will say “Lets take a data driven approach and not rely on gut instinct only.” Many will say this, but they won’t know what they’re talking about. The result is a reckless throwing of data at whatever issue or project they are working on and assuming using data analytics will solve it. Mr. Wetzel points out that this is not always the case. Often times, there are projects that require more human mindset than only machines. This means that project teams would meet and brainstorm about the nature of the problem or project be it sticky notes or a Word Document.

Going off of that, this means we focus on the concepts at play and see if they apply to the project. It often becomes gamification where the team is adopting a “fail first” mindset and testing the concept behind the trial they come up with. This is preferred because while the team wants the project to be a success, they are not beholden to a concept. This forces the team to use their imagination and creativity, two things only human beings are capable of. We are not looking for an easy solution to the problem, but exploring different concepts to use and constantly evolving them in what we call a Rapid Prototype. A Rapid Prototype is the fruit of a

quick brainstorming session and collaboration between business analysts and data scientists to make a solution to test their concept. It is meant to be low fidelity, i.e. low use of software to solve problems.

Feedback loop is about developing a system that tells if your algorithm made a good prediction or a bad prediction. An example of this is the Net Promotor Score often employed in marketing. It works off a 5-star system, so data scientists could apply this for algorithm prediction feedback in terms of its accuracy. Other examples include Facebooks thumbs up-thumbs down system. Humans are needed to label something as a thumbs up. For thumbs down, humans (analysts) will need to find out why and they may or may not remove that from the training data set based off of that, although that is unlikely to solve the problem at its root. If a company practices this with a defined metric and defined frequency, once/quarter for example, to look at the thumbs down, they can then look at using machine learning-deep learning, natural language processing, and similar things.

Going off of that, ML Ops is an attempt at applying Dev Ops to Machine Learning. Dev Ops was a practice in which there was a Development team and an Operations team. Part of the concept was trying to make a more efficient feedback loop and ML Ops endeavours to do this by using machine learning to automate the feedback to the operations team. This eliminates the need for humans to comb over a large quantity of responses on feedback and thus saves labor cost.

Whether or not a company chooses to use a third party to set up these kinds of systems is up to the company. If the company truly wishes to be “data driven” and they feel they understand Data Analytics, AI, and Machine Learning well enough, they may choose End to End solutions. End to End is when a company is vertically integrated, so they set up such as system in house and handle the management of it.

Something else that's up to the company is the architecture of the system. The company may choose to adopt REST API's (Representational State Transfer Application Programming Interface) refers to the most popular type of API today. The 'REST' part refers to a set of functions a client may use to access the companies server(s). The API is the more foundational part. API's are another type of tool where two computer applications or software tools can communicate and exchange data with each other. This can be employed in ML Ops and in feedback loops.