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## Design Thinking

Design thinking is a fascinating iterative process that utilizes an approach, different from traditional methods, that helps understand users and create innovative solutions. Essentially, design thinking involves using intuition and having a greater understanding of the people that we are designing products and services for. Using empathetic thinking, we dig deeper into our observations of the problem that is presented and help us ask better questions to improve the products and services that the user is providing.

Design thinking, or empathetic human-centered design thinking, is the future of how we will do software projects in corporate America. Empathetic thinking is not traditionally something that data scientists are comfortable with, since typically they rely on statistics and are math driven. However, business problems are often not simple math problems and require creative thinking to pull out what business executives want in their heads, which becomes exceptionally complex. By understanding what businesses want directly, we can create end-to-end solutions that are created with empathy for end users and encourages feedback to allow for the constant flow of improvement in services and products. Businesses can then utilize Rest APIs, or representational state transfer APIs, to process data and make predictions to solve problems that they have at hand. Furthermore, feedback loops, which is a process where the outputs of a system are circled back into inputs, are very important in data

science and business problems, as they help to identify any poor predictions in a model and improve the product or service. The usage of feedback loops in businesses takes positive and negative responses from customers and helps them adjust their services and products to improve the user experience. In AI models, feedback loops refer to taking the predictive outputs and reusing them to train new versions of the model. This concept is very important in design thinking because it directly empathizes with the user to create a product that is directly catered to them.

The use of rapid prototyping is a great way to implement design thinking to bring ideas to life and create experimental models for testing before businesses fully committed to building a system. Rapid prototyping is a process that involves quickly developing a preliminary version of a product to evaluate the design and potential functionalities. This process allows for ideas to be conveyed in a more direct manner compared to other approaches, as it allows everyone working on the project to visualize the entire product and how it should look and perform. It allows for better feedback and allows for better discussions and more experimentation. Oftentimes, business directors and executives do not have an exact understanding of the solution that they are looking for to solve a problem that they may have. By creating a prototype, they may gain better insights into the product that they ultimately want and this process saves them time and money.

MLOps (Machine Learning Operations) is a core function of machine learning that enables a collaborative environment for data scientists and machine learning engineers to up the pace of model development. Machine learning production is very difficult and requires many components like data preparation, model training, model

tuning, model deployment, model monitoring, and many more. The use of an MLOps platform streamlines this process and improves efficiency, scalability, and reduces risks. Iterative data exploration, real-time co-working capabilities for experiment tracking, feature engineering, and model management, as well as controlled model transitioning, deployment, and monitoring, are all made possible by an MLOps platform, which offers data scientists and software engineers a collaborative environment where they utilize design thinking. The operational and synchronization components of the machine learning lifecycle are automated by MLOps.