**TIM-6540 Week 3 Case Study**

A data science team was put together to address the following research questions:

* Can we forecast sales and transactions with greater accuracy than with current methods?
* Can we scale the data processing and algorithms faster and cheaper than with current methods?

The team examined various datasets as well as various algorithms. The team benchmarked their results against current methods and new methods that were prototyped and explored. Examples include adding weather data and external events (e.g., local conventions, festivals, sporting events) to the models and testing different algorithms (e.g., traditional smoothing, ARIMA, gradient boosting regression trees).

The team reported their results to internal stakeholders, which consisted of vice president level attendees and above from the business (supply chain management), strategy, IT, and advanced analytics.

Prior to the meeting, the team sent the stakeholders a link to a 30-minute video covering the overall context and details of their efforts. The working team assumed that the stakeholders had viewed the video prior to the meeting.

In the meeting, the team reported that including weather events and local events did not help improve forecast accuracy for the vast majority of the stores. The stakeholders were stunned and very skeptical of the team’s message and methodology. Because the team assumed that the leadership team / stakeholders had viewed the video, they omitted some key details or context from their messaging. What they should have said was that based on the data that they had available, local events did not help to improve forecast accuracy because the data was not accurate or reliable for the vast majority of the stores. Also, for stores with very high forecast accuracy, the effort of obtaining such data might not result in a positive return on the investment. With regard to weather, they should have explained that they had not had a chance to integrate their extreme weather model into the forecast, and therefore they were only limited to temperature and precipitation. With the addition of this input to the models, they expect to see improvements in the forecasts for stores that had sales and transactions dips with extreme weather events such as snow storms.

One thing that the team did well was to provide visual aids to support the messaging. For example, they selected a set of stores that represented the varying scenarios that were of interest and told a story about the data and analysis progress made to date along with the existing challenges, which lead to future recommendations or next steps.