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Part 1

When it comes to the system of a weather station system, it is important to have a layered model of applications to use to make sure everything is accounted for and working correctly. The first layer to have would be a data collection layer where you have applications to collect data and enable communication amoung the sensors and devies you use to collect the data. The layer to come next is a layer to process data with data enrichment applications to convert the raw data into a structured format and an application to detect relevant events that may have caused the data that was obtained. The final layer I would have would be to store the data that was obtained. The applications in this layer would include databases for storing time-series data, and another one to store large files like images.

Part 2

Adaptors are needed when systems are constructed by integrating application systems because the interface may need to be separated from the application’s business logic, existing classes can be integrated with other components without much change needing to be done, and using adaptors can increase flexibility and maintainability of the code. In the current day and age, it is important to have highly adaptable software to stay competitive. When you have legacy code, you are at a severe disadvantage against your competition and may need adaptors to edit your code quickly and make it act efficiently. Adaptors are also very useful when it comes to editting time-sensative software such as medical equipment. Learning about adaptors has been very helpful for me to understand that editing code can be easier than I thought, but it is also important to understand the practical problems that come along with using them.

When thinking of practical problems that can occur in writing the adaptors, it is important to think of the disadvantages of adaptors. The disadvantages include making code be more complex, more performance overhead, and the potential risk of duplication. The usage of adaptors requires mode code and can cause confusion due to the complexity of the adaptor code and the code it is integrating with. Adaptor code can also lead to performance overhead which can lead to the program becoming slower and not being able to perform as efficiently as it needs to. Finally, using adaptors can have duplicate code and possibiy duplicate functionality of the program it is integrating with, which can cause many issues when editing the code, as it may need to b e edited in multiple positions.

Sources:

Eduard Ghergu                              Software Architect. (2023, July 26). *Adapter Design Pattern - Definition and Examples | Pentalog*. Pentalog. https://www.pentalog.com/blog/design-patterns/adapter-design-pattern/