Group Assignment 1- Discuss the various approaches to project management. Focus on Waterfall versus Agile approach. Do research and cite references. Provide a description of each approach, its advantages and disadvantages and at least one each project of each that is more appropriate for the approach.

Description of each approach:

The Waterfall methodology is an approach to project management that follows a linear and sequential design process made up of a series of interdependent steps and phases. It has well-defined, linear stages of systems development and support, consisting of analysis, design, construction, testing, and support.

The Agile methodology, known for its flexibility, is a project management and software development approach whereby value is shipped to users in small increments called sprints. "The short iterations in the Agile cycle allow changes to easily be made, helping the team modify the process to best fit its needs rather than the other way around" (Robinson, Tech Target). In the Agile methodology, products are launched only after they are well presented to the stakeholders and have received client reviews.

Advantages and Disadvantages of each:

Advantage of the Waterfall technique: Everyone shares a common goal and collaborates effectively on project outcomes because tasks and deadlines are assigned and set early on. This approach ensures an effective and well-structured production process. It is a predictive methodology.

Disadvantage of the Waterfall approach: Implementing changes carries risks, as changing one aspect may require revising the whole project outline. This involves running through the whole series of steps again and again, since each step depends on the previous one, potentially leading to downtime.

Advantage of the Agile approach: Since it involves breaking the entire product process into phases, Agile is more efficient than the Waterfall methodology because it allows for on-the-go deployment of changes. Agile does not require a specific time frame or downtime to bring forth changes. It also values the feedback of both its team members and customers.

Disadvantage of the Agile approach: Owing to its inherent flexibility, the predictability of the Agile methodology is often rather low. This could be seen as either an upside or a downside, depending on the team's efficiency. Deadlines and milestones are not as rigid as in the Waterfall methodology as they continuously unfold based on feedback.

Example of an appropriate project for the Waterfall approach:

An example of the Waterfall approach being used to successfully manage a project is the Burj Khalifa project (Nieto-Rodriguez, HBR), the tallest structure in the world. This project required a rigid and structured timeline for all parties involved to follow, ensuring that each phase of construction was carefully planned for and carried out. Without this structured approach, any step in the process falling out of sync with the schedule would have held up all subsequent work dependent on its completion.

Example of an appropriate project for the Agile approach:

Mobile app development, where features and content are added incrementally and continuous improvements are implemented according to user feedback and requirements, lend themselves particularly well to an Agile approach. Uber utilized Agile methodologies during its development (International Agile Federation, Medium). Agile methodologies allowed the development team to quickly improve the app and implement new features, such as privacy controls, after gathering user feedback (Dr. Engin Bozdag, Uber).

Agile- may be better for startup projects and breakthrough technologies
Waterfall- may be better for complex but fixed undertakings such as transportation infrastructure.

References:
What Is Agile Methodology? | Introduction to Agile Methodology in Six Minutes | Simplilearn
What is Agile software development? | Definition from TechTarget.
It's Time to End the Battle Between Waterfall and Agile
How Agile Fueled Uber's Rise? | Medium
USENIX Enigma 2020 - Privacy at Speed: Privacy by Design for Agile Development at Uber