**Methods that ARUP applied to produce high-quality results or support the projects**

1. **Project selection**

Different from other companies, Arup used to select projects which were quite unique and innovative. And Arup was praised for their design and management skills [1]. Those strict rule of choosing a project is an important factor to produce high-quality results.

1. **Safe working environment and freedom culture**

The working environment in Arup is safe and comfortable which is a key factor to produce the high-quality project. The company developed many ways to solve the conflicts between the different teams, which helps the staff feel free to design. Especially When conflict occurred, the leader could solve the problem among team members and encourage the team to innovate. Meanwhile, the company also advocates a culture of freedom for the team. The leader will give the design team more freedom and autonomy [2] so that everyone can work on their positions and do their jobs efficiently.

1. **Available technology and innovation**

Arup used the 3D and CAD technologies, BIM that they used on previous projects as well and by doing continuous improvements they used the Total Design aspect. By innovating new materials and technologies, Arup in a way inspired many people working for them and by working on the sustainable design they gave a message of innovation in the workers and public hence providing high-quality results. This innovation and high morale of the people was a part of the success of the project [3].

1. **The concept of multidisciplinary total design**

Different from traditional design concept, the concept of Arup is that they give equal importance to all the disciplines in their team. The company will call all engineers to discuss the project and brainstorm project requirements. Engineers with different professional backgrounds will ask different questions related to their own background and discuss how to solve the problems together. It is this design concept that allows ARUP to achieve high-quality.

1. **Management of cultural diversity**

Arup is an international company which has 90 offices in 37 various countries all over the world. So, it has accumulated lots of experience from the previous projects about the way to deal with cultural differences. These can be used to solve cultural conflicts among employees from different backgrounds, thus improving work efficiency and producing high-quality results [3].

1. **Staff training**

Arup could systematically train their employees’ technical skills and develop their comprehensive capabilities. They also provide more opportunities for young employees to go abroad for training. In this environment, employees could grow quickly [1]. In this way, ARUP can maintain and improve their design team's professional level and create high-quality results

1. **Advanced managing tools**

The management team adopted a method called ‘Total design’ in order to achieve the project goal well, they divided the whole work into 4 parallel streams. The practice which enabled the success of the project was ‘creating a safe design environment’ [2] In this way, the project team could work more effectively.

**Lessons learnt from the Water Cube**

1. **Collaboration**

One of the valuable lessons that Arup had learned in the Water Cube project is collaboration. Perhaps Arup does not lack the experience of working with other companies, but this is the first time that Arup needs to deal with such large-scale and complex cooperation. Arup could learn how to achieve better teamwork in larger and complex international projects, thereby improving their work efficiency. Furthermore, people who cooperate with Arup are all professionals in this industry in China. Arup can learn the culture, the way they work, the way they communicate, the way they discuss, and the way they solve problems. And this could help Arup to expand their business in China in the future [2] [3].

1. **Management of time and budget**

In the project of Water Cube, Arup needed to complete the project within a limited time and budget. It was a challenge for them. But they not only used new materials to help the Chinese government to lower the budget but also used IT technology to finish the work within the allotted time. Through this project, Arup had got valuable experience in managing time and budget, which also help them Enhance their international reputation, especially in China [1][4].

1. **Sustainable Design Solutions**

In terms of the Water Cube, Arup not only did this project for their own status and interests but also provided effective solutions for sustainable development in the field of architecture and construction. The success of the Water Cube project has promoted the greening of the capital of China [1]. Meanwhile, Arup also used this project to gain a deeper understanding of sustainable development in the field of construction and construction, helping them to provide better solutions in this area in the future.

1. **Technology and Innovation**

Through the Water Cube project, Arup understands the importance of information technology capabilities and learns to use technology to improve work efficiency. I believe in the future, Arup will constantly update their technology to help them improve their work efficiency. At the same time, Arup also created a number of innovative technological achievements, which are excellent technical achievements that the company can use again for its future work.

**Rewards that Arup achieved in this project**

1. **Economic**

The success of the Water Cube has brought Arup huge economic benefits. The company's revenue in 2008 has reached US $ 1.1 billion. Through its outstanding performance in the Beijing Olympic Games, the company successfully opened up the Chinese market. It is conceivable that in the future, ARUP will get more projects in China and make more profits.

1. **Reputation**

After completing projects within a limited time and budget, Arup successfully enhanced its reputation and further expanded its offices in China. This has laid a good foundation for Arup's future projects.

1. **Capability enhancing**

As mentioned above, regardless of technology, management, or collaboration, this is a priceless wealth for Arup on this project of Water Cube. And all can be used in future projects to improve their efficiency. In addition, the success of the project also proves the correctness of the company's innovative ideas.

[1] Arup official website, “Projects - Arup.” [Online]. Available: <https://www.arup.com/projects>, accessed: 24 May 2018.

[2] R. G. Eccles, A. C. Edmondson, and D. Karadzhova, “Building the Water Cube,” no. May, pp. 1–21, 2010.

[3] Association for Project Management, “APM Project Management Awards Winner’s - Case Study,” no. Ccdi, pp. 1–8, 2008.

[4] Zou, Patrick & Leslie-Carter, Rob, 2010, ‘Lessons Learned from Managing the Design of the Water Cube National Swimming Centre for the Beijing 2008 Olympic Games’, Architectural Engineering and Design Management, vol. 6, no. 4.