APS1013 - Final Project Report Abstract - Team 2

Crystal Fountain is a water feature company that provides innovative water design projects and separate products, but there are also existing problems. There are warranty issues caused by over-emphasis on innovation, cultural conflicts, etc., but overall, it won't cause too much financial loss. Besides, the company's work distribution is unreasonable since the R&D team receives too many tasks from different departments simultaneously, and most of its tasks can be classified into the following four categories: product optimization, product innovation, technical debt and warranty. With limited resources and workforces, it's impossible to satisfy all the demands. The current problem is that the company lacks a standardized process to guide them on allocating resources rationally and determining task priority, resulting in a loss of profits. Thus, the main objective of this project is to design a systematic decision-making model to reallocate the resources for R&D's main activities and help the company maximize the net profits.

Various methods were used in the project. Online meetings were held regularly within the team and the clients to ensure effective work and progress and collect essential data and information. Additional data was also gathered through online searching, which helps get more familiar with the company's real problem and identify customers' needs. The project's goal was updated several times to better satisfy the clients' ultimate needs. Several analytical tools, such as the '5-whys' approach, fishbone diagram, were applied to analyze the root causes. The organizational structure, workflow, work distribution and interrelationship between departments are analyzed.

The solution is a decision-making model for resources reallocating, and the team proposed three versions in total: the draft, the candidate, and the final model. In the draft model, the profit of doing/not doing a project is measured through financial numbers for a 5-year cycle. The net present is calculated considering profit, loss, and an inflation rate of 3%. It was assumed that only one of the four tasks could

be done each time. Under this model, the net present for technical debt is the highest. The candidate model included two development cycles per year to be in line with the company's actual condition. It also considers the effects of continuously doing or not doing the same project. The draft and candidate models assume that the R&D team can complete a project in one cycle for a 5-year decision-making period**.** The final model integrates the idea of the candidate model and the feedback from clients, including the addition of new variables such as effort, impact, and strategic multiplier. The final model offers a more distinct comparison between the task options by replacing the estimated numbers with the real financial numbers coming from the actual corporate products.

Furthermore, the model will only focus on the ongoing development cycle since future market trends are unpredictable. The final model measured the potential profit difference generated by each available task and offered a priority ranking based on this variable. The limitations for the models due to the assumptions and estimations are also discussed.