

Dear Customer,

This project is focused on developing the best critical path for managing a consumer-focused recommendation system for over one hundred restaurants in Marlborough, Massachusetts. The objective is to identify the number of team members needed to complete the eight general tasks and eight subtasks and identify the critical path through each task or subtask. The results will then be presented in the Excel sheet and a graphical representation of the critical path. This document will be used to interpret the results and describe the methods used to determine the optimal solution.

The Excel spreadsheet used, titled 'project-plan-v003.xlsx', had identified the job titles of team members that will be needed, the different variations in hours required to complete tasks, and the names of the tasks (and subtasks) needed to develop a strategy for the project. The hourly rates for each role were estimated based on the contracting site, Upwork ("Browse Top Freelancers by Category" 2019). There were some assumptions made that these hours could be slightly altered, so adjustments were made to align more closely with the Customer's Company requirements.

The results have proven that our consulting group will request roughly \$22,400. With additional testing and reworks, we could require anywhere from \$25,000-\$30,000 from your business. The time it will take to complete this project will be, best-case scenario, 4 to 5 weeks. Our realistic timeline will be 6 to 8 weeks, with a possible worst-case scenario of 10 to 12 weeks. This is also assuming the team requirements identified are met and their efficiency remains in line with the time constraints used in the study. With additional contractors included on the team

due to an increase in budget spending, we are confident that the prototype could be delivered in the best-case scenario of 4 to 5 weeks. This is when the team is expanded with a frontend and backend developer, a second data engineer, and an additional QA tester.

As we completed this analysis, we decided to identify and weigh the pros and cons of other methods that can potentially better help with uncertain situations like these. The Monte Carlo simulation excels when estimating the expected total project duration and risk delay factors. We also analyzed the Stochastic programming method as well, which will consider multiple future scenarios and will optimize its decision(s) before uncertainty is resolved. While this is very beneficial when looking for proactive decision-making and efficient management of unexpected disruptions, we determined that the programming models used in this study are sufficient for the requirements laid out for us. If we were to utilize any other method, the Monte Carlo simulation would be easier to implement, whereas the stochastic programming method can be considered overly complex for a project of this size.

Overall, our team is confident that we have delivered the best possible project timeline and most efficient budget estimation for the prototype's development. Using a combination of linear programming and network modeling, we've provided several outlines on how the project can be completed, with best-case, worst-case, and expected scenarios clearly defined. We're looking forward to your feedback and please don't hesitate to contact us with any questions regarding the results or the methods used.