UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

MINIMIZATION OF TRAVELING TIME FOR COURIER SERVICES USING FLOYD-WARSHALL ALGORITHM (CASE STUDY IN SEREMBAN 3)

NUR HAIFA NADHIRA MOHD HISHAM (2021118809)
NORFATEHAH HAIRUDDIN (2021340833)
WAN NUR AMIRA NATASYA WAN ANUAR (2021172775)
(P13S22)

Report submitted in partial fulfillment of the requirement for the degree of
Bachelor of Science (Hons.) (Management Mathematics)
College of Computing, Informatics, and Media

FEBRUARY 2023

ACKNOWLEDGEMENTS

IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL

Firstly, we would like to say Alhamdulillah, and we are grateful to Allah S.W.T. for giving us the strength to complete this final year project successfully although there are many obstacles during completing this final year project.

We would like to express our sincere gratitude to Madam Hjh Noraimi Azlin Mohd Nordin, supervisor lecturer of this subject, for making this final year project possible. Her direction and counsel helped us get through every stage of writing our final-year project. Working and learning under their direction was a real honor and privilege. We also wish to thank her for her patience during the session regarding the final-year project to ensure that we are on track.

Moreover, we would like to express our sincere gratitude to our lecturer, Dr. Rossidah Wan Abdul Aziz, for guiding us through our final year project. Her concern and advice really encouraged us to finish this final-year project.

In addition, we wish to thank our parents and family members for their motivation and support. For providing us with information on our final year project, we would like to express our gratitude to the courier company that we chose for their cooperation.

Finally, we would like to express our sincere gratitude to all our friends, especially to our group members. They have provided us with helpful advice and made a big contribution to the project. We hope that with the completion of this final year project, everything that we have put in can be used as inspiration in the future.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

The existence of online shopping increased the demand of courier services. Due to this demand, there may be a delay in delivering consignments to customers. Thus, distributors might take time to deliver the consignments to customers and will probably go beyond their own working hours. This problem leads to a lack of coherence in the delivery process where the distributor has difficulty determining an appropriate delivery route that is as short as possible. Furthermore, other problems may also contribute to the delay in the delivery process such as high traffic jams. Hence, this gives the motivation to this study in finding the minimum travel time from the courier office to the receivers. Next, to establish the shortest path based on the minimum travel time from the courier office to the receivers and finally, to compare the service between current practice by the courier service and the proposed method used in the study. The time distance and sequence matrices were built based on the data collected from Google Maps and interviews were conducted at the local courier office. This study focused on Floyd-Warshall algorithm in finding the shortest path to deliver the consignment with the least travel time. A Floyd-Warshall algorithm is implemented after both matrices have been completed. An algorithm was run in software called Toolkit for Oracle (TORA). As for the result, the shortest path for the courier was obtained. By using the proposed algorithm, courier services may find the shortest traveling time possible. In conclusion, the courier service can reduce up to 8.3%, 30%, and 21.25% of their travel time for each zone.