ACKNOWLEDGEMENTS

This thesis has been completed with the invaluable support of several individuals throughout this journey. I would like to express my deepest gratitude and thanks to:

- 1. **Dr. Eng. Favian Dewanta, S.T., M.Eng.** as my primary advisor. His exceptional guidance, insightful feedback, and unwavering support have been instrumental in the successful completion of this research. Your extensive knowledge and dedication have profoundly influenced the direction and quality of this work. His constructive critiques and encouragement have been invaluable in navigating the complexities of the research and achieving the desired outcomes.
- **2. Dr. Yudha Purwanto, S.T., M.T.** as my secondary advisor. His thorough reviews, valuable advice, and consistent support have greatly enhanced the depth and rigor of this study. Your expertise and thoughtful recommendations have played a critical role in addressing research challenges and refining the final presentation of this work.
- 3. The Examination Committee, including Suryo Adhi Wibowo, S.T., M.T., Ph.D., who served as the instructor for the Thesis Proposal course, Assoc. Prof. Dr. Ida Wahidah, S.T., M.T., who evaluated the Thesis Proposal Seminar, Assoc. Prof. Dr. Doan Perdana, S.T., M.T. and Assoc. Prof. Dr. Nyoman Bogi Aditya Karna, S.T., MSEE, who served as examiners during the Monitoring Session, and Assoc. Prof. Dr. Istikmal, S.T., M.T. and Dr. Iman Hedi Santoso, S.T., M.T., who assessed the final thesis defense. Your insightful feedback and constructive criticisms from the proposal development stage through to the thesis defense have significantly contributed to the refinement and successful completion of this work.
- **4. Other Supportive Individuals**, all individuals and colleagues who have contributed to this research in various capacities but whose names I am unable to mention individually. Each contribution has been appreciated and has significantly impacted the completion of this work.