DEDICATION

This thesis is completed with the support of my family. I praise Allah SWT and express my gratitude to everyone who has assisted, guided, and supported this work. I dedicate this effort to my cherished parents, Yusuf Abdullah and Sofiani Evie Mubarun.

Finally, this thesis is dedicated to all informatics students worldwide. I hope this research makes a meaningful contribution to the field of Computer Science.

ACKNOWLEDGMENTS

This thesis is compiled with the help and support of both students and lecturers. I want to express my deepest gratitude and thanks to:

- 1. The God Almighty, Allah S.W.T, for his mercy, grace, and blessing so that I can complete this thesis research.
- 2. My beloved parents, H. Yusuf Abdullah and Hj. Sofiani Evi Mubarun, my dear sisters, Kakak Lian, Adik Syahny and Nabila, who never stop praying for me, always giving me tremendous encouragement and support, which gave me the strength to finish this thesis research
- 3. My thesis supervisor and mentor, pak Isman Kurniawan, S.Pd., M.Si., M.Sc., Ph.D., for all the knowledge, guidance, direction, and valuable input provided to me during this thesis research
- 4. My thesis examiner and reviewer, Irma Palupi, S.Si., M.Si., Ph.D., Dr. Untari Novia Wisesty, S.T., M.T., Dr. Rian Febrian Umabara, S.Si., M.Si., who have provided constructive criticism and feedback to improve my research.
- 5. All the lecturers and staff of the Faculty of Informatics at Telkom University, for sharing their knowledge of my master's studies.
- 6. My S2IF residency comrades in arms: Bella, Labib, Bintang, Fiki, Jubi, Pratama, Ghina Kak Ifah, Kak Tryaa, Saskia, Rakha, Ridha, and Bang Aje, and many others, for always encouraging and motivating me to keep going.
- 7. All my Avexi Discord friends who always accompany me during my thesis research.