

ACKNOWLEDGMENTS

This thesis is compiled with the effort, help, and support from both students and lecturers. First and foremost, I would like to express my deepest gratitude to Allah SWT for granting me the strength, patience, and determination to complete this thesis. I extend my sincere appreciation to my parents, whose unwavering support, love, and prayers have been my greatest source of motivation. Your sacrifices and encouragement have guided me through this academic journey, and for that, I am forever grateful. I would also like to convey my heartfelt thanks to my thesis advisor, Dr. Warih Maharani S.T., M.T., for their invaluable guidance, constructive feedback, and continuous support throughout the research process. Your expertise and encouragement have been instrumental in shaping this work. My appreciation extends to the faculty members and staff of the Informatics Department at Telkom University, who have provided me with knowledge and opportunities that have enriched my academic experience. A special thanks to my friends and fellow Informatics students, who have shared this journey with me—through long nights, discussions, and moments of doubt. Your support, motivation, and camaraderie have made this process more bearable and rewarding. Finally, I would like to express my gratitude to everyone who contributed directly or indirectly to the completion of this thesis. Your help, advice, and encouragement have meant the world to me. This thesis is a product of collective efforts, and I am deeply grateful to each person who has been part of this journey.