

## **DEDICATION**

This thesis is compiled with the support of all parties involved. I praise Allah and thanks to all who have helped, directed, and supported this work. I dedicate the work to my grandmother Dewi Kuraesin, my parents Dr. Drs. H. Utang Moch. Muchtar, M.Si and Dra. Hj Jati Siti Tjurajati, my in-laws H. Atang Djuanda and Hj. Sri Hayati, my beloved wife Mina Susilawati, my kids: Ilmina Ula, Isnia Khairunnisa, Yasmin Putri Sofia and Mohamad Faishal Khatami Yusuf, my brothers and sisters, my colleagues in office and home. Finally, this thesis is dedicated to all informatics students in the world. I hope that this research may provide valuable contribution in Computer Science.