Acknowledgement

Firstly, my gratitude goes to my research guide Professor Dr. Karbhari V. Kale, who was the source of encouragement and motivation during the whole work. His advice, useful hints, indications, suggestions and solution to bottleneck problems encountered during this work are just immensurable. I owe a deep thank to him for directing my research work with extreme competence, without which I would not have been able to accomplish this thesis work. I thank to Dr. Pradnya K. Kale for her precious advice, invariable encouragement, support and guidance. A sincere gratitude is extended to Dr. S. C. Mehrotra, Dr. R.R. Deshmukh, Dr. S.N. Deshmukh for their encouragement and kind support time to time.

I specially thank Dr. Rameh R. Manza, Dr. B.W. Gawali, Dr. Pravin Yannawar, Dr. Vikas T. Humbe and Dr. Ganesh M. Magar for contributing their valuable research ideas during the work.

I specially thank Dr. Deshpande S.V. District TB officer, District TB Hospital Aurangabad. Dr. Kandlikar District TB officer, District TB Hospital Jalna. Mr. Jadhav B.S. and Mr. Awchrmal Ashok Lab. Technician of Aurangabd & Jalna respectively. Who have provided live data for my research and verified my results.

I would like to express my gratitude to my colleagues, Dr. V. M. Thakare, Dr. Prapti Deshmukh, Dr. Shivanan S. Gornale, Dr. M. P. Dhore, Dr. Ashok Gaikwad, Dr. Chitra Atole, Dr. Virendra Gomase, Dr. S. Jambhorkar, Dr. C. Namrata, Dr. Mukta Dhopeshwarkar, Dr. Seema Kawthekar, Ms. Sonali Kulkarni, Dr. Punam Thakare, Mrs. Mamta Baheti, Dr. Avinash Kadam, Dr. Arjun Mane, Mrs. Vijaya Kale, Kavita Khobragade, Mr. Premal Nirpal, Mrs. Vidhya Shengule, Najran Al Dawala, Mr. Mazar Kazi, Yogesh Rode, Yogesh Rajendra and Siddharth Dabhade.

For inspiring working environment I would like to thank Prof. K. V. Kale’s research group and all the teaching and non-teaching staff of the Department of Computer Science and Information Technology, Dr. Babasaheb Ambedkar
Marathwada University, Aurangabad for their cooperation and constant support during my work.

I would like to thank Dr. Ganesh R. Manza, Dr. Rakesh Ramteke, Dr Mouffak, Mrs. Mansi Baheti, Sunil Nimbhore, Vaishali Ingale, Arvind Bhalerao, Dr. Madhuri Dixit, Dr. Ganesh Janavale, Arshiya Khan, Manisha Bhalerao, Shasibala Rao, Vishal Waghmare, for their support during the work.

I would like to extend my thanks to all my friends, teaching and non-teaching staff of Vivekanand College, for their cooperation, support and constant inspiration during my work.

I thank the university authorities for their supports and proper communication.

The words cannot truly express the gratitude that I owe to my parents, my father-in-law and mother-in-law, my sisters, sister-in-laws, all brother-in-laws, niece, nephews and all family members for their love, affection and constant encouragements.

I specially thank my husband Mr. Rajendra G. Borade the man behind the wheel and backbone in all the phases of this research for his constant support and motivation.

Lastly, my kids Saakshi and Om, who sacrifice a lot in seeing me through this study and everybody associated to me, you all I dedicate this work to.

Thank you all.

Ms. Mukti Eknathrao Jadhav