Acknowledgement

First I would like to pay my gratitude to almighty God, for without His blessings this piece of work would have never been completed.

It had been a long journey towards the completion of this thesis. I would not have able to complete it without the support of countless people who have strengthened me at various stages. It is really a pleasure to thank all such people who made this work possible.

I must take this opportunity to express my gratitude towards my supervisor Dr. (Mrs.) Maya Ingle, Professor and Senior System Analyst, School of Computer Science and Information Technology, DAVV, Indore who is an institution of knowledge. I have always been encouraged by seeing her enthusiasm towards research and development. She has always been a great source of motivation for me. Her inspiration, advice, teachings and guidance throughout the research period and thesis writing had helped me towards the completion of this thesis. She helped me to successfully coordinate my ideas, offered direction, and provided insight towards interpretation. Despite her busy schedule, she had always been available and gave me help whenever I required direction. I would also like to thank her for constructive criticism and encouragement. I thank her for showing faith in me and I consider myself fortunate to be her student. You are the Mahesh (‘Atma’, The Soul) of the Trimurti Symbol of my research work.

I would like to thank Late Dr. A. K. Ramani, Former Professor and Head, School of Computer Science and Information Technology, for guiding me and providing excellent environment for pursuing research. He was the Vishnu (‘Nirmata’, The Creator) of my Ph.D work. Without his efforts, my entry in the world of research would have not been possible. His encouraging words, patience and trust towards my work were driving force for my research. His sad demise definitely was a shock for all of us. His eminent personality will forever stay in our hearts. I dedicate my work as a tribute to Late Dr. A. K. Ramani.
I am sincerely grateful to Dr. Parag Kulkarni, Director EkLat Research, Pune. I must say he is my co-supervisor with high respect and deep sense of appreciation for his expert and active involvement in providing all necessary things to carry out research. In spite of that initially he was not my co-guide on paper due to his number of seats exhausted, but still he continued to share his expertise and spare his time every fortnight. His constant guidance and his technical expertise are undoubtedly incomparable in the entire Pune University. His confidence in me, especially after the sad demise of Dr. A.K. Ramani Sir, is enduring. I was fortunate enough to gain some technical proficiency from his ocean of technical expertise, and also learnt the art of how to handle situations patiently. Sir, you contribute the symbol of Brahma (‘Shrishti’, The Universe).

Special thanks to Dr. Rajkamal, Professor and Head, School of Electronics, whose energy and expertise has been a constant encouragement and motivation for all of us. I owe my sincere thanks to Dr. S. Tanwani, Professor and Head, School of Computer Science and Information Technology, DAVV, for providing an excellent environment enriched with resources for pursuing my research.

I would be honored to extend my gratitude to the management of MIT College of Engineering (MITCOE) especially Dr. Mangesh Karad Sir, who has always understood the problems I faced during this journey and for believing in me and supporting me for my studies. I am indebted to my students and colleagues of MITCOE for providing a stimulating and fun environment in which to learn and grow. I owe my sincere thanks to colleagues of MITCOE and my students for their support, encouragement.

Above and beyond all, my heartfelt gratitude to my parents without whom I would not have been standing. They sowed the seeds of knowledge and learning in my life. They both were constantly with me with their blessings, inspiring words, their never ending love and care during my research. I am greatly thankful to my father, Late Er. Bhagwan Tewani. He passed away on 6th October 2013. I remember Papa; you told me to book your flight ticket when I would be awarded the Ph.D
degree. I miss you Papa! Due to my Ph.D submissions, I was not able to communicate with you much during your last days.

Words fall short to thank my husband Harcharanjeet Butalia for being my strength and boosting my moral. I thank him for motivating and supporting me unconditionally during the duration of research. I would specially like to thank my dearest daughter Prisha who stood by me with patience, and sacrificing some of her demands. I have no words to really thank her emotional attachment, kindness and love. She has been constantly with me sharing responsibilities along with her own studies. My cutie thanks to Suvir, who was very small, when my work accelerated. I have really stolen their time for my research work. I am thankful for their love and care for me.

I should not forget to thank Kalpana mausi and Munni mausi, who have worked as helpers at my place. They have been very caring, and understood my problems during research work emotionally as well. May God help them to overcome their problems.

Lastly, I would like to owe my sincere thanks to all those who have helped me directly or indirectly for successful realization of this thesis. Thanks to all of you.

Ayesha Butalia