ACKNOWLEDGEMENT

Before beginning I pay my obeisance to The Almighty, for being the impetus of this research work.

I take this opportunity to thank my supervisor Dr. Ashok Kumar, Professor and Chairman, Department of Computer Science and Applications, Kurukshetra University, Kurukshetra, who made my dream come true. I have no words to express my deep respect for Dr. Ashok Kumar whose venerated guidance and meticulous supervision made this happening possible. This thesis would not have been possible without him. His guidance, understanding, constructive criticism and support have been stimulating and motivational during this work.

I am also grateful to all the teachers of the department of Computer Science and Applications, Kurukshetra University, Kurukshetra for their encouragement and motivation during the entire period of study. I am especially thankful to Dr. Sanjay Kumar Tyagi who encouraged me to think of this course of action and helped me a lot. I am also very thankful to non teaching staff of the department of Computer Science and Applications, Kurukshetra University, Kurukshetra for their cooperation all the time duration this research work.

Special gratitude is extended to all the teachers in the department of Computer Science and Engineering, Guru Nanak Dev University, Amritsar for their moral support. My thanks are also due to all my colleagues in the Computer Centre, Guru Nanak Dev University, Amritsar for their technical support and encouragement during my study.

I also wish to thank my parents for their support, everlasting
encouragement and blessings. I owe a great deal to other family members and in particular to my wife Devinder Kaur Gill, younger brothers Manjit Singh Gill, Jasbir Singh Gill, my son Gurbinder Singh Gill and my daughter Parminder Kaur Gill for their love and support.

I thankfully acknowledge the cooperation and support extended by various software development companies and client organizations, software engineers, software developers, software managers and software professionals in the designated organizations in making this research more meticulous by providing me the necessary information required for the case studies.

(Bakhshish Singh Gill)