## CONTENTS

- Acknowledgements III
- Abstract IV
- List of Figures and Tables VII

### CHAPTER 1. INTRODUCTION 2 - 6

1.1 Introduction 2
1.2 Earlier developments 3
1.3 Problems and Challenges 3
References 6

### PART 1: SYSTEM ANALYSIS 8 - 42

### CHAPTER 2. ARCHITECTURE 8 - 42

2.1 Introduction 8
2.2 MSTAPI Feasibility study 9
2.3 MSTAPI Architecture 14
2.4 JTAPI Architecture (feasibility tested) 19
2.5 SAPI in conjunction with TAPI 27
2.6 Hardware analysis 27
2.7 Database analysis 39
References 41

### PART 2: SYSTEM DESIGN 44 - 180

### CHAPTER 3. ALGORITHM FOR MLS SYSTEM 44 - 48

3.1 Embedding MLS system 44
3.2 Problems with dynamic data 44
3.3 Solution for a generalized component 45
3.4 Conclusion 48
References 48

### CHAPTER 4. USING WIN32 API'S 50 - 160

4.1 Introduction 50
4.2 TAPI Messages 54
4.3 TAPI Functions 73
4.4 TAPI Structures 102
4.5 TAPI Constants 117
4.6 Telephony operations life cycle 130
4.7 Using Atom Table 134
4.8 Multithreading problems and solutions 140
4.9 Using Sound API 152
4.10 Miscellaneous Issues 155
References 159

CHAPTER 5. DATABASE INTEGRATION 162 - 180
5.1 Introduction 162
5.2 Database Requirements 163
5.3 Using MS JET Engine 163
5.4 Using DAO 163
5.5 Conclusion 180
References 180

PART 3: REAL WORLD IMPLEMENTATIONS 182 - 228

CHAPTER 6. BUILDING A COUNSELING SYSTEM 182 - 228
6.1 Introduction 182
6.2 Requirement and specification 183
6.3 System Design 186
6.4 Flow of Interaction 192
6.5 Code Listings 193
6.6 Product Installation 215
6.7 Product Usages 219
6.8 Using BazarConnect 220
6.9 Using BazarUpdate 221
6.10 Using BazarReport 222
References 227

Summary and Conclusions 229

Future Developments 231

List of Presentations 233