Project Guidelines:

1. **Application Development Project**

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| **Chapter No** |  | **Details** |
| **1** |  | **Introduction** |
|  | 1.1 | Company Profile / Institute Profile / Client Profile |
|  | 1.2 | Abstract |
|  | 1.3 | Existing System and Need for System |
|  | 1.4 | Scope of System |
|  | 1.5 | Operating Environment - Hardware and Software |
|  | 1.6 | Brief Description of Technology Used   * + 1. Operating systems used (Windows or Unix)     2. RDBMS/No Sql used to build database (mysql/ oracle, Teradata, etc.) |
| **2** |  | **Proposed System** |
|  | 2.1 | Study of Similar Systems ( If required research paper can be included) |
|  | 2.2 | Feasibility Study |
|  | 2.3 | Objectives of Proposed System |
|  | 2.4 | Users of System |
| **3** |  | **Analysis and Design** |
|  | 3.1 | System Requirements (Functional and Non-Functional requirements) |
|  | 3.2 | Entity Relationship Diagram (ERD) |
|  | 3.3 | Table Structure |
|  | 3.4 | Use Case Diagrams |
|  | 3.5 | Class Diagram |
|  | 3.6 | Activity Diagram |
|  | 3.7 | Deployment Diagram |
|  | 3.8 | Module Hierarchy Diagram |
|  | 3.9 | Sample Input and Output Screens (Screens must have valid data. All  reports must have at-least 5 valid records.) |
| **4** |  | **Coding** |
|  | 4.1 | Algorithms |
|  | 4.2 | Code snippets |
| **5** |  | **Testing** |
|  | 5.1 | Test Strategy |
|  | 5.2 | Unit Test Plan |
|  | 5.3 | Acceptance Test Plan |

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|  | 5.4 | Test Case / Test Script |
|  | 5.5 | Defect report / Test Log |
| 6 |  | **Limitations of Proposed System** |
| **7** |  | **Proposed Enhancements** |
| **8** |  | **Conclusion** |
| **9** |  | **Bibliography** |
| **10** |  | **Publication / Competition certificates** |
| **11** |  | **Appendix – Cost sheet , Data sheet** |
| **12** |  | **User Manual** (All screens with proper description/purpose Details  about validations related to data to be entered.) |

1. **Embedded Systems / IoT Project**

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| **Chapter No** |  | **Details** |
| **1** |  | **Introduction** |
|  | 1.1 | Company Profile / Institute Profile / Client Profile |
|  | 1.2 | Abstract |
|  | 1.3 | Existing System and Need for System |
|  | 1.4 | Scope of System |
|  | 1.5 | Operating Environment - Hardware and Software |
|  | 1.6 | Brief Description of Technology Used   * + 1. Operating systems used (Windows or Unix)     2. Database (if applicable) |
| **2** |  | **Proposed System** |
|  | 2.1 | Study of Similar Systems ( If required research paper can be included) |
|  | 2.2 | Feasibility Study |
|  | 2.3 | Objectives of Proposed System |
|  | 2.4 | Users of System |
| **3** |  | **Analysis and Design** |
|  | 3.1 | Technical requirements – H/W , S/W |
|  | 3.2 | System Architecture / Block Diagram |
|  | 3.3 | System Hardware Details |
|  | 3.4 | Pin Diagrams |
|  | 3.5 | Interface diagrams |
|  | 3.6 | Design Sequence |
|  | 3.7 | System Software Details |
|  | 3.8 | Process / System Flow chart |
| **4** |  | **Coding** |
|  | 4.1 | Algorithms |
|  | 4.2 | Code snippets (if applicable) |

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| **5** |  | **Testing** |
|  | 5.1 | Results & reports |
|  | 5.2 | Test cases |
|  | 5.3 | Acceptance Testing |
|  | 5.4 | Test reports in IEEE format |
| **6** |  | **Limitations of Proposed System** |
| **7** |  | **Proposed Enhancements** |
| **8** |  | **Conclusion** |
| **9** |  | **Bibliography** |
| **10** |  | **Publication / Competition certificates** |
| **11** |  | **Appendix – Cost sheet , Data sheet** |
| **12** |  | **User Manual** (All screens with proper description/purpose Details  about validations related to data to be entered.) |

1. **ETL Projects**

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| **Chapter No** |  | **Details** |
| **1** |  | **Introduction** |
|  | 1.1 | Company Profile / Institute Profile / Client Profile |
|  | 1.2 | Existing System functionality (Source System for which the ANALYTICS is  being developed) |
|  | 1.3 | Business process understanding and specifications 1.3.1 Business Requirement Specifications:   * + - 1. The o/p from BR Analysis are BRS Business Requirement Specifications (Business specific Rules to be mentioned here from analysis point of view)       2. Identify the dimensions, required attributes, measures, filter conditions, adjustments for KPIs going to be used in the Target system and its availability in the Source System. If any gaps suggest remediation of gaps     1. Business Rules Collection     2. Identify the Key Performance Indicator (specified by     3. Establish the User Acceptance Criteria client) |
|  | 1.4 | Scope of the project |
|  | 1.5 | Operating Environment - Hardware & Software, Description of Tools / Technology to be used in the Target system   * + - 1. Operating systems used (Windows or Unix)       2. RDBMS/NoSql used to build database (mysql/ oracle, Teradata, etc.)       3. ETL tools used (Talend/Informatica, Datastage etc)       4. OLAP/ Data mining/ machine learning/ analytics tools used (Python/ Cognos, BO, etc.)       5. Data visualization tools (power BI / Tableau) |

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| **2** |  | **Proposed System** |
|  | 2.1 | Creating multiple ETL strategies - Specifying metadata details,  identifying heterogeneous architectures, processes for I/O only for ETL, |
|  |  | scrapping , identifying the volatilities in the channels , designing  strategies in the context of the business and existing ERP |
|  | 2.2 | Comparing them in the context of selected business system (as per the  business requirements) |
|  | 2.3 | Suggesting optimum solution (process) |
| **3** |  | **Analysis and Design** |
|  | 3.1 | Use Case Diagram |
|  | 3.2 | Activity diagram to demonstrate Process flow (execution of ETL process) |
|  | 3.3 | Design of Target system (Elaborate the tiers of DW architecture in the  Target System) |
|  | 3.4 | Database schema / Table specifications of Target system |
|  | 3.5 | Details of Source & Targets of mapping in the database |
|  | 3.6 | Details of Load (Full/Incremental etc.) |
|  | 3.7 | Design of ETL schema/strategy |
| **4** | **4.1** | **Design of strategy for Visualization**   * + 1. Visualizations in support of comparison of performance of various ETL strategies     2. Data visualization using different techniques (if any) |
| **5** |  | **Drawbacks and Limitations Proposed Enhancements** |
| **6** |  | **Conclusion** |

1. **Research Projects**

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| **Section No** | **Section Title** | **Details** |
| **1** | **Title Page** | Title of the research project |
| **2** | **Acknowledgements** | Acknowledge contributions from supervisors, institutions, organizations, or individuals involved in any phase of the project (planning, conduct, analysis, reporting) |
| **3** | **Abstract** | A 250–300 word summary including:   * Study question * Aims and objectives * Background literature * Methods * Results * Key conclusions * Recommendations |

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| **4** | **Introduction** | Introduction to the subject, background to the topic, study question or hypothesis, and aims and objectives |
| **5** | **Literature Review** | Review of previous studies or related work, discussion on methodologies if using new research methods, critical comparison with existing findings |
| **6** | **Methods** | Methodology based on research domain:  For Computer Management Research:   * Study design * Population and sampling method * Survey design and instruments * Data collection protocol * Ethical considerations * Information letters and consent forms * Data management and analysis * Statistical analysis/tests   For Computer Science Research:   * Study design * System architecture * Implementation (experimental or simulated) * Data management and analysis * System analysis and testing |
| **7** | **Results** | Presentation of research findings using tables, charts, and figures with clear numbering and titles |
| **8** | **Discussion** | Interpretation of results, comparison with published research, implications and significance, limitations of the study |
| **9** | **Conclusion** | Summary of key results, conclusions based on findings, reflection on original aims and objectives |
| **10** | **Recommendations** | Suggestions for further research and recommended actions based on findings |
| **11** | **References** | All sources cited in the report including books, journal articles, conference papers, media, etc. |
| **12** | **Appendices** | Copies of questionnaires, consent forms, ethics approvals, and additional supporting information or tools |