

## **Intelligent Fault and Performance Management in Telecommunications Networks**

The purpose of this project was to develop a complete low cost network alarm and fault management system in telecom networks that takes care of all the basic aspects of international standard alarm management system. The system was successfully developed and is in working state.

### *Key Objectives*

1. Design and architecture of intelligent fault and performance management for telecom networks.
2. Development of the intelligent system for fault and performance management capable of handling certain, vague and incomplete data along with the data analysis through artificial intelligence techniques (including data mining, fuzzy logic and CBR) to predict faults and performance degradation.
3. Development of an Event Prediction Engine (EPE) that can predict future sequence of events based on historical event data. A particular application of the EPE will be for the prediction of future faults using historical alarm data.
4. Efficient and smart data store to provide quick and intelligent data retrieval.
5. Advance techniques for efficient and parallel development of modules. Smart system integration of all the modules i.e. data acquisition storage, decision making engine along with the front end.
6. Open source general release of efficient and low cost intelligent fault performance management software solution for the industry.

There were a few academic objectives too, which are listed as follows:

1. To strengthen research in the field of intelligent network management and AI in Pakistan.
2. To support students of PhD/MS studies in the area of AI in telecommunications network management and provide impetus to the latest research trends in this area in the country.
3. To devise a new course on intervention of AI in network management.
4. Develop an open source platform for the students and faculty to work in the intelligent network management area.
5. MS/PhD in software methodologies for utilizing open source platforms and software to develop commercial quality application using efficient and parallel development processes.

### *Significant Results*

ALL OBJECTIVES MENTIONED ABOVE WERE ACHIEVED. Moreover, it is a complete alarm management system for telecom networks and also a low cost product of international standard. The project was completed in time other than the testing as it was performed in one extended quarter after the availability of data from the industry; with no change in the approved budget.