Project: HR Management System
Organization: Ekushey Television Limited
Developer: Ariful Islam Emon
Stack: Visual Basic, MS SQL Server, Biometric Fingerprint Integration
Domain: Workforce Management • Data Engineering • Operational Analytics

1. Project Report

1.1 Background

Ekushey Television operates in a continuous 24×7 broadcasting environment requiring accurate workforce tracking across rotating shifts. Manual attendance processes were inefficient, error-prone, and unsuitable for real-time operational oversight. To address these challenges, a centralized HR Management System (HRMS) was designed and implemented to automate employee data management, attendance processing, leave tracking, and administrative reporting.

1.2 Objective

The project aimed to develop an integrated HR platform that:

- Automates attendance capture from biometric devices
- Supports shift-based workforce scheduling
- Provides analytics-ready workforce data
- Enables administrative control and reporting
- Ensures data accuracy and operational transparency

1.3 System Architecture

The system follows a structured data workflow:

Biometric Device → Raw Attendance Storage → Validation → Transformation → Application Database → HR Reporting

Key architectural characteristics:

- Centralized relational database (MS SQL Server)
- Desktop application interface (Visual Basic)

- Rule-based attendance evaluation engine

- Role-based user access control

1.4 Key Outcomes

- Automated attendance processing across departments

- Reduced manual reconciliation and reporting effort

- Accurate tracking of shift-based workforce activity

- Structured data foundation for HR analytics
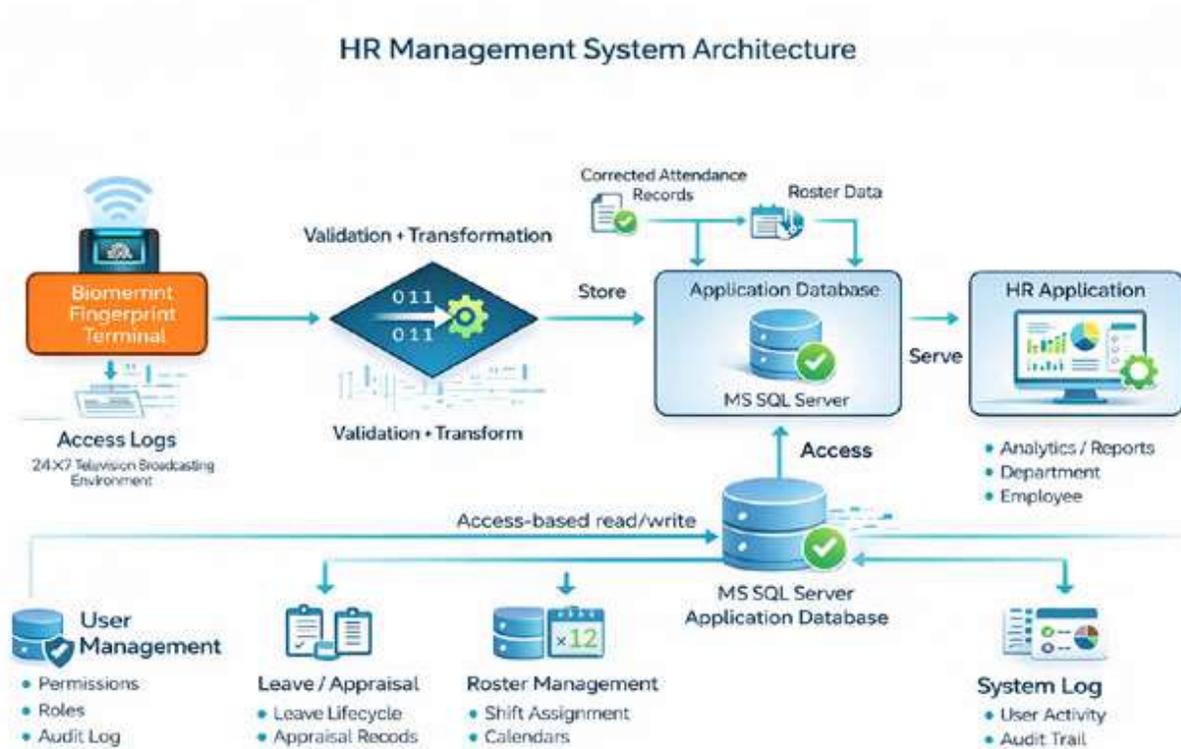
- Improved administrative governance and auditability

Figure 1: Employee information

2. Software Documentation

2.1 Module Architecture Overview

The system is organized into functional modules supporting employee lifecycle management and workforce monitoring.

2.2 Module Details

Employee Information Module

Purpose: Centralized employee master data management

Features:

- Personal and demographic information storage

- Profile photo management

- Address and contact details

- Educational background records
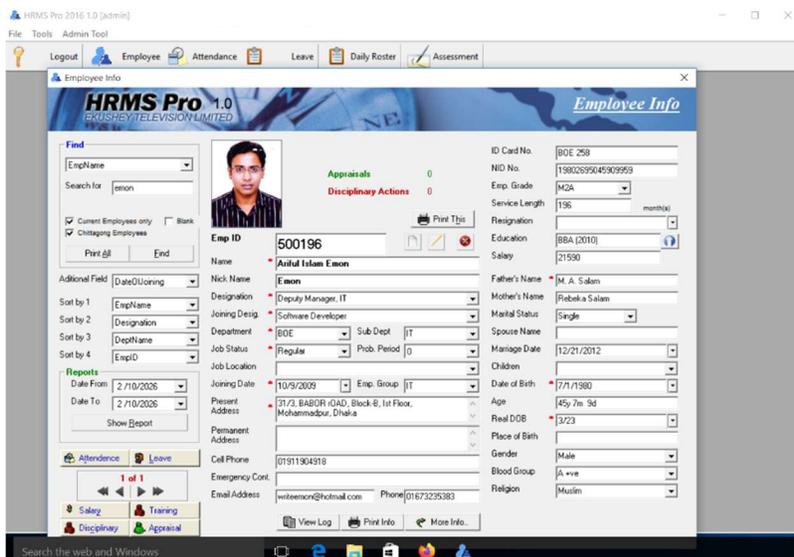
- Employee identification management

Figure 2: Employee information

Data Role: Master data source for attendance, leave, and reporting modules.

Attendance Management Module

Purpose: Automated workforce presence tracking and evaluation

Features:

- Integration with biometric fingerprint access control

- Individual and department-wise attendance reports

- Manual attendance entry and remark management

- Attendance status classification:

    - On-time

    - Late

    - Extremely late

    - Shift change

    - Holiday

    - Day off

- Monthly attendance summaries

- Total Working Hours (TWH) calculation
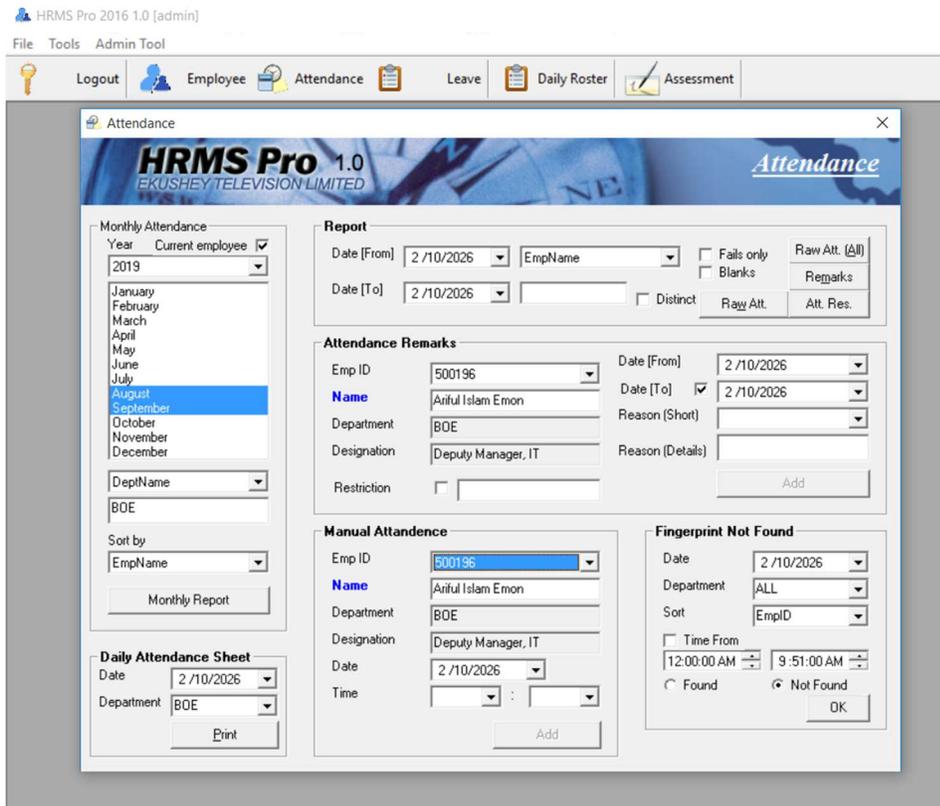
- Detailed and summarized reporting

Figure 3: Attendance module

Data Engineering Functionality:

- Event ingestion from biometric devices

- Data validation and cleansing

- Shift-aware time interpretation

- Rule-based attendance classification

Leave Management Module

Purpose: Structured leave lifecycle administration

Features:

- Leave application entry and tracking

- Leave form generation

- Leave history search and reporting

- Annual leave quota management
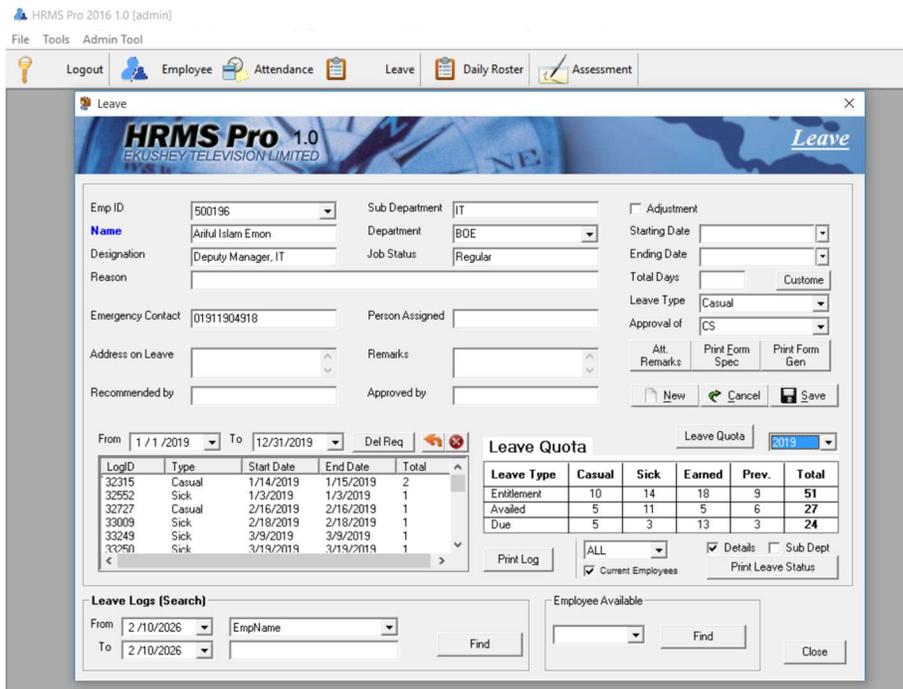
- Year-end leave carry-forward processing

Figure 4: Employee leave management

Roster Management Module

Purpose: Workforce scheduling and shift assignment

Features:

- Weekly roster configuration

- Date-specific shift assignment

- Departmental schedule management
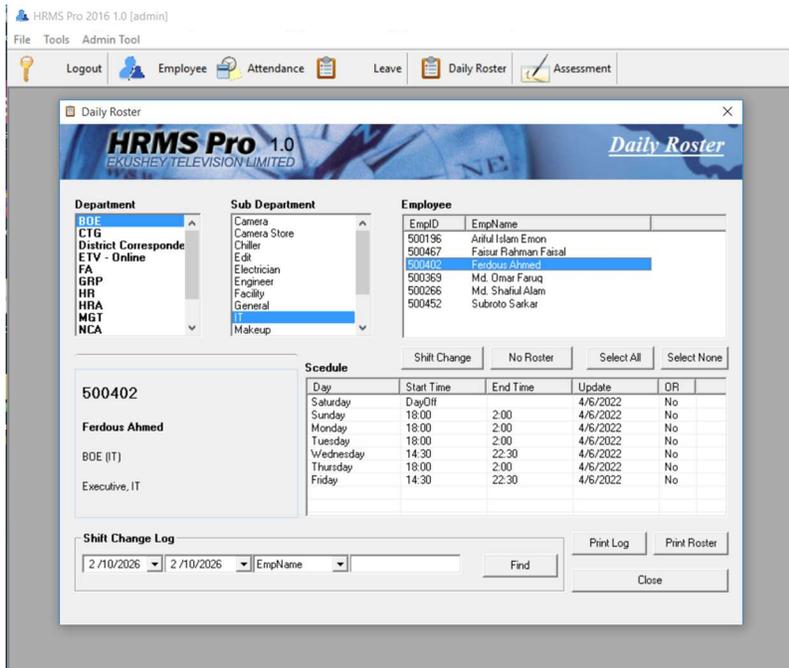
- Integration with attendance evaluation logic

Figure 5: Roster / scheduling module

Appraisal & Disciplinary Records Module

Purpose: Employee performance and compliance documentation

Features:

- Appraisal record management

- Disciplinary action logging

- Historical performance tracking

User Management Module

Purpose: System security and administrative control

Features:

- Role-based access control

- User permission configuration
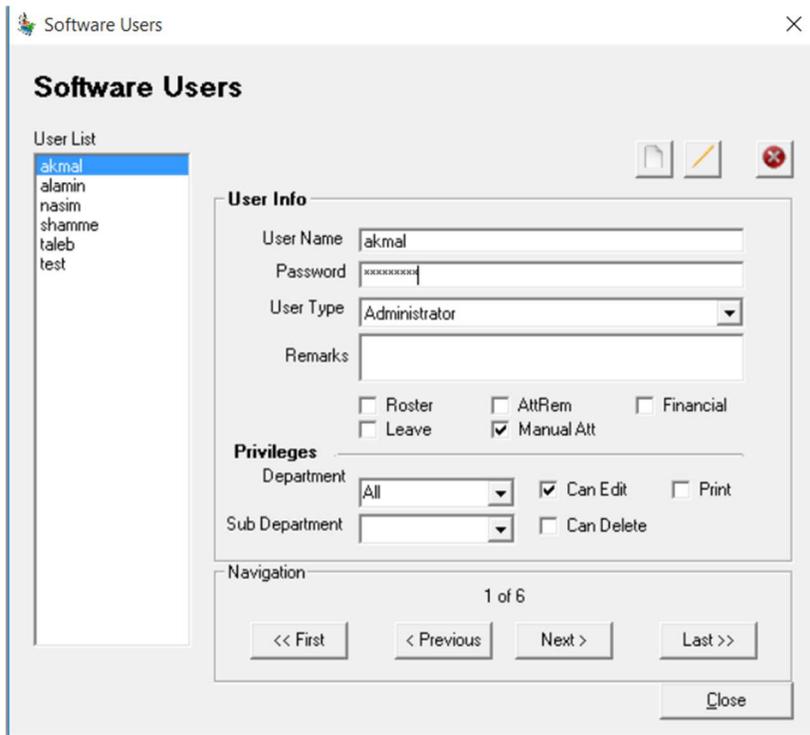
- Secure administrative operations

Figure 6: Employee permission module

2.3 Administrative Support Features

Organizational Configuration

- Department management

- Holiday calendar configuration

- Workforce policy alignment

Data Governance Tools

- Administrative correction tools

- Audit logging of user activity

- System operation tracking

2.4 Data and Reporting Layer

The system generates structured operational reports to support:

- Workforce monitoring
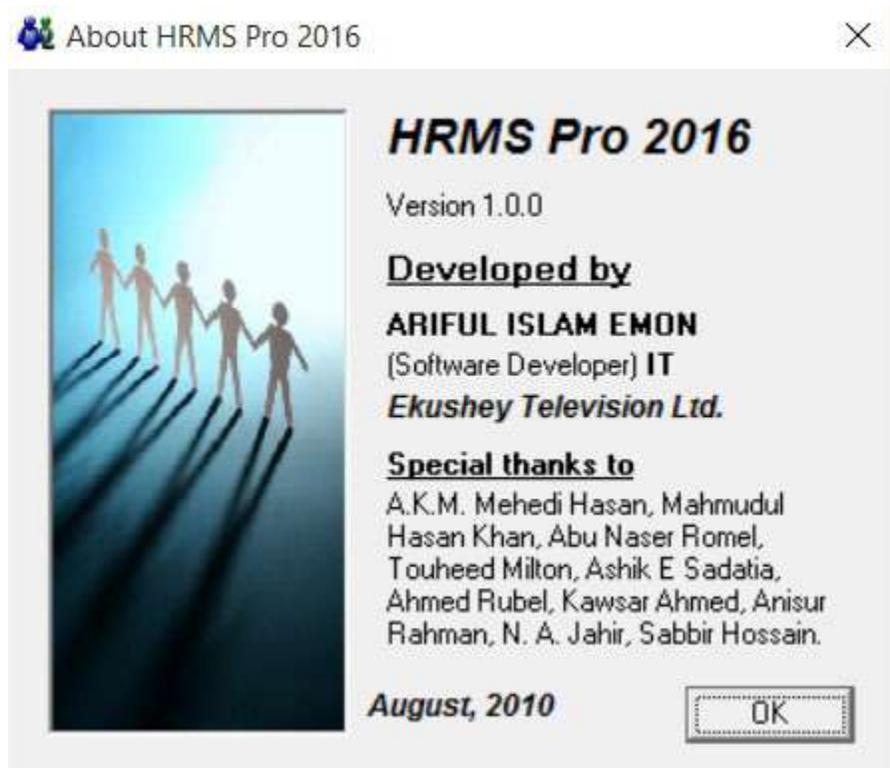
- Departmental oversight

- Compliance tracking

- Administrative decision-making

Figure 7: About the software