

ERP-based Integrated Student Management System (ISMS)

Using **LEO satellite connectivity + modem** for internet access
(instead of expensive fiber / terrestrial lines)

1. Project Concept

You're solving the problem of **fragmented records** (admission, fees, hostel, exams) in colleges by creating a **low-cost ERP solution** built on **cloud office tools + satellite internet for connectivity**.

Core Features

- **Admissions** → Online forms feed data into a central database.
- **Fees** → Auto-generated receipts + linked to student records.
- **Hostel/Library** → Real-time occupancy tracking, record updates.
- **Exams** → Marks entry, attempts, result generation.
- **Dashboards** → Key performance indicators for administrators.
- **Security** → Role-based access, backups, and audit trails.

2. Infrastructure (with LEO Satellites)

****Since some colleges (especially rural or remote) lack reliable internet, your ERP will run via satellite modem + LEO satellites.**

Requirements

1. **Receiver Dish + Modem**
 - Provided by satellite ISP (e.g., Starlink Kit).
 - Connects to router → Wi-Fi/LAN → ERP system.
2. **Cloud Office Suite**
 - Google Workspace (Sheets, Forms, Apps Script, Data Studio).
 - Microsoft 365 (Excel Online, Power Automate, Power BI).
 - Open-source alternatives (Nextcloud + OnlyOffice).
3. **Backend Database (if needed)**
 - Google Sheets (lightweight, free).
 - Airtable / Supabase
 - MySQL/PostgreSQL on a cloud VM (if ERP grows).

3. Workflow Integration

1. **Admission Intake** → Google Forms → central student database (Google Sheets/Airtable).
2. **Fee Collection** → Payment integration (UPI/PayPal/Razorpay) → Auto receipt → Updates central DB.
3. **Hostel Allocation** → Online form + auto seat availability update in DB.
4. **Library/Exams** → Staff enter marks, book loans, etc. → Updates same DB.
5. **Dashboards** → Google Data Studio / Power BI → Real-time analytics.
6. **Connectivity** → All data syncs through LEO satellite internet → Works in remote colleges.

4. Challenges & Solutions

Challenge	Why it matters	Possible Solution
Latency & Bandwidth	Even LEO has 30–50 ms latency; bulk data transfer could slow.	Use lightweight apps (Sheets, Forms, dashboards) instead of heavy ERP software.
Power Backup	Satellite modem + router need power.	Use UPS/solar backup for rural colleges.
Data Security	Student & financial data are sensitive.	Role-based access + encrypted cloud storage.
Training Staff	Many staff are only used to ledgers.	Keep UI simple, provide short training.
Cost	Proprietary ERP is expensive.	Use free/low-cost cloud office suites + existing satellite kits.

4. Expected Outcome

A **prototype ERP system** using Google Workspace / Microsoft 365.

- Real-time dashboards showing admissions, fees, hostel, exams.
- Demonstration that **satellite internet** makes it accessible **anywhere**, especially for rural/public colleges.
- Cost-effective → No servers, no expensive ERP license, just **modem + dish + cloud apps**.