

## ✅ A. Full Roadmap to Evolve CampusHub into a Global Web App

### Level 1: Console Foundations (You're already here)

- Student class
- Add, display, update, delete
- Input validation
- Data stored in memory

Skill gained: core CRUD logic

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### Level 2: Web Backend Transition

Use **C++ Drogon framework** to build a REST API

Endpoints like:

POST /students

GET /students

GET /students/{id}

PUT /students/{id}

DELETE /students/{id}

Skill gained: actual backend engineering

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### Level 3: Database Integration

Use **PostgreSQL**

Implement proper database schema (coming next in section C)

Skill gained: permanent storage like real apps

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### Level 4: Authentication + Roles

User types:

- Admin (can manage students)
- Student (view profile only)

Use:

- Password hashing
- JWT tokens

Skill gained: secure real-world systems

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### Level 5: Frontend Web App

Choose **React** for smooth UI

Pages:

- Login
- Dashboard
- Student list
- Add/Edit student
- Profile view
- Analytics view

Skill gained: full-stack ability

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### Level 6: Deployment

- Docker container for backend + DB
- Deploy to **Render/Railway/AWS**
- Custom domain

Now your CampusHub is **publicly live on the internet**

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### Level 7: Professional Extras

- Pagination + Search + Filters
- Icons, charts, UX
- Error logs
- Admin actions tracking
- High-quality branding

Now it feels **like a real SaaS product**

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### Roadmap Summary

Console app → Web API → Database → Authentication → UI → Cloud Deployment → SaaS polish

This is the EXACT growth path real startups take.