Success Story

Developing a student record management system for NeGD

Customer	Country	Industry
Academic Bank of Credits	India	Government

About The Client

The Academic Bank of Credits (ABC) is an innovative initiative introduced by the Government of India as part of the National Education Policy (NEP) 2020. Operating in tandem with the National Academic Depository (NAD), ABC functions as a digital repository enabling students to securely store their academic credits acquired throughout their educational journey. It aims to simplify administrative tasks, offer valuable academic insights, guide career development, and facilitate connections with industries.

Technology Stack

Amazon Glue	amazon REDSHIFT	python
Apache Airflow	mongoDB	DynamoDB

Business Situation

The National Academic Depository (NAD) recognized the evolving needs of the education sector in India, particularly regarding the management and authentication of academic records. With people seeking a more efficient and reliable system, NAD envisioned a solution that would not only digitize academic credentials but also improve the way academic credits are handled.

Understanding the challenges students faced in transferring credits between educational programs and institutions, NAD saw an opportunity to innovate and streamline this process. Thus, the Academic Bank of Credits (ABC) emerged as a strategic initiative to address this issue. Its goal was to provide students with the freedom to navigate their academic journeys more smoothly.

However, NAD encountered several hurdles in implementing its ABC application. One major obstacle was the lack of a skilled and talented workforce to develop and maintain the application. Additionally, their existing technology stack was outdated, posing compatibility and performance issues. Furthermore, NAD faced difficulties in data management and fragmentation, hindering the seamless integration of academic records across institutions and courses.

Given the magnitude of this undertaking, NAD turned to Daffodil, a trusted technology partner for various government entities, including NeGD and RBI. With a proven track record of successful collaborations, Team Daffodil was well-equipped to understand NAD's vision and nuances of the education landscape.

The key requirements were to:

- ✅ Develop a scalable backend system to efficiently manage data storage, retrieval, and processing, ensuring high performance and reliability.

- ✅ Improve front-end design and usability to enhance the overall user experience, making it intuitive and user-friendly.

- ✅ Migrate student academic data from MongoDB to AWS Redshift, ensuring data integrity and minimal disruption.

- ✅ Design and implement an interactive dashboard for real-time data visualization and reporting, allowing stakeholders to track various metrics related to credit points and semester-wise data.

- ✅ Integrate with NAD for seamless document storage and retrieval, ensuring compatibility and security.

- ✅ Develop APIs for smooth data exchange and file uploads, facilitating seamless integration with external systems and ensuring data security.

The Solution

The project kicked off with Team Daffodil and the client delving deeply into defining the product's vision and specific requirements. This collaboration was pivotal in establishing a strong groundwork for the project, ensuring that the development process was precisely aligned with the client's goals.

With the roadmap set, the Daffodil team started the development of the ABC application. We utilized frameworks such as CodeIgniter to enrich client-side functionality for dynamic user experiences. On the server side, Lumen and Python were employed, and AWS was chosen for efficient data storage and management.

Our product designers meticulously analyzed the solution requirements and crafted feature lists, process flow diagrams, wireframes, and prototypes to visualize the web portal's structure. After integrating the final design into our technological framework, extensive usability testing was conducted to ensure the web portal effectively met the client's objectives and provided an optimal user experience.

Throughout the development journey, we remained agile and receptive to client feedback, continually refining the solution to meet their evolving needs and preferences.

The final solution created by Daffodil, comprised the following capabilities and phases:

Interactive dashboard

Real-time insights: Users gain access to real-time insights and data analytics, allowing stakeholders to monitor student enrollment trends, track credit accumulation, and stay informed about academic achievements as they occur. This feature empowers decision-makers with timely information for strategic planning and intervention.

Customizable data views: The dashboard provides customizable data visualization options, enabling users to tailor their data views according to their preferences and specific needs. Users can choose from dynamic charts, graphs, and tables to visualize academic data in a format that best suits their requirements, facilitating deeper analysis and understanding.

Records management and templates

Comprehensive credit management: The application offers robust tools for administrators to manage student credit records comprehensively. From viewing and updating credit information to tracking credit history, this feature ensures accurate and up-to-date records, essential for academic planning and evaluation.

Standardized document templates: Administrators have the ability to create, customize, and maintain standardized templates for official documents such as certificates, transcripts, and credit reports. Standardized templates ensure consistency and professionalism in document formatting, enhancing the credibility and trustworthiness of issued documents.

The Solution

Certificate approval and verification

Structured approval workflow: A structured workflow enables designated officials to systematically review, approve, or reject certificate requests within the application. This feature ensures that only verified and authenticated certificates are issued to students, maintaining the integrity and credibility of academic credentials.

Robust verification tools: Users have access to robust tools for verifying the authenticity of certificates issued through the application. These verification tools provide additional layers of security, helping to prevent fraud and unauthorized use of academic credentials.

Academic mobility and security

Seamless credit transfer: The application facilitates the seamless transfer of academic credits between institutions, enabling administrators to efficiently process credit transfer requests initiated by students. This feature supports academic mobility and flexibility, allowing students to progress smoothly through their educational journey.

Secure curriculum upload: Institutions can securely upload course curricula and supporting documents directly into the application. This feature ensures centralized and secure storage of curriculum information, making it easily accessible to authorized users and facilitating curriculum management processes.

Data processing and migration

The project encountered significant challenges in managing and processing data efficiently, particularly with the NAD's existing MongoDB database. To address this, the Daffodil development team devised a solution that involved migrating data from MongoDB to Redshift, a data warehousing solution known for its scalability and performance.

The migration process was facilitated through the implementation of AWS Glue, a fully managed extract, transform, and load (ETL) service that automates the process of preparing and loading data for analytics. This allowed for seamless data transfer from MongoDB to Redshift, overcoming issues related to data phase and ensuring the reliability and integrity of the data.

Furthermore, a data pipeline was formed to streamline the data migration process and ensure its sustainability. This pipeline, orchestrated through AWS Glue, enabled automated data processing on a daily basis, eliminating the need for manual intervention and minimizing downtime.

Integration with NAD platform

Our team developed custom APIs to seamlessly integrate the ABC with the NAD platform. These APIs facilitated secure data exchange, enabling real-time synchronization of student records, academic metrics, and accreditation status. This streamlined data management processes, enhanced interoperability, and improved decision-making capabilities for stakeholders.

The Impact

The implementation of the solution resulted in tangible improvements in system performance and user satisfaction. The streamlined data migration process and backend optimizations led to faster data processing and enhanced data accessibility, ultimately improving the overall user experience. Furthermore, the solution facilitated an increase in registrations from educational institutions on the ABC platform, indicating improved efficiency and user satisfaction. This positive impact on stakeholders underscores the effectiveness of our solution in addressing key challenges and driving positive outcomes in the education sector.

290M +	students registered
1900+	AIs (Universities, INIs) listed
6.1M +	academic records mapped with ABC ID

Services Used

UI/UX Services

Software Product Engineering

Have a software product vision in mind?
Setup a personalized consultation with our technology expert.

Let's Talk

daffodil
info@daffodilsw.com
www.daffodilsw.com