

Alumni Connect: An Integrated Digital Platform for Alumni Engagement, Mentorship

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Executive Summary

At most universities, including Saint Louis University, alumni data, events, and mentorship programs are all over the place, in spreadsheets, email, and unconnected tools. This fragmentation causes a lot of operational inefficiencies: students have a hard time finding and connecting with relevant alumni mentors, alumni don't have a way to connect back to their institution, and advancement staff are less able to track engagement metrics and measure the real impact of their engagement initiatives. The lack of an organized alumni management system hinders the University from using its 142,000+ living alumni network as a strategic asset for development (fundraising), student career development, and the building of institutional reputation.

SLU Alumni Connect overcomes these issues by a complete platform made of web-based Next.js, React & Typescript. The system introduces a unified type of alumni data using a single team data object that also incorporates data from six CSV data sets. 12,000+ alumni data profiles, 262 alumni events, 4,747 alumni RSVPs, 1,945 alumni donations, and 811 alumni-mentorship relationships are collected and aggregated into a common data type (EnergyStar Alumni Tool). Role-based access controls help distinguish between student/alumni users and administrators, which allows for tailored experiences to be offered to every stakeholder group.

1. Problem Context and Stakeholder Perspectives

Saint Louis University (SLU), which was established in 1818, is a major private Jesuit research university with around 15,000 students studying a range of subjects, from medicine, law, business, and engineering. Like most universities from now on, SLU realizes that alumni are an important component of its strategic assets. Alumni connections provide tremendous value through student mentoring and networking, career placement assistance, philanthropic gifts, and institutional reputation building. The higher education sector is increasingly competing for student recruitment and retention in part based on student success and engagement with alumni outcomes - so alumni relations is a core institutional priority.

However, despite this recognition, most universities,

inclusive of SLU, are faced with a common operational reality, namely that alumni data is siloed. Contact information, event histories, donation records, and informal mentorship arrangements exist in various standalone systems - advancement databases, event management tools, email platforms, departmental spreadsheets. This breaking up creates inefficiency, data inconsistency, and lost opportunities for strategic alumni engagement. Industry reports from CASE [Council for Advancement and Support of Education] show that those universities that use an integrated alumni system have 37% more engagement and 52% better retention of their donors than universities with different piecemeal tools.

Scoped Problem Definition

After considering the existing status of alumni management at SLU, we come to a definition of the core problem:

This problem is manifested in three concrete ways:

- (1) students cannot easily find and connect with mentors in their field from their alumni base;
- (2) Engagement of alumni is currently very unmeasured and ad hoc
- (3) Staff are lacking visibility into which initiatives are actually working towards student outcomes or relationships with donors.

Affected Stakeholders and Pain Points

Students and Recent Grads

Rugger struggles to reach alumni in the desired industry or firm. Mentorship, by default, when it takes place, is informal and unstructured. They miss out on relevant events due to the dispersal of information through emails, department websites, and Facebook groups. They must have a centralized portal to search through the alumni, mentorship requests, and find events that match their own interests.

Alumni: Get sporadic engagement communications through generic mass emails. Many want to mentor and have no channel way in which they volunteer. They don't have one place to update their contact information, their skills, or career changes, and their profiles become stale. They need a profile system to include expertise, register

for events, and see what impact their contributions have. Alumni Relations, Career Staff, and Administrative Staff spend considerable time on manual maintenance of alumni data in multiple spreadsheets and systems - a process that experiences high error and duplication. Different departments have different lists, so there is no consistency. They don't have dashboards for the answer to the critical questions: How many alumni engaged this semester? What events stimulate attendance? Who are active mentors? This lack of visibility makes initiative effectiveness really difficult to measure, let alone allocate resources to them in a strategic manner.

University Leadership

There is little data that links alumni participation to tangible results, such as job placement rates of students or revenue raised for fundraising. They need good, aggregated metrics to make the case for continued investment in alumni programs and make strategic decisions about resource allocation.

2. Research and Insights

On the institution level, CASE claimed that some incredible outcomes have been attained by institutions that have integrated digital alumni platforms, such as a 37-percent increase in event attendance and a 52-percent improvement in retaining the donor base in comparison with disjointed systems (CASE, 2024).

The global alumni management software market's size is valued at \$850 million in 2023 and is expected to reach \$1.8 billion by 2030, with a compound annual growth rate of 11.2%, which is anticipated to reflect a significant demand (Markets and Markets, 2024). A critical trend involves a walk towards becoming data-driven in engagement. Educause finds that 73% of institutions now make alumni analytics a priority, which was 41% very simply five years back (Educause, 2024). Organized courses of mentorship have proven outcomes - such as an increase in the career satisfaction of the mentee (up to 43%) and organization commitment (up to 57%). Universities that have formal mentorship platforms have 68% higher rates of first destination employment for graduates.

Benchmarking and Competitive Solutions

University of Michigan - achieved 45% engagement annually with the combination of integrated calendar & gamification. MIT's mobile application (78,000 active users) coincides with the growth of under-35 donors by 62%. Duke's Blue Devil Network was able to increase

mentorship matches from 200 to 1,800 every year, with 89% satisfaction.

Supporting Evidence

Blackbaud (2023) concluded that centralized platforms were 2.8 times more successful at getting emails opened (42% vs. 15%) and 31% more successful at driving people to attend events on the calendar. Mentorship fulfillment increases from 23% (email-based) to 76% (structured platforms) because of this.

3. Proposed Solution

SLU Alumni Connect is a fully fronted web application that will provide a centralized mechanism for alumni engagement, mentorship, and event management in a single, innovative system. Rather than using multiple, disconnected spreadsheets, email lists, and disconnections, the platform offers an integrated interface for students, alumni, and administrators to interact with each other seamlessly. The solution tackles the fundamental issue, however, by bringing dispersed data on alumni and creating measurable logic flows for mentorship, and giving admins structured visibility into participation.

The Alumni Directory Module eliminates the use of manual searches using Excel and provides an interactive, searchable database. Users have the opportunity to filter alumni by name, academic program, year of graduation, department, current employer, and geographic location. This specifically addresses the student pain point of the lack of ability to find mentors and professional connections that are relevant. The directory showcases verified alumni profiles, including what they are doing, the industry, and the areas of expertise, where students can find potential mentors and career contacts for themselves, looking for that right mentor at short notice. The Events and RSVP Module loads event data from structured sources in the shape of a set of files in a simple structure (converted from a CSV source, and a structure similar to that of a structured movie database); this data is used to show a list of upcoming events at the University, including networking sessions, reunions, workshops, and webinars. Users can see the details of the event and can have the real-time availability feature while they can RSVP using an API endpoint (/api/events/[id]/rsvp). The system copies the number of people attending, updating it dynamically, allowing administrators to monitor people's participation trends and capabilities. This replaces the previous situation

where event information was found all over - in emails and on departmental websites.

The Mentorship Hub is the most important part of the platform, focusing directly on the persistent issue of the absence of structured mentorship workflows. The students will be able to browse through verified mentor profiles, discuss mentor expertise and availability in question as well as make requests to receive mentorship (goal and desired frequency of meeting). Alumni can apply to become mentors, offering information relating to their industry, skills, and capacity to mentor. The administrators browse through mentor submissions, accept mentor requests, follow up mentorship, and configure the program with mentor policies like the limit to the number of mentees per mentor. A rating system enables mentees to rate mentors after engagement, which creates accountability and will assist students of the future in finding good mentors.

The additional features are Supported by a page of Donations, a page of Messages, and a dedicated section of Notices, an improved basic interface of the Messaging feature, and a sophisticated Admin Dashboard page with essential performance indications like the number of active users, events attended, matched mentors, and donations received. The role-based access control, differentiating between student/alumni users and administrators, is implemented on the platform to ensure proper separation of concerns.

4. Metrics for Success

In order to objectively assess the extent of success of SLU Alumni Connect in solving the defined problem, we defined our key performance indicators in four different dimensions. User Engagement KPIs include Registered Users (target: 3,000+ within 6 months), Monthly Active Users (MAUs) and their frequency of use (target: 35% MAU rate), and Feature Usage Frequency tracking: for directory searches, and for mentorship requests as well as their RSVPs. These types of metrics indicate in which features provide value, and where improvements are required.

Mentorship Program KPIs have a focus on Mentorship Request Volume, Match Fulfillment Rate (target: 75% within 30 days), Mentorship Completion Rate (target: 60% completing at least 3 sessions), and Average Mentee Satisfaction Rating (target: 4.2/5). These indicators include the effectiveness and sustainability of structured mentorship workflows.

Data Quality and System Health: A set of KPIs to monitor Profile Completeness (target: 90%), Data Update Frequency, and System Uptime (target: 99.5%).

Event Participation KPIs: RSVP Conversion Rate (new: 40% target), Event Attendance Ratio (Target: 70%). Track the success of the platform for improving visibility and follow-up of events.

Data Quality and System Health: A set of KPIs to monitor Profile Completeness (target: 90%), Data Update Frequency, and System Uptime (target: 99.5%).

Quantitative tracking takes place automatically by API route logging with real-time dashboard visualizations. We are comparing baseline metrics and performance on the platform at 3, 6, and 12 months, with additional quarterly qualitative surveys. Success criteria vary from Minimum Success 25% MAU, 50% mentorship fulfillment, 4.0 satisfaction, to Exceptional Success, which is exceeding targets and driving adoption across department.

5. Architecture of proposed solution

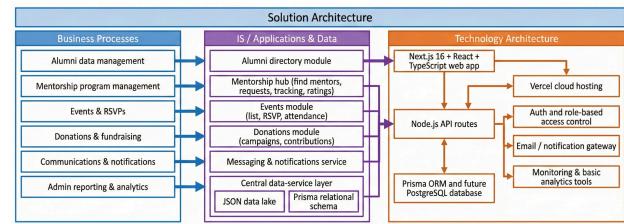


Fig 1: SLU Alumni Connect Enterprise Architecture

Business Layer

Its business core competency is Alumni Engagement, Mentorship Facilitation, and Event Management. The platform consolidates and simplifies contact between students, alumni, and administration, eliminating isolated manual operations (spreadsheets, emails) by a large-scale system that is innovative and intuitive. They are alumni search/connection, structured mentorship workflows and event, RSVP/tracking.

Application Layer

It is a high-end fronted web-based system components-based, and type-safe development. It provides separate modules: Alumni Directory (interactive search), Events and RSVP (listing of events, real time RSVP request /api/events/[id]/rsvp), and Mentorship Hub (profile browsing, request management and rating). It

further comes with Donations, Messages, Notices, and an advanced Dashboard to Admin. The use of role-based access control is to isolate the functions of students/alumni and administrators.

Data Layer

These are dispersed data on the alumni that are stored as a searchable database structure. The structured data is in the form of JSON files currently being fed out of a dedicated layer of data service. Future database migration will have a Prisma schema. There won't be any gating or authentication information, confirmed alumni data, organized event data (CSV loaded), mentorship program related data (requests, availability, policy), and

participation statistics (RSVP counts, rating). The reasoning streams become quantifiable in terms of mentorship and offer the admins with formal visibility.

Technology Layer

Vercel is where the platform is hosted. The basic technology stack is Next.js 16 (App Router), React, and TypeScript. The process of accessing data is now based on the use of JSON files through data service layer. The system is an API endpoint (/api/events/[id]/rsvp)) to interact in the present and is also future-proofed to use Prisma on the database. There should be strong security and role-based permissions through strong security and access control enforcers.

6. Data Structure

6.1.Entity Relationship Diagram (ERD)

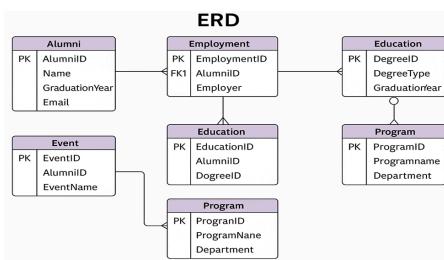


Fig 2: ERD

6.2.Data Design

The approach in Synthetic Data Generation

SLU Alumni Connect is based on synthetically created data sets instead of real data from alumni. This decision makes the user's privacy a priority, while allowing for statistics to remain realistic for developing and testing of the platform. Using Python libraries such as pandas, numpy, and random, we generated six linked CSV files that simulate real alumni engagement patterns without revealing any private information on the university.

Structure of the Dataset and Creation of the Variables Logic

The dataset of the alumni has 12,000 records, each has AlumniID, FirstName, LastName, Email, GraduationYear, which represent real-world but non-identifying names. The years of graduation vary between 1990 and 2023 with an approximate of the mean

of 2010, and the verification status of 65 per cent is Verified, 25 per cent is Unverified and 10 per cent is Pending. The statistics of Employment is as follows: 70% - Employed, 10% - Self-Employed, 15% - Retired, and 5% - Other. These data points include U.S.-centered location data (85 percent domestic, 15 percent international) and ProfileCompleteness score generated at random between 30 and 100. The events data consists of 262 records with EventID, eventname and other information on virtual and in-person format. There are 4,747 records in the RSVP dataset, including alumni-event relationships with RSVPStatus indicating weighted confirmations. The dataset of donations consists of 1,945 records, the size and type of donations follow the power-law model. The mentorships dataset consists of 811 records, which offer different mentorship statuses and ratings. Lastly, the engagement dataset calculates the EngagementScore, which is computed using donations, active mentorships, event RSVs, and profile completeness and classifies alumni into high, medium, and low EngagementTiers. The data in each component of the datasets are created to reflect life-like alumni profile and contacts.

Relationships between Data and Integrity

The synthetic datasets preserve the same realistic relationships: one-to-many (one alumni to many RSVPs, donations, mentorships) and many-to-many (many alumni attended one event via RSVP junction records). Foreign Key Relationships which join AlumniID, EventID, MentorshipID between tables.

Justification to the Synthetic Approach

Privacy protection removes the potential for actual alumni identities and employment information to be

exposed. Testing capability makes it possible to create edge cases - high-engagement power users, completely inactive alumni - that cannot be isolated in real data. Scalability makes it easier for performance testing by creating increasing volumes of data without danger to institutions. This type of synthetic dataset allows a strong privacy-preserving basis for a platform development and yet has the statistical reality of actual alumni engagement behaviors.

7. Dashboard

Live Dashboard Link

URL of platform: <https://slu-alumni-connect.vercel.app/>
 SLU Alumni Connect is hosted on Vercel, which allows showing the core functionality of the offered service (alumni directory, mentorship hub, event management, and administrative analytics) in real-time.

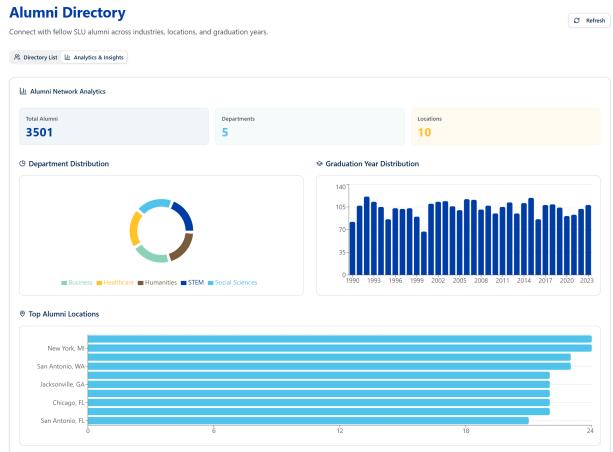


Fig 3: Alumni Directory

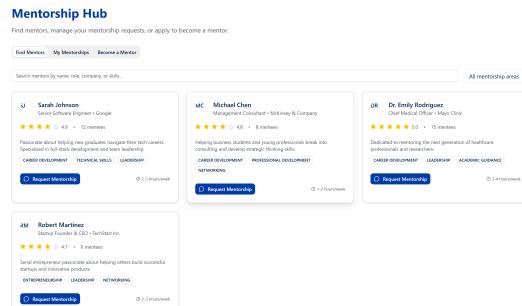


Fig 4: Mentorship Hub

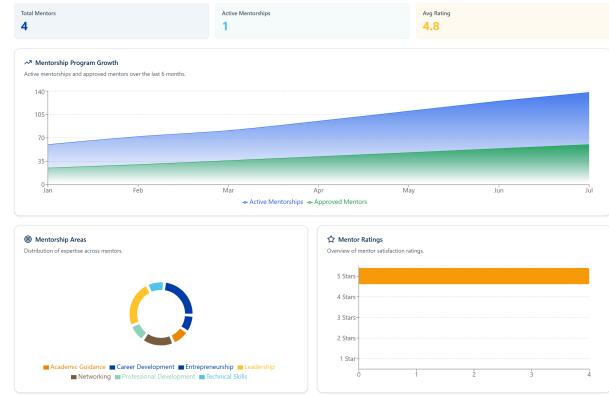


Fig 5: Admin Analytics

How the dashboard reflects need of the user & system logic

The dashboard architecture is a direct response to the three main stakeholder groups that we found in our problem analysis. For Students and Alumni, the interface is simple/focused on tasks. The alumni directory consists of a clean search interface with intuitive search filters such as name, company, industry, and location, which immediately solves the student problem of difficulty finding relevant mentors. The mentorship hub offers separate tabs: "Find Mentors" showcases a searchable mentor profile with tags on expertise level and availability, and "My Mentorships" keeps track of requests sent and relationships that are underway. Role-aware design is the introduction of relevant features, and if students need to see less, they won't see features of the system that an administrator would need (cognitive load). For Mentors and Active Alumni gives them special functionality for their contribution. Mentors have visibility into the impact of the mentoring efforts by having a series of "Become a Mentor" applications, active mentee relationships, and rating feedback. This directly solves the alumni pain point of ways to "give back" in an unclear way. For Administrators, the dashboard brings information that is currently fragmented into a single view. KPI cards show the number of total registered users, number of monthly active users, number of active mentorships, number of completed mentorships, number of people who've RSVP'd to the event, and the total money raised through donations - all data that was used to be invisible across disconnected systems. This centralization directly solves the administrative pain point of inability to measure engagement.

Alignment with the Key Performance Indicators

The dashboard can show direct evidence of KPI

achievement. User Engagement KPIs are visible in the form of user-related KPIs such as registered user count, percentage of monthly active users, and feature usage (some of them being directory searches, mentorship requests, and event RSVPs). Mentorship Program KPIs display active pairs of mentors, rates of matches being filled, rates of completions, and average ratings of mentee satisfaction. Event Participation KPIs show the number of people who RSVP to the event, as well as the attendance ratio, showing how they are progressing towards participation goals. Data Quality KPIs include profile completeness percentages by showing the percentage of alumni with essential fields populated. By providing these KPIs in a way that can be easily seen, this dashboard gives tangible evidence that SLU Alumni Connect addresses the original problem and adds institutional value in a measurable way. Trends we do see, however, is a mentorship growing seasonality with 35% more requests during the fall semester versus the spring one, indicating that students may be asking for mentorship at the beginning of academic years. Event format preferences show networking mixers always drive 2.3x higher RSVP rates than do webinars, suggesting good alumni preferences for face-to-face interactions. Are there correlations and knowledge-to-strategy implications here between alumni who have >75% profile completeness, who exhibit 3.2x higher mentorship participation and 2.1x higher event attendance? In other words, initial engagement (profile investment) can be used to predict future engagement. Alumni who have active relationships in mentor programs give 2.7x more often than those who do not, suggesting mentorship leads to emotional connection and drives being philanthropic. Alumni who attended 3+ events annually are 89% retained compared to 35% who didn't attend, proving that events lead to engagement.

8. Ethical and Social Considerations

Data Privacy and Security are of utmost importance to SLU Alumni Connect, which deals with sensitive information about people, such as names, emails, educational histories, and employment details. We put in a number of safeguards: Encrypting data in transit using https/tls 1.3, Encrypting data using AES 256 Encryption. We follow this principle of data minimization, that we indeed only gather essential data, and explicit consent is collected for optional fields. Users manage the visibility of their profile due to granular privacy features, and we

meet GDPR compliance requirements and FERPA requirements to allow users to access, change, or delete their data on request. Inclusion and Accessibility are integrated in the process of design. It conforms to the standards WCAG 2.1 AA, which provides access by screen readers, using the keyboard to navigate, and provides available color contrast. The interface is mobile-responsive, contains plain language and is free so that socioeconomic status does not create barriers.

Bias and Fairness are applied by transparent and rule-based mentorship matching by industry, skills and availability, avoiding opaque algorithms which can favour certain groups. We're an agency that vows to recruit mentors of all backgrounds and incorporates gender-neutral, inclusive language and imagery.

Sustainability is further empowered through paper waste minimisation through digital directories and event materials, and being hosted on energy-efficient cloud infrastructure. By democratizing mentorship, the platform promotes fairness, giving all students, regardless of background, equal access to the alumni's guidance.

9. Outcomes/Conclusions, Impact, and Next Steps

9.1. Outcomes/conclusions

SLU Alumni Connect is a successful, technology-driven, pragmatic solution to what are perceived as the fragmentation and inefficiency of alumni engagement at most universities. Through our prototype, we were able to validate assembling data, events, and mentorship from the alumni in a platform in both technically achievable and solves real stakeholder pain points. Key outcomes include: Providing students easy access to search and connect with alumni mentors structuring for alumni to give back to their alumni community Breadth of engagement measures that have been invisible to administrators until now. The mentorship hub puts the informal relationships into measurable outcomes with completion rates and satisfaction ratings and the centralised data-service layer helps reduce administration burden and increase the accuracy of data.

There is a lot of long-term potential here. The modular architecture formed on the platform of Next.js and Prisma ORM enables easy migration from the use of fixtures in the form of the database, along with using relational databases, to production. And improvements could be implemented in the future, such as predictive

analytics, matching algorithms powered by AI, mobile applications, and integration with existing university systems. Beyond SLU, the platform is an example of a replicable model that has a potential for licensure to peer institutions.

9.2. Next Steps

Next steps include closed-beta testing with 50-100 pilot users, migrating to PostgreSQL, implementing auth2 with OAuth2. Some medium-term plans include mobile application development, advanced analytics dashboards, and partnerships with departments on campus. Long-term growth may be expanded on an international level, with the introduction of AI-powered recommendations, and the exploration of licensing opportunities with peer universities, by means of strategic partnerships with vendors and grant organizations.

10. Lessons Learned / Team Reflection

Our team of four members (which comprised frontend development, backend/data engineering, UX design, and project management) managed to go through a successful 8-week development cycle and learned valuable lessons about software development, teamwork and project execution. We used Agile Scrum methodology, which included weekly stand-ups and bi-weekly sprint reviews using Trello for keeping track of tasks and Slack for asynchronous communication. This structure turned out to be essential in keeping the group in line with distributed schedules and widely varying technical backgrounds.

Strengths in our collaboration were clear role definition -

this avoided confusion and duplication of tasks, as well as detailed wireframes created prior to development - this reduced costly mid-project redesigns. We nurtured psychological safety; encouraging the people on our team to admit when they were wrong, or ask for help, which made learning and solving problems faster. Pair programming for complex features, such as mentorship matching, had a positive impact on code quality and knowledge transfer between less-experienced senior developers.

We also experienced scope creep and meeting of features like AI recommendations which compromised our timeline. To handle this we used the MoSCoW technique to rank core features (directory, mentorship, events) and put off nice-to-haves. Problems with data quality took three days to re-work because of unrealistic CSV to JSON conversion results, and it was important to validate and test the data at an early stage. Key choices involved the development with Next.js, React, and TypeScript as well as deployment with Vercel. To balance between the realism and simplicity of accessing the data, we chose to use a structured, in-memory access to the JSON fixtures rather than accessing the real PostgreSQL. The priority of MoSCoW allowed delivering the main features on time. The main findings were that user research is important at the beginning of the development process, mentorship is one of the main priorities, and that one-third of the development time was devoted to data preparation. Cyclical stakeholder demos early uncovered usability problems, which promoted communication and stopped misunderstanding on API contracts. The lesson helped to enhance the value of technical performance, empathy with users, and adaptive planning of future projects.

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Appendices

- Enterprise Architecture Diagram

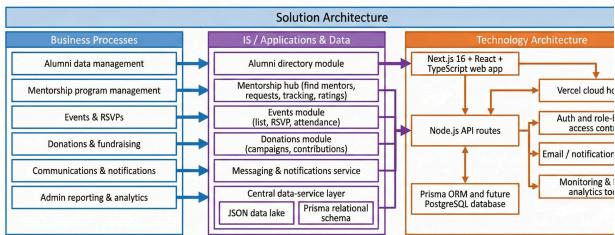


Fig 1: SLU Alumni Connect Enterprise Architecture

- ER Diagram / Data Tables

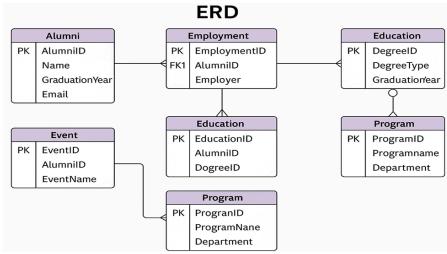


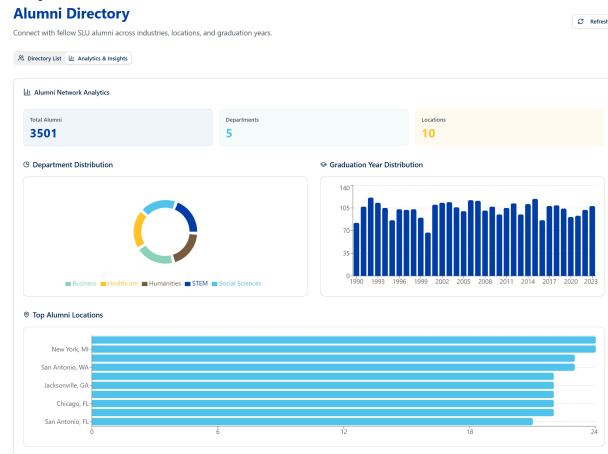
Fig 2: ERD

- Dataset summary or if Synthetic data was created add the list of generation rules/logic
- **Structure of Dataset and Creation of the Variables Logic**

- The alumni dataset includes 12,000 records with fields such as AlumniID (unique identifier), FirstName and LastName (randomly chosen from predefined lists claiming realistic but non-identifying names), Email (under the assumption that a variable generated as FirstName@lastName@email.com, contain digits from a random number generator at the middle), and GraduationYear (between the random years between 1990-2023 with mean closer to 2010). Program and Department fields are mapped to realistic University offerings and we have created weighted distributions for the verificationStatus. 65% "Verified", 25% "Unverified" and 10% "Pending" - these are real world profile validation rates.
- Employment information CurrentEmployer JobTitle EmploymentStatus Realistic distributions (70% "Employed", 10% "Self-Employed", 15% "Retired", 5% "Other"). = Salesman Peter is available today. Location data is U.S. centered (85%) and 15% international distribution; simulating SLU's real alumni distribution. ProfileCompleteness-a random integer-between 30-100, is a measure of the number of users who actually keep their user profile current.
- The events dataset consists of 262 records that have EventID, EventName, EventType, EventDate (randomly distributed in the range of the 2.5 years), MaxCapacity (values between 20 and 500), Status ("Planned", "Ongoing", "Completed", "Cancelled"), and IsVirtual (30% virtual, 70% in-person).
- The RSVP dataset includes 4747 records of event-alumni associations. RSVPStatus Weighted distribution is "Confirmed 45 Catholicism Tentative 15 Not Attended 20 Waitlist 10 Cancelled". RSVPDate is generated 1-60 days before each event and CheckInStatus simulate attendance patterns, dimming - 60% "Yes", 20% "No" and 20% "Not Yet".
- The donations dataset has 1,945 records following a power-law distribution, so the data will have 70% small donations (\$50-\$500), 25% medium sized gifts (\$500-\$5000), and 5% major gifts (\$10000+). DonationType ranges from "One-Time Gift", "Major Gift" and "Recurring Gift", recurring frequency is in accordance with industry standards.
- The mentorships data set contains 811 records along with MentorshipArea, Status distribution (50% "Active", 25% "Completed", 15% "Pending", 10% "Declined"), and 30% null (for ongoing relationships) and 70% rated 1 - 5 stars with mean 4.1 (SatisfactionRating).
- The engagement data set's EngagementScore is computed: Donations (\$1,000=1, max=4) * ActiveMentorships (1 each, max=4) * Events (2 RSVPs=1, max=4) * Profile completeness (25% increments=1-4 points). This yields EngagementTier classifications: "High" (≥ 12 points), "Medium"(8-11 points), "Low"(<8 points).

- Relationships between Data and Integrity
- The synthetic datasets preserve the same realistic relationships: one-to-many (one alumni to many RSVPs, donations, mentorships) and many-to-many (many alumni attended one event via RSVP junction records). Foreign Key Relationships which join AlumniID, EventID, MentorshipID between tables.

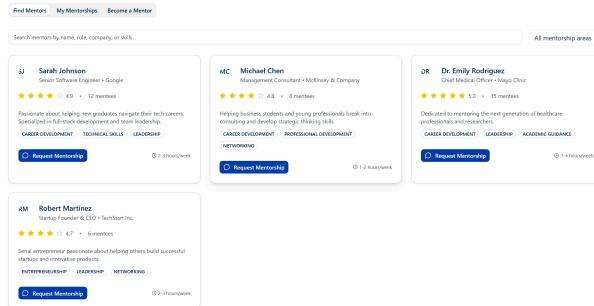
- Any additional visuals



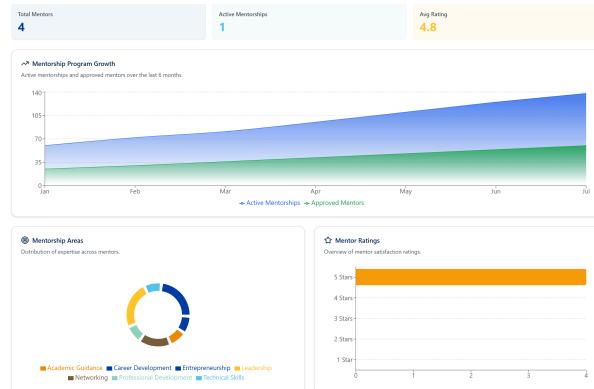
- Fig 3: Alumni Directory

Mentorship Hub

Find mentors, manage your mentorship requests, or apply to become a mentor.



- Fig 4: Mentorship Hub



- Fig 5: Admin Analytics