



# **ALBERS SCHOOL OF BUSINESS AND ECONOMICS**

**Alumni Management System**

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**Brief Introduction:** Alumni are a truly asset, University doesn't want to lose their data and instead wants to focus on a lifelong relationship with them! Alumni are a formidable asset for us, they are:

- Potential recruiters for your new graduates
- Brand ambassadors for your school
- A significant source of revenue through donations and memberships
- A large pool of expertise across different industries and roles
- A precious help for the organization of your alumni events

Hence, we are developing this system for Marvel University. Currently they do not have an updated online alumni management system. They do have individual offline records that different organizations maintain independently. This system will help them create a centralized and updated system that can be used by all the different organizations.

**Learning from different phases of this project:** in this project we had the opportunity to work on different aspects of database including data modeling, cloud database, visualization, analytics, programming reproducible queries, database backup etc. Learnings and challenges, we faced in each phase of the project:

- Data modeling & backup:** Here, we learned to design a database based on the requirements of our hypothetical client. We learnt to understand the business requirements and then to translate them to our database. We learnt to generate backup using MySQL workbench Data Export feature to generate a script that could restore the existing database locally or on the cloud.
- Cloud database:** We learnt to create a cloud MySQL database and migrate the local database to AWS RDS instance using a script generated on local database. Some of the issues we faced were:
  - Collation issues – We required to change the MySQL version of our cloud database to 8.0.15 to resolve this error.
  - The Super admin rights were required to execute the script generated for the stored procedures. On browsing through the AWS documentation, we learnt about creating and assigning a new parameter group with the value for `log_bin_trust_function_creators=1` and then rebooting the database instance. This also did not resolve the error in our case. Finally, we resolved it by replacing `'root'@'localhost'` with `CURRENT_USER` to grant the creation rights to the default user.
  - For being able to access the cloud database from anywhere, we learnt about the security groups. The inbound rule had to be modified to accept connections from all IP addresses.
- Advanced SQL:** Here we learnt about the benefits of using stored procedures and views. Using them allowed us to turn complicated queries containing insert, select, joins, aggregates into reusable one-line calls. The business case we tried to solve using these queries are as follows:
  - Make it easy to create an event and invite all alumni from a department in one query,
  - Find alumni by department – this could be used at all the places where we want to look up for an alumni information and their email and could be used in places where alumni have to be filtered by department,
  - For views we tried to encompass different features of mysql like aggregation, joins and subquery to yield results for getting alumni profile snapshot (this could be used in profile information as well as applying analytics to uncover the relationship between events and donations), getting the catalogue of all events organized and getting top 5 donations from the alumni to send them appreciation letters. ( This is in line with our objective of maintaining lifelong relationships)
- Analytical Queries & Visualization:** This gave us opportunity to put our database to use for solving real business problems which would have taken huge time and efforts without it. To implement these, we used aggregated functions, joins, selection and grouping. The output was visualized in a format that business people can understand. Learning from this section are as follows:
  - We learned how to securely connect a cloud database to visualization tools like tableau
  - The main challenge was to write custom SQL queries on top of database imported from cloud.
  - If we compare visualization tools, In PowerBI, we can create as many graphs in single worksheet, but this is a limitation of tableau which we came to know.
  - To make the worksheet interactive (Link 2 or more graphs) we learned how to link two worksheets using 'Worksheet' -> 'Action'
  - Every visual is linked to some data source, either imported from cloud (tables/views) or build locally using analytical queries. We learned how to link different visuals, different worksheets to different data sources.

**Scope for future improvements:**

- We would like to resolve the error while restoring database on the AWS RDS instance from a backup programmatically.
- Extend this database to create an online social network to increase alumni participation.
- For dashboard reporting, we can enhance the visual by adding time series data for each event by year.
- We wanted to add geographical and text cloud visuals but were constrained by the amount of sample data.
- Add more data or use real data to arrive at actionable insights.