

# **PROPOSAL**

Brand Name:

**TerpTrak: Smith School Success Metrics**

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Mission Statement:

Our mission is to provide a comprehensive report on the program rankings at the University of Maryland Smith School, using diverse data sources to assist prospective students in their decision-making. This endeavor aims to enhance academic excellence and improve the quality of education and services.

Mission Objectives:

- Collect and compile data of Smith School Program Rankings over the years.
- Aggregate department information, encompassing the number of programs and faculty size.
- Compile program details, including program duration, number of credits, program type, ranking, intake, and accreditation.
- Collect data regarding courses, encompassing course name, credits, and intake.
- Gather faculty information, such as faculty names, qualifications, years of experience, ratings, research publications, awards, and alumni status.
- Acquire alumni data, including alumni names, graduation years and industry of employment.
- Retrieve employer details, covering employer names, roles offered, the number of alumni employed, industry, average salary offered, employment type, and sponsorship.
- Analyze and interpret program rankings, accreditation, and other performance factors for graduate programs.
- Present the deliverables and suite with a user-friendly interface in a timely manner.

Business Terms, Facts, Attributes and Identifiers:

- Department: The academic department within the institution that houses the program.
- Program: The specific degree or course of study.
  - Program Type:
    - Online: Programs that are delivered entirely through digital platforms, allowing for remote learning.
    - In-person: Traditional programs that require students to attend classes physically at the institution's location.
    - Hybrid: Programs that combine online and on-campus learning, offering a blend of in-person and remote education.
  - Program Accreditation:
    - STEM: Accreditation for programs in Science, Technology, Engineering, and Mathematics, indicating adherence to standards in these fields.
    - Non-STEM: Accreditation for programs outside the STEM disciplines, ensuring quality and compliance with educational standards in various other fields.
  - Program Fee In/Out of State:

- In-state Tuition: The tuition fee charged to students who are residents of the state where the institution is located, typically lower than out-of-state tuition.
  - Out-of-state Tuition: The tuition fee charged to students who reside outside the state of the institution, generally higher due to non-residency.
- Faculty: Professors and lecturers associated with the program.
  - Faculty IsAlumnus: Faculty members who have also graduated from Smith denoting a dual role as both educators and former students.
- Alumni: Graduates from the program.
  - Alumnus Industry Employed: The specific industry or sector in which an alumnus is currently employed, reflecting the professional placement of the institution's graduates.
- Employers: Companies and organizations that hire graduates from the program.
  - Employer Employment Type: Internship, Full-time
  - Employer Sponsorship: Yes or No

#### ER Schema:

1. Department (**departmentId**, departmentName, departmentNumPrograms)
2. Program (**programId**, programName, programDuration, programCredits, programType, programIntake, programAccreditation, programFeeInState, programFeeOutState)
3. Ranking (**sourceName**, **rankYear**, **programId**, rankPosition, sourceURL)
4. Course (**courseId**, courseName, courseCredits, courseIntake)
5. Faculty (**facultyId**, facultyFirstName, facultyLastName, facultyQualification, facultyYearsExperience, facultyRating, facultyResearchPublications, facultyAwardHonors, facultyIsAlumnus)
6. Alumnus (**alumnusId**, alumnusFirstName, alumnusLastName, alumnusGraduationYear, alumnusCompany, alumnusPosition)
7. Employer (**employerName**, **alumnusId**, employerRoleOffered, employerIndustry, employerAverageSalary, employerEmploymentType, employerSponsorship)

Relationships, Attributes, Degrees, Participating Entities and Constraints:

Offer: (binary relationship)

1 Department to 1 or more Programs

1 Program to 1 Department

Encompass: (binary relationship)

1 Program to 1 or more Courses

1 Course to 1 Program – **Note: Inferred so no limitation.**

Teach: (binary relationship)

1 Faculty to 1 or more Courses

1 Course to 1 Faculty

Graduate: (binary relationship)

1 Alumnus to 1 Program

1 Program to 1 or more Alumni

Employ: (binary relationship)

1 Employer to 0 or 1 Alumnus

1 Alumnus to 1 or more Employers – **Note: Inferred by best judgment.**

Mentor: (binary relationship)

1 Faculty to 0 or more Alumni

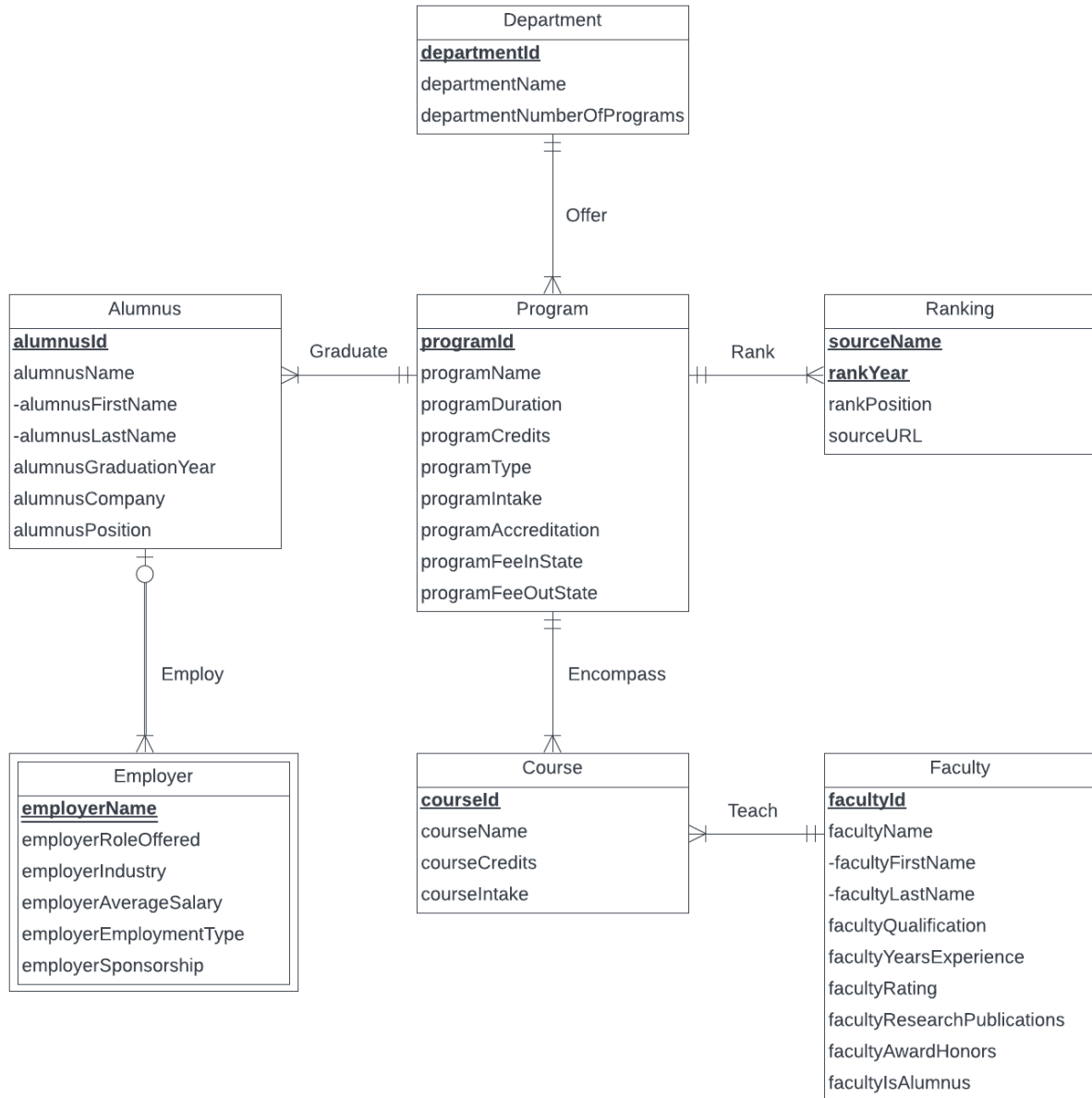
1 Alumnus to 0 or more Faculty

Rank: (binary relationship)

1 Ranking to 1 Program

1 Program to 1 or more Rankings

## ER Diagram:



**Project\_0502\_15\_ERD**  
**TerpTrak:**  
**Smith School Success Metrics**

#### Relations:

1. Department (**departmentId**, departmentName, departmentNumberOfPrograms)
2. Program (**programId**, **departmentId**, programName, programDuration, programCredits, programType, programIntake, programAccreditation, programFeeInState, programFeeOutState)
3. Ranking (**sourceName**, **rankYear**, **programId**, rankPosition, sourceURL)
4. Course (**courseId**, *programId*, courseName, courseCredits, courseIntake)
5. Faculty (**facultyId**, *courseId*, facultyFirstName, facultyLastName, facultyQualification, facultyYearsExperience, facultyRating, facultyResearchPublications, facultyAwardHonors, facultyIsAlumnus)
6. Alumnus (**alumnusId**, *programId*, alumnusFirstName, alumnusLastName, alumnusGraduationYear, alumnusCompany, alumnusPosition)
7. Employer (**employerName**, **alumnusId**, employerRoleOffered, employerIndustry, employerAverageSalary, employerEmploymentType, employerSponsorship)

#### Functional dependencies:

departmentId ⇒ departmentName, departmentNumberOfPrograms

programId ⇒ departmentId, programName, programDuration, programCredits, programType, programIntake, programAccreditation, programFeeInState, programFeeOutState

sourceName, rankYear, ⇒ programId, rankPosition, sourceURL

courseId ⇒ programId, courseName, courseCredits, courseIntake

facultyId ⇒ courseId, facultyFirstName, facultyLastName, facultyQualification, facultyYearsExperience, facultyRating, facultyResearchPublications, facultyAwardHonors, facultyIsAlumnus

alumnusId ⇒ programId, facultyId, alumnusFirstName, alumnusLastName, alumnusGraduationYear, alumnusCompany, alumnusPosition

employerName ⇒ alumnusId, employerRoleOffered, employerIndustry, employerAverageSalary, employerEmploymentType, employerSponsorship

### Business Rules:

- [R1] When a department ceases to exist, the association to that department from each program must be removed, indicating that the programs are no longer administratively linked to the non-existent department.
- [R2] Updates to a department's information should cascade through to the associated programs, ensuring that program records are up-to-date and reflect the current state of the department.
- [R3] If a program is discontinued, all related courses must also be removed from the database, ensuring that no outdated or orphaned records persist.
- [R4] Any changes made to a program's details should propagate to all related courses, maintaining the integrity and relevance of the related records.
- [R5] Eliminating an employer from the database must not delete historical employment records of alumni to maintain a complete record of alumni employment history.
- [R6] Adjustments to an employer's details should be reflected in the employment history of associated alumni, ensuring that each alumnus' employment record is up to date.
- [R7] If a program is discontinued, the corresponding rankings associated with that program should not be deleted to maintain the information of legacy rankings.
- [R8] If program details are revised, corresponding updates will be made to the rankings associated with that program to maintain data consistency.
- [R9] When a course is no longer offered, the faculty information related to the course should not be deleted in order to preserve data integrity.
- [R10] When course details are altered in the database, no changes should be made to the corresponding faculty data.
- [R11] When a program is no longer offered, the details of previously graduated alumni should not be altered to preserve old records.
- [R12] If program details were to be changed, no action should be taken for altering the data of previously graduated alumni.

Referential Integrities:

Relation	Foreign Key	Base Relation	Primary Key	Business Rule	Constraint: ON DELETE (NO ACTION)	Business Rule	Constraint: ON UPDATE (CASCADE)
Program	departmentId	Department	departmentId	R1	CASCADE	R2	CASCADE
Ranking	programId	Program	programId	R7	NO ACTION	R8	CASCADE
Course	programId	Program	programId	R3	CASCADE	R4	CASCADE
Faculty	courseId	Course	courseId	R9	NO ACTION	R10	CASCADE
Alumnus	programId	Program	programId	R11	NO ACTION	R12	NO ACTION
Employer	alumnus	Alumnus	alumnusId	R5	NO ACTION	R6	CASCADE

Sample Data:

**Department**

departmentId: ACC  
departmentName: Accounting and Information Assurance  
departmentNumberOfPrograms: 3

**Program**

programId:MSIS  
departmentId: OPR IT  
programName: MS in Information Systems  
programDuration: 16  
programCredits: 30  
programType: In-person  
programIntake: 100  
programAccreditation: STEM  
programFeeInState: 48919.00  
programFeeOutState: 62160.00

**Ranking**

sourceName: Financial Times  
programId: EMBA  
rankYear: 2022  
rankPosition: 14  
sourceURL:<https://rankings.ft.com/schools/193/university-of-maryland-smith/rankings/2909/mba/2023/ranking-data>

**Course**

courseId: BUAC706  
programId: MSA  
courseName: Business Ethics for Accountants and Auditors  
courseCredits: 2  
courseIntake: 65



## Faculty

facultyId: F0001  
courseId: BUDT704  
facultyFirstName: John  
facLastName: Bono  
facultyQualification: Ph.D., Nova Southeastern University  
facultyYearsExperience: 20  
facultyRating: 4  
facultyResearchPublication: NULL  
facultyAwardHonors: NULL  
facultyIsAlumnus: 0

## Alumnus

alumnusId: A0001  
programId: MSSCM  
alumnusFirstName: Zhexi  
alumnusLastName: Jane Smith  
alumnusGraduationYear: 2015  
alumnusCompany: Google  
alumnusPosition: Business Analyst

## Employer

empolyerName: Amazon  
alumnusId: A0001  
employerRoleOffered: Systems Analyst  
employerndustry: Information Technology  
employerAverageSalary: 107530  
employerEmploymentType: Full-time  
employerSponsorship: 0