Appendix 4 — Capstone Proposal Template

**Section I: Project Data**

**Student Information**  
Student Name: Shreya Sunkari  
Email Address: pf60494@umbc.edu  
Semester and Year of Capstone Experience: 4th Semester and 0 Year]  
Expected Graduation Date: December 2024

**Capstone Course Information**  
Capstone Faculty: Dr. Samarah, Dr Melissa Sahl  
Capstone Advisor: Dr Samarah

**Sponsor Client Information**  
Client Contact Name: Dr. Samarah and Dr. **Melissa Sahl**   
Client Contact Title: Professor   
Client Contact Email Address: [msamarah@umbc.edu](mailto:msamarah@umbc.edu) , [melissam@umbc.edu](mailto:melissam@umbc.edu)  
Client Organization: University of Maryland, Baltimore County

**Section II: Project Information**

**Project Title**  
**Capstone Portfolio**: A Comprehensive Platform for Capstone Project Storage, Discovery, and Collaboration

**Problem Statement**  
The focus of Capstone Portfolio is to build a centralized digital platform where in students can exhibit their capstone projects. This portfolio serves a hub for exploring diverse projects with a structured environment for students to upload comprehensive detailing about their projects including essential metadata like titles, abstracts, team members, sponsors, faculty advisors, and various media types such as reports, videos, and images. The Capstone Portfolio consolidates these features into a unified repository, making it simple for students, faculty, and potential sponsors to access and share academic work. This streamlined platform enhances collaboration and engagement within the academic community, fostering connections that can lead to innovative partnerships and opportunities.

With the system's powerful search and browsing features, academics, students, and outside organizations will be able to find interesting projects, work together on ongoing initiatives, and gain knowledge from previous projects.

**Section III: Project Background**

**Description of Client and Organization**  
 The Capstone Portfolio will serve the university’s Capstone Program. The University of Maryland, Baltimore County (UMBC) is both the client and the entity for which the Capstone Portfolio platform is being developed., The platform intends to assist academic and professional development by establishing a long-term digital repository for capstone projects and encouraging collaboration between students, professors, and outside organizations.

**Stakeholders**

* **Students**: By uploading and sharing their projects on the site, students will support a collaborative learning environment.
* **Faculty Advisors**: The ability to peruse, look up, and investigate projects in order to mentor students or consult past work when instructing.
* **External Organizations**: May peruse initiatives in search of ideas, possible joint ventures, or creative answers to pressing issues.

**Shareholders:**

**UMBC College of Engineering and Information Technology**: Supports the development of the capstone platform and seeks to improve student outcomes and strengthen partnerships with industry.

**Graduate Programs:** Benefit from the platform as it provides practical applications and showcases the innovation happening within graduate projects.

**Expectations:**

* A unified portal for managing and uploading capstone projects.
* Features like search, filtering, and labeling enable effective project discovery.
* Secure access for different roles (teachers, students, outside groups).
* Dynamic analytics to monitor interaction, ratings, and project visibility.
* An easy-to-use interface for displaying student projects.

**Resources Required**

* **Development**: For backend development, front-end design, and system integration.
* **Database**: PostgreSQL/MongoDB/Cassandra for project metadata and media storage.
* **Cloud Infrastructure**: Cloud hosting services (e.g., AWS, Azure, or Google Cloud) for secure, scalable storage and computing power.
* **Search Engine**: An advanced search engine (e.g., Elasticsearch or Solr) to support complex querying and fast retrieval.
* **UI/UX Team**: To design a clean, intuitive interface that offers ease of use to students, faculty, and sponsors.
* **Media Storage Services**: To handle large file uploads, especially media content like videos, high-res images, and code files.
* **User Authentication**: OAuth or similar user authentication methods for secure access control.

**Section IV: Proposed Solution**

**Functional Requirements**

1. **Structured Project Uploads and Metadata**
   * **Expected Outcome**: Students can upload media and relevant project details in a standardized format, ensuring consistency and ease of retrieval.
2. **Comprehensive Media Integration**
   * **Expected Outcome**: Projects will include rich media content for an in-depth presentation of student work.
3. **Search and Browse Capabilities**
   * **Expected Outcome**: The search functionality will allow users to quickly find projects using robust filtering and sorting options.
4. **Bookmarking and Favorites**
   * **Expected Outcome**: Users can create a personalized list of important or interesting projects for quick access.
5. **Portfolio Analytics**
   * **Expected Outcome**: Users can access detailed project metrics, gaining insights into how frequently their work is viewed, rated, or bookmarked, helping them understand its influence within the platform.
6. **User Authentication and Role Management**

* **Expected Outcome**: A secure login system with role-based access control will ensure that users can upload, view, or manage projects based on their role.

1. **User Profile Pages**

* **Expected Outcome**: Each user will have a profile page showcasing their activity on the platform, including uploaded projects, bookmarks, and feedback.

1. **Dynamic Project Sorting and Filtering**

* **Expected Outcome:** Users will be able to sort and filter projects by criteria such as popularity, date, and ratings, improving the discoverability of relevant projects. This functionality will enhance user experience by offering personalized project views based on their preferences.

1. **Featured Projects Section**

* **Expected Outcome:** Showcase standout projects on the homepage, increasing their visibility. This will encourage users to explore highlighted projects.

1. **Tagging and Categorization**

* **Expected Outcome**: A dynamic tagging system will ensure that projects are grouped and categorized logically, enhancing searchability.

1. **Student and Team Profiles**

* **Expected Outcome**: Each project will display team profiles with roles and skills. Users can visit profile pages to explore past projects and skills, aiding collaboration, or recruitment.

1. **Public and Private Viewing Modes**

* **Expected Outcome**: Project owners can toggle between public and private modes, allowing them to restrict access to their projects. Private projects will only be accessible to designated users (e.g., faculty, team members), while public projects will be visible to everyone on the platform.

**USER Stories:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.no** | **Requirement (stated as a user story)** | **Expected Completion Date** | **Complexity** | **Risk** |
| 1 | As a user, I want to upload my project in a structured way so that my project details are consistent and easy to retrieve. | |  | | --- | |  |   09/25/24 | MediumMedium | LowLow |
| 2 | As a user, I want to attach media files (reports, code, videos, etc.) to my project. | |  | | --- | |  |   10/05/24 | HighHigh | MmediumMedium |
| 3 | |  | | --- | |  |   As a user, I want to search for projects using specific criteria like title, course, or semester. | 10/10/24 | MediumMedium MediumMedium | LowLow |
| 4 | |  | | --- | |  |   As a user, I want to securely log in and have role-based access (e.g., student, faculty, external). | 10/17/24 | High | High |
| 5 | |  | | --- | |  |   As a user, I want to bookmark or mark projects as favourites. | 10/19/24 | Low | Low |
| 6 | As a user, I want to view analytics (views, ratings, bookmarks) for a project. | 10/26/24 | High | Medium |
| 7 | As a user, I want a profile page displaying my contributions, uploaded projects, and bookmarks | 10/31/24 | Medium | Medium |
| 8 | As a user, I want to sort and filter projects by criteria such as popularity or ratings. | 11/06/24 | Medium | Low |
| 9 | |  | | --- | |  |   As an administrator, I want to showcase specific projects in a “Featured Projects” section. | 11/08/24 | Low | Low |
| 10 | As a user, I want to tag projects with relevant keywords and categories (e.g., "AI," "Blockchain"). | 11/12/24 | Medium | Low |
| 11 | As a user, I want to view detailed profiles of students or teams behind each project. | 11/17/24 | Medium | Medium |
| 12 | As a project owner, I want to toggle my project between public and private viewing modes. | 11/25/24 | Medium | Medium |

**Non-Functional Requirements**

1. **Scalability**  
   Over time, the system must grow to support thousands of users and projects without sacrificing availability or speed.  
   **Solution**: By Using a cloud-based infrastructure to check scalability in both data storage and processing power.
2. **Security**  
   Prioritizing data security and user privacy is essential, particularly when it comes to safeguarding sensitive data and project ownership.  
   **Solution**: By Implementing role-based access control (RBAC), SSL encryption, and secure storage practices.
3. **Performance**  
   The system must provide fast search results and allow users to upload large media files efficiently.  
   **Solution**: Utilize caching, database optimization, and content delivery networks (CDNs) to enhance speed and performance.
4. **Usability**  
   The platform should be intuitive for all users, including students, faculty, and external partners, with an emphasis on easy navigation and accessibility.  
   **Solution**: Employ best practices in UI/UX design, ensuring a responsive, mobile-friendly interface that supports ADA compliance.

**Section V: Risk Analysis and Mitigation Strategies**

1. **Data Storage and Performance Issues**
   * **Risk**: The volume of media files may overload the system, leading to performance degradation.
   * **Mitigation**: Use cloud-based storage services with elastic scalability and ensure media files are compressed and optimized.
2. **Search Optimization Challenges**
   * **Risk**: Users may experience slow or inaccurate search results due to inefficient query optimization.
   * **Mitigation**: Implement an advanced search engine, such as Elasticsearch, with indexing for rapid and relevant results.
3. **Privacy and Security Concerns**
   * **Risk**: Unauthorized access to projects or personal data could occur if security protocols are not enforced.
   * **Mitigation**: Implement robust encryption, access control measures, and regular security audits.
4. **Long-Term Maintenance and Updates**
   * **Risk**: As technology evolves, the system may become outdated, requiring continuous updates and support.
   * **Mitigation**: Develop a maintenance plan with scheduled updates and ensure the platform is built with modularity for easier upgrades.
5. **Scalability Issues with Growth in Users and Data**

* **Risk**: As more users begin using the platform, the storage and database system may struggle to keep up with the growing number of projects, media files, and search queries, affecting performance.
* **Mitigation**: Use a scalable cloud architecture (e.g., AWS, Google Cloud) that can dynamically expand storage and processing resources. Monitor system performance regularly and optimize database queries for speed and efficiency.

1. **Cross-platform and Device Compatibility**

* **Risk**: User accessibility and experience may be impacted by the platform's inconsistent performance across various platforms (such as mobile, tablet, desktop), operating systems, and other combinations.
* **Mitigation**: Conduct thorough testing on various operating systems and screen sizes to guarantee that the platform is responsive and optimized for all device kinds. Use a mobile-first design methodology to ensure that your work will work on a variety of devices.