



SOEN 6841 SOFTWARE PROJECT MANAGEMENT

PROJECT - AI BASED ACADEMIC ADVISOR

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Group 15

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Project GitHub Repository:

<https://github.com/Riyaguptacse/soen6841f24>

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Feasibility Study

We'll look at three main aspects to determine whether an AI-based academic advisor is feasible:

1. Technical Feasibility

Technology Requirements: Machine learning techniques, natural language processing (NLP) for dialogue, and strong data analytics skills are probably going to be needed for the solution.

Essential components include a reliable AI model (such as GPT, BERT, or bespoke models), a knowledge base of academic programs, courses, and prerequisites, as well as interface with existing student information systems (SIS).




Data Availability: A wealth of information on course offerings, requirements, student performance, and user comments will be required by the AI. Privacy issues need to be addressed, especially when student data is involved.

Infrastructure Requirements: Enough processing power is required for both model deployment and training. To scale the system affordably, cloud providers (such AWS, Google Cloud, or Azure) could be used.

Technical Expertise: For initial setup and continuing maintenance, proficient AI developers, data scientists, and educational domain experts are necessary. The group will require expertise in data protection, natural language processing, and AI model training.

Cloud Service Comparison (For Infrastructure):

- **AWS vs. Google Cloud vs. Azure** (highlight scalability, pricing, and services)

	 AWS	 AZURE	 GCP
LAUNCHING YEAR	2004	2010	2008
AVAILABILITY	84 availability zone & 24 Geographical locations	60+ region across all over the country	24 region & 74 total Zones
SERVICES	212+ SERVICES	200+ SERVICES	100+ Services
CLOUD SHARE	33% of the Market	21% of the Market	8% of the Market
COMPUTE ENGINE	EC2 (Elastic Compute System)	Virtual Machine	Compute Engine
NETWORKING	VIRTUAL PRIVATE CLOUD	VIRTUAL NETWORK (VNET)	CLOUD VIRTUAL NETWORK
CLIENTS	Netflix, BMW, Samsung, Unilever, Expedia	HP, Apple, Polycom, Honeywell, Johnson	LG, Toyota, Vodafone, Spotify, New York Times
PRICING	Based on Charge per hour	Based on Charge per minute	Based on Charge per minute

2. Operation Feasibility

Availability of Resources: Data, technology, and personnel must all be easily accessible.

Educational institutions must support the project in order to integrate the data into their systems.

It will also be essential to teach employees on AI maintenance and operation.

Scalability: The AI adviser ought to be able to manage several users at once. It should scale to meet demand without sacrificing dependability or performance if properly implemented.

User Adoption and Training: For smooth communication, academic advisers and students require an intuitive interface. It will be easier to implement and guarantee efficient use if staff and students receive training.

Maintenance and Support: To stay accurate, the AI system will require regular updates, such as content updates and model retraining. For monitoring, troubleshooting, and improvement, a support staff is necessary.

Student Adoption Timeline:

Early adopters, gradual adoption, and mass adoption Visual: A line graph showing adoption over time, perhaps with a predicted growth trajectory.



3. Economic Feasibility

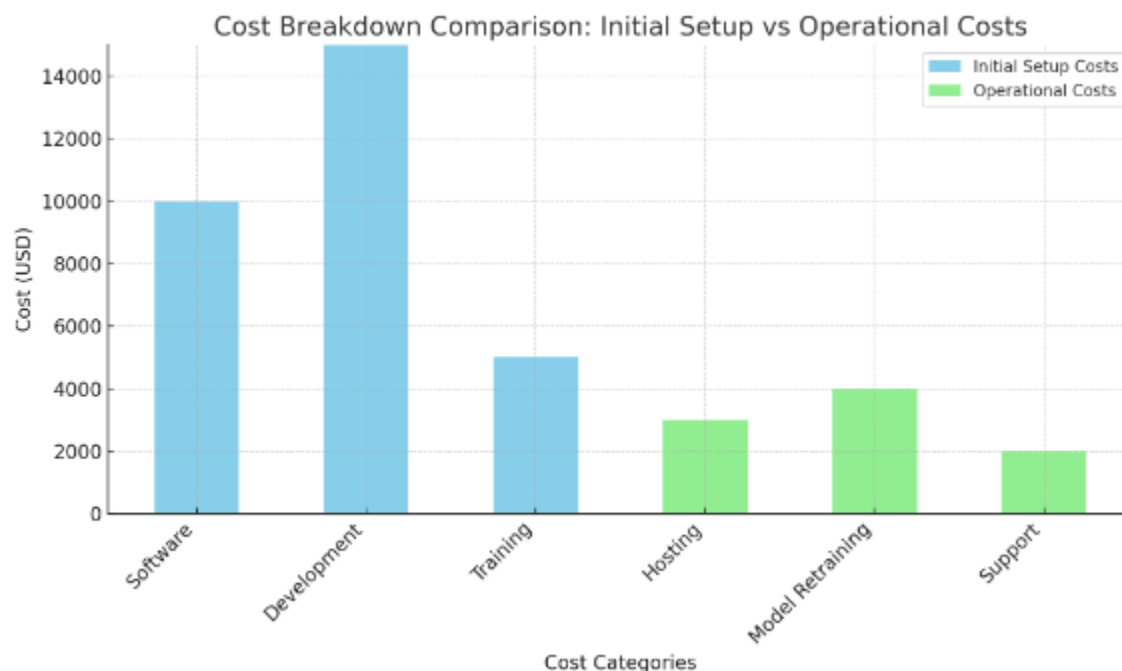
Software development, data collecting, training AI models, cloud infrastructure, and staff are all included in the initial investment costs. Development and setup expenditures may result in high initial costs.

Operational Costs: Following launch, expenses will arise for support personnel, hosting, upkeep, and updates. By improving data utilisation and model efficiency, cloud hosting expenses can be kept under control.

Possible ROI: The AI adviser might ease the workload for academic advisors who are human, increasing productivity and freeing them up to concentrate on more complicated issues. Particularly in large or online universities, quicker and more individualised advising may result in higher student satisfaction and retention rates.

Revenue Generation: Collaborating with educational institutions or charging students a subscription fee are two ways to monetise. Improved academic achievement and higher student retention may indirectly result in financial gains.

Initial setup vs. operational costs Visual: A stacked bar graph to visually differentiate between one-time investments (software, development, training) vs. recurring costs (hosting, model retraining, support).



Here is the stacked bar graph visualizing the cost breakdown comparison between initial setup and operational costs. The graph differentiates one-time investments (software, development, training) from recurring costs (hosting, model retraining, support). The initial setup costs are displayed in sky blue, while the operational costs are shown in light green.

Challenging component: Navigating Complexity for Future-Proof AI Solutions

Data ownership, prejudice, systemic risk, model responsibility, ethical considerations, sustainability, stakeholder alignment, opposition to change, and technical difficulties are some of the obstacles to the use of AI in academic advising. Because AI systems may inherit biases from prior data, which would reinforce disparities, data ownership and governance are essential. Maintaining personal relationships and preventing job displacement require striking a balance between human input and AI skills. AI systems must be in line with sociocultural dynamics and ethical norms, and model accountability and transparency are also essential. Financial sustainability and long-term institutional support are also essential. The introduction of an AI-based academic advisor goes beyond the technicalities of model training and system deployment—it introduces complex layers of ethical, governance, and operational challenges that require careful navigation. By addressing issues such as bias, data governance, system accountability, and stakeholder resistance, institutions can lay the foundation for a truly sustainable and impactful AI solution in academic advising. However, the success of such a system is contingent not only on the immediate feasibility but also on the long-term adaptability and alignment with evolving educational philosophies and regulatory environments.

In conclusion

If the school is willing to invest in top-notch AI models and committed support, the AI-based academic advisor appears feasible based on the aforementioned considerations. Securing a strong technological infrastructure, guaranteeing data availability, and budgeting for ongoing maintenance and operating expenses are all critical success aspects. Because of the enhanced student experience and expedited advising procedures, the potential return on investment is encouraging; nonetheless, sustainability depends on careful budget allocation and continuous management.

Solution Proposal

Solution Overview

a) Comprehensive Description of the Proposed Software Solution

Description: The "AI-Based Academic Advisor" is a personalized advising tool designed to guide students through course selections, academic milestones, and career path options. Built with AI and machine learning, the solution will integrate with university databases to access academic records and understand students' progress, preferences, and challenges. The system offers personalized recommendations, real-time academic tracking, career guidance, and scenario-based planning.

Architecture and Scalability: The core architecture comprises a cloud-based AI model and an interface designed for both students and advisors. It leverages an API-based data pipeline to seamlessly integrate with Learning Management Systems (LMS) and Student Information Systems (SIS) for real-time data access. The design will be scalable, allowing expansion to multiple departments or institutions, and secure, following data protection standards like GDPR and FERPA.

b) How It Addresses the Identified Problem or Opportunity

The AI-Based Academic Advisor directly addresses the need for scalable, personalized academic support. In large institutions, students often struggle with accessing timely, relevant guidance due to limited advisor availability. By providing personalized course suggestions, degree planning, and career insights based on individual academic trajectories and labor market data, the solution aims to enhance students' academic success and career preparedness.

This solution improves upon traditional advising methods by integrating academic data with predictive analytics, allowing for dynamic adjustments to students' plans. Use cases, such as students with specific career aspirations, showcase how the system tailors advice to align with both academic requirements and market trends.

Key Features and Functionalities

a) Essential Features and Functionalities

1. Personalized Course Recommendations:

- AI-based suggestions on courses that align with students' academic goals, considering prerequisites, requirements, and GPA thresholds.

2. Real-Time Academic Tracking and Alerts:

- Sends alerts for crucial deadlines, career opportunities, and potential academic concerns.

3. **Career Path Recommendations:**

- Provides career advice aligned with students' academic progression and market trends, suggesting internships, workshops, and certifications.

4. **Integration with University Systems:**

- Allows advisors to access students' academic data and progress through an interactive dashboard.

5. **Gamified Engagement Tools:**

- A reward system to encourage students' active engagement with their academic and career planning.

Feature	Description
Personalized Course Suggestions	Recommends courses based on academic record, preferences, and career goals
Academic Tracking and Alerts	Real-time tracking, deadlines, and academic alerts
Career Path Guidance	Market-driven career suggestions, including internships and skills
Integration with LMS/SIS	Syncs with university systems for comprehensive advising
Gamified Engagement	Encourages user engagement with goal tracking and rewards

b) Use Cases or Scenarios Illustrating How Users Will Interact with the Solution

Use Case 1 - Course Selection Support:

- **Scenario:** A first-year student, Alex, is uncertain about which courses to take for their major in Software Engineering.
- **Interaction:** The AI-Based Advisor uses Alex's academic records and career aspirations to suggest courses that align with both their graduation requirements and market-demand skills.

Use Case 2 - Career Path Guidance:

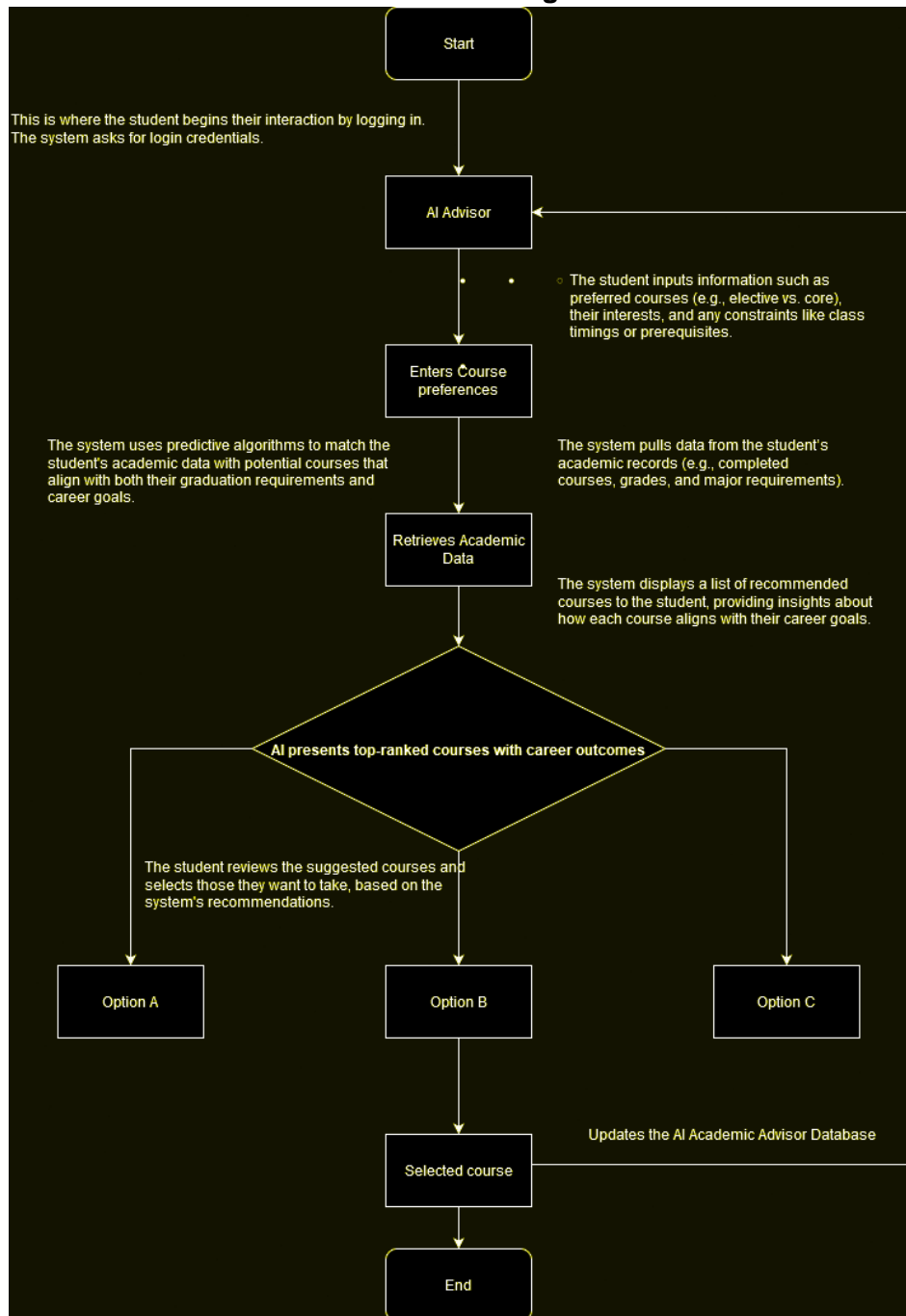
- **Scenario:** Samantha, a third-year Computer Science student, is interested in AI research but unsure about industry-specific skills.

- **Interaction:** The system evaluates Samantha's completed courses and recommends supplementary certifications and relevant AI electives, directing her toward research-based internships.

Use Case 3 - Alerts and Tracking:

- **Scenario:** Jamie, a second-year student, is struggling to meet GPA requirements for their desired graduation plan.
- **Interaction:** The system sends proactive alerts with academic resources, tutoring options, and course recommendations to help Jamie improve their academic standing.

Process Flow Diagram:



Benefits and Impact

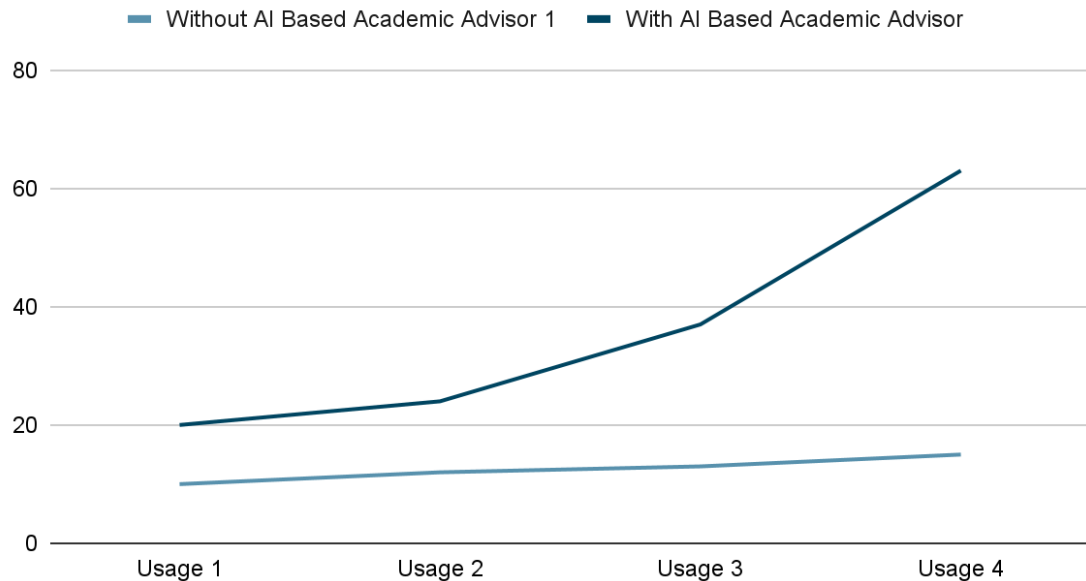
a) Benefits that Users and Stakeholders Will Derive from the Solution

- **Students:** Students gain personalized support, enabling them to make informed academic choices, improve their career readiness, and meet graduation requirements on time.

- **Academic Advisors:** Advisors can efficiently manage larger caseloads, focusing on students requiring additional guidance.
- **University Administration:** The institution benefits from improved retention rates and student satisfaction, as the AI-driven advising system helps students stay on track academically.

Stakeholder	Short-Term Benefits	Long-Term Benefits
Students	Course guidance, career clarity	Improved career readiness, timely graduation
Advisors	Efficient case management	Reduced workload, better student engagement
University Admin	Increased student satisfaction, retention	Enhanced reputation, optimized advising resource allocation

Number of potential courses explored

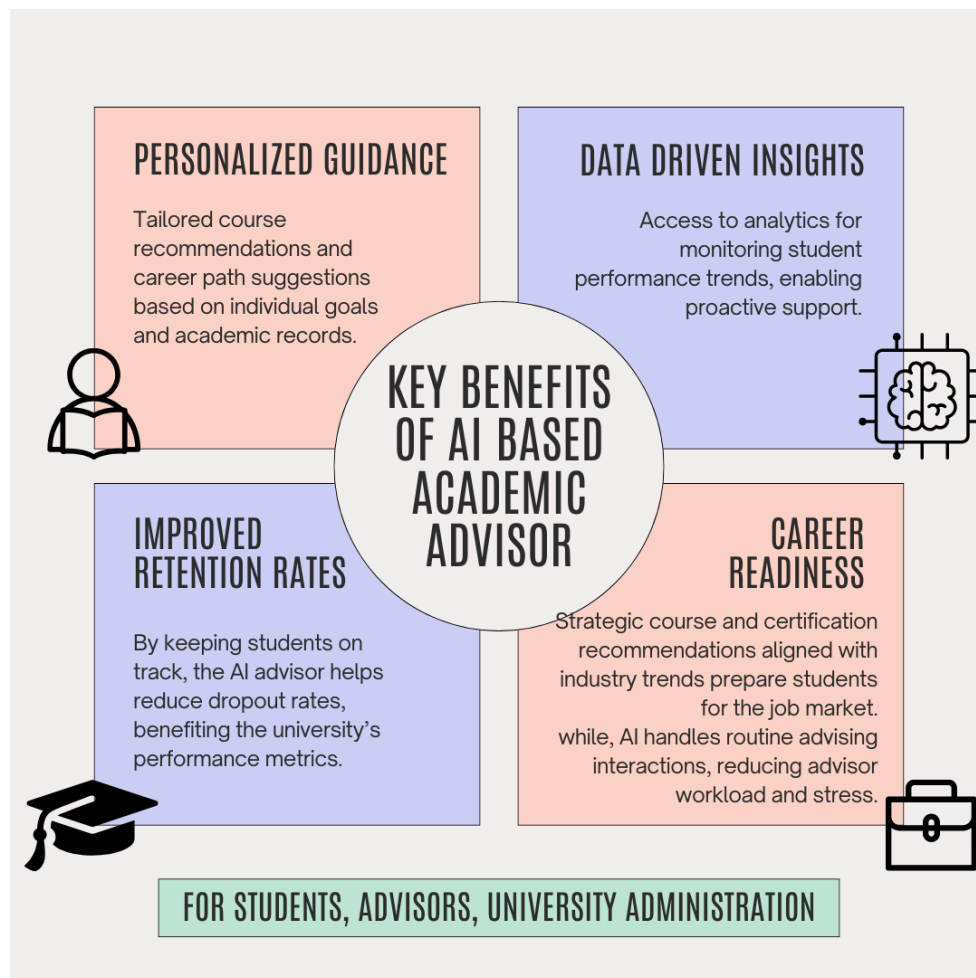


b) Expected Impact on the Target Audience and the Broader Domain

The AI-Based Academic Advisor has the potential to reshape academic advising by automating routine guidance and focusing human resources on more complex cases. The system's predictive analytics help students succeed academically and transition smoothly into the

workforce. Broader adoption in the education sector could lead to a shift toward data-driven, personalized education models, positively impacting students and educational institutions.

Impact Level	Description
Short-Term	Enhanced academic decision-making, proactive intervention for at-risk students
Long-Term	Improved educational outcomes, career alignment, transformative advising models for the industry



Project Plan (WBS)

Project Initiation And Structure

The AI-Based academic Advisor project initiates with requirements, gathering and stakeholder participation, which will take about 7 days. In this phase, we will conduct interviews with key stakeholders-students, academic advisors, and university administration-to define the project's expectations and objectives. This initial engagement will provide a basis for drafting a comprehensive software requirements specifications (SRS) document, capturing a project's essential features and functionalities.

AI Model design and development phase: Scheduled to span six weeks, the team will focus on designing machine learning algorithms, natural language processing (NLP) models, and analytics tools to tailor recommendations for academic advising. Additionally, the team will recast the knowledge based on academic programs, course requirements, and student data sources, which will drive the AI's recommendations.

SYSTEM INTEGRATION AND BACK-END DEVELOPMENT: Estimated to about eight weeks. Here the development team will make the backend infrastructure, integrating the AI system with the SIS and learning management system (LMS) for seamless data access. Cloud servers will be configured to support data storage and AI model processing. In parallel, **the Fronted end development and UI** design phase will create a responsive, user-friendly interface for students and advisors, optimized for both desktop and mobile.

QUALITY ASSURANCE AND TESTING: spanning around four weeks, will rigorously test the platform's functionality, stability and scalability. QA specialist will conduct regression testing, functional testing, and acceptance testing to validate that the system meets the performance expectations.

PILOT TESTING AND FEEDBACK COLLECTION/TRAINING AND DEVELOPMENT

PREPARATIONS: During the fourth month, the pilot testing and feedback collection phase will launch the platform to a small group of users for real-world feedback, which informs final adjustments. Simultaneously, the Training and development preparation phase will provide tutorials, workshops, and training materials to ensure that both students and academic advisors can use the system efficiently. This phase will confirm with GDPR and FERPA data protection standards.

FULL SYSTEM DEVELOPMENT: is scheduled for February 2025, after which the platform will be available for all users, supported by ongoing technical support to maintain optimal performance. The total project budget is estimated at \$495,000, including all development, testing, training, and support costs.

SERVICE LEVEL AGREEMENTS (SLA's)

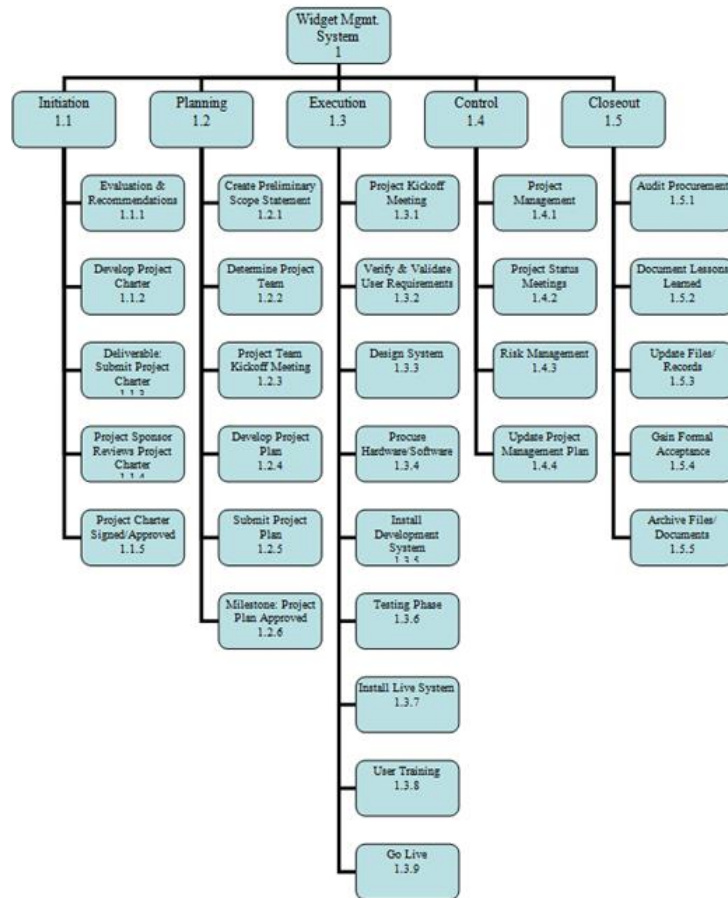
1. **Uptime:** The platform should be accessible 99.5% of the time, especially during peak usage periods.
2. **Response Times:** technical support should respond to critical issues within 5 hours and non-critical issues within 24 hours.
3. **Data Privacy:** The platform must adhere to GDPR and FERPA regulations.
4. **Performance:** Key performance indicators like system speed and accuracy will be monitored.

WBS (WORK BREAKDOWN STRUCTURE):

The project is divided into the following phases:

1. **Requirements analysis:** Gathering and Documenting stakeholder needs.
2. **AI Model development:** Designing, training, and testing the AI model.
3. **Backend Development:** Integrating the system with existing systems like SIS and LMS.
4. **Frontend development:** Designing and developing the user interface.
5. **Quality Assurance and Testing:** Ensuring the system's functionality and reliability.
6. **Pilot testing and Feedback:** Launching a pilot version and gathering user feedback.
7. **Training and Deployment Preparation:** Developing training materials and ensuring compliance.
8. **Full Deployment and Support:** Launching the full system and providing ongoing support.

By combining a well-defined WBS with rigorous SLA's the program aims to deliver a reliable, efficient and compliant AI-based academic advisor platform.



Source: "Work Breakdown Structure (WBS) Template," Project Management Docs.

Project Timeline: -

Phase	Timeline	Description
Phase 1: Requirements Gathering	Nov 1 - Nov 7, 2024	Identify and validate user requirements, finalize SRS.
Phase 2: AI Model and System Design	Nov 8 - Dec 31, 2024	Develop AI models, design system architecture, create UI prototypes, and integrate data.
Phase 3: System Integration and Testing	Jan 1 - Jan 31, 2025	Integrate the system with university databases, perform rigorous testing, and ensure quality standards.
Phase 4: Pilot Rollout	Feb 1 - Feb 15, 2025	Deploy the system to a selected group of students and advisors, collect feedback, and make necessary adjustments.

Phase 5: Full Implementation and Training	Feb 16 - Feb 28, 2025	Deploy the system to all users and provide training to students and academic advisors.
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Milestones and Deliverables: -

Milestone	Description	Deliverables
Requirements Gathering Completed	SRS and stakeholder interviews completed and validated.	SRS, stakeholder feedback
AI Model and System Design Completed	AI model prototypes and system design finalized.	System architecture design, AI model design, UI prototypes
System Integration and Testing Completed	Successful integration with university systems and preliminary testing.	Integrated system with testing documentation
Pilot Rollout Completed	Pilot phase completed, with feedback collected and analyzed.	Feedback report, system updates based on pilot results
Full Implementation and Training Completed	System fully deployed, with training provided to all users.	Deployed system, training materials, documentation for users

Task Breakdown and Tracking (JIRA)

Each deliverable will be broken down into tasks tracked in JIRA. Tasks will include assignments for each team member and time estimates:

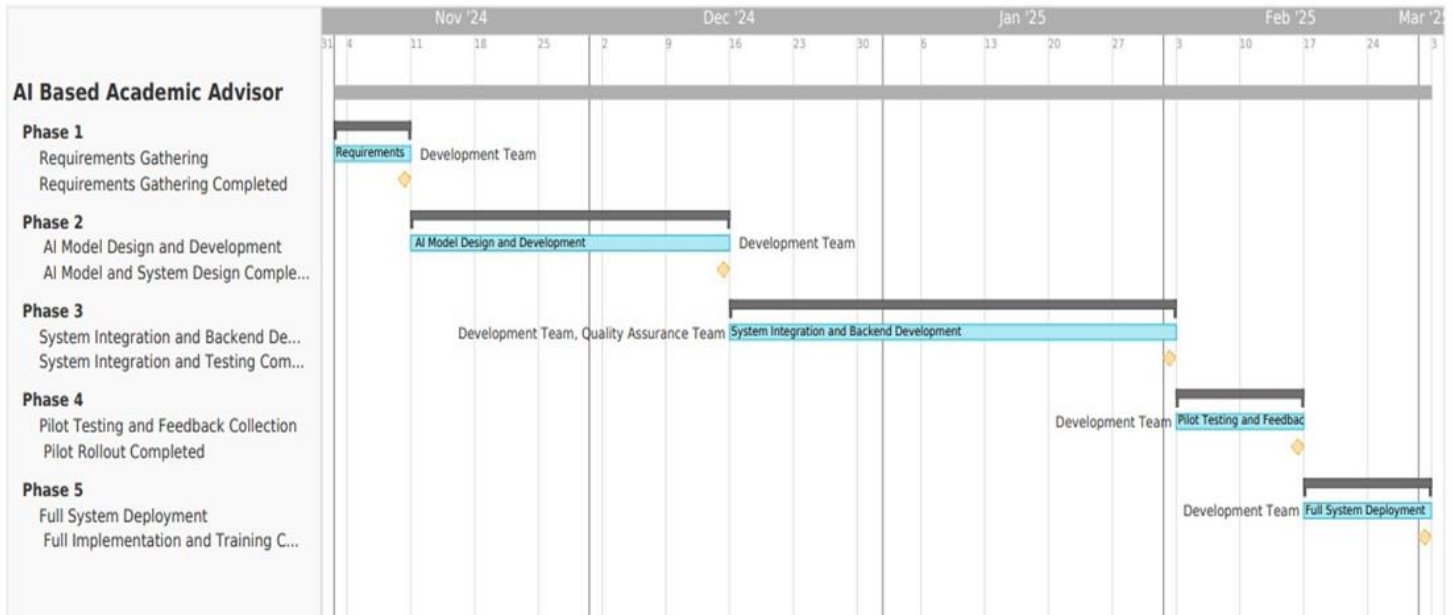
1. AI Model and System Design Development:
 - Task 1: Develop recommendation algorithm – 20 hours
 - Task 2: Train model with sample academic data – 30 hours
 - Task 3: Integrate NLP for interactive advising interface – 25 hours
 - Task 4: Test and validate AI model accuracy and performance – 20 hours
2. System Integration with University Systems:
 - Task 1: Begin data integration with Student Portals – 15 hours
 - Task 2: Integrate with Learning Management System (LMS) – 20 hours
 - Task 3: Configure APIs for seamless data exchange – 15 hours

- Task 4: Perform integration testing for data consistency – 12 hours
3. Frontend Design:
- Task 1: Design student dashboard interface – 15 hours
 - Task 2: Design academic advisor dashboard interface – 12 hours
 - Task 3: Conduct user experience testing and gather feedback – 10 hours
 - Task 4: Improve UI based on user testing feedback – 8 hours
4. Data Privacy and Security:
- Task 1: Implement data encryption for student records – 12 hours
 - Task 2: Set up user access controls for secure access – 10 hours
 - Task 3: Guarantee compliance with GDPR and FERPA standards – 10 hours
5. Testing and Quality Assurance (QA):
- Task 1: Unit testing for separate components – 25 hours
 - Task 2: Integration testing with all system components – 20 hours
 - Task 3: Perform UAT (User Acceptance Testing) – 18 hours
 - Task 4: Review tests and make necessary changes – 12 hours
6. Deployment and Pilot Implementation:
- Task 1: Set up production environment on cloud – 12 hours
 - Task 2: Deploy the system for pilot group access – 10 hours
 - Task 3: Gather user feedback during the pilot phase – 8 hours
7. Project Closure:
- Task 1: Conduct final review and seek for approval from stakeholders – 10 hours
 - Task 2: Collect lessons learned for project assessment – 8 hours
 - Task 3: Submit the project closure report – 7 hours

The total number of hours sum up to 364 hours that fit comfortably in a 4-month project timeline.

Gantt Chart

The project will follow the below schedule for different phases and achieve milestones.



Risk Assessment and Mitigation Plan for AI-Based Academic Advisor

Objective:

This plan aims to identify, analyze, and develop mitigation strategies for the associated risks while developing and deploying an AI-based academic advisor. Mitigations shall focus on reducing challenges and uncertainties for smooth project execution and successful outcomes.

1. Risk Identification

Comprehensive List of Potential Risks:

Risk Category	Description
Technical Risks	Technological, algorithmic selection, and data quality challenges.
Operational Risks	Issues arising from project management, staffing, and collaboration.
Economic Risks	Financial constraints, budget overruns, and resource limitations.
Project-Specific Risks	Potential delays in project milestones and scope creep.

❖ Technical Risks:

- **Algorithm Inefficiency:** AI models, such as NLP and recommendation engines, can be suboptimal, impacting prediction accuracy.
- **Integration Challenges:** Integrating the academic advisor system with the existing university databases may lead to compatibility and security problems.
- **Data Privacy Risks:** Handling sensitive student data raises privacy concerns, particularly compliance with data protection regulations.

❖ Operational Risks:

- **Resource Availability:** The unavailability of necessary resources, including skilled AI developers and data scientists.
- **User Adoption and Resistance:** Students and faculty may be resistant to using the AI-based advisor due to their preference for traditional methods.
- **Training Requirements:** Time and resources needed to train students and staff in the use of the system.

❖ Economic Risks:

- **Budget Overrun:** The possibility of unplanned expenses in the form of extra software licenses or outside consultants for AI skills.
- **Maintenance Costs:** The future costs of maintenance, especially updating the AI models, can be more than what was initially budgeted.

❖ **Project-Specific Risks:**

- **Schedule Delays:** Potential delays in project milestones due to dependencies on data procurement, model training time, or technical issues.
- **Scope Creep:** The expansion of project requirements due to evolving expectations from stakeholders, which may impact time and resources.

2. Risk Impact Analysis

Assessment of Risk Impact and Prioritization:

Risk	Impact Level	Likelihood	Priority (High, Medium, Low)
Algorithm Efficiency	High	Medium	High
Data Quality and Availability	High	High	High
System Integration	Medium	Medium	Medium
Model Interpretability	Medium	Low	Low
Project Delays	High	Medium	High
Resource Allocation	High	Medium	High
Communication Gaps	Medium	Medium	Medium
Budget Constraints	High	Medium	High
Cost Overruns	Medium	Low	Low
Data Breaches	High	Low	High
Compliance with Privacy Laws	High	Medium	High
Policy Compliance	Medium	Low	Low
Liability	Medium	Low	Medium

Risk Impact Analysis

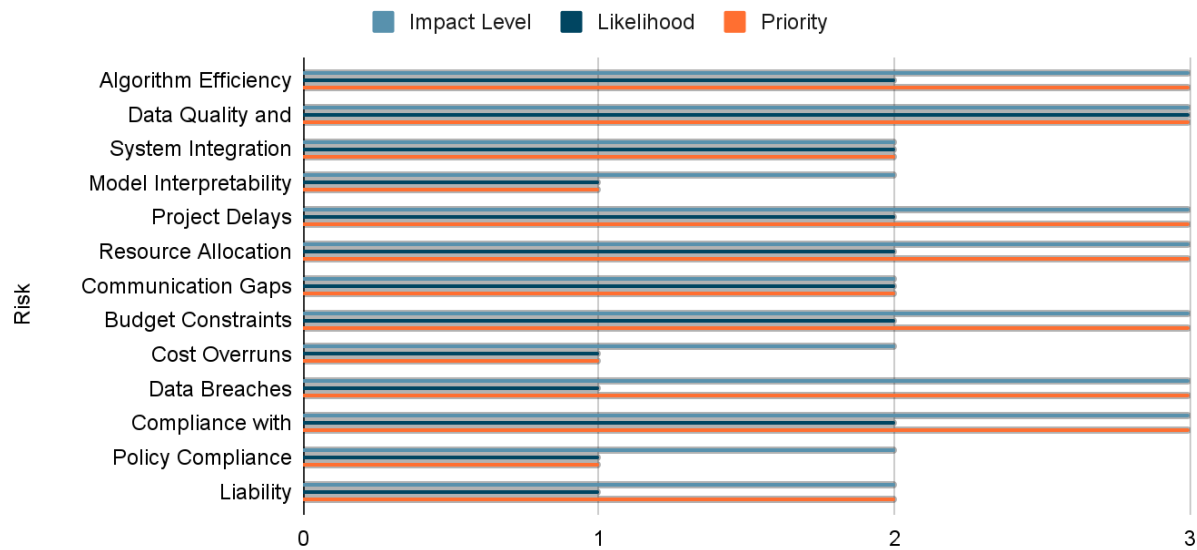


Fig: Risk Impact Analysis (Low = 1, Medium = 2 and High = 3)

3. Risk Mitigation Strategies

❖ Algorithmic Inefficiency

Extensive testing by the team using different academic datasets will help the algorithm learn how to handle most scenarios for the best performance. Testing will reveal certain of its weak points and their finetuning in advance.

- **Contingency Plan:** In case of failure in performance, iterative updates will be done, refining the algorithm with feedback and new data. This will help make adjustments during the whole project life cycle and not wait until the end.
- **Example:** If the preliminary tests show that the AI struggles with specific input data, then the team can include more layers in the model or use different algorithms such as boosting, yielding better performance.

❖ Data Privacy Risks

Given that it refers to student's data, the protection should be very strong. Encryption and anonymization will be implemented, as well as auditing to detect and patch vulnerabilities.

- **Contingency Plan:** In case of a data breach, the team should inform all concerned individuals in a well-planned manner to contain the situation as soon as possible.
- **Example:** Assuming there is some anomaly in the data access logs, the team would immediately audit the logs, pinpointing the breach, informing where needed, and taking measures to prevent recurrence.

❖ **Resource Availability**

We will cross-train team members on major tasks that, if a skill shortage were to occur, would disrupt the team. Specialized tasks may be outsourced, if need be, while maintaining a scheduling buffer that can absorb delays in case of resource gaps.

- **Contingency Plan:** If key resources become unavailable, we'll use temporary staff or consultants and adjust project timelines for less critical tasks to allow continued progress.
- **Example:** In case of the lack of an AI specialist, for example, a backup consultant will replace him until such time the main representative returns to work.

❖ **Budget Overrun**

A built-in schedule buffer is provided to the team such that high-risk tasks can be adjusted in case of delays. There will be project software to keep you on track and to flag when you're close to running behind so adjustments can be made soon.

- **Contingency Plan:** However, rather than being taken for granted, the resources from the low-priority areas will be reallocated to fill in any unexpected schedule setbacks, and the project timeline will be adjusted where called for to make sure that high-impact tasks remain on track.
- **Examples:** If data integration runs behind, the project manager might move staff from other noncritical areas to concentrate on this task to guarantee that most of the main deliverables do not slip behind.

❖ **Budget Overrun**

We'll make sure we don't end up with a budget problem by watching all the expenditures closely. We then establish an emergency reserve to cover any unexpected costs, which keeps us flexible and doesn't touch the main budget.

- **Contingency Plan:** The team will lower non-important spending and cut down on low-impact activities if an overrun is likely to stay well under budget.
- **Examples:** In case the project will be equipped with additional software tools when they are needed, the reserve part can be used, reducing the amount of lower-priority things like optional training or external consulting hours.

Conclusion:

The risk assessment and mitigation plan provided in this project presents a project structure for identifying, analyzing, and solving critical risks in the AI-based Academic Advisor project. Through proactive risk management, the project team mitigates risk to potential negative impacts, helps maintain project timelines, and improves the likelihood that the project will be completed successfully.

Budgeting and Resource Costing with Outsourcing

Budgeting is the process of estimating and allocating financial resources for a project. It ensures that funds are effectively distributed across all phases, helping to avoid overspending and resource shortfalls. A well-planned budget is crucial for timely project completion, risk management, and achieving desired project outcomes.

The **Delphi method** was combined with research into average outsourcing rates for specialized IT services to provide realistic figures. This method helps incorporate expert consensus via extensive research for potential unknowns, while outsourcing market research ensures costs align with industry standards.

Cost Categories and Resource Costing:

Development and Outsourcing Costs:

1. AI Model Development (Outsourced):

- **Cost:** \$120,000.
- **Justification:** This cost covers the design, development, and training of custom machine learning algorithms for personalized academic advising. Outsourcing rates for AI development can range from \$50 to \$150 per hour [\[source: Clutch\]](#).

A 6-month period project (approximately 1,200-1,500 hours) falls within the \$100,000 to \$150,000 range.

2. Software Development (Outsourced):

- **Cost:** \$100,000.
- **Justification:** This includes frontend and backend development for the web/mobile interfaces and system integration. Software development outsourcing typically costs between \$40 to \$100 per hour [\[source: Accelerance\]](#). The project scope estimates around 1,200 hours for development.

Integration and System Deployment (Outsourced):

3. Integration with University Systems (SIS/LMS):

- **Cost:** \$50,000.
- **Justification:** This budget covers API development, data pipeline creation, and integration with existing university systems. Specialized integration work can be outsourced at rates between \$60 to \$120 per hour [\[source: GoodFirms\]](#).

4. Cloud Infrastructure and Hosting:

- **Managed by the Outsourcing Company.**
- **Cost:** \$50,000.

- **Justification:** The cost for cloud infrastructure management for a year, including AWS or Google Cloud hosting.

Testing and Quality Assurance (Outsourced):

5. QA Testing:

- **Cost:** \$25,000.
- **Justification:** Functional, regression, and user acceptance testing are included. QA outsourcing typically ranges from \$30 to \$50 per hour [\[source: Testlio\]](#), with around 500-600 hours estimated for thorough testing.

6. Pilot Program:

- **Cost:** \$10,000.
- **Justification:** Conducting a pilot test with a controlled user group and collecting feedback for adjustments.

Training and Support (Outsourced):

7. Training for Advisors and Students:

- **Cost:** \$15,000.
- **Justification:** This includes developing user training materials, manuals, and conducting workshops. The outsourcing company would involve training specialists to ensure smooth user adoption.

8. Ongoing Technical Support (Year 1):

- **Number of Personnel (equivalent):** 2 support staff.
- **Cost:** \$40,000.
- **Justification:** Covers the cost for a year of technical support and maintenance post-launch. Typical support outsourcing ranges from \$30,000 to \$50,000 annually [\[source: Upwork\]](#).

Marketing and Awareness (Handled Internally with Limited Outsourcing):

9. Promotion to Students and Advisors:

- **Cost:** \$20,000.
- **Justification:** Managed by the main project team with outsourced design services for promotional materials.

Miscellaneous and Compliance (Outsourced):

10. Data Privacy Compliance:

- **Cost:** \$15,000.
- **Justification:** Covers outsourcing to legal consultants to ensure GDPR and FERPA compliance [\[source: Nolo\]](#).

11. Contingency Budget:

- **Cost:** \$50,000.
- **Justification:** Reserved for unforeseen expenses, calculated as approximately 10-15% of the project budget.

Revised Total Estimated Budget with Outsourcing:

- **AI Model Development (Outsourced):** \$120,000.
- **Software Development (Outsourced):** \$100,000.
- **Integration and System Deployment (Outsourced):** \$50,000.
- **Cloud Infrastructure:** \$50,000.
- **QA and Testing (Outsourced):** \$25,000.
- **Pilot Program:** \$10,000.
- **Training and Support (Outsourced):** \$15,000.
- **Ongoing Technical Support (Year 1):** \$40,000.
- **Marketing and Awareness:** \$20,000.
- **Data Privacy Compliance:** \$15,000.
- **Contingency:** \$50,000.

Total Budget: \$495,000.

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