PROJECT REPORT

TEAM MEMBERS

GROUP 5

Mahima Advilkar

Title: Migration of CSUEB data Infrastructure

PROJECT PROPOSAL

1. Education : Implementing a Student Data Management System for CSUEB Admissions Department

Industry -

- **Higher Education Technology**: The higher education sector is increasingly adopting advanced technology solutions to enhance operational efficiency and improve student experiences.
- This industry focuses on data management, cloud computing, and information systems that facilitate streamlined processes for admissions, enrollment, and academic records. With the shift towards digital solutions, institutions must manage vast amounts of data securely and efficiently while complying with regulatory standards.

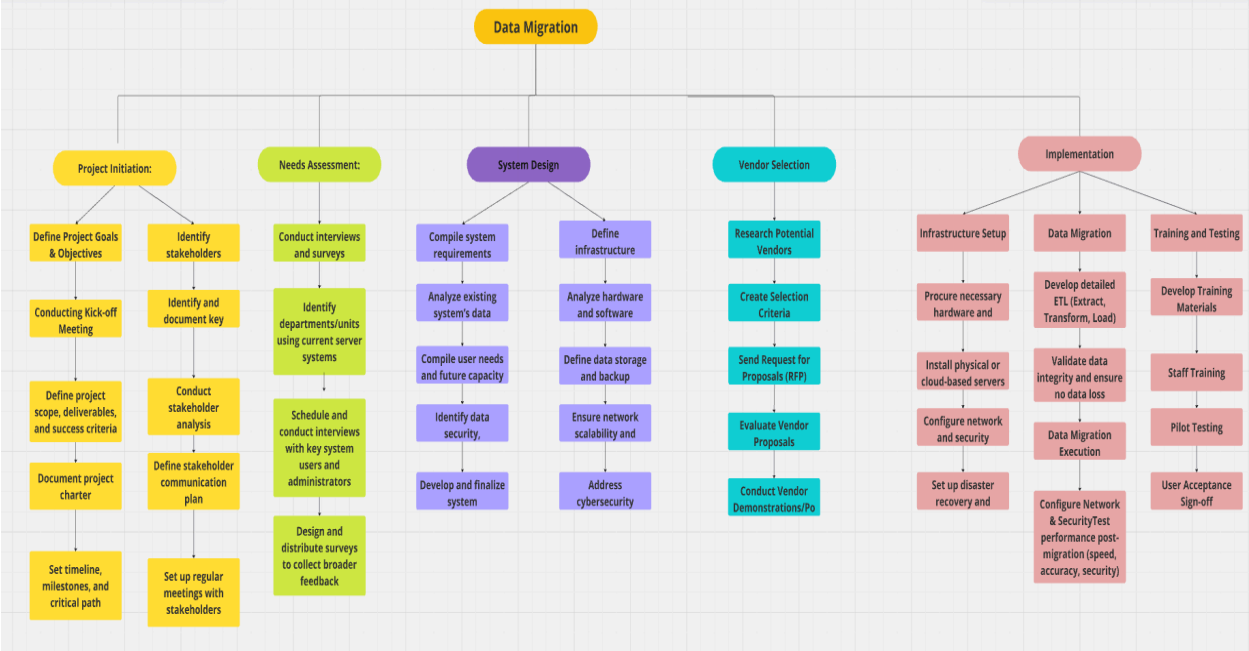
Project Description -

- The project involves transitioning the California State University, East Bay (CSUEB) from its existing on-premises Student Data Management System to a modern, fully cloud-based data warehouse.
- The project will be executed in multiple phases, including assessing the current infrastructure, selecting appropriate vendors, implementing the new system, and conducting thorough testing and training.

Project Significance

- The migration of the Student Data Management System is crucial for CSUEB as it seeks to modernize its data management processes and improve operational efficiency.
- By adopting a cloud-based solution, the university can enhance data accessibility, streamline admissions processes, and ensure compliance with data protection regulations.

Project Work Breakdown Structure (WBS) Overview



1. Project Initiation

This phase sets the foundation for the entire project by defining its objectives and aligning all key stakeholders.

- Define Project Goals & Objectives: The project begins by establishing its purpose, defining clear goals to ensure everyone understands the direction.
    - Duration: 0.5 weeks.
- Conduct Kick-off Meeting: A meeting is held to bring all stakeholders together and confirm the scope of the project.
    - Duration: 0.5 weeks.
- Identify Stakeholders: Key internal and external stakeholders are identified, ensuring that the right people are involved throughout the project.
    - Duration: 0.5 weeks.

2. Needs Assessment

This step involves gathering data from relevant departments to understand the system's requirements.

- Conduct Interviews and Surveys: Data is collected from stakeholders to understand their needs and expectations from the new system.
    - Duration: 1 week.

- Compile System Requirements: The gathered data is analyzed to consolidate the technical and operational requirements.
    - Duration: 1 week.

3. System Design

Once the requirements are understood, the system's design specifications are created.

- Define Infrastructure Requirements: The hardware, software, and network needs are identified to support the system's operations.
    - Duration: 1 week.
- Create System Specifications: Detailed technical specifications are drawn up, covering aspects like servers, storage, and network infrastructure.
    - Duration: 1 week.

4. Vendor Selection

The process of choosing a suitable vendor to supply the required services and hardware begins after the system design is finalized.

- Research Potential Vendors & RFPs: Vendors capable of meeting the project's requirements are identified, and Request for Proposals (RFPs) are sent out.
    - Duration: 1 week.a
- Evaluate Vendor Proposals: Vendor proposals are reviewed based on criteria like performance and cost.
    - Duration: 1 week.
- Finalize Vendor Contracts: The best vendor is selected, and contract negotiations are completed.
    - Duration: 0.5 weeks.

5. Implementation & Testing

Once a vendor is selected, the system is installed and thoroughly tested before the final launch.

- Infrastructure Setup: The system's hardware and software infrastructure are installed and configured.
    - Duration: 2 weeks.
- Data Migration (ETL): Data from the old system is migrated to the new one using Extract, Transform, Load (ETL) processes.
    - Duration: 2 weeks.
- Pilot Testing: A pilot test is conducted to ensure the system functions properly on a small scale before full deployment.

    - Duration: 1 week.
- Staff Training: IT staff and end-users are trained on how to use the new system.
    - Duration: 1 week.
- End-to-End Testing: The entire system is tested for performance, security, and overall functionality.
    - Duration: 1.5 weeks.

6. Feedback, Risk Management & Closure

After implementation, feedback is collected, risks are managed, and the project is closed out.

- Collect User Feedback: User feedback from the pilot test is gathered to ensure the system is ready for full deployment.
    - Duration: 0.5 weeks.
- Final Implementation: The system is fully deployed after successful testing and any necessary adjustments based on feedback.
    - Duration: 1.5 weeks.
- Post-Implementation Review: The system's performance is reviewed, and final feedback is gathered to close the project.
    - Duration: 0.5 weeks.
- Risk Monitoring & Mitigation: Continuous risk monitoring is conducted throughout the project to ensure any issues are addressed.
    - Ongoing Duration.

A	B	C	D	E	F	G
WBS 0	WBS Level	Activity ID	Activity Description	Immediate Predecessor	Time (Weeks)	Other Details
	Project Initiation	1	Define Project Goals & Objectives	None	0.5	Must be completed first, sets project direction.
		2	Conduct Kick-off Meeting	1	0.5	Aligns all stakeholders and defines initial scope.
		3	Identify Stakeholders	1	0.5	Document key internal and external stakeholders.
	Needs Assessment	4	Conduct Interviews and Surveys	3	1	Gather data from departments using current systems.
		5	Compile System Requirements	3	1	Consolidate needs and capacity for the new system.
	System Design	6	Define Infrastructure Requirements	5	1	Specify hardware, software, and network needs.
		7	Create System Specifications	5	1	Detailed specs for server, storage, and network.
CSUEB - Data Migration						
	Vendor Selection	8	Research Potential Vendors & RFPs	7	1	Identify vendors for hardware and services.
		9	Evaluate Vendor Proposals	8	1	Review proposals based on performance, cost, etc.
		10	Finalize Vendor Contracts	8	0.5	Select vendor and finalize contract terms.
	Implementation & Testing	11	Infrastructure Setup	10	2	Install servers, storage, and configure network.
		12	Data Migration (ETL)	10	2	Migrate data using Extract, Transform, Load (ETL).
		13	Pilot Testing	12	1	Test limited data to ensure accuracy and security.
		14	Staff Training	12	1	Conduct training sessions for IT staff and users.
		15	End-to-End Testing	13	1.5	Test the entire system (performance, security, etc).
	Feedback, Risk Management & Closure	16	Collect User Feedback	15	0.5	Gather feedback from pilot testing.
		17	Final Implementation	15	1.5	Deploy system fully after successful testing.
		18	Post-Implementation Review	17	0.5	Evaluate system performance, gather final feedback.
		19	Risk Monitoring & Mitigation	Continuous	Ongoing	Ensure continuous risk monitoring during the project

Project Schedule

The migration of the Student Data Management System (SDMS) for the Admissions Department at California State University, East Bay, spans across five major phases over 12 weeks, structured to ensure a systematic and efficient transition to a cloud-based platform. This schedule not only drives project timelines but also supports critical compliance and risk management protocols.

Phase 1: Project Initiation (Weeks 1-2)

The project starts with a formal definition of goals and objectives, serving as the foundation for the entire migration effort. The initial kick-off meeting brings together key internal stakeholders, such as department heads from Admissions, IT, and compliance officers, along with external consultants to align on the project scope, deliverables, and responsibilities. Early identification of stakeholders is crucial, as they play a continuous role in steering the project through critical milestones, ensuring that the system meets all operational and regulatory requirements.

The inclusion of external vendors and CSU system representatives as stakeholders highlights the need for cross-functional collaboration, which will be essential when integrating the new system with other California State University systems. By the end of this phase, a comprehensive stakeholder matrix will be created, specifying roles, decision-making authority, and communication plans.

Phase 2: Needs Assessment and System Design (Weeks 3-4)

This phase is focused on gathering in-depth insights into the current system's limitations through interviews and surveys with departments like Admissions, Financial Aid, and Registrar's Office. Feedback is collected on the performance of the existing infrastructure and expectations for the new system. A detailed requirements-gathering process is key to understanding not just the data storage needs but also compliance with laws such as HIPAA for health-related student data, GDPR for international students, and PCI DSS for secure payment processing.

Based on this input, the system's infrastructure requirements will be defined, specifying the hardware, software, cloud storage, and network configurations needed to handle large volumes of sensitive data. The new system will also include features like data encryption, user authentication, and role-based access control to ensure compliance with PII and SOC 2 standards. This phase lays the groundwork for creating a scalable and secure data environment, with designs ensuring seamless integration with CSU's broader data management ecosystem.

Phase 3: Vendor Selection and Setup (Weeks 5-6)

The vendor selection process begins with a Request for Proposals (RFPs) sent to potential service providers. These vendors are evaluated on various criteria including system performance, cost, scalability, security features, and past experience with higher education institutions. A thorough evaluation ensures the selection of vendors that meet the university's technical requirements while adhering to the compliance framework. Risk mitigation is factored in through vendor SLAs (Service Level Agreements), ensuring accountability throughout the setup process.

The infrastructure setup will follow, involving the installation of cloud-based servers and storage environments. Data pipelines will be created to allow real-time data streaming and integration with CSU's other student systems. By incorporating a data stream processor, the project ensures that the system can handle large volumes of admissions data while allowing for real-time analysis of student applications, transcript data, and admission decisions.

Phase 4: Implementation, Testing, and Training (Weeks 7-9)

With the infrastructure in place, data migration begins using the Extract, Transform, Load (ETL) method. Data from the legacy system, including student transcripts, admission decisions, and enrollment records, is securely migrated to the new platform. To ensure accuracy and compliance, pilot testing is conducted with a subset of data, verifying that the new system can process, store, and retrieve data accurately while adhering to privacy laws such as PII and GDPR.

Staff training is a vital part of this phase, ensuring that both IT personnel and admissions staff are well-equipped to operate the new system. Training will focus on data management, system security, and using new automation tools that streamline admissions workflows. The project team will conduct role-specific sessions to ensure that all users understand how the system works, and training will also cover key compliance topics, such as handling sensitive student data and performing regular security audits.

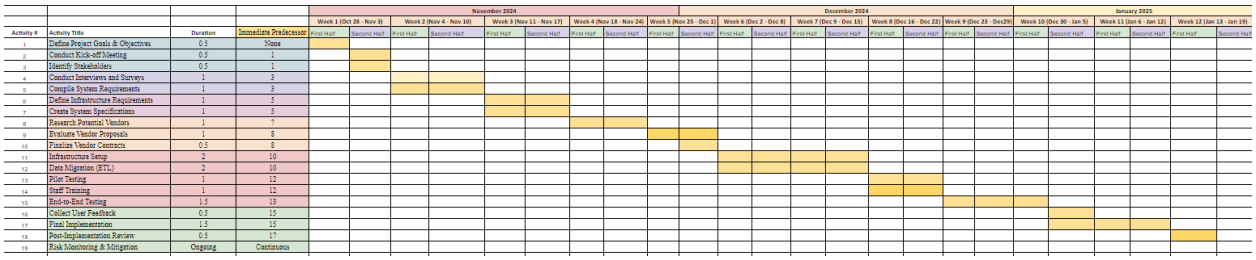
End-to-end testing is crucial during this phase. It involves rigorous security checks, performance assessments, and functionality tests to ensure that the system can support peak loads, such as during admissions deadlines, and that data privacy standards are maintained throughout. This testing ensures that the system can handle sensitive information and large volumes of admissions data without errors or delays.

Phase 5: Full Implementation and Project Closure (Weeks 10-12)

Upon successful completion of pilot testing and staff training, the system will undergo a final round of testing, including stress tests and security evaluations, before being fully deployed. The final implementation will see the migration of all remaining student data and the decommissioning of the legacy system. Risk management processes will remain active throughout this phase, with the project team monitoring potential risks such as data corruption or system downtime.

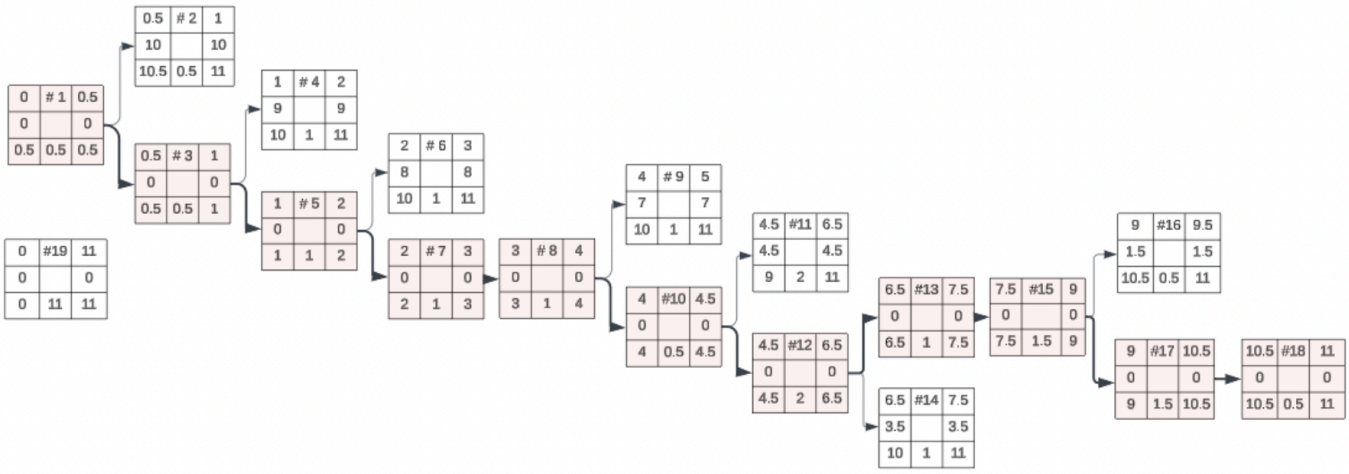
User feedback will be gathered during this period to assess the system's performance and user-friendliness. A post-implementation review will be conducted, where the project team will evaluate the system’s overall success, compliance with regulatory requirements, and performance against project goals. This review will also consider any remaining risks and include plans for ongoing system monitoring and updates.

By following this structured schedule, the project ensures that the SDMS migration is completed within the 12-week timeframe while minimizing risks to operations, maintaining compliance, and ensuring a smooth transition for all users.



				November 2024				
				Week 1 (Oct 28 - Nov 3)		Week 2 (Nov 4 - Nov 10)		Week 3 (Nov
Activity #	Activity Title	Duration	Immediate Predecessor	First Half	Second Half	First Half	Second Half	First Half
1	Define Project Goals & Objectives	0.5	None					
2	Conduct Kick-off Meeting	0.5	1					
3	Identify Stakeholders	0.5	1					
4	Conduct Interviews and Surveys	1	3					
5	Compile System Requirements	1	3					
6	Define Infrastructure Requirements	1	5					
7	Create System Specifications	1	5					
8	Research Potential Vendors	1	7					
9	Evaluate Vendor Proposals	1	8					
10	Finalize Vendor Contracts	0.5	8					
11	Infrastructure Setup	2	10					
12	Data Migration (ETL)	2	10					
13	Pilot Testing	1	12					
14	Staff Training	1	12					
15	End-to-End Testing	1.5	13					
16	Collect User Feedback	0.5	15					
17	Final Implementation	1.5	15					
18	Post-Implementation Review	0.5	17					
19	Risk Monitoring & Mitigation	Ongoing	Continuous					

Project Network Diagram and Critical Path Analysis



The diagram above represents a project schedule network, visualizing the tasks, their dependencies, and the overall project timeline. Each numbered square corresponds to a specific task, with important scheduling details provided within each box.

Key elements include:

- Task Identification: Each task is denoted by a number (e.g., #1, #2), representing individual activities within the project.
- Task Durations: The numbers inside the boxes represent the duration of each task in time units (e.g., days or weeks). For example, "0.5" indicates a half-day or half-week task duration.
- Dependencies: Arrows connecting the task boxes highlight the sequence in which tasks must be completed. This creates a flow, where certain tasks cannot begin until others are finished.
- Parallel Activities: Tasks connected by arrows at the same level can be completed simultaneously, indicating parallel workflows that help reduce overall project time.
- Critical Path: The red-highlighted blocks indicate tasks on the critical path. These are the tasks that directly influence the project's end date. Delays in any of these tasks will result in a delay in the project completion.

- Earliest and Latest Start/Finish: Each box contains information about the earliest and latest possible start and finish times for each task, allowing for flexible scheduling where possible.
- Milestones: The numbers in the final column of the diagram indicate milestone points, helping to track progress against the overall timeline and ensuring that key project objectives are met on time.

This diagram serves as a valuable tool in project management for identifying critical activities, optimizing resources, and ensuring that the project is completed on schedule. By understanding the critical path and dependencies, the project team can better allocate resources and prevent bottlenecks.

Agile Planning for Data Migration Project

In light of the limited timeframe and diverse stakeholder needs for the California State University, East Bay (CSUEB) data migration project, we have opted to implement agile planning methodologies. Agile principles emphasize flexibility, iterative development, and customer collaboration. By breaking the initial five-phase project plan into manageable sprints, we aim to foster strong communication among team members and stakeholders while ensuring that feedback is continuously gathered and integrated. This approach will facilitate a more responsive and effective migration process, ultimately leading to a successful transition to the new cloud-based data management system.

Project Sprints and Schedule

To adapt our project into an agile framework, we will organize our work into a series of iterative and incremental sprints, each lasting two weeks. The following outlines our project sprints:

Sprint No.	Duration	Objectives	Deliverables
Sprint 1	Weeks 1-2	Requirements gathering and initial assessment	Initial requirements document, product backlog with college-specific user stories. ● Conduct meetings with admissions representatives from each college to gather specific requirements. ● Document individual user stories reflecting each college's needs in the product backlog.
Sprint 2	Weeks 3-4	Data migration for College of Letters, Arts and Social Sciences	Data Migration for Each College. ● Each sprint will focus on migrating data for one college at a time. ● Conduct validation checks and gather feedback from college representatives after each migration to ensure data accuracy and system functionality.
Sprint 3	Weeks 5-6	Data migration for College of Science	
Sprint 4	Weeks 7-8	Data migration for College of Education and Allied Studies	
Sprint 5	Weeks	Data migration for College	

	9-10	of Business and Economics	
Sprint 6	Weeks 11-12	Final testing, user training, and project closure	Final Testing, User Training, and Project Closure. ● Perform comprehensive testing for the entire system, ensuring all colleges' data is correctly integrated. ● Provide training sessions for staff across all colleges, focusing on how to use the new system effectively. ● Prepare a project completion report detailing achievements, challenges, and future recommendations.

Additional Notes

- **Daily Stand-ups**: Conducted each morning,these short meetings during each sprint to monitor progress and address any issues promptly.
- **Sprint Reviews**: At the end of each sprint, hold a review meeting with the involved college representatives to showcase completed work and gather feedback.
- **Retrospectives Meeting**: After each sprint, conduct a meeting to discuss successes and areas for improvement, allowing the team to adapt and enhance their approach for subsequent sprints.

Roles and Responsibilities

- **Scrum Master:** oversees the project's progress, facilitates communication among team members, and removes obstacles to ensure agile practices are followed.
- **Product Owner:** prioritizes the product backlog based on business needs, sets sprint goals, and ensures that the team delivers align with the university's objectives.
- **Project Team Members:** cross-functional members selected based on skills and experience. Each member will be chosen for their expertise and availability to contribute effectively to the data migration process.
    - **Data Migration Specialists:** Handle the ETL processes.
    - **Systems Architect:** Designs the system architecture and ensures compatibility with existing infrastructure.
    - **Business Analysts:** Collaborate with stakeholders to define requirements and document user stories.
    - **QA/Testers:** Testing the migrated data and ensuring the system functions.
- **Stakeholders**

- **Provost/Academic Affairs Officers**: Ensures alignment with academic goals and policies.
- **IT Director**: Oversees IT infrastructure and ensures compliance with data security regulations.
- **College Deans**: Represent each college's interests and ensure their specific needs are met.
- **Admissions Representatives**: Provide insights into the admissions process and system requirements.
- **Registrar's Office**: Manages student records and ensures data integrity.
- **Compliance Officer**: Ensures compliance with legal requirements.
- **End Users (Faculty, Staff, Students)**: Direct users of the new system.
- **IT Support Staff**: Assist with technical issues and provide training to users.
- **External Vendors and Consultants**: Bring expertise and support for the migration process.

Resources Needed (Category-Wise)

1. **Human Resources**
    - Project Manager
    - IT Lead
    - Data Migration Specialist
    - Systems Architect
    - Vendor Manager
    - Compliance Officer
    - Training & Support Lead
    - Testing & QA Team
2. **Technological Resources**
    - Cloud Platform (AWS or Azure)
    - ETL Tools (Talend, Apache NiFi)
    - SQL Tools (MySQL Workbench, SSMS)
    - Data Quality Tools (Informatica, Trifacta)
    - Encryption Tools (AWS KMS, Azure Key Vault)
    - Monitoring Tools (Splunk, AWS CloudTrail)
    - Project Management Tools (Jira, Asana)
3. **Financial Resources**
    - Budget for software licenses
    - Staff salaries
    - Vendor costs
4. **Material Resources**
    - Hardware (servers, networking equipment)
    - Documentation (user manuals, training materials)
5. **Compliance and Legal Resources**
    - Data protection regulations (HIPAA, GDPR)
    - Audit tools for compliance
6. **Training and Support Resources**
    - Training programs for staff and users
    - Help desk support
7. **Project Management Resources**
    - Gantt Chart for tracking timelines
    - Risk management plans
8. **Testing Resources**
    - Testing environments for validation
    - Quality assurance processes

Risks (Category-Wise)

Product Risks

1. **Functionality Risks**: The new system may not meet user requirements, leading to dissatisfaction (e.g., missing key admissions features).
2. **Performance Risks**: The system may experience slow response times during peak usage (e.g., high traffic during admissions).
3. **Integration Risks**: Challenges in integrating with existing university systems may lead to data silos (e.g., incompatibility with current databases).
4. **Security Risks**: Vulnerabilities could expose sensitive data, risking compliance violations (e.g., data breaches).
5. **Data Quality Risks**: Inaccurate data migration could result in flawed admissions decisions (e.g., incorrect applicant data).

Project Risks

1. **Schedule Risks**: Delays in project phases could push the timeline (e.g., extended vendor selection).
2. **Budget Risks**: Unforeseen expenses may exceed the allocated budget (e.g., increased cloud service costs).
3. **Resource Risks**: Availability issues with team members could impact productivity (e.g., key staff being unavailable).
4. **Stakeholder Risks**: Misalignment among stakeholders may affect support and decision-making (e.g., poor communication).
5. **Compliance Risks**: Failing to meet legal regulations could lead to penalties (e.g., non-compliance with FERPA).
6. **Change Management Risks**: Resistance to the new system may hinder user adoption (e.g., inadequate training).

Rough cost of the Project

Category	Description	Cost
Personnel Costs	Salaries and benefits for the project duration	$125000
Software/ Licensing Costs	software licenses and tools	$30000
Cloud Services Costs	cloud hosting and services - for storage, data transfer, etc	$40000
Training and Support Costs	training staff and providing ongoing support	$15000
Vendor Costs	Payments to external vendors -consulting, integration support, etc	$25000
Hardware Costs	Hardware purchase - for servers, networking equipment, etc	$15000
Compliance and Security Costs	Expenses related to ensuring compliance - for compliance audits, security tools, etc.	10000
Contingency Costs	A reserve fund to cover unexpected expenses that may arise during the project. (10% contingency reserve)	25000

Total Cost - $285000

The total estimated cost for the CSUEB Data Migration Project is $285,000. This budget encompasses several key categories: $125,000 for personnel costs, covering salaries and benefits; $30,000 for software and licensing expenses; and $40,000 for cloud services, which include hosting and data transfer. Additionally, $15,000 is allocated for training and support, while $25,000 is earmarked for vendor costs associated with consulting and integration. Hardware purchases are estimated at $15,000, and $10,000 is set aside for compliance and security measures. A contingency reserve of $25,000 is included to address unforeseen expenses, ensuring the project remains financially sound and capable of meeting its goals during the migration of the Student Data Management System.

CONCLUSION

The CSUEB Data Migration Project represents a significant strategic initiative aimed at modernizing the university's admissions data management system by transitioning from a legacy on-premise solution to a cutting-edge, cloud-based infrastructure. The project followed a meticulously structured phased approach, ensuring a clear path from project initiation to full implementation. Starting with the identification of project goals and objectives, and continuing through stakeholder engagement, system design, vendor selection, and robust data migration processes, the project was carefully managed to minimize risks and operational disruptions.

By applying project management best practices, including risk monitoring, iterative feedback loops, and resource optimization, the migration ensure data integrity, compliance with privacy regulations, and long-term system scalability. This structured approach also integrated agile methodologies, allowing for flexibility and adaptability in addressing unforeseen challenges during migration and implementation. The inclusion of thorough testing phases, such as pilot and end-to-end testing, guaranteed that all functional, security, and performance requirements were met before full deployment, ensuring a seamless user experience post-launch.

The project also placed significant emphasis on collaboration, with clear communication channels established between stakeholders across various departments—including IT, Admissions, and external vendors—allowing for quick resolution of issues and alignment with the university's overarching goals. The comprehensive training provided to staff ensured that users were well-equipped to handle the new system, thereby enhancing the efficiency of admissions processes and improving decision-making capabilities.

In conclusion, the successful execution of this project will position California State University, East Bay at the forefront of modern data management practices within the education sector. By ensuring a scalable, secure, and efficient system, the university is better equipped to manage the complexities of student admissions, safeguarding sensitive data while optimizing performance. This project not only meets the immediate operational needs but also future-proofs the university’s admissions platform, providing long-term value and setting a benchmark for similar institutional transitions in the future.

APPENDIX

References

1. Chat GPT
2. Perplexity
3. California State University, East Bay Website.
4. https://www.slideshare.net/slideshow/data-migration-steps-powerpoint-presentation-slides/140289748
5. Excel Spreadsheet: WBS Scope, Network Diagram, Rough drafts etc.
6. Presentation Slides: Migrating CSUEB Data Infrastructure

THANK YOU