GoldFusion AI

Milestone 4

12.10.2023

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Lessons Learned Report:

Ja'Chelle Johnson:

During this process, I want to change my career and explore a career in UX design. I began this process by thinking I wanted to be a leader and a project manager. After creating the interactive design, I learned I wanted to be creative through technology and website design. I learned this information when I was allowed to do this project. I also learned that I prefer to avoid being a project manager because you never know who will be on your team, and the project manager must represent the team regardless of how the group operates.

Jonathan Jean:

During the project, I learned about the extensive uses of APIs and how they can be connected and used to improve projects. After creating the list of AIPS that would be needed, I went on to look for videos of people successfully using APIs, and I was impressed with the wealth of information I found during the search. I learned that I enjoyed not being a project manager because it's easier for me to be told what part of an assignment I need to complete so that I can mainly focus on that and not have to make sure others are on task.

Ramsey Burls:

I learned much more about what is needed to start a project during the project. One of my biggest takeaways was the documentation of everything that we did throughout the semester. Usually, I am used to taking notes for myself, which tends to be less detailed, but with other people viewing what you are completing, tasks need to be more fledged out. I also learned that I enjoy not being a project manager as the lack of responsibility over the project helped me balance completing everything easier.

Risk Register:

AI FINANCIAL AID RISK REGISTER

ID	Risk Description	Category	Likelihood (1-5)	Impact (1-5)	Risk Score	Mitigation Strategy	Owner	Status
R001	API Service Outage	Technology	3	4	12	Implement backup APIs	[Technical Lead]	[Closed]
R002	Data Security Breach	Security	2	5	10	Regular security audits	[Security Officer]	[Closed]
R003	Unreliable AI Predictions	Technology	3	3	9	Continuous model monitoring	[Data Scientist]	[In Progress]
R004	Integration Complexity	Technology	4	4	16	Conduct thorough integration testing	[Integration Specialist]	[Open]
R005	Inadequate User Training	Human	2	3	6	Provide comprehensive user training	[Training Coordinator]	[Closed]
R006	Legal Compliance Issues	Compliance	3	4	12	Regular legal reviews	[Legal Counsel]	[Closed]
R007	API Versioning Issues	Technology	2	3	6	Monitor API updates and plan for versioning	[Technical Lead]	[Open]
R008	Insufficient Vendor Support	Procurement	3	3	9	Establish clear communication channels with vendors	[Procurement Lead]	[In Progress]
R009	Inadequate Scalability	Technology	3	4	12	Conduct scalability testing	[Technical Lead]	[In Progress]

RO36	Lack of Cross-Training for Team Members	Human	2	3	6	Implement cross-training programs	[Team Lead]	[Open]
RO37	Inadequate Knowledge Transfer	Human	3	3	9	Facilitate knowledge transfer sessions	[Knowledge Manager]	[Open]
RO38	Lack of Succession Planning	Human	2	4	8	Implement a robust succession planning process	[HR Manager]	[In Progress]
RO39	Inadequate Documentation	Documentation	3	3	9	Ensure comprehensive project documentation	[Technical Writer]	[In Progress]
RO40	Inadequate Contingency Planning	Project Management	2	4	8	Develop and test contingency plans	[Project Manager]	[In Progress]

RO28	Inadequate Testing Environment	Technology	3	3	9	Ensure a realistic testing environment	[Quality Assurance Lead]	[In Progress]
RO29	Insufficient Data Governance	Data Governance	3	4	12	Implement robust data governance policies	[Data Governance Officer]	[In Progress]
RO30	Lack of System Redundancy	Technology	2	4	8	Implement system redundancy measures	[IT Operations]	[In Progress]
RO31	Inadequate User Access Controls	Security	3	4	12	Implement strong user access controls	[Security Officer]	[Open]
RO32	Lack of Regulatory Compliance Checks	Compliance	2	3	6	Implement regular compliance checks	[Compliance Officer]	[Open]
RO33	Inadequate Incident Response Plan	Security	3	5	15	Develop and test an incident response plan	[Security Officer]	[In Progress]
RO34	Lack of Training for Support Team	Human	2	3	6	Provide comprehensive training for support team	[Training Coordinator]	[Closed]
RO35	Inadequate Vendor Risk Assessment	Procurement	3	4	12	Conduct regular vendor risk assessments	[Risk Manager]	[In Progress]

RO19	Inadequate Change Management	Change Management	2	4	8	Implement effective change management processes	[Change Manager]	[In Progress]
RO20	Inaccurate Data Inputs	Data Quality	3	3	9	Implement data validation checks	[Data Analyst]	[Open]
RO21	Lack of Performance Testing	Technology	3	4	12	Conduct rigorous performance testing	[Performance Engineer]	[Open]
RO22	Insufficient Backup Strategy	Technology	3	3	9	Implement regular data backups	[IT Operations]	[In Progress]
RO23	External Dependency Failure	Technology	2	4	8	Identify and monitor critical dependencies	[Technical Lead]	[In Progress]
RO24	Lack of AI Model Explainability	Technology	3	3	9	Implement explainability techniques	[Data Scientist]	[In Progress]
RO25	Insufficient Capacity Planning	Technology	3	4	12	Perform regular capacity planning	[IT Operations]	[In Progress]
RO26	Inadequate User Feedback Mechanism	Human	2	3	6	Implement user feedback mechanisms	[User Experience Lead]	[Open]
RO27	Lack of Vendor Performance Monitoring	Procurement	3	4	12	Monitor vendor performance metrics	[Procurement Lead]	[Closed]

RO10	Changes in Regulatory Landscape	Compliance	4	4	16	Stay informed and adapt policies	[Compliance Officer]	[In Progress]
RO11	Lack of User Adoption	Human	2	3	6	Implement user feedback loop	[User Experience Lead]	[Closed]
RO12	Insufficient System Monitoring	Technology	3	4	12	Implement robust monitoring tools	[IT Operations]	[Closed]
RO13	Budget Overruns	Financial	2	4	8	Regularly review and adjust budget	[Financial Manager]	[Open]
RO14	Lack of API Documentation	Technology	3	2	6	Ensure comprehensive API documentation	[Technical Writer]	[In Progress]
RO15	Inadequate Disaster Recovery Plan	Technology	3	5	15	Develop and test a robust disaster recovery plan	[IT Manager]	[Open]
RO16	Incomplete Requirements	Project Management	2	3	6	Conduct thorough requirements analysis	[Business Analyst]	[Closed]
RO17	Insufficient Stakeholder Communication	Communication	3	3	9	Establish regular communication channels	[Project Manager]	[Closed]
RO18	Lack of Cross-Functional Collaboration	Collaboration	3	4	12	Foster a collaborative project culture	[Project Lead]	[In Progress]

Data Dictionary:

Table Name	Attribute Name	Type	Format	Domain	Required	PK/FK
	id	Integer	123	Student ID	Y	PK/FK
	name	String	Abc	Student Name	Y	
	famuID	Integer	123	University ID	Y	
	email	VarChar	Abc/123	Email	Y	
Student	dob	VarChar	123	Date of Birth	Y	
	id	Integer	123	Financial Aid Database	Y	PK
	year	Integer	123	Financial Aid Database	Y	
	status	String	Abc	Financial Aid Database	Y	
	requestID	Integer	123	Financial Aid Database	Y	
FinancialAid	requestType	String	Abc	Financial Aid Database		
	id	Integer	123	Financial Aid Repository	Y	PK
	timestamp	Integer	123	Financial Aid Repository	Y	
chatHistory	message	String	Abc	Financial Aid Repository	Y	
	id	Integer	123	Student Guardian Information	Y	PK
	name	String	Abc	Student Guardian Information	Y	
	studentID	Integer	123	Student ID	Y	FK
guardians	dob	VarChar	123	Student Guardian Information	Y	

Collections Relationship:

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{
  "students": [
    {
      "_id": 1,
      "name": "<Student Name>",
      "famuID": "<FAMU ID>",
      "email": "<Student Email>",
      "dob": "<Student Date of Birth>",
      "financialAid": [
        {
          "_id": 101,
          "year": <Year>,
          "status": "<Financial Aid Status>",
          "requests": [
            {
              "_id": 1001,
              "type": "<Aid Type>"
            }
          ]
        }
      ],
      "chatHistory": [
        {
          "_id": 2001,
          "timestamp": "<Timestamp>",
          "message": "<Chat Message>"
        }
      ],
      "guardians": [
        {
          "_id": 301,
          "name": "<Guardian Name>",
          "studentID": 1,
          "dob": "<Guardian Date of Birth>"
        }
      ]
    },
```

```json
  {
    "_id": 2,
    "name": "<Student Name>",
    "famuID": "<FAMU ID>",
    "email": "<Student Email>",
    "dob": "<Student Date of Birth>",
    "financialAid": [
      {
        "_id": 102,
        "year": <Year>,
        "status": "<Financial Aid Status>",
        "requests": [
          {
            "_id": 1002,
            "type": "<Aid Type>"
          }
        ]
      }
    ],
    "chatHistory": [
      {
        "_id": 2002,
        "timestamp": "<Timestamp>",
        "message": "<Chat Message>"
      }
    ],
    "guardians": [
      {
        "_id": 302,
        "name": "<Guardian Name>",
        "studentID": 2,
        "dob": "<Guardian Date of Birth>"
      }
    ]
  }
]
}
```

Poster:

GoldFusion AI
Ja'Chelle Johnson, Jonathan Jean, and Ramsey Burls
College of Science and Technology

FAMU

INTRODUCTION

Florida A&M University is embarking on an innovative project to revolutionize its financial aid process using AI technology. This effort addresses the pressing need to increase accessibility and efficiency in the way student financial aid is distributed. The principal objective is to achieve a 30% reduction in the processing time for financial help, thereby enhancing the speed and efficiency of the current system. Meanwhile, the initiative seeks to achieve a 20% increase in financial assistance award accuracy, guaranteeing a more equitable and accurate distribution of funding. Improving user experience is a crucial part of this project, as it will make the financial assistance application process easier to understand and less stressful for staff and students alike. This artificial intelligence (AI) solution guarantees to greatly enhance the overall quality of financial support services while also streamlining administrative processes at Florida A&M University.

OBJECTIVES

Using artificial intelligence, the financial aid procedure can overcome significant obstacles. It improves accessibility by giving students precise information on available aid alternatives and eligibility requirements, filling in any knowledge gaps. More students are encouraged to apply for help since the system makes complicated application processes simpler and provides individualized guidance. Additionally, it looks for fraud, ensuring that aid is given to qualified recipients and enhancing system integrity. The AI technology also simplifies communication by giving frequent updates on application status and deadlines, reducing stress. Overall, it supports evidence-based policy decisions to better financial aid programs by optimizing resource allocation, enhancing transparency, and increasing accountability.

PROCESSES

Requirement Analysis: Identified essential features such as document upload, aid application assistance, and AI-driven query resolution.

Prototyping: Developed interactive prototypes emphasizing conversational interfaces akin to ChatGPT.

User-Centric Design: Ensured the interface was intuitive, with clear call-to-action buttons and real-time AI interaction points. Focused on implementing FAMU colors and photos to encourage school spirit. The goal was to create a seamless, conversational user experience reflective of ChatGPT's capabilities, focused on ease and accessibility.

Design patterns used include:

- Model-View-Controller (MVC): This pattern could be used to separate the application into three main components: the model (data), the view (user interface), and the controller (business logic), to simplify maintenance and scalability.
- Command Pattern: Actions like 'Attach a required document' or 'Check your refund status' might be implemented using this pattern, encapsulating a request as an object, thereby allowing parameterization of clients with queues, requests, and operations.

WIREFRAME

TECHNOLOGY

1. Natural Language Processing (NLP) API: APIs like GPT-3, BERT, or spaCy can be used for understanding and processing user queries and generating human-like responses.
2. User Interface (UI) Integration API: To interact with the system through a user-friendly interface, web-based and mobile app APIs may be used.
3. Database and Storage API: To store and retrieve user data, including profiles and financial aid history.
4. Authentication and Authorization API: For user authentication and ensuring data privacy and security.
5. Financial Aid Data API: This API would connect to the financial aid database to access information about available aid programs, eligibility criteria, and application deadlines.
6. Personalization API: To tailor the user experience by understanding user preferences and needs.
7. Communication and Notification APIs: To send alerts and notifications to users about deadlines, application status, and updates.
8. Payment Processing API: For processing financial aid disbursements and payments to users.
9. Knowledge Base API: To provide access to a knowledge base or FAQ section for common questions and guidance.
10. Document Management API: For users to upload and share necessary financial documents securely.
11. Reporting and Analytics API: To generate insights and reports about the financial aid process and system performance.
12. Integration with Educational Institutions' Systems: To access and exchange data with the college's student information system and financial aid management system.
13. Chatbot API: To enable chatbot functionality for interactive conversations with users.
14. OCR (Optical Character Recognition) API: To extract information from scanned or uploaded documents like tax forms, ID cards, and other relevant documents.
15. Document Verification API: To validate the authenticity of documents and information provided by users.
16. CRM (Customer Relationship Management) API: To manage interactions and communication with users effectively.
17. Data Analytics and Machine Learning APIs: To analyze and make data-driven decisions, such as identifying trends in financial aid applications and predicting potential issues.
18. Geolocation API: To provide location-specific information and resources related to financial aid programs and resources.
19. Payment Gateway API: To facilitate financial transactions and disbursements securely.
20. Video Conferencing API: For offering video support and assistance to users who need more personalized help.

CONCLUSION

In the culmination of this project, we have envisioned and brought to life an innovative solution at the intersection of technology and compassion — our AI-powered financial aid system. This project represents more than just a technological advancement; it embodies our commitment to addressing real-world challenges and making a meaningful difference in the lives of individuals facing financial hurdles. Our AI-powered financial aid system stands as a testament to the potential of artificial intelligence to revolutionize how we approach complex problems. By seamlessly integrating with various APIs and services, our system has evolved beyond conventional methodologies, offering a dynamic and personalized approach to financial assistance. This project signifies our dedication to harnessing technology for the greater good, ensuring that the benefits of innovation are felt by those who need it the most. Together, we are shaping a future where advanced technology catalyzes positive change, fostering a world where financial assistance is not just accessible but tailored to the unique needs of each individual. This project is more than a system; it's a step towards a more inclusive and compassionate future.