

AskMissy

For a more *personalized*
educational resource finder

Prototype Presentation - December 14, 2021

Team Red
CS410
Fall 2021

Old Dominion University



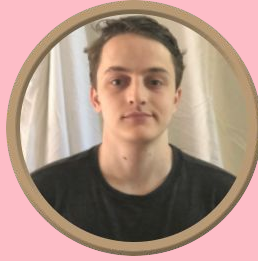
Team Red



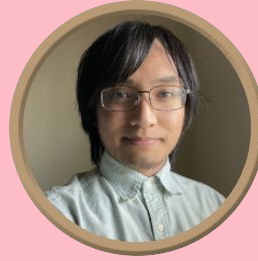
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The Problem



Students' performance are non-optimized because of a lack of materials tailored to their learning preferences



The *AskMissy* Solution

The AskMissy software application will help users find the resources necessary for them to bridge the gap between conventional and digital learning for a more personalized experience.

Solution Characteristics

Personalized resources using machine learning

Resource Statistics (ISBN, Reviews, Genre, ect.)

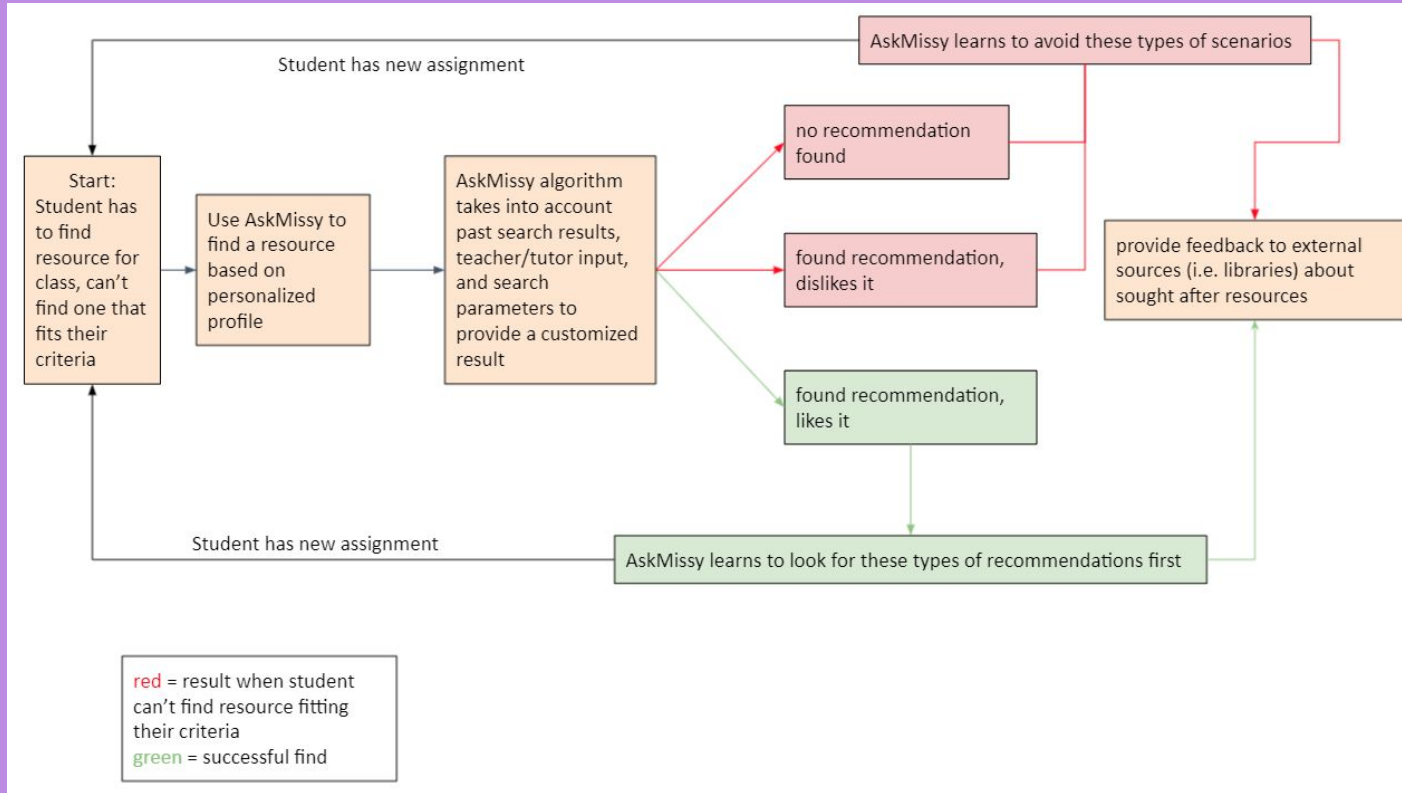
Subcategory search tool

Public or private profiles

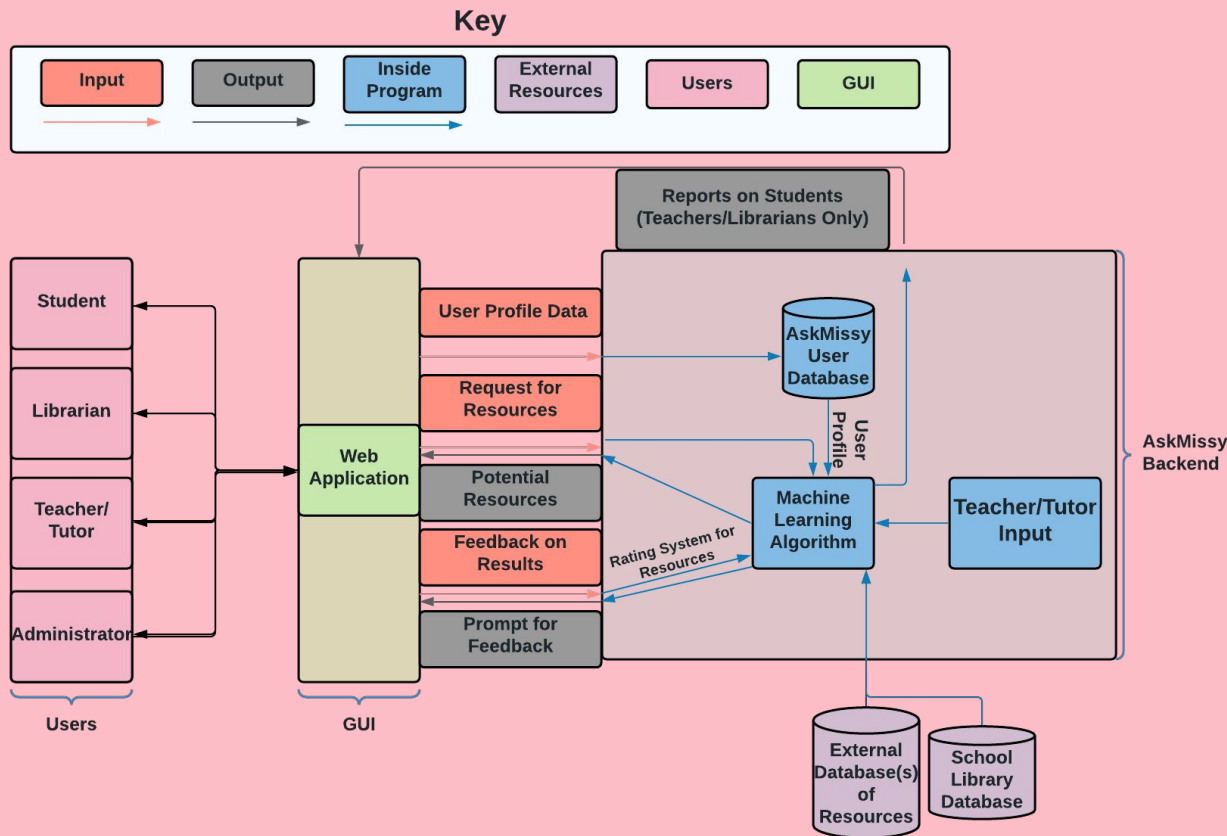
Local library interaction



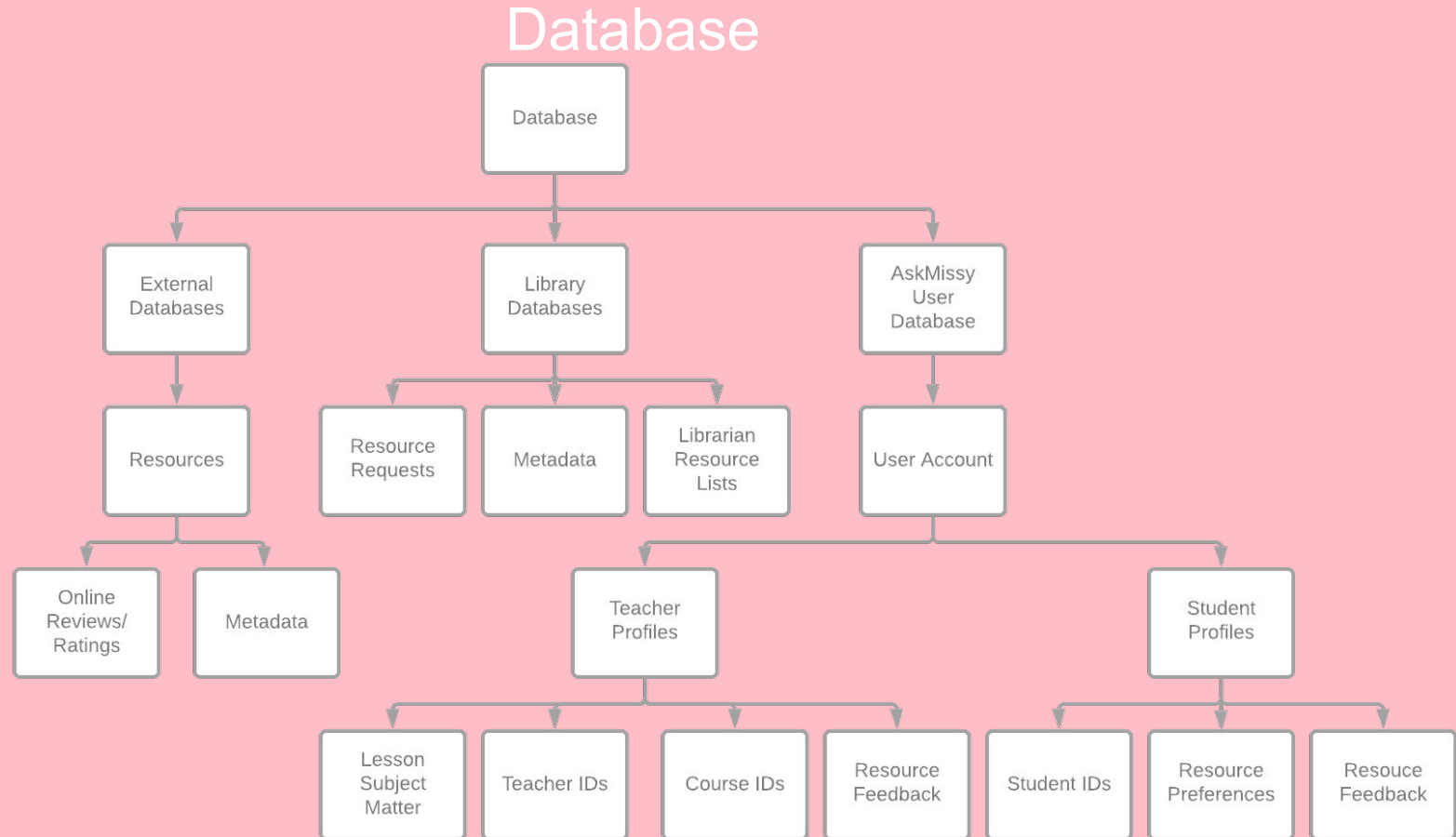
Solution flow



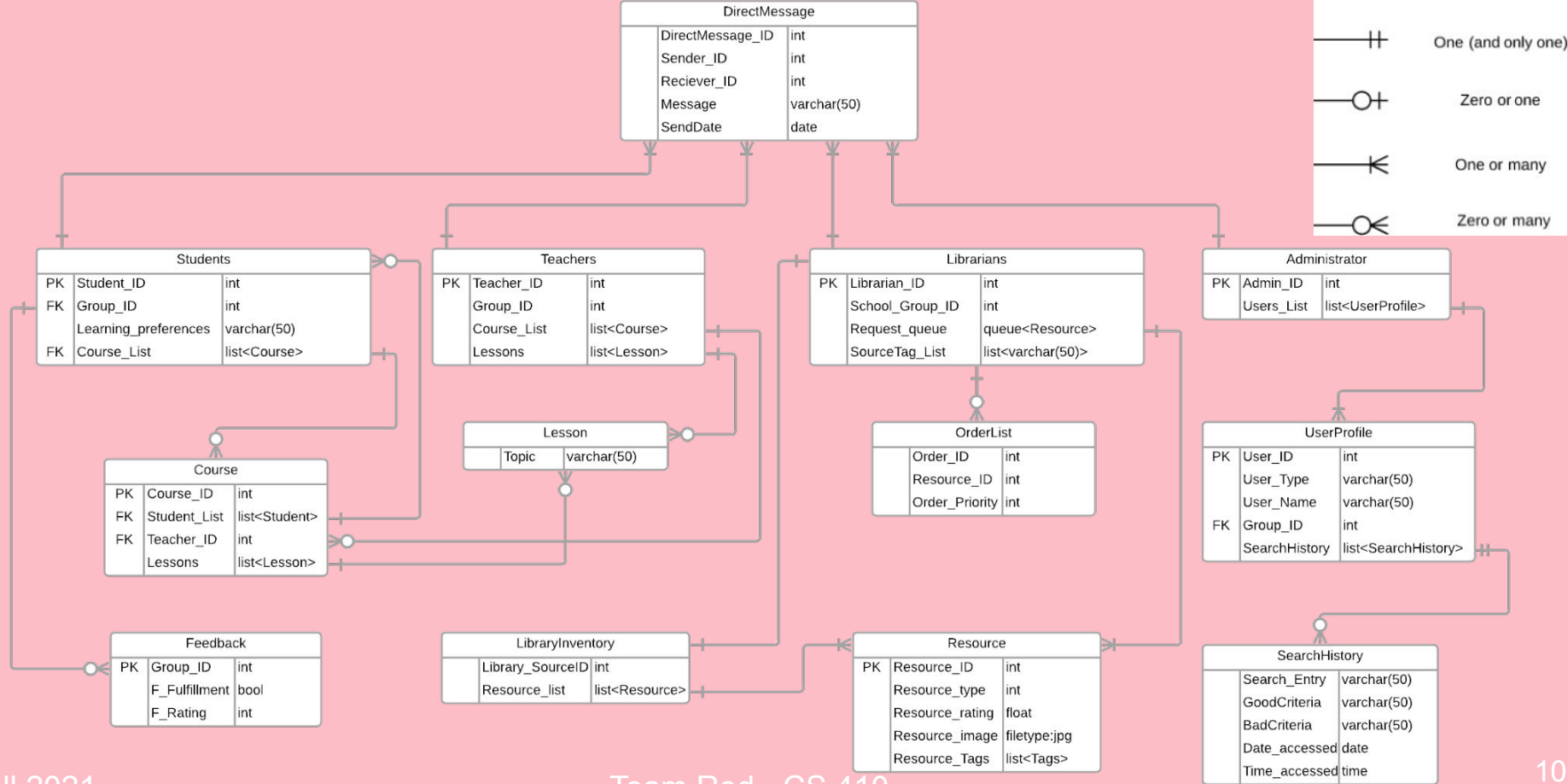
Major Functional Component Diagram



Work Breakdown Structure



Database Schema



RWP vs Prototype

Category	Feature	RWP	Prototype	Reasoning
Data Retrieval	Metadata Report	Full	Partial	Limited test data as a proof of concept
	Basic Search	Full	Full	
	AskMissy Search	Full	Full	
Data Management - Live Product	Machine Learning	Full	Partial	Limited test data as a proof of concept
	Source Tag Creation	Full	Full	
	Source Tag Management	Full	Full	
	Lesson Plans	Full	Partial	Limited test data as a proof of concept
	Internal Database Manipulation	Full	Full	
	External Database Manipulation	Full	Full	
Data Management - Development	Source Tag Development	None	Full	Use to develop default tags
	Machine Learning Training	None	Full	Use to develop algorithm defaults
	Simulated Data	None	Full	Use to fill database with simulated data for testing
	User testing reports	None	Full	Use to develop user interface

RWP vs Prototype cont.

Category	Feature	RWP	Prototype	Reasoning
Security	Login/Authentication	Full	Partial	Limited test data as a proof of concept
	Data Encryption, moving	Full	None	Best practices will be put in place
	Data Encryption, resting	Full	None	Best practices will be put in place
Account Management	User Profile	Full	Partial	Limited test data as a proof of concept
	Feedback	Full	Full	
	Group Management	Full	Partial	Limited test data as a proof of concept
	Login/registration	Full	Full	
UI	Group Interaction	Full	Partial	Limited test data as a proof of concept
	Bug Report	Full	Partial	Limited test data as a proof of concept
	Basic Search	Full	Full	
	AskMissy Search	Full	Full	
	Communication	Full	Partial	Limited test data as a proof of concept
	Personal Data Report	Full	Partial	Limited test data as a proof of concept

Development Tools

- Python environment for large-scale data processing, machine learning and scientific computing. Useful for organizing external code libraries, and provides easy access to the following libraries:
 - NumPy
 - SciPy
 - Matplotlib
 - Pandas
 - IPython
 - Jupyter Notebook
 - scikit-learn

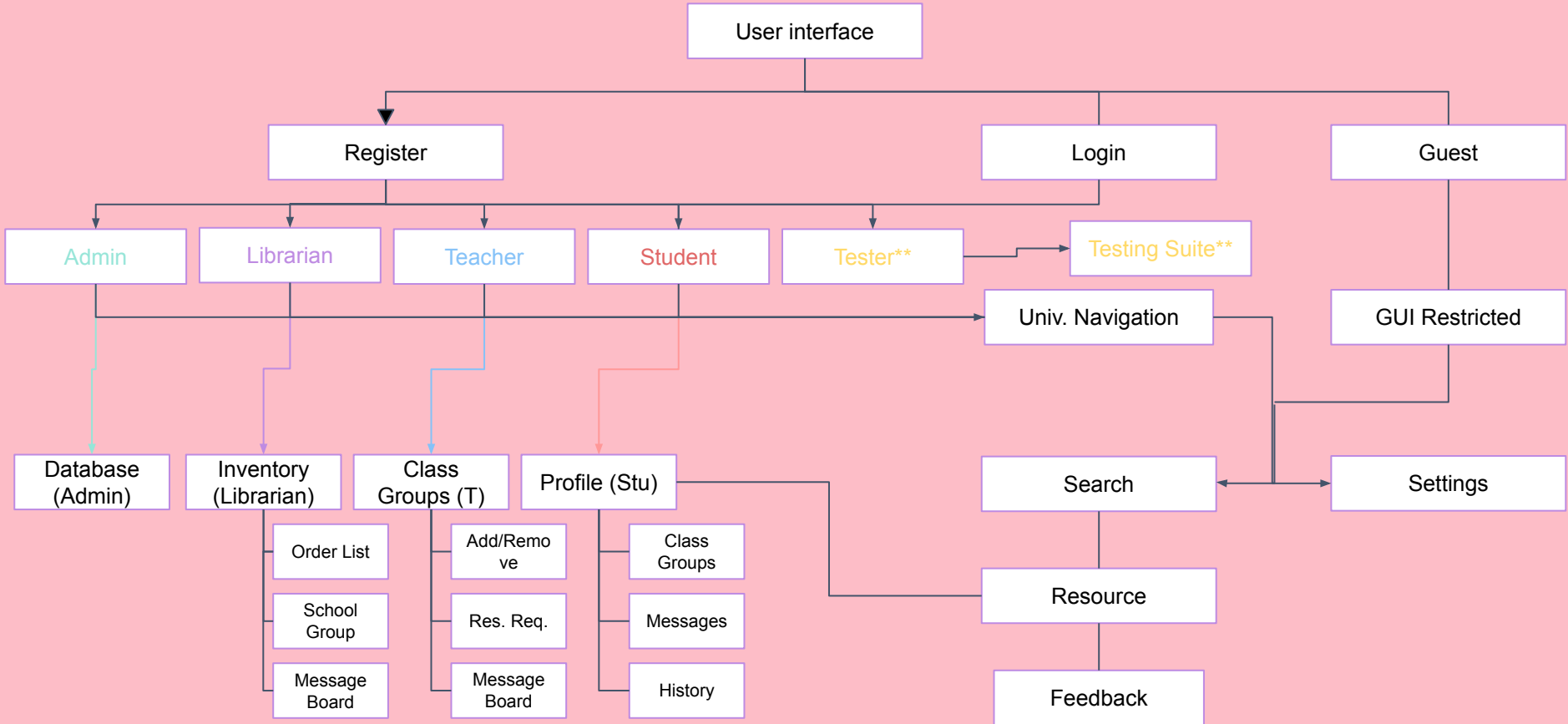
Hardware Requirements

- Device with internet access
- Multiple Servers
 - Main frontend server
 - Main backend server
 - Web scraping backend server
 - machine learning backend server
 - Main database backend server

Software Requirements

- Frontend
 - HTML5
 - CSS3
 - JavaScript
- Backend (machine learning algorithms, and natural language processing)
 - Python
- Repository
 - Gitlab
- Database
 - Amazon RDS, MySQL

UI FULL



Mockups - Login

AskMissy Registration

AskMissy

Login to AskMissy

or do via email

☐ Remember me

Don't have an account? [Register](#)

[REGISTER](#) [HOME](#) [TEAM](#) [SEARCH](#) [SETTINGS](#)



AskMissy


For a more personalized
educational resource finder

[SEARCH RESOURCES](#)

[LOGIN](#)

Mockups - Students

[Home](#) [My Recommendations](#) [Resource History](#)



PROFILE INFO

Name

School

Bio

Other Info

Message Board

CLASS GROUPS

CLASS 1

CLASS 2

CLASS 3

CLASS 4



ADD CLASS






- Home
- Profile
- History
- Settings
- Logout

Your Recommendations



Teacher Recommended



Recommended For You



Popular Within Subjects



- Home
- Recommendations
- Profile
- Placeholder

Settings

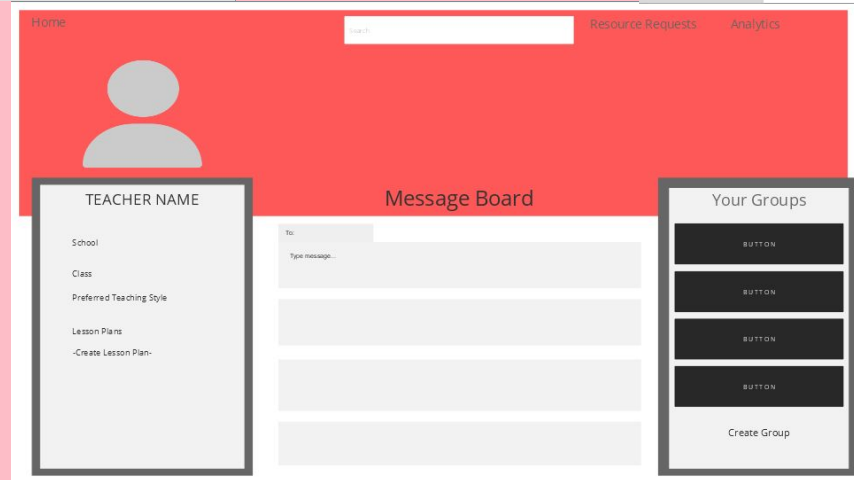
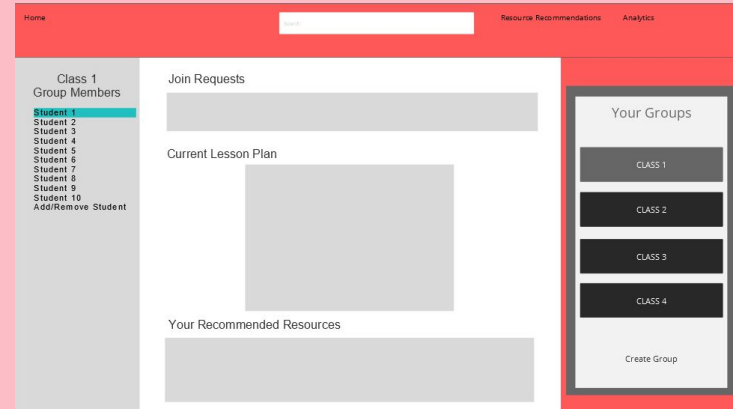
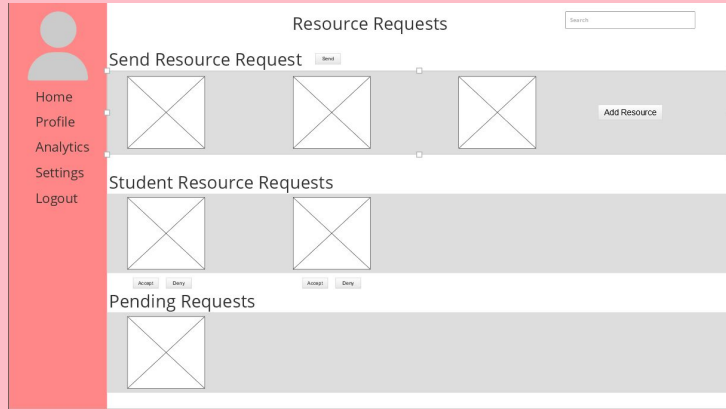
Account

Password

School

[Change School](#)

Mockups - Teacher




Mockups - Librarian

[Home](#) [Settings](#) [Orders](#) [School Group](#)

[Filter](#)
[Backstock](#)
[Add](#)
[Remove](#)
[Inventory Search](#)

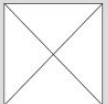
Book Title	Author	ISBN
Resource 1	Last, First	Numbers
Resource 2	Last, First	Numbers
Resource 3	Last, First	Numbers
Resource 4	Last, First	Numbers
Resource 5	Last, First	Numbers
Resource 6	Last, First	Numbers
Resource 7	Last, First	Numbers
Resource 8	Last, First	Numbers
Resource 9	Last, First	Numbers
Resource 10	Last, First	Numbers
Resource 11	Last, First	Numbers
Resource 12	Last, First	Numbers
Resource 13	Last, First	Numbers
Resource 14	Last, First	Numbers
Resource 15	Last, First	Numbers



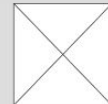
[Home](#)
[Inventory](#)
[School Page](#)
[Settings](#)
[Logout](#)

Order Viewer

Teacher Resource Requests



[Accept](#) [Deny](#)



[Accept](#) [Deny](#)

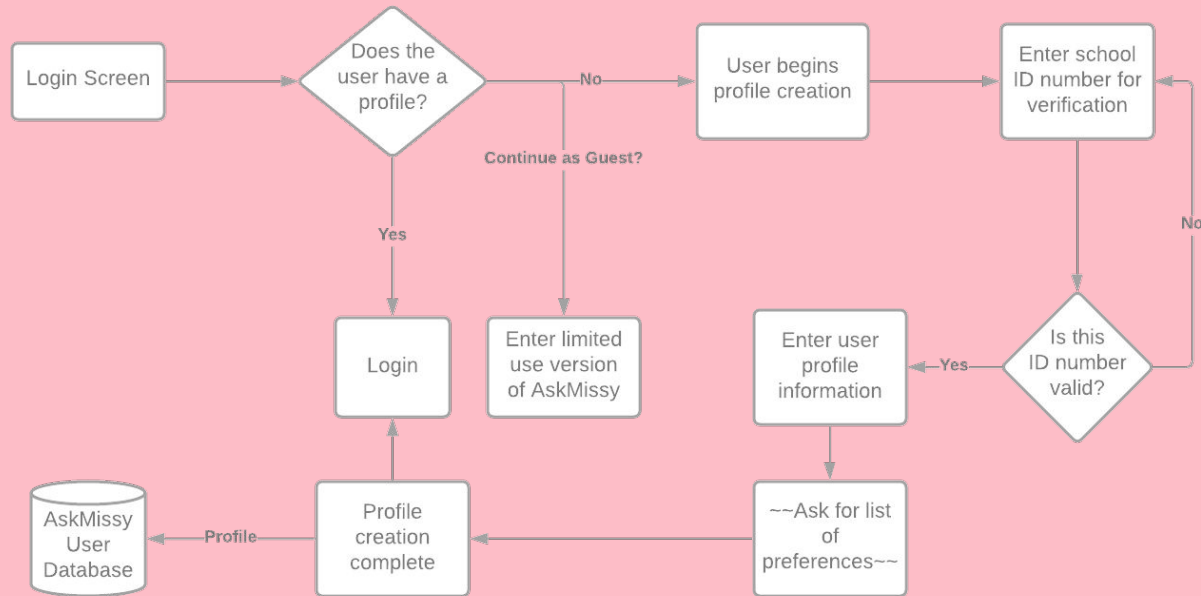
Order List

Resource	Last, First	ISBN
Resource	Last, First	ISBN
Resource	Last, First	ISBN
Resource	Last, First	ISBN
Resource	Last, First	ISBN
- Add Resource -		
- Add Resource -		

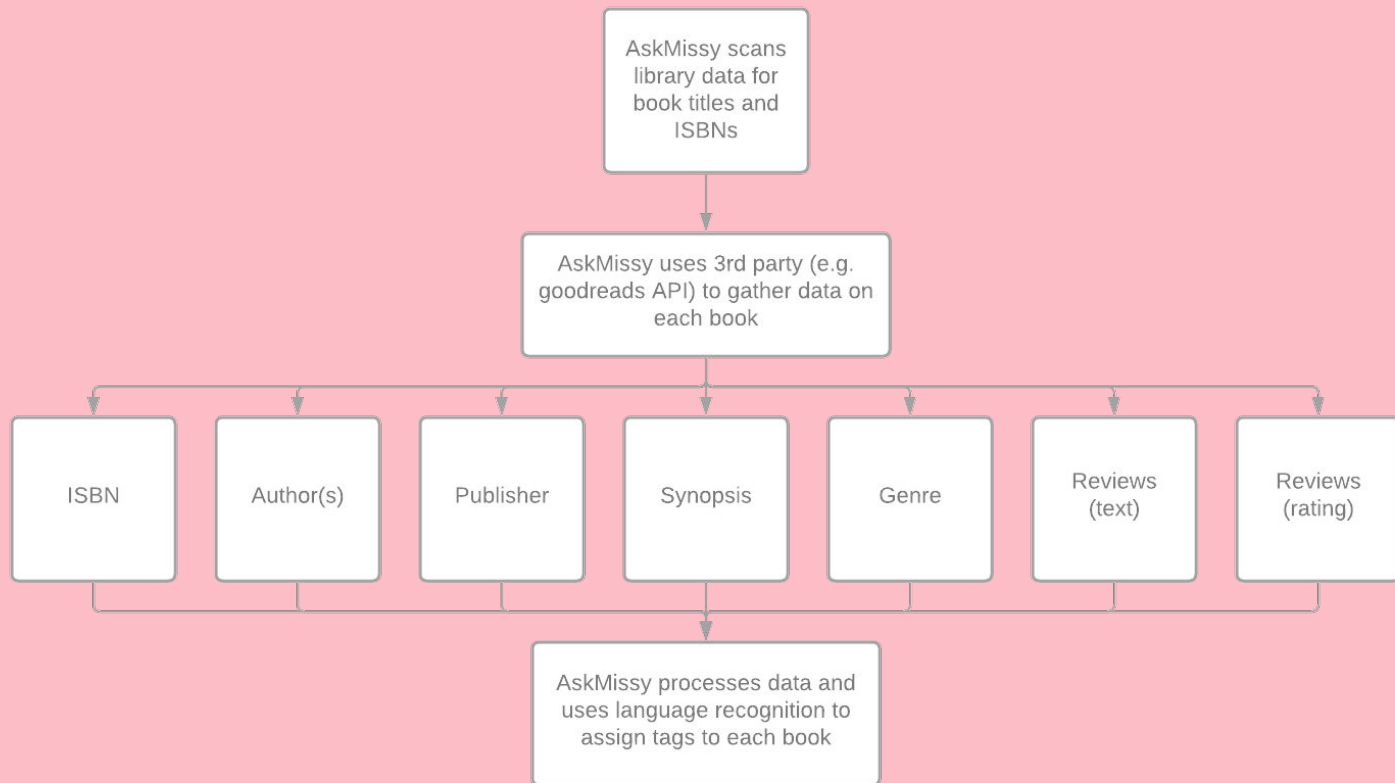
[Place Order](#)

Process Flow

Algorithms - Profile Creation

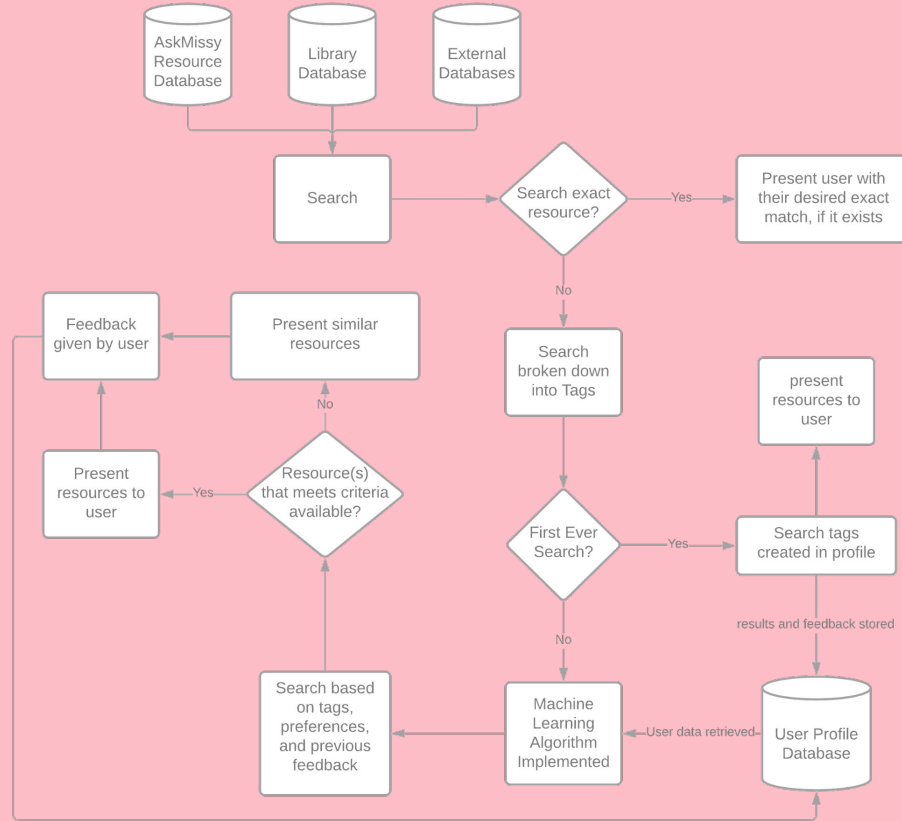


Machine Learning Algorithm - Data Entry



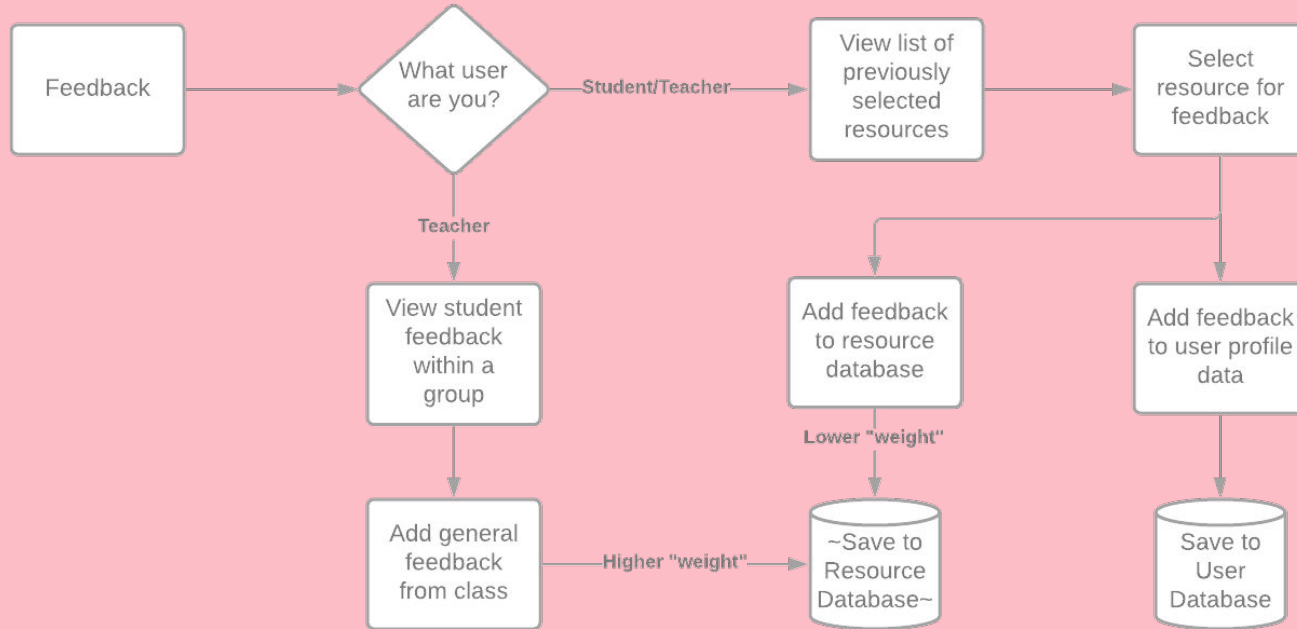
Work Breakdown Structure

Algorithms - Resource Matching

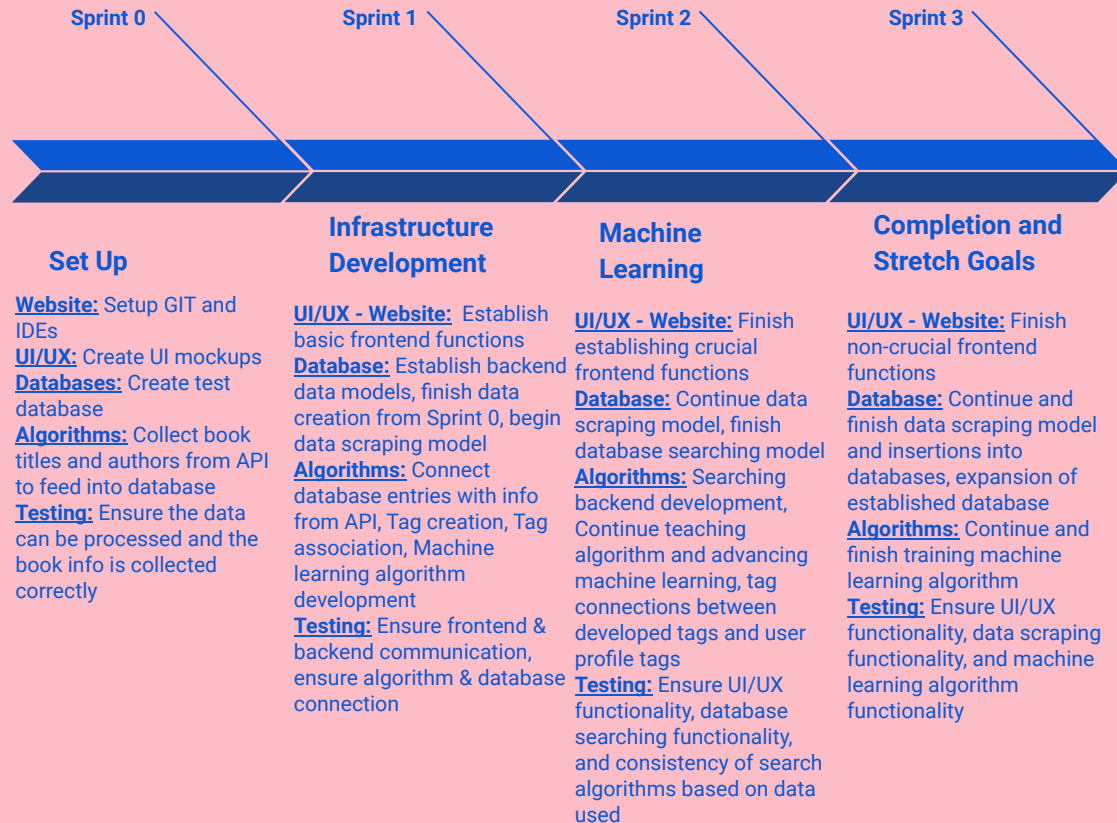


Work Breakdown Structure

Algorithms - Feedback



Agile Sprints



User Stories

As a Guest I need to:

1. Search for resources using the system without personalized results
2. Attempt to create a non-guest profile using validation
3. Sign into an existing non-guest profile using validation

As a Student I need to:

1. Use my student number to create and validate my account
2. Request to join a class group within AskMissy
3. Be able to be in more than one class group
4. Input search criteria to find sources
5. Prioritize searches based on specific criteria
6. Have machine learning learn my personal preferences based on a number of Personal Search Factors (see list below)
7. Receive recommendations of sources to use from my teachers and other users
8. Give my own feedback about a specific source and whether or not it fulfilled my expectations
9. View ratings and reviews about a recommended source
10. Request for a resource to a Teacher/Librarian
11. Send/receive messages to Teachers and Librarians

As a Student I want to:

1. Share the sources that I enjoy to other users
2. Learn what criteria the teacher used to find a specific source and how closely that source matched the criteria
3. View my own search history
4. Prioritize searches based on learning style
5. View my previous ratings of resources
6. Create a "To Read/Future Use" list
7. Manage my "To Read/Future Use" list
8. Change or amend my previous ratings

User Stories

As a Teacher I Need to:

1. Upload a lesson plan's key subject matter to AskMissy
2. Be able to access the save lesson plans at any time
3. Search for relevant sources pertaining to a saved lesson's key subject matter based on the criteria I've inputted
4. Take the relevant sources that AskMissy gave me and present multiple avenues to obtaining this source (avenues shown below)
5. Share the sources that AskMissy has found for me to other users
6. Give my own feedback about a specific source and whether or not it fulfilled my expectations
7. Observe the feedback and reviews from other users and their experience with a specific source
8. Create a class group
9. Be in more than one class group
10. Manage members and applicants of a class group
11. Send a resource requests to librarians
12. Take resource requests from students
13. ~~Forward a student's resource request to a librarian~~ (redundant, ref. Line 12)
14. Send/receive messages to students, other teachers, and librarians

As a Teacher I Want to:

1. View analytics of student preferences
2. Send lesson plans to librarians
3. Filter relevant sources with statistics about aspects including the author, the publisher, the time it was published, what criteria from my search that it meets or avoids
4. Upload a profile describing my preferred teaching style based of off criteria to be determined at a future date, but will include things like my class subject and preferred means of accessing teaching resources

As a Librarian I Need to:

1. Upload my library's inventory to the AskMissy database
2. Make changes to my library's inventory
3. Create qualities for inventory sources such as media type, intended reading level, or other objective topics
4. Pre-assign qualities to inventory sources as a 'default' description
5. Receive list of most requested resources from students and teachers
6. Create a resource order list
7. Create a school group
8. Manage members and applicants of a school group
9. ~~Remove members from a school group~~ (redundant, ref. Line 8)
10. Send/receive messages to students, teachers, other librarians and administrators

User Stories

As a Librarian I Want to:

1. Add priority to an order list
2. View analytics of student preferences
3. Maintain the availability of a source in real-time to reflect current inventory accurately
4. Create a calendar for the year
5. Receive lesson plans from teachers
6. Take lesson plans created by teachers and plug those topics into the calendar
7. Promote sources with high ratings during specific times of the year that correspond to the lesson plans of all students within that lesson
8. Blacklist resources within library inventory

As an Administrator I need to:

1. Back up the data within AskMissy so that the data is safeguarded
2. Encrypt, edit and retrieve the data within AskMissy
3. Connect AskMissy to external databases through legacy tools like API
4. Manage AskMissy's connection to external databases
5. Manage the profiles of the users
6. Encrypt the data of the users
7. Send/receive messages to librarians and other administrators
8. Verify requests from Librarians to create School groups
9. Contact a user about their experience using standardized communications

As an Administrator I want to:

1. Contact an owner about data requests

As a Tester I need to:

1. Evaluate the quality of the product
2. Ensure Beta readiness (Alpha)
3. Focus on finding bugs within the AskMissy program
4. Evaluate customer satisfaction (Beta)
5. Ensure release readiness for production launch (Beta)
6. Focus on collecting suggestions/feedback (Beta)
7. Evaluate feedback effectively (Beta)
8. Create test product documentation
9. Design testing scenarios for usability

As a Tester I want to:

1. Carry out testing as per the defined procedures
2. Participate in walkthroughs of testing procedures
3. Prepare all reports related to the software testing carried out
4. Ensure all test requirements are carried out as per the defined standards and procedures

Customer Risks

Risk	Mitigation
C1: User is dissatisfied with the application	C1: Users are asked for their feedback on improving the application in future
C2: Users don't get the experience they expected from a resource they searched up	C2: The software will ask the user for their intended experience and tones to look for it in a resource
C3: Texts do not fit the user's personalized preferences or are too hard to read	C3: Users are able to search for specific subcategories and filter results by difficulty level to their liking
C4: Users do not know how to use the AskMissy application	C4: Users are given tutorials on setting up their personalized profiles and all the search/filter tools available to them

Customer Risk Matrix

	Consequence				
Likelihood	Insignificant	Minor	Moderate	Major	Critical
Almost certain					
Likely		C2			
Possible	C3 C2	C3			
Unlikely	C4	C1 C4	C1		
Rare					



Post-Mitigated

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Pre-Mitigated

Technical & Security Risks

Risk	Mitigation
T1: Searches leading to incorrect or inconsistent results of resources	T1: Thorough testing of the search and filtering algorithms with datasets
T2: The servers can't keep up with the growing database as the app grows popular with users	T2: Implement an architecture for the app that can be scaled up from the user growth
T3: Compatibility with external resources becoming unaligned	T3: Steady connection with external resources to stay up-to-date
S1: User data security breach	S1: Database Encryption
S2: Unauthorized users entering the application	S2: Strong password and authentication methods

Technical & Security Risk Matrix

	Consequence				
Likelihood	Insignificant	Minor	Moderate	Major	Critical
Almost certain					
Likely					
Possible		T3			T1
Unlikely		T3	T1	S2	S1
Rare		T2	S2	T2	S1



Post-Mitigated

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Pre-Mitigated

What AskMissy *Won't* Do

AskMissy *won't*:

Teach students directly - it will help users find the appropriate resource

Be a social media platform

Store the full resources found within the database - users will need to obtain resources separately

Allow for the creation of external tags

Conclusion

Student performance is falling across the board

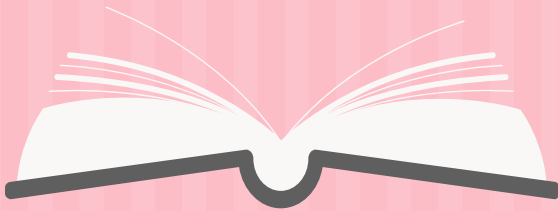
Adjustment to new learning mediums must become a regular aspect of student learning

Individualized resource locator is vital to student learning

Machine learning will provide personalized resource recommendations

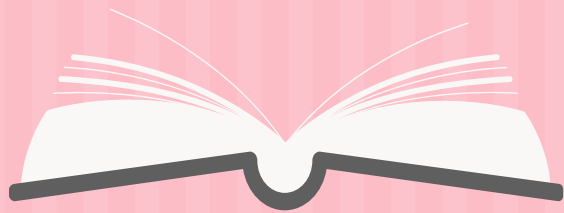
AskMissy will allow students to efficiently find resources to aid them in their learning journey

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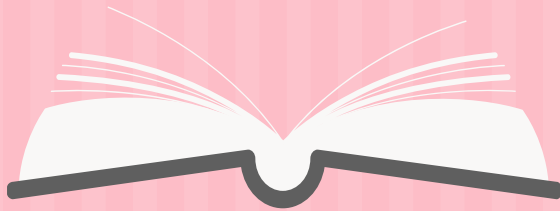
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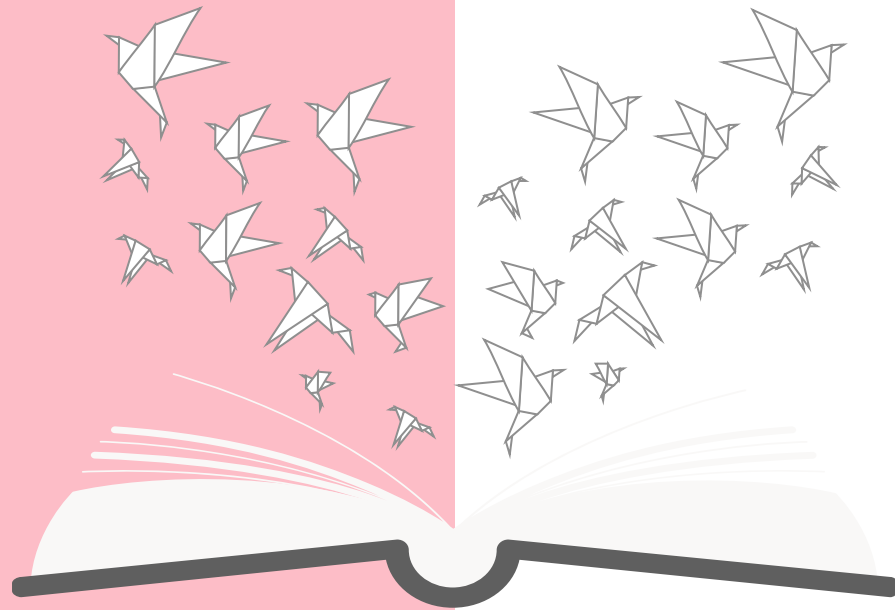


Glossary of Terms

- **Administrator:** A user who is responsible for managing a majority of AskMissy's working data.
- **Agile:** Set of frameworks and practices where solutions evolve through collaboration between self-organizing cross-functional teams
- **AskMissy:** A software application that will help users find more relevant resources
- **API:** Application Programming Interface
- **Data Retention:** The continued storage of an organization's data for compliance or business reasons
- **Database:** Structured data held in a computer
- **Economically Disadvantaged:** A student in Virginia is considered economically disadvantaged if the student:
 - is eligible for Free/Reduced Meals
 - receives TANF, or
 - is eligible for Medicaid
- **Exact Match Search:** A search for a single specific type of resource.

- **File Server:** Controls access to separately stored files
- **Guest:** A user who is not a student, teacher, librarian, or administrator; has limited access to the AskMissy program.
- **Librarian:** Responsible for managing the library's inventory/database, communicating with teacher and students
- **Personal Learning:** An educational approach that aims to **customize** learning for each user's strengths, needs, skills, and interests.
- **Student:** A person studying at a K-12 education institution in need of reliable resources.
- **Teacher:** A person who helps students (K-12) to acquire knowledge; Responsible for making plans, managing students' groups/communication.
- **Temporary Assistance for Needy Families (TANF):** Provides eligible families with a monthly cash payment to meet their basic needs
- **Tester:** Responsible for designing and conducting testing suites for usability testing
- **User:** A user will be anyone using the AskMissy Interface and will fall into the category of a guest, student, teacher/mentor, librarian or admin.
- **Web Scraping:** Extracting/scraping data from websites
- **Web Server:** A computer that runs websites.
- **Windows:** Series of operating systems developed by Microsoft





Thank You