



A³ framework

Aggregation and Archiving of Artifacts

“A Repository of Reliable Resources for academia”

FEASIBILITY PRESENTATION

CS 410, SPRING 2020

TEAM CRYSTAL

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Team Crystal, comprised of computer science students at Old Dominion University, is developing the A³ framework.



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Algorithms Developer/Testing



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UI/UX Developer

TEAM MENTORS

Janet Brunelle and Thomas Kennedy are both serving as mentors to Team Crystal in developing the A³ framework. Our mentors contributed heavily, explaining their needs and how other services have not been able to fill those needs. A³ seeks to fulfill those needs.



Janet Brunelle



Thomas Kennedy

OUTLINE

- Problem Statement
- Traditional Shortcomings
- Current Process Flow
- Solution Statement
- Solution Characteristics
- Solution Process Flow
- Major Functional Components
- UI/UX Elements
- Potential User-base
- Competition Matrix
- Risk Matrix
- Conclusion
- References

PROBLEM STATEMENT

Educators and students lack a framework to aggregate and archive fragmented and domain-specific artifacts for the purpose of academic knowledge management.

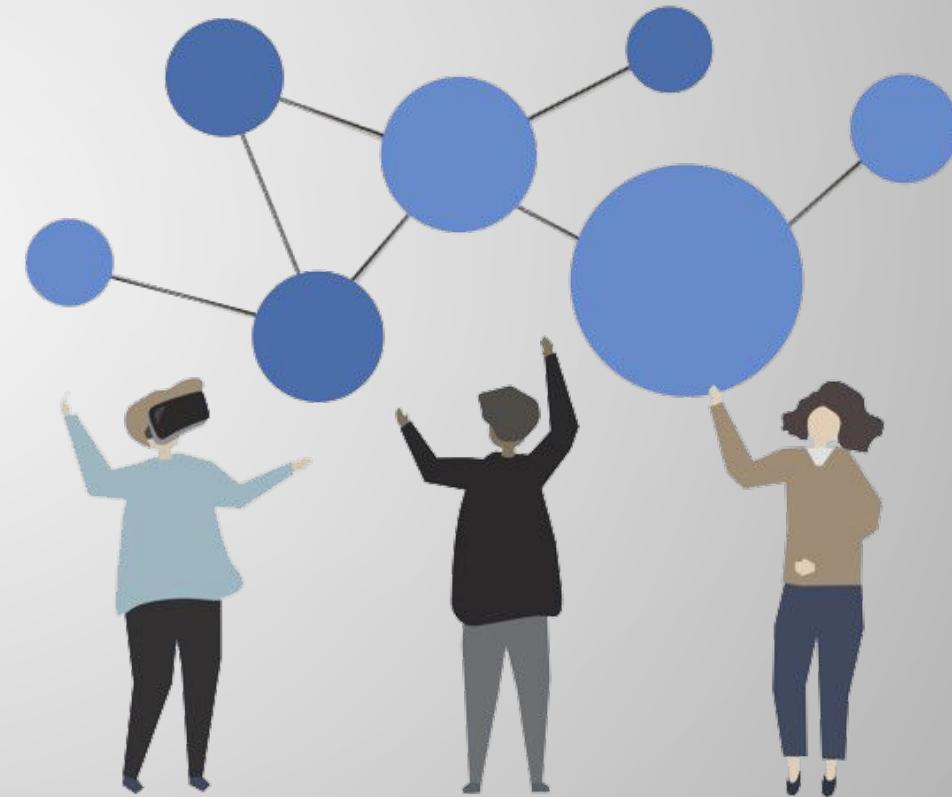
TRADITIONAL SHORTCOMINGS: Knowledge Repositories

- Formal artifact aggregation in traditional academic environments does not exist [14]
- The aggregation that does currently exist does not support tracking of changes [15]
- Current aggregation is not strong enough to be considered centralized



TRADITIONAL SHORTCOMINGS: Knowledge Accessibility

- Knowledge is isolated by specialization [16]
- Access is often restricted by course or major [16]
- Format preference by instructor can vary wildly and may not be functional to others [15]



TRADITIONAL SHORTCOMINGS: Knowledge Environment Enhancement

- Reference materials are specific to each course
- ODU instructors use a variety of platforms (Bb, PLE, CoWeM) [15]
- Special needs and distance learning lack proper support [14]
- Shared reference material can benefit organizations on a fundamental level [16]



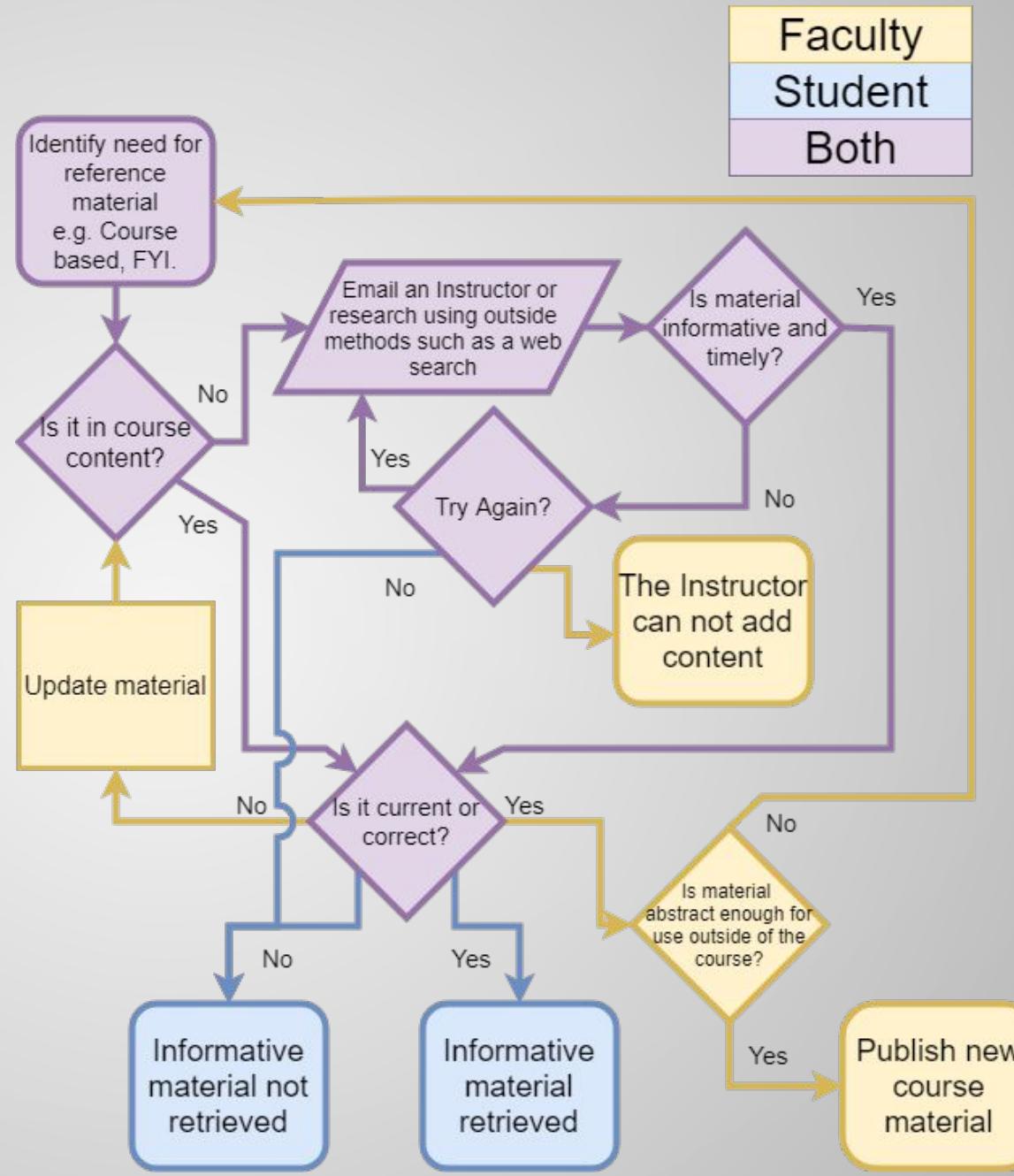
TRADITIONAL SHORTCOMINGS: Knowledge Asset Management

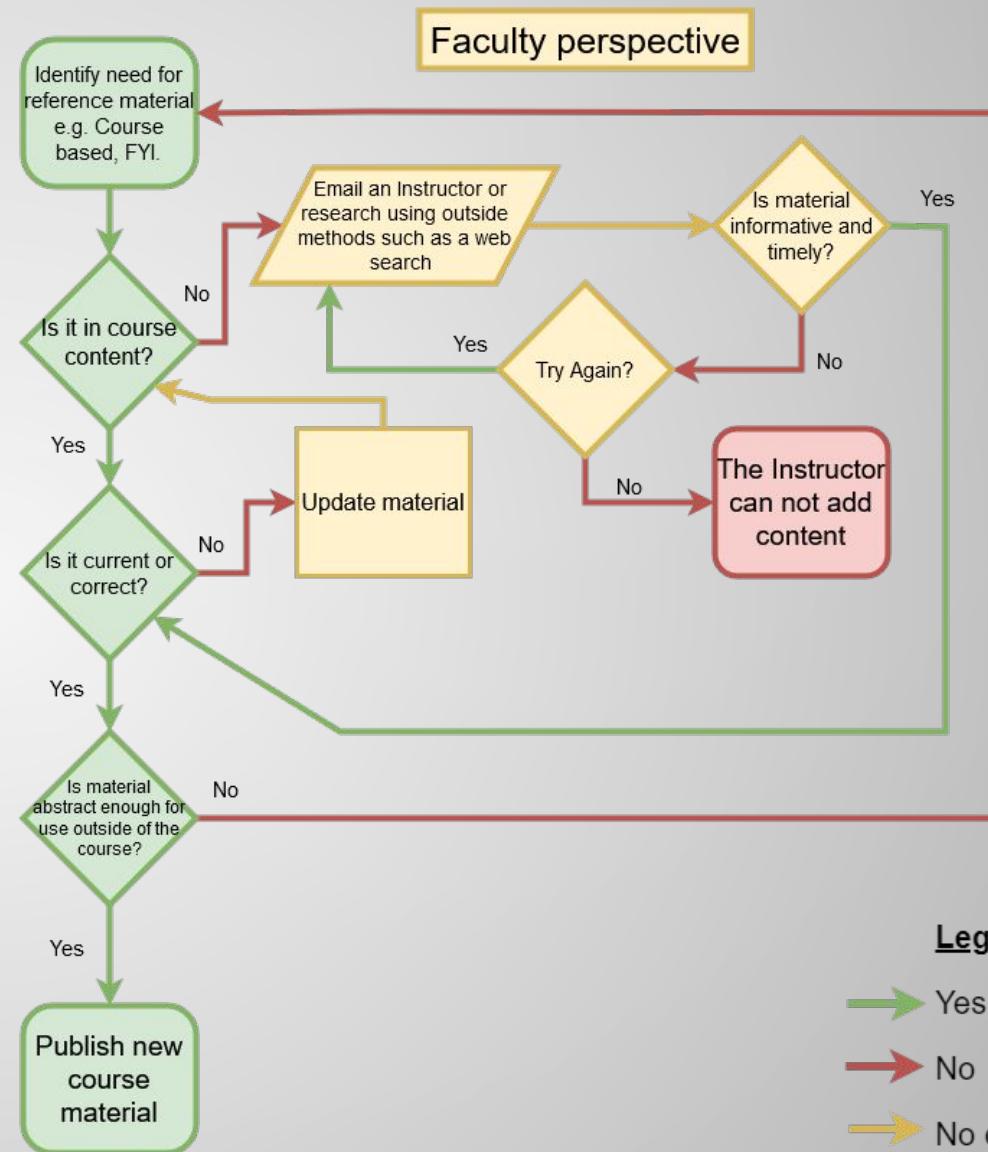
- Instructor materials are often created in variety of formats
- Individual instructors must often be petitioned for information [15]
- Loss of artifacts from reassignment of responsibilities [16]
- ODU CS department syllabi collection once took two months [15]



CURRENT PROCESS FLOW

The process flow when viewed from a comprehensive standpoint





Legend

→ Yes

→ No

 No choice

SOLUTION STATEMENT

A³ is a framework for aggregating and archiving artifacts for educators, researchers, and students. A³ seeks to overcome the challenges of individualization, location, and formatting in academic knowledge management by keeping information available, normalized, and centralized while being enhanced by a robust user interface.

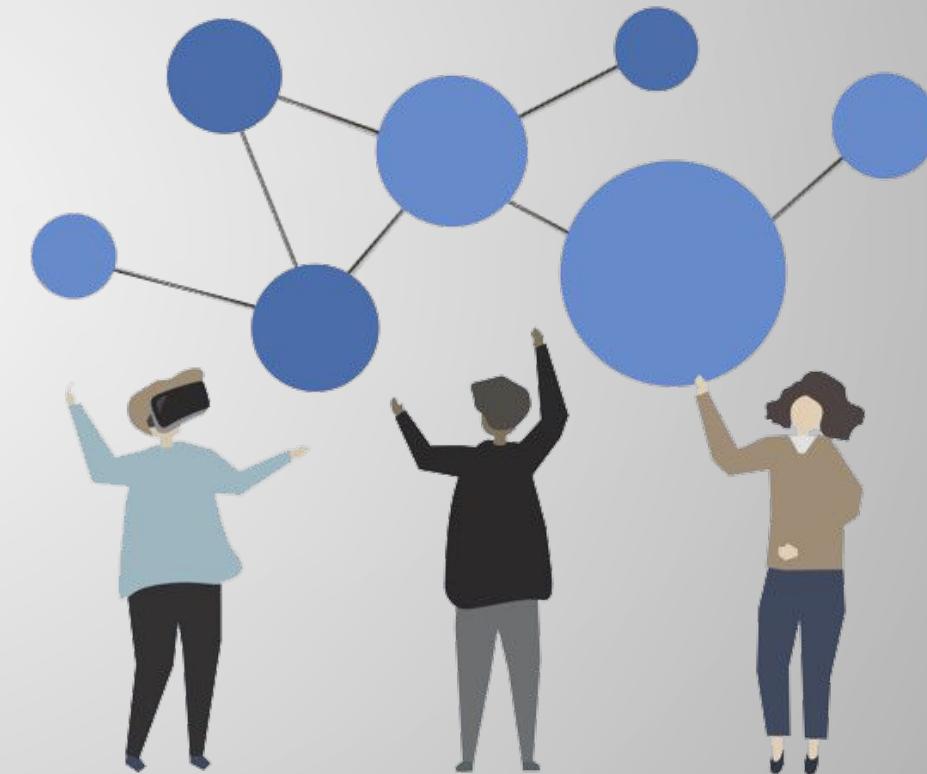
SOLUTION CHARACTERISTICS: Creating Formal Knowledge Repositories

- Create a robust infrastructure for artifacts
- Support change logs of artifacts and knowledge assets
- Centralize information concisely and effectively



SOLUTION CHARACTERISTICS: Improve Knowledge Accessibility

- Create knowledge artifacts that are widely applicable
- Create an cross course accessibility
- Normalize information from varied platforms (Blackboard, PLE, etc.) into translatable formats



SOLUTION CHARACTERISTICS: Knowledge Environment Enhancement

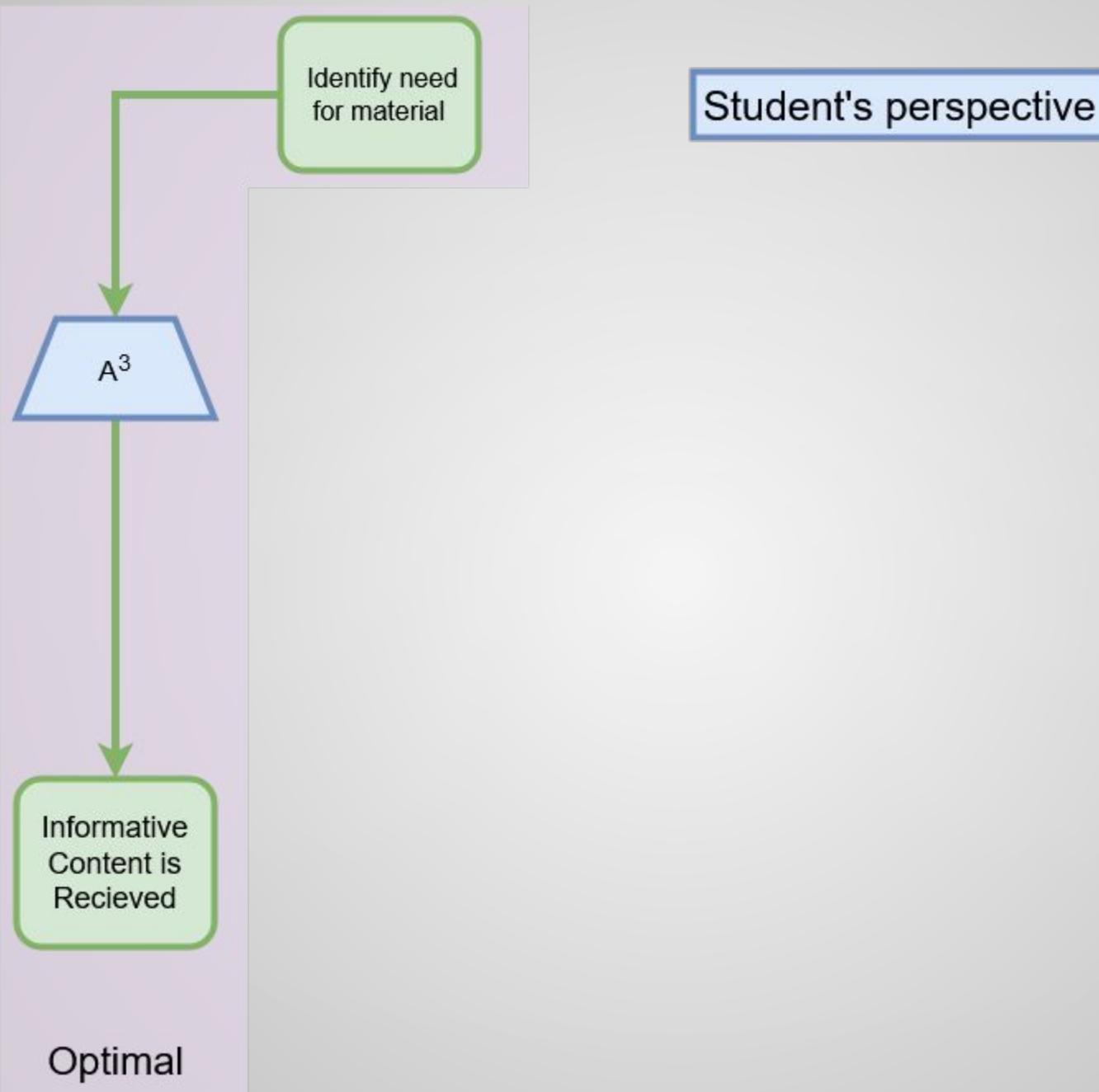
- Create universal reference material standards
- Core organizational improvements through a cooperative environment
- Normalization to allow cross platform functionality
- Special needs and distance learning accessibility



SOLUTION CHARACTERISTICS: Knowledge Asset Management

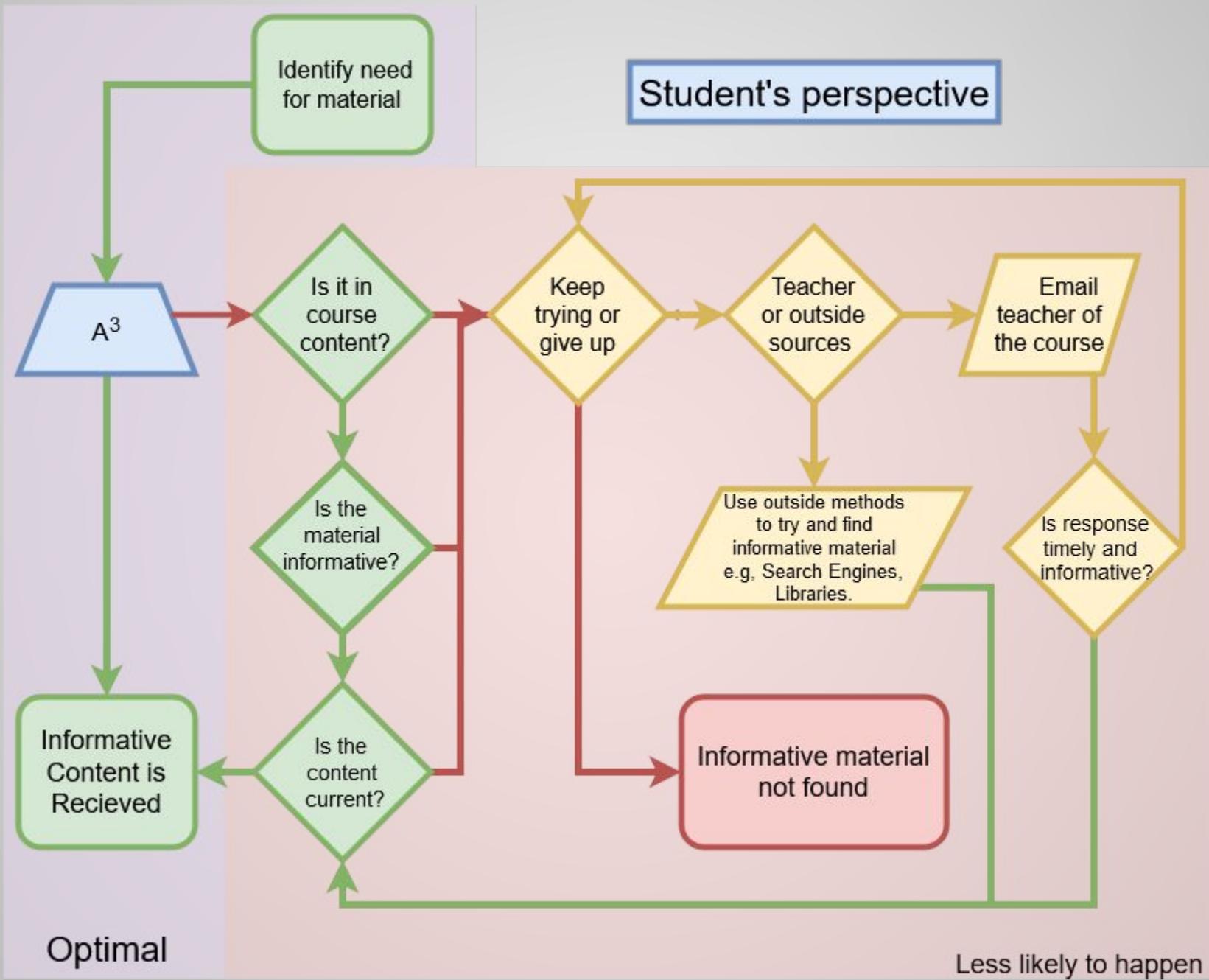
- Unify formatting among instructors through normalization
- Remove necessity of individual asset request
- Create systematic storage of vital course information
- Automate collection of standard reference materials



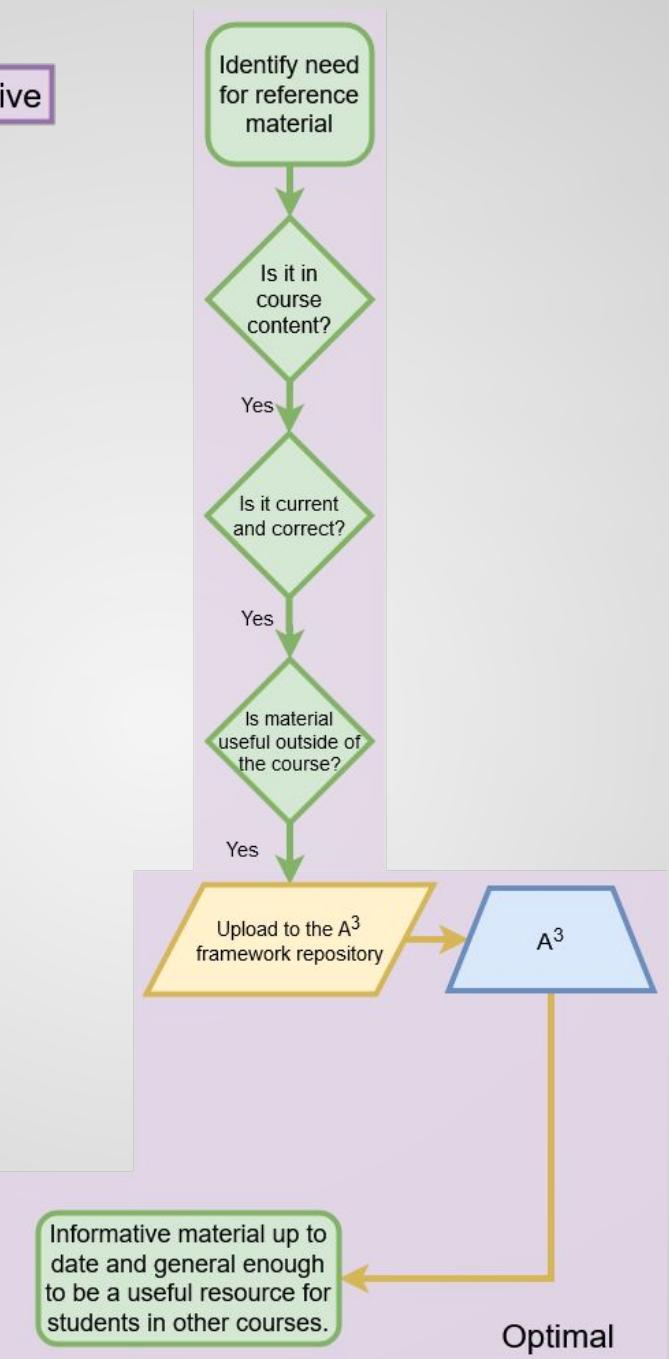


Student's perspective

- Legend
- Yes
 - No
 - No choice

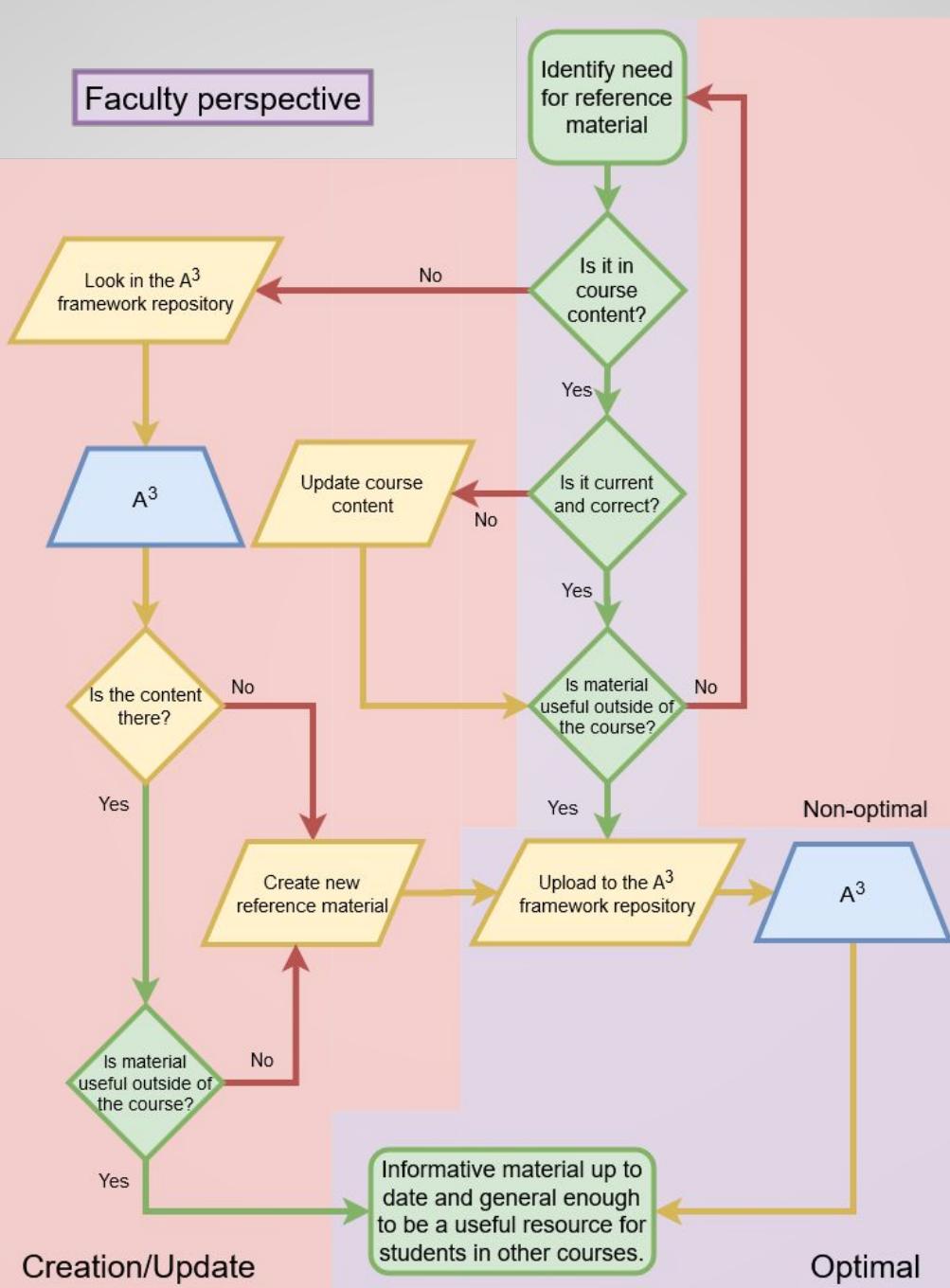


Faculty perspective



Legend

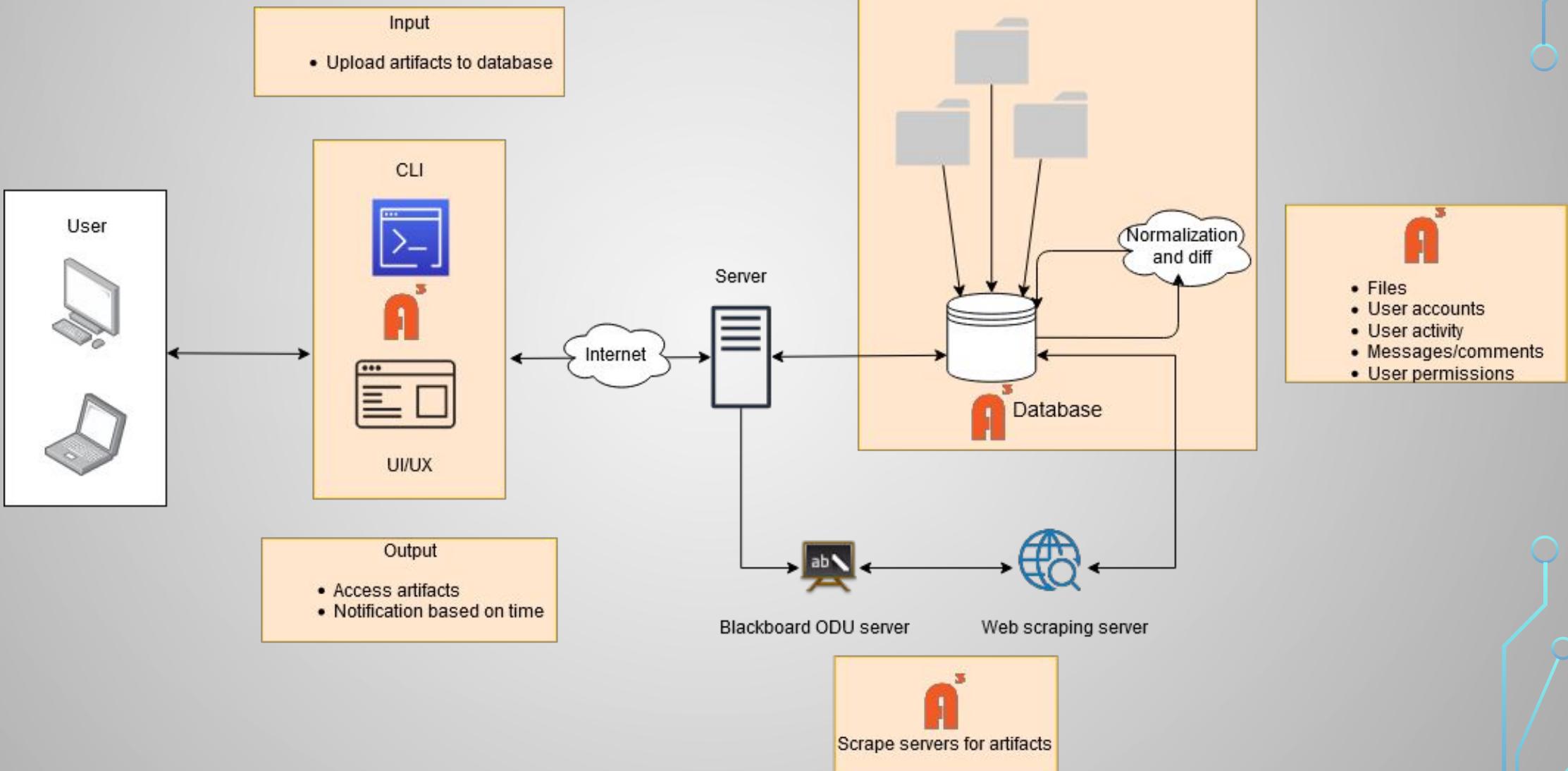
- Yes
- No
- No choice



Legend

- Yes
 - No
 - No choice

MAJOR FUNCTIONAL COMPONENTS



UI/UX Elements

- Modal Window Popup: This element of the UI will determine what kind of actions each members has the ability to make.
- A³ Precision Feedback: Unspecific feedback is often useless. A³ resolves the issue by asking specific questions to the user to create new features.
- Deploy: Deliver files in various formats, e.g., pdf, pptx, or html.

Potential User Base (Worldwide)

All Enrollments and Online Enrollments, 2016 and 2017

	2016	% of 2016 total	2017	% of 2017 Total	% Change, 2016 - 17
All Students	20,224,069		20,135,159		-0.44%
Enrolled Exclusively Online	2,974,836	14.71%	3,104,879	15.42%	4.19%
Enrolled in Some Online Courses	3,325,750	16.44%	3,552,581	17.64%	6.38%
Enrolled in No Online Courses	13,923,483	68.85%	13,477,699	66.94%	-3.31%

Lederman, D. (2018, November 7). Inside Higher Ed. Retrieved March 10, 2020, from
<https://www.insidehighered.com/digital-learning/article/2018/11/07/new-data-online-enrollments-grow-and-share-overall-enrollment>

CURRENT COMPETITION

eFileCabinet - A centralized location for all documents and files. Allows for up to 5 TB of storage. The service can break files down into separate departments and folders. eFileCabinet also lacks in the ability to be locally hosted and controlled by system administrators.

Localized Databases - Databases can contain much of the same information. These are generally not easily accessible by many people due the difficulty included creating SQL queries and data retrieval.

FileCloud - A cloud-based solution to sharing files among students, faculty and administrators. Lacks the ability to be locally hosted and controlled a University.

CURRENT COMPETITION

GitHub - A cloud-based repository system for contributing to projects. This is an all-to-one system where the users all contribute to one project. Useful for Programming and its associated documentation.

SharePoint - A cloud-based platform that contains the tools of Microsoft Office while allowing collaborative work. Sharepoint is often presented as a document storage and management system, but is fairly customizable.

COMPETITION MATRIX

Features	A	FileCloud	Localized Databases	eFileCabinet	GitHub	SharePoint
File Storage	X	X	X	X	X	X
Change Tracking	X	X	X	X	X	X
Content Search by Filename	X	X	X	X	X	X
File Sharing	X	X		X	X	X
Change Reporting	X	X			X	X
Content Search by Subject	X			X	X	X
Notifications	X				X	X
Reports	X					X
Format Normalization	X					
Automation	X					

RISK MATRIX

	Impact				
	Negligible	Minor	Moderate	Significant	Severe
Probability	Negligible	Minor	Moderate	Significant	Severe
Very Likely					
Likely				T1	
Possible				C2, C3	C1
Unlikely			T4	T2	
Very Unlikely			C4	T3	

Risk ID	Title	Impact	Probability	Mitigation
T1	Integration with Blackboard - scraping	Significant	Likely	Use of a tool similar to the Blackboard Archive Extractor. Will periodically scrape Blackboard for material and update archive. [10]
T2	Loss of data	Significant	Unlikely	Will adhere to best practices, as defined by the National Institute of Standards and Technology. [9]
T3	Information is changed and user is not notified	Significant	Very Unlikely	Unit Testing during development to ensure user is notified of changes.
T4	File type not supported	Unlikely	Moderate	Will list supported file types
C1	Faculty does not upload material	Severe	Possible	Will make UI/UX easy to use and understand. School encourage use of A ³ .
C2	Does not update material/reference	Significant	Possible	Will allow users to notify them if something has not been update in a certain amount of time. Will allow user to see when last updated.
C3	Inputs incorrect information	Significant	Possible	System will use backups, information can be reuploaded upon correction.
C4	Too difficult to use	Moderate	Very Unlikely	Will utilize both a CLI and UI/UX.

T#- Technical Risk

C#- Customer Risk

WHAT A³ WILL DO AND WILL NOT DO

A³ **will...**

- Allow users to view changes to an artifact
- Link artifacts to the original source
- Allow users to convert documents to markdown for normalization
- Automate the update of artifacts

A³ **will not...**

- Allow users to edit archived artifacts
- Provide server hosting
- Require document templates
- Provide continuous integration

Conclusion

 is a framework and tool set for Aggregation and Archiving of Artifacts.

- Configurable for different environments
- Extensible to integrate useful tools as needed

Utilizing

- Normalization
- Automation
- Web-scraping
- Archival Processes



A repository of reliable resources.
Our goal is simplicity.

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