Anonymous Architects Phase 1 Interim Presentation

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Presentation Overview

- Requirements
    - FRS
    - NFRS
    - SIG
- Architecture
    - Abstract Architecture
    - Class Diagrams
    - Sequence Diagrams
    - Architectural Alternatives
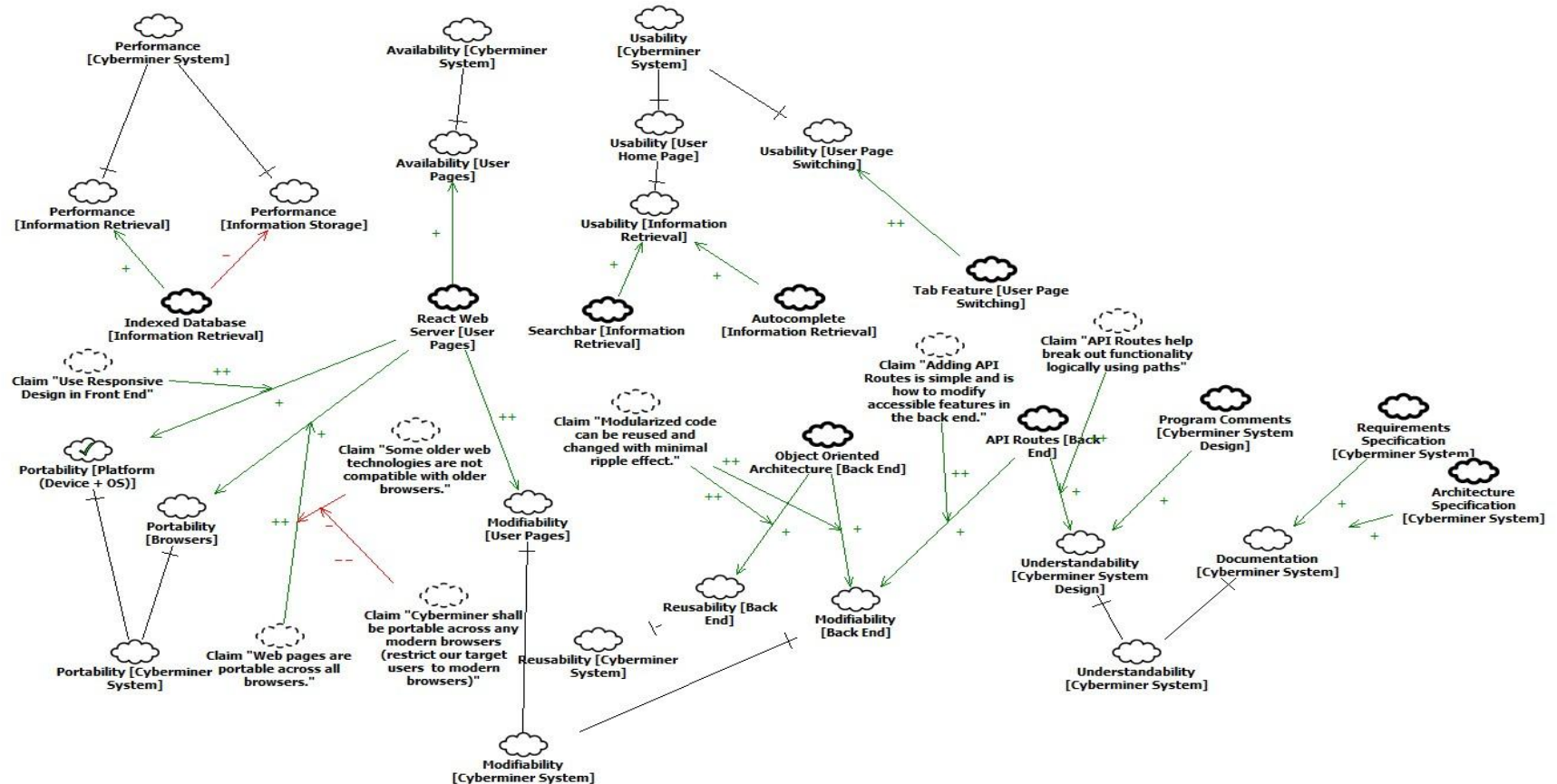   - Garbage Words
- Demo

Requirements - FRS

> Backend: Process circular shifts requests

> Frontend: Handle user interface interactions

> Event-driven format: If-then specifications

> Clear system component boundaries

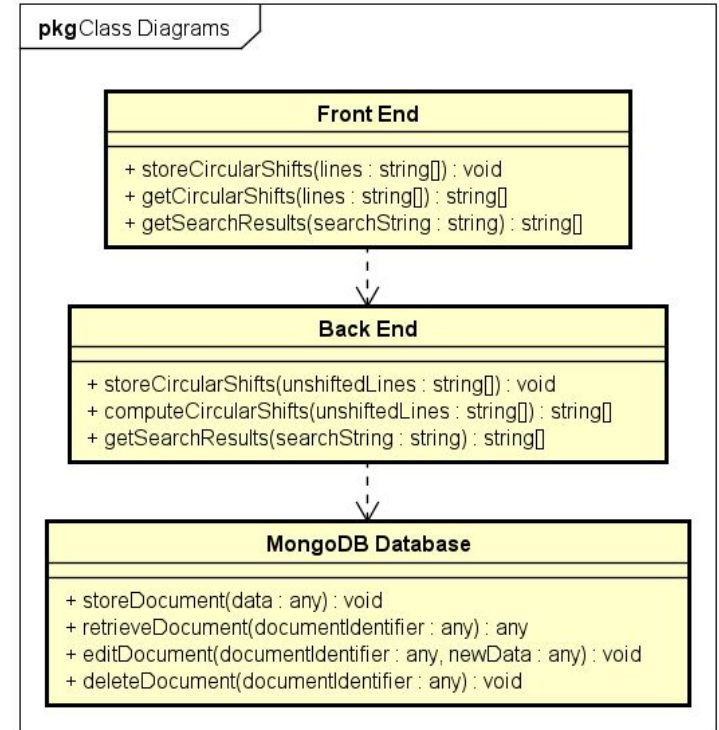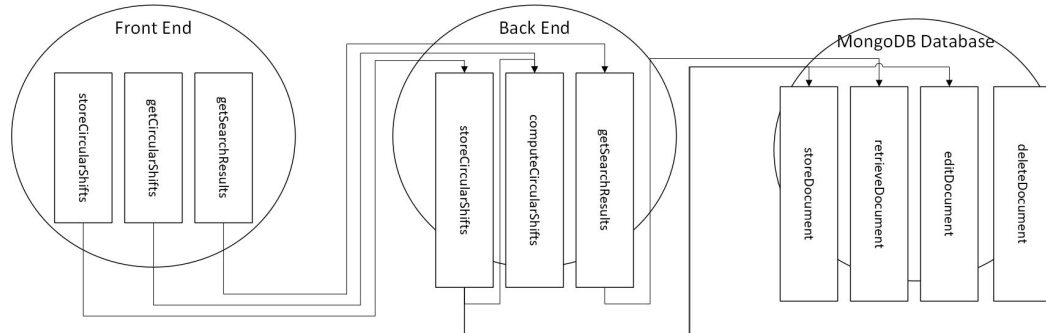> Real-time progress monitoring specified

Requirements - NFRS

Performance: Measurable speed metrics

Usability: Quantified user experience

Availability: System reliability targets

17 measurable NFRs defined

NFRS linked to system features

Requirements - SIG

Architecture - Overall Cyberminer System Architecture

- Based on Model-View-Controller
- Shared UI system for KWIC tester & search engine
- High level of abstraction (These aren't real methods)
- UML adds data types, removes method invocations

pkg Class Diagrams

Front End

+ storeCircularShifts(lines : string[]) : void
+ getCircularShifts(lines : string[]) : string[]
+ getSearchResults(searchString : string) : string[]

Back End

+ storeCircularShifts(unshiftedLines : string[]) : void
+ computeCircularShifts(unshiftedLines : string[]) : string[]
+ getSearchResults(searchString : string) : string[]

MongoDB Database

+ storeDocument(data : any) : void
+ retrieveDocument(documentIdentifier : any) : any
+ editDocument(documentIdentifier : any, newData : any) : void
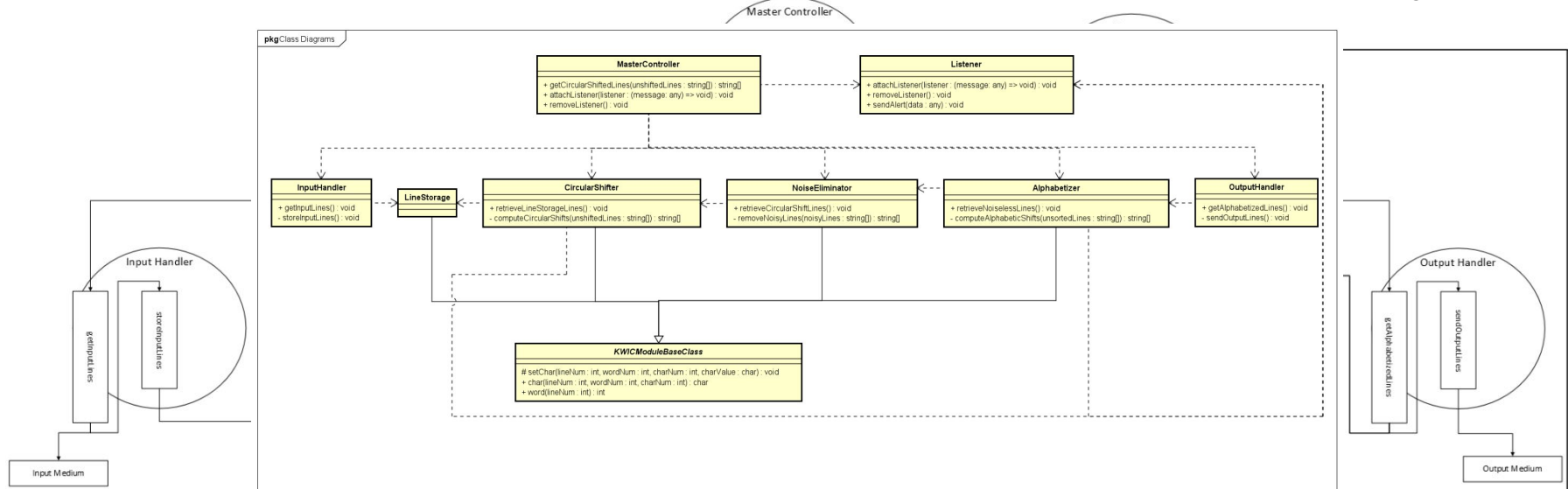+ deleteDocument(documentIdentifier : any) : void

Architecture - KWIC Module Architecture

Object-oriented design. Each processing step is a separate data type.

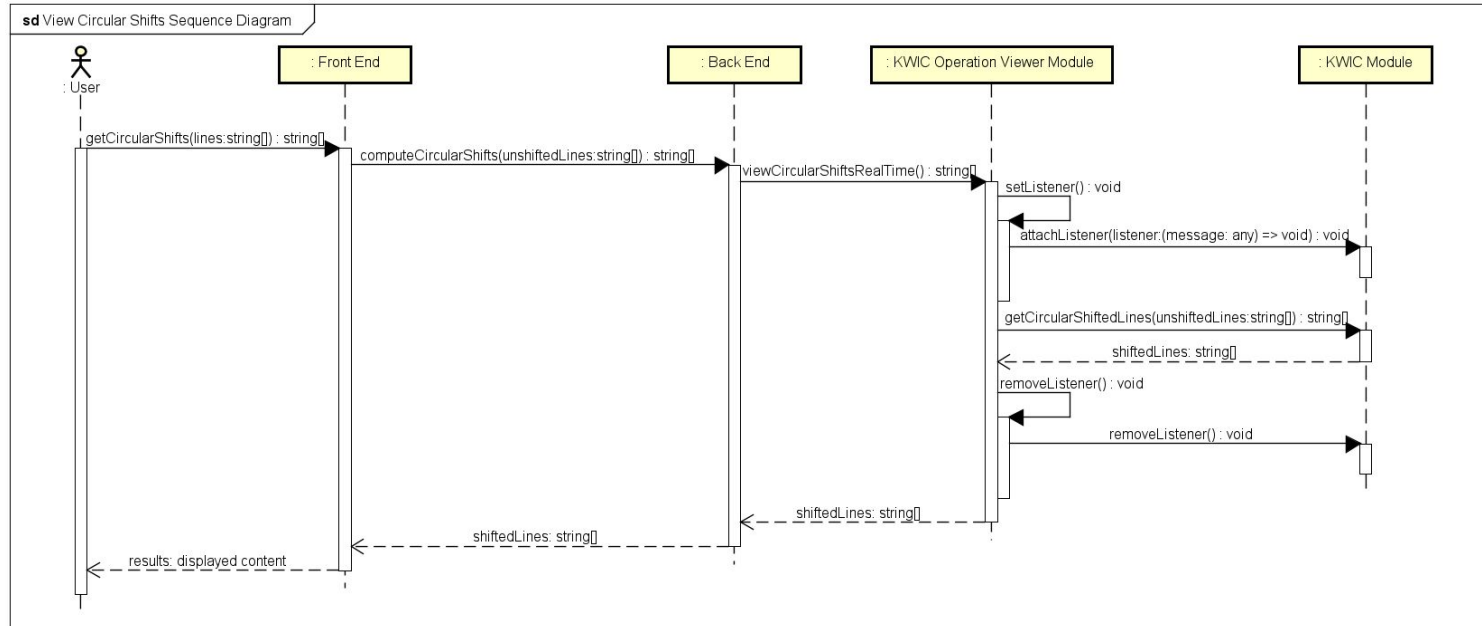Initial input, final output, and master controller are also separate data types.

External modules can attach an event listener or obtain shifted lines directly.

Architecture - Sequence Diagrams

Helps to clarify interactions in high-level architecture.

High level of abstraction. Detailed design is hidden.

Architecture - Architectural Alternatives (Style)

Quality Attributes (NFRs)	Shared Data	Abstract Data
Availability	XX	XX
Maintainability	--	++
Modifiability	--	++
Performance	+	-
Portability	XX	XX
Responsiveness	XX	XX
Reusability	--	++
Understandability	--	++
Usability	XX	XX

Architecture - Architectural Alternatives (Tools)

AR_DEC_3.   Indexed Database Structure

Option 1: SQL Tables, 1 line per URL

- +   Simple SQL to store
- -   More complex SQL to retrieve

Option 2: SQL Tables, all associated URLs on 1 line

- +   Simple SQL to retrieve
- -   Variable size storage

Option 3: NoSQL Data Storage

- +   Dynamic data format, large-scale data
- -   Inconsistent formatting, tool-specific language

Final Decision: Option 3

Garbage Words

- And
- By
- Nor
- Or
- With

- As
- For
- Not
- So
- Yet

- At
- In
- Of
- Than

- But
- Is
- On
- The

Live Demo

References

[1]   L. Chung. "Advanced Software Architecture and Design." UTD Webpages. Accessed: Sep. 26, 2025. [Online.] Available:
        https://personal.utdallas.edu/~chung/SA/syllabus.htm

[2]   "List of Conjunctions in English with Examples." 7esl.com. Accessed: Sep. 27, 2025. [Online.] Available:
        https://7esl.com/conjunctions-list/

[3]   "Prepositions." Cambridge Dictionary. Accessed: Sep. 27, 2025. [Online.] Available:
        https://dictionary.cambridge.org/grammar/british-grammar/prepositions