Architecture Specification

for

Key Word In Context

Version 1.0 Approved

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# Architectural Style: Pipe and Filter

The project will be implemented using Pipe and Filter architecture. This architecture can be used for stream processing, and we will be processing a stream of data that is lines of text represented as strings.

* The components of this architecture are filters.
  + Filters are a processing and computation step.
  + Filters are independent of each other.
  + Each filter takes a stream of data as input and outputs another stream of data.
* The connectors of this architecture are pipes.
  + Pipes are streams of data inputted to and outputted from filters.
  + The pipes move data from one filter to the next.

## Application to KWIC\*

The filters for the KWIC\* system are CircularShiftFilter, InputFilter, SortFilter, and OutputFilter. The pipes are the streams of data inputted to and outputted to and from the filters, namely the lines of text.



## Advantages of Pipe and Filter

* Pipe and filter is simple to implement
* The filters can be reused for other purposes as the project expands in the future.
* System is easy to maintain.

## Disadvantages of Pipe and Filter

* If the client decides to add interactive requirements, they will be difficult to implement.
* In cases where the input is large, performance loss could be large.
* If a filter had a fault the entire system would not work.

## Conclusions

Because the system has a simple purpose, pipe and filter is a good choice for this system. Each filter can operate independently and interactivity is not necessary with the current requirements. The largest downside is that if input is large the performance will not be ideal. However, since the most obvious application of this type of system is a search engine, it not likely the input would be large.