

# Project Phase I: KWIC Architecture Specification

*Versions 2.0*

CS/SE 6362 Advanced Software Architecture (Fall 2015)

**Submitted to:**

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## Revision History

<b>Date</b>	<b>Version</b>	<b>Description</b>	<b>Author(s)</b>
9/29/2015	1.0	Preliminary version of K.W.I.C system architecture	All
10/15/2015	2.0	Updated version with professor suggestion from interim presentation	All

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# 1. Introduction

The Project that our team will be working on is a web search engine.

A web search engine is a web-based tool that is designed to search and locate information on the World Wide Web. Popular examples includes Google, Yahoo! and Bing. These Search engines utilize automated software applications (referred to as robots, bots, crawlers or spiders) that travel along the Web, following links from page to page, site to site. The information gathered by the spiders is used to create a searchable index of the Web. The search results are generally presented in a line of results often referred to as search engine results pages (SERPs).

## 1.1 Purpose

The purpose of our project is to develop KWIC index System (Keyword In Context) proposed by David Parnas in early 70's using Java Applet. This System provides a convenient search mechanism for information in a long list of lines, such as book titles, or online documentation entries.

Parnas described the KWIC problem as follows:

*“The KWIC index system accepts an ordered set of lines; each line is an ordered set of words, and each word is an ordered set of characters. Any line may be “circularly shifted” by repeatedly removing the first word and appending it at the end of the line. The KWIC index system outputs a list of all circular shifts of all lines in alphabetical order.”*

In his paper of 1972, Parnas used the problem to contrast different criteria for decomposing a system into modules. Our team followed the same phenomena to implement KWIC system, by designing the system with 5 highly cohesive modules (input, line storage, circular shift, alphabetical sort, and output). We analyzed functional and nonfunctional requirement, design architecture styles, implement using Java applet and test the system. The KWIC system architecture style shall be an Abstract Data Type (ADT) style as this will provide clear object oriented structure with desire qualities of high cohesion and low coupling.

## 1.2 Scope

The KWIC system shall be designed, implemented and tested to satisfy list of functional and nonfunctional requirements. Based on design specification, the system should be implemented using Java applet. Finally, we describe user manual as a guideline for using KWIC system. All the materials of project should be uploaded on our web site.

### 1.3 Definitions, Acronyms, and Abbreviations

- KWIC: Key Word In Context describes a way to display related and accurate results to a specific search query.
- Architecture acronym if applicable
- UML(Unified Modeling Language): This provides a way to describe structure, behavior and architecture of application along with business process and data structure

### 1.4 Project Deliverables

#### Phase 1:

##### Phase 1.1: Interim Project I

Deliverables: Preliminary Definition, PPT, and Presentation

Due Date: September 29<sup>th</sup>

Team Leader: Barbara Maweu

##### Phase 1.2: Final Part I

Deliverables: Project Report, Presentation, and Design Plans

Due Date: October 15<sup>th</sup>

Team Leader: Sruthi Chappidi

#### Phase 2:

##### Phase 2.1: Interim Project II

Deliverables: Outline, Project Plan, Presentation

Due Date: November 10<sup>th</sup>

Team Leader: Maryellen Oltman

##### Phase 2b: Final Part II

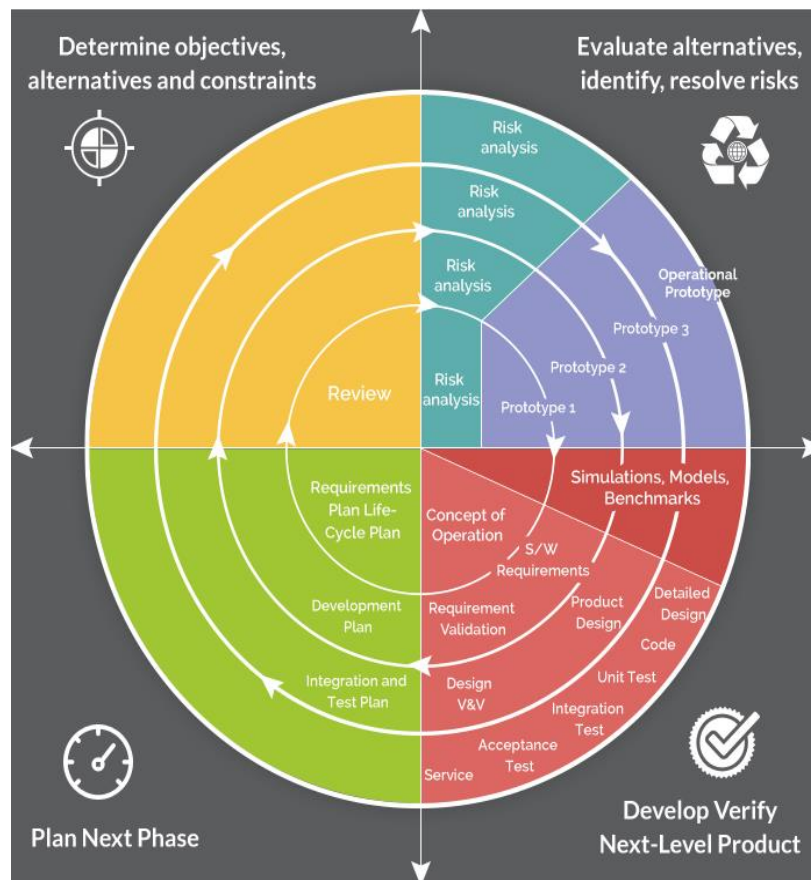
Deliverables: Presentation and Demo

Due Date: December 1<sup>st</sup>

Team Leader: Twinkle Sharma

## 2. PROJECT ORGANIZATION

### 2.1 Process Model



### 2.2 Organizational Structure

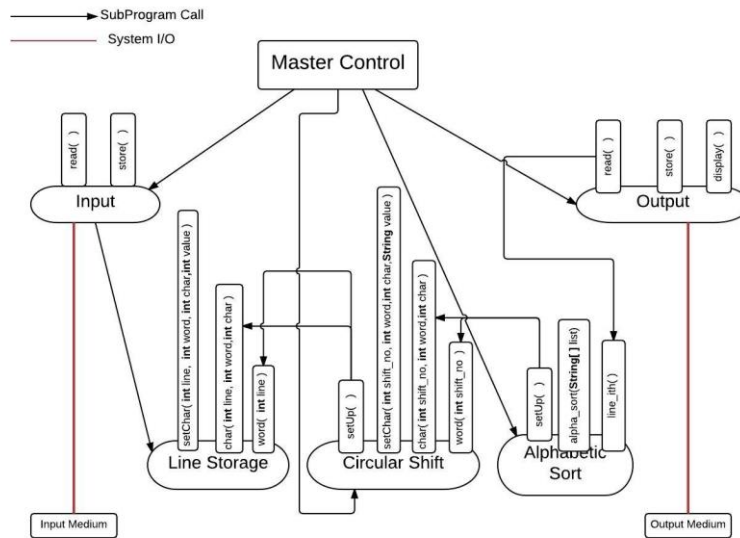
### 2.3 Work Schedule

Date	Task	Responsibility
9/03/2015	Requirements Gathering	Sruthi, Twinkle, Maryellen, Barbara
9/29/2015	Software Architecture Analysis & Design	Sruthi, Barbara
10/15/2015	Developers	Twinkle, Maryellen
11/10/2015	Testers	Twinkle, Sruthi
12/1/2015	End users	Barbara, Maryellen

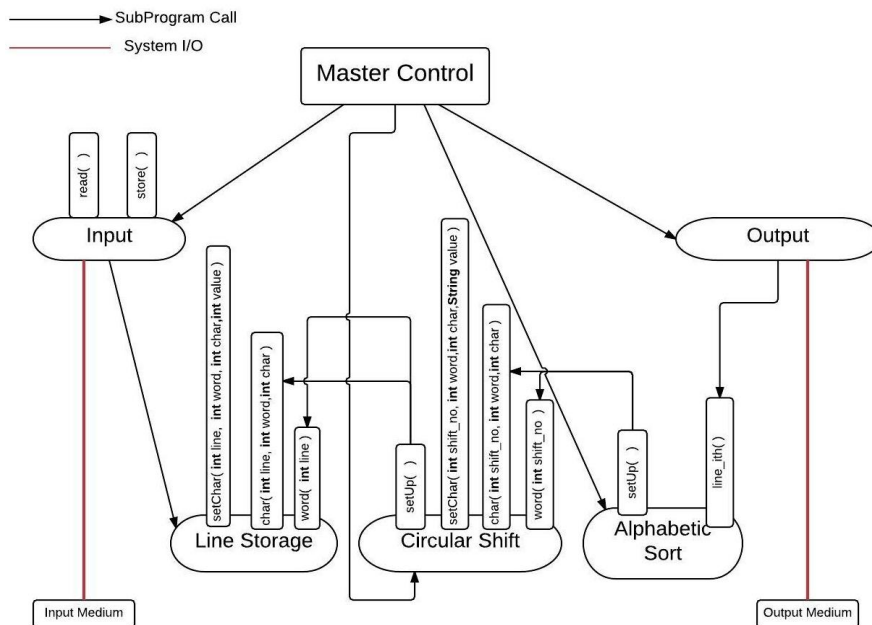
### 3. Software Architecture

#### 3.1 Abstract Data Type Architectural Style

##### Design 1



##### Design2:



## 4. Traceability Matrix

### Functional Requirement and Software Architecture Traceability Matrix

Functional Requirement	Architecture Specification
FR1.0: The KWIC system shall provide an input field to accept an ordered set of lines.	KWIC system has an <i>input medium</i> to accept an ordered set of lines
FR2.0: The KWIC system shall accept an ordered set of lines	KWIC System accepts ordered set of lines through the <i>input</i> module
FR3.0: The KWIC system shall perform a “circular shift” on each the inputted ordered set of lines by repeatedly removing the first word and appending it at the end of the line	KWIC System provides a <i>circular shift</i> module to perform a circular shift on each input of ordered set of lines
FR4.0: The KWIC system shall output a listing of all circular shifts of all ordered set of lines in ascending alphabetical order	KWIC System provides a <i>output medium</i> module that displays a listing of all circular shift of all ordered set of lines in ascending alphabetical order



## 5. Prototype/Screen Shots

Please enter some lines\$With a dollar sign\$In between each one

Generate Index

### Here are the original lines:

- 1: Please enter some lines
- 2: With a dollar sign
- 3: In between each one

### Here are the circular shifts:

- 1: Please enter some lines
- 2: enter some lines Please
- 3: some lines Please enter
- 4: lines Please enter some
- 5: With a dollar sign
- 6: a dollar sign With
- 7: dollar sign With a
- 8: sign With a dollar
- 9: In between each one
- 10: between each one In
- 11: each one In between
- 12: one In between each

### Here are the alphabetized circular shifts:

- 1: a dollar sign With
- 2: between each one In
- 3: dollar sign With a
- 4: each one In between
- 5: enter some lines Please
- 6: In between each one
- 7: lines Please enter some
- 8: one In between each
- 9: Please enter some lines
- 10: sign With a dollar
- 11: some lines Please enter
- 12: With a dollar sign

Hello, my name is\$Maryellen. Nice to\$meet you

Generate Index

### Here are the original lines:

- 1: Hello, my name is
- 2: Maryellen. Nice to
- 3: meet you

### Here are the circular shifts:

- 1: Hello my name is
- 2: my name is Hello
- 3: name is Hello my
- 4: is Hello my name
- 5: Maryellen. Nice to
- 6: Nice to Maryellen.
- 7: to Maryellen. Nice
- 8: meet you
- 9: you meet

### Here are the alphabetized circular shifts:

- 1: Hello my name is
- 2: is Hello my name
- 3: Maryellen. Nice to
- 4: meet you
- 5: my name is Hello
- 6: name is Hello my
- 7: Nice to Maryellen.
- 8: to Maryellen. Nice
- 9: you meet

## 6. References

- <http://www.utdallas.edu/~chung/SA/syllabus.htm>
- *Documenting Software Architectures: Views and Beyond*, P. Clements, F. Bachmann, L. Bass, D. Garlan, J. Ivers, R. Little, R. Nord and J. Stafford, MA: Addison-Wesley, 2003.