**CHAPTER 3**

**METHODOLOGY**

The software development methodology to be utilized in the study is Extreme Programming (XP). It is a software development methodology that provides values and principles to guide the team behavior and improves the quality of the results of the study.

The researchers used this methodology because it is a pragmatic approach to program development that emphasizes results first and takes an incremental, get-something-started approach to building the product, using continual testing and revision.

Examples of Software Development Cycles

* Traditional monumental or waterfall methodologies
* Agile or lightweight methodologies
  + - Extreme Programming, also known as XP
    - Dynamic Systems Development Method (DSDM)
    - SCRUM
    - Feature Driven Design (FDD)
    - Crystal
    - Agile modeling
    - Lean Software Development
    - Rational Unified Process (RUP)
* For NLP topics, you may present your methodology integrating NLP process (Data Collection, Data Cleaning, Processing, Analyzing) in your chosen Software Development Cycle or you can present it separately. Your NLP process should also be presented in figure.
  + Define each specific phase of your development
  + Sources of Data should also be integrated in your methodology
    - Interviews, observations, e-books, unpublished undergraduate theses, internet, etc.
  + Programming Languages and Tools should also be discussed in your methodology
    - PHP, Java SDK, MySQL, Mallet, WEKA, APIs, etc.
  + Relate your study to what the researcher’s actual tasks for every phase.

Note: Discussion of some of your methodology phases during the proposal should only be discussed descriptively; researcher’s task will be included and discussed after the development of your system. All necessary changes that the researchers have undergone should be reflected in the discussion of your methodology.

The following figures and tables should also be integrated in your selected methodology based on the Software Life Cycle Activities:

* Requirements Analysis – Flowchart (existing), Gantt Chart
* Requirement Documentation (System/Logical/Physical Design) – Activity Diagram / Game Flow Diagram
* Implementation – Deployment Diagram, Test Cases, Software/Hardware requirements

Sample: **Methodology Used is (RUP) Rational Unified Process**

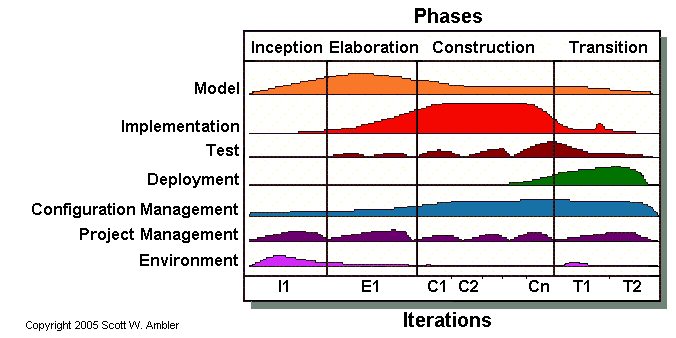


Figure 1

**Rational Unified Process**

The researchers used the Rational Unified Process as research methodology in developing the System. It is a sequential process wherein there are series of tasks to be completed.

**Phase 1: Inception Phase**

General Definition: The Inception phase is where the researchers get familiarity with the project goal and scope. It helps determine the project feasibility, what customer wants, and how the researchers will get into more resource consumable phase.

Researchers’ Tasks: The researchers planned to integrate GetOldTweets in the system for the collection of data. To make sense of the collected data, topic modelling should be done. For the topic modelling, the researchers integrated Mallet. To analyze the data, visualization is needed. To visualize the generated topic models, the researchers planned to use GraphStream.

Provide discussion for each of the presented diagrams

**Phase 2: Elaboration Phase**

General Definition: This phase is one of the crucial parts in the development of the study since collecting the most significant requirements for the system takes place. In this phase, the researchers should be able to define and baseline the architecture of the system in order to provide a stable basis for the bulk of the design and implementation effort in the Construction Phase.

Researchers’ Tasks: This is where the researchers determine the requirements of the proposed system. This can be presented by the various modules/features based on your presented objectives.

Include here the following:

1. Flowchart
2. Gantt Chart (by weeks from June to March, part of your appendices)

Include here the Flowchart of your proposed study

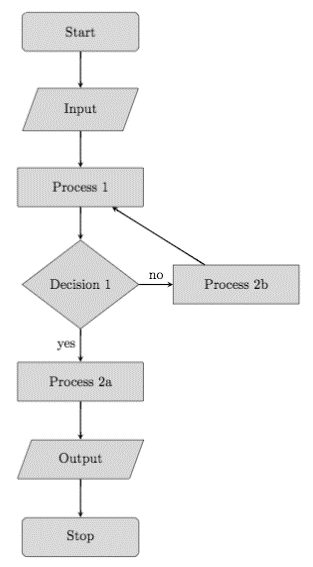


Figure 2

**Flowchart**

Provide discussion for each of the presented diagrams

**Phase 3: Construction Phase**

General Definition: The Construction Phase is about cost-efficient development of a complete product and operational version of the system that can be deployed in the user community. It is where the researchers develop a complete product that is ready for transition to its community.

Researchers’ Tasks: The researchers translated both the initial logical and physical designs to actual system development. The Java programming language was used by the researchers in the development of the system and tools were utilized to accomplish goals. The researchers used tools to accomplish our goals. For the data gathering, we used GetOldTweets1 an unofficial Java library for the Twitter 20 API and we used MAchine Learning for LanguagE Toolkit or MALLET2 for the topic modelling. MALLET is a Java-based package for statistical natural language processing, document classification, clustering, topic modelling, information extraction, and other machine learning applications to text. For the visualization, the researchers used GraphStream3, it is a tool for generating graphs, links and networks. We also used jFreeCharts for the visualization of the frequency of the words.

**Design of Software**

Software design is the process of transforming user requirements into appropriate abstracts which helps the researchers in designing, coding and implementing the developed software.

Include here the following:

1. Activity Diagram / Game Flow Diagram
2. Conceptual Framework Diagram
3. Initial Designs

Provide discussion for each of the presented diagrams

**Knowledge Requirements**

Related Literature

* Payroll System
* Inventory System
* Biometrics
* Online Systems

Related Studies

* Payroll System
* Inventory System
* Biometrics
* Online Systems

Algorithms

* Shortest Path

Hardware Requirements

* Desktop Computer
* Intel Core i7
* 8GB Memory

Software Requirements

* PHP
* APIs and Libraries
* JAVA
* MySQL

**RUP-Rational Unified Process / NLP Process**

Inception Phase

* Identification of problems
* Conduct of Interview
* Secondary sources of Data

Elaboration Phase

* Identifying user requirements

Construction Phase

* Transforming user requirements to designs
* Design of Software

Transition Phase

* Implementation Deployment plan
* Test Cases

**Title of your System**

Evaluation / Feedback

Figure 3

**Conceptual Diagram**

**Phase 4: Transition Phase**

General Definition: The purpose of the transition phase is to transition the software product to the user community. In this phase the researchers validate the new system against user expectations.

The researchers prepared test cases to ensure that the developed system requirements were met…

Include here the following:

1. Deployment Diagram
2. Test Cases
3. Software/Hardware requirements

Table 1

**Test Cases**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case ID** | **Test Scenario** | **Test Steps** | **Test Data** | **Expected Results** |
| TCID001 | Check Login with valid Data | 1. Go to link 2. Enter UserId 3. Enter Password 4. Click Submit | Userid = admin1234  Password = passadmin1234 | User should Login into application |

Discuss identified test cases and results

Table 2

**Hardware Requirements**

|  |  |  |
| --- | --- | --- |
| **Component** | **Minimum** | **Recommended** |
| Processor | Intel Core i3-4130 Processor (3M Cache, 3.40 GHz) | Intel Core i5-4570T Processor (5M Cache, 3.40 GHz) |
| RAM | 2GB | 4GB or higher |
| Hard disk | 512 GB | 1TB |

Table 3

**Software Requirements**

|  |  |  |
| --- | --- | --- |
| **Component** | **Minimum** | **Recommended** |
| Operating System | Windows 7 | Windows 7 or higher |
| Java SDK | Version | Version |
| Xampp | Version | Version |

Every computer system has requirements in terms of Software and Hardware used for better implementation. In this case, the researchers listed in the table above the required software and hardware to be used in the proposed system.

For your NLP process, you may include under the implementation phase of your methodology the following but not limited to: Data Collection, Data Filtering, Data Processing, Data Analysis. These NLP processes may also integrate discussion of the algorithm used, notations and formulas, evaluation methods, tools used, and other NLP concepts.