

Applet Development Lifecycle Document

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Applet Development Lifecycle Document

This document provides guidelines for developers to select a concept, analyze, design and implement the applets and document each phase. The complete documentation should not exceed 3-5 pages of text for each applet or a set of related applets.

Concept Analysis helps you in deciding “What to develop” and “Why to develop”. Once you decide on the concept, a prototype is planned and reviewed in the requirement specification phase. Design specification phase makes you start thinking of the different functionalities that you would provide like user interactions etc., based on the requirements that have been outlined for the concept. Software implementation is the final phase where class diagrams, sequence diagrams and coding is undertaken to develop the applet.

Concept Analysis

1. Literature Survey – Do a literature survey of reports, white papers, about different approaches of teaching a concept specifically - using animations , simulations for courseware, independent and distance learning. Check out the animations available on the internet. Provide a brief summary of the survey with your observations. . This section should be very brief and informative.
2. Selection of a concept - (Suggested approach - Analyze the properties of a concept/s. Understand the concept. Discuss with an area expert. Take notes while you are understanding, discussing/analyzing the concept/s). Consider the following while selecting a particular concept for animation/simulation:
 - Can animations/simulations help in explaining the concepts more clearly?
 - Can the animations/simulations assist an instructor in classroom or distance teaching?
 - Can you design the applet to make the user explore ?

- Is it stand-alone or part of a full module for independent learning?
- any others.

Section details: Your report of this section should contain concept analysis, discussions with experts (this could be a consolidated report of the notes taken during the selection of the concept/s). Report conclusions and justification for selecting the concept.

3. Introduction to Selected concept/s:

- A problem statement (Brief concept introduction)
- concept level - (Ex: school/undergraduate/graduate/others)
- prerequisites, assumptions made - related to user understanding of the concept. (Ex: User is expected to be conversant with a certain concept before attempting to take up this topic).

Section details: In this section provide an introduction to the concept that you have selected with other details as mentioned above.

4. How - Brief introduction to the number of animations/simulation you plan and a brief description of the same.

Section details: This section would give overview of the concept along with the approach that will be taken to explain the concept, the total number of animations/simulations planned and a brief description of each.

Requirement Specification of the Animations

1. Concept demo specification – Demo of a concept explains the concept to the user. Prepare a power point slides presentation or a prototype of the demo design before implementing the applet.

Section details: Each slide should be provided with notes which would explain the functionality of the content represented in that particular slide. The prototype basically should unfurl the concept to the user.

2. Animations/simulations with user interaction – Through a power point presentation build a workflow of each and every event that follows an

interaction that you intend to provide on the template. If the above section overlaps with this section you may combine both and present a single power point presentation.

Section details: Each slide should be provided with notes that explain how the proposed Animation will add interactivity not supported by the power point animations.

3. Experiments/Assignments – Provide a design and description of the experiments that you would like the user to perform with your Animation in order to understand the concept.

Section details: A document (or power point presentation) for this section should also be provided.

Design of the animation/s

Template design

(For internal trainees/developers a standard template has been designed. The code for the template will be available for reuse.)

1. Applet interface design for the animation/simulation which should include the following:
 - Title of the animation
 - the radio buttons for
 - demo
 - instructions to run the animation
 - concept description
 - user interaction (can be more than one as per requirement)
{ We should standardize the names for the buttons to be provided which occur commonly. }
 - Consider all aspects of the animation while designing the template including stop/continue/clear/previous/next etc., functionalities that may be required.

Section details: Consider the applet specifications while designing the template. Provide details of the function of each and every item that is provided on the applet interface template.

Applet/s Design

Note: The design should match the requirements provided in the previous section.

Use the following guidelines while designing the applet:

- The designed template (finalized in the previous section) should be consistently used through out the applet. (Note-The number of buttons and number of inputs from user can vary from applet to applet.)
- As far as possible, applet/s should provide interactivity, such as taking values of some parameters from the user or modifying in-built values based on mouse movement. (If necessary redesign the template).
- Each applet should have associated instructions which would help the user to understand the functionality and working of applets.
- Each applet should be associated with a set of exercises/tutorials that a user can try out once he/she has gone through the demo applet. (specially applets built for independent/distance learning).
- User inputs should be validated and boundary conditions should be mentioned through a mouse over or as a static text along with input box.

Section details: For each power point presentation in the requirement specification provide a second version using the template design and the other design aspects that are finalized. Build a prototype of the animation using power point slide presentations. This should include each and every work flow of the applet interface template. It is more or less like a sequence diagram represented through one or more power point presentations.

Each item on the template should have a mouse over help. Prepare the help contents and provide in the power point presentation.

Applet Implementation - Specification And Design Document

Software Analysis

1. Analysis of available tools for the selected concept
2. Selection of tool/language for building the animation/simulation (why and advantages – platform independent, web hosting, open source etc.).
3. Any specific mathematical/analytical algorithms proposed to be used for implementation.

Section details: A list of tools available in open source will be provided with links to documentation/tutorials and animations built using the tools. A survey should be conducted to find out if the concept design could be implemented using one of the tools. Prepare a report of the survey with conclusions/results.

Include other details like proposed mathematical/analytical etc., algorithms to be used for implementation.

{For example, if you are building an Applet on Matrix manipulation you may need to use a library call to functions such as Matrix multiplication}

Software Design

Implementation using Existing open source tool

- For each workflow specified in the Power Point presentation provide the corresponding detailed design with
 - existing classes or objects to be invoked
 - pseudo-code and interaction diagram for your additional code
 - sequence diagram giving the flow through all the objects.

Implementation using Core Java

- For each workflow specified in the Power Point presentation provide the corresponding detailed design with
 - Use cases
 - Object Interaction diagram
 - sequence diagram giving the complete flow and

- data dictionary (if database is used).

Software Documentation

1. Applet installation details. Provide an self-extracting installation tool.
2. A listing of code files with purpose of contents of the file.
3. If database has been used – data dictionary details.
4. References
5. Provide an experience report which would help future implementors.