

ProxyMITY XML EDITING TOOL

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ABSTRACT

There has been a phenomenal rise in the number of engineering colleges in India over the past decade or so. As a consequence, the situation arises where students from many of these colleges find it difficult to fulfill basic requirements of their curriculum. Also, a significant number of talented students, faculty and professionals are struggling with challenges of mastering the ever-changing technology. This led project team at IITB to think of a better educational order and facilities by disseminating knowledge to the future citizens of India. So, an application is needed to circulate the knowledge on various topics, especially the engineering stream. This led to the design and development of ProxyMITY. It is for e-learning is an attempt to create application software for integrating certain aspects of e-learning on a single platform. Here we plan to integrate video lectures with presentations, providing the features of timeline, Dictionary, Dual Video Display, Tree View implementation and Animated Slides support, Presentation templates and Slideshow in JavaFX and a product installer. The procedure to be followed to use the system is the teacher first imports the data of the particular topic, be it presentation slides, documents, PDF files and video. These are to be indexed with slides. User then synchronizes the video with the presentation slides that are imported as well as other multimedia items. User finally publishes the multimedia lecture. When a student views the same at a remote location, he is expected to see the finalized product and learn from multimedia video lectures. For this whole system we need a xml file which will act as database with no platform dependencies. So in this document we have created ProxyMITY XML Editor Tool which can create a new xml file or open an existing xml file and modify it.

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1 Problem Statement

To develop application software for modifying and create the xml file used by the ProxyMITY tool for generating its UI for the video lectures. This xml file has all the data like “Video Name”, “Speaker”, “Course”, various URLs and themes with different “Slide”, “Start Time” and “End Time”. This tool should be platform independent and open sourced and should provide a user friendly environment for such tedious task. Teachers should be able use this tool for generating such xml data files which will support the ProxyMITY tool to import presentation slides, lecture videos, and video details and prepare multimedia lectures that would help in better understanding and easy learning to students.

2 Introduction

This document is intended to give you a broad overview of the GUI based xml editing tool called ProxyMITY XML Editing Tool on Computer System and Android Platform, and what is the scope of this software. Our goal is to explain how the features in ProxyMITY Editing Tool help you create the video data XML file easily and dynamically.

3 Scope

Working with ProxyMITY XML Editing Tool, we can create a variety of XML files based on your specific needs.

This software product would be platform independent i.e. it would recognize multiple operating environments (Windows, Linux, Mac OS and Android)

4 External Interface Requirements

The external users are students, teachers, educational administration, professionals and others.

4.1 User Interface Requirement

The deployments would result in software that can be used by the teachers to synchronize lectures with slides, provide details to these lectures and other information such as URL, contact numbers, so that student is able to clarify his doubts to a major extent.

4.2 Software Requirement

The ProxyMITY XML Editor is developed for Linux as well as for Android. The Software Requirement for them is as follow:

4.2.1 Software Requirement for Linux/Windows

Requirement	Version
Operating Platform	Windows/ Linux
Software package	JDK 7 , JavaFX SDK 2.0, NetBeans

Table 1 Software Requirement for Linux/Windows

4.2.2 Software Requirement for Android Platform

Requirement	Version
Operating Platform	Android 2.2 or Higher Version
Software Package	JDK 7, Android SDK , Eclipse

Table 2 Software Requirement for Android

4.3 Hardware Requirement

The ProxyMITY XML Editor is developed for Linux/Windows as well as for Android. The Hardware Requirement for them is as follow:

4.3.1 Hardware Requirement for Linux/Window

Requirement	Specification
Processor	+Dual Core
RAM	+256 MB

Table 3 Hardware Requirement for Linux/Windows

4.3.2 Hardware Requirement for Android Platform

Requirement	Specification
Processor	+600MHz
RAM	+256MB

Table 4 Hardware Requirement for Android

5 FUNCTIONAL REQUIREMENTS

A functional requirement defines a function of a software system or its component. A function is described as a set of inputs, the behavior, and outputs (see also software).

5.1 Functional model and description

A function model or functional model in systems engineering and software engineering is a structured representation of the functions (activities, actions, processes, operations) within the modeled system or subject area

5.1.1 NEW FILE

Description: User will be able to create new xml file for ProxyMITY Tool. He will be able to add theme tag, link tag, detail tag and modify it also.

5.1.2 OPEN FILE

Description: User will be able to open already existing xml file .All contents of that file will be displayed. User will be able to add tags, delete tags and modify already existing tags.

5.1.3 INSERT

Description: Any user who wishes to add Link tag or Theme tag in xml file. User will be able to add tag between any tags in xml file i.e. user can add tag after any tag no.

Requirements: User will be given option to Insert either Theme or Link. After selecting option, User will have to give input to the text fields regarding details of that tag. When user fills all the text fields of selected tag and click on ok button then corresponding tag will be inserted in ArrayList.

5.1.4 DELETE

Description: Any user who wishes to delete Link tag or Theme tag in xml file. User will be able to delete particular data/tag i.e. current data.

Requirements: User will be given option to delete. When user clicks on Delete button then corresponding tag will be deleted from XML file.

5.1.5 SEARCH

Description: This section allows the user to search for any information regarding the data present in xml file. The user can enter anything that he wishes to search for like theme name, link name, slide name, course name etc. The results of the search are displayed.

Requirements: User enters the string for which he requires to search. This section searches the complete file for the string provided by the user and displays the results. If no entry matches the search provided by the user, it gives a result saying that no results to display.

5.1.6 MODIFY FILE

Description: This section allows the user to view all tags .User can Modify the current tag, delete the tag

Requirements: Detail of tag will be displayed in text fields. User can edit the value of text fields and click on next button to go to next tag.

6 BEHAVIOUR REQUIREMENTS

Use Case Diagram

6.1.1 Software Use Case Diagram

a use case is a list of steps, typically defining interactions between a role (known in UML as an "actor") and a system, to achieve a goal. The actor can be a human or an external system.

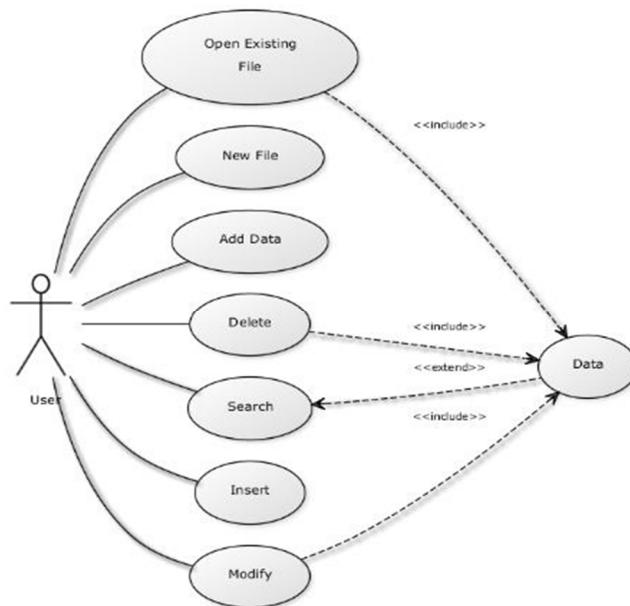


Figure 1. Software use case diagram

6.1.2 Insert Use Case

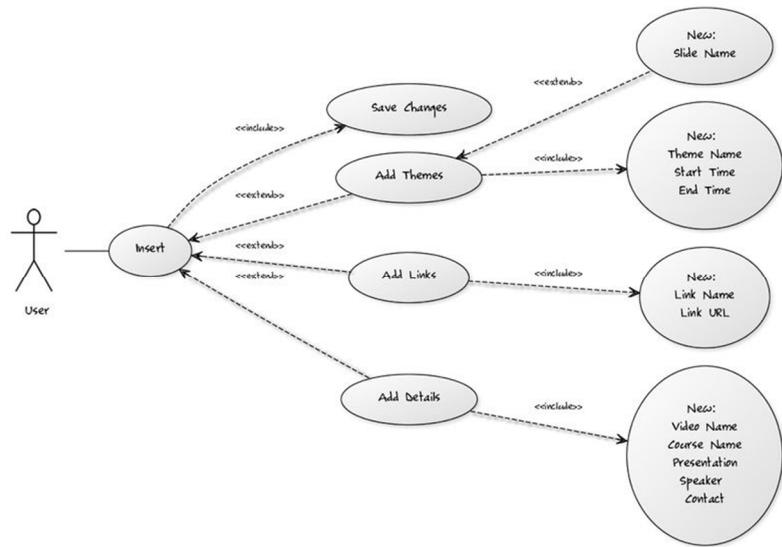


Figure 2 Insert Use Case Diagram

6.1.2 Delete Use Case

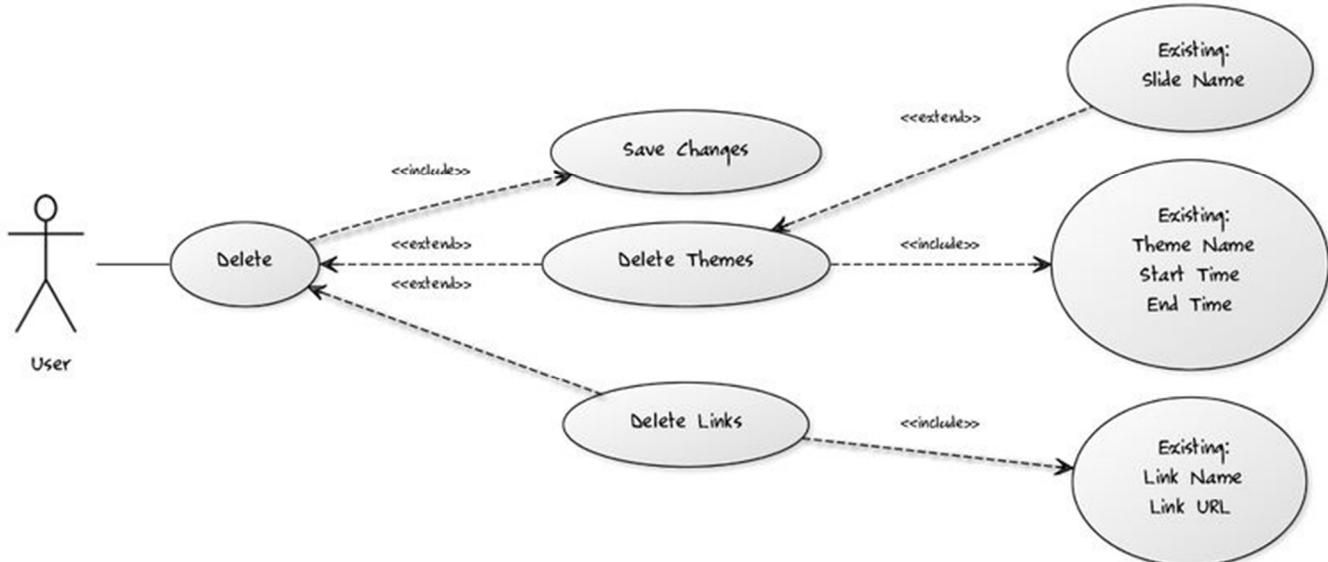


Figure 3 Delete Use Case diagram

6.1.3 Update Use Case

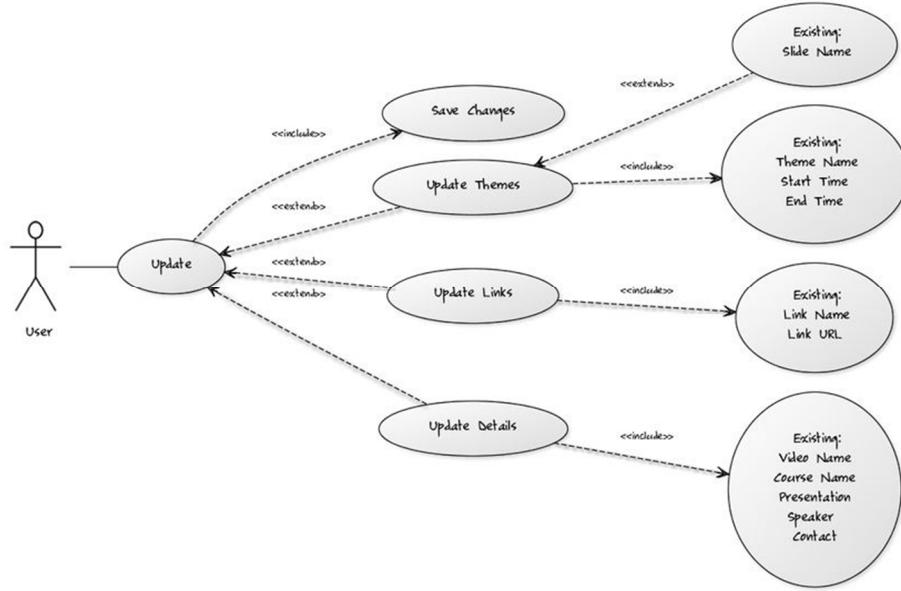


Figure 4 Update Use Case Diagram

6.1.5 Search Use Case Diagram

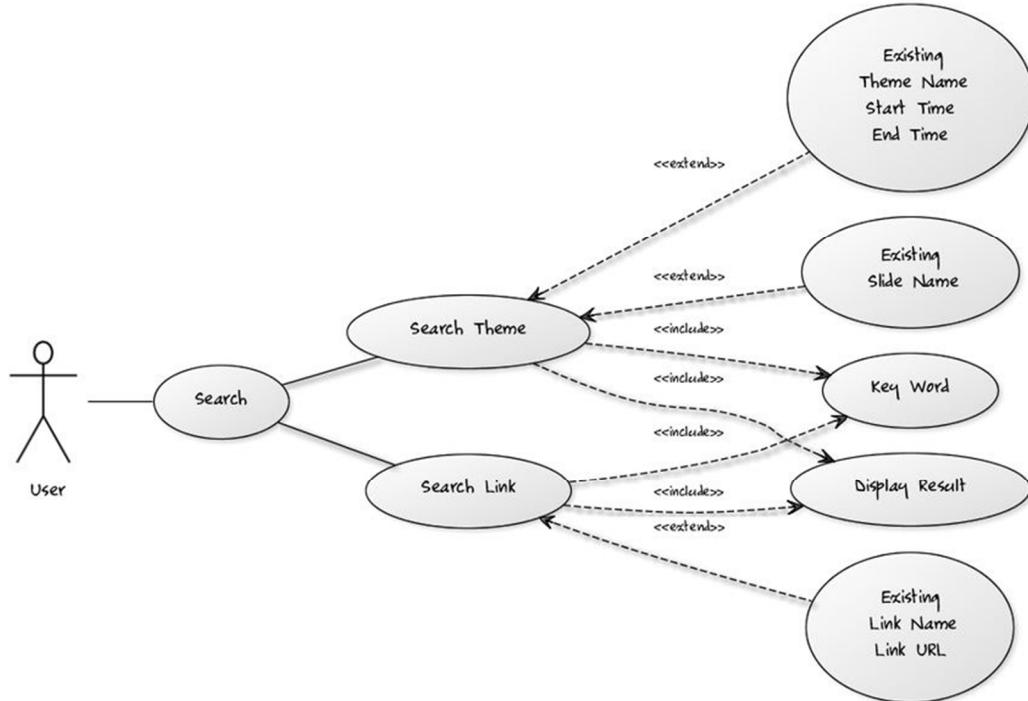


Figure 5 Search Use Case Diagram

6.2 Data Flow Diagrams

A data flow diagram (DFD) is a graphical representation of the "flow" of data through an information system, modeling its process aspects. Often they are a preliminary step used to create an overview of the system which can later be elaborated. DFDs can also be used for the visualization of data processing (structured design).

6.2.1 Data Flow Diagram Level 0 (Context Diagram)

DATA FLOW DIAGRAM

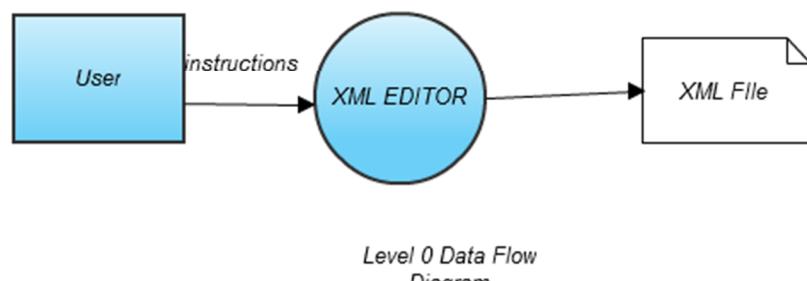


Figure 6 Level Zero Data Flow Diagram

6.2.2 Data Flow Diagram Level 1

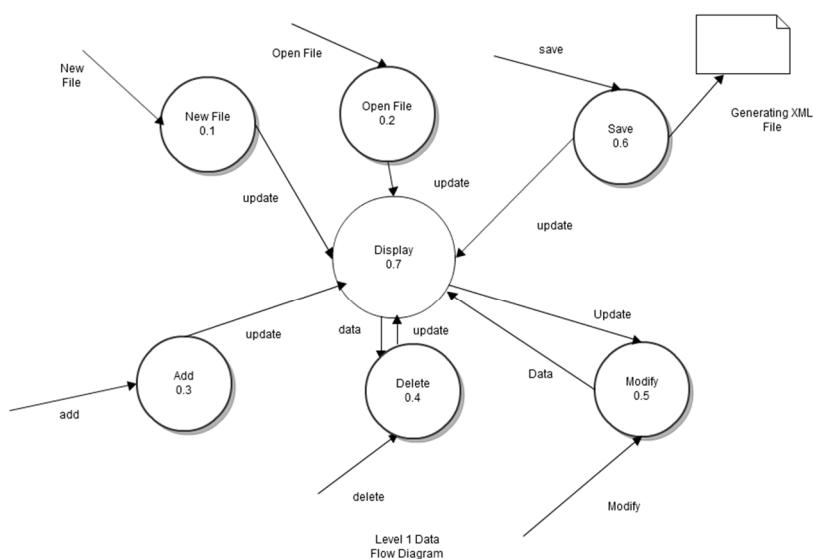


Figure 7 Level One Data Flow Diagram

6.2.3 Data Flow Diagram Level 2

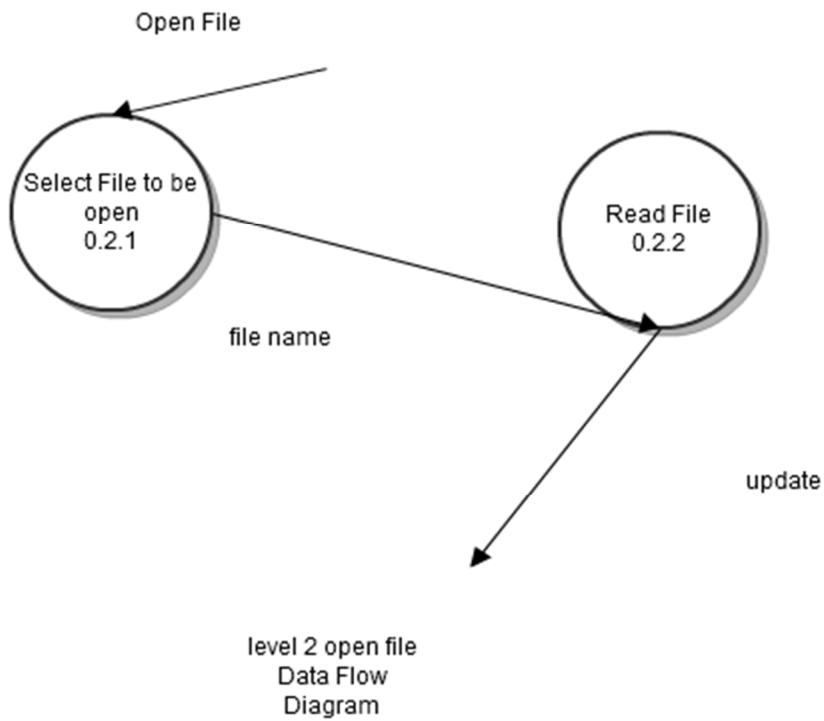


Figure 8 Level Two Data Flow Diagram (Open File)

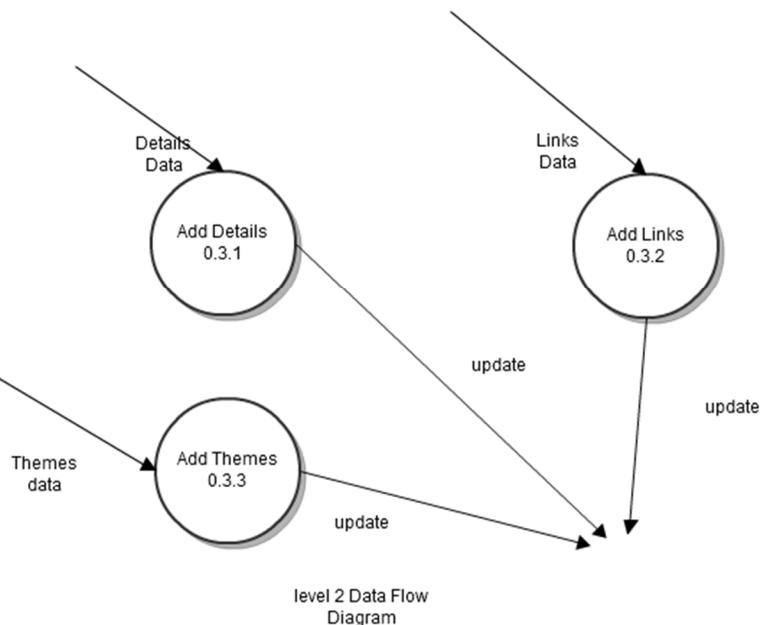


Figure 9 Level Two Data Flow Diagram (Add Process)

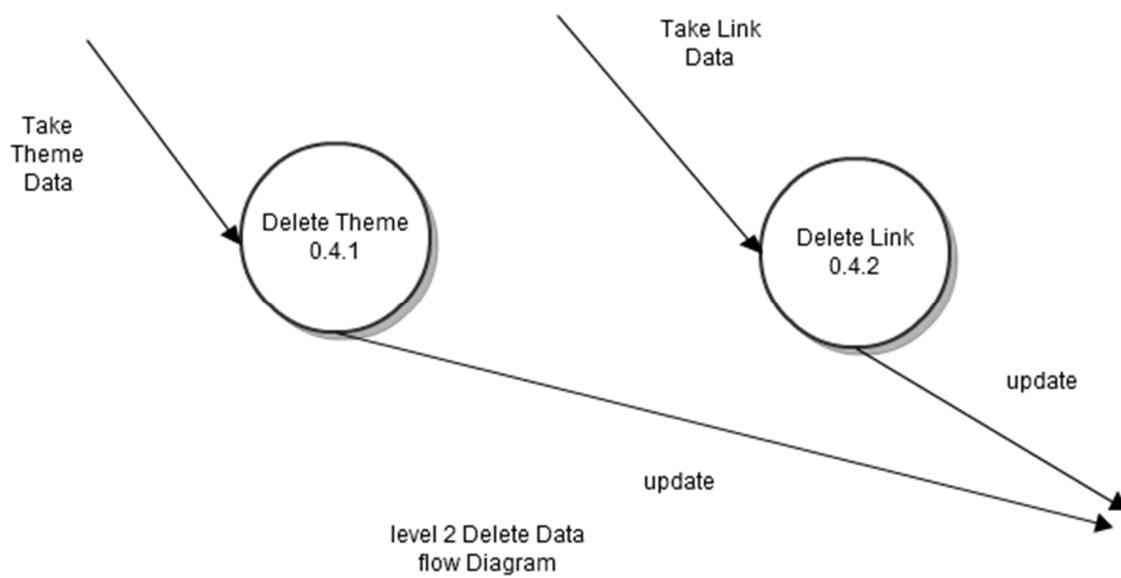


Figure 10 Level Two Data Flow Diagram (Delete Process)

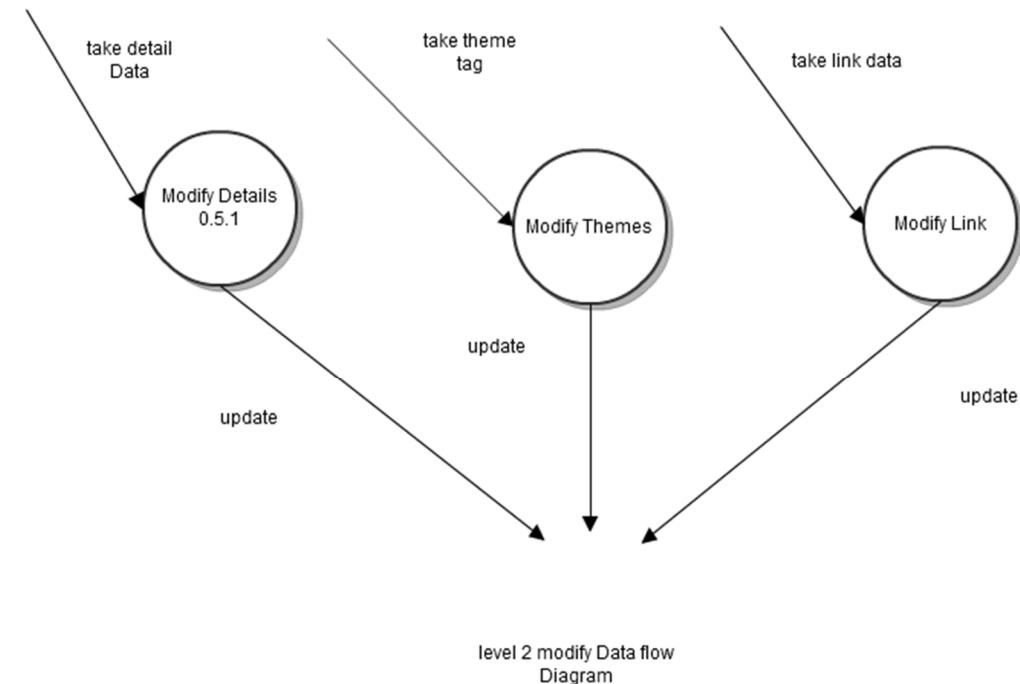


Figure 11 Level Two Data Flow Diagram (Update Process)

6.3 Activity Diagram

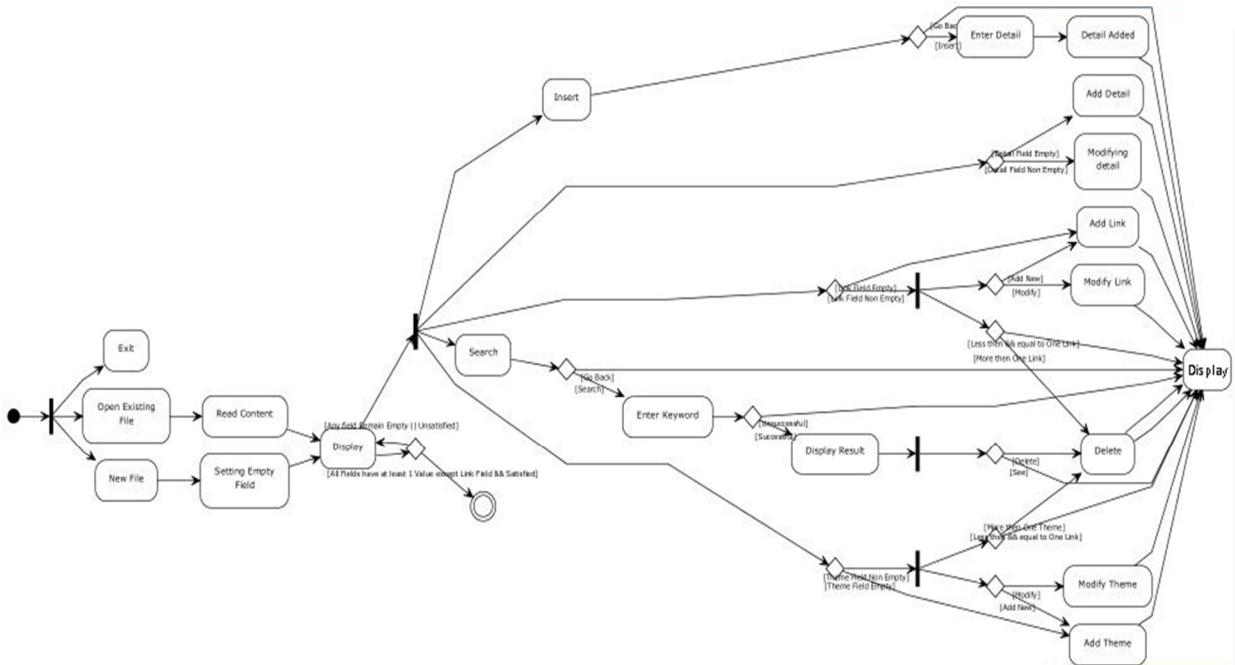
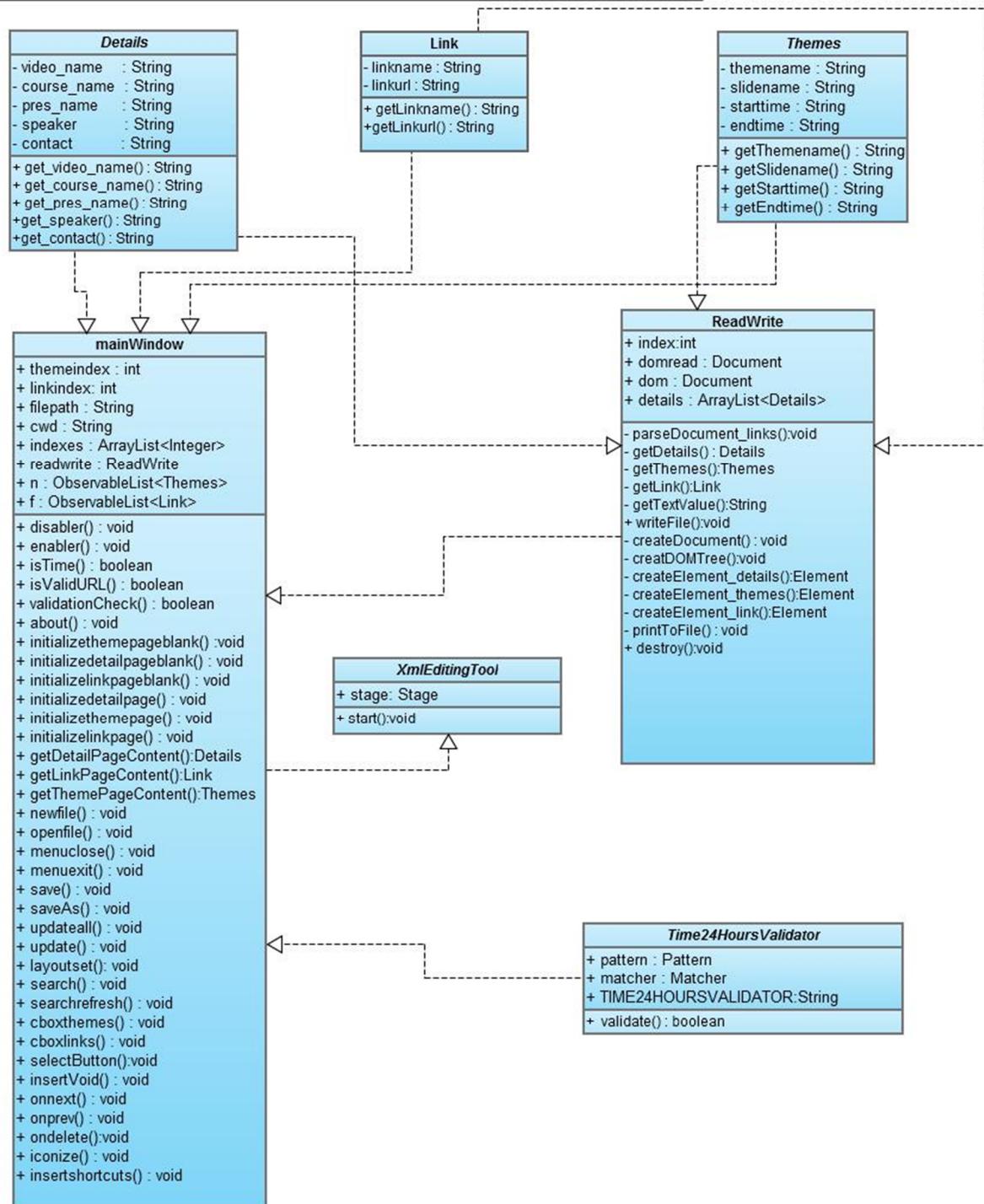


Figure 12 Activity Diagram

6.4 Class Diagram

Class Diagram



6.5 Availability and Maintainability

Main aim towards development of the product is to make this tool available to maximum number of teachers across India and provide quality education to mass through the proxyMITY Tool. There are no specific maintenance requirements for this software, and is expected to work properly after installation of the clients machine. New features can be added and interface can be made more user friendly as per user requirements

6.6 Performance

Whole system is to be developed in JavaFX, which has better support for multimedia environment and expected to provide better performance; with the introduction of JavaFX 2.0 SDK launching time of the multimedia items is also reduced to tremendous extent, as compared to JavaFX 1.3.1

6.6.1 Java APIs for JavaFX

Oracle has introduced a new set of Java APIs that opens JavaFX capabilities to all Java developers, without the need for them to learn a new scripting language. The JavaFX APIs are a variation on typical JavaBeans properties and listeners, and are designed to work well with the lambda expressions coming in future releases of Java SE.

The new Java APIs:

- Allow the use of powerful Java features such as generics, annotations, and multi-threading
- Make it easier for Web developers to use JavaFX from other popular dynamic languages such as JRuby, Groovy, and JavaScript
- Allow Java developers to use other system languages which run on the JVM, such as Groovy, for writing large or complex JavaFX applications

6.6.2 Swing Interoperability

JavaFX 2.0 APIs can be used within a Swing application to provide a smoother transition to JavaFX. JavaFX components, such as WebView, allow developers to extend existing Swing applications and gain experience with the new JavaFX APIs.

6.6.3 JavaFX Binding APIs

A Java API for binding is available in JavaFX 2.0. This includes support for high performance lazy binding, binding expressions, bound sequence expressions, and partial bind re-evaluation. Active contributors for alternative languages, such as Groovy), can take advantage of this binding library to introduce a JavaFX Script-like binding syntax if they choose to do so.

6.6.4 Sequence, Observable List, and Observable Map APIs

For JavaFX 2.0, Oracle will release an `ObservableList` interface, which extends the `java.util.List` interface and is a proper collection, and is also observable. Oracle will also release a

`ObservableMap` interface and implementation for adding listeners (or binding to) instances of `ObservableMap`.

7 Tool and Technologies Used

Tools and technologies for the developed application can be broadly categorized in two sub parts which are:

7.1 For Window and Linux Environment

Following are the tools and technologies used for the desktop application

7.1.1 Java refers to a number of computer software products and specifications from Sun Microsystems, a subsidiary of Oracle Corporation, that together provide a system for developing application software and deploying it in a cross-platform environment. Java is used in a wide variety of computing platforms from embedded devices and mobile phones on the low end, to enterprise servers and supercomputers on the high end. Java is used in mobile phones, Web servers and enterprise applications, and while less common on desktop computers, Java applets are sometimes used to provide improved and secure functionalities while browsing the World Wide Web.

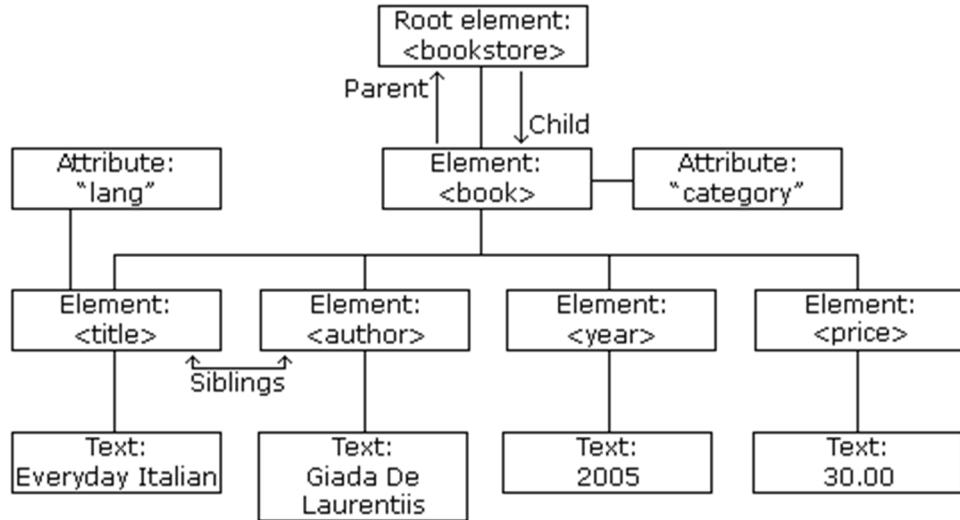
Java Language										
JDK	Tools & Tool APIs	java	javac	javadoc	apt	jar	javap	JPDA	JConsole	Java VisualVM
		Security	Int'l	RMI	IDL	Deploy	Monitoring	Troubleshoot	Scripting	JVM TI
Deployment										
JRE	User Interface Toolkits	AWT			Swing			Java 2D		
		Accessibility	Drag n Drop		Input Methods	Image I/O	Print Service	Sound		
Java SE API	Integration Libraries	IDL	JDBC™		JNDI™	RMI	RMI-IIOP		Scripting	
		Beans	Intl Support		I/O	JMX	JNI		Math	
Lang and Util Base Libraries	Other Base Libraries	Networking	Override Mechanism		Security	Serialization	Extension Mechanism		XML JAXP	
		lang and util	Collections	Concurrency Utilities		JAR	Logging		Management	
Java Virtual Machine Platforms		Preferences API	Ref Objects	Reflection		Regular Expressions	Versioning	Zip	Instrument	
		Java Hotspot™ Client VM				Java Hotspot™ Server VM				
Solaris™				Linux		Windows			Other	

The Java Development Kit (JDK) is a Sun product aimed at Java developers. Since the introduction of Java, it has been by far the most widely used Java SDK. It contains a Java compiler and a number of other important development tools as well as a full copy of the Java

Runtime Environment. The current version, *Java SE 6* (December 11, 2006) — Codename *Mustang* — is bundled with a database manager, facilitates the use of scripting languages (currently JavaScript using Mozilla's Rhino engine) with the JVM and has Visual Basic language support. As of this version, Sun replaced the name "J2SE" with Java SE and dropped the ".0" from the version number.^[12] Other major changes include support for pluggable annotations (JSR 269), lots of GUI improvements, including native UI enhancements to support the look and feel of Windows Vista, and improvements to the Java Platform Debugger Architecture (JPDA) & JVM Tool Interface for better monitoring and troubleshooting.

7.1.2 Dom Parser

The Document Object Model (DOM) is a cross-platform and language-independent convention for representing and interacting with objects in HTML, XHTML and XML documents. Objects in the DOM tree may be addressed and manipulated by using methods on the objects. The public interface of a DOM is specified in its application programming interface (API). The World Wide Web Consortium (W3C), founded in 1994 to promote open standards for the World Wide Web, brought Netscape Communications and Microsoft together with other companies to develop a standard for browser scripting languages, called "ECMAScript". The first version of the standard was published in 1997. Subsequent releases of JavaScript and JScript would implement the ECMAScript standard for greater cross-browser compatibility. After the release of ECMAScript, W3C began work on a standardized DOM. The initial DOM standard, known as "DOM Level 1," was recommended by W3C in late 1998. About the same time, Internet Explorer 5.0 shipped with limited support for DOM Level 1. DOM Level 1 provided a complete model for an entire HTML or XML document, including means to change any portion of the document. DOM Level 2 was published in late 2000. It introduced the "getElementById" function as well as an event model and support for XML namespaces and CSS. DOM Level 3, the current release of the DOM specification, published in April 2004, added support for XPath and keyboard event handling, as well as an interface for serializing documents as XML because DOM supports navigation in any direction (e.g., parent and previous sibling) and allows for arbitrary modifications, an implementation must at least buffer the document that has been read so far (or some parsed form of it).



DOM Parser Tree Example

7.1.3 NetBeans IDE

NetBeans refers to both a platform framework for Java desktop applications, and an integrated development environment (IDE) for developing with Java, JavaScript, PHP, Python (no longer supported after NetBeans 7), Groovy, C, C++, Scala , Clojure , and others. The NetBeans IDE 7.0 no longer officially supports Ruby and Ruby on Rails[1], but a third party plugin allows for development. The NetBeans IDE is written in Java and can run on Windows, Mac OS, Linux, Solaris and other platforms supporting a compatible JVM. A pre-existing JVM or a JDK is not required.

The NetBeans platform allows applications to be developed from a set of modular software components called modules. Applications based on the NetBeans platform (including the NetBeans IDE) can be extended by third party developers.

The NetBeans Platform is a reusable framework for simplifying the development of Java Swing desktop applications. The NetBeans IDE bundle for Java SE contains what is needed to start developing NetBeans plugins and NetBeans Platform based applications; no additional SDK is required.

Applications can install modules dynamically. Any application can include the Update Center module to allow users of the application to download digitally-signed upgrades and new features directly into the running application. Reinstalling an upgrade or a new release does not force users to download the entire application again.

Among the features of the platform are:

- User interface management (e.g. menus and toolbars)

User settings management

Storage management (saving and loading any kind of data)

Window management

Wizard framework (supports step-by-step dialogs)

NetBeans Visual Library

Integrated development tools

NetBeans IDE is a free, open-source, cross-platform IDE with built-in-support for Java Programming Language.

All the functions of the IDE are provided by modules. Each module provides a well defined function, such as support for the Java language, editing, or support for the CVS versioning system, and SVN. NetBeans contains all the modules needed for Java development in a single download, allowing the user to start working immediately. Modules also allow NetBeans to be extended. New features, such as support for other programming languages, can be added by installing additional modules. For instance, Sun Studio, Sun Java Studio Enterprise, and Sun Java Studio Creator from Sun Microsystems are all based on the NetBeans IDE.

7.2For Android Environment

Following tools and technologies were used for developing the android version of the application:

7.2.1 Android SDK (Software Development Kit)

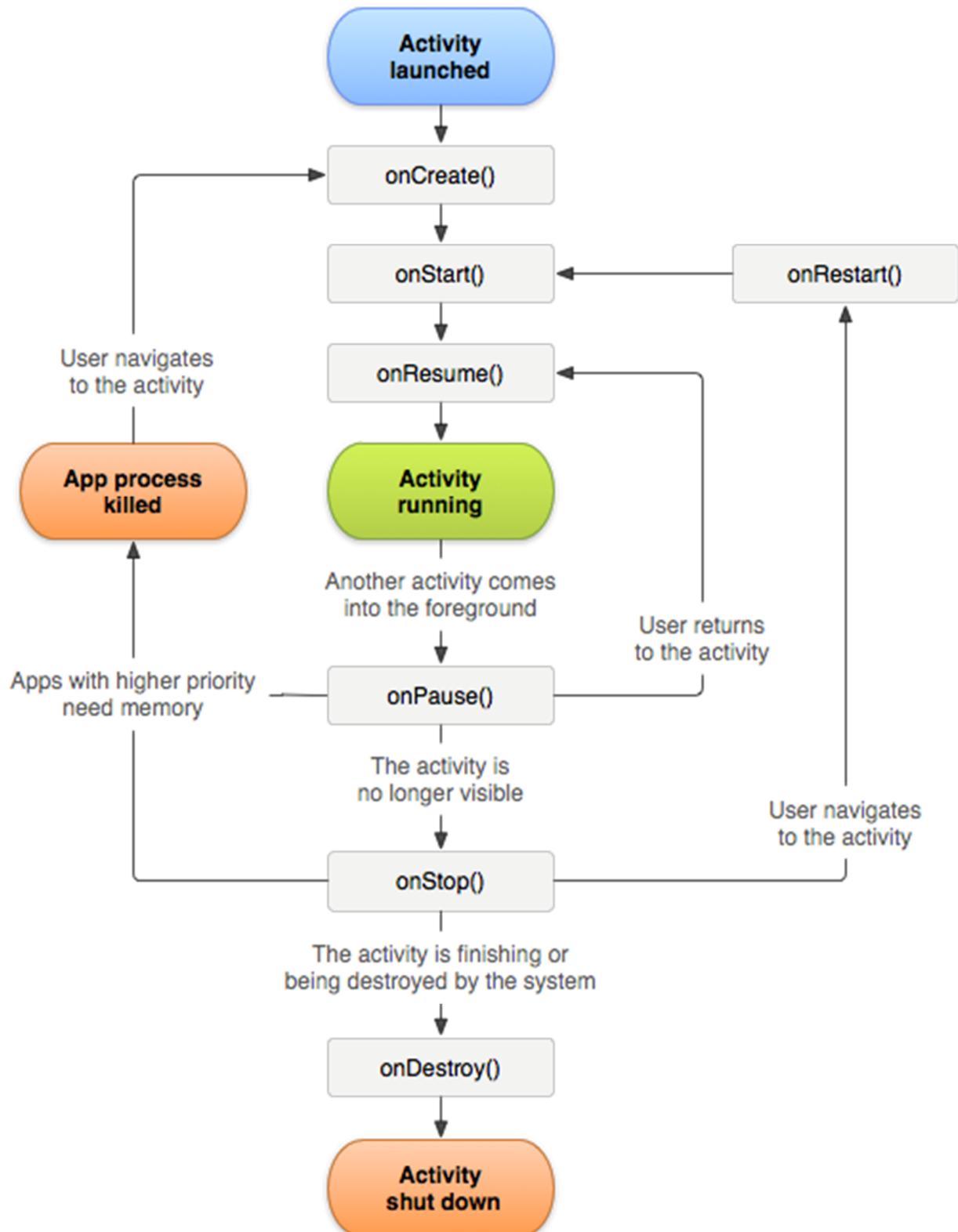
Android software development is the process by which new applications are created for the Android operating system. Applications are usually developed in the Java programming language using the Android Software Development Kit, but other development tools are available. As of April 2011 more than 200,000 applications have been developed for Android, with over 3 billion downloads [2] [3]. The Android platform has also grown to become a favorite among mobile developers. A June 2011 research indicated that over 67% of mobile developers used the platform, at the time of publication

The Android software development kit (SDK) includes a comprehensive set of development tools. These include a debugger, libraries, a handset emulator based on QEMU, documentation, sample code, and tutorials. Currently supported development platforms include computers running Linux (any modern desktop Linux distribution), Mac OS X 10.5.8 or later, Windows XP

or later. The officially supported integrated development environment (IDE) is Eclipse using the Android Development Tools (ADT) Plugin, though developers may use any text editor to edit Java and XML files then use command line tools (Java Development Kit and Apache Ant are required) to create, build and debug Android applications as well as control attached Android devices (e.g., triggering a reboot, installing software package(s) remotely).

Enhancements to Android's SDK go hand in hand with the overall Android platform development. The SDK also supports older versions of the Android platform in case developers wish to target their applications at older devices. Development tools are downloadable components, so after one has downloaded the latest version and platform, older platforms and tools can also be downloaded for compatibility testing

Android applications are packaged in .apk format and stored under /data/app folder on the Android OS (the folder is accessible only to root user for security reasons). APK package contains .dex files (compiled byte code files called Dalvik executables), resource files, etc.



The Activity Life Cycle

7.2.2 XML Pull Parser

XML Pull Parser is an interface that defines parsing functionality provided in XMLPULL V1 API

Pull parsing treats the document as a series of items which are read in sequence using the Iterator design pattern. This allows for writing of recursive-descent parsers in which the structure of the code performing the parsing mirrors the structure of the XML being parsed, and intermediate parsed results can be used and accessed as local variables within the methods performing the parsing, or passed down (as method parameters) into lower-level methods, or returned (as method return values) to higher-level methods. Examples of pull parsers include StAX in the Java programming language, XMLReader in PHP and System.Xml.XmlReader in the .NET Framework.

A pull parser creates an iterator that sequentially visits the various elements, attributes, and data in an XML document. Code which uses this iterator can test the current item (to tell, for example, whether it is a start or end element, or text), and inspect its attributes (local name, namespace, values of XML attributes, value of text, etc.), and can also move the iterator to the next item. The code can thus extract information from the document as it traverses it. The recursive-descent approach tends to lend itself to keeping data as typed local variables in the code doing the parsing, .

There are following different kinds of parser depending on which features are set:

non-validating parser as defined in XML 1.0 spec when FEATURE_PROCESS_DOCDECL is set to true

validating parser as defined in XML 1.0 spec when FEATURE_VALIDATION is true (and that implies that FEATURE_PROCESS_DOCDECL is true)

when FEATURE_PROCESS_DOCDECL is false (this is default and if different value is required necessary must be changed before parsing is started) then parser behaves like XML 1.0 compliant non-validating parser under condition that no DOCDECL is present in XML documents (internal entites can still be defined with defineEntityReplacementText()). This mode of operation is intended for operation in constrained environments such as J2ME

7.2.3 SAX Parser.

A parser that implements SAX (i.e., a SAX Parser) functions as a stream parser, with an event-driven API. The user defines a number of callback methods that will be called when events occur during parsing. The SAX events include (among others):

XML Text nodes

XML Element Starts and Ends

XML Processing Instructions

XML Comments

Some events correspond to XML objects that are easily returned all at once, such as comments. However, XML elements can contain many other XML objects, and so SAX represents them as does XML itself: by one event at the beginning, and another at the end. Properly speaking, the SAX interface does not deal in elements, but in tags. SAX parsing is unidirectional; previously parsed data cannot be re-read without starting the parsing operation again.

There are many SAX-like implementations in existence. In practice, details vary, but the overall model is the same. For example, XML attributes are typically provided as part of the data passed to element events, but can also be provided as separate events. For another, some implementations provide "Init" and "Fin" callbacks for the very start and end of parsing; others don't.

7.2.4 ECLIPSE

Eclipse is a multi-language software development environment comprising an integrated development environment (IDE) and an extensible plug-in system. It is written mostly in Java. It can be used to develop applications in Java, Android and, by means of various plug-ins, other programming languages including , C, C++, COBOL, Haskell, Perl, PHP, Python, R, Ruby (including Ruby on Rails framework), Scala, Clojure, Groovy and Scheme. It can also be used to develop packages for the software Mathematica. Development environments include the Eclipse Java development tools (JDT) for Java, Android Software Development Tool(SDK) Eclipse CDT for C/C++, and Eclipse PDT for PHP, among others.

The initial codebase originated from VisualAge. The Eclipse SDK (which includes the Java sins written for the Eclipse Platform, such as development toolkits for other programming languages(Like android), and can write and contribute their own plug-in modules.

Released under the terms of the Eclipse Public License, Eclipse SDK is free and open source software. It was one of the first IDEs to run under GNU Classpath and it runs without issues under IcedTea.

Eclipse provides the Rich Client Platform (RCP) for developing general purpose applications. The following components constitute the rich client platform:

Equinox OSGi – a standard bundling framework

Core platform – boot Eclipse, run plug-ins[citation needed]

Standard Widget Toolkit (SWT) – a portable widget toolkit

JFace – viewer classes to bring model view controller programming to SWT, file buffers, text handling, text editors

Eclipse Workbench – views, editors, perspectives, wizard.

8. CONCLUSION AND FUTURE WORK

To conclude with, all the assigned tasks have been successfully completed by the team and the above mentioned features were integrated to both desktop and the android version of the application.

- Parsing can be made more generalized. This will allow the user to remove redundant information as well as adding important information to the lecture video.
- This editing mode can be integrated with the proxyMITY tool itself. This will enable the end user to modify the application as per their needs.
- The application can integrate the media player with itself. This will allow the editors to edit the details simultaneously while watching the video. This will decrease the amount of time required to create such files and can also reduce the work load from the editors.

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