TeXchat Project Management Document

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Publication Date: 2013/09/15
Document Version: Version 3.3

Change History:

Date:	Version Update:	Member:	Description:
2013/08/22	1.0	fractals	Document created.
2013/08/24	1.1	fractals	References Updated
2013/08/24	1.2	fractals	Outstanding Risks/Challenges added
2013/08/24	1.3	fractals	Support for Latex and Mimetex Libraries updated
2013/08/24	1.4	fractals	System Description updated
2013/08/24	1.5	fractals	Team Portfolio added.
2013/08/24	1.6	fractals	Responsibilities added for: Michelle Peens
2013/08/24	1.7	fractals	Responsibilities added for: Stephan Botha
2013/08/24	1.8	fractals	Responsibilities added for: Janine Venter
2013/08/24	1.9	fractals	Issue Management Plan updated
2013/08/24	2.0	fractals	Software Development Process updated
2013/08/24	2.1	fractals	Project Progress updated
2013/08/24	2.2	fractals	Software Development Process updated
2013/08/24	2.3	fractals	Project Progress updated
2013/09/15	2.4	Michelle Peens	Kanban board created.
2013/09/15	2.5	Michelle Peens	Kanban board updated
2013/09/15	2.6	Stephan Botha	Kanban board updated
2013/09/15	2.7	Janine Venter	Kanban board updated
2013/09/15	2.8	Janine Venter	Outstanding Risks/Challenges updated
2013/09/15	2.9	Janine Venter	Team Profiles updated
2013/09/15	3.0	Janine Venter	Project Scope updated
2013/09/15	3.1	Janine Venter	System Description updated
2013/09/15	3.2	Janine Venter	Support for Latex and Mimetex Libraries updated
2013/09/15	3.3	Janine Venter	Messaging updated

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1. Introduction

1.1 Purpose

The purpose of this document is to provide our client with a high level overview of the architectural strategies or tactics and patterns that will form a basis for the development of the Latex Chat Application. The overall outline of these concepts and how they are implemented will provide our team with a means to achieve the given set of requirements as previously agreed upon in the Requirements and Design document.

1.2 Document Conventions

- Document Formatting: LaTeX

1.3 Project Scope

The aim of the project is to develop an open source android XMPP chat client which supports the embedded LaTeX base equations which are rendered as images. LaTeX based equations will be rendered on the handset to produce mathematical equations. Our system will also provide the ability to view, edit and correct equations before sending. The application will provide a similar functionality to yaxim. Exchange of images and mathematical expressions will be possible through our software solution. The TeXchat application will have the ability to show a preview of the entered text send the equation as LaTeX code and then render it on the receiving end on the client handset.

1.4 References

- Mr. Will van Heerden.

2. System Description

The goal of our software application is to provide a chat service that will allow users to exchange messages and also to send mathematical equations in a rendered image format. The application is intended to provide a service to users that require the ability and support for a chat client that allows them to communicate more efficiently and effortlessly in a scientific, and mathematical context. It will provide a more usable mobile version of a Latex chat application.

Support for LaTeX and MimeTeX Libraries
The final application will have to make use of a Latex based library for the rendering of equations as images on the mobile device. For this reason we have implemented support for the MimeTeX library, through the use of the Android NDK (Native Development Kit), which allows us to embed the native C/C++ code of the MimeTeX library, in the source code of this release. The library is compiled through Eclipse using a special makefile that sets specific compiler flags to indicate that it is in math mode and not text mode.

Messaging
Our final goal is for messaging to be possible between multiple clients, and the support for sending Latex based equations, rendered on the client side and displayed as images on the handheld device. In this release however, our server supports two initial users, and have capabilities for them to send plain text messages and display these in a easy to understand manner. The ability to create, render, view and send mathematical equations have been implemented and is currently working. It is now possible to send and receive these equations in image format between the two clients. These messages should be stored statically on the device for later retrieval. For this purpose a SQLite database was implemented.

Login
A user should be authenticated by some type of login component. This has been implemented during the initial phases of development of this application. The server that our application uses provides the basic functionality for this authentication component, and uses a username and password based authentication method.

3. Software Development Process

The process/methodology we are using throughout the development of our software solution for the Latex Chat Application will be a scaled down version of RUP, to accommodate our smaller group size, in conjunction with agile approaches, to accommodate the initial assumptions that the clients requirements for the application will change during the development of the application.

This approach of combining the structured methods of RUP software development with agile approaches will allow us a structure for developing our software solution in an iterative manner, which will allow for changes, while still being able to design, code and test each version of its release in a controlled manner against the requirements set out for that specific release.

Each release will have requirements, design, implementation, testing and integration phases, which are in line with the RUP process, and since this approach is based on regular and consistent user or client involvement, it will allow for changes in the requirements by the client during each release, which is in line with our agile approach.

4. Team Profile

Michelle Peens
- Documentation
- Designing of the database
- Development of the system.
- Testing
- Project management
- Problem solving

Stephan Botha
- Documentation
- Development of the system
- Testing
- Project management
- Problem solving

Janine Venter
- Setting up meetings with the client and daily group meetings
- Documentation and converting documentation to LaTeX documentation.
- Testing
- Development of the system.
- Project management
- Problem solving

Issue Management Plan

- Issues are handled by discussing them with our client, as well as trying to resolve the issues by either working on it together or by doing research on the internet.
- All issues are resolved as quickly as possible except when it is a big hurdle.
- All issues are discussed openly.

6. Project Progress

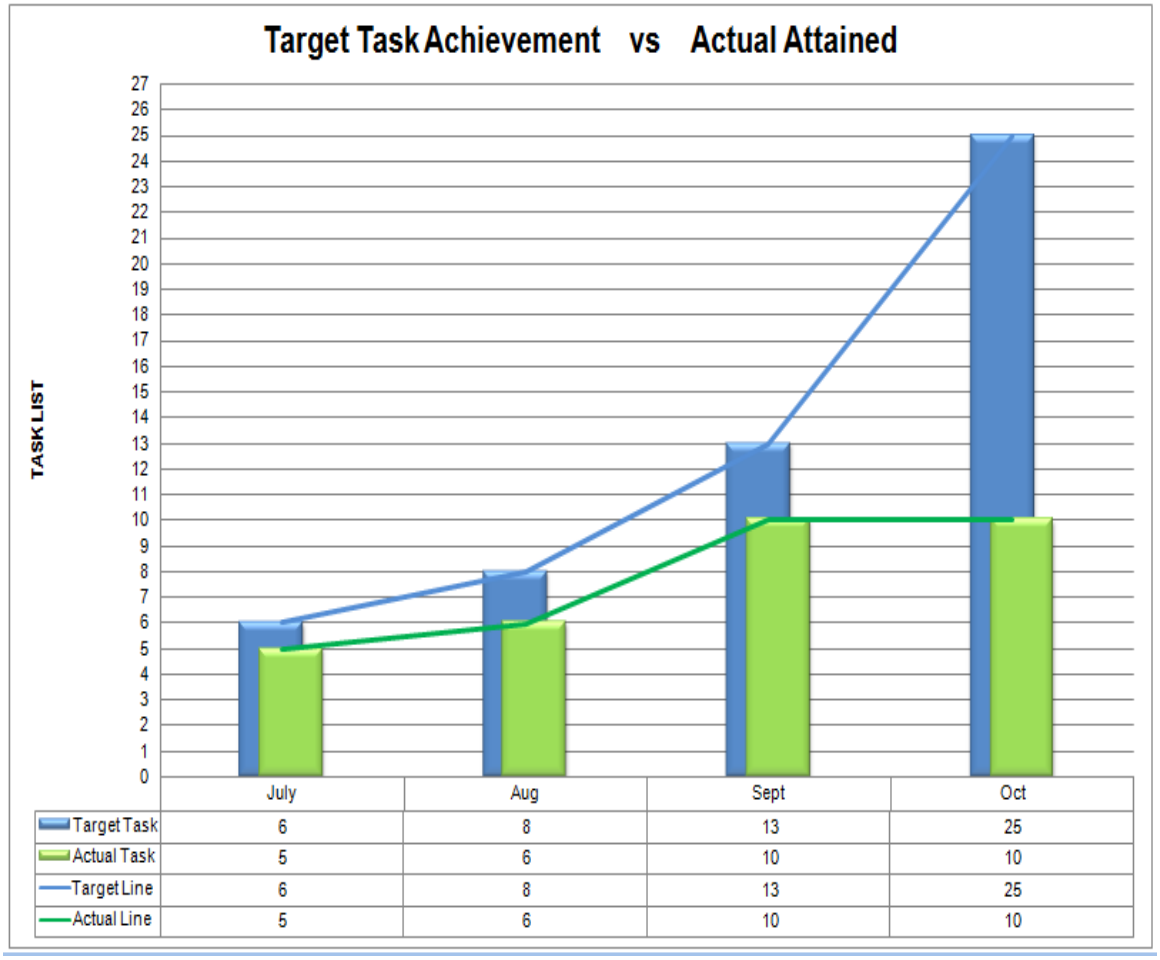
During this release of our software solution we aimed to create the basis for further development phases. This release is still in the initial phases of the overall development, and therefore only includes basic functionality as required for this release, namely:

- The application supports user login, and status update to 'online' on the server side.
- It allows the user to view messages that was previously sent, through making use of an SQLite database on the client side.
- The application has basic client chat support, in that it allows for sending basic text messages between clients on the server through the XMPP protocol.
- The Android NDK has also been included, so as to support the use of native code in the application. This feature will be further developed in the next release to support the Mimetex libraries.

6.1 Kanban Board

Tasks(To Do)	**In Progress**	**Completed**
Visual Aspects ○ Display Of Messages. ○ Display Of Various Pages.	User Authentication.	User Login Component.
User Profile Functionality: ○ Profile Picture. ○ Status Update. ○ Online / Offline. ○ General Information.	Unit Testing ○ UI testing ○ Services testing	SQLite Database
Logo/Icon Design.	Integration Testing.	Android NDK
Predefined Expression Image Selections	Documentation	Including Mimetex Lib
Adding/Deleting Contacts	Exception Handling	Image Rendering
Security Features (Encryption)	Settings Page	Expr. String Handling
Integration Testing	Stability of Application	Unit Testing ○ Services Testing ○ Database Testing
Test Usability	Online Server	Documentation
Documentation	Visual Aspects	Exception Handling
Exception Handling		

6.2 Burndown Chart Progress Chart



[Figure 1] Burndown Chart

Task:	Task List:
User Login Component	1
View Contact List	2
Message Sending Component	3
Exit Component	4
SQLite Database	5
Android NDK	6
Mimetex Library	7
Image Rendering	8
String Handling	9
Unit Testing	10
Integration Testing	11
Exception Handling	12
Database Cleanup	13
User Registration	14
User Authentication	15
Security Features	16
Settings Page	17
Visual Aspects	18
User Profile Functionality	19
Logo / Icon Design	20
Predefined Expression Images	21
Adding / Deleting Contacts	22
Unit Testing	23
Integration Testing	24
Exception Handling	25

7. Outstanding Risks/Challenges

- The aesthetics of the application is less of a challenge, but making it usable and user friendly is more challenging.

8. Open Issues

Open Issues are only relevant towards the Android application itself, there are no open issues in terms of project management.
Open Issues in the development of the application:

- Aesthetics of the application
- Usability

9. Glossary

- Agile - Development methodology
- NDK - Native Development Kit