
Software Requirements Specification

for

Soothsayer

Version 2.0 approved

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Revision History

Date	Notes	Version
02/15/2014	**Rough draft.**	**1.0**
02/16/2014	**Writing session.**	**1.1**
04/30/2014	**Final version.**	**1.2**

1. Introduction

1.1 Purpose

This document is designed to specify the software requirements needed for developing the Soothsayer system, a project created on behalf of the Aurora Forecasters at the Geophysical Institute. Soothsayer is meant to replace the functionality of the current forecast system, create a forecast database, and to provide an extensible framework for hand-off to the Forecast group.

1.2 Document Conventions

We will call the system we are constructing **Aurora Soothsayer**, or just **Soothsayer**. **Forecaster, customer**, or **client**, will be any member of the group for whom Soothsayer is being developed. The **scientist** is a forecaster who interacts with the Soothsayer database and has the ability to modify its content. The **administrator** is a client who has root access to Soothsayer's subsystems and is able to modify code. The **moderator** is responsible for running the web forum and is able to add/delete/edit all content run on the forum. **Web client** will refer to any client accessing the Soothsayer website. In cases where the distinction matters, **mobile client** will mean any web client whose user-agent claims to be a mobile device. **Users** will be web clients who have created an account with the Soothsayer system, and **anonymous users** will be web clients who have not provided user credentials.

1.3 Product Scope

Soothsayer will be responsible for acquiring, parsing, and storing data pertaining to several different forecasting sources. Further, it will display that data in accessible form on a website, and possess a notification system.

1.4 References

The Nowcast - http://www.swpc.noaa.gov/ftpdir/lists/wingkp/wingkp_list.txt
The 1-Hour Forecast - http://www.swpc.noaa.gov/ftpdir/lists/wingkp/wingkp_list.txt
The 3-Day Forecast - http://www.swpc.noaa.gov/ftpdir/forecasts/geomag_forecast/0120geomag_forecast.txt
The 28-Day Forecast - http://www.swpc.noaa.gov/ftpdir/weekly/27DO.txt
The Carrington Rotation - http://alpo-astronomy.org/solar/rotn_nos.html

2. Overall Description

2.1 Product Perspective

Soothsayer will be a distributed application, replacing the malfunctioning features of the actual system; with additional features.

2.2 Product Functions

Soothsayer will have the following functionality:

2.2.1 Automatically download data for the nowcast, 1-hour forecast, 3-day forecast, 28-day forecast, and the Carrington Rotation.

2.2.2 Convert different data formats to a unified, JSON object format.

2.2.3 Maintain a historical database for further scientific experimentation and research.

2.2.4 Host a web interface that provides forecast information.

2.2.5 Host a website to which users can log in, and subscribe for newsletter updates.

2.2.6 Host a website that provides a Photo Gallery in which users can upload photos.

2.3 User Classes and Characteristics

Users will be able to view forecast data, see the forecast plotted in several maps and in a Carrington Rotation Graph. Users will also be able retrieve forecast data from the recent past (as dictated by Soothsayer Administrators); scientists will be able to study that data. The forecaster can insert special forecast comments that display on the front page of the website. Users can receive notifications and forecast announcements, as well as upload photographs to be displayed on the website. The system will be available for both web client and mobile clients. Anonymous users can only view web page contents that are publicly available.

2.4 Operating Environment

The Soothsayer system runs on a Linux machine, it is known to work on Ubuntu 14.10 and 14.04 servers. As servers, the environment will include a mysql-compatible database such as MariaDB. The user will interact with the system through his web browser from either his laptop, desktop or mobile device. The website will be built using Drupal 7 content management system.

2.5 User Documentation

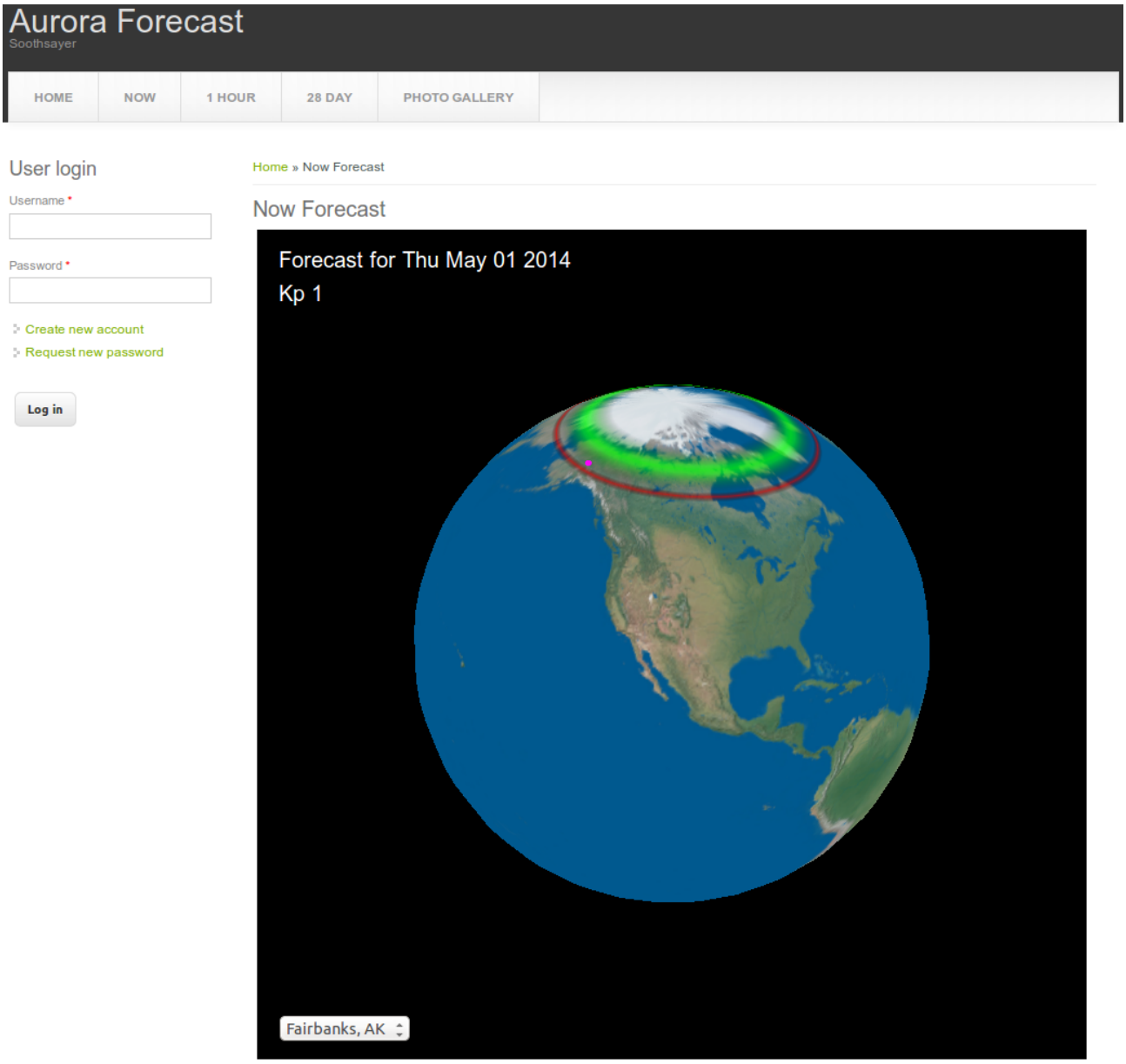
A design document will contain implementation specifics. Installation documentation and developer's documentation must be provided.

2.6 Assumptions and Dependencies

Soothsayer is completely dependent upon the NOAA website's data delivery service. To a lesser extent, we rely on the Carrington Rotation information, which has been redefined at least one time in the past, but as long as it is standardized, is not a tight coupling.

3. External Interface Requirements

3.1 User Interfaces



Home page mockup.

User login

Username *

Password *

Create new account

Request new password

Log in

Home » Photo Gallery

Photo Gallery

Aurora Canada

Uploaded by: rpkolesnik

Aurora Test

Uploaded by: rpkolesnik

Comment:
Aurora Test
Location:
Alaska Fairbanks
GPS:
64.8436° N, 147.7231° W
Camera:
Nikon

Photo gallery mockup.

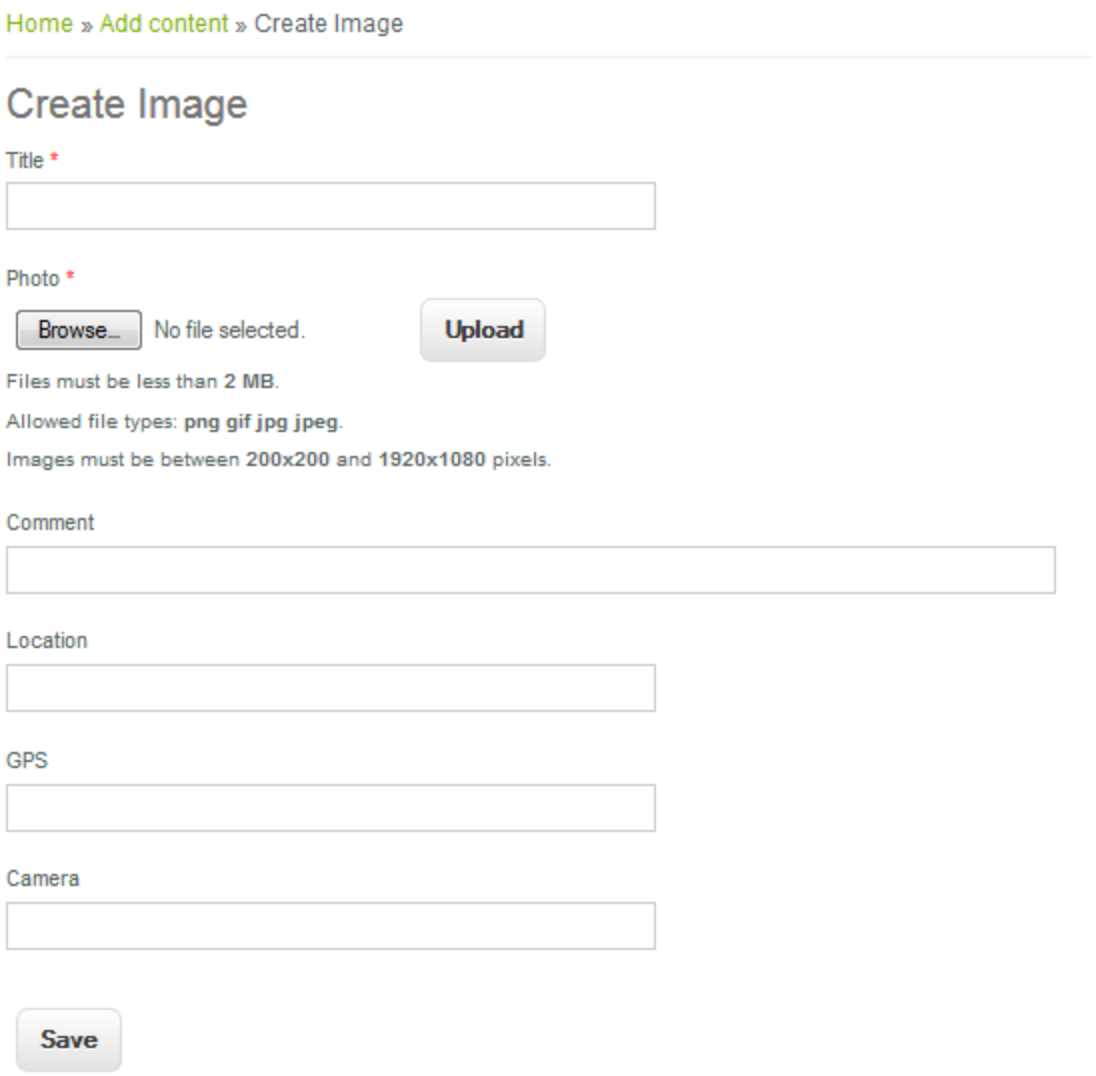
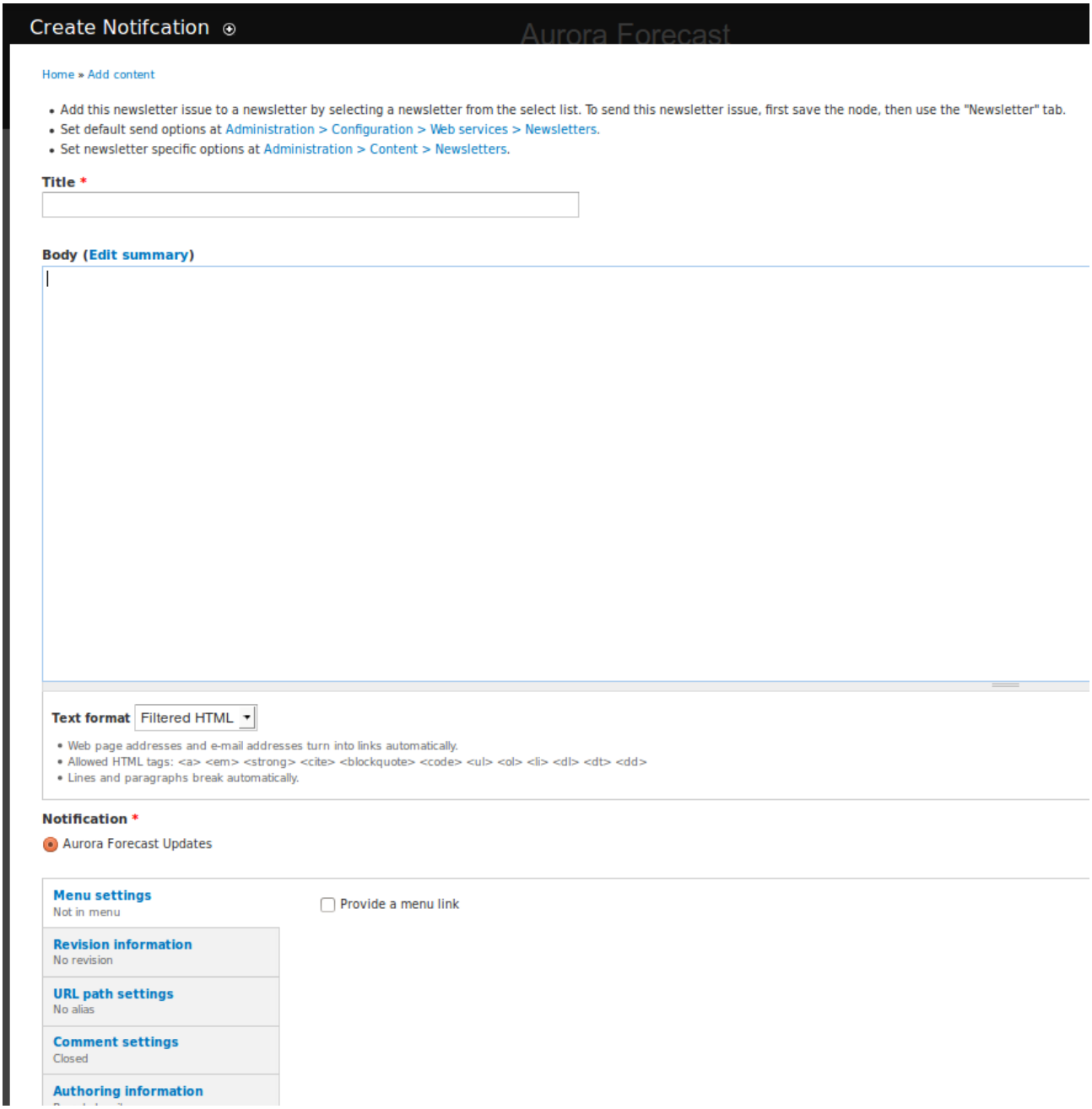
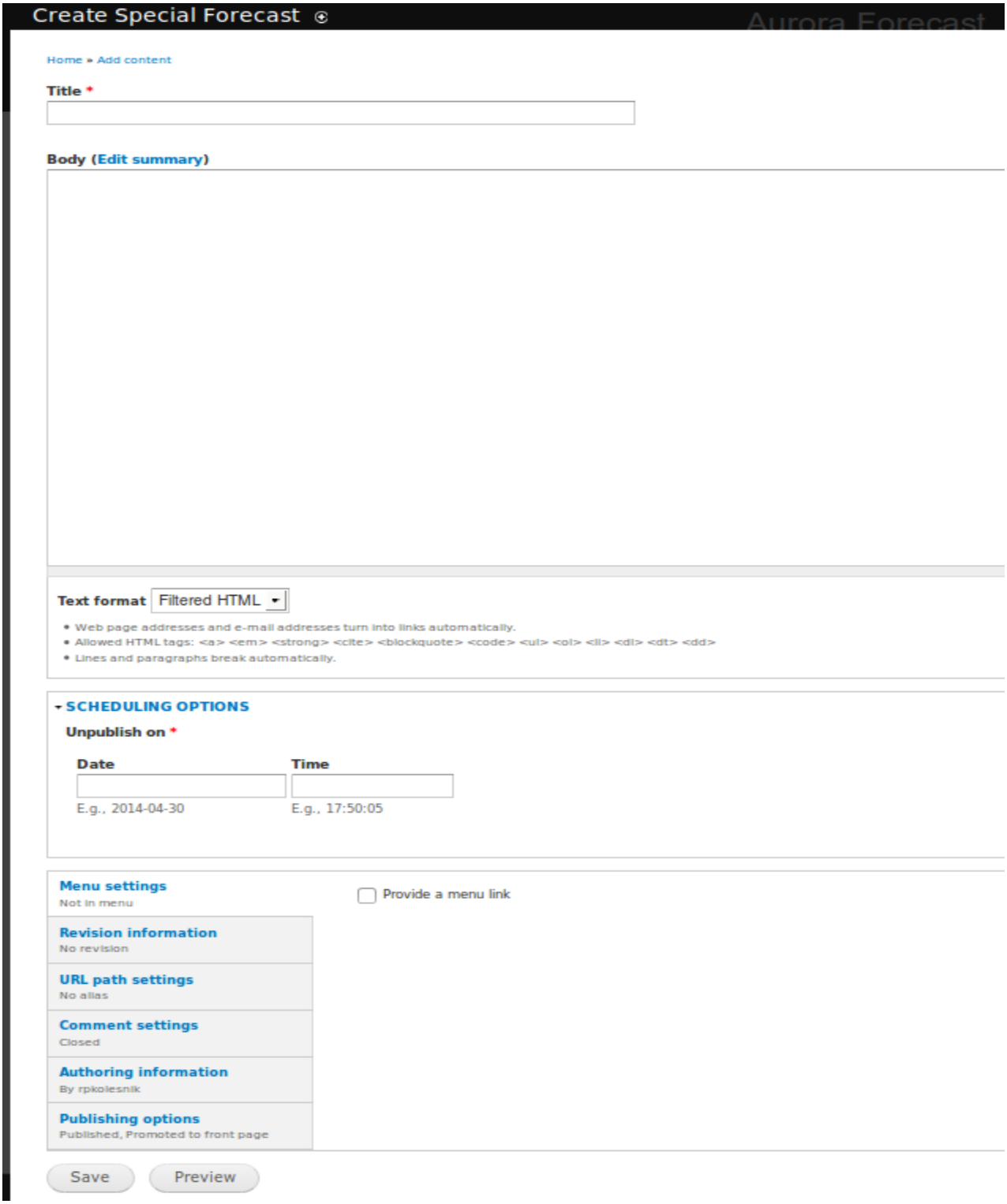


Image upload mockup.



Notification mockup.



Create special forecast mockup.

3.2 Hardware Interfaces

Soothsayer requires the use of any computer (laptop, desktop, or mobile) that is HTML5 compliant.

3.3 Software Interfaces

Soothsayer will be supported by any HTML5-compliant web browser.

4. System Features

4.1 Forecast Retrieval

4.1.1 Description

Data for Nowcast, 1-hour, 3-day, 28-day forecast, and Carrington Rotation shall be pulled from an external source and stored in the database.

4.1.2 Functional Requirements

Data for all the forecasts will need to be downloaded from an external site, converted into JSON format, and entered into the database. Shall be able to run as a cron job.

4.2 Forecast Database

4.2.1 Description

All forecast data will be stored in a central database. This database will be available for public download, with administrators able to determine how much can be downloaded at any given time.

4.2.2 Functional Requirements

Forecast data shall be accessible to web clients in a standard format.

4.3 Special Forecast Entry

4.3.1 Description

The forecaster will be able to enter special forecast data into a form on Drupal, which will be published to the front page of the website.

4.3.2 Functional Requirements

An interface shall be provided to the forecaster to enter special forecast information.

4.4 Notification Service

4.4.1 Description

A notification system shall provide important forecast data to subscribers.

4.4.2 Functional Requirements

A list of subscribers shall be stored, and subscribers who wish it shall be notified of upcoming forecast information.

4.5 Notification Subscription

4.5.1 Description

Web clients shall be able to subscribe to forecast notifications.

4.5.2 Functional Requirements

Web clients shall have an interface through Drupal to subcribe to the notification service.

4.6 Notification Subscription Cancellation

4.6.1 Description

Subscribers shall be able to unsubscribe from forecast notifications.

4.6.2 Functional Requirements

Web clients shall have an interface through Drupal to unsubscribe from the notifications..

4.7 Web Interface

4.7.1 Description

A web interface shall be provided to web clients so they can browse forecast information.

4.7.2 Functional Requirements

The web interface shall support all standard screen sizes.

4.8 Mobile Web Interface

4.8.1 Description

A web interface shall be provided to mobile clients so they can browse forecast information on their phone, tablet, or other small screened device.

4.8.2 Functional Requirements

All mobile devices shall be supported.

4.9 Photo Uploader

4.9.1 Description

Web clients shall be able to upload photos to the site.

4.9.2 Functional Requirements

An interface shall be required for web clients to upload photos. Uploaded photos shall be moderated by officials designated by the forecaster group. Only users can upload photos.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

Soothsayer will provide access to the website at a minimum of 16,000 hits per minute.

5.2 Security Requirements

The general public will be able to view the aurora forecasts and associated information, without authentication as anonymous users. Members of the general public who become authenticated users shall have some degree of uploading capability. Finally, there will be several users designated as moderators for the photo gallery, who shall be approved by the forecaster group and have some elevated privileges to police the content system.

5.3 Software Quality Attributes

Soothsayer will provide an easily accessible and intuitive interface to the general public. Users will be able to navigate to the web page, view the various Aurora forecasts (Now cast, 1-hour forecast, and the Carrington Rotation chart that displays 3-day and 28-day forecasts, along with the solar cycle information); upload photos to a forum, and view information regarding the Aurora.

Appendix A: User Stories

As a user, I want to see auroral activity for tonight. I go to the website and check the forecast. The real-time forecast is displayed by default.

As a user, I would like to be alerted when an aurora is about to happen. I would like lots of options so I can pick the one that best suits my needs: text messaging, Twitter alerts, Facebook alerts, email…

As a user who has some interest in data, I would like to have access to an XML feed so that I can crunch my own numbers.

As a user, I would like to be able to chat with other people interested in auroras and share some of my photographs.

As the scientist, I would like to see prediction accuracy by looking at real-time vs long term predictions.

As the administrator, I would like to be able to easily update the system when formats change, and extend features without major headaches.