Rx Interact
Software Design Document

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INTRODUCTION

Purpose

This software design document describes the architecture and system design of Rx Interact. The intended audience is software developers who wish to understand the architecture of Rx Interact.

Scope

Provide a description and scope of the software and explain the goals, objectives and benefits of your project. This will provide the basis for the brief description of your product.

SYSTEM OVERVIEW

Rx Interact is designed to give doctors a way to check drug to drug interactions for a patient. It gives the doctors information regarding the severity and likelihood of the interaction and a description of the interaction.

It is designed to be used on a tablet-based computer using a finger. The application runs inside a web browser and uses standards based technology to present the information.

SYSTEM ARCHITECTURE

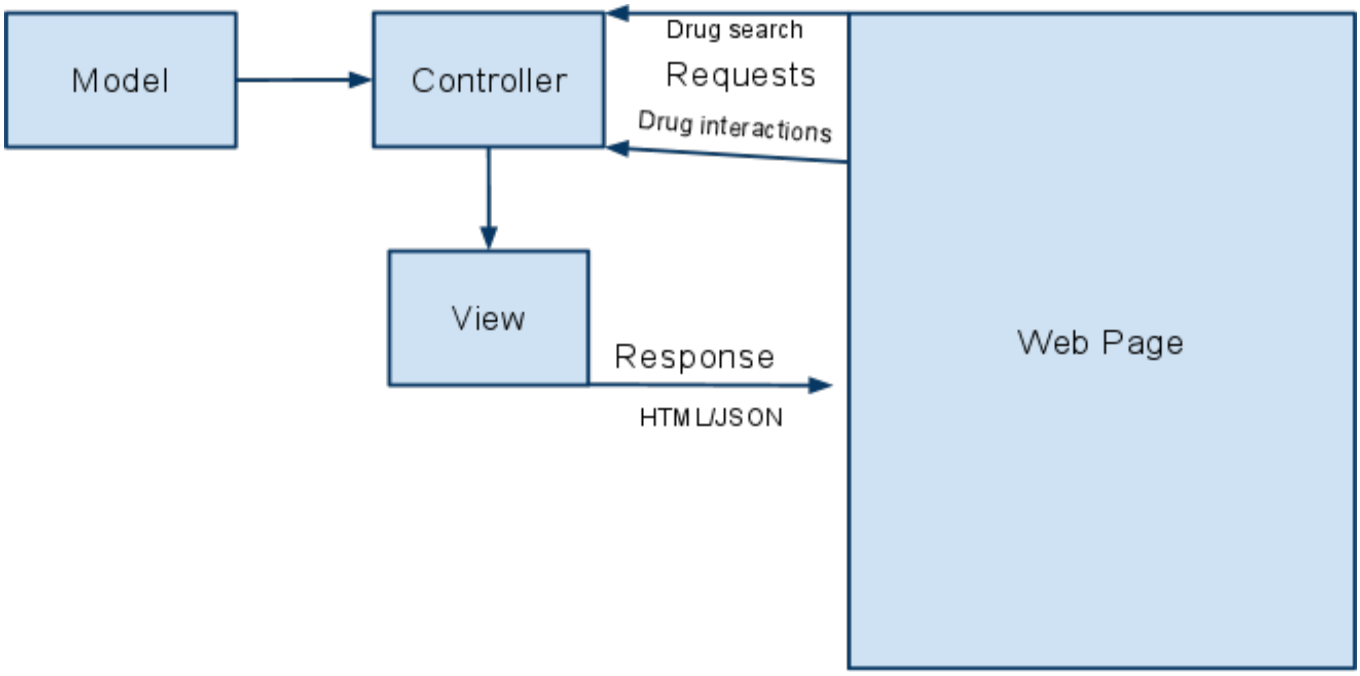
Architectural Design

The drug information is stored in a relational database.

The design patterned used is the Model-View-Controller pattern. The model is responsible for modeling the data and providing data access methods such as searching or retrieving by ID. The controller is responsible for gathering all the information regarding the user's current request, using the models to fetch the appropriate information, and sending that payload to the view. The view is responsible for rendering the information and presenting it to the user.

The application is made up of a single web page that contains the graph rendering and

drug rendering logic.



Design Rationale

The MVC model was chosen due to it's natural fit for the request and response model that is inherent to web interactions. The Rails framework provides all the necessary structure and machinery for using MVC over HTTP.

DATA DESIGN

Data Description

The data for Rx Interact is provided by DrugBank.ca. The data is available for download at http://drugbank.ca/downloads and is provided in a XML document. The document provides the name, description, pharmacology, and any potential drug interactions.

Rx Interact is able to import this XML file and translate its structure to the relational

database used by Rx Interact by iterating over each drug and each interaction within that drug and creating the appropriate rows in the database.

Data Dictionary

There are two data structures in Rx Interact; Drug and DrugInteraction. These are represented in both a model in the application and tables in the database.

Drug

This is a fundamental type in Rx Interact. It has the following properties:

- ID, integer, primary key, auto incrementing.
- Name, nvarchar(512)
- Description, text
- Pharmacology, text
- DrugBank ID, integer
- Created Date, date time
- Modified Date, date time

DrugInteraction

A single drug to drug interaction is made up of two drugs that interact with each other.

- ID, integer, primary key, auto incrementing.
- Drugbank_Id, integer, foreign keyed to Drug.DrugBank_Id
- Interaction_Drugbank_Id, integer, foreign keyed to Drug.DrugBank_Id
- Description, text
- Severity, floating point
- Likelihood, floating point

HUMAN INTERFACE DESIGN

Overview of User Interface

The application will be designed to be used from a tablet-based device using a finger to interact with the user interface. The application will provide search functionality so the user can locate the drugs they want to test for interactions. Once located and selected a graph display the severity and likelihood of the interaction, along with exact percentages and a description available below the graph.

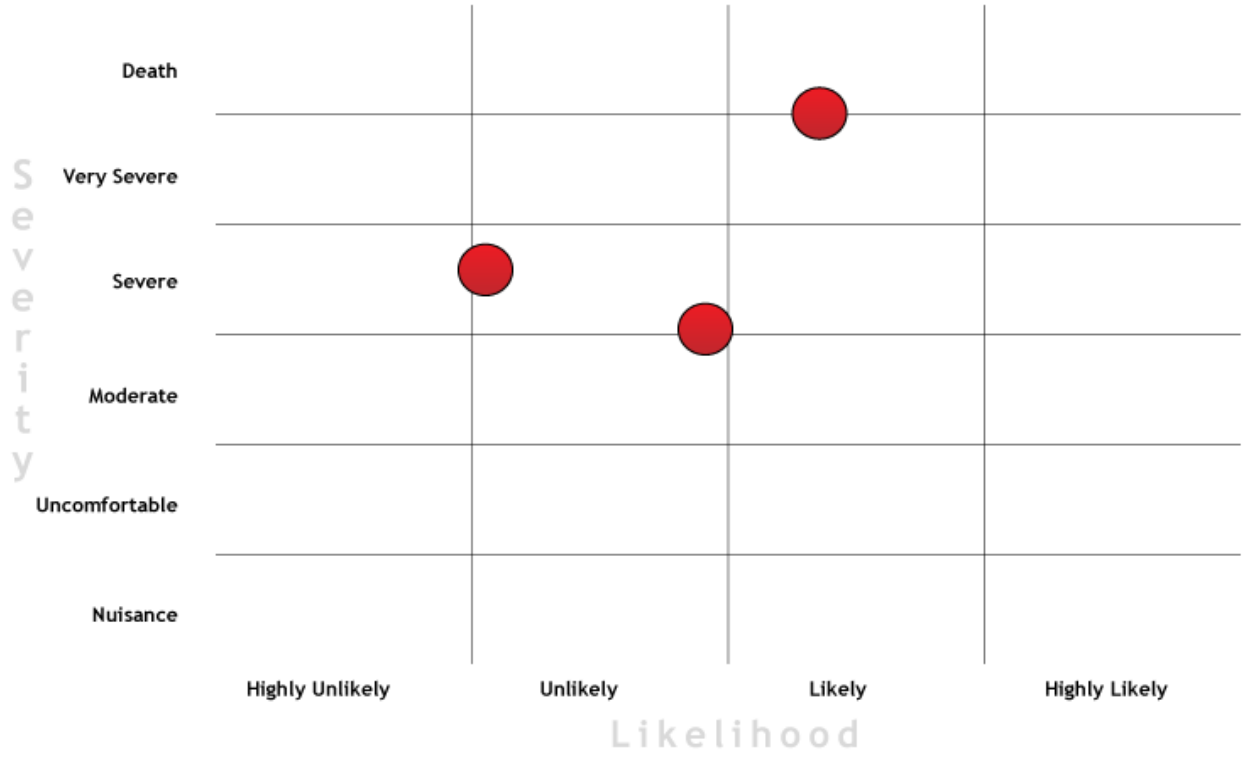
GLOSSARY OF TERMS

Git	Git is a source control system, otherwise known as a version control system.
JSON	JavaScript Object Notation
HTML	Hyper Text Markup Language
MVC	Model-View-Controller

Rx Interact

Abciximab ✗ Trastuzumab ✗ Doxorubicin ✗

Interaction Graph (3)



Interaction List (3)

Severity	Likelihood	Drugs	
🔴	🔴	Trastuzumab with Doxorubicin	>
🟠	🟡	Trastuzumab with Abciximab	>
🟠	🟡	Doxorubicin with Abciximab	>

Rx Interact

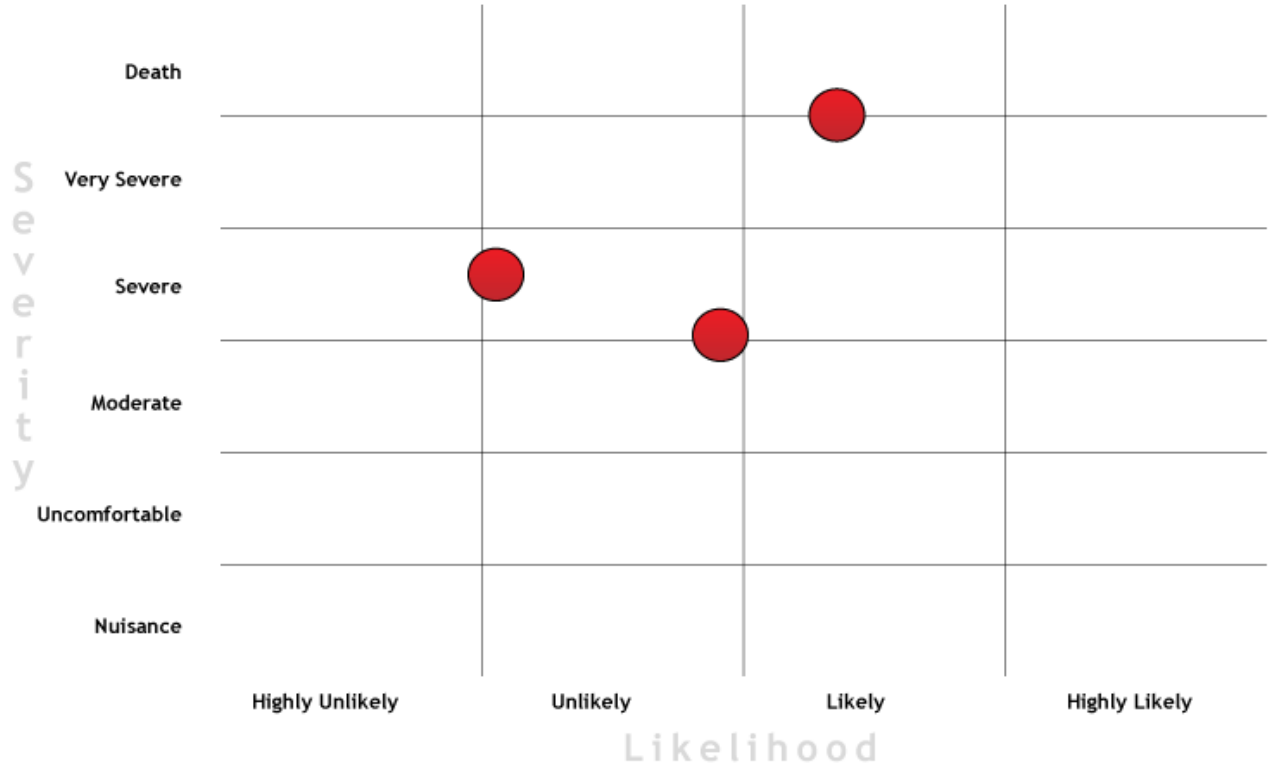
Car

Carbimazole
Carmustine

Abciximab x

Trastuzumab

Interaction Graph (3)



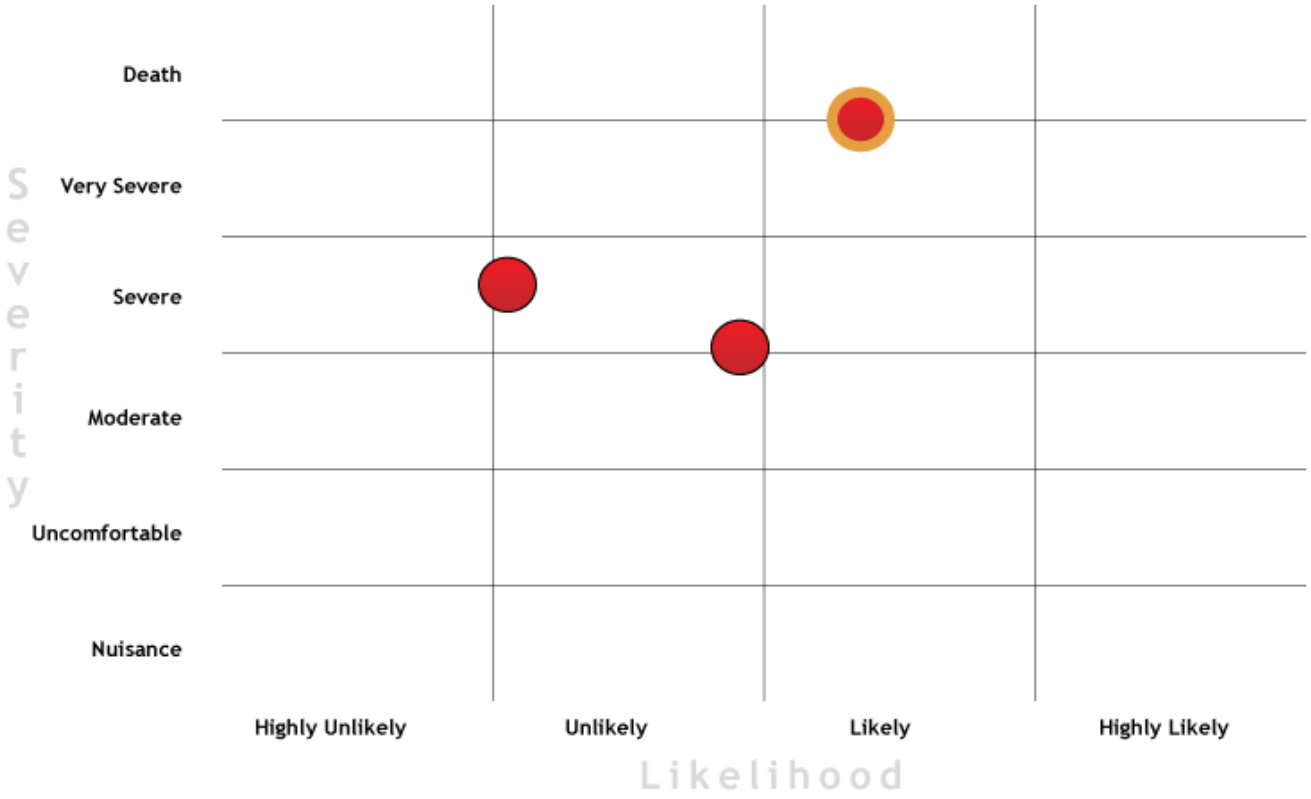
Interaction List (3)

Severity	Likelihood	Drugs	
		Trastuzumab with Doxorubicin	>
		Trastuzumab with Abciximab	>
		Doxorubicin with Abciximab	>

Rx Interact

Abciximab ✗ Trastuzumab ✗ Doxorubicin ✗

Interaction Graph (3)



Interaction List (3)

Trastuzumab with Doxorubicin

Trastuzumab may increase the cardiotoxicity of Doxorubicin. Signs and symptoms of cardiac dysfunction should be monitored frequently for increased risk of heart failure. Trastuzumab may increase the risk of neutropenia and anemia. Monitor closely for signs and symptoms of adverse events.

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