System Design Document

UMBC Market

**Client**

Abhay Kashyap

**Team 4**

Cory Ferrier

Sam Leung

Seth Jenkins

Wesley Chiou

Zachary Robinson

UMBC Market

System Design Document

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1. **Introduction**

1.1 Purpose of This Document

The purpose of this document is to describe the design of the UMBC Market application. Key topics covered in this document include the high level system architecture, lower level class designs, and the persistent data design of UMBC Market.

1.2 References

* UMBC Market Systems Requirements Specifications
* UML Distilled, 2nd edition, Martin Fowler and Kendall Scott, 2000
* UMBC Market Systems User Interface Design

1.3 Intended Audience

This document is intended to be read by the client for verification purposes and the engineering team as a reference for the work done on the system.

1. **System Architecture**

This section will detail the system structure, including the server-client relationships, of the UMBC Market application.

2.1 Architectural Design

Overview.png

The UMBC Market application will be built using the Meteor Javascript web framework. The Meteor framework is loosely broken down into collections, components, and Templates and follows a Model View Controller architecture (MVC).

The collections layer consists of the MongoDB Database and contains collections of items with class like-properties. This is exclusively on the server side.

The information from these collections is passed down to components which consist of a series of functions, (some on the server, some on the client side) that provide functionality such as editing, updating, deleting, and inserting new collection items. Components have functions and properties that can be run/accessed on the client, the server, or both. Meteor detects where the code is running and processes the file accordingly.

This functionality is accessed through the templates, which handle the client rendering information provided by the components.

2.2 Decomposition Description

System FLow.png

In the Meteor Framework, the client requests a series of objects from the server and provides a filter object that the server can check against. The server then checks its database against the filter and returns whatever it determines the user is authorized to see. The client then passes this information to the templates for rendering.

In our case, we will be primarily fetching message chains, sets of messages, representing a ‘conversation’ between two users, and product/service listings.

An important feature of Meteor is that it only talks to the server when necessary. This should only be when an action requires the database be updated, data needs to be fetched, or an action requires authentication.

Data Updates.png

The above demonstrates the overall process when performing an action that will update the database. For our application, this means Add/Changes/Deletions in regards to Messages, Users, and Listings.

The change is requested by the client with the relevant information attached, the server determines if the action is valid and returns an error if it’s not, it then attempts the requested action on the database and returns an error if the action fails. Otherwise it returns an updated set of information depending on what was changed. The client then updates the display based on the result.

**3. Persistent Data Design**

The following section details the persistent data storage architecture, including the relationships between database elements.

3.1 Database Descriptions

All Database objects are kept in a MongoDB instance that comes packaged with Meteor. The schema for the database is modeled below.

DB Objects Updated.png

**4. Requirements Matrix**

The table below describes the relationships between system requirements and system design components.

|  |  |  |
| --- | --- | --- |
| **Use Case** | **Requirement** | **System Component** |
| 1 | Account Registration | Registration interface |
| 2 | Account Login | Login Interface |
| 3 | Listing a product/service | Product Listing button/interface |
| 4 | Edit/Remove listing | Editing/remove button |
| 5 | Listing complete | Complete button |
| 6 | Searching market | Market search button and backend database |
| 7 | Contacting seller | Messaging component |
| 8 | Managing messages | View, delete, reply buttons |

# Appendix A - Agreement Between Client and Contractor

The client and contracted team members have come to an agreement on the scope and functionality of the UMBC Market Application to be created. The scope and functionality is detailed clearly through the provided use cases in section two of this document.

If future changes to this document are required, any modifications made will be reviewed by the client and each team member. The client and each team member will then again sign and date the document indicating their approval. When all parties have verified and signed the modified document, the modified document will then become the active working document for the application and the prior instance is deemed void.

**Client**

Name(print): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Comments: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Team**

Name(print): Cory Ferrier Date: 10/31/2016

Signature: Cory Ferrier

Name(print): Zachary Robinson Date: 11/2/2016

Signature: Zachary Robinson

Name(print): Sam Leung Date: 11/2/2016

Signature: Sam Leung

Name(print): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Name(print): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_

Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Appendix B - Team Review Sign-off

Each team member has reviewed this document and approves of its content and format. Any minor points of contention are addressed in the comments below.

**Team**

Name(print): Cory Ferrier Date: 10/31/2016

Signature: Cory Ferrier

Comments: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Name(print): Zachary Robinson Date: 11/2/2016

Signature: Zachary Robinson

Comments: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Name(print): Sam Leung Date: 11/2/2016

Signature: Sam Leung

Comments: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Comments: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Comments: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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# Appendix C - Document Contributions

Zachary Robinson: Wrote section introductions and reviewed and made syntactical edits to this document.

Cory Ferrier: Added Section 2 - System Architecture and Section 3 - Persistent Data Design

Wesley Chiou: Contributed to section 1 and made edits following feedback. Made formatting edits.

Seth Jenkins: Created Requirements Matrix, proofread document for grammatical/spelling errors, and checked for full compliance with instructions as laid out in the template.

Sam Leung: Reviewed and made some formatting changes to the document.