***Algorithmic Trading***

***Project Plan***

Okanagan College

Algorithmic Trading System

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**Revision Sheet**

| Revision | Date | Brief Summary of Changes |
| --- | --- | --- |
| Version 1.0 | 2024-01-23 | Baseline document draft |

# Planning

## Scope

The Algorithmic Trading System (ATS) will retrieve relevant financial data from multiple sources for stocks, index composites, treasuries, commodity prices, and company information. The system will be configurable by the end user via a User Interface (UI). The system will be used to collect relevant information for Machine Learning (ML) models.

## Milestones

| Milestone | Description | Delivery Date |
| --- | --- | --- |
| Environment Configuration | Setup and configure development and testing environments. | 2024-01-31 |
| UI Prototype | A functional User Interface (UI) prototype. | 2024-02-14 |
| Redundant Data Source Support | Implement support for additional data sources in case of outages for certain sources. | 2024-02-28 |
| Improved logging system Functioning CI | Create more detailed logs that are more useful for the end user. Finalize UI. | 2024-03-13 |
| Beta testing | End-user testing on a nearly complete system. | 2024-03-27 |
| Final release | Project is completed and presentable. | 2024-04-10 |

## Phases

| Phase | Description | Delivery Date |
| --- | --- | --- |
| Inception | Establish a business case for the system along with supporting documentation | 2024-01-17 |
| Elaboration | Develop an understanding of the problem domain and establish the architectural framework of the system. | 2024-01-31 |
| Construction 1 | System design, programming, testing, and supporting documentation. | 2024-02-14 |
| Construction 2 | System design, programming, testing, and supporting documentation. | 2024-02-28 |
| Construction 3 | System design, programming, testing, and supporting documentation. | 2024-03-13 |
| Transition and Refactoring | Moving the system from the development environment to the user environment. | 2024-03-27 |
| Maintenance | Make changes to the system as needed or as requested by the client. | 2024-04-10 |

## Resources

| Task | Resources |
| --- | --- |
| Retrieve Financial Data | API subscriptions for stock market data |
| Database Hosting | A hosting service for hosting the database in which financial data is stored. |
| Continuous Integration | Git Actions |

# Project Plan

## Sprint 1 - Iteration

**Sprint Goals:**

* Requirements gathering
* Reviewing and Revising analysis and design

**Planned Sprint tasks:**

* Gather new requirements from clients
* Reflect on unfinished or unpolished components of previous release
* Write user Stories
* Write/update use case specifications
* Review project technical documentation
* Review project analysis

**Anticipated Obstacles/Solutions**

* Previous system has not yet been tested by stakeholders
  + SOLUTION: Work with student research assistant and teach them how to use the system

## Sprint 2 - Elaboration

**Sprint Goals:**

* Elaborate on design decisions made during Inception
* Develop baseline project architecture
* Setup development environment
* Risk Management Protocols

**Planned Sprint tasks:**

* ATS User Interface analysis and design
* Setup development and testing server environments
* Research continuous integration tools
* Update project technical documentation
* Create initial requirements table and assign priority with stakeholder input
* Analysis and Redesign of system logging
* Test suite development

**Anticipated Obstacles/Solutions:**

* Lack of test suite foundation
* Finding technologies that best suite our needs (UI design tools, continuous Integration tools

## Sprint 3 - Construction 1

**Sprint Goals:**

* Develop a UI Prototype
* Analyze and assess switching configuration to YAML
* Continuous Integration
* Test execution

**Planned Sprint tasks:**

* Develop initial UI Framework
  + Login Screen and landing page
  + Change Configurations page
  + Scheduling frequency page
* Implement CI tool into development suite
* Test development:
  + Unit test
  + Integration test
  + Regression test
  + Acceptance test

**Anticipated Obstacles/Solutions:**

* Inexperience with UI development from some developers
  + SOLUTION: XP Pairing with more experienced team members

## Sprint 4 - Construction 2

**Sprint Goals:**

* Alternate data sources support
* Change config file format to YAML
* Simplify system configuration processing

**Planned Sprint tasks:**

* Implement support for alternate data sources
  + Integration test with UI
* Test alternate data sources
* Update real time data collection script to support YAML format
  + Test this, and decide whether or not to update the rest of the scripts
* Continuous integration

**Anticipated Obstacles/Solutions:**

* Cannot ensure compatibility with extra data sources

## Sprint 5 - Construction 3

**Sprint Goals:**

* User and Developer documentation update
* Polish and finalize logging system
* Continuous Integration

**Planned Sprint tasks:**

* Improve system logging component
  + Meaningful log messages
* Finish continuous integration tasks
* Update developers guide
* Update users manual

**Anticipated Obstacles/Solutions:**

* N/a

## Sprint 6 - Transition and Refactoring

**Sprint Goals:**

* End-user testing
* Make system ready for production environment

**Planned Sprint tasks:**

* Finish development on all major feature requests
* Finish end-user documentation
* Provide end-users with nearly complete system and observe interactions
* Actively seek out and fix major bugs

**Anticipated Obstacles/Solutions:**

* End-users reject significant parts of the system that would take too long to redesign/redevelop

## Sprint 7 - Maintenance

**Sprint Goals:**

* Fix as many problems with the system as possible
* Finalize project
* Present final product to client(s)

**Planned Sprint tasks:**

* Monitor live system for problems
* Actively seek out and fix any remaining bugs
* Update documentation to reflect final release
* Create, rehearse and execute client presentation

**Anticipated Obstacles/Solutions:**

* Difficult to fix bugs, too many bugs, or bug fixing requires refactoring a lot of code

# User Stories

| JIRA Ticket | User Story | Story Points (Effort) | Phase |
| --- | --- | --- | --- |
| ATS-30 | As a User, I would like to have a Non-programming User Interface to manage the system. | 4 | Construction 1 |
| ATS-32 | As a user, I would like the system to run automatically without the need for manual intervention | 4 | Transition and Refactoring |
| ATS-43 | As a user, I would like to have meaningful system logging so that I am able to easily troubleshoot issues with the system. | 3 | Construction 3 |
| ATS-52 | As a developer, I would like the project to have CI tools to make deployment and maintenance easier. | 3 | Construction 1, 2 and 3 |
| ATS-53 | As a user, I would like the system to support configurations for multiple data sources. | 3 | Construction 2 |
| ATS-54 | As a user, I would like a system UI that allows me to change the configuration of the financial data to be collected. | 3 | Construction 2 |
| ATS-55 | As a stakeholder, I would like the system to handle big data processing. | 2 | Transition and Refactoring |
| ATS-56 | As a stakeholder, I would like system processing time to take no longer than 6 hours. | 1 | Maintenance |