Project Initiation Document

Project Title: Rules Based Decision Aid Framework

Distribution:

ASRC Federal Mission Solutions, Kimberly Davis

ASRC Federal Mission Solutions, Kevin Wainwright

ASRC Federal Mission Solutions, Christopher Barone

Rowan University, Professor Jack Myers

Rowan University

Table of Contents

Project Scope Statement

Proposed Solution

This project will consist of developing a decision aid framework using open-source rule based decisions engines to be integrated into a command and control (C2) system. This involves the framework taking in data feeds, normalizing and processing these feeds into rules or chains of rules, and providing actionable results based off selected rules.

In Scope:

- A prototype architecture implementing an open-source rules engine for rule creation and configuration.
- A simple user interface for increased visibility by users to configure rules at anytime.
- Research and analysis of the chosen rules engine.

Not In Scope:

- The capability to specifically couple data to predefined or generated rules.
- Final deliverable will be a prototype, not a production ready product.

Project Background

We originally received this project from Mission Solutions Engineering (MSE). Our customers from MSE overseeing this project are Kevin Wainwright and Christopher Barone. In the initial project description, the goal was to discover a rules engine and create a decision framework that can be implemented into a command and control system.

After doing research and talking with our customers via teleconference, it was revealed that one of the goals for the rules-based decision engine (RDE) for the C2 system is to handle data and make timely and efficient decisions based off data sent through the decision engine. An example would be an operator on a battleship who receives data through the C2 system and augments their decision making process by feeding that data into the RDE of the C2 system to take accurate and accelerated action. Funneling the C2 system data through a RDE would allow the operator to make informed and educated decisions at a much faster rate.

This is where the RDE comes into play. While having just the C2 system can help operators make decisions, it would be difficult to extend or change the system's decision models. Each decision model has its own unique architectures, data feeds and sets of functionality. This can make changing anything related to data or decisions time consuming, expensive, and even logic breaking. With a decision engine feeding information into a C2 system, it makes extending and reusing complex decisions much easier.

Assumptions, Dependencies, and Constraints

Assumptions:

- The set of data types for this prototype is not important. Instead, the focus is on researching rules engines, and creating a simple and effective way to handle rule creation.
- Rules within the framework should be chainable, which means one rule can be combined with other rules to make larger sets of rules.
- The user interface is required but not a major emphasis of the project. Instead the framework capabilities should be prioritized.
- The final prototype will not have to be production ready, but instead be a functional tool that could be expanded upon.

Dependencies:

We were not given any details as to how our RDE will be integrated into a C2 system, so we have no idea what the architectural dependencies (or constraints) are. We were also informed that our RDE is to be data independent, so there are few documentable dependencies currently.

- The RDE framework will depend on an already established rules engine, such as Drools.

Constraints:

Not many constraints were placed upon us, as we have been given a good amount of freedom in how we would like to develop this framework.

- We were informed by the stakeholders that the framework must be written in any high level language, such as Java, C++, or something similar.

- Our online repository is constrained to GitHub.
- RDE Framework may not be coupled to a specific decision point of the data which it evaluates.

Organization and Governance

The organization and the governance of the project is as follows:

Stakeholders	
Kimberly Davis	ASRC Federal Mission Solutions
Kevin Wainwright	ASRC Federal Mission Solutions
Chris Barone	ASRC Federal Mission Solutions

The Project Team		
Title	*Name*	*Role*
Project Manager	Professor Jack Myers	Works closely with the scrum master to offer the team guidance.
	Scrum Team	
Product Owner	Mike Moscariello	Maximizing value of the product and the work of the development team.
Scrum Master	Klaydon Balicanta	Enacting the scrum principles and rules.
Development Team	Ian Markind Mike Crinite Shiv Patel Trae Lewis	Delivering potentially releasable increments of “done” at the end of each sprint.

Communication Plan

Our plan is to have three scrum meetings each week on Monday, Wednesday, and Friday. In these meetings, we will take turns discussing what we have been working on, what we plan to do next, and if there are any obstacles preventing us from achieving a task or goal.

We will have bi-weekly sprint reviews with our contacts at ASRC Federal Mission Solutions via teleconference or video call. In these reviews, we will do the following:

- Analyze the work accomplished during the sprint
- Determine if we met all of the intended sprint goals
- Determine if the product delivered adheres to our definition of done
- If the deliverable is not “done”, determine what is missing and establish a high level plan how to accomplish this for the proceeding sprint
- Locate and document any potential problems with our deliverable
- Listen to feedback from ASRC
- Gather as much information as possible to potentially adjust requirements during the next sprint planning

The anticipated dates for these sprint reviews will be as follows:

- Sprint Review 1 - October 14th
- Sprint Review 2 - October 29th
- Sprint Review 3 - November 11th
- Sprint Review 4 - December 2nd
- Sprint Review 5 - December 16th

After each sprint review, we will have a sprint retrospective, followed by a sprint planning meeting, where we will prepare and plan for our next sprint, with the idea of amending our plan as needed.

Other communications will include regular email updates from our product owner to one or more stakeholders at ASRC Federal Mission Solutions. The product owner will also be in charge of setting up meetings for the bi-weekly sprint reviews. There will also be weekly meetings and regular email communications between our scrum master and project manager.

Although some documents will be emailed occasionally, we plan to primarily share our code and documentation through our GitHub repository, as this is the most direct and simple method to do so.

Quality Plan

The progress, activities, and products of this project shall be monitored by the scrum master during every daily scrum. They are to keep everyone on topic and create a consistent workflow throughout the project. If anyone is having trouble on their task at hand, the Scrum Master is to step in and try to resolve the problem. If the scrum master is having trouble resolving the issue, they are to ask for assistance from the project manager.

If the development team has any questions or concern, the product owner is responsible for contacting any stakeholder who is capable of providing the appropriate answer. The product owner is also in charge of adding tasks to the product backlog and governing their importance to the customer.

A log of all activities and tasks will be maintained on the team's online scrum board using Trello. Here we can keep track of our progress, the changes made, and visually see what remains to be completed for the whole project using the product backlog as well as for each individual sprint using the sprint backlogs. These logs will be updated whenever a task or goal is accomplished. These logs can be accessed and viewed by the project team as well as the sponsors.

Feasibility Analysis

To gauge the feasibility of this project is not straightforward. There is some concern among our team that a completely “done” deliverable at the conclusion of sprint 5 (final sprint) that matches the initial overall project requirements will be difficult. This is partially due to what is perceived to be undefined aspects of the project, and time constraints.

The undefined aspects of the project, include a lack of specified data types for input or output to/from the rules engine, and a lack of the system architecture that this project is intended to integrate with. For example, if this rules engine framework were to be integrated with a database, having the database schema could be helpful. Without any information of expected data types, we could possibly design the framework to have the user select the datatype from a set of every possible data type that we could think of, however that would certainly increase the size of the project and the project scope.

The time constraints concern is directly related to the size of the project. Although we are perhaps overestimating here, the project appears to be a large one that will require a substantial amount of time to complete. With the entire scrum team having other classes, jobs, and other obligations, each of us can allocate approximately ten hours a week to this class, which simply may not be enough time to accomplish all of the project goals. Of course there will be analysis of our progress during the sprint reviews, and if the end goal appears to be in jeopardy of not being completed, there may have to be some concessions.

Hopefully this analysis is inaccurate, and everything will be completed within the given timeframe. We will certainly do everything reasonably possible to obtain all of the project goals, and our own number-one goal is to ensure that the client is satisfied with the end-result that we deliver.

Risk Assessment

Risk Description	Severity/Likelihood	Plan to Avoid Risk
1. There is a risk that the team will not be able to universally accept all types of data input as specified by the customer.	3/3	The team will attempt to standardize all incoming data, or support as many data types as possible.
2. There is a risk that the time allotted may not be sufficient to produce a product which can be integrated to the extent that the customer has requested.	1/3	The team will prioritize the most crucial features, as determined from both a business and development standpoint, in order to develop the most deliverable prototype possible.
3. The system may allow a user to enter an incorrect data input that could prevent proper processing of actions to be taken.	5/5	Feedback to user in order to ensure correct parameters of input entered if it is of improper format.
4. The system may encounter a feed of incorrect data that conflicts with data it currently is processing or has already processed that could drastically alter the action decided.	5/2	The system will be constrained to perform one decision check to eliminate the possibility of multiple users, user input, or data feeds.
5. Unexpected system shutdown of RDE	5/1	Strenuous testing to increase system reliability

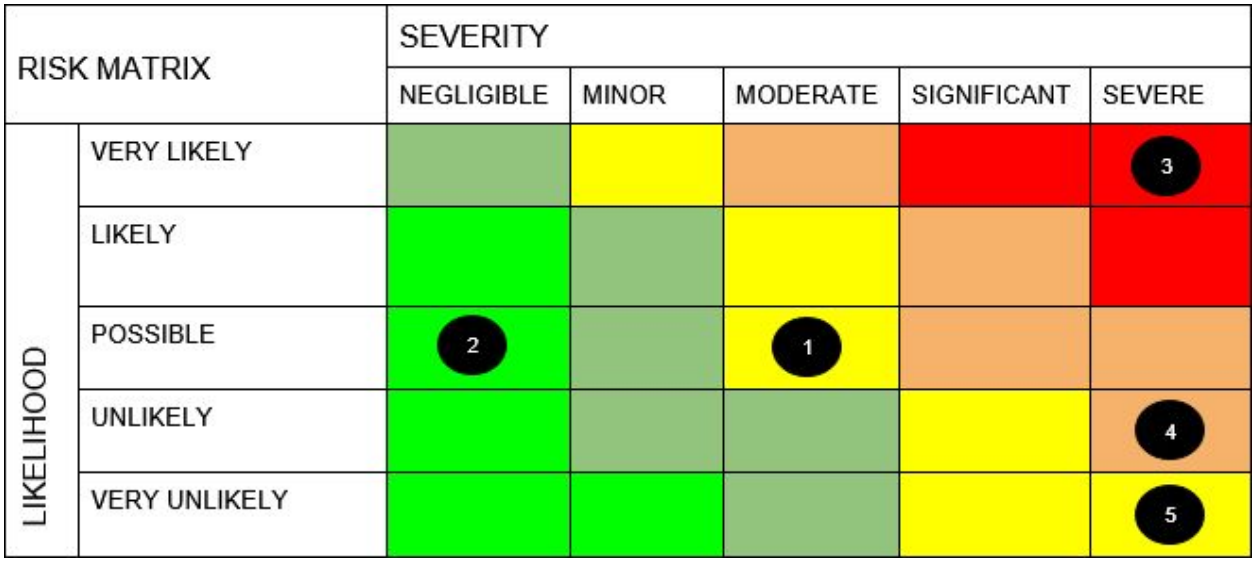

Figure: Risk matrix displaying risks that would or would not need mitigation/avoidance planning

Estimated Cost and ROI

Estimated Cost:

The estimated cost of this project from a financial perspective is extremely low, since no one on the scrum team is being paid for their contributions. There is a cost in terms of time that affects the scrum team, the project manager, and the stakeholders. The scrum team will be investing a substantial amount of time into creating this prototype. The project manager will be involved regularly to give advice and work directly with our scrum master. The stakeholders will have regular communications and input into the project throughout the entire development process. Outside of these factors, there are no other observable costs for the initial development process itself.

It should be noted that there could be future technical debt associated with this project, were it to be refined, implemented, and maintained over a period of time. Our team will likely have no involvement in that process, as we currently have no agreement

in place with the stakeholders to be involved with this project beyond the end of this school semester.

Return on Investment:

The return on investment could be tremendous if this project were deemed a success. We can envision the usefulness of having a RDE framework and how that could simplify the decision making process for complex decisions to be made with time sensitivity in mind. A RDE framework would allow a set of rules to be created for any scenario, and that could be extremely beneficial to many, including private and government sectors.

Of course this is all dependant upon us ensuring that our final delivery meets the expectations and is capable of doing everything that the stakeholders are seeking. If the final deliverable were to not meet or exceed expectations, the negative impact would be minimal. We can confidently make this claim because when you consider the relatively low cost of this project compared to the potential return on investment, there would not be much lost. This relates to our section on risk assessment, and our view that this project risk level is considerably low.