Functional Requirements:

**1) Calculate stock option price**

**a) Description**

This functionality is part of the integrated Option Pricing System to help traders calculate and compare price options using several algorithms. A user interface is designed such that the trader selects the region of Stock option and the algorithm from the list of algorithms (Binomial trees/Simulation/Numerical Integration). The user then enters a set of parameters relevant to the selected algorithm in order to calculate the stock option price. The system runs the algorithm and calculates the stock option price.

**b) Criticality**

This is the primary purpose of the Option Pricing software, therefore it is highly critical to ensure the system’s success

**c) Technical issues**

The user interface must be created to ensure the input parameters are accurately entered by the user to calculate the stock option price. The input fields should only allow a range of acceptable values and signal an error of the input do not meet the data types.

**d) Risks**

There is a risk of incorrect calculation of option price in case the input parameters are incorrectly entered by the user.

**e) Dependencies with other requirements**

This functionality fully depends on the input parameters provided by the user/trader:

* + Current Stock price
  + Duration
  + Expected growth rate
  + Stock price volatility,
  + Risk-free interest rate
  + Strike price
  + Option to call or put

It also depends on the algorithm selected by the User namely Binomial trees, Simulation or Numerical Integration which will determine the output.

**2) Display result**

**a) Description**

The result of the executed algorithm of calculating stock option prices should be displayed to the user along with the Volatility smile curve in less than 0.5 sec. If the algorithm successfully runs, the results are displayed on the screen. Users are given an option to make a new selection.

**b) Criticality**

Displaying the results to the trader is integral to the system, hence this is a critical functionality.

**c) Technical issues**

A GUI interface needs to be designed to appropriately display the results of the selection. The original values of parameters entered to calculate the price must be retained by the system to allow users to modify the selection or make a new selection. The result should be within an error margin of 1% and should be displayed within 0.5 sec.

**d) Risks**

There is no risk involved in displaying the results.

**e) Dependencies with other requirements**

This functionality depends on the successful execution of the algorithm in calculating the stock price and volatility smile.

**3) Add custom algorithm**

**a) Description**

This functionality of the Option Pricing system enables the user to add their own custom algorithms into the system to calculate stock option prices. The user interface is designed so that the user can opt to add an algorithm. The user enters the algorithm and additional variables if any. The program checks for syntactical errors. If the algorithm is syntactically correct, it is added to the user’s list of existing algorithms to choose from. If it is syntactically incorrect, it displays an error message signaling the occurrence of an error.

**b) Criticality**

As this functionality is not required for the Option Pricing System to work, it is not a critical requirement. However, it offers flexibility to the user to customize the software according to his needs.

**c) Technical issues**

GUI in the user interface must be designed so that the user can opt to add an algorithm. The interface for the algorithm to be entered has to be designed. The system should also be configured to verify the algorithm for syntactical errors and add the algorithm to the list of options available for calculating option prices. Verifying if the custom algorithm is correct and accurate is another technical issue.

**d) Risks**

The accuracy and efficiency of the algorithm is not tested. The GUI interface to allow a user to create a custom algorithm also poses a risk. It is also difficult to predict the run time or processing time of the algorithm.

**e) Dependencies with other requirements**

This functionality depends on the ability of the system to accurately run the custom algorithm once the user adds it to calculate the Option price. It also depends on whether the algorithm is syntactically correct.