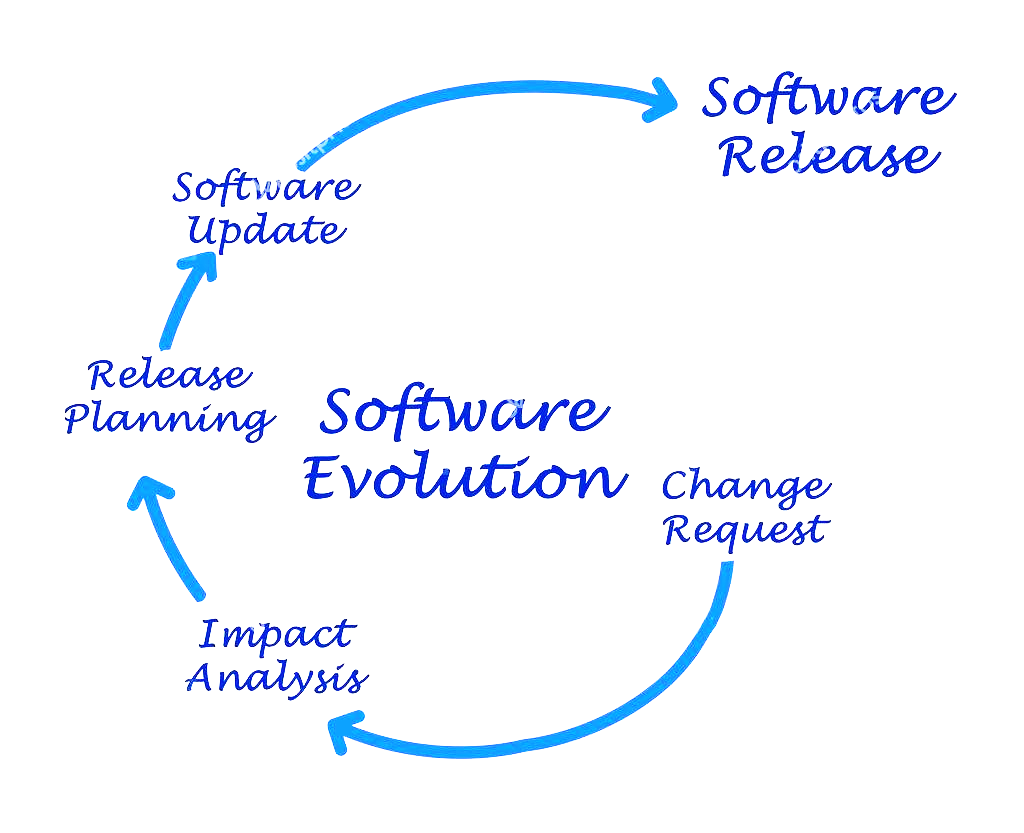
**(Group2**)’s **Software Evolution Project Final Report**

Group: 2  
Dr Adil Al-Yasiri  
Software Evolution   
University of Salford – 2018



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| **Group Members** |

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| * Zahera Mohamad |
| * Alweh Almohsin |
| * Uddin Forhad |

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| **Introduction** |

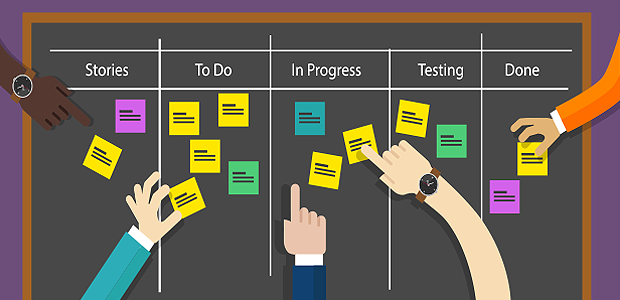
This report is an overview of the group teamwork of a software evolution and software maintenance project that has been practiced throughout the semester, to ensure the two software’s phases has been demonstrate in the way it should.

The essay basically divides into three main paragraphs firstly the introduction, then the main body and finally the conclusion. The body will be divided into subparagraphs that will demonstrate the whole journey of the project with the evidences of the work that has been done by the group members and all the modifications on the system.

The project is based on a security trading system (built in Python) that is used by a financial broker firm the customer and the traders of the firm, by way of a command line tool to submit orders to the market of execution. The team was provided with the system source code and all information needed to modify the system to an evolutional software that is qualified and eligible to maintenance in the future with new requirements and new technologies, in addition to that be able to have the longest lifecycle a software can have.

Throughout the essay, it will be explained how the group employed Agile methodologies to rebuild and modify the software in a three-week period. The software includes all requirements as requested and has been modified in the best way it could, to be able to carry the features of the software evolution and software maintenance.

This report has been written in a very simple, easy, organized and user-friendly way, mostly illustrated through tables, photos and diagrams.

Firstly, in the beginning of the body, there will be a calendar explaining how the group divided the sprints and how the team organised and managed the time, following by the section of “Sprint Development Processes” that demonstrating each of the group members’ tasks by a large table with all process of planning, designing, implementing and coding throughout the length of the project.

Secondly, in the next page, the software solution has been created by following the reverse engineering which produces an architectural diagram, use case diagrams and class diagrams of both before and after system’s modifications. Following by all evidences, screenshots and more information of the modified application.

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| **Project Planning** |

The group members did split the project into three sprints with each of a four-day long.

* **Sprint 0**
* 1 day
* As a start out, the group decided to have a sprint 0 to access the requirements documents provided by the lecturer and discuss it as a team, to ensure that everything is straight and clear to all members of group and that the team have a solid understanding of the brief. As a result, the backlogs for the sprints have been created and was ready to prepare it for splitting them off into tasks for each member of the group to tackle.
* **Sprint 1, 2 and 3**
* 4 days
* As the initial requirements document was very well detailed and included enough information to accurately rebuild and modify the software, the team did decide for three sprints, each with four-days in length.
* **Final Report**
* Maximum of 10 days

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| **April 2018** | | | | | | | | | | | | | | | | | | | | | | |
| **Tu** | **We** | | **Th** | **Fr** | **Sa** | **Su** | **Mo** | **Tu** | **We** | | **Th** | **Fr** | **Sa** | **Su** | **Mo** | | **Tu** | | **We** | | **Tu** |
| 10  Start of the project  Sprint **0** | 11  Sprint **1** | | 12  Sprint **1** | 13  Sprint **1** | 14 | 15 | 16  Sprint **1** | 17  Sprint **2** | 18  Sprint **2** | | 19  Sprint **2** | 20  Sprint **2** | 21 | 22 | 23  Sprint **3** | | 24  Sprint **3** | | 25  Sprint **3** | | 26  Sprint **3** |
|  | | | | | | | | | | | | | | | | | | | | | | |
| **Fr** | **Sa** | **Su** | **Mo** | **Tu** | **We** | | **Th** | **Fr** | **Sa** | **Su** | **Mo** | **Tu** | **We** | | | **Tu** | | **We** | |
| 27  Report | 28 | 29 | 30  Report | 1  Report | 2  Report | | 3  Report | 4  Report | 5 | 6 | 7  Report | 8  Report | 9  Report | | | 10  Report | | 11  End of the project | |

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| **Sprint’s development processes** |

* **The table below will illustrate the process of how each sprint was developed.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sprint 1** | | | |
| * Sprint goal |  | | |
| * Sprint backlog |  | | |
| * Sprint plan |  | | |
| * Sprint review meeting |  | | |
| * Sprint retrospective |  | | |
| **Sprint 2** | | **Sprint 3** | |
| * Sprint goal |  | * Sprint goal |  |
| * Sprint backlog |  | * Sprint backlog |  |
| * Sprint plan |  | * Sprint plan |  |
| * Sprint review meeting |  | * Sprint review meeting |  |
| * Sprint retrospective |  | * Sprint retrospective |  |

**More Details:**

1. **Sprint 1:**

By looking at the requirements document, it was obvious that without the implementation of security class, it is not possible to move to the other requirements. Therefore, the team decided to firstly implement the Security class in sprint 1.

To be able to create the best structured class that would be able to hold the features of the software evolution and maintain its functionality in future maintenance, the best solution was to create a class security that holds the attributes of an security which is obviously, the name, the symbol, the sector and the industry of a particular security, and a class that will be the responsible aspect of these securities in general and manage them even in the future, taking in mind all cases and changes that may occur. For example, if a security does not exist in feature or if a new security is presented in the broker trade system or any other future modifications in the trading system.

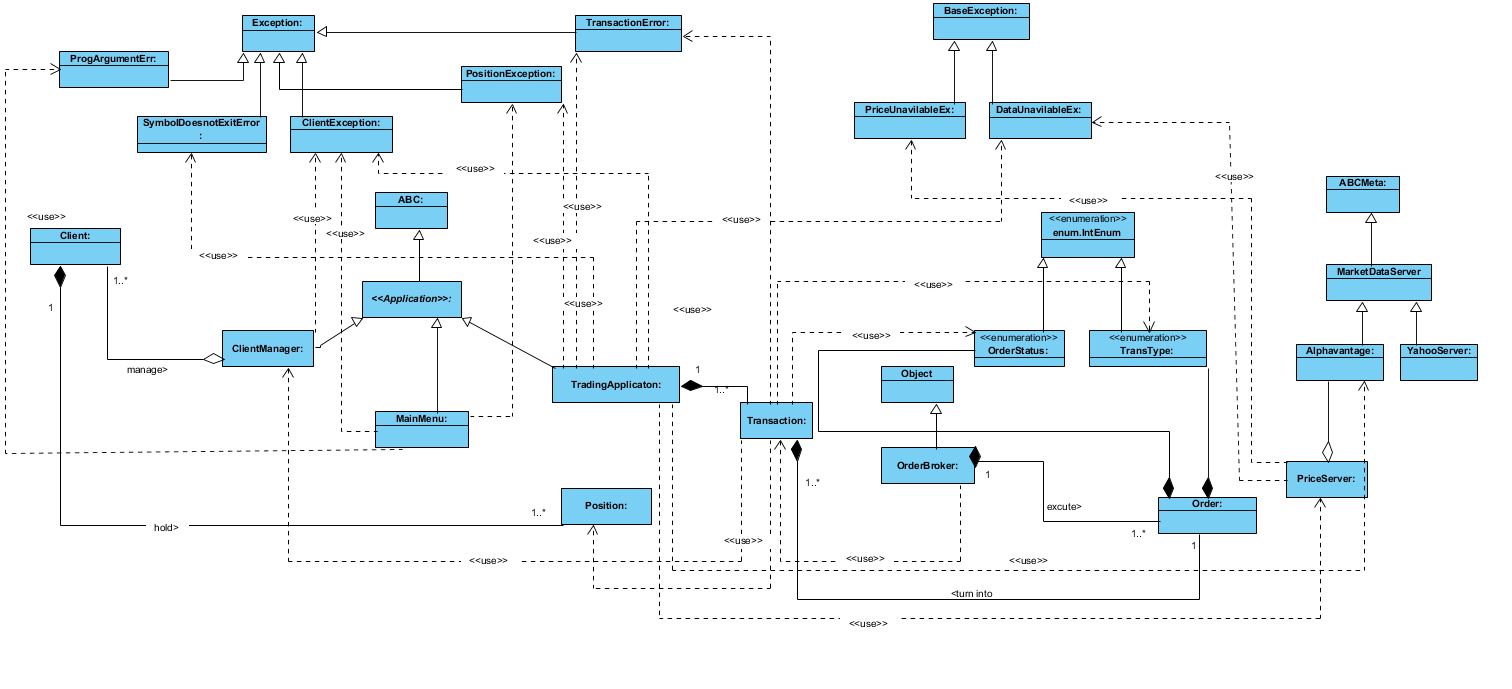
1. **Sprint 2:**

After creating the Security class, it was logical to move on to the next requirements.

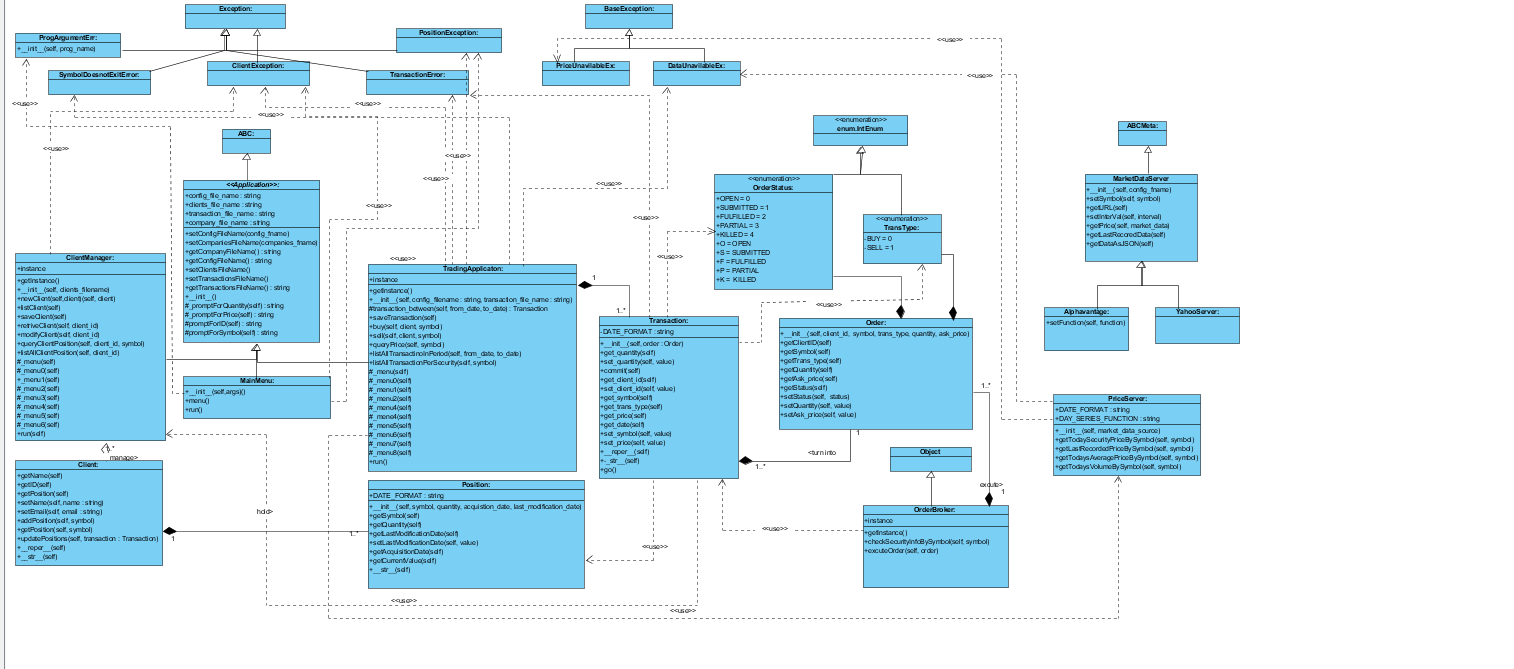
(4.3 Implement a more realistic order execution & 4.2 Improve the System Output)

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| **System Design** |

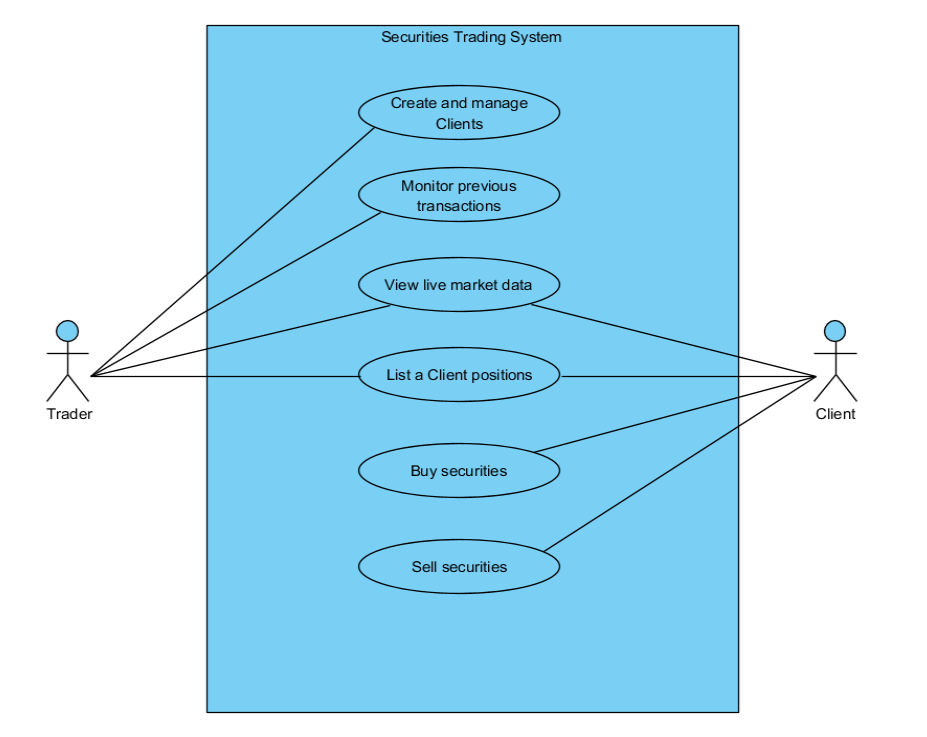
Class Digram (BEFORE MODIFICATION)



Class Digram (BEFORE MODIFICATION)



Use Case Digram (BEFORE MODIFICATION)



Architecture Diagram (AFTER MODIFICATION)

A close up of a map

Description generated with high confidence

**Market Data**

Market Data Server

A screenshot of a cell phone

Description generated with very high confidenceA screenshot of a social media post

Description generated with very high confidence

Class Diagram (AFTER MODIFICATION)

**TRADES**

**UI**

A screenshot of a cell phone

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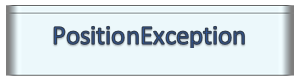
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**SERVER**

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**EXCEPTIONS**

Use Case Diagram (AFTER MODIFICATION)

**Security Trading Application**

A picture containing text, map

Description generated with very high confidence

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| **Appendices** |

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Sprint 1** | | | | | |  | Day 1 | Day 2 | Day 3 | Day 4 | | Date | 2018-04-11 | 2018-04-12 | 2018-04-13 | 2018-04-16 | | Time | 10:00:00 | 10:30:00 | 10:15:00 | 10:00:00 | | Attendance | 3/3 | 3/3 | 3/3 | 3/3 | |

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Sprint 2** | | | | | |  | Day 1 | Day 2 | Day 3 | Day 4 | | Date | 2018-04-17 | 2018-04-18 | 2018-04-19 | 2018-04-20 | | Time | 10:00:00 | 10:30:00 | 10:00:00 | 10:00:00 | | Attendance | 3/3 | 3/3 | 3/3 | 3/3 | |

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| |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Sprint 3** | | | | | |  | Day 1 | Day 2 | Day 3 | Day 3 | | Date | 2018-04-23 | 2018-04-24 | 2018-04-25 | 2018-04-26 | | Time | 11:00:00 | 10:30:00 | 10:00:00 | 10:00:00 | | Attendance | 3/3 | 3/3 | 3/3 | 3/3 | |

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| **User’s Guide** |

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| **Solution implementation** |

* **Implementing a Security and a Security Manager Class:**

The system was representing a security in term of ticker symbol only, and did not have a class referring to security, neither it had any information about the securities except of the symbol of a security. The user did not get any additional information of a certain security as it was unable to do complex operations. In additional to that the system looked dishevelled and unorganised.

And in term of software evolution and maintenance, this case is a serious issue that would prevent any future maintenance on the software. Therefore, to be able to tackle it, the lecturer required a security class to represent the security in the broker trades system, that carry the necessary and essential attributes and methods.

Although the security class itself would tackle the main issue that is holding the software for future evolutions and maintenance, however, the team was thinking for further development in this direction and extra features that would extend the ability of the software for any future changes that may occur. Therefore, the best solution was to create a new class, named SecurityManager, that is responsible for the security and may be able to create in the future a new menu in the main menu of the application and will permit traders staff to add the new securities that have been added to the trade system or remove any securities that is not anymore in the trade system and modify any changes that might occur.

The security class holds four attributes representing the security’s name, symbol, sector and industry that will be initialised inside the class’s constructor, beside to the getter’s and setter’s methods. Whereas the security manager class will read the stock companies’ file and pass it to the Security class’s constructor. Moreover, the security manager class would have other methods related to the security such as,

1. retrieveSecSymbol method, that is retrieving the symbol of a certain security by typing the company’s name the user wants to know about.
2. getCurrentMarketValue method, that is retrieving the price of a particular security based on the symbol a user will type on the system.
3. listSecurities method, that will list all existing securities

in addition to other methods that allows a user to check for additional information of a symbol, name, industry or sector of a particular security.

* (4.3 Implement a more realistic order execution
* 4.2 Improve the System Output)

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| **Conclusions and Reflections** |

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