**Software Engineering Standards**

**System Requirements and Analysis Specification**

**(RAS)**

Version 1.0

Document Number: RAS-001

Project Team Number: A9

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1. **Introduction**

**1.1. Purpose**

The purpose of this document is to provide an overview of the objective of our team’s software and other related factors pertaining to the use of the software, as well as the technical requirements for the software to be developed and operated successfully.

The intended audience for this document is mainly but not limited to, the client of the software product, the management level personnel involved with the software team, developers of the software, and the testers and end-users of the software.

1. **Scope**

**2.1. Identification**

Social Network Analysis with Deep Learning Requirements & Analysis Specification Version 1.0.

**2.2. Bounds**

There is a lack of simple, efficient and modularized support for determining the efficacy of marketing campaigns by operating on different data sets and performance metrics. The system will address these concerns by allowing the plugging-in of various data sets and the standards used to determine their success, as well as predict future performance. The system will provide an easy-to-use interface for this purpose, which will show results of big data analytics in visual formats, such as GIS maps, charts and spreadsheets. The system, and the algorithm that supports it, will be fine-tuned to support modularity for a variety of data sets that may be used with it as well as the performance indicators used to measure potential success. Such a system would have tremendous benefit for many organizations, simplifying the process of using Deep Learning greatly while also reducing the cost of implementing such techniques.

**2.3. Objectives**

The highest priority objectives are the optimization of the algorithm necessary to perform analytics on data sets, as well as the actual representation of the analysis. As such, the visual component of the system will be crucial—making certain that the customer has the several interchangeable way to view the analytics they will use the system for. Making the system simple to use will also be a high priority deliverable, with a functional and self-descriptive dashboard being necessary. Another important, but lower priority objective will be modularization of the algorithm itself. Being able to use different data sets is an important long-term goal of the system, but not before the structure has been created for a general use case.

Because the system will require constant testing of the algorithm itself on various data sets, the project will run incrementally at each step of production, with testing and requirements analysis being done at every stage of development for maximum productivity and time-line benefit.

Initial Deliverables:

* Project Proposal: 2/08/18
* Software Requirement and Analysis Specification (RAS):
  + Business & Project Definition: 2/20/18
  + Software Requirements: 3/06/18
  + Complete: 3/20/18
  + Software Analysis Specification: 4/17/18
* Software Project Management Plan (SPMP): 4/05/18
* Software Design Document: 5/01/18

1. **Overall System Review**
   1. **Context Diagram**

AI Main System

Social Networks

Clients

Database

Data Analysis

Analytical & Graphical results

* 1. **Additional Descriptive Items**

Product Functions

* Collect large amounts of data on social network
* Analyze the sentiment of general public towards a specific topic
* Predict a trend towards a topic

User Characteristics

* Product will be used by marketing teams of firms, data scientists and researchers
* End-users can range from being not highly proficient with computers to extremely technical, but in general should know how to interact with a well designed UI
* End-users is expected to know how to read and input data

Constraints

* If the software product is not allowed to input data from social network companies
* Computer processing power is not enough to compute the result of a large amount of data
* Public databases that are available for data mining may not have sufficient types of data
* Development language can be exploited to create a security loophole

Assumptions and Dependencies

* Availability and quality of the data types to be processed
* The optimization of analysis and prediction algorithm

Requirement subsets

* User interface and general user-friendly control mechanism could be delayed until the algorithm of processing the data is done

1. **Document Overview**

This document is organized in such a way to first provide a top-level description and analysis of the need for this system as well as the general solutions being used for implementation. The document then further delves into the business applications of the system—the economic and technological drivers utilized by the system in order to be effective. The functional and non-functional requirements of the system are detailed and the analysis of these requirements is provided below. The manner of system testing is described for the purpose of finding defects. The document describes its own examination and validity, as well as the validity of each individual artifact stemming from its original functional requirement. This document details the iterative approach taken in designing the system chronologically as it evolves, with new revisions of this document and their differences being described in a section below. The appendix serves as a method of tracking the of schedule and defects encountered when designing the system.

1. **Reference Documents**

* “Team A9 Project Proposal”, Social Network Analysis with Deep Learning, A9, Version 2.0, February 16, 2018

1. **Business Requirements**
   1. **Technology**

Technology Drivers

* Seamless integration and information exchange with various social systems;
* Visible, integrated, reportable data
* Automated and accessible (self-service function, information sharing and broadcasting) service delivery & support
* Customer centric production planning.

Business Drivers

* Traceability of incidents and problems from initiation to resolution
* Efficient and effective sharing of resources
  1. **Economics**
* Build a platform that is preemptive, pivotal, proprietary, and scalable

## Commerce and regional economic integration.

* 1. **Regulatory and Legal**
* Privacy Laws
* System manipulation and fraud

**6.4. Market Considerations**

* Increasing emphasis on collaborative learning tools
* Automating assessment functionalities
* Rising adoption of cloud-based management tools

**6.5. Risks and Alternatives**

|  |  |
| --- | --- |
| Business Risk: | Limited access to data from companies |
| Probability: | Medium |
| How discovered: | Other companies limit use of data |
| Responsible Party: | Management, Legal |
| Status: |  |
| Mitigation Plan: | Deal making, benefits to companies |

|  |  |
| --- | --- |
| Operational Risk: | Project Delay |
| Probability: | Medium |
| How discovered: | Schedule Tracking |
| Responsible Party: | Developers, PM |
| Status: |  |
| Mitigation plan: | Have meetings to follow up with dev |

|  |  |
| --- | --- |
| Technology Risk: | Not enough quality data |
| Probability: | Medium |
| How discovered: | After getting results from data analysis |
| Responsible Party: | Developers |
| Status: |  |
| Mitigation Plan: | Extract specific data types |

|  |  |
| --- | --- |
| Economic Risk: | Market too niche |
| Probability: | Low |
| How discovered: | Not many people willing to switch to system |
| Responsible Party: | Designers |
| Status: |  |
| Mitigation Plan: | Adopt more traditional elements |

**6.6. Human Resources and Training**

* Developers should have knowledge in data science and machine learning

1. **Specific Requirements (Descriptive Functional Requirements)**
2. **Non-Functional Requirements Definitions**
3. **Analysis**
4. **System Test Plan Requirements**
5. **Qualification Provisions**
6. **Requirements Traceability**
7. **Evolution of the RAS**
8. **Rationale**
9. **Notes**
10. **Appendices**

**Schedule Tracking**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Artifact or Deliverable | Who (Individual or Team) | Estimated | Actual | Difference |
| RAS Business & Project Definition | Anish  Mark  Mehmed | 02/20/2018  02/20/2018  02/20/2018 | 02/20/2018  02/20/2018  02/20/2018 | —  —  — |
| RAS Software Requirements | Anish  Mark  Mehmed | 03/06/2018  03/06/2018  03/06/2018 |  |  |
| RAS Complete | Anish  Mark  Mehmed | 03/20/2018  03/20/2018  03/20/2018 |  |  |
| Software Analysis Specification | Anish  Mark  Mehmed | 04/17/2018  04/17/2018  04/17/2018 |  |  |
|  | Summary |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Artifact or Deliverable | Who (Individual or Team) | Estimated | Actual | Difference |
| SPMP | Anish  Mark  Mehmed | 04/05/2018  04/05/2018  04/05/2018 |  |  |
|  | Summary |  |  |  |

**Cumulative**

|  |  |  |  |
| --- | --- | --- | --- |
| Who (Individual or Team) | Estimated | Actual | Difference |
| Anish |  |  |  |
| Mark |  |  |  |
| Mehmed |  |  |  |
| Summary |  |  |  |