# Graph Automation System

Version 1.0.0.0

**Software**

**Requirement**

**Specifications**

###### Table of Contents

1. Project Drivers . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3

* 1. Purpose . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .3
  2. Scope . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3

1.3 Abbreviations . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .4

1.4 Client, Customer and other Stakeholders. . . . . . . . . . . . . . . . . . . . . . . . . . . . .4

1.5 Users of the Product. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .6

1.5.1 The Users of the Product . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 6

1.5.2 Viewpoints . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 7

2. Project Constraints . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .10

2.1 Mandated Constraints . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 10

2.2 Implementation environment of the current system . . . . . . . . . . . . . . . . . . . . .11

2.3 Partner applications . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .12

2.4 Schedule . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . ..12

2.5 Budget . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .12

3. Functional Requirements . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . ……12

3.1 The Scope of the Work . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 12

3.2 The Scope of the Product . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 13

3.3 Functional Requirements . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 14

4. Non - Functional Requirements .. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 15

4.1 Look and Feel Requirements . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .15

4.2 Usability Requirements . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 15

4.3 Performance Requirements . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .15

4.4 Operational Requirements . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 15

4.5 Maintainability and Portability Requirements . . . . . . . . . . . . . . . . . . . . . . . . . 16

4.6 Security Requirements . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .16

4.7 Legal Requirements . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .16

**5.** Project Issues . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .16

5.1 Open Issues . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .16

5.2 User’s Documentation and Training . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .16

6. References . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .17

7. Appendix 1. System Models . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 17

1. PROJECT DRIVERS

* 1. Purpose

The purpose of this document is to familiarize reader with software. Specification describes all hardware and software requirements for product, behavior of it and its components. Software Requirements Specification (SRS) allows to verify the customer that all his requirements are observed and implemented correctly by developer.

* 1. Scope

The software will reflect all the requirements defined by the customer. Graph Automation System will allow the user to draw graphs automatically using the software.

The design of product interface to be developed will be supported by Windows 7 64-Bit Operating System. User interfaces will be ergonomically and easy-to-use.

* GAS-Graph Automation System
* SRS – Software requirements specification
* PC – Personal Computer
* HDD - Hard Disc Drive
* RAM – Random Access Memory
* IE – Microsoft Internet Explorer

1.4 Client, Customer and other Stakeholders

1.4.1 The *client* is the person/s who pays for the development, and owner of the delivered system.

All client remarks will be improved immediately. Product deliverables have appropriated project schedule, approved by the client.

1.4.2 The customer is the person/s who will buy the product from the client.

In our case, the roles of the client and the customer are filled by the same company.

1.4.3 Stakeholders include:

* End - Users (detailed in section 1.5)
* Customer
* Project Manager
* Requirements Engineer
* System Designer
* System Tester
* System Administrator
* Configuration Manager

SRS identifies each type of stakeholder:

**Table 1. End - Users**

|  |  |
| --- | --- |
| Stakeholder Identification | End - Users |
| Knowledge needed by the project | Basic knowledge of Microsoft Windows-based interfaces, Microsoft Excel Workbook |
| Necessary degree of stakeholder’s involvement | Low. End – Users are not involved in software development, just in some kinds of sociological surveys |
| Degree of influence for that stakeholder | High. Software to be developed to satisfy first of all the End-Users. |

**Table 2. Customer**

|  |  |
| --- | --- |
| Stakeholder Identification | Customer |
| Knowledge needed by the project | Customer’s requirements, Project plan, business modeling and forecasting. |
| Necessary degree of stakeholder’s involvement | Middle. Customer supervises project, establishes budget |
| Degree of influence for that stakeholder | High. Software development process may be canceled by Customer. |

**Table 3. Project Manager**

|  |  |
| --- | --- |
| Stakeholder Identification | Project Manager |
| Knowledge needed by the project | Project plan creating, computer skills. |
| Necessary degree of stakeholder’s involvement | High. Project Manager supervises project, establishes team, provides deadlines, negotiates with customer. |
| Degree of influence for that stakeholder | High. All development process requires constant control and decision making from Project Manager, |

**Table 4. Requirements Engineer**

|  |  |
| --- | --- |
| Stakeholder Identification | Requirements Engineer |
| Knowledge needed by the project | SRS creating, computer skills. |
| Necessary degree of stakeholder’s involvement | High. Requirements Engineer summarizes requirements provided by customer, updates them. |
| Degree of influence for that stakeholder | Middle. Requirements Engineer defines SRS under strict Customer and Project Manager control |

**Table 5. System Designer**

|  |  |
| --- | --- |
| Stakeholder Identification | System Designer |
| Knowledge needed by the project | Computer-based Design tools, Internet technologies |
| Necessary degree of stakeholder’s involvement | High. System Designer defines all software interfaces, how the product will look like, providing success of product from the End – Users point of view. |
| Degree of influence for that stakeholder | Low. System Designer will not use product to be developed in appropriate way. |

**Table 6. System Tester**

|  |  |
| --- | --- |
| Stakeholder Identification | System Tester |
| Knowledge needed by the project | Computer-based Testing tools, Internet technologies, Testing requirements and specifications. |
| Necessary degree of stakeholder’s involvement | Middle. System Tester is looking for mistakes in software and verify product’s possibilities. |
| Degree of influence for that stakeholder | Low. System Tester will not use product to be developed in appropriate way. |

**Table 7. System Administrator**

|  |  |
| --- | --- |
| Stakeholder Identification | System Administrator |
| Knowledge needed by the project | Strong computer skills, Internet and network technologies. |
| Necessary degree of stakeholder’s involvement | Low. System Administrator is not involved in software development process. |
| Degree of influence for that stakeholder | Middle. System Administrator will maintain and install product. |

**Table 8. Configuration Manager**

|  |  |
| --- | --- |
| Stakeholder Identification | Configuration Manager |
| Knowledge needed by the project | Computer-based Testing tools, Internet technologies, Testing requirements and specifications. |
| Necessary degree of stakeholder’s involvement | High. Configuration Manager responsible for project repository, project web pages. |
| Degree of influence for that stakeholder | Middle. Configuration Manager must follow job description and deadlines, to prove his/her quality. |

1.5 Users of the Product

**1.5.1 The Users of the Product**

Potential Users of the GAS are organizations or institutes.

**Table 8. Users**

|  |  |
| --- | --- |
| User name | End Users |
| User role | To use GAS for calculations and graph plotting |
| Subject matter experience | MANUAL. Everything was done manually. This software is adopted for manual to automation conversion. |
| Technological experience | Basic computer skills are obligatory. |
| Intellectual abilities/disabilities | Middle intellectual abilities |
| Age group | Retirement age for employees |

**1.5.2 Viewpoints**

This project consists of several stakeholders, which were defined above. The viewpoint model is deliberately flexible and informal. Viewpoints can be adapted to specific organizational practice and standards as can the notations used to describe system requirements. Viewpoints may be used during the early stages of a requirements engineering process as a structuring mechanism for requirements elicitation and analysis. Identifying viewpoints and organizing information around them at this stage reduces the possibility that critical information will be missed during requirements elicitation and provides a traceability mechanism for linking requirements with their sources. Let us define the following model of stating a viewpoint PREview:

The viewpoint *name*.

The viewpoint *focus*.

The viewpoint *concerns*.

The viewpoint *sources*.

The viewpoint *requirements*.

**Table 10**: **Users viewpoint**

|  |  |
| --- | --- |
| **Name** | Users |
| **Focus** | Entering parameters for calculation and plotting graph |
| **Concerns** | To familiarize students with software functions |
| **Source** | Requirements specification from the Customer |
| **Requirements** | * Enter the parameters * Allow the software to compute the result. * Allow the software to plot graph. * Save the necessary files. * Browse and manage the temporary or data files. |

**Table 11**: **Project manager viewpoint**

|  |  |
| --- | --- |
| **Name** | Project manager |
| **Focus** | Team establishment, project plan creating, control software development process, follow schedule provided by the Customer |
| **Concerns** | GAS creation according to deadlines |
| **Source** | Job description |
| **Requirements** | * Follows deadlines and budget * Responsible for all deliverables * Easy communication with team and the Customer * All project stages should be fully documented * MS Word * Internet connection * MS IE, Netscape or Opera browsers |

**Table 12**: **Requirements engineer viewpoint**

|  |  |
| --- | --- |
| **Name** | Requirements engineer |
| **Focus** | Requirements specification creating, customer interviewing, collect and specify requirements |
| **Concerns** | Constantly updating SRS accordingly customer’s requirements |
| **Source** | Requirements specification from the Customer |
| Requirements | * Requirements from Students, Customer and team members should be prepared * Requirements should be clear, complete and consistent * MS Word * Internet connection * MS IE, Netscape or Opera browsers |

**Table 13: System Designer viewpoint**

|  |  |
| --- | --- |
| **Name** | System Designer |
| **Focus** | Design user interfaces, creation of design specification document |
| **Concerns** | Formal design |
| **Source** | Project plan, requirements specification from the Customer |
| **Requirements** | * Clear and complete SRS * Adobe Photoshop * MS Word * Internet connection * MS IE, Netscape or Opera browsers |

**Table 14: System Tester viewpoint**

|  |  |
| --- | --- |
| **Name** | System Tester |
| **Focus** | Design testing strategies, creation testing documents, realize test cases |
| **Concerns** | Validation of software quality |
| **Source** | Requirements specification from the Customer  ISO 9001 Standards |
| **Requirements** | * Knowledge of software to be tested * Testing tools * MS Word * Internet connection * MS IE, Netscape or Opera browsers |

**Table 15: System Administrator viewpoint**

|  |  |
| --- | --- |
| **Name** | System Administrator |
| **Focus** | Maintenance of GAS |
| **Concerns** | GAS maintenance and troubleshooting |
| **Source** | Inner SRS from Requirement Engineer, Internet and LAN specifications |
| **Requirements** | * Licensed software with automatically update tools * MS Word; * Internet connection * MS IE, Netscape or Opera browsers |

Table16: Configuration Manager viewpoint

|  |  |
| --- | --- |
| **Name** | Configuration Manager |
| **Focus** | Configuration and change management, project repository control, project web-pages maintenance and follow calendar of events |
| **Concerns** | Change control to achieve Quality assurance required by the Customer |
| **Source** | Inner company’s SRS  Job description |
| **Requirements** | * All hardware and software should be available * Adobe Acrobat Reader * Internet connection * MS IE, Netscape or Opera browsers |

2. Project Constraints

**2.1 Mandated Constraints**

Next items must be used to verify software:

* + 1. For user home PC workstation

Hardware

* IBM-compatible PC with PentiumΙ processor and higher
* 500Mbytes free space on HDD
* 1 Gbytes RAM
* Internet connection

Software

* MS Windows XP/7/8

**2.2 Partner applications**

There are some applications that are not part of the product but with which the product will collaborate. This section can be completed, by including written descriptions, models or references to other specifications.

* ISO/OSI model
* TCP/IP specifications
* LAN’s specifications
* SMTP/POP e-mail protocols description

**2.3 Schedule**

The Schedule is presented by the Project Manager.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Deliverable** | **Deadline** | **Time** | **Extended** | **Objective** |
| Project Plan | March 15, 2014 | 10:00 | NO | Reached |
| Requirements documentation | March 16, 2014 | 10:00 | NO | Reached |
| Implementation Plan | March 17, 2014 | 12:00 | YES |  |
| Project binder | April 10, 2014 | 12:00 | NO |  |

**2.4 Budget**

Budget is not completely assigned to the Project.

3. FUNCTIONAL REQUIREMENTS

**3.1 The Scope of the Work**

Software to be developed should be providing all necessary action for minimizing the manual plotting of graphs and for higher calculations.

1. To optimize work and time.
2. To expand services.
3. To check ability of commercial using of GAS.

The GAS doesn’t require internet access.

**3.2 The Scope of the Product**Features provided by the graph automation system:

1. Do heavy calculations.
2. Allow help menu.
3. System will provide the end results and an option to plot graph based on the results.
4. System will allow the plotting of graph from external files also.
5. System will help user browse through the files.
6. Possibility of files and folder management.
7. Allows user to manage space used by the software.

**3.3 Functional requirements**

Functional requirements are the following:

* 1. The GAS should perform heavy calculations that were earlier done manually.
  2. The GAS should support only one user on one pc at a time.
  3. The GAS should allow users to plot graph from external excel workbook also.
  4. The GAS should provide files and folder management system.
  5. The GAS should provide access to excess the physical copy of the graph.

**4**. **Non - Functional Requirements**

**4.1 Look and Feel Requirements**

According to the Customer requirements, the GAS should include following interfaces:

* + The GAS interfaces will be based on C# application. Differences will depend on users’ functions.
  + The GAS interface for system administrator will include C# application.
  + Desktop Interface- It will provide an easy way to access the application.

**4.2 Usability Requirements**

* Ergonomically and clear interface.
* The interface should contain prompts and help to avoid making mistakes.
* The product should be used by people with no training.

**4.3 Performance Requirements**

* + Any interface between a user and GAS should have a maximum response time of 5 seconds
* The response should be fast enough to avoid users’ response collisions
* The GAS should be available for use 24 hours per day, 365 days per year.

**4.4 Operational Requirements**

* + The GAS should be used on IBM-compatible workstations with 500Mbytes free space on HDD for workstations.
  + The GAS should be correctly implemented in Windows 7 64-Bit.
  + The GAS should correctly interface if MS Access applications and MS SQL Server

**4.5 Maintainability and Portability Requirements**

* + Changes must be verified once per day at least.
  + The GAS is expected to run under MS Windows XP/7/8.­­­

**4.6 Security Requirements**

* + The GAS should provide authentication and authorization process for the organization.
  + Access to the GAS is permitted as per the organization or institution.

**4.7 Legal Requirements**

* Personal information should be protected.
* The GAS should comply with quality assurance standards.
  + 1. Project Issues
  1. **Open Issues**

Requirements elicitation haven’t yet completed, thus SRS are constantly updated by Requirements Engineer.

**5.2 User’s Documentation and Training**

User documentation is under construction now and will be available accordingly to schedule. System Designer will present guide of User’s Interfaces.

6. References:

[1] Sommerville, Ian, Pete Sawyer, and Stephen Viller (1998), Viewpoints for requirements elicitation: a practical approach, in Proceedings of the IEEE International Conference on Requirements Engineering - ICRE'98, April 6-10, 1998, Colorado Springs, Colorado. <http://www.comp.lancs.ac.uk/computing/research/cseg/projects/reaims/publications.html> [cited 11.11.02]

[2] Volere Requirements Specification Template

<http://www.volere.co.uk/template.rtf> [cited 12.11.02]

[3]Software Requirements Specification (SRS) Template.  [http://swiki.cc.gatech.edu:8888/uploads/cs4320/145/Srs.doc](http://irmc.state.nc.us/documents/approvals/reporting/SRSPLAN.doc) [cited 10.11.2002]

[4] Project-Based Software Engineering Homepage

<http://www.it.lut.fi/kurssit/02-03/010752000/projects.html>

7. Appendix 1. System Models

**Scenarios**

The following stages describe main scenarios performed by the GAS:

* Perform calculations
* Plot graph
* Browse files

#### **Scenario 1**

|  |  |
| --- | --- |
| **Name** | Perform calculations |
| **Actors** | Employees or students |
| **Preconditions** | Knowledge of standard Windows environment. |
| **Description** | User opens the program and enters the required parameters. |
| **End Result** | Final data results after calculations. |

#### 

#### **Scenario 2**

|  |  |
| --- | --- |
| **Name** | Plot Graph |
| **Actors** | Employees or students |
| **Preconditions** | Correctly installed Microsoft Office |
| **Description** | Plots graph on a button click |
| **End Result** | Graph is shown on the screen |

#### **Scenario 3**

|  |  |
| --- | --- |
| **Name** | Browse Files |
| **Actors** | Employees or students |
| **Preconditions** | Correctly installed operating system |
| **Description** | Browsing the folders and files used or created by the software |
| **End Result** | Copy, move, delete or view the files |