

Requirements Document for the VirtualArtViewer

CS633-Fall 2017

1. Introduction

Over the past few years, “Apogee Arts, Inc.” slowly but surely has taken the market lead in providing art lovers all over the world access to artistic paintings over a wide range of themes. To do so, “Apogee Arts, Inc.” each year painstakingly draws out several expensive and rare paintings all over the world and publishes those paintings in an annual magazine. After recognizing the potential of the Internet as an advertising medium for its paintings, “Apogee Arts, Inc.” plans to develop a web site that hosts a number of paintings and allows people to electronically view the paintings. To that effect it commissioned a study to determine whether such an application that uses a hypermedia framework to provide users links to various kinds of information would be successful. The study concluded that it would, and “Apogee Arts, Inc.” now has decided to produce as a first step, the “VirtualArtViewer”, a desktop application that offers a friendly interface for anyone to view paintings and all related descriptions.

Not surprisingly, “Apogee Arts, Inc.” lacks expertise in designing and building software systems. Therefore, they have hired Paragon Software to develop this requirements specification and the subsequent design and implementation of the VirtualArtViewer. This document is based on extensive interviews that the software engineers at Paragon Software conducted with the board of directors and concerned parties at “Apogee Arts, Inc.” All information in this document has been determined to be accurate at the time of this writing.

This document contains the detailed requirements for the VirtualArtViewer that is being developed for “Apogee Arts, Inc.” The document should serve as the official basis for any further development of the VirtualArtViewer.

The document contains the following sections:

- Executive Summary
- Application Context
- Functional Requirements
- Environmental Requirements
- Other Requirements
- Software Qualities
- Time Schedule
- Potential Risks
- Future Changes
- Glossary
- References

2. Executive Summary

“Apogee Arts, Inc.” is looking to significantly increase its customer base by providing the VirtualArtViewer. The VirtualArtViewer will allow not only the “Apogee Arts, Inc.” administrators to create, edit and store paintings and information about the paintings, but will also allow general users to retrieve their favorite paintings and all related relevant information. “Apogee Arts, Inc.” strongly believes that the VirtualArtViewer has the potential to revolutionize the world of art by not only acting as a channel to expose the minds of people to a wide range of art but also providing a tool for them to have access to every bit of information available about every piece of art — hence the desire to aggressively move into this market quickly.

The VirtualArtViewer provides the following key features:

- *Creating and storing paintings* – A user acting as an administrator can create and enter information about paintings, artists, galleries and locations and store them on the server on “Apogee Arts, Inc.”
- *Viewing a painting information* – Any user can use the application to retrieve and view detailed descriptions about paintings and any other information related to the painting.
- *Printing a painting information* – A user can conveniently print the information about any painting easily from his computer and carry the printout to any art gallery.

Two of the most important risks posed by the development of the VirtualArtViewer are the following:

- *Usability* – The VirtualArtViewer must be as easy to use as possible, otherwise novice users will simply not purchase the program.
- *Rapid development* – The schedule according to which the VirtualArtViewer will be developed is extremely aggressive to ensure that “Apogee Arts, Inc.” is the first company with this novel art viewer application. Other qualities cannot be sacrificed as a result of this rapid development.
- *Maintaining Link Consistency* – Since the description and various kinds of information of paintings, artists, galleries and locations are linked, it is imperative that consistency of links is maintained as new information is added or existing information is changed or removed.

3. Application Context

The VirtualArtViewer allows any user to retrieve any available and related information about any painting. The introduction of the VirtualArtViewer will require some of the staff of “Apogee Arts, Inc.” to be retrained to be able to create, store and maintain paintings and their descriptions electronically and also provide suitable links to all relevant related information. In addition they will also need to provide customer support for the VirtualArtViewer.

4. Functional Requirements

ADMINISTRATOR FUNCTIONALITY

Administrator Login

- 4.1.1. All Apogee Arts, Inc. administrators have to be verified using a login and password that is issued by Apogee Arts, Inc. The application should offer the administrator a set of user interfaces different from those offered to the normal user since he has access to features that allow him to edit, delete and add information to the database.

Creating New Paintings

- 4.1.2. Every painting always belongs to only one "Theme" for example such as modern art or nature, etc.
- 4.1.3. The system has a drop-down list of themes already created for an administrator to choose from while adding a new painting information.
- 4.1.4. The graphical user interface (GUI) should allow the information of only one painting to be entered at a time.
- 4.1.5. The GUI should allow the administrator to create new painting information, retrieve and edit existing painting information and save them. If painting information section with the same title already exists, the GUI should prompt administrator accordingly.
- 4.1.6. The "Painting Information" for a painting includes:
 - 4.1.6.1. The name or title of the painting. Every painting must have a unique name/title by which it can be identified.
 - 4.1.6.2. The image/picture of the painting. The image for a painting can be selected only from folders in the local file system through the GUI. Only jpg and gif files are considered as image files. Image size should be 300 X 300 pixels on the screen.
 - 4.1.6.3. The name of the artist and this should be linked to the "Artist Information" for that particular artist.
 - 4.1.6.4. The year in which the painting was known to have been created.
 - 4.1.6.5. The theme under which the painting can be classified. This should provide a link to "Theme Information" for that particular theme.
 - 4.1.6.6. The name and location of the gallery where the piece of art is currently located. The name of the gallery should provide a link to "Gallery Information" for that particular art gallery. The location (city and country where the gallery is located) should provide a link to "Country Information" for that particular location.
 - 4.1.6.7. A short description of the painting. This description can include references to other paintings, artists, art galleries and locations in

which case, they should all point to the corresponding information section.

- 4.1.6.8. The GUI should provide suitable fields and options to allow all the above information/description to be added to the particular painting information. All links should be accordingly displayed in the GUI.
- 4.1.7. The GUI should allow the administrator to create new artist information, retrieve and edit existing artist information and save it. If an artist information section with the same name of the artist already exists, the GUI should prompt administrator accordingly.
- 4.1.8. The “Artist Information” for an artist includes:
 - 4.1.8.1. The name of the artist.
 - 4.1.8.2. A list of the names/titles of all the paintings that the artist created. Each title should be a link to its corresponding “Painting Information”.
 - 4.1.8.3. A short description of the artist. This description can include references to other paintings, artists, art galleries and locations in which case, they should all point to the corresponding information section.
 - 4.1.8.4. The GUI should provide suitable fields and options to allow all the above information to be added to the particular artist information. All links should be accordingly displayed in the GUI.
- 4.1.9. The GUI should allow the administrator to create new theme information, retrieve and edit existing theme information and save them. If a theme information section with the same theme name already exists, the GUI should prompt the administrator accordingly.
- 4.1.10. The “Theme Information” for a theme includes:
 - 4.1.10.1. The name of the theme.
 - 4.1.10.2. A list of the names/titles of all paintings that can be classified under that particular theme. Each title should be a link to the “Painting Information” for that painting and should appear as a link in the GUI.
 - 4.1.10.3. A short description of the theme. This description can include references to other paintings, artists, art galleries and locations in which case, they should all point to the corresponding information section.
 - 4.1.10.4. The GUI should provide suitable fields and options to allow all the above information to be added to the particular artist information. All links should be accordingly displayed in the GUI.
- 4.1.11. The GUI should allow the administrator to create new gallery information, retrieve and edit existing gallery information and save them. If a gallery information section with the same gallery name already exists, the GUI should prompt the administrator accordingly.
- 4.1.12. The “Gallery Information” for a gallery includes:

- 4.1.12.1. The name of the gallery.
 - 4.1.12.2. The location (city and country) where the gallery is located. This should provide a link to “Country Information” for that particular location.
 - 4.1.12.3. A list of names/titles of all the paintings that the art gallery contains. Each title should be linked to the “Painting Information” for that painting.
 - 4.1.12.4. A short description of the art gallery. This description can include references to other paintings, artists, art galleries and locations in which case, they should all point to the corresponding information section.
 - 4.1.12.5. The GUI should provide suitable fields and options to allow all the above information to be added to the particular artist information. All links should be displayed in the GUI.
- 4.1.13. The GUI should allow the administrator to create new country information, retrieve and edit existing country information and save them. If a country information section with the same country name already exists, the GUI should prompt the administrator accordingly.
- 4.1.14. The “Country Information” for a country/location includes:
- 4.1.14.1. The name of the country.
 - 4.1.14.2. A list of names of all the art galleries in that particular country. Each gallery name should be linked to the “Gallery Information” for that gallery.
 - 4.1.14.3. A short description of the country. This description can include references to other paintings, artists, art galleries and locations in which case, they should all point to the corresponding information section.
 - 4.1.14.4. The GUI should provide suitable fields and options to allow all the above information to be added to the particular artist information. All links should be accordingly displayed in the GUI.
- 4.1.15. While adding new information or updating or removing existing information, the administrator is responsible for creating suitable descriptions and maintaining the links. (For example, if the administrator adds a new painting information with an artist whose entry does not already exist, he not only needs to create a new “Painting Information” for the painting, but also create a new “Artist Information” manually for that artist and provide suitable links between the two as described in the requirements above. However if he does not create the “Artist Information” for that artist, the name of the artist acts like a broken link).
- 4.1.16. The VirtualArtViewer GUI should make the input of all the information including images as easy as possible.

Saving a Painting

- 4.1.17. The VirtualArtViewer application should allow the administrator to save any information about any painting, artist, gallery and location on the “Apogee Arts, Inc.” server at any point during editing.

Editing a Painting

- 4.1.18. An administrator should be able to perform all the search queries as a normal user. Moreover, he should be able to edit any of the information sections (like paintings, artists, themes, galleries, countries) and is responsible for updating and maintaining information links.
- 4.1.19. He should be able to delete any existing information section. Before deleting an existing information section, the application should elicit a confirmation from him. When any section is deleted, all the links that point to it are broken. Moreover, only one information section can be deleted at a time.

Updating Log Files

- 4.1.20. A log book is maintained on the “Apogee Arts, Inc.” server that contains a list of each painting title in the database and how often it has been printed.
- 4.1.21. When any user issues a “print” command for a painting information, the application updates the log file on the server by incrementing the number of times that particular painting has been printed.

Reporting

- 4.1.22. Administrators can create reports that show how often each painting has been printed.
- 4.1.23. Administrators can create reports that show the top 50 most popular paintings (e.g., those paintings that have been printed the most times) of all times.

USER FUNCTIONALITY

Searching for a Painting

- 4.1.24. The GUI should allow the user to retrieve all paintings by specifying a particular theme. The set of results returned should be a list of titles/names of the paintings sorted alphabetically and should be links that take the user to the corresponding painting information.

- 4.1.25. A user should be able to locate a painting (or a set of paintings) by using a search for the title or part of the title. The results returned should be sorted alphabetically according to their titles and should be links that take the user to the corresponding painting information.
- 4.1.26. A user should be able to retrieve all links for an artist by using a search for the name or part of the name of the artist. The results returned should contain the names of the artists sorted alphabetically and should be links that take the user to the corresponding artist information.
- 4.1.27. A user should be able to search for paintings with the name or part of the name of the art gallery. The search results returned should be sorted alphabetically according to the name of the art galleries and should be links that take the user to the particular art gallery information.
- 4.1.28. A user should be able to retrieve paintings by location (for example, all paintings in (art galleries of) Italy). The search results returned should be sorted alphabetically according to the name of the art galleries in the location and should be links that take the user to the particular art gallery information.
- 4.1.29. The application should support a combination of the above searches. The search results of any combination search should be always list the titles of the paintings that match the criteria, sorted alphabetically, and should be links that take the user to the particular painting information.

Viewing information

- 4.1.30. The user should be able to view any information section, the results of any kind of search and a list of titles of paintings that have been put in the user's Favorites folder (see 4.1.36)
- 4.1.31. Any entity/text on the user interface that is a link should be in blue font and underlined.
- 4.1.32. The information in any "Painting Information" should have the title of the painting on top, followed by the image, the artist, the date the painting was created, the theme of the painting, the name and location of the art gallery where the painting is located and the description of the painting. The links should be as described in 4.1.6.
- 4.1.33. The information in any "Artist Information" should have the name of the artist, the list of paintings he created and the description of the artist. The links should be as described in 4.1.8.
- 4.1.34. The information in any "Theme Information" should have the name of the theme, the list of paintings that fall under that theme and the description of the theme. The links should be as described in 4.1.10.
- 4.1.35. The information in any "Gallery Information" should have the name of the gallery, the location of the gallery, the list of paintings in the gallery and the

description of the gallery. The links should be as described in 4.1.12.

- 4.1.36. The information in any "Country Information" should have the name of the country, the list of art galleries in that country and the description of the country. The links should be as described in 4.1.14.

Selecting paintings to the "Favorites" Folder

- 4.1.37. A user should have the option to select one or more paintings and put them in a folder called "Favorites" that is generated by the application the first time it is started. The "put" operation is equivalent to that of a "copy".
- 4.1.38. The Favorites folder exists on the user's computer and cannot be renamed by the user.
- 4.1.39. While the Favorites folder contains the complete painting information about any painting the user has put into it, the user interface that displays the Favorites information should only contain the titles of the paintings in the Favorites folder along with other user interface components like buttons etc.
- 4.1.40. The user should be able to remove paintings from the Favorites folder.

Printing a Painting

- 4.1.41. A user can print multiple paintings only from the Favorites folder. For this, he first selects the desired paintings in the Favorites folder and then prints them.
- 4.1.42. Assuming a user has a printer, he should be able to print a painting from his computer. The application should first print the image followed by the name of the artist, the year it was created, the theme of the painting, the name of the art gallery that contains the painting including the location of the painting inside the art gallery, the location of the art gallery (city and country), and description of the painting.
- 4.1.43. Whenever a user prints a painting from his Favorites folder, the application updates the log file with the print information. So, a user can print from the Favorites folder only when he is connected to the server.
- 4.1.44. A user can also print "Artist Information", "Theme Information", "Gallery Information" and "Country Information" for any artist, gallery and country respectively while viewing the information. However, he can only choose to print one information section at a time.
- 4.1.45. A user can specify printing multiple copies of a painting, theme, artist, gallery and country information while issuing the print command.

Help Section

4.1.46. The VirtualArtViewer application should have a “Help” function that allows the users to search for help on a variety of topics.

4.1.47. The help function should also include a short tutorial guide on how the VirtualArtViewer can be used.

MISCELLANEOUS FUNCTIONALITY

User Interface

4.1.48. “Apogee Arts, Inc.” has a requirement that the user interface always display the name of the company and its logo across the top. The layout of the unspecified part of the user interface is left to the designers.

Error Handling

4.1.49. All error handling is left to the designers of the VirtualArtViewer.

5. Environmental Requirements

Since it is expected that users from all over the world will be using VirtualArtViewer, and since Microsoft Windows is the most popular and widespread platform, “Apogee Arts, Inc.” has decided that the VirtualArtViewer should be able to run on Windows XP, Windows 2000, Windows 7 desktops. Other platforms do not have to be supported, since “Apogee Arts, Inc.” expects sufficient numbers of users from these basic platforms.

Further, “Apogee Arts, Inc.” hired a consultant regarding programming languages and based on its report recommends that the VirtualArtViewer application be implemented in Java™, to ensure portability across platforms as well as easy maintainability. Use of the JDK 1.3 is expected.

6. Other Requirements

VirtualArtViewer will operate as a stand-alone application and does not have to interface with other applications.

Paragon Software will deliver detailed user manuals for the VirtualArtViewer application.

7. Software Qualities

- *User-friendliness* – Since users of the VirtualArtViewer will be of all sorts and types and not all of them will be very experienced with computers, it is essential that the application be as user-friendly as possible.

- Correctness – Because “Apogee Arts, Inc.” is investing a lot of time and money in the VirtualArtViewer system, it is imperative that the VirtualArtViewer performs correctly and does not print incorrect information about paintings.
- Reliability – Reliability of the VirtualArtViewer is not expected to be essential, but nonetheless important. Accepted rate of failure is 1 crash per fortnight. Increased rate of failure will decimate the impression of “Apogee Arts, Inc.” products in the market.
- Performance – It is highly essential that the VirtualArtViewer application runs efficiently. Any “search” should not take more than 5 seconds.
- Reusability – Reusability will not be important in this application.
- Extensibility – Over time the system will be enhanced with small features, therefore the application should be extensible.
- Evolvability – Over time, the VirtualArtViewer will undergo significant enhancements and changes to position the product for future market leadership. As such, the system must be evolvable.
- Robustness – It is expected that the VirtualArtViewer application does not crash if a user inputs wrong data or makes mistakes or if links are broken.
- Verifiability – The limited schedule may not permit a complete formal verification of the software. However, extensive testing should be performed to ensure reasonable accuracy of the functioning of the system before release.
- Maintainability – “Apogee Arts, Inc.” expects that the VirtualArtViewer will be used by different kinds of users over varying periods of time. Routine maintenance may be necessary at times, hence the system should be easily maintainable.
- Repairability – Since it is possible that the application may not be fault-free, VirtualArtViewer application should be designed and implemented such that it can be easily repaired in the future.
- Safety – The VirtualArtViewer is not a critical application that can affect society at large and therefore there is not much concern about safety of the application.
- Portability – Since the VirtualArtViewer application is implemented entirely in Java which is a portable programming language itself, portability is of little concern in the design and implementation of the system.
- Understandability – To support evolvability, repairability, and maintainability, it is imperative that all aspects of the VirtualArtViewer (design, code and test cases) be easily understandable, even to future developers who are not currently involved in the creation of the VirtualArtViewer.
- Interoperability – Since the VirtualArtViewer does not have to interoperate with any other software, interoperability is not a concern.
- Productivity – Productivity is not of a concern for the VirtualArtViewer.
- Size – Nowadays, computers have lots of memory and hard disk space, so size is not an issue for the VirtualArtViewer application.
- Timeliness – The VirtualArtViewer application is first of its kind to hit the market. Needless to say, the first such application will surely achieve a large competitive advantage and a huge, loyal user base. Due to this very competitive nature, no deviations from the time schedule will be tolerated.

- Visibility – Visibility is not a concern in the development of the VirtualArtViewer.

8. Time Schedule

“Apogee Arts, Inc.” has come to know of a similar application solution that is being developed by its main rival “ABCD, Inc.” As a result, “Apogee Arts, Inc.” is pushing the development of its VirtualArtViewer in an aggressive 3-month schedule.

9. Potential Risks

- Difficult to use – The VirtualArtViewer has a lot of features and addresses every kind of user. Hence, it is possible that some users might find it difficult to use the VirtualArtViewer.
- Inconsistent links – It can prove to be an arduous task for the administrators to maintain the connectivity and consistency of links whenever new information is added or old information is updated or replaced.
- Limited schedule – The schedule according to which the VirtualArtViewer is being developed is extremely aggressive and may result in a product that does not satisfy the needs of “Apogee Arts, Inc.” This could turn out to be doubly risky since the VirtualArtViewer is the first such venture of “Apogee Arts, Inc.”
- Complex Search Algorithms - Paragon Software may have to design and implement efficient search algorithms that facilitate the different types of search.

10. Future Changes

- Web Interface – In future versions, “Apogee Arts, Inc.” may want to make all paintings accessible through a web interface.
- Advertising products – In future versions, the VirtualArtViewer may include advertising to bring in extra revenue by selling the advertising space to other organizations.
- Artella – “Apogee Arts, Inc.” long term plans call for it to develop a Gnutella-like peer-to-peer art sharing mechanism called *Artella*. Not only, should the VirtualArtViewer application be able to interface with Artella to allow online users to share and exchange arts and paintings, but also be able to interface with a database on every user’s computer.

11. Glossary

- **VirtualArtViewer** – The system under development; a software application that helps people choose and print paintings.

- **Apogee Arts, Inc.** – The client company contracting the development of VirtualArtViewer.
- **Gnutella** – Gnutella is a peer-to-peer distributed technology that is used in information and file sharing applications.
- **Java™** - A highly portable, general purpose programming language developed by Sun Microsystems in the early- to mid-1990's.
- **Painting** – The process, art, or occupation of coating surfaces with paint for a utilitarian or artistic effect. A picture or design in paint.
- **User** – User is an ordinary person who wishes to use the art viewer system to find and print paintings, enter new paintings and edit paintings.
- **Paragon Software** – The company that will develop the VirtualArtViewer system.

12. References

- <http://www.dictionary.com>
- <http://www.gnutellaneews.org/information/>