
Software Requirements Specification

for

CS179G / ABC Paint Project

Version 1.0

Prepared by Benjamin Arai and Conley Read

ColorKast

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Revision History

Name	Date	Reason For Changes	Version

1. Introduction

1.1 Purpose

In third quarter 2004, ABC Paint will migrate to a new paint numbering scheme. This migration comes at a time that ABC Paint will be adding and discontinuing a number of paints and **collections**. Although the remaining customers who utilize these soon-to-be-discontinued products are encouraged to begin using other paints in our product line, the initial transition is not occurring as rapidly or as easily as ABC Paint would like.

For ABC Paint customers to remain loyal and happy, we will create an easy to use system, allowing conversion to the new paints and **collections**. The new system must be in place by the second quarter of 2004, allowing customers the time to adjust to the new scheme before they will not be able to order the discontinued products. The use of the **application** will be long-term, used for the immediate transition and in the future when previous customers may return for more paint with old-scheme numbers.

This single **application** will be a version 1.0 product with no previous revisions in use. This stand-alone product includes features to enable ABC Paint to easily and seamlessly include the **application** in their current website.

1.2 Document Conventions

Two primary typographical conventions were followed in the generation of this specification paper. First, all acronyms are fully defined in their first use and then identified. They are also redundantly defined in the glossary, Appendix A. Any **bold italicized** item in the specification is also briefly defined in the Appendix A glossary.

You may find it helpful to review the list of documents related to the project as referenced in the references section, section 1.5, of this specification. You can also review the exhaustive list of documents and interviews related to the ABC Paint Project at:

HTTP://cs179g.conleyread.net/exec/project/docs.htm

1.3 Intended Audience and Reading Suggestions

This document is intended for reading by developers and project managers. These readers will find that this document is a product specification only, not a design document. It is recommended that all readers complete the introduction section before continuing onto the other sections. The introduction section that you are now reading provides a broad overview of the entire project and serves as a guide to the other sections. Developers will find sections two, four most useful to them while sections three and five will most likely be paid the most attention by project managers.

Sections two and four provide both overall descriptions of the project and the product itself. Sections three and five present an outline of the product interface requirements and other non-functional or performance requirements, which the final product must meet. The project manager will find these requirements most enlightening to peruse, as they will help guide decisions and performance choices throughout the entire product development process.

1.4 Product Scope

Ensure that you have read section 1.1 before continuing to this section.

This system must enable a smooth transition to the new paint numbers and scheme. The system will be designed for use as long as the hardware and operating systems specified in this document remain available. The product will be highly accessible to ABC Paint **clients** and distributors. To enable this wide access to the **application**, the new system will be integrated into the current ABC Paint website.

Each main feature of the **application** will be modularized. Each module will fit on a single webpage. The **application** will provide a theme and styling mechanism to allow ABC Paint web designers to integrate the **application**.

ABC Paint has made it very clear that they will make trade-offs to retain the benefits of the **application** being available on the web, retaining high accessibility. The product will also include documentation available to website users, paint distributors, and full setup documentation for the ABC Paint information technology department so that they may manage the **application** themselves.

1.5 References

ABC Paint Project Disaster Recovery Plan
HTTP://cs179g.conleyread.net/docs/disaster_recovery.pdf

ABC Paint Design Problem Statement
HTTP://cs179g.conleyread.net/docs/ProblemStatement.pdf

Karl E. Wiegers, Software Requirements, Second Edition
HTTP://www.microsoft.com/mspress/books/index/6496.asp

2. Overall Description

2.1 Product Perspective

As defined in sections 1.1 and 1.4, the **application** for ABC Paint will be a first-of-type solution to ensure that their business and their customer's paint selecting experience maintains continuity and consistency throughout their transition to an entirely new product line.

The product is a stand-alone web **application** with a theme mechanism to allow easy integration of the **application** into the ABC Paint website. The ColorKast solution is a **server** based **application** with a web-based **client** for consumer and enterprise access.

In some respects, the **application** is the next generation of the old mechanical, hand-select, palette board system located in paint stores everywhere.

Primarily, the **application** will include a old to new product-line "translator," a graphical color chooser, a color search-engine, a user color palette, possibly, an easy to use color matching system, and an administrative interface. All of these will be defined and described later in this same document. The actual user interface will be described in a separate user interface specification whitepaper.

All references to performance or specification apply to the **application client**. Specifications and performance estimates apply to the **application server** only if explicitly stated.

2.2 Product Functions

These functions are modularized sub-components of the **client application**. Each of the functions has a single purpose and can accomplish its mission without the other components. Together, the components function as a stand-alone **application**.

- Color Chooser (**Pointing device** driven color selection utility)
- Color number translator (old scheme -> new scheme)
- Find a particular number of colors near a given color
- Session persistent user **color palette** (colors picked, images uploaded)
- Color search engine (all **collections**, specific collection)

- Color matching (uploaded image, see section 4)

- Administrative interface (update, add, delete colors, add users)

2.3 User Classes and Characteristics

ColorKast has identified two user classes for access to the new **application**. The first user class is default for all users and allows no administrative functionality whatsoever. The second class, the administrative user, is composed of several subclasses for the secure management of access to data and permissions throughout the organization.

Default: This user has access to all functionality of the **application** except the administrative function. The user data stored by this user is not password protected but is session persistent.

Administrative: This user is composed of three subclasses. Level 3, the highest level administrative user has all access, update, add, delete permissions, and can create other administrative users at any level. Level 2, has update, add permissions, and can create administrative users up to Level 2. Level 1, has add permissions and can add administrative users at Level 1 only.

2.4 Operating Environment

The proposed ColorKast Solution will be implemented in a **client/server** model. All processing of searches and storing of information will be local to the **server**.

Server: The **server** requires at least a 1GHz processor and 512 MB of system memory for each group of 50 employee or consumer users.

Client: The web-based **client** is compatible with most operating systems and requires a working installation of Internet Explorer 4.01, Netscape 6.0, or Mozilla 1.0 or later. The **client** computer should match or exceed the system requirements specified for the web browser intended for use with the **client application**.

2.5 Design and Implementation Constraints

A few issues limit our choices when implementing a suitable solution for the ABC Paint Project.

It is very important that the **application** be web-based. We understand that in any design choice, precedence should be given to the implementation of a completely web-based **client**.

Wherever possible, the **application** should retain full usability with a keyboard input device only. This allows an easy transition for employees who are primarily used to keyboard input in current ABC Paint business **applications**.

Finally, a utility should be available to report errors. In all instances, the **application** should attempt full recovery and report errors automatically to ColorKast without encroaching on the user experience.

2.6 User Documentation

Documentation for users will be made available in the form of on-line help within the **client application** itself. An online tutorial will also be made available.

2.7 Assumptions and Dependencies

ColorKast assumes that any use of the **application** will occur in an environment with full compliance to this specification.

The **application** will be used on a **client** computer that matches or exceeds the requirements laid out in section 2.4. The **server** component of the **application** will run on a computer system that matches or exceeds the requirements laid out for the **server** in section 2.4.

We assume that the **application** will only be in use for duration of the wide-installation of the software and hardware, as defined in this document, that is required for installation of the **server** component and use of the **client application**.

We assume that finding the nearest colors in the red-green-blue color space will always give acceptably similar colors to the given color for the purpose of color search.

The **application** will be dependant on third-party databases for storage of paint information and implementation of the color search engine. The databases will give responses to **Queries** in sub-second time.

3. External Interface Requirements

3.1 User Interfaces

The **application** will have a task-based screen interface for increased usability and workflow pace. The interface will use accelerator keys heavily to allow limited “keyboard-only” **application** use.

A task-pane will be available in all workflow scenarios to allow easy access to on-line help and next-step options. The navigation options in every screen will be similar to lower or eliminate the **application** learning curve.

Input confirmation and error notification will be consistent throughout the **application**.

Theming of the **application** allows consumers to use the **application** in the context of the ABC Paint website, while ABC Paint employees may use the new system in the familiar environment of a enterprise **LAN**.

A **Pointing device** will be required for color selection, for example, when matching colors or using the graphical color chooser.

3.2 Hardware Interfaces

The **application** is dependent on existing hardware for a display device and for data-entry via a keyboard and **Pointing device**. The new system does not support legacy monochrome displays. The **application** provides minimal support for **client** computers without a **Pointing device**.

Display dependency: The **client** computer must have a display device capable of display of 16.7 million colors or greater. Colors displayed on the target **client** computer will only be accurate when the device is properly calibrated.

Keyboard: The keyboard is used to enter and place **Paint name** and paint number searches. The keyboard also provides “keyboard-only” **application** functionality when a **Pointing device** is not available.

Pointing device: The **Pointing device** provides intuitive, fluid control of the **application** for less sophisticated consumer users, and ease-of-use for the graphical color chooser interface.

3.3 Software Interfaces

The ColorKast software will interface with other software for storage of paint information, paint **collection** data, and the matching and translation of paint **color values**.

Interface 1: Connection to database for storage of information for paint number, name, **collection**, and company.

Interface 2: Database connection for color search, matching, and paint number scheme translation.

These connections are implemented on the **server**. The interface protocol is not specified, but will meet the requirements of the intended interaction

3.4 Communications Interfaces

This product will require communication via the Hyper Text Transfer Protocol (**HTTP**) to complete transaction based services with **client** computers. As identified in the Assumptions and Dependencies section 2.7, this product requires a web browser to function. The Web Browser must comply with standards for **HTTP** version 1.0 or 1.1. **HTTP** version 1.0 is a well founded and highly supported protocol. Now considered legacy by some organizations, we believe this is a safe foundation for the product.

The product also indirectly requires some network connection to the internet, over which it may communicate in **HTTP**. This network connection assumes a physical or wireless connection from the **client** computer to a consumer Internet Service Provider (**ISP**) or enterprise environment Local Area Network (**LAN**).

4. System Features

Each feature has a single mission it can complete independently. This feature set is a modularized representation of the stand-alone **application**. The modularization approach allows for a more robust **application** with fault tolerance and easy module replacement for **security** and upgradeability.

4.1 Graphical Color Chooser

The graphical color chooser will be a pointing device driven intuitive color selection tool.

4.1.1 Priority

High priority.

4.1.2 Functional Requirements

The color chooser requires the presence of a hardware pointing device.

4.2 Color Translator

The color translator is a special case of the color search engine. The color translator allows old scheme to new scheme paint number translation, given a paint number, collection and a target collection.

4.1.1 Priority

High priority.

4.1.2 Functional Requirements

The color translator requires the presence of the software color search module.

4.3 Closest Colors

The closest color tool is a special case of the color search engine. The closest color tool allows the user to locate an arbitrary number of close colors to given a paint number, collection in a target collection.

4.1.1 Priority

High priority

4.1.2 Functional Requirements

The closest colors tool requires the presence of the software color search module.

4.4 Color Search Engine

The color search engine tool will allow locating an arbitrary number of colors in any or all collections based on initial input of a paint name, number, or color value in a industry standard common format.

4.1.1 Priority

High priority

4.1.2 Functional Requirements

The color search engine requires the color space and paint information databases to be present. These two databases store paint and collection information.

4.5 User Color Palette

This is a user experience tool. The user color palette tool will store a list of the user's recent color searches. If the color sample matcher is loaded, the user color palette tool will also store recent uploaded images for matching. The user color matcher only associates this information with a single client based on a persistent client session. This user data will be removed from the server after 30 days. This information is private but not secure.

4.1.1 Priority

High priority

4.1.2 Functional Requirements

The User Color Palette requires the color search engine for color requests and the color sample matcher to enable the storing of uploaded images for matching.

4.6 Administrative Interface

The administrative interface allows administrative users to update, add, and delete paint information. Administrative users are also able to add users. Refer to section 2.3 for development and implementation of user classes and access permissions.

4.1.1 Priority

High priority

4.1.2 Functional Requirements

The application administrative interface requires the color space and paint information databases to be present.

4.7 Color Sample Matcher

The color sample matcher allows the client user to upload images in a common format for matching. The color sample matcher will allow the user to graphically select with a hardware pointing device the color or blended color group they wish to use in a color search.

4.1.1 Priority

Low priority. This module is not a requirement of the project. It is included for specification purposes only.

4.1.2 Functional Requirements

The color sample matcher requires the color search engine module to function. The color chooser requires the presence of a hardware pointing device.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

Color searches among the various **collections** defined by ABC Paint will be processed in sub-second time on the **server**.

Changes to Paint and **collection** information will occur in **Real-time**, although the actual processing time will vary with respect to the amount of information to be updated, added, or deleted on the **server**.

While performance requirements are transparently defined at the **server**, ColorKast makes no guarantees as to the speed, completeness, or timeliness of service over the greater internet. Performance of the **application** will vary on the speed and type of internet access to which the **client** computer has access.

To verify the performance of the **application**, ColorKast will show the amount of time the **server** takes to process a request. The time shown will not take into account the transit time of the information over various computer networks.

5.2 Safety Requirements

Analysis of the proposed product requirements and features has not brought any safety concerns to light. ColorKast recommends that a full legal review of the final product be undertaken prior to any public use of the product or business-wide rollout. This will ensure that ABC Paint is allowed full indemnification of liability.

Refer to current state and federal regulations regarding workplace use of keyboard-based products. Experts have concluded that the continued, repetitive use of data-entry and **Pointing devices** leads to injury in almost all circumstances. ColorKast takes no responsibility for injury or resulting damages from the use of these devices.

5.3 Security Requirements

Due to the nature of the product, the data stored in repositories of the product is generally public information consisting of **paint names** and **color values** not easily secured or obfuscated and always recoverable by a sophisticated end user. No attempts will be made to secure this information.

Information that the product will collect or store, which need access protections include user specified **color palettes** and their store of access permissions. Access to this information must be private. Most important, the store of access permissions to administrative features and access permissions must be secure.

Implementations of **Privacy** and **security** must be on par with industry standards.

5.4 Software Quality Attributes

The proposed modular specification of the **application** lends itself to adaptability, robustness, and reusability.

Questions of **application** correctness come to light with respect to the accurate display of color samples on the target **client** computer. In the enterprise environment, we can assume that the kiosk or employee computer will have a correctly calibrated display device. In the consumer market, we cannot make this same assumption. To allow calibration of the **client** display device is a possible extension of this **application**, but is not currently included in the specification.

5.5 Business Rules

ColorKast recommends that ABC Paint apply their conventional business processes and **security** regimen to granting administrative access to the new system. ColorKast believes that a typical employee or consumer should be granted default privileges only. A limited number of administrative users should be created to manage the paint data updates. Administrative users can give other users administrative access up to their own access level only.

Appendix A: Glossary

Terms:

Application:	The software product being developed by ColorKast for ABC Paint.
Client:	A computer or program that can run applications or request application -based services from a server .
Color collection:	A group of colors made by the same company, designed by a specific designer, or provided in a separate group from other paints. For example, the Ralph Lauren Collection .
Color palette:	A card, list, or other utility for displaying available or selected colors.
Color value:	Logical color numbers used to represent physical colors normally represented as RGB triplets.
Data-entry device:	Hardware, a keyboard or mouse used to interact with an application .
Paint name:	A distinctive title given a paint. Not a paint's product number.
Pointing device:	An input device, such as a mouse, joystick, or trackball, with which one can move or manipulate a cursor or pointer to interact with an application .
Privacy:	Limited security through indirect verification of identity. For example, in the ColorKast application , persistent user data is linked to a specific client session on a client computer, not a single individual. No security is implemented.
Query, Queries:	A client 's request for information, generally as a formal request to a database or search engine.
Real-time:	Not what you might think. This relates to computer systems that update information at the same rate as they receive data. For example, if the time required to update information on the server is five minutes, then a Real-time update will take five minutes.
Security:	Similar to Privacy , but much more secure. A individual is linked directly to their persistent user data using a username and associated pass phrase. This is required for all administrative level access.
Server:	A computer that processes requests for data and Queries that are elements of the application .
Server side:	Processing for the client or server that occurs only on the server .

Acronyms:

HTTP: *Hyper Text Transfer Protocol.*

ISP: *Internet Service Provider.*

LAN: *Local Area Network.*

RGB: *Red Green Blue.*

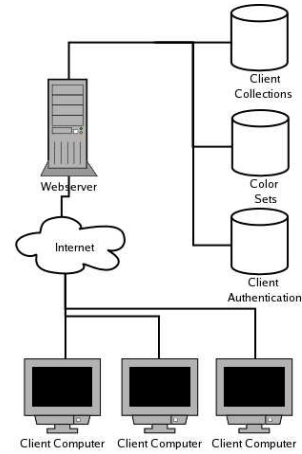
TBD: *To Be Determined.*

Appendix B: Analysis Models

The project requirements elicitation interview conducted by ColorKast helped to define the proposed architecture of the product.

The proposed system breaks the problem into two distinct parts, both separated by a connection to the internet.

In this proposed scenario, the **client** computers access the product **application** over the internet on a **server**, which hosts the **application**. The **application** stores all related paint, **client** data and authorization information in a local data cloud.



Appendix C: To Be Determined List

This To Be Determined (**TBD**) list serves to collect all currently outstanding decisions, choices, and unresolved requirements, including questions the development team may need to ask of the ABC Project Liaison.

Presently there are no remaining TBDs. All TBDs have been tracked to their closure.

Approval Signatures: Approve Version

I hereby approve the attached Software Requirements Specification (SRS). The SRS satisfies all design requirements. I acknowledge that my approval of the attached SRS is binding and that I may no longer add or change any of the design requirements without the agreement of ColorKast.

Sign _____

Date _____

Sign _____

Date _____