

# Software Design Document

## Introduction

- GraphyX is an advanced graphics editor designed to create and manipulate geometric shapes, text, and bitmap images. This document outlines the design of the system, including data models and ER diagrams.

## Problem Specification

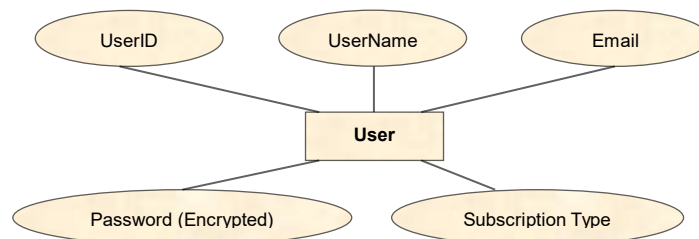
- Key Features:**
  - Creation of geometric shapes and text
  - Object selection and modification
  - Copying, moving, deleting objects
  - Saving and loading graphics
  - Importing bitmap images
  - Zoom, fitscreen, pan functions
  - Grouping and clipboard management

- Entity Relationship Diagrams**

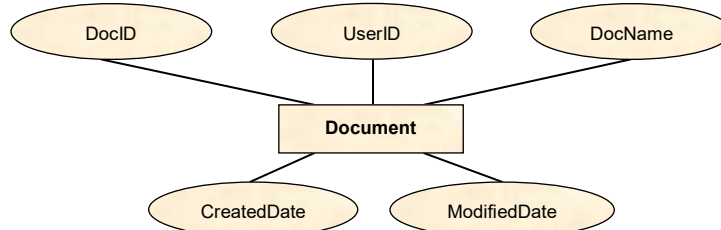
The following ER diagrams represent the main components and their relationships in the GraphyX system.

**Entities:**

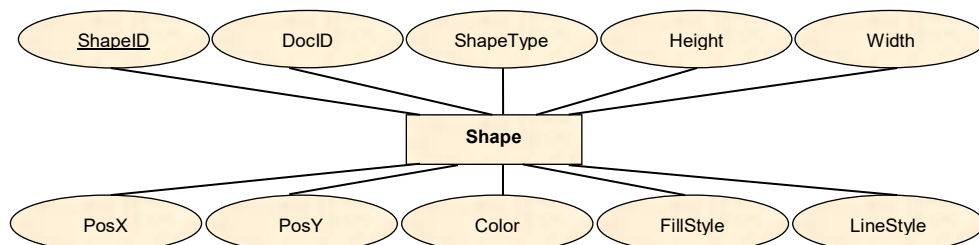
- User:** Represents individuals using the software.



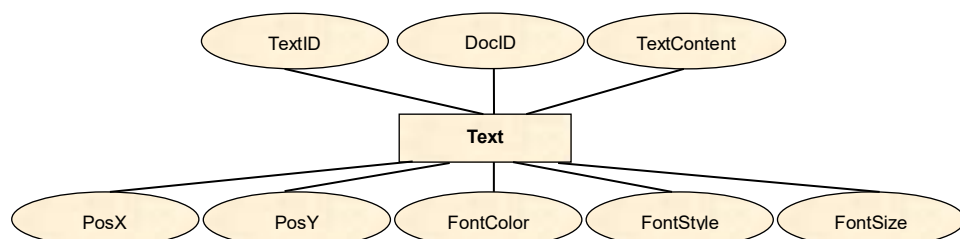
- Document:** Represents a file or project created by the user.



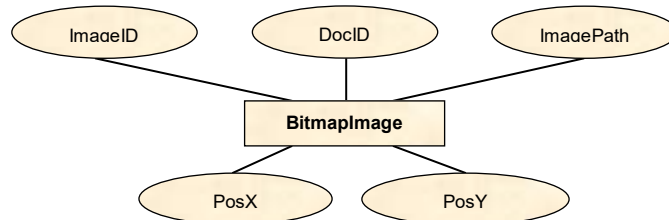
- Shape:** Represents geometric shapes within a document.



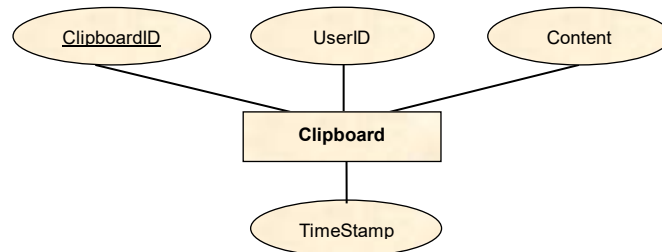
- TextObject:** Represents text elements within a document.



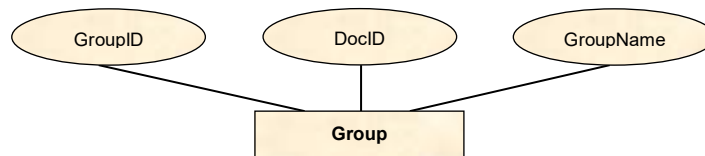
- **BitmapImage**: Represents imported bitmap images.



- **Clipboard**: Represents the clipboard storage for copied objects.



- **Group**: Represents grouped objects for collective manipulation.



#### Relationships:

- **User – Document**



- **Document - Shape**



- **Document – Text**



- **Document – BitMap Image**



- **Clipboard – User**



- **Group – Text**



- **Group – Text**



- **Group – BitMap Image**



## Module Specification

- **User Interface Module:**

- Description: This module is responsible for the overall user interface of the software, including layout, menus, toolbars, and panels.
- Key Components:
  - Main Workspace: The primary area where users create and edit designs.
  - Toolbars & Menus: Includes tools for drawing, editing, and navigating.
  - Properties Panel: Displays properties of the selected object for editing.
  - Import and Selection: Allows User to Select BitMap Images to import into the current project.
  - Clipboard: Easily accessible Clipboard with atleast 10 spots.

- **Drawing Tools Module:**

- Description: Provides the core drawing functionalities, allowing users to create and manipulate graphic elements.
- Key Components:
  - Basic Tools: Inserting Shapes (Polygons, Lines, ellipses, etc.)
  - Text Tool: Allows users to add and edit text within designs.
  - Color Picker: A utility to select and apply colors.
  - Grouping Section: Allowing User to Group two or more elements into a single entity.

- **File Management Module:**

- Description: Handles all file related operations such as creating, opening, saving, and exporting projects.
- Key Components:
  - File Open/Save: Supports various file formats, including project specific and common image formats (e.g., .png, .jpg, .svg). Allows saving into the disc and loading from it.
  - Export Options: Options to export designs in different formats and resolutions.
  - Version Control: Basic version history and recovery options.

- **Transformation & Alignment Module:**

- Description: Allows users to transform and align objects within the workspace.
- Key Components:
  - Transform Tools: Scale, rotate, skew, and flip objects.

- **View Module:**
  - Description: Allows user to view the details of the workspace in specific degrees of Magnification for better manipulation.
  - Key Components:
    - Zoom: Allows Selecting a Rectangular Area on the Screen and Zooming it to fill the entire Screen
    - Fit-Screen: Automatically adjusts the pan and zoom value to fit the Graphic to the entire screen.
    - Pan: Allows panning of the Document in any direction by a specified amount.
  
- **Import/Export Module:**
  - Description: Manages the import and export of different media and formats.
  - Key Components:
    - Image Import: Import images into the project.
    - Data Handling: Handle metadata, file information, and other data related tasks.
  
- **Help & Documentation Module:**
  - Description: Provides in-software help and documentation resources for users.
  - Key Components:
    - Help Center: In-app help articles, tutorials, and FAQs.
    - Tooltips: Contextual tooltips and help-prompts.
    - User Guides: Comprehensive user manuals and guides.
    - Support Integration: Contact support or access community forums.
  
- **Performance & Optimization Module:**
  - Description: Ensures the software runs efficiently and smoothly.
  - Key Components:
    - Resource Management: Manages memory and CPU usage to prevent lag.
    - Rendering Engine: Optimized rendering for high resolution designs.
    - Background Processing: Allows heavy tasks to run in the background.
  
- **Security & Authentication Module:**
  - Description: Handles user authentication, licensing, and security features.
  - Key Components:
    - User Accounts: Manage user accounts and authentication.
    - License Management: Ensure valid licensing and prevent unauthorized use.
    - Encryption: Secure data and file encryption.

## Requirements Tracing

Requirement ID	Requirement Description	Linked Modules	Design/Implementation Artifacts	Testing Artifacts
UI-01	Provide a Customizable workspace for creating and editing Designs	UI Module	UI Wireframes, Mockups	UI Functional Test Cases, Usability Tests
UI-02	Toolbars and Menus for accessing Drawing Tools and Features	UI Module	UI Design Document, Toolbar Prototypes	Functional Test Cases, UI Tests
UI-03	Selectable Objects, Highlighted when Selected. Properties Panel Shows Properties of Selected Object	UI Module	Properties Panel Design, Highlight Description	UI Tests, Integration Tests

Requirement ID	Requirement Description	Linked Modules	Design/Implementation Artifacts	Testing Artifacts
DT-01	Provide a Selection Panel of Shapes to Select from and insert into the Workspace.	Drawing Tools	Tool Design Specifications	Unit Tests, Functional Tests.
DT-02	Toolbar to add Text Elements and must contain Font Types, Sizes. Text Should be editable.	Drawing Tools, Typography	Text-Tool Design Document	Unit Tests, Functional Tests.
DT-03	Color Panel to select colors for all Elements of the Drawing.	Drawing Tools	Color Picker Design Document	Unit Tests, Usability Tests.

Requirement ID	Requirement Description	Linked Modules	Design/Implementation Artifacts	Testing Artifacts
FM-01	Supports Opening and Saving Projects in Various Formats.	File Management	File Handling Design Document	Functional Tests, Compatibility Tests.
FM-02	Provide Export Functions for different Formats and Resolutions.	File Management, Export	Export Functionality Specification	Export Functionality Tests.
FM-03	Implement Version Control and Recovery Options	File Management	Version Control Design Document	Functional Tests, Integration Tests.

Requirement ID	Requirement Description	Linked Modules	Design/Implementation Artifacts	Testing Artifacts
TA-01	Implement Transform Tools for scaling, rotating, skewing, flipping.	Transformation	Transform Tools Design Document	Functional Tests, Unit Tests.

## Conclusion

- This design document outlines the core data structures and relationships required for GraphyX. The ER diagrams provide a blueprint for the database schema, ensuring all required features are supported and interrelated components are properly managed.