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MSPainter+
Technical Design Document

A Puzzle Platform Painter Game

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GAME OVERVIEW

MSPainter+ is a puzzle platformer for the PC that challenges players to reach the exit by using materials available to them and "vandalizing" the level. Use various materials to overcome obstacles before the janitor cleans up your mess!

MSPainter+ is a simplistic side view puzzle platformer with a humorous side as the player tries to outsmart the janitor by drawing platforms and using other materials to try to get to the exit before the janitor can clean it up.

The game follows a concept such that N+ meets Crayon Physics inside of Microsoft Paint.

GAME CONCEPT

The original concept for our game was to design a game where the player would control a person who is trying to reach an exit in a room where obstacles exist. These obstacles are trying to hinder your progress; the key obstacle is the janitor. This NPC comes out and erases a portion of the screen removing the characters platforms. The platforms the characters create are drawn using the mouse. The player has a selection of five tools each with its own unique attributes.

TECHNICAL GOALS

A-LEVEL

- Platformer controls and layout
- Allow the player to draw their own platforms
    - By creating sprites where the mouse button is held down (which was implemented) or by using a particle system (could not be implemented)
- An element of challenge
    - Limiting amount of materials
    - A range around the character where materials can be drawn
    - Janitor AI that cleans the markings drawn by the player
- Different materials available
    - Pencil
    - Pen
    - Glue
    - Eraser
- Game obstacles
    - Normal platforms
    - Rotating platform
    - Object that makes the character "die" (spikes of death)
- About 10 levels

B-LEVEL

- Additional levels of challenge
    - Extra materials that can be acquired within levels by finding secret areas or reaching challenging areas
- Additional materials available
    - Rubber bands
    - "Weapons"
        - Chalkboard eraser
        - Paper airplanes/crumpled paper
- Additional game obstacles
    - Bounce platform
    - Pivot platform
- Up to 20 levels

C-LEVEL

- Additional game obstacles
    - Conveyor belt platform
    - Fan object that blows air and moves the player
- Sound in the game
- 25 – 30 levels

TECHNICAL RISKS

The technology we used for our game was Torque Game Builder. Torque Game Builder, TGB, is a developer's kit for indie and large scale developers alike who need an easy and intuitive interface for development. TGB does however have its draw backs, suffering from a less than stellar physics system and finicky issues with the GUI builder. The overall experience of developing MSPainter+ with Torque was positive and it allowed our team to develop a successful game almost completely true to our original concept, something rare in this age of gaming.

The key risk factor in developing MSPainter+ was that if the interface and the line drawing weren't well implemented, the game would not come close to reaching its design goal. By keeping true to the original concept, the game turned out well with the GUI and platform drawing system working very well and allowing the player to create a familiar yet new draw-your-own escape type game.

- Problems arising from Torque Game Builder
- The uncertain availability of Torsion, which was eventually distributed by the TA of the course
- Game bugs that could not be fixed before the deadline
- The game loading slowly
- The game not working on some computers for whatever reason
- Bugs that the developers didn't encounter that are very harmful to the gameplay

THIRD PARTY TOOLS

TORQUE GAME BUILDER

http://www.torquepowered.com/products/torque-2d

“Torque Game Builder is the world's most powerful and easy-to-use 2D game engine. Built atop the common Torque core architecture, it offers many of the features of our cutting-edge 3D game engine, but customized for 2D gameplay.”

TORSION

http://www.torquepowered.com/products/torsion

“Torsion is a powerful development environment for creating TorqueScript based games and mods.

Created by dedicated Torque developers, Torsion will maximize your productivity when working on your project based on the Torque line of game engines (including Torque 3D). Unlike other editors, Torsion solely targets TorqueScript development to ensure a focused tool without features for other engines getting in your way.”

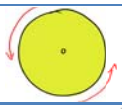
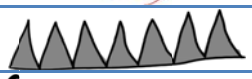
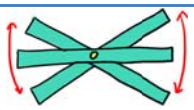
ADOBE PHOTOSHOP CS4

http://www.adobe.com/products/photoshop/photoshop/whatsnew/

“Adobe® Photoshop® CS4 software redefines digital imaging with a strong focus on photography; breakthrough capabilities for superior image selections, image retouching, and realistic painting; and a wide range of workflow and performance enhancements.”

GAMEPLAY

STRUCTURES

Picture	Item	Description
	Generic platform	Normal fixed platforms or walls. No special attributes.
	Spinning Platform	A round object that spins. Players can run on top of it or stick onto it with glue to reach areas.
	Spikes	The player will die if they come into contact with them.
	Bouncy platforms	The player can bounce on them to get to higher areas. The bouncy platform may also become an obstacle and bounce the player into a difficult or deadly situation.
	Air Vents	The air vents blow out air that push the player away from them. These may be useful to the player to reach an area or they may work against the player by slowing them down or blowing them into obstacles
	Pivot platforms	Platforms that pivot on a central axis. The player must balance when using these. Additionally, the player may use strategies such as blocking it on one end and covering the surface with paint to create a speed ramp.

MATERIALS

Picture	Item	Description
	Pencil	A weak platform that can only be used once before it breaks
	Pen	A solid platform that does not break
	Glue	Can be spread on a surface and allow the character to stick to the surface. When jumping from it, the character only jumps half the normal jumping distance
	Eraser	Enables the player to erase anything they have drawn in the level
	Paint	Makes a surface slippery to allow more speed. Can be used to get more momentum for better jumps

LEVELS

When making levels for MSPainter+, each level was tested multiple times after creation. Variables were tweaked and adjustments were made to ensure each level was playable and offered challenge to the audience.

TUNING AND PLAYTESTING METHODS

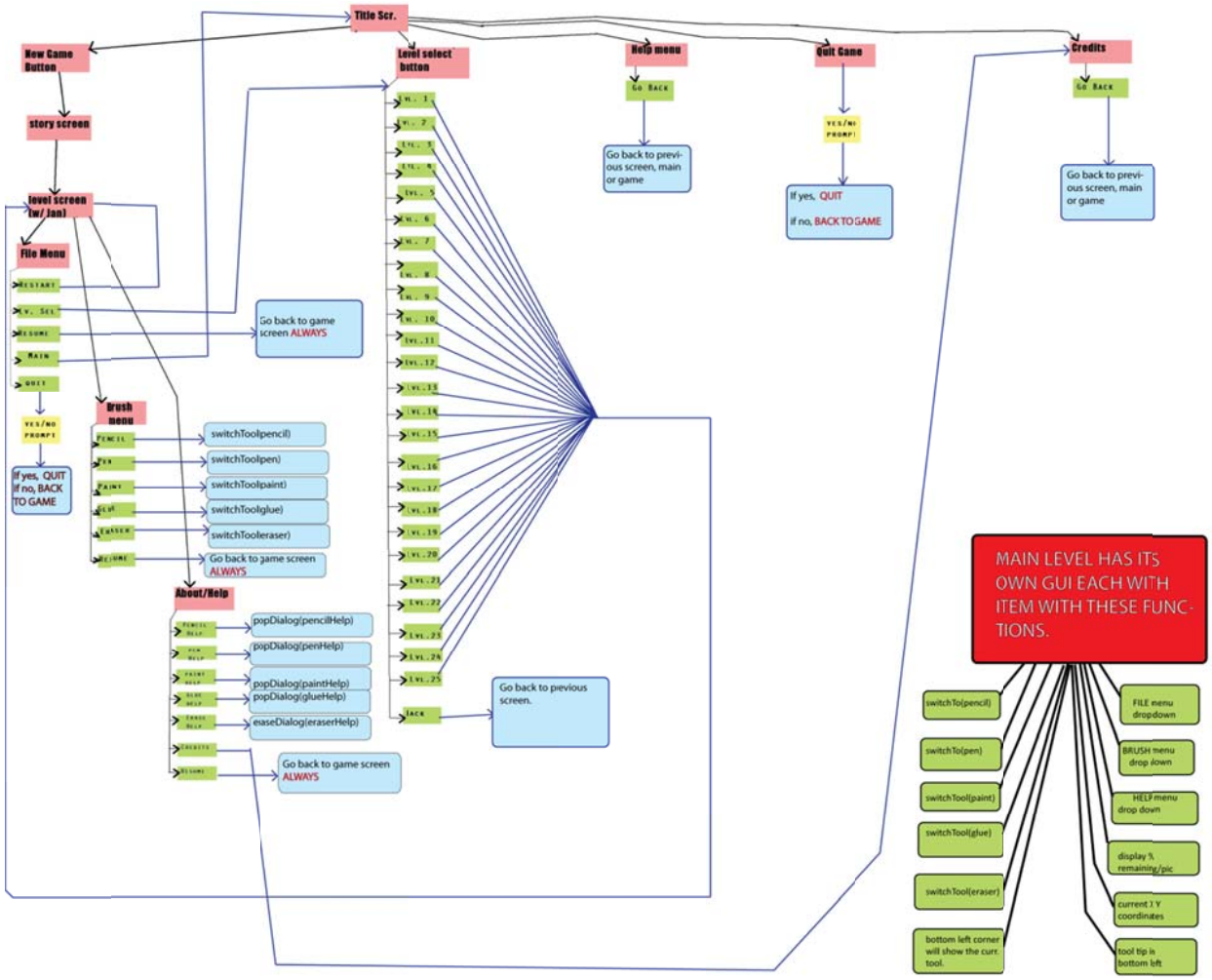
While designing levels for MSPainter+, the level designer made sure to carefully play test each one. The goals for each level were:

- PLAYABILITY – can the level be played through and finished?
- TWEAKING OF GAME OBJECTS – how much force should the objects exert when interacted with?
- AMOUNT OF MATERIALS – how much of each material should be given to the player at the beginning of each level? What is the minimum? How much extra should be included (if any)?
- EASE OF MOVEMENT – How well can the player progress through the level? Do bugs occur if objects are placed too closely together?
- CAN THE PLAYER "CHEAT?" – is there one or more ways to complete the level? Should this be prevented or left in?
- HOW CAN THE LEVEL BE IMPROVED? – can the level be made more fun by adding something? By removing something? By making something a little bigger or smaller? Can alternate solutions be added for a different level of challenge?
- LEVEL DIFFICULTY – Is this level too easy? Too difficult? How can it be balanced to make it fun yet challenging?

By keeping all these factors in mind, our team believes that the levels created would be fun for the audience to play. Additionally, many people find painter programs fun, and Microsoft Paint is often a choice. In this way, a cultural aspect was incorporated to our game with the widely known and used painting program.

GRAPHICAL USER INTERFACE

The user interface in the game is quite extensive. Influenced completely by Microsoft Paint, a program familiar to anyone who has used a Windows computer in the past fifteen years, the GUI follows the layout closely in order to give the player a game with a low learning curve within a familiar interface.



For a clearer view of this image, please see the file “flowchart.png” in the folder.

MENUS

Each menu in the game has been designed to follow the games theme, the player is a student trying to escape from school and everything is trying to stop him, especially the janitor. The entire GUI is themed around a school feel. The credits screen for example is displayed as a yearbook page, the story screen as a homework assignment on the blackboard.

Title	The title menu screen buttons link to either a new game, credits, level select, quit game or a help screen.
Main	The main screen greets the player with a very familiar interface, that of the Microsoft Paint interface.
File	The file menu allows the user to start over, go to the level select, exit or quit.
Brush	Brush menu allowing the player to change their current brush 3 ways; drop down menus, side bar and right click.
About/Help	This menu includes a pop-up window for each brush, explaining their use and their effectiveness. Also included is an option allowing the player to access either the control or credits screen.
Level Select	The last large menu is the level selection menu. This menu allows the user to load the level they want to play. Plans are being implemented to add a save feature that would allow the game to save current level progress. With saved progress the level select screen would work completely as intended, the menu would only allow you to access any levels you have beaten, trying to access a level you haven't beaten displays a screen informing the player the level is locked.
Options	The only real option in this game is to enable or disable the janitor. Again following with the school scene, on the beginning of each level the player is prompted to 'call the janitor into work'. Calling the janitor into work will raise the difficulty of the game as he will come around and erase the players' platform. Other options exist in the drop down menus mentioned above.
Controls	The controls for this game are displayed in the "Orientation" menu. Once again following the school theme, Orientation or a way to get to know your surroundings, is the help screen which lists the controls for the player.

CONSOLE

The console in this game is once again made to follow the Microsoft Paint.

Tool Select	This interface is on the left side. Each of the tools in the game has their own unique benefits. Explained in Materials part of this document.
Current Tool	In the bottom left there are plans to implement a current brush icon as well as the % remaining of the current tool.
Bottom	At the bottom of the screen there are also plans to add a tool tip, this will be based on the current brush and will allow the player to see the brush benefits without going to the about/help menu.

MOVEMENT

The player is controlled in this game via simple WASD commands and a mouse to draw platforms/switch tools.

Looking Around	The entire level is visible during all times of gameplay. In this sense, the player isn't really able to look around, but it is not an issue because the level is presented on the screen in its entirety.
In-Game Menu	The in game menu is explained above in detail.
Death Screen	Displayed when the player collides with one of several 'deadly' objects. The death screen in MSPainter+ however is designed to reflect a detention slip where the player can choose to reset level, level select or go to main menu.
Win Screen	There are two different win screens in MSPainter+ one for beating the level and another for beating the last level. The one for beating a level allows the player to continue or quit, the other allows the player to return to menu or quit.

GRAPHICS

Since our game was largely in part based off of an Microsoft Paint interface the graphics in our game are reflected to follow that style. Opting for simple 2D graphics drawn in a GUI window mounted with the game window which appears almost to be on a new document, but inside that document we placed obstacles in which the player must brave in order to reach the exit. The animations drawn within our game were hand drawn by our artist.

The artwork was done in a cartoon-like way is because it fits in with the school theme of MSPainter+. The characters, cursors, and game objects have the look of what could be doodles drawn by any student in public school. This helps to keep with the theme in a fun sort of way. Another reason the player character and the janitor are very simple and a "blank canvas" of sorts is because it allows the player to project their own ideas of what these characters are like. It allows them to relate to the student more easily than if it had a face, gender, or name already applied to it.

FORMAT

The image files are all in .png format. This is to allow transparency where it is needed in the game, for example with the character and game object animations, so the background can be seen through the characters. And not appear as a square or something unsightly. It is used for the rest of the files, such as the cursors, to allow transparency and for consistency.

SUMMARY

MSPainter+ was an overall success, regardless of the risks and technical faults that were encountered.