Thoughts and ideas on the development and design of "REMEMORY"
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Abstract
At first the purpose and details of the project are explained. The several possibilities of the XIMPEL platform are stated. After that, the impact of goals in games is discussed and some alternatives to the current theme are described.
The next part consists of a justification of the design choices such as: item choice, combinations and placement.
The technical details show that the game is basically a large network of menus linked together and the XIMPEL experiences tell what difficulties there were during development (with what seems to be one small bug).

Introduction
The goal for the Project Interactive Multimedia is to create an interactive application. This can be in the form of:
- A video such as a story branching into several paths, allowing you to influence what happens and getting a different ending every time (or even the same ending but through a different way of getting there);
- A quiz which shows you information on a specific subject and then tests to see how much you remembered (can be used as a teaching tool);
- A game to entertain;
- A multimedia application such as a sampler (to create your own songs) or a version of interactive TV (to pick the parts that interest you and view what you want, when you want);
- A combination of any of the previously named types.

To create the application, the XIMPEL framework had to be used. XIMPEL is based on Adobe Flash and allows users to show videos and pictures and link them together so they will be played in a specific order or allow the user to influence the order. The users can choose their path by clicking on an overlay shown on the screen.
XIMPEL is mainly meant for videos but can be edited to allow for games and other advanced multimedia applications as well.

Creating a concept and considering alternatives
When trying to come up with a concept, I tried to avoid a regular "branching story" and had no intention to reprogram the XIMPEL package. I quickly landed on the game of Memory and wanted to add something new and refreshing. Experience with regular Memory made me realize that it isn't that exciting because remembering the cards isn't that hard, plus there are no real surprises in the game (sometimes, in Memory tournaments, a perfect recall of the cards is assumed so that winning depends solely on the used strategy, making it a game of probability calculation).
The use of cause and effect, or combinations, seemed like a good idea. The players would have to both remember the cards AND match them with a different one to see what effect they would create. This concept would change original Memory from merely memorizing to proactively thinking and creating possibilities as well.

However, a game with no goals whatsoever can get boring very quickly, even though some gamers might contest this. The lack of goals or scores to achieve in a certain manner can be said to stimulate players to experiment with what is possible in the game.
They create their own rule set or goals, and get satisfaction from playing their "own" game or stretching the limits of what the game could be about. A game with goals could be described as a coloring page ready to be colored in; failure or success is dependent on the colors you use, combined

with the ability to stay inside the lines. However, a game without goals could be seen as an empty page, a canvas, the only way you are being limited is by the colors that are available to you. The only way you are being limited is by what the gameplay allows you to do.

The feeling of mixing colors and ending up with something entirely new is great, but it takes a lot of effort to keep experimenting and pushing boundaries without knowing whether this is what you are supposed to do, without knowing whether you are done (or without ever being done).

Sadly, Memory has gameplay which is less deep than the gameplay of Minecraft (where you have no specified goals or high scores to work towards and the only limit seems to be your own imagination as you have to bring your own goals into the existence of the game using the many options of creating items and (re)shaping the Minecraft world). Whereas Memory with added combinations would still be limited to the imagination of the creator and the player could not "imagine" a goal as there is a lack of information on his side. The player has no knowledge what combinations are possible or what effects they cause (which is what allows the game to surprise you and can be considered a considerable part of the fun factor).

That is why I decided to introduce a theme for Rememory: so the player can know what to work towards, what connections should be made between the cards.

Unless (nearly) all cards could be combined with the other cards into different effects that make some sort of sense and could entertain enough on their own to keep the player interested, a goal would give the player a much better grip on the game. Without one, it would be, as I see it, a matrix of combinations and their effects with the player systematically testing them, which would reduce gameplay to an annoying way of viewing a list of videos (thus the focus on the entertainment value of the combination effects on their own).

Several themes came to mind. Some feasible, others less so because it wasn't clear how the rules would work out.

- Recreate the periodic table. When clicking two elements they get combined and a video plays of what chemical reaction they would produce. This could be used as a teaching tool for high schools. The elements could be available to see, or hidden so to students have to learn which element resides somewhere on the table.
- Use "destruction" as a theme. With the right item set this could have many different effects without a concrete goal. Of course there would be more points for a large explosion than for lighting a candle, but there would be no real end. This would be a sort of cross-over between a game with and a game without a goal.
  Using the metaphor of the coloring pages, it could be seen as a Connect-The-Dots page.
- There is one set of cards but at the beginning of the game the user can choose what the goal will be. When replaying the game with a different goal, the player will notice that the same cards have different uses in a different context.
- Write a short story on a page and make all the words clickable so, depending on which words get clicked, the story changes into something new. It wasn't sure whether the change would be caused by the combination of words or in what order you selected them, nor was it clear how the chosen word(s) would influence the new story (would it generate a different story with the selected word as its subject? Would the new story start with the selected word? Would there be a few preset templates with the chosen words filling in the gap ("This story is about a [NOUN] which once [VERB]ed the entire country", "The [NOUN] roared triumphantly, not noticing that his neighbor was about to [VERB] him to death")).
  In the last example, the words "roared", "noticing", "neighbor" and "death" would be selectable to transfer to the next template.
  This idea was influenced by the nearly poetic review of Infinity Blade on the website of alternative gaming magazine Kill Screen: http://killscreendaily.com/articles/reviews/infinity-blade

Eventually the following theme was chosen:
You are stuck in a room with and have to escape. The Memory cards are represented as "items" you can choose to use for the combinations. This theme allows for a more diverse approach than just "destruction" and was influenced by adventure games such as Monkey Island. Even older text adventure games (sometimes referred to as Interactive Fiction) have a whole subcategory dedicated to "one-room" levels.

Design Choices
Ten items were picked to interact with and combine together: lighter, dynamite, paperclip, hammer, dice, map, Gameboy, knife (a secret item which has to be unlocked), door and computer.
The last two are items already in the room, as a part of the setting. The other items can be used on these setting-items to force an escape. Using items which are not already in the room can cause something to happen, but never a move required to win.
The game is split up in three parts with different solutions to advance to the next part and win:
-Part one requires the player to hack the computer with the Gameboy to release the secret item
-Part two needs the player to slide the map under the door
-Part three's solution is to push the knife through the keyhole and push the key on the map.

There was another item as a part of the setting: "the wall", but as it had no other actions to perform than the door had, I decided to remove it. The non-setting items (lighter, dynamite, etc) all were chosen fairly quick. Several interactions seemed to be possible between different items: about one or two for every item, although afterwards this seemed to be not as many interactions as I'd like.
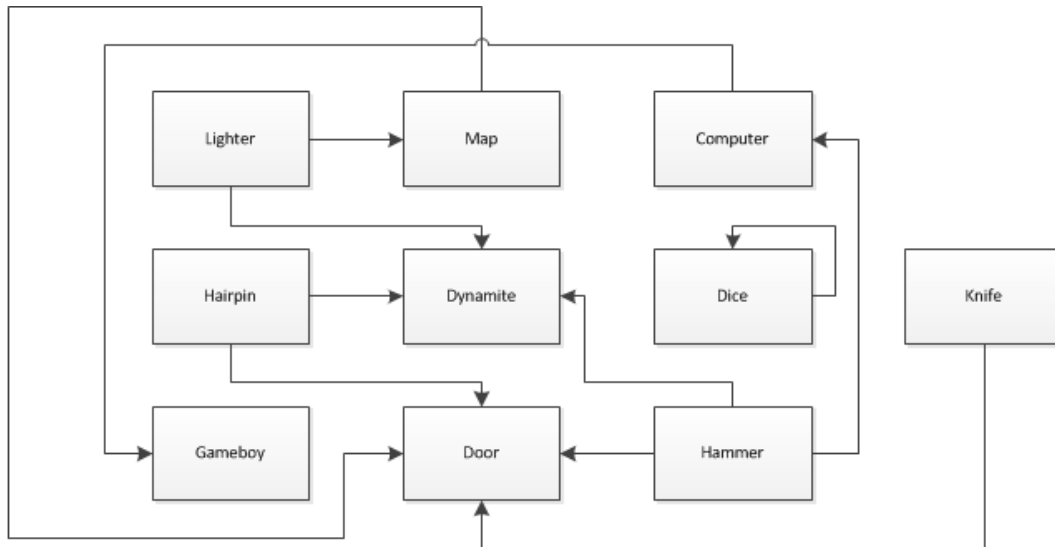A player could go several rounds without anything happening to the game. There are also some cards which nearly guarantee a death. Most combinations with the dynamite will end up killing the player. On the other hand, it's also possible for the player to guess the first solution in one try. This could be seen as luck and less as skill. The relatively high amount of "useless" combinations (for which nothing happens) should even out the chances and allow players to explore the items to use their reasoning skills to plan out an escape plan.

The choice to have the setting as part of the selectable options might seem somewhat weird but fixes the problem that combining two items without a location could cause something to happen you didn't have in mind and you otherwise wouldn't be able to specify where you'd want to apply to combination.
Besides fixing those two problems, it makes the player think outside the box. As the computer is part of the setting and part of the gameplay enabling you to escape (or even helping you escape), it could be seen as a component of the narration of the story. In this story however, the narrator is unreliable and holding back vital information.

Item placement had to be varied: combinations couldn't all be clustered around one place and the distance between combinations had to vary as well.

Item	Amount of combinations	Average distance to combination
Lighter	2	1,5
Map	2	1,5
Computer	1	4
Paperclip	2	1,5
Dynamite	3	1,7
Dice	1	0
Gameboy	1	4
Door	4	2
Hammer	3	1,7
Knife	1	3

The crucial combinations for the solution have a distance of 4 (the highest amount possible in a 3x3 grid), 2 and 3 respectively. They are all placed in different areas of the grid.

The dice are somewhat of an Easter egg as they can be combined with no other items and only with themselves (all other items can only be combined with a different item). If the player does this they get a hint about the solution of the current part of the game.

Because the game is split up in three parts it would be possible to shuffle the cards again when a new part starts. The locations of the items have to be discovered again by the player, prolonging the gameplay but also disrupting the planned combinations the player had in mind.

Some other ideas that didn't make it into the final game were a countdown timer with every action taking some time until the time was up, and a 3 item combination after the computer hack instead of the current 2 item combinations. This last idea would have exponentially increased the amount of combinations and would take huge amounts of time to work out.

Technical realization

As I mentioned before, I didn't want to program in the XIMPEL package, that's why I chose Memory. The game is set up as a background image with 9 overlays functioning as buttons. The overlays have an image embedded with the ALPHA and HOVER_ALPHA set to 1.0 so nothing can be seen behind the overlay. Behind these overlays is the background image with the pictures of the items placed directly underneath the buttons. It could be seen as a menu, allowing you to navigate through the items. Clicking any of these buttons (picking a first card or item) goes to the menu of that item: the overlay disappears and shows that part of the background image.

All items were numbered (1 through 9 before the hack happens), so the menu of the item is called after the number you clicked and if you choose a second item it will append the number of that item as the name of the action that will happen.

An example: first pick the door: you are now in menu 8 (the overlay for the door disappears), then pick the hammer (item 9): you are now in menu 89 where the overlay for the hammer disappears as well. The cards are shown for 3 seconds, then go to the action linked to this combination and afterwards return to the first menu.

Using this method was a lot of manual work but because it was structured quite well it allowed me to skip duplicate items. Menu 36 is the same as menu 63: the same graphic shows and the same action happens, so once a combination is worked out it doesn't have to be entered again.

The same goes for the actions and the items' non-reflexive relations. The dynamite exploding only has to be entered once and can be referred to by other menus. And no items (except for the dice) can be used twice in a row.

Experiences with XIMPEL

XIMPEL was easy to work with and intuitive, although I couldn't get the online version to work even though I followed the tutorial (which seemed to have some inconsistencies) and to my knowledge used the correct XIMPEL3.0 syntax.

Here is some trouble I ran into during the project:

- The name of the next menu would be shown in the upper right corner when hovering the mouse over an overlay. In general this is a nice feature but could spoil the gameplay of memory: the player could "see" what's behind the card. I tried renaming them to the menu names with only numbers, but this would show up in the end making no sense, so I ended up removing all the descriptions.
  This is most likely a simple setting in the XIMPEL framework when editing the source files in Adobe Flash Builder.
- Because the player has to see the cards for a few seconds to memorize them, a time out is built in before the movie starts playing. At this moment he could click another card to go to a different menu and cheat their way through the game. All items during this timeout are rerouted to the same menu as the player already is on, forcing him to keep the chosen combinations.
- No images could be placed on top of the background without using the overlay to link somewhere. This is why the images for the items are embedded in the background image.
- When there is an image showing with a duration set and you use the "Next" button at the bottom of the page, as soon as another image without a duration is shown, the remaining duration of the first image will still count down. This resulted in unexpected game overs during the menus.

Conclusion

A goal isn't necessary for a game to be fun, depending on the gameplay and the context. The game of Rememory does need a background story to give the player an incentive to keep playing.

A lot of different items are in the game, influencing the feeling of luck and skill required to win. Other items would have created other experiences, but all the current design choices seem to work well together.

In the end it wasn't needed to actually program to create a game, only to work structured within XIMPEL.