CHANGING THE PAST: TIME-REVERSAL AS GAME MECHANIC

Raine Koskimaa, raine.koskimaa@jyu.fi
Professor of Digital Culture, University of Jyvaskyla, Finland
raine.koskimaa@jyu.fi

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In fiction, also time is a fictive construction. In principle this would allow for all sorts of temporal experimenting. There are certain genres like science fiction, where time-travel is a common figure, but the conventional 'arrow of time', the principle of time flowing in one direction, is strong in fictions as well. In games, however, the situation is different. There the possibility of 'going back in time' is exerted in two main ways. First, it is customary in many games, that after the game character dies, the player is taken to a previous point in the fictional world of the game. Second, in many games it is possible to save any given game state, and return to a previous state, if the results of the actions taken do not satisfy the player. Both of these ways create the experience of going back *in the fictional time* of the game. The real time naturally goes on as usual, which creates the double temporal framework, where the game-character is returning to a previous state and losing everything it may have collected up until that point, whereas the player is continuously accumulating knowledge. The erased game sequence is contributing to the player's increasing knowledge and skill regarding the game world.

Game Time

As interactive and dynamic media form, games are specifically temporal in nature.

One of the common gaming situations is such, where the *game actions gain speed* as the player advances. Usually the limits of human response time are exceeded long before the computer reaches its limit of performance. Anyone who has played *Tetris*, for example, knows this very well.

In some games *there are several temporal layers at play simultaneously*. In the hugely popular *Civilization* games (by Sid Meier) there are the levels of cultural and social history, marked by advances such as the invention of horseback riding leading to advanced military strategies based on cavalrymen, the invention of writing leading to bureaucracy etc. The development on this level is modeled after quite a crude causal network, which dictates the order in which the inventions follow each other. On the level of the time of events, the player manages his cities and citizens in their daily tasks. The game is, actually, turn-based and quite insensitive to time, as the player may use as much time as he wishes to complete his turn. Each turn, however, has an equivalent of fictional time, so that after each turn a certain amount of years passes. The dynamics of the engagement with the game is grounded on the tension between the two temporal levels.

In the game *Max Payne*, the bullet time effect of the film *Matrix*, was quite successfully employed. In the game the two distinct temporal levels were integrated as a part of the fighting system. In order to effectively engage in combat within the game, the player frequently needs to use the bullet time option.

Playble Time of *The Braid*

There are some games, which take the manipulation of time to a higher level. One example is an indie game *The Braid* (2008) by Jonathan Blow, a platform puzzle, where the player embarks on a journey through a strange world to save a Princess. At any point in the game, it is possible to reverse the direction of the time within the game world. By simply using the Shift button (in the Windows version of the game), the action starts reeling back, and any mistake can be undone. The time-reversal is not fully consistent,

however, and to proceed in the game, it is often crucial to detect the incoherencies and use them to solve the puzzles.

There are six stages or 'worlds' within the game, each employing a different temporal game mechanic: (the list begins with the World 2, as the World 1 is accessible only after completing each of the other five worlds)

World 2: reversal of time by pressing 'Shift'. All actions performed may be reeled back.

World 3: specific objects (designated with greenish glow) are not affected by the time reversal. It is possible to get a key by performing a jump which kills the character. Through time reversal the character is resurrected, but still holding the key. Moving objects which are needed as jumping platforms can be synchronized by time reversal, as some of them are not affected by the reversal.

World 4: space and time are intertwined, so that when the character moves to the right the time moves forward, leftward movement triggers reversed time, and if the character stays still or jumps upwards also time stays still. This requires extremely careful planning of all actions.

World 5: When the player reverses time, a shadow character appears which performs the actions that the real character took before the reversal. There are such specific objects with which both characters may interact . Some puzzles require coordinated actions of the past and present characters.

World 6: The character carries a magic ring, which may be used to slow down time within the proximity of it.

World 1: Time runs backwards constantly here and using the time reversal restores the normal movement of objects.

This is an impressive set of temporal manipulations and enable quite unique puzzles in a 2D platform game. It is not surprising that *Braid* has won a few awards, including the 2006 Independent Games Festival award for "Innovation in Game Design" and IGN's award for "Best Puzzle Game of E3 . It is obvious that there are close connections to the notions of time and temporality on modern physics, the time-reversibility being one of the key issues in quantum computing, time and space entanglement stemming from Einstein's theory of relativity, splitting to parallel realities known through Schrödinger's Cat etc. On one level the game can be seen as an instantiation of the temporal possibilities, often highly counter-intuitive in modern physics (cf. Davies 1995).

The Grand Narrative

Additionally, there is a strong narrative aspect in *The Braid*. In the frame story the game-character Tim tells how he has done something in his life, which he strongly regrets (related to his former girlfriend) and wishes to be able to render undone. It is this narrative motivation of the in-game time-reversal which makes *The Braid* so intriguing. It is obvious that the Princess the protagonist is chasing after has at least double meaning. On one level the Princess is the former girlfriend of Tim, but on the metaphorical level The Princess stands for some ultimate goal that Tim the scientist is looking for, truth, wisdom, knowledge, power... There are plenty of signs alluding to the possibility that Tim has been involved in developing the first nuclear bombs, the detonation of the first bomb being the terrible deed he wishes to be made undone, and the Princess standing for the mastery over Mother Nature. More elaborated interpretations equal Tim with Albert Einstein, the Princess in this case standing for the Unified Field Theory Einstein did seek for in vain.

The game-play does not relate closely to either of these story lines. There are, however, puzzle pictures within certain game stages, depicting persons who could be related to the

love story. The time manipulations on the other hand link to the scientist/Einstein story. Even more challenging would be to reconcile these two stories somehow with each other.

The story itself seems to be linear, even though its direction seems to be open to discussion. In the story level we have the broken temporality of chapters presented in non-linear order. The game starts with World 2, continues with Worlds 3,4,5, and 6, after completion of which the player is only allowed to enter the World 1. This could be compared to quite a traditional logic of many mystery stories, where something (often a murder) has already happened, and the story begins in medias res. Then, the events leading to the murder are revealed only right at the end. On the other hand, there are postmodernist novels like *Lanark. A Life in 4 Books* by Alasdair Gray, where the books are printed in such a way, that first comes Book 3, then Books 1,2 and 4. As time reversal is the main issue in the *Braid*, it is not at all clear how the order of the worlds should be understood. Ending with World 1 quite explicitly refers to reversal in that the beginning is presented only as the last stage, but, how about the remaining worlds, should their order be reversed as well or not? (1,6,5,4,3,2 vs. 1, 2, 3, 4, 5 ,6) In any case, in order to complete the game, after finishing the World 1, the player has to run through the whole stage in reverse order – but the rule for the World 1 was, that time runs backwards there, so reversing reversed time should result in 'normal' direction of the time's arrow. That is, the scene after the time reversal will be the beginning of the story, Tim is not saving the Princess, but she is running away from him.[1]

Temporal system vs. state machine

In the case of the Word 2 the logic of time reversal is quite simple. The possibility of reeling back time is, in principle, similar to the possibility of saving a game state and returning to that after a mistake. The difference is practical, in that the time reversal in the Braid is easier to accomplish, and because of that, enables a kind of real-time trial-and-

[1] About the conceptual problems caused by the notion of time's arrow, and thought experiments with reversing its direction, see Horwich 1992.

error method simplifying the task of adjusting certain challenging movements. Of course, it also neatly fits with the frame story and its insistence on undoing past mistakes. Only thing that is transferred across the time barrier is knowledge.

In the subsequent worlds, with elements and objects not affected by the time-reversal we have a more complicated situation. Let's look at an example, where a key is so located that a lethal jump is required to reach it. After the grabbing of the key and following death of the character, the player needs to rewind time to return from the pit, only this time the character is still holding the key. In the beginning, at the point t=0 (there is no clock or timer on screen – I am using hypothetic time values here in order to illustrate the argument) the character is standing on the ground, not holding anything. He then moves forward, jumps into the pit, grabs the key (t=9) down in the pit, and, gets killed when hitting the bottom of the pit (t=10).Then the player starts rewinding time, at t=9 the character passes the place where the key was, but the key is not deposited in that place again. At t=0 the character is back in the beginning position, but this time holding the key. There is an analogue to time-travel paradoxes: the character goes to future, and returns back carrying an object with it. If there was another character in the fictional world, it would see the key suddenly appear in the player-characters hand. Another example makes things even more complicated. In this stage there is a moving platform, which the player has to start moving to the right. Then he has to go to a specific place in the left end of the stage, run back to the switch, make the platform return to left by switching the lever again, then reeling back time to return to the left-end in order to be able to jump on the platform when it is reaching the left end. The simple time-reversal is not enough, though, as it would not take the character quick enough to the place it needs to be. Thus, an accelerated reversal is needed (it is possible to accelerate reversal up to 8x). It is very hard to conceptually understand what is really happening here, if we take it for granted, that we are witnessing simple time-reversal. The character and platform are moving both through time and space in a way where the speed of movement through time may be manipulated in case of the character. If we forget for a moment the fictional framework of time-reversal fantasy, we may much easier figure out what is happening. The game world is a programmed state-machine, where instead of time manipulation, we can talk

about running through the states forwards or backwards. The next step required is to consider the different moving objects (the character, platform, and other moving objects) as three different systems of state-machines. Then, we are not dealing with any sort of time-paradoxes, but simply with synchronizing different systems of state-machines. This approach is limited to figuring out the external behaviour of the system, and that is the 'pure programme' aspect involved, or the measurable (scientific) time of Henri Bergson.

Types of backward narration

If we want to consider the whole game, the software practice and the attached fictional world, then we are dealing, in Bergson's terms, with duration, the personal experience of time. In this approach we try to project the game behaviour to the experiences of the world(s) thus defined. We then return to the paradoxes of time-travel, which are tried to be coped with in the framework story, but that is partial at best, and must rely on the strategy where things are left mainly open, they are only hinted at in an enigmatic way, creating an atmosphere of wonder and amazement[2]. Even though the *Braid* does not, as fiction, manage to avoid the problems of more traditional time-travel stories, it still manages to operationalize them through its game mechanic.

Seymour Chatman has presented a model of backwards narration in his recent article (2009). He divides between two main categories of backward narration: flashback and sustained types. Flashback may be short or extended. Sustained backwards narration may be episodic or continuous. Continuous backwards narration, on its turn, may be simple time-reversal, or, involve also semantic (causal) reversal:

-Flashback:
    -short
    -extended (partial / whole)
-Sustained:
    -episodic

[2] For the experienced time in narrative fiction, see Ricoeur 1988.

-continuous:

-temporal reversal

-temporal and semantic reversal

The framework story in the *Braid* is episodic backwards narration (including aspects of flashbacks), but the game-play itself would rather fall into the continuously backwards category. Seen from the state-machine perspective we are talking about temporal reversal (simple reversal of order), but the framework story and the game-play together create an ambiguous combination of all the various types of backwardnesses.

The Conclusion

In the continuation of my work, I'll concentrate more on the framework story of the *Braid*, comparing it to the novels *Time's Arrow* (by Martin Amis) and *Counter-clock World* (by Philip K. Dick), trying to grasp how the intuitive notion of duration is represented in these works. Also, I'll compare the *Braid* with other games with complex temporal dimensions (*Trinity*, *Second Sight*).

All this means that games offer us the flexibility and preciseness of digital simulations, with the potential of psychologically engaging narrative qualities, which together open up a whole new field of experimenting with temporally dynamic media. The possibility to play with simulated temporality may help us to better understand what time really is. *The Braid* foregrounds our implicit notions of the flow and direction of time, and refers to new narrative strategies opened up by the interactive digital media.

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