

A Proposed Cost Analysis Tool for Mediated Experiences

Joshua Tanenbaum & Jim Bizzocchi

School of Interactive Arts & Technology

Simon Fraser University Surrey

250-102nd Avenue

Surrey BC V3T 0A3

ABSTRACT

One of the issues facing theorists of digital media today is how to evaluate narrative experiences across multiple mediated forms. In this article, we propose a technique for comparatively evaluating the subjective experiences of the author and the reader across a spectrum of media including traditional fiction, digital hypertext, and games. It is our hope that this technique will provide an additional useful lens for discussions of signification and meaning in mediated experiences, and of the affordances and limitations of particular media forms in relationships to each other.

1: INTRODUCTION

One of the issues facing theorists of digital media today is how to compare narrative experiences across multiple modalities of communication. How do we discuss the experience of the reader of a linear novel in contrast to a reader of a hypertext story? Can the experience of watching a film be compared to the experience of playing a cinematic narrative game, such as *Myst*, *Final Fantasy*, or *Oblivion*? Scholars of game studies have long grappled with the difficulty of comparing the "apples and oranges" of Story and Play. The resultant debates surrounding the role of narrative in games have filled books. (Crawford 2005; Juull 2005; Salen and Zimmerman 2004; Wardrip-Fruin and Harrigan 2004) It is evident that digital and interactive experiences not only require new techniques for understanding the lived experience of the reader, but also raise questions about the reader's experience of pre-digital media as well.

In conjunction with questions of the reader's experience, there has been much debate as to the responsibility of the author, especially in games and other digital media. The ongoing attempts of the field to grapple with the tension between player agency and authorial control are rooted in issues of narrative meaning creation and signification. The very act of authoring within an interactive environment is qualitatively different from authoring a traditional, static narrative.

In this article, we propose an analytical framework and a set of associated metrics for comparing the subjective experiences of the author and the reader across a spectrum of media. We do not claim that this technique can be the sole, nor even the primary tool, for comparison and analysis across works and across media. That difficult and rewarding task requires a battery of conceptual tools and perspectives in order to reach meaningful and substantive conclusions. It is our hope that this technique will provide an additional useful lens for discussions of signification and meaning in mediated experiences, and of the affordances and limitations of particular media forms in relationship to each other. We believe that our perspective can

support and amplify the use of other comparative perspectives in the difficult task of analyzing and comparing the dynamics of meaning and creation across multiple works and genres.

We have two specific and distinct goals for this technique. The first is to provide games and media scholars with an appropriate tool for disambiguating interdisciplinary discourse. The second is to advance current discussions of the semiotics of digital media by providing a useful technique for discussing meaning denotation and connotation across different media forms and narrative experiences. In the next sections we briefly expand on both of these goals, before moving into the specifics of the tool itself.

2: THE HUMANITIES TRADITION

Much of the canonical theory about digital media can trace its lineage back to the broader traditions of humanities scholarship. For instance, Janet Murray, author of *Hamlet on the Holodeck*, has a background in Victorian era literature. Lev Manovich, author of *The Language of New Media*, is a scholar of film in addition to being a classically trained artist and graphics programmer. Both of these authors use previous media as touchstones for their discussion of the emergent digital forms. Murray uses the metaphor of the *Holodeck* from the Star Trek as her prototypical future media experience, but she also often turns to her roots in literature to describe her vision of the future, dedicating lengthy discussions to the implications of the lives and writings of the Bronte siblings. (Murray 1997) Manovich uses Russian filmmaker Dziga Vertov's *Man with the Movie Camera* to guide his discussion of new media forms.(Manovich 2001)

Discussing the principles and properties of an art form is difficult to do without a specific discussion of an artifact that exemplifies those principles and properties. Indeed, the humanities tradition is built upon the critique and analysis of particular works which provide doorways into more general discussions of form and structure. Games scholarship is rooted in the same techniques, with theory often arising out of discussion of a specific play experience. A variety of qualitative methodologies have been brought to bear on these experiences, including close-reading, autoethnography, and phenomenology. However, comparative discussion across the multi-disciplinary divides that exist within digital media and game studies often suffers from a lack of a shared vocabulary for discussing observations and experiences that are rooted in an individual reader's or author's experience of a specific artifact. Even more often, it seems, debate in the field is the result of a *contested shared vocabulary* that is the focus of several conflicting value systems and agendas across the field. The framework proposed in this paper attempts to address some of these issues by providing the means for making these implicit perspectives more explicit.

3: LITERARY SEMIOTICS

The second goal of this paper is to show how this technique can be used as a gateway for more rigorous discussion of the semiotics of digital media artifacts, and for this we turn to several earlier works on reading and signification. In 1935 Mikhail Bakhtin helped lay the groundwork for modern and post-modern understandings of narrative in his essay *Discourse in the Novel*. In order to evaluate the Novel as a multi-linguistic phenomenon, Bakhtin introduces

the idea of *active understanding*. Bakhtin describes active understanding as a dialectical phenomenon that grows out of everyday conversation and dialogue. He uses this metaphor to illuminate his ideas about the emergence of linguistic meaning. The meaning of any given word is dependent on the relationship between the word and the environment: an environment populated by other words, potentially about the same object. (Bakhtin 1981) It is only in negotiating this relationship that a word's meaning takes shape.

By treating the meaning of words as *context dependent* Bakhtin laid the foundation for an understanding of narrative meaning as an interpreted or *decoded* phenomenon, rather than a static, *encoded* one. Almost 30 years later, Umberto Eco discussed this idea more explicitly in his 1962 book *The Open Work*. Eco is an example of a theorist who uses readings of specific art works to shape a discussion of larger issues. In *The Open Work*, he discusses a selection of indeterminate musical compositions from the young experimentalist movement. These pieces are explicitly "open" works because they are *rules based*: they rely upon interpretation of the performer and the audience in order to be experienced and "closed". Eco takes this as a starting point for making an argument about the "openness" of all mediated experiences.

"[a reader's] comprehension of the original artifact is always modified by his particular and individual perspective. In fact, the form of the work of art gains its aesthetic validity precisely in proportion to the number of different perspectives from which it can be viewed and understood....A work of art, therefore, is a complete and closed form in its uniqueness as a balanced organic whole, while at the same time constituting an open product on account of its susceptibility to countless different interpretations which do not impinge on its unadulterable specificity. Hence, every reception of a work of art is both an *interpretation* and a *performance* of it, because in every reception the work takes on a fresh perspective for itself" (Eco 1989)

Eco's concept of the Open Work is in keeping with Bakhtin's framing of the novel as a dialectic, but instead of using conversation as the metaphor, Eco uses live performance to illustrate his point.

By contrast, Roland Barthes makes a significantly stronger claim about narrative meaning. Although still rooted in Bakhtin's ideas of heteroglossia and discourse, his 1967 *Death of the Author* regards textual meaning as elusive and unsignifiable. The Author, in Barthes' opinion, is merely a "scriptor", arranging and re-arranging text from a limitless "ready-formed dictionary", making it impossible to author meaning via language. The sole responsibility for meaning creation lies in the hands of the reader.

"Thus is revealed the total existence of writing: a text is made of multiple writings, drawn from many cultures and entering into mutual relations of dialogue, parody, contestation, but there is one place where this multiplicity is focused and that place is the reader, not, as was hitherto said, the author. The reader is the space on which all the quotations that make up a writing are inscribed without any of them being lost; a text's unity lies not in its origin but in its destination. (Barthes 1977)

Barthes further advances and refines this argument in his 1970 reading of Honore de Balzac's *Sarrazine*. In *S/Z* Barthes treats the original short story as a terrain to be traversed in explicit detail, resulting in what has been described as the "most sustained yet pulverized meditation on *reading*...in all of Western critical literature" (Barthes 1970). In *S/Z* Roland Barthes identifies five distinct codes, or groupings, of textual signifiers, the Hermeneutic, Semantic, Proairetic, Cultural, and Symbolic.

"Each code is one of the forces that can take over the text (of which the text is the network), one of the voices out of which the text is woven. Alongside each utterance, one might say that off-stage voices can be heard: they are the codes: in their interweaving, these voices (whose origin is "lost" in the vast perspective of the *already-written*) de-originate the utterance: the convergence of the voices (of the codes) becomes *writing*, a stereographic space where the five codes, the five voices, intersect...." (Barthes 1970)

A full discussion of the differences between these five codes is outside the scope of this paper, but Barthes' overall conception of the reader's role in the creation of meaning is an important evolution of his earlier ideas because it more directly maps back to Bakhtin's concept of *heteroglossia*. Barthes is arguing for an understanding of a text as a multi-voice, interpreted experience, where *denotational* meaning is continually fracturing under the lens of *connotational* meaning. This analysis takes us to a place where we can start evaluating formally the extent to which any mediated experience supports this plurality of signification and interpretation. The corollary question we pursue most actively is the examination of the investments and efforts associated with the production and the reception of these multiple signs and meanings. In the next sections we will describe our model for discussing these issues in terms of specific media experiences.

4: AN ECONOMIC MODEL

We frame our discussions of mediated experiences in terms of "cost of access". We use the notions of accessibility and cost in a particular way, which we describe below. When discussing the accessibility of a mediated narrative experience, there are a number of things which might be meant. For instance, the narrative might be written in a language that is not widely spoken, or it might reside in a software program that requires obsolete hardware in order to run. It might cost a small fortune in order to buy a ticket to the narrative experience, or it might be impossible for all but highly skilled programmers to operate the storytelling system. All of these possible barriers to access are what we are terming as *access costs* which must be negotiated or overcome in order to experience the story. Because the potential domain for framing *access costs* is so broad, it is necessary to more narrowly specify what aspects of accessibility are relevant to this argument.

The first distinction we make is between *reader access cost* and *author access cost*. The first, *reader access cost*, refers to the overall accessibility of a narrative experience to a reader. The second, *author access cost*, refers to the accessibility of a narrative medium or system to a potential author.

This notion of cost is not unique to this work. The initial inspiration for this idea comes from Bruce Sterling's *Shaping Things*, in which he introduces two immaterial costs that characterize people's relationships with technology. These two phenomena are *cognitive load* and *opportunity cost*. *Cognitive load* is essentially the amount of mental energy delegated to having to think about a particular thing, often at the expense of having energy to think about another thing. *Opportunity cost* is the amount of time sacrificed in order to "make room in the day" for any given technology, at the expense of time to devote to another activity. (Sterling 2005) There is a third cost that Sterling discusses as well: the monetary or material cost of a particular technology, which he takes as a given. In evaluating the costs of access for a given interactive narrative artifact, we propose a reframing of Sterling's three part framework as a set of lenses more specific to the task at hand. For a discussion of mediated experiences in general, and of digital narratives in particular, we propose the terms *material cost*, *proficiency cost* and *creativity cost* as the parameters around which we will be structuring our analysis.¹

4.1 Material Cost of Access

For a reader, the *material cost* may be defined as the infrastructural expense above and beyond an *assumed* baseline² in order to experience the narrative. For instance, we consider a system freely distributed on the internet to have a lower material cost than a system that requires a dedicated gaming console in order to access it. In this case, the key word is *dedicated*; if a dedicated expenditure of capital must be made in order to experience the interactive story, then this is considered part of the *material cost*. The *material cost* of authoring is similar: if specialized tools or software are needed to author a system than these constitute the *material cost of authoring*. *Material* costs are the most literally economical vector of our analysis.

4.2 Proficiency Cost of Access

The *proficiency cost* for a reader describes any specialized skills or knowledge needed to experience the story within a given medium. These might be physical abilities, such as controller operation, they might be performative abilities and improvisational skills, or they might be domain specific knowledge and specialized conceptual abilities. For an author of an interactive story the *proficiency cost* is the set of technical skills needed in order to effectively design within the medium, the most immediately apparent of which is programming ability. One of the difficulties we have encountered in constructing this model is whether or not to attempt to represent elements of authorial skill or quality of craftsmanship in our analysis. Our goal is to attempt to render key aspects of a highly subjective area within a model at least *relatively* quantifiable. Issues of quality and craftsmanship quickly cross into the domain of *personal taste*, which for us confounds the attempt at objectification beyond reasonably justifiable limits. For this reason, we are treating *proficiency* cost as simply a measure of basic necessary skills, and not as a measure of artistry or talent, both of which are outside the scope of this technique.

4.3 Creativity Cost of Access

Finally, *creativity cost* is the cost associated with actually generating narrative meaning. It is at this point in the model that the issues of semiotics and meaning discussed above come into play. The word *creativity* in this case could be easily replaced with the word signification. We use it here to represent the discourse surrounding meaning connotation in narrative, even though the word itself is perhaps imperfect to the task at hand.

For the reader, *creativity cost* is the amount of mental effort they must expend in order to extract (or generate) narrative meaning from an artifact. As has been described by Barthes, Bakhtin, and Eco, this is a non-trivial act, even in traditional pre-digital acts of reading. As we move this discussion towards specific readings of digital interactive media, this shifts from an interpretative act to an explicitly creative and participatory engagement in the experience.

For an author, the *creativity cost* is the amount of meaningful content they must generate within a given system, whether that content is textual, visual, or auditory in nature. Authorial *creativity cost* could also be described as degree of narrative specification afforded to author within a given medium. In many cases there is an inverse relationship between the amount of signification for which the author is responsible and the amount of interpretation which the reader is permitted. This is often discussed in terms of a conflict between the author and the reader in interactive systems. As our analysis progresses, we hope to shed some light on this perceived opposition.

5: A SAMPLE COST ANALYSIS

To better illustrate how we will be applying these costs we offer the following example. Figure 1 is a depiction of how a linear narrative medium—in this case the novel—might be evaluated in terms of its cost of access. First, in terms of its *author access cost*, a novel has a reasonably low *material cost* in that pretty much anyone can pick up a pen and paper and begin writing one. Authors have to be *proficient* with the language in which they are writing, but compared to what a designer of an AI system needs to learn, a novelist has a comparatively uncomplicated task. This is not to say that a novelist has it easy, but where many people walk around with that unfinished novel sitting on the shelf, very few walk about with the half implemented agent architecture that they've been meaning to get back to. We consider the novel to have a low *proficiency cost*. Finally, the *creativity cost* for the novelist is reasonably high. They must decide upon and set down a singular perspective on a story, which is then left for a reader to decode. Barthes would argue that the author in this case has no responsibility for the meaning of the text which the reader is experiencing. However, if we compare the amount of narrative signification available to a novelist to the amount of narrative signification available to a designer of a game such as *The Sims*, it is evident that an author of a novel has more responsibility to the specifics of the narrative experience.

This brings us to the *cost of access* for the reader. A book is inexpensive, when compared to a Playstation 3, giving it a comparatively low *material cost*. In order to read and understand a novel, the reader must have a decent command of the language it is written in, but they probably do not require the same proficiency with the language as the novelist. This makes

novels moderately low *proficiency cost* for the reader. As for *creativity cost*, the reader's job is primarily interpretative. Where Barthes might contend that there is no meaning to the narrative until the reader has decoded the text, we again take a less hard-line approach to meaning creation. We argue that the reader interprets the text within a domain of possibilities that is defined by the author of the novel.

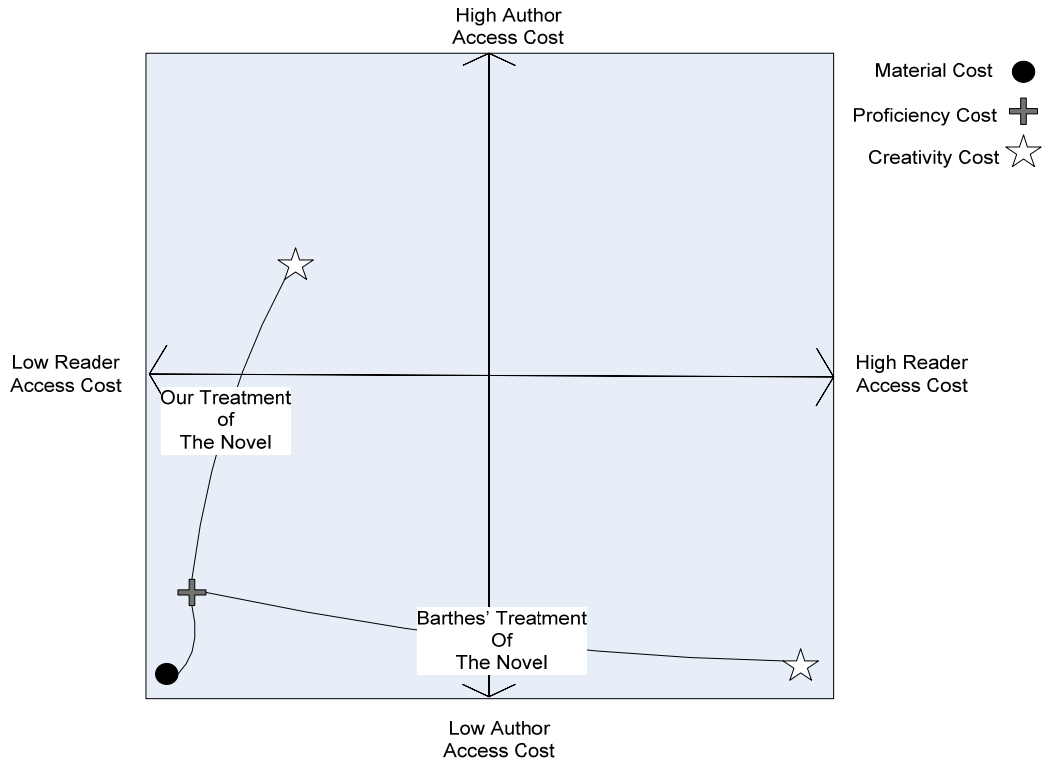


Figure 1 - Cost of Access of the Novel

The act of interpreting is a creative act but the overall creative opportunity, or *creativity cost*, is low for the reader, when compared to the work of the author. Figure 1 shows how we can graph out these costs in order to highlight the distinction between our perspective, and Barthes' point-of-view. We can show Barthes' extreme stance on *connotated* meaning represented by swinging the *creativity cost* star firmly over into the reader's territory.

This chart shows *one* way in which our framework may be applied: to demonstrate differences in the treatment of a single media form across multiple theorists' viewpoints. The second way which we use this model is to show a *single perspective on the relative characteristics of multiple forms*. In this second case, the graph may be seen to constitute a visualization of the theorist's argument, rather than an objective representation of the workings of the media objects. This allows a theorist to examine, analyze, and describe her point-of-view, using these graphs to visualise the relationships between or across multiple artifacts, as we hope to show in the following sections.

6: COST ANALYSIS OF DIGITAL MEDIA

In this section we present analyses of four different forms of digitally mediated narrative and games. We begin with several of the earliest forms such as hypertext fiction, and interactive fiction, selecting specific examples of canonical pieces where appropriate in order to ground our discussion in specific works. For each genre under consideration we'll briefly introduce the form, before performing the analysis.

6.1 Hypertext Fiction (HF)

Perhaps the earliest form of non-linear narrative is Hypertext Fiction. Hypertext works are structures comprised of *links* and *nodes*, the navigation of which are at the discretion of the reader. Arguably, the most well known form of hypertext fiction is the popular “Choose-Your-Own-Adventure” series of children’s books, first published by Bantam Books in 1979. In them, pages constitute the nodes, and instructions on where to turn next act as the links between nodes. Different choices result in the reader experiencing different plot events, which leads to a variety of possible story outcomes.

More recent hypertext fiction stories, such as Stuart Moulthrop’s *Victory Garden*, are designed to take advantage of hyperlinking in a digital environment. There is the potential for a much more sophisticated network of choices in a digital hypertext, but the core of the experience remains unchanged from its predecessor. While it is possible to author hypertext fiction with just a pen and several sheets of paper, as the narrative grows in complexity the task becomes cumbersome. A number of authoring systems have been developed to assist in tracking and visualizing the links between story nodes. Moulthrop, for instance, uses Jay David Bolter’s hypertext authoring tool *Storyspace*, which visualizes the “writing space” and allows the author to reorganize and extend interconnected nodes of text in a graphical environment. (Bolter and Joyce 1987)

The *reader access cost* for HF is relatively low in all three categories. In terms of *material costs* no specialized technology is needed. In terms of *proficiency costs*, the reader is not asked to learn a difficult set of new skills in order to experience the narrative—she simply has to select from a set of offered links. The *creativity cost* for the reader of hypertext fiction is greater than that of reading a linear narrative, because she has the option of retracing her steps and selecting a new route. In a hypertext, the need to be able to maintain a mental picture multiple, potentially conflicting, threads of narrative meaning contributes to the reader’s creativity cost.

Let’s now consider the *author access cost* for hypertext fiction. In terms of material costs, hypertext authoring at its simplest can be as cheap as a pen and paper. However, should the story grow to the point where having a digital authoring system is desirable, the material costs grow as well. At the time of this writing, the *Storyspace* software is available for just under \$300, online. Not prohibitively expensive, perhaps, but not as cheap as a notepad and pencil either. In hypertext, the *proficiency cost* of authoring is relatively low: no programming languages must be learned, no data structures or architectures assimilated. The core

proficiency required is the same as authoring in a traditional linear narrative medium. At its most technically demanding—without the aid of any expensive authoring tools—hypertext requires a minimal understanding of HTML script, which is readily acquired online.

It is at the *creativity cost* level where hypertext authoring becomes expensive. In *The Art of Interactive Design*, Chris Crawford describes the practical implications of a sophisticated branching narrative.

“Let’s assume that our interactive story-thing needs only a hundred events or actions. In other words, there will be 100 layers in our interactive story. Let us further assume that each branchpoint will have only two choices available to it—this is the absolute minimum required. This means (according to standard calculation) that the storytree will have a total of 2^{100} nodes in it. How many is that? About 10^{30} ...You’re going to have difficulty making your deadline.” (Crawford 2003)

Crawford’s example is an extreme case, but is illustrative of how the amount of creative work can scale to an unmanageable degree in a branching narrative; as a hypertext narrative grows in sophistication, the amount of work required to generate the content for it grows exponentially.

6.2 Interactive Fiction (IF)

“IF is not hypertext fiction, except of course when it is hypertext fiction.” -Jeremy Douglass (Douglass 2007)

Interactive Fiction, often abbreviated as IF, is a subset of hypertext fiction which is interesting enough to merit its own analysis. IF is a term that has been used to describe almost every work discussed in this article, however we are using it here to refer to a specific phenomenon. For the purposes of this study we use a definition from Jeremy Douglass:

“The Interactive Fiction (IF) genre describes text-based narrative experiences in which a person interacts with a computer simulation by typing text phrases (usually commands in the imperative mood) and reading software-generated text responses (usually statements in the second person present tense).” (Douglass 2007)

The most common style of IF is the “text adventure”, the classic example of which is the game *Zork*. *Zork* was developed at MIT in the late 1970s and was one of the first Text Adventure games. Text adventures are more game-like in nature than pure hypertext fiction, often containing puzzles to solve, enemies to defeat, and rewards to earn. Instead of presenting the reader with a selection of hyperlinks to choose from, IF can be characterized by its use of a free form text parser as the primary mode of interaction.

On one side of the IF spectrum is Adam Cadre’s *Photopia*; a piece that more closely resembles a linear novel than an adventure game. In *Photopia* the reader has a limited freedom to explore the world within scenes, however point of view and location shift periodically, inexorably steering the reader to the unavoidable conclusion. The reader’s interaction with the

system gives her the opportunity to delve more or less deeply into the details of the story, but it does not meaningfully alter the trajectory of the plot. On the other side of the spectrum is Emily Short's *Galatea*, which uses the mechanism of IF to simulate a conversation with an animate statue. Unlike *Photopia*, *Galatea* has no clear narrative arc, and has a number of possible endings. Interaction within *Galatea* may elicit different moods or reactions from the statue, which close off other avenues, and ultimately it is left to the reader to construct narrative meaning.

In between these two extremes is *Savoir-Faire*, also by Emily Short. *Savoir-Faire* has strong puzzle elements, which are often difficult to separate from the equally strong story components, and in many ways exemplifies the current state of the medium. *Savoir-Faire* contains many of the standard elements of IF, including a scoring system that rewards the reader for successful achievements, an inventory of items that the reader may combine in various ways, an environment containing puzzles to solve in order to score points, and a wide array of text commands to be discovered, combined and recombined over the course of the story.

Interactive Fiction has a low *material cost* for both readers and authors. Most of the software needed to view or create IF stories is freely available on the web, and may be found with a minimum of effort. However, compared to hypertext fiction, IF has a higher *proficiency cost* for both authors and readers. A first-time reader of IF is in for a daunting task, and many authors designate an explicit difficulty level for their pieces in order to avoid frightening off the novice reader with a piece that requires a significant amount of domain-specific knowledge in order to enjoy. Authoring IF requires a much higher degree of programming proficiency than authoring hypertext fiction as well, and unlike hypertext fiction, IF cannot be done in a non-digital domain, and it cannot be done without specialized tools. Finally, IF, in most cases, suffers from all of the creative challenges of hypertext fiction, while also requiring the author to create narrative puzzles to be solved by the reader. Authors of IF need to consider appropriate responses to every possible reader action within their system, and so must have an understanding of every allowed permutation of events and consequences that their stories afford. IF therefore has a relatively low *creativity cost* to read, but an extremely high *creativity cost* to author.

It is these high costs which we believe contribute to IF's place as a niche medium rather than a mainstream one. The high *proficiency cost* of reading serves as a bar to entry for many potential readers, while the two high author access costs slow the creation and distribution of the stories, and also act as limiting factors on the possible narrative sophistication of work within the medium.

6.3 "Rails" Games

Many games use the same techniques as IF and HF as part of their narrative design. There are games that branch, similarly to hypertext fiction, and games which involve puzzle solving and inventory management approaches that are very similar to interactive fiction. Another common narrative technique in games is known as the "rails" technique, exemplified in games

like *Half-Life* and *Bioshock*. “Rails” games are so-named for their resemblance to automated real-world attractions, such as those found at amusement parks. The amusement park attraction metaphor is particularly appropriate for these types of games because of two things that successful amusement park rides do very well. First, they create and support the illusion that the ride is a free rather than a tightly controlled environment. Second, they rely on this controlled environment to consistently deliver the same experience to each participant. In a “rails” game these two elements correspond to these two contradictory aims: the illusion of narrative agency for the player and the maintenance of narrative coherence within the game system. As Henry Jenkins points out:

“The most significant difference [between amusement park rides and games] is that amusement park designers count on visitors keeping their hands and arms in the car at all times and thus have a greater control in shaping our total experience, whereas game designers have to develop worlds where we can touch, grab, and fling things about at will.”(Jenkins 2004)

Rails games, much like amusement park rides, can only sustain their illusions if the player stays on the track, and so they are designed to prevent the player from straying. The resulting experience is carefully crafted to deliver a specific authored narrative to the player, allowing them agency over only strategic play elements, but no control over the ultimate outcome.

The cost analysis for rails games reveals some interesting properties of the medium, especially in comparison to the previously discussed systems. For one thing, the *material cost* to both reader and the author is significantly higher than IF and HF. Videogames have traditionally required their players to expend significant material resources in order to experience them. Where there was once a culture of pouring quarters into arcade machines, there is now a culture of specialized home gaming consoles and custom built gaming PCs. Authoring today’s games requires teams of specialists, even in the amateur “modding” communities, and access to specialized applications and development tools for 3D modelling, software development, and asset creation. It often involves costly motion capturing systems, professional performers, and an extensive logistical and support infrastructure.

The *proficiency cost* to author games is even higher, requiring all of the specialized skills needed to author IF as the minimum required proficiency, and then scaling up substantially from there. *Proficiency cost* for the reader, on the other hand, is higher than reading hypertext fiction, but significantly lower than IF, because games have a much more confined set of possible interactions (compared with natural language parsing), while also providing better support and training structures to ease novice players into the experience. Finally, the *creativity cost* to read (or play) rails games is lower than either IF or HF, as more of the narrative content is specified for the reader within the system, and much less is left to the imagination as a result. The *creativity cost* for authoring at this degree of specificity, however, is very high, as the game design team is responsible for creating not just the textual narrative elements, but also all of the visual elements of the setting and characters, and any auditory components as well.

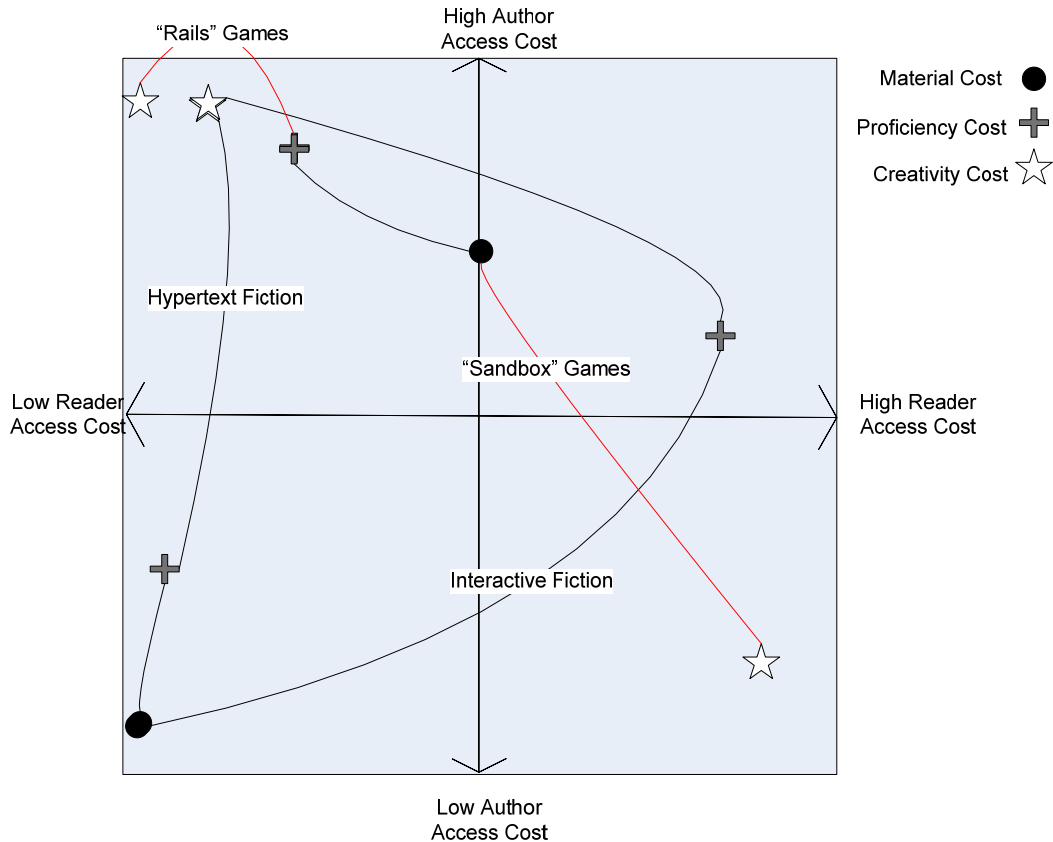
6.4 “Sandbox” games

One of the most popular new approaches to story and games, and a complete inversion of the rails game approach, is the sandbox style of game, also called “open world games”. The term “sandbox” game comes from the open-ended and non-linear nature of the virtual play space, in which players are free to explore with very few external structures or constraints imposed on them. In this sense it resembles the type of freeform creative/destructive play that is afforded by a child’s sandbox. The milestone game that put this genre on the map was Rockstar Games’ *Grand Theft Auto III*, released in 2001. *GTAIII* places characters in a rich urban setting with an open ended set of activities available to them, most of them criminal in nature. Players may elect to follow more structured micro-narratives in the form of missions as they play the game, and over time these missions combine to tell a story, however the central pleasure of the experience is the exploration of the environment. The storylines which the players encounter are linear, static, and optional. Sandbox games have captured the attention of the interactive narrative community for the ways that players use the game to tell themselves stories as they play within it.

Sandbox games have a *material cost* consistent with the rails games discussed above for both readers and authors. They also have author and reader *proficiency costs* that are no more or less than the rails games discussed earlier. For sandbox games, however, the *creativity cost to author* is significantly lower than a rails game or a branching narrative game, because it is less important that the game tell a “good story” than that it support a wide range of player actions. The *reader creativity cost* is subsequently much higher, as they are responsible for creating and telling meaningful stories through their interaction with the environment.

7: A COMPARATIVE ANALYSIS

We have now introduced four different examples of digitally mediated narrative: two from the early days of computers and the web and two more contemporary game genres. In each analysis we presented a brief discussion of the relative cost of access for these systems across three subjective valences: *material cost*, *proficiency cost*, and *creativity cost*. In Figure 2, we see the relationship between these four different mediums—Hypertext Fiction, Interactive Fiction, “rails” games, and “sandbox” games—graphically represented. [Figure 2] This diagram represents one particular way of looking at the relationships between four narrative forms. It is also an effective way for us to communicate some of our assumptions and observations about the experience of reading and authoring within these forms.



Figure

2 – Comparative Analysis of four systems

There are several areas in this graph where two different forms coincide. The two videogame genres, for instance share material and proficiency costs in our analysis, since both require the same approximate outlay of resources and expenditure of time and skill in order to create a final product. We have indicated where they differ in red to highlight what we consider to be salient distinctions between these two genres. These differences are especially interesting to us because they highlight how profoundly different the signification of narrative meaning can be within the larger category of “games”.

HF and IF also share two nodes, at both the material and the creativity cost locations in our analysis. The significant point of departure is in the proficiency cost required to author and experience these stories. The outlying proficiency cost of IF in particular speaks to the medium’s position as an acquired taste, rather than a popular staple of interactive storytelling.³

8: CONCLUSION

We believe that this cost analysis approach provides media theorists a useful technique to help in the comparative analysis of different narrative media or narrative works. While we do not expect this approach to resolve the many differences that have troubled discourse around narrative and games, we hope that it will help to illuminate the underlying assumptions upon which at least some of these differences are founded. We believe this technique provides an

additional set of metrics to help understand and describe the complicated dynamics involved in the creation of meaning within the design and the experience of mediated signification.

There are a number of questions around the construction of this model which need further exploration. For instance, while we believe that we have demonstrated that this technique can be used to discuss artifacts across media forms and genres, it remains to be seen whether this approach has significant utility in the analysis of differences between specific works within a given genre or form. We intend to explore this question in depth in our future work.

We maintain that this technique provides an interesting perspective on the debates that have characterised games research, even though we recognize that our analysis raises as many questions as it might answer. For example, much of the disagreement over the role of narrative in games can be seen as stemming from positions that claim that games are (*or should be*) located in only one of the four extremes of these quadrants. Our analysis concludes that at least two game forms can be experienced in very different ways. The experience of narrative in a rails game is very different from the experience of narrative in a sandbox game. In addition, the responsibility for specifying the details of that narrative is very different across the two genres. However, this analysis leads to another series of questions. Are there any games or other narrative media that could be considered to have both *high author creativity cost* and *high reader creativity cost*? What would such an artifact look like, and what computational and conceptual models would be necessary to create it? Where would imagined experiences, like the *Holodeck*, fall on our chart?

Games and digital media are difficult to discuss in terms of their narrative qualities because the separation between form and content is much more dramatic than in traditional linear narratives, where the relationship between the two is much more interwoven. Text on pages, bound together, might be a novel, or it might be a phonebook; the content distinguishes the form. A set of rules and media objects delivered by a computer might be a first-person-shooter, it might be a puzzle, it might be a social environment, or it might be something very different. While any of these things might be said to be games, labelling them as such is as useful for understanding the experience of encountering them as calling both a phonebook and a novel “books”. We feel that in discussing how specific digital experiences signify meaning, it is possible to move past the labels of story and game, and begin understanding digital media forms on their own terms.

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¹ The word “cost” in these situations might unintentionally convey certain negative connotations that we wish to avoid. We use it for the sake of consistency; however, it could just as easily be understood as “opportunity” or “responsibility.”

² For the purposes of our analysis, this *assumed baseline* is the average consumer of electronic media in the developed world. Any discussion of material cost is of course dependent on context. The baseline costs of access that we have selected for this analysis are set by our own socio-economic situation, but this line is meant to be flexible, and subject to the perspective of the theorist performing the analysis.

³ It is significant to note that the reading audience for IF almost completely corresponds with the authoring community, much more so than in any of the other mediums considered.