



# REAL GOAL-BASED SCENARIOS ARE FICTION

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Abstract. Use of a goal-based scenario, or any role-playing simulation, depends on a person's skill at negotiating the standard structure and conventions of fiction, as found in films, plays, novels, and short stories. Designers of role-playing simulations, hence, are bound by the same constraints binding authors and directors concerning the use of narration, the depiction of characters, the sequencing of actions, and the handling of time and place. The author posits two general principles which govern all forms of fiction, then four specific rules derived from them which role-playing simulations must obey in order to be effective.

We are able to use Goal-Based Scenarios (GBSs) and other types of role-playing simulations<sup>1</sup> because we are experts at comprehending works of fiction, including movies, plays, novels, and short stories. We know a "story" when we see it, know how to decipher the actions of characters within an artificial world, how to observe via a point of view, and how to recognize a climax and denouement. Simulations such as YELO, HRM, and Sickle Cell Counselor do not mirror reality, at least our day-to-day sense of it: to be understood, they depend on our ability to comprehend standard conventions of fiction. For a role-based simulation to use such conventions successfully, however, it must obey their rules. Otherwise, people will dislike it, for the same reasons people dislike a bad play or movie.



In this paper, I first explore the evolutionary nature of art and, in particular, fiction. I argue that role-playing simulations are part of this evolution, that what makes them "work" is the same as what makes any piece of fiction "work". I then posit two simple principles applicable to all fiction. From those two principles, I outline four rules prescribing the structure of all role-playing simulations.

## The Nature of New Forms of Expression

Art, and all forms of thought conveyance, is evolutionary. Each new form emerges out of the ashes of the old, incrementally distinct but by no means wholly different from the form which preceded it. Expressionist painters such as Jackson Pollack, radical and nouveau as they seemed at the time, were only a stage in the evolution of painting pushing the boundaries of our conception of representation, from the Impressionists, extending through the Cubists' relaxing of perspective, to the Surrealists. Similarly, cinematography was built upon theater, relying, for instance, on audiences' ability to ignore the laws of time and space in order to comprehend the actions occurring in the medium. Radio made it possible for television to become accepted, assimilating audiences to the notion of episodes, voice-over narration, and the like.

People simply do not respond to a work which violates all the conventions of a particular, recognizable form. Artists who are said to have been "before their time" produced work which broke too many rules at once; only when audiences have been prepared to entertain the possibility of those rules being broken can the work of such artists be accepted. Van Gogh, for one, violated notions of line and especially color, using broad smudgy strokes to capture what before seemed to demand exact detail and subdued colorization, and so remained obscure for much of his life. As Monet and the other Impressionists demonstrated the pleasurable effects gained from such approaches, Van Gogh's paintings grew in popularity. Philip Glass would assuredly never have made it in the 18th century.

The reason for this is that people -- and for that matter the artists themselves -- use the old forms to adapt to the new. A work of art is effective only to the extent it is understood, and this entails knowledge concerning the conventions of the genre to which it belongs. We understand a fairy tale, in part, because we know it is a fairy tale. When cinema was first made practically available, for example, directors basically filmed plays, the camera held fixed and stationary for the entire film. They did this because they rightly believed that people were used to theater, and would not understand a radically different orientation to the world. When we watch a sitcom on TV, we expect certain things, such as the protagonist getting into an



irksome, though not life-threatening or particular painful jam, and to resolve it by the end of the half-hour (often by losing an opportunity, such as a chance to escape an island or win money). By expecting these things, we can readily comprehend any new sitcom that comes along -- why events in the situation occurred, why characters behave as they do, and so on.

Most artwork depends on our expectations regarding the genre to which it belongs, in order to surprise, confound, and otherwise entertain us. Artists play off standards in order to make a point. For instance, Woody Allen achieved comic effect by employing "camp", where characters turn and directly address the camera with an observation; this violated our expectation that characters must at all times stay within their role, and so worked to great comic effect. At the same time, the bulk of Woody Allen's filmwork adheres to conventions of cinema and our notions of a plot, that is, a logical progression of actions leading to a climax. As Wayne Booth points out, "...authors may surprise us by violating conventions, but only so long as conventional expectations are available in a given public to be played upon. When everyone prides himself on violating conventions, there is nothing left to violate; the fewer the conventions, the fewer the surprises." (Booth, xxxx, page 127) If Allen had violated all cinemagraphic rules at once, the comic effect would have been lost, his work merely chaos.

## **Goal-Based Scenarios fall under the Genre of Fiction**

Most people have little trouble figuring out how to play Dungeons & Dragons, SimCity, Civilization, Hidden Agenda, and most other computer-based simulations where the user plays a role, from Ninja warrior to President of the United States (whether they enjoy it or not is another matter). The reason for this is that role-playing simulations utilize our well-developed understanding of fiction's form and structure. They contain most of the elements of standard, narrative fiction, including protagonists (often the user) and antagonists, a setting, props, a goal to be achieved along with impediments to that goal. Such simulations are usually organized, like most fiction, into distinct episodes which are logically (e.g., causally or temporally) sequenced, and which reach some culmination point (such as getting the girl or dying). In addition, like most older novels, most make heavy use of an omniscient narrator who describes the events, the motives and thoughts of characters, and so on. In short, role-playing simulations are very much like other fiction, including works found in novel, film, and theatrical form.

We indeed demand that role-playing simulations operate under the rules governing all fiction. We expect that the designer has a point to make (such as some emotion



for us to feel or some comment to make on our life), and that every element in the finished piece contributes, at least potentially, to its communication. Randomality is the mark of life but the enemy of art. When an event occurs in a work -- a change of fortune, a surprise, a strange background noise-- we expect the artist to include an explanation, preferably by showing it to us, rather than telling us directly. We treat happenstance as a flaw. It is interesting that we say of a work, that such and such an event was 'fake', at the same time ignoring significant portions of it that blatantly are, such as the elapsing of a great deal of time between scenes, juxtapositions of space, and so on. When we label some effect as "fake", we do not mean it is unreal but that it is improbable, based on the set of laws that every work establishes. I will discuss this more, later.

It seems fairly obvious that our well-developed sense of fiction is derived from our experience with children's play. Such experience no doubt contributes to our enjoyment of games as well, and one could, in fact, argue that role-playing simulations are not an offshoot of fiction, but of gaming. Games are not sufficient for explaining how we interact so readily with role-playing simulations, however: role-playing simulations do not seem bound by the same kinds of constraints that bind a computer-based games such as PacMan. For instance, most games, like chess, are so abstracted from life that we have lost the correspondence between the two; the game has become a world onto itself, apart from reality and bound only by its own internal logic. Yet, in role-playing simulations, as in fiction, the correspondence between the system and reality must be clear at all times. It would not feel right to command a World War II submarine that could be in multiple places at once, or to command a country with unwavering altruistic assistants. While some games, such as Monopoly, seem more realistic than others, such as checkers, all are judged as ends onto themselves, rather than as a means to seeing reality differently. This is where fiction and gaming differ, and I believe where gaming and role-playing simulation differ as well. Ultimately, it is to fiction that we must look in order to understand what "works" in role-playing simulation.

The notion that role-playing simulations are actually a sub-genre of narrative fiction should come as no surprise to their designers, since they at least implicitly acknowledge it in their work. For instance, Sickle Cell Counselor includes a realistic-looking syringe icon, characters which say "Ouch!" when blood is "taken" from them, and other touches of realistic portrayal. At the same time, it omits others: there is no "set", couples seeking advice do not physically enter or exit the screen, conversations with experts are initiated by button presses, and so on. Something guided its designers in their decision-making, something besides technological know-how, since these mechanisms are feasible. The designers of



Sickle Cell Counselor chose what to include because they had overall effect they were trying to achieve, and shaped the parts in accordance to it. Hence, while depiction of an office is superfluous to the effect of being a counselor, taking blood is integral, and so blood-taking was portrayed realistically while the interviews with the clients were not.

In their treatment of space and time, in particular, role-playing simulations are much more faithful to fiction than they are to reality. The events in SimCity and Civilization, for instance, take place over dozens of years, across a large expanse (a city in the former, and a continent in the latter); we experience neither in "real life". Many employ a variety of stock cinemagraphic mechanisms: a clock and/or calendar reflects the passage of time, one scene fades into the other with continuity maintained by, for example, the presence of the same character in both, system time corresponds to "real time" within an episode while hours and even centuries pass between episodes. If our conception of how space and time can be treated in fiction were not so ingrained, such conventions would, at best, seem awkward, at worse, completely incomprehensible. Yet they work, and work well.

One possible objection to my thesis is that, while role-playing simulations built merely to entertain may be bound by the conventions of fiction, many are built to instruct, and hence the constraints governing fiction do not hold (perhaps replaced by the constraints governing instruction). However, the instructional effectiveness of role-playing simulations generally depend on two qualities: they provide a realistic context for the acquisition of knowledge, and they are motivating, that is, interesting and challenging to the user. Both of these conditions, not coincidentally, are critical to good fiction, as well. A poorly-built simulation is such regardless of whether it was built to instruct or to entertain, and the reason for its inadequacy is inevitably due to some violation of fictional principle -- it does not provide a sense of continuity, it is too embroiled in detail at the expense of the overall effect, etc. Moreover, pedagogical effectiveness itself depends on the simulation's dramatic portrayal: if a user cannot understand why a simulation performs as it does, if he cannot fathom the causes of the events occurring within it, there is little chance he will learn much from it (except perhaps what constitutes bad simulation). Though role-playing simulations built for the purpose of instruction may have additional rules to obey (such as the nature of the content to be explored), the basic aesthetic criteria governing fiction still apply.



## Two Basic Principles of Fiction and, Hence, of Role-Playing Simulation

Not only do role-playing simulations conform to the tenets which guide all fiction, their success or failure utterly depends on that conformance. The reason that a given simulation does not "work"-- that is, seems fake, does not captivate us, even bores us-- is inevitably the same reason a particular short story or film has a similar effect. If this is true, then it is useful to examine the reasons why certain pieces of fiction succeed or fail. In the remainder of this paper, I first briefly explore two basic principles applicable all fiction, loosely based on Aristotle's Poetics. I then distill these two principles into four basic rules that all role- playing simulations must follow, in order to be effective.

### Principle of fiction, #1: The ultimate struggle is for closure

Aristotle's Poetics is the backbone of Western literary criticism, its simple explanation of what works in tragedy specifically, and more generally all artistic expression, the basis for nearly all subsequent aesthetic philosophy. As such, it makes sense to use it as a framework for describing the form and function of fiction.

At the heart of Poetics is Aristotle's notion of "Unity of Action", the feature of drama and other fiction which produce an "organic whole" and so separates a piece of art from everyday life. Effective drama revolves around a sequence of actions, usually called its "plot", which have a natural, logical progression. Plot is the vehicle by which drama achieves its goal of completeness, and is thus "the greatest thing of all" in a tragedy: a good plot can save a bad drama, but a bad plot invariably ruins one. To Aristotle, action is supreme: characters, their speeches, sets, music, and even narration must be subservient to it. This is why Aristotle writes that "poets should be a maker of plots over verses".

An organic whole, for Aristotle, has a beginning, a middle, and an end. There are no set rules for what should constitute any of these parts, except that a beginning should be something which does not seem to follow anything else, but which suggests something else should follow, the middle should feel as if something comes before, and something should come after, and an end, something that nothing comes after, but something before. While this may seem tautological, it actually has meaning: no one may be able to dictate what a beginning, middle, or end may entail, but we all know one when we see one. Think about the feeling you get when you leave a movie early, or come late. Beginnings feel like beginnings,



such as Dustin Hoffman jogging at the beginning of *Marathon Man*, or the mayor and other government officials gathered together to discuss a letter announcing the imminent arrival of the inspector in Gogol's *The Government Inspector*. We know endings when we see them as well, from the Prince finding Cinderella to the death of a realized King Lear.

Not only must all fiction have a beginning, middle, and end, but they must be close enough together in time and space for the viewer to be able to take the whole thing in at once, to be able to comprehend the entire work as a single entity. This is the reason Edgar Allen Poe was so enthralled by the short story: readers can read them in one sitting, and are thus the perfect vehicle for bringing about an effect. Novels, which must inevitably be read over the course of weeks and even months, solve this problem by creating, in effect, sub-units, often divided into convenient chapters, each with a beginning, middle, and end. Defining what constitutes a beginning, middle, and end is not important here; what is important is recognizing that all simulations must have them; otherwise (as has been my experience with many virtual-reality and hypertext systems), our experience with them becomes a fragmented stream of sensation, void of purpose or meaning. Only by comprehending the whole can we understand the parts, why they were included and what meanings they are supposed to convey.

Good role-playing simulation, as all good fiction, must convey a sense of wholeness, of completion, of closure. This inevitably means that the opening scene, such as King Lear divesting his kingdom to his daughters, literally "set the stage" for a sequence of events, which ultimately reach some natural conclusion, such as Lear's death. Even sensory-rich systems, such as virtual reality, which supposedly give the user complete control over a situation, must necessarily begin somewhere, and end somewhere else: the decision that their designers make regarding where to begin and where to end are critical to the work. If our adventure begins on an uncharted island, we are inclined to want to chart it, perhaps to devise a way off of it.

## **Principle of fiction, #2: The goal is not realism, but effect**

Poets are not historians, Aristotle asserts: they strive not to show what happened but what might have happened, what ought to happen. A plot is not a simple, chronological sequence of events, a fact quite evident in stories which move backwards in time, or which revolve around a central theme. Our everyday experience has precious little sense of closure, of culmination and climax, and yet, as I have previously stressed, it is the highest intent of art. When a writer constructs a story, or a designer, a simulation, the primary battle is always what to

include, and what to leave out. This battle is dictated by the overall effect one is trying to achieve, from the acquisition of knowledge about sickle cell to the comprehension of forces which shape city design. And while the correspondence between the simulation and the thing being simulated must be clear, by no means do they have to be identical -- in fact, they seldom are.

It is useful to further illuminate this contention, since it is central to recognizing a misconception I believe is evident in many simulation designs. Contemporary critics of Shakespeare faulted him for disobeying unities of time and space, that is, for allowing years to pass between scenes, for depicting one event in one part of the world, and the next in a completely different part. Such tricks, they contend, causes the audience to realize that they are watching a play instead of the thing that the play represents, and thus to lose the overall effect. Samuel Jonson, in his Preface to Shakespeare (Jonson, xxxx), persuasively argues that such criticisms are completely unfounded. At no time do we ever believe that we are actually watching, say, the fall of Troy or the goings on of the prince of Denmark: we know all along that we are watching a depiction, a bunch of actors on a stage evoking memorized lines. At the same time, in order to understand such a depiction, to empathize with the characters and ultimately to feel an emotion toward the experience, we "pretend", consciously, that it is Troy or Denmark that we view. This effect is what Coleridge called our "willing suspension of disbelief", and is central to all fiction. It is the reason why a falling curtain or a voice-over does not confuse us, why a stage that is at one moment a city street and the next a country barn can seem plausible, even probable.

Jonson went even further: not only do we enjoy a play by willingly suspending our disbelief, but our enjoyment of a play in fact depends on it. It would be difficult to enjoy, say, Macbeth if for a moment we thought the murder on stage actually occurred; by knowing it is make-believe, we can unleash the emotions surrounding such an act without experiencing the fear that would inevitably attend it as well. It is hard to imagine people paying to see Friday the Thirteenth or the Exorcist, if they believed for a moment it was real. Anecdotally, I had trouble enjoying Scorsese's After Hours, though I am generally a big fan of comedy where a central character endures a host of calamities; I think this was because the events were depicted too realistically, so I was too caught up in the hero's pain to feel like laughing (I thought it much funnier the second time I saw it).

People respond to role-playing simulations in the same way, willingly suspending their disbelief that they are actually the president of a Central American country or a genetic counselor while they engage in the actions. This means that designers need not be obsessed with capturing all aspects of reality, just enough to get the





intended effects across. If a playwright can create a castle out of a velvet curtain and a throne, surely a simulation designer can work similar magic with a minimum of realistic detail. And while the more reality one can include, the greater the range of potential effects (note that many people favor movies to theater), a simulation lacking realistic detail is not inherently less enjoyable or effective than one with it. Freed of the clutter, it may perhaps even be superior, to the extent that its structure is more visible and less buried in "noise".

Yet, many designers do not appear to recognize this. Joseph Bates, for instance, states that one of the intents of the OZ project at Carnegie Mellon is to explore whether they can involve a user in, say, Hamlet in such a way that the user does not, as Brenda Laurel recommends, feel as if they are themselves in Hamlet's role, but rather to feel as if they are Hamlet (Bates, xxxx). And yet, this violates the notion of willing suspension of disbelief: at no time will anyone ever feel this, nor can they if they are to receive maximal effect from a given simulation. In the end, role-playing simulation does not depend on the user's ability to completely immerse himself in an experience, but on the designer's cleverness in arranging dramatic elements to achieve some conscious effect.

Treating the goal of role-playing simulations as the achievement of effect, rather than realism, gives designers enormous license in their design. The designers of Sickle Cell Counselor, for instance, did not have to worry about depicting the entrance and exit of characters, about giving the user the ability to speak in his/her natural language, nor a host of other concerns that would at best have complicated development and, at worst, crippled it, due to technological limitations. We can employ buttons for, say, asking questions of experts, something which has no real-world correlate. At the same time, it means designers must have a clear sense of the effect they are trying to achieve, and a clear understanding of how the different aspects of the system contribute to expression. If there is no intended effect -- if the developer, for instance, wanted merely to recreate some reality, as does the historian -- then the simulation is lost, regardless of how realistic it appears to be.

In the section that follows, I translate these two principles -- that fiction needs closure and completeness, and that its primary goal is for effect, rather than the depiction of realism per se -- into four specific rules that separate good role-playing simulation from bad. Before explaining them, however, I should address a general distaste that people, particularly writers, have had with critics attempting to formulate a system of laws for defining "art", a novel, or the like. Inevitably, one can find an exception to any such law; when, for instance, James says a novel should tell, rather than show, one need only point to Homer, or Flaubert, or Dickens. Nevertheless, a system of aesthetics is useful, whether writers like them



or not: they are a way to focus on the essence of what art does to us, to draw out the reasons why particular works succeed and, in such a way, to make those reasons available for other artists to utilize. Art as a whole is not advanced by saying, simply, that some things work, and others do not. Good simulation design, too, consists of much more than simply knowing what one likes.

## Four Rules for Effective Role-Playing Simulation Design

### Rule #1: Avoid Deus ex Machina whenever possible

"Deus ex machina", translated into "god in the machine", refers to a technique in Greek drama in which a character playing a god was lowered onto the stage on a platform, to magically tie up all of the sticky business in the plot, such as saving the hero and condemning the villain and explaining all the unsolved mysteries. It has since come to refer to any artificial contrivance included in a work simply to resolve the plot. We spot such hacks immediately -- a sudden stroke of luck like discovering money, a policeman just "happening" on the scene, a fortuitous coincidence -- and usually condemn the entire work as a result. The author is the absolute dictator in the world being created, so audiences expect him/her to treat that power with judiciousness and respect.

The simulation designer, too, is dictator of the simulation, and must be equally respectful of and judicious with that power. Events included simply to tie up loose ends or gloss over thorny details detract from its effect, usually fatally. In adventure games, for instance, this sort of thing happens all the time -- you mysteriously come across a magic ring, "discover" a secret or an exit, and so on. To use an example closer to home, HRM employs this device, popups announcing the goings-on of the mysterious organization you work for, such as a new policy. To be fair, the designers were aware that this wasn't ideal, but could not think of a more clever way to handle it (Korcuska, personal communication). In YELO, we are accompanied by an invisible genie with extraordinary powers: we are teleported around, magically given an account file or pitch book at precisely the moment we need them, and so on. I may appear to be a bit too hard on YELO and HRM in this respect, in that their purpose is not to entertain, but to instruct. But, the argument I am making in this paper is that users will judge a piece of software as they would any piece of fiction, and will thus treat deus ex machina techniques as cheap hacks even in the context of educational simulation.

Closely related to the Deus ex machina technique, perhaps a subset of it, is the use of omniscient narration, that is, a narrator who can go anywhere and describe



anything, such as the thoughts of the characters, relevant happenings in remote parts of the world, the past, and even the future. Use of the omniscient narrator can solve any problem in a work, and hence is something to be avoided. Aristotle warns against the device, saying "the poet himself should do as little talking as possible." (Poetics, xxxx) Because omniscient narration can, and often is, handled very poorly, the realist novelists such as Henry James sought to remove all traces of it in their work, seeking instead to let the meaning of the work emerge fully from the characters and their actions, alone (Booth, xxxx). This philosophy is summed up in the advice of realist Ford Malcolm Ford: "the writer should show, not tell".

To illustrate the weakness of this technique, consider the movie *The Blade Runner*. The original movie lacked a voice-over narrator; the studio, deciding that the story was too obscure to be understood by the audience, decided to include voice-overs of its hero, Harrison Ford, in Sam-Spade-like fashion. A friend of mine saw both versions, and said they were radically different; without the narration, the movie was much stronger, less a space-age Mike Hammer and more a dark, probing look at the nature of technological innovation and man's trepiditous existence. For instance, at the climax, when the android played by Rutgar Howard, who had been pursuing Ford with the intent to revenge Ford's murder of another android, does an about-face and saves Ford's life, the narrator's voice comes on and says "I don't know why he saved me, he must have realized that life, any life, is precious." Yet, this narration is entirely superfluous, insofar as this message could easily be inferred from the action itself. Narration here completely underestimates the viewer's intelligence, to the point of being insulting.

Like novelists, simulation designers should do as little talking as possible. Whenever possible, they should show rather than tell. A popup or omniscient guide appearing on the screen at every juncture to describe what is happening or to comment on an event robs the user of the chance to discover, and to interpret, events himself. Few devices are, in fact, more irritating. Certainly, such narration seldom occurs in real life; insofar as simulations attempt to reflect reality, the device works against the effects it is attempting to bring about.

Several projects at ILS, in my opinion, make too much use of omniscient narration. In *YELO*, it drives the entire work, from the moment "You are in front of the Swain's" to the moment you don't close the sale. Who is this person who addresses us with such power and authority? How does he know what Ed is thinking right now? In *Dustin* and *HRM* as well, we are told where we are, what we must do, and so on, by some disembodied entity without name nor emotion, but with the power to get in our face whenever it wants. Advise the President makes perhaps the



heaviest use of this device, insofar as virtually every "event" in the system is described, rather than shown. These comments may seem overly critical, even carping, insofar as they ignore all of the good things offered by each of these programs. Nevertheless, I believe that the use of omniscient narration should be treated as a flaw, and hence something to avoid whenever possible.

Notice that I, like Aristotle, use the phrase "whenever possible" here. As Wayne Booth examines at length (Booth, xxxx) , use of narration cannot be avoided in certain circumstances. In fact, it is sometimes superior to use it even when an alternative technique is available. For instance, Henry James admitted to using what he called a "presci character", one whose sole existence in the work is due to the need to bring out some quality of another character, a function typically assigned to narration. Often, narration is the only way to get the reader to understand a scene, or to adopt a necessary frame of mind.

In role-playing simulation, too, the need for narration exists -- to bridge between scenes, to provide background material, and so on. I still believe designers should strive to show whenever possible; when they must tell, I believe there are a lot more clever ways of handling it than is currently handled in HRM, YELO, and Dustin, and Advise the President. How can these programs handle narration differently?

First, they might give their narrator a personality, making it less like a voice in the machine and more like a human being. This entails giving the narrator a face, a set of beliefs and opinions, perhaps even moods, such as whimsicalness, irritation, and so on. Think about how Dickens handles it: though his narrator is omniscient and ever-present, it doesn't get in the way, because we feel we know him as we would a friend. (Naturally, this depends on Dicken's genius as a story- teller, and designers shouldn't forget it takes a certain genius to pull this off. ) You might have a narrator make comments about certain soundbites or events, even the user himself. Imagine a wise-cracking narrator in YELO: "You are in front of the Swain's, on a day that looks amazingly like the day before, the fish in the pond are still biting." Or, a narrator who hates some of the experts and likes others, and constantly making his or her feelings known.

Another technique is to make the narrator a character in the simulation, as is done in many novels, especially modern ones. Suppose, for instance, that the narrator in HRM were actually the user's boss: it would still describe events and give orders, but do so in a biased, opinionated way. For instance, he might say things like 'here's yet another hoop the company's making us jump through...' as a preface to filling out a report; or, when the user decides to fire an employee, he might

interject and say 'you can't fire Joe! He's my nephew, and my wife would kill me!'. The narrator might even be an actual agent in the system, that is, able to change the course of events: if the narrator in YELO were a rival salesman, it might withhold information, purposefully steer the student down blind alleys, and so on. Using a character as a narrator must, of course, accord with the overall aim of the simulation. "When the novelist chooses to deliver his facts and summaries as though from the mind of one of his characters, he is in danger of surrendering precisely 'that liberty of transcending the limits of the immediate scene' -- particularly the limits of that character he has chosen as his mouthpiece....a fact, when it has been given to us by the author or his unequivocal spokesman, is a very different thing from the same 'fact' when given to us by a fallible character in the story. When a character speaks realistically, the convention of absolute reliability has been destroyed, and while the gains for some fictional purposes are undeniable, the costs are undeniable too." (Booth, xxxx, page 174-5)

Still another technique is to use multiple narrators, each with a different slant on the world. Here, they might consist of alternative popups (perhaps colored differently to keep them distinct) that provide conflicting accounts, contradict each other, perhaps even get into fights, not unlike the agents envisioned for the original Story Archive. Imagine one narrator suggesting the user watch one expert soundbite, the other suggesting another one that directly contradicts it. This could be especially useful in Advise the President and other domains in which interpretation is more important than fact.

The particular examples I use above are off the top of my head, and better ones can almost certainly be devised. I offer them only to show that there are almost a universe of possible things we can do here. And as I said, the better solution is often to find a way to do away with it completely, to let the actions speak for themselves.

## **Rule 2: Time and place can be divorced from reality, but must be treated consistently and logically**

One of the biggest mistakes that a simulation designer can make is to assume that time and place in a simulation must exactly correspond to the real world, for fear that, otherwise, users won't "believe" the role they are playing. As I explained previously under the second principle of fiction, users of role-playing simulation at no time think they are actually, say, an astronaut, a presidential advisor, or pilot of an F1-11; how could they, when the world they see is only a two-dimensional display on a computer screen, their only interaction via a keyboard and a mouse? Yet, people still find pleasure in operating flight simulators and other simulations.

As Samuel Jonson points out, much of that pleasure is actually derived from their knowledge that they are only engaged in a simulation: they can dismiss the fears that attend, say, learning to fly an actual plane, or the stress that would come with actually being a presidential advisor.

Samuel Jonson writes:

Time is, of all modes of existence, most obsequious to the imagination; a lapse of years is as easily conceived as a passage of hours. In contemplation we easily contract the time of real actions, and therefore willingly permit it to be contracted when we only see their imitation.

--- Samuel Jonson, Preface to Shakespeare

A simulation designer, like the novelist and playwright, can stretch and compress time and space to serve his needs; the only constraints on his treatment is that it be comprehensible, that is, logical and consistent. If shifts in time and space are not made clear to the audience (such as a movie which shifts willy-nilly from scene to scene without any bridge), the audience becomes confused, and hence, the effect of the work is lost. That is not to say that bridges have to be overt nor intrusive, however. For instance, a technique that is common in fiction is to use characters to introduce a transition, such as one saying at the beginning of a scene "I can't believe it's been three years since we've seen Tom". Another is to use a changing object -- calendar pages flying off, a clock changing time, a pastoral scene that is first summer, then autumn, then fall. People tend to readily understand their meaning, and indeed, most are probably not even consciously aware of it.

Many simulations, including most of them at ILS, handle time and space fairly well. It is illuminating to examine how different simulations do so, both because each technique has strengths as well as limitations, and because contrasting different techniques may suggest others for simulation designers to exploit. I first treat the handling of time, then turn to the handling of space.

The handling of time in a simulation. There are three areas in which simulations vary in handling time:

- Time advance
- Length of a "turn"
- Absolute versus relative clocks

*Time advance.* Some simulations, such as SimCity, SimEarth, SimLife, Gato (a World War II submarine game), and flight simulators, have continuously- running system times; others, such as Civilization, HRM, and Hidden Agenda, treat time

discretely. In a continuous-time simulation, time advances regardless of user intervention. This is, of course, very approximate to reality, though none of these systems make use of "real time" (i.e., one minute in system time is not equal to one minute of real time). In a discrete-time system, in contrast, time is advanced in discrete "clicks", often predicated on a user's action, remaining otherwise frozen.

Each technique has limits. We closely associate time with change, that is, when time is advanced, we expect to see change -- populations to increase, cities to grow, new problems to ensue. Simulations with a continuously-running clock can hence easily confuse us. To take an extreme example, one may leave SimCity to go to the bathroom, only to find a completely different city on our return. Obviously, such systems can alleviate this problem by including a Pause button, but it illustrates a more-subtle problem with such systems. For as we focus on one part of the system, changes are simultaneously happening in another part, which may confound us. For instance, a user may be watching new homes spring up around a new factory, only to be startled by the existence of homes in a completely different part of the city. In addition, there are moments in every simulation where you would like to step through time manually, in order to observe change incrementally, at your own pace. Sometimes, you'd like to do this for sheer enjoyment, as when an especially interesting effect occurs, or when you are on the verge of achieving your goal. And there are still other moments, especially in educational software, where the designer himself would like to slow time down, say during an intricate chain of events, or an especially-illustrative happening. Such manipulations of time are difficult, if not impossible, in simulations with continuously-running clocks.

On the other hand, systems employing discrete time jumps face the problem of when to advance time. Designers may choose, as in Hidden Agenda, to advance time whenever a student takes a significant action; the problem with this is that it prevents the user from taking multiple actions at a given moment, necessary in certain roles and situations. This is especially true in simulations which focus on the act of planning. Obviously, this is not a problem in systems with a continuously-running clock (provided the user works quickly). Another weakness of systems with discrete clocks is that it is sometimes desirable for time to be advanced without the user taking an action. For instance, a designer may want to have occasional system events occur, such as a flood, market crash, or the like; if the system clock is predicated on user action, how can the designer do so, without causing a conflict between the user action and the system event, and hence causing confusion? About the only way around this is to delay the advent of the user's action until after the system event, which can easily become irritating.



One solution to the problem of how to allow simultaneous actions or no action, as described previously, is to give the user control over advancing the clock, a technique employed by HRM and its "Advance Time One Month" button. That way, a user can take any number of actions (including none) before time is advanced, and hence change unleashed. Unfortunately, this feels like an artificial contrivance, a bit of Deus ex machina, since it is so unreal, so seemingly alien to the role of resource manager (or any role, for that matter). An alternative, perhaps, is to have time advance dependent not on any action, but on particular ones; a system might advance time only after a user has, say, submitted an evaluation report, ala BOSS. At least this way, time is advanced in a way more congruous to the context. What we really need, however, is some technique for combining a continuous clock with a discrete one: I leave this as a challenge for the reader.

*Length of a "turn"*. In nearly all simulations, the same amount of time is advanced between ticks of the clock, or "turns". In HRM, for example, each turn is one month; in others, turns may take a hour, week, or even century. Some simulations vary their lengths across the course of the simulation; Civilization, for one, begins with long ticks and later shifts to shorter ones, presumably because its world starts simply and grows more complex, necessitating that time is correspondingly slowed. In the vast majority of simulations, time is used only to signal change (that is, when time is advanced, users know to expect some change to have occurred), so a fixed-length clock tick is sufficient.

Few simulations make use of turns which arbitrarily vary in length. One exception is YELO which, as in theater, has varying amounts of time pass between scenes (though of course, not too much time, since users then wonder what they missed during the movement of the clock). It is interesting to me why more do not make use of this, since it is something we readily accept in fiction. In drama, for instance, we have no problem with the fact that a scene is unfolded in real time, while days or years pass between scenes. Why can't such a device be successfully employed in a simulation, as well? Perhaps designers fear that users will be confused. If a system clock which had been advancing one month per turn suddenly advanced 10 years, the resulting changes in the system might baffle a user, unless he is aware that 10 years have passed. Yet, such confusion depends more on the way the time shift is handled -- how explicitly it is advertised, for instance -- than on anything intrinsic to variable-length turns.

*Absolute versus relative time*. Many simulations employ an explicit, user-accessible system clock, including HRM, Hidden Agenda, YELO, and SimCity. Other systems, such as Sickle Cell Counselor and Dustin, do not make use of a system clock. This is not to say that such systems do not have a temporal



component, however, only that it is relative, that is, that one event comes "before" or "after" another, there being no absolute scale along which some events lie. In SimCity, one can say that the user decided to build a factory at some specific point in time; in Dustin, one can say only that the user passes through customs before taking a limousine to St. Charles.

There are merits and drawbacks associated with each method of handling time. Systems with an absolute clock make it possible to move backwards in time, a feature that can be especially useful for instruction; in HRM, movement backwards in time is critical to the interaction, in that you are moved back whenever you commit an error, in order that you may correct your failure. In simulations with a relative clock, conversely, movement backwards is difficult except in some sort of "undo" fashion, where users are returned to the state immediately preceding the current one.

One problem with systems having an absolute clock is that they add another layer of complexity to the system, both for the designer, and for the user. For instance, an explicit system clock would only get in the way in Sickle Cell, because none of the operations (advising clients, taking tests, listening to experts) depend on time in any way. Clocks take up valuable screen real estate, so their inclusion has to be driven by some practical concern. In Dustin, while a clock might have some use (to teach users that it should take about an hour to drive to St. Charles, for instance), it would clutter the interface and add to its complexity. Moreover, inclusion of a system clock can place too much focus on time itself, making it too important a part of the world being modeled. For instance, if Sickle Cell had a clock, a user might believe that it is somehow important that, say, an hour passes between taking a blood test and advising a client.

Naturally, if time is an integral element of the domain being modeled (as in most planning tasks, for example), a clock is necessary. Because of this, we might conclude that one should include an explicit system clock only if time is integral to the domain. However, explicit system clocks serve an auxiliary role in simulations, one that might justify their inclusion even if time is not required in the model. Namely, clocks can be used to signal change to the user. Since, as I mentioned before, we associate time with change, we can use the passage of time to adjust our expectations of change. A clock whirring forward on the screen can serve as a convenient way to tell the user that the system is in a new state. How much the clock advances, furthermore, indicates how much change in the system to look for. For instance, in SimCity, if a day goes by, we expect the city to look very much as it did before. On the other hand, if 10 years have passed, we expect to see major changes in it. What is more, we temper our expectations with our knowledge of



how long certain processes will take; to again use SimCity as an example, if we know it takes, say, 10 years for homes to arise around factories, then after building a factory, we know that we don't need to look for homes around it until 10 years hence. Clocks, in short, can serve as a useful tool for reasoning about a system.

Handling space in a role-playing simulation. As in their handling of time, simulations vary with respect to how they represent space and volume. These differences boil down to two general areas:

- Global versus episodic view of the world
- Set-driven versus event-driven staging

*Global versus episodic view of the world.* When you create a world in which users interact, you must decide whether to display the whole thing at once, or a piece at a time. The former, seen in SimCity, Civilization, and others, I call a "global" view of the world, the latter, as in Hidden Agenda, HRM, and Dustin, I call episodic. Global views of a world do not necessarily entail having the entire world literally on the screen at once; note that in SimCity, only a portion of the world is visible at any one time, and some of that world (such as current spending) is available only via auxiliary popup views, such as reports. The distinction here is that, in some simulations, the entire world is potentially able to be seen at any time, while in others it is not. For instance, in Dustin, one cannot see, say, the customs agent when one is at the St. Charles facility; that part of the world has in effect been "put away" forever.

Obviously, some domains naturally suggest a global view, while others, an episodic one. Yet, the choice of which perspective to use is not so straightforward. For instance, though SimCity seems especially suited for a global view, one can, in fact, picture an episodic alternative, say where the world is organized as set of city-planning decisions to be made, presented serially. Furthermore, Dustin could potentially have been built using a global perspective, such as a top-down map of the sites to be visited with a marker to indicate the current location of the user. Ultimately, there are a number of important considerations that must go into the decision of which type of view to employ.

In a global view, the user has the entire world spread out before him: he can assess all of the components that comprise the simulation, observe changes in the system instantly, tell (more or less) how one part relates to another, and so on. Such a view provides users with an explicit and visible model of the world, enabling them to get a good handle on the "big picture" from the beginning; thus, a great deal of information can be presented to the user without the need for extensive explanation.

At the same time, detail is lost -- one loses the trees for the forest, so to speak. In SimLife, for example, one can see critters fluttering around the screen; however, it can be difficult to make them out, to tell at a glance what kind of animal just raced across the screen, for example. In my opinion, at least, the global view works much better in SimCity than in SimLife: scale undoubtedly plays a role in this (a city is more circumscribed than an ecosystem), as does the domain (buildings remain stationary, while animals do not). Even in SimCity, however, detail is lost, an inevitable consequent of representing the world globally.

The psychic distance of characters (that is, how much we relate to them) is an important component of a piece of fiction's effect (that is, the emotions those characters can arouse). In cinema, psychic distance is related to physical distance (that is, how close characters are shot relative to the camera). For example, Keaton and other early comic directors discovered that shooting comedy from far away, so characters are relatively small on the screen, heightened the humorous effect. Conversely, close-ups are often used to arouse sympathy and empathy, since they enable us to closely dwell on a character's facial expressions, that universal indicator of people's thoughts. The relationship between physical and psychic distance, I believe, plays an important role in simulations, as well. Think how much different SimCity would feel if you could actually walk the streets, seeing the buildings rising above you on either side, the city's residents, and so on. My guess is that you would feel more emotionally attached to the city, and would make decisions differently than you do when your view is as distant and impersonal as it is currently. Can a bombardier release his charge as readily on a city he once spent time in? Users as a rule feel more removed and so less personally involved, in simulations with global views.

In contrast, simulations featuring an episodic view, such as Dustin and YELO, more readily engage the user emotionally, because the physical and, hence, psychic distance between the viewer and the viewed is closer. It makes a big difference when you can actually see expressions on the faces of people you deal with, and even inanimate objects seem more involving from close up. Systems with an episodic view inevitably abound in detail: because the world is presented sequentially, the only restriction on what can be included is time (and hence boredom), rather than screen real estate, so the designer can include as much as is deemed necessary to fully achieve an intended effect.

The danger in such systems, however, is that the user loses the forest for the trees. It is relatively easy to become disoriented and lost with such a perspective. When one scene, and with it a view of one piece of the world, is replaced by another, the user has no way to relate the two, other than temporally (i.e., by noting that the

second scene followed the first). However, as the number of scenes increase, such an organization tends to break down. Disorientation is not a problem in either Dustin's nor YELO's case, but this is largely due to the fact that both systems represent, from a spatial standpoint, an extremely simple world. If YELO, for instance, had dozens of customers, each at a separate location, the user could very quickly become lost.

One potential way to gain the orientation advantages of a global view while retaining the emotional and cognitive detail advantages of an episodic one is to do as many adventure games have done, that is, include both views in the system. In some adventure games, the screen is divided into two separate views, one a top-down view of the various rooms that have been visited, the other a detailed view of a particular room. This seems to be a workable solution, with two potential caveats. One is the loss of screen real estate, since supporting two simultaneous views necessitates that each be relatively smaller than they would be if they were used alone. In some domains, a smaller view may not be workable. The second drawback is the need, in such a dual perspective, to maintain a correspondence between the global view and the episodic one; if the user does not know which part of the latter that the former represents, he is very likely to become confused.

Though the global view included in the vast majority of systems, including Civilization, SimCity, and SimLife, are top-down models of the spatial world -- maps, in effect -- there is no reason that global perspectives must be limited to maps. A global view can be anything that gives a picture of the entire system. For instance, in BOSS, I consider the Agenda to be a global view, since it encompasses everything that is of importance in the world it represents, namely, different kinds of interactions with employees. Hence, BOSS quite nicely combines a global and an episodic view, the agenda providing the big picture, the office and the characters providing the detail.

There is, at least theoretically, another technique for combining a global and an episodic view, one that does not necessitate dividing the display into separate panes. That technique is similar to the "establishing shot" in film, where a city or building is shown, then an interior, letting audiences know that the scene being filmed takes place in that city or building. Simulation designers might employ the same technique. For instance, in SimCity, you could start with the existing, top-down view of the world, then move into a detailed view on the street after, say, deciding to raze an impoverished neighborhood. This is not the same as showing both simultaneously, because one perspective is completely overtaken by the other, rather than mutually entertained, hence the effects will be correspondingly



different (though this is sketchy, since I cannot think of a simulation which uses such a device).

*Set-driven versus event-driven staging.* Another area in which simulations differ in their treatment of space is the use of a physical set (and props) and characters or other agents in the system. This is one area, I think, where role-playing simulation depart from novels or plays. Pretty much all novels and plays are set in one or more locations, and include at least one character; role-playing simulations, in contrast, do not seem bound by the same requirement. In SimCity, for instance, there is a setting, namely the city, but no characters (except perhaps) the user. In Sickle Cell Counselor, there is no physical setting, but multiple characters. HRM, too, includes three fairly well-developed characters (the employees), but lacks a set. On the other hand, Dustin, YELO, and BOSS include both a physical set and characters.

As in fiction, the reason for these differences should, and probably do, stem from the nature of the domain, and the effects being sought. YELO and Dustin explore human-to-human interaction, so well-developed characters are critical to them. On the other hand, both include a realistic set: if interpersonal communication were all they sought to treat, their set is superfluous. In HRM, it is completely done away with. And rightfully so, since a set adds to the "noise": my guess is that YELO could eliminate its set as well and, if anything, be stronger as a result. On the other hand, since Dustin aims to teach about the set (e.g., what the immigration station looks like) as well as about communicating with people in English, its set is important. In each of these systems, characters must behave sophisticatedly and realistically, since each of them focus on interpersonal interaction.

In SimCity, on the other hand, characters are largely unimportant (though if it really sought to teach about city planning, rather than simply to entertain, this may not be true), so it dispenses with characters altogether. In Sickle Cell, characters provide a degree of relevance (e.g., to recognize that sickle cell is a disease that certain people get, and that it has a profound effect on their life), as well as providing a source of motivation (e.g., the role of counselor is more charged when people's lives at stake). At the same time, it does not need to have robust, self-directed characters as does YELO, so it suffices to represent them as canned soundbites. Indeed, "thinking" characters would probably only lessen Sickle Cell Counselor's appeal, since they would shift the user's focus from the details of the disease itself to details of the character's personality and behavior.



### **Rule #3: Role-Playing simulations must have "unity of action"**

The first principle of fiction, described previously, is that works of fiction must have some sort of closure, that is, that they revolve around a set of actions which have a beginning, middle, and end. This, for Aristotle, was critical, everything else -- characters, setting, and so on -- subordinate to it. It is the thing that defines art, and separates artistic experience from reality. In novels, films, and plays, which are presented linearly in a canned fashion, such a striving for a unity of action seems logical; in simulations, on the other hand -- where the user exerts some control over actions and, hence, events -- it may seem like an unnecessary, even impossible thing to achieve. But I argue that it is, indeed, achievable, and no less important to the entire work.

A colleague described an experience he had playing the "Detroit" scenario in SimCity. In this scenario, the user is put in charge of Detroit, and asked to solve its problems (a decaying infrastructure, high crime, a low quality of life for its inhabitants, etc.) by the time that re-election rolls around. My friend, out of desperation, began dumping money furiously into various civic projects right before the election, and found that, indeed, he had "won" the scenario (though of course, the city went belly-up soon after). His experience with SimCity thus had a "point", reflecting as it did a tactic pursued by more than one big-city mayor. In this particular occasion, at least, the simulation achieved a certain unity of action, possessing as it did a clear beginning, middle, and end, and having an overall theme, the actions all working to underscore it, though undertaken by my friend without knowledge of it at the time.

This is probably the biggest area in which most simulations are inferior to most novels and plays, and hence the best way for designers to improve the nature of their simulations. YELO, for instance, completely bombs in this regard: there is no rising action culminating in some climax (at least as it exists the last time I looked at it). In short, YELO does not build toward anything, which gives it the feeling of a bad novel, that is, a set of experiences linked only temporally, rather than thematically or structurally. Because of that, it is difficult to "get into" playing with YELO. While not strictly a role-playing simulation, RoadTrip, too is weak in this regard: there is no "crisis", and hence no release of emotion after the climax (which I presume is reaching a destination).

One may, perhaps, think that the need for an ending is obviated by the nature of most simulations, which are designed to be played for an indeterminate number of



hours. Yet in many ways, such a situation is analogous to novels, especially Kafka's *The Castle*, which doesn't even have an ending. Novels achieve a unity of action by being sub-divided into units, often chapters, each with a beginning, middle, and end. There is no reason that simulations might not be so sub-divided, as well. For instance, a simulation could be effectively broken up into scenarios, each with some culminating action. To extend this analogy, shorter GBSs such as *Sickle Cell Counselor* can be thought of as short stories, each striving for a single effect.

When building a simulation, designers should be thinking exactly as novelists do: what will be the "climax" (or climaxes)? What actions should lead up to it? What setting and characterization best contribute to it? It is the overall flow of action which should dictate what elements to include in a simulation, and which to omit. Without it, it does not much matter whether the simulation is realistic or entirely artificial, whether it has life-like, agentic characters or simple stereotypes. We judge the parts by the whole; when the whole is absent, the parts have no value.

In this regard, I believe *Sickle Cell Counselor* does well. It has what feels like a beginning, namely, a couple seeking advice on whether to have kids. It has a distinct ending, too, namely, the result of the couples following the user's advice. In between, it includes a set of actions which are congruent with the role of genetic counselor -- taking blood, running the electrophoresis machine, using the Punnett square. The nature of the role and its attendant actions provide a logic for deciding what elements to include in the simulation, necessitating a realistic portrayal of genetic testing (as I pointed out previously), and obviating the need for a set and well-developed characterization. Consequently, *Sickle Cell Counselor* feels like a clear, lucid work of art.

*Hidden Agenda*, too, has a fairly well-defined beginning and end. Users take over the country during a time of foment and crisis. They work to form alliances, please constituencies, and solve various civil problems, culminating in either re-election or, more likely, overthrow. *SimCity*, in contrast, lacks such a unity, and as a result, I personally found it to be somewhat tedious, after I grew familiar with it. There is no sense of building toward anything; in time, I became bored with it, and began to introduce ever greater perturbations -- railroads that ran in circles, factories piled one on top of the other -- simply to get the system into some culminating state (such as a catastrophe). No wonder they include the ability to unleash fire, or a monster, in the city; without a culmination, most simulations become boring very quickly.



## **Rule #4: The selection of actions to culminate in a theme is the "Greatest Thing of All" in a role-playing simulation**

Aristotle called the plot the "greatest thing of all" in a tragedy, since it alone defined the organic whole of the work. I believe the same holds true in a simulation, namely, that it is defined by its actions, and succeeds to the effect that those actions contribute to an overall theme. This is the biggest challenge in simulation design, to so shape the events that occur within them that they feel like they are taking the user somewhere.

Aristotle, in *Poetics*, provides advice on writing a play which is relevant to role-playing simulation designers, as well. Aristotle writes:

And the argument of the play, whether previously made or in process of composition by oneself, should first be sketched out in abstract form and only then expanded and other scenes ("episodes") added. I mean, as a way of gaining a general view of the play, the following, for example with the Iphigenia: A certain young woman is sacrificed but spirited away without the sacrificers perceiving it. She is established in another country, where the custom is to sacrifice all foreigners to their goddess, and wins this priesthood. A considerable while later the priestess's brother happens to come to the country... and having come and been captured he is about to be sacrificed when he recognizes his sister, and then comes his deliverance. At this stage, but not before, one may assign names to the characters and add other scenes...

This is, in reality, how most simulations are built at the Institute. First, a designer sketches out a general demo script, a circumscribed path which reflects, as it does in Aristotle's example, the overall structure ("argument") of the work. Only when such a skeleton is devised does the designer work to fill in the details, adding characters and scenes as they are contribute to the overall effect. What I am stressing here is that the demo path must embody a climax, some culminating action, whether it is a chapter ending or an ending to the entire simulation. That is, a demo path should be more than simply a piece of the simulation (e.g., the first 10 minutes): it should, in fact, be a general skeleton for the entire work. Only then can it serve as a suitable framework for continuing the development process.

Great works of fiction provide a host of exemplars for achieving a profound, overall effect; many of these, I think, could be successfully employed in role-playing simulations. For instance, one of the identifying traits of epics, such as Homer's *The Iliad* and Milton's *Paradise Lost*, is that they begin in *medias res*



(meaning literally "in the middle of things"), that is, that they begin with some critical action, and only later fill the viewer in on the events which led up to it and the events which followed. It is a way to immediately engage the viewer, to motivate him to closely attend to the work and to keep reading. However, I cannot think of a simulation that makes use of this technique. Hidden Agenda comes close, insofar as the user takes over the country at a time of great turbulence in the air, following the overthrow of the prior administration; yet, the beginning is the beginning, in that it is the user's first day on the job. Alternatively, it might begin in true medias res -- the user already has a set of advisors, scandals are have already surfaced, and the public is clamoring for the user's head.

The problem with using this technique is that it almost certainly calls for a movement back in time, to fill the user in on the events which led up to the first scene. In fiction, this is often accomplished with flashbacks. Simulations could, potentially, use flashbacks as well, though how the designer can delineate the flashback from present "reality" (in movies, this is often done with wavy lines) will take some creative genius. Alternatively, designers might use "literal" flashbacks, that is, somehow pop the system back to a previous state, which then becomes the present "reality". Some films have employed this technique when they show scenes out of chronological sequence, and did not lose the audience; there's no reason to believe users will be confused by it in simulations, either. An potential avenue for exploration, at any rate.

Another technique for heightening the overall effect of fiction is the use of sub-plots, that is, another story that is simultaneously pursued in the course of telling the main one, which provides additional illumination of the theme. In Shakespeare's King Lear, the story of Gloucester's betrayal and disfigurement by his illegitimate son, while kept distinct from the main storyline, reflects in many ways the plight of the hero, the King. It would be very interesting to attempt to include a sub-plot in a simulation. In most goal-based scenarios, the user is the protagonist, and the plot is the user's pursuit of the primary goal. The rising action, to use Gustav Freytag's terminology, are the impediments that rise up in the simulation between the hero and the achievement of the goal; the climax is when the user finally achieves it. If this is the overall framework, a sub-plot would be a secondary character -- either an intelligent character in the simulation, or another user -- pursuing another goal that is structurally similar to the user's own. For instance, in YELO, it might be a rival salesmen, trying to close a deal with another roofer. I frankly have no idea how a designer would intermix the primary plot, namely the actions taken by the user, with the secondary plot, namely the actions

taken by the secondary character. It would be an interesting problem to wrestle with, I think.

## Conclusion

It has been strangely exhilarating to characterize role-playing simulations -- even ones built for educational purposes -- as a type of fiction, because it makes the reason we do things as we do suddenly obvious. Such a perspective gets the designer thinking about the right things: it emphasizes action instead of objects, overall effect instead of imitation, thematic unity instead of local elements. The simulation designer, like the novelist or playwright, works ultimately to arouse some feeling in the user, that is, to make the experience with the simulation somehow meaningful. Without arousing such meaning, simulations have no value, no matter their purpose.

I believe that the simulation is a form of expression whose potential we have not even begun to realize. We have yet to define it as a distinct form of expression. At the same time, we must be cognizant that we are not on uncharted territory, that the issues we face have been faced before, the problems we work to solve have been solved many times in the past. We must be aware that there is a world out there, namely the world of fiction, that we can tap into, and profit from. Before we do so, however, we must read the warning labels, or our simulation will flop as badly as a child's staged play.

In the ultimate role-playing simulation, the true masterpiece of the genre, each and every one of its elements -- its actions, characters, buttons on the screen, soundbites, and so on -- will contribute toward some profound, overall effect. Such an opus has not yet been built. But it is toward this ideal that all simulation designers strive, and as long as they continue to push the envelope, to build upon what works and to avoid what proves futile, systems of such magnitude will inevitably emerge. It is an exciting thing to contemplate.

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In my analysis, I include both existing Goal-Based Scenarios and other software programs which, while not technically goal-based scenarios, are very similar, such as Hidden Agenda and Civilization. In this paper, I lump all such systems together under the broad rubric "role-playing simulations": while the differences between goal-based scenarios and other types of simulations may be important, for the purpose of my discussion they are not.

