



# Sketching a Map of the Storylets Design Space

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**Abstract.** Linear and branching narrative structures are widespread in games, but limited in their dynamism and expressiveness. We consider the alternative *storylets model* of interactive narrative content, in which a game’s narrative is assembled from a database of discrete, reorderable narrative “chunks” or “modules” known as *storylets*. This paper represents a first attempt to map out the design space of storylet-based narrative systems in games. We define the common elements of storylet-based systems; categorize such systems along several distinct dimensions; and survey implementations of such systems in existing games.

**Keywords:** Interactive narrative design · Procedural narrative

## 1 Introduction

Linear and branching narrative structures are widespread in games, and for good reason: they give the designer precise control over the story’s direction, are easy to implement, and have been thoroughly explored by existing games. However, these narrative structures also place natural limitations on a game’s narrative dynamism, replayability, and expressiveness [13].

The *storylets model* represents one potential alternative way to structure narrative content in games. Under this model, a game’s narrative is assembled over the course of a playthrough from a database of discrete narrative “chunks” or “modules” known as *storylets*. Both the player and the game have a degree of control over which storylets will be chosen and in what order: the availability of storylets is dependent on the current game state, which player actions may alter, and players might even be permitted to choose which of the available storylets they want to play next. In this sense, under the storylets model, the player does not pass through a story dictated up front by the game’s designer. Rather, the player and the game work together to assemble a story from the modules at their disposal, with both having some ability to influence the direction of the story as it is built.

This paper represents a preliminary attempt to map out the design space of storylet-based interactive narrative systems. By surveying existing storylet-based systems, we aim to identify similarities and differences between them and categorize the differences into several independent dimensions of variation.

## 2 Defining Storylets

### 2.1 Common Elements and Precondition Types

The term “storylet” first appeared in the game *Fallen London* [2] (originally titled *Echo Bazaar*), and referred to the player-selectable mini-stories from which the bulk of the game’s narrative was composed [4]. These storylets were gated by *qualities*: numerical stats pertaining to the player character, with values varying based on the player’s choices. We use the term more broadly; for our purposes, storylets are discrete, self-contained, and reorderable modules of narrative content, gated by preconditions that determine whether they can be presented to the player at any given moment in time. Some types of preconditions are especially common; in particular, many games use preconditions to restrict access to storylets based on the player character’s current location in the game world, effectively binding storylets to certain locations. For instance, in StoryNexus [3] games such as *Fallen London*, nearly all storylets are location-bound.

An interesting extension of preconditions can be seen in *Starfreighter* [7], where *parametrized storylets* augment preconditions with *dynamic queries* that treat the game state as a database. These queries search for characters, inventory items, and so on that meet certain criteria and “bind” them to named parameters. A parametrized storylet may only be presented to the player if all of its parameters are successfully bound; a single parametrized storylet may also be satisfiable by several different sets of parameters, and which parameter bindings are chosen can impact both how the surface text of the storylet is instantiated and what effects the storylet will have on the game state (Table 1).

### 2.2 Repeatability

Can a single storylet be shown to the player more than once? Different systems answer this question in different ways. In some games, such as *The King of Chicago* [16, 17], storylets are never repeatable: each storylet may be encountered once and only once in the course of a single playthrough. In some systems, the opposite is true: all storylets are repeatable unless designers take special care to prevent the repetition of particular storylets by means of hand-authored preconditions. Still other systems provide a means by which designers may select, on a per-storylet basis, whether or not this storylet is intended to be repeatable.

### 2.3 Internal Structure

Narrative content within storylets may be structured in a variety of ways. The simplest possible storylets contain fixed, static text. Other systems extend this mechanism by allowing for the substitution of variables from the game state into otherwise static text templates.

Still other games and systems allow for greater dynamism in storylet-internal content. Dynamic assembly of content pairs well with reusable storylets; if a single base storylet may be expanded or instantiated in multiple distinct ways

**Table 1.** Selected existing games and systems that make use of storylets to structure narrative content, classified according to the dimensions discussed.

Game or system	Precondition types	Repeatability of storylets	Internal structure of storylets	Content selection architecture
<i>Epitaph</i>	Quality check	Never repeatable	Replacement grammar; templated text	Player choice (from simple list); random selection
<i>Façade</i>	Quality check	Author chooses per-storylet	Recursive (storylets are drama managers with their own content pools)	Drama manager
<i>Ice-Bound</i> [14]	Quality check	Never repeatable	Replacement grammar; templated text	Player choice (via complex interface, requiring exploration)
<i>Reigns</i>	Quality check; location	Usually repeatable	Branching	Weighted random selection
<i>Starfreighter</i>	Dynamic query	Usually repeatable	Branching; replacement grammar; templated text	Weighted random selection
StoryAssembler	Quality check	Author chooses per-storylet	Branching; replacement grammar; templated text	Pathfinding/search
StoryNexus	Quality check; location	Usually repeatable	Branching	Player choice (from simple list)
<i>The King of Chicago</i>	Quality check	Never repeatable	Branching	Saliency-based

depending on the game state or on random selection of alternatives, this may help to mask the fact that content is being repeated or mitigate the potentially boredom-inducing effect of verbatim repetition on the player.

Some systems structure storylets internally as replacement grammars, with the grammar being used to instantiate a fresh variant of the text content each time the storylet is reused. The procedural narrative idlegame *Epitaph* [5] uses this approach [6]. Other systems may permit storylets to feature internal branching, effectively enabling the author to approach each storylet as a miniature Choose Your Own Adventure story. Many existing games use this approach, including both StoryNexus games and *Reigns* [12].

In addition, these approaches may be freely mixed with one another. *Starfreighter* in particular uses a hybrid of all of the approaches mentioned here.

## 2.4 Content Selection Architectures

There are many ways for a system to choose which storylet it will present to the player next. Each of these mechanisms is an example of what Michael Mateas terms a *content selection architecture* [10, 11] – a means by which an interactive narrative system decides what content to present – for storylet-based systems. These content selection architectures may be combined in arbitrary ways.

One of the simplest possible approaches is to present players with an interface that allows them to select for themselves, from all the currently available storylets, which one they would like to play next. This is the approach used in StoryNexus games. Alternatively, an equally straightforward but opposite approach is to make a simple random selection from the pool of available storylets.

*Weighted random selection* extends simple random selection with an additional layer of complexity: a “weight” for each available storylet is calculated based on the current game state, making some storylets more likely to be selected than others. *Reigns* uses a weighted random approach, framing it in terms of a “deck of cards” metaphor: a storylet (or “card”) that is highly relevant to the current game state may be dealt into the “deck” multiple times [1].

A related approach, *salience-based selection*, compares the actual current game state to an “ideal” game state with which each storylet is tagged and selects the storylet that represents the closest match. Some storylets, tagged with highly specific state conditions, match the game state only rarely but are especially relevant when selected; others, tagged with highly generic state conditions, are used as fallbacks when none of the more specific storylets represent a good match for the current state. *The King of Chicago* takes this approach.

One uncommon approach to selecting storylets involves the use of pathfinding or search algorithms on a graph of possible future directions for the story to take. One example is StoryAssembler [15], which maintains an internal “story spec” detailing the storytelling goals it wishes to accomplish and searches for paths through the database of storylets that can effectively fulfill these goals. Similarly, in Emily Short’s *Glass* [19], player and non-player characters take turns “steering” a conversation through a graph of interconnected discussion topics, with the goal of successfully steering the conversation onto specific topics. Short refers to this approach as *waypoint narrative* [18].

Perhaps the most potentially complex approach involves the use of a full-fledged *drama manager* to determine which storylet should be presented next. This is the approach taken by *Façade* [8], an “interactive drama” in which narrative content is structured as a pool of “beats” and a drama manager makes selections from this pool in response to the player’s actions [9].

## 3 Conclusions

This paper represents a first attempt to map out the design space of storylet-based narrative systems in games. We provide a definition of storylet-based systems grounded in their common elements; identify four independent dimensions (precondition type, repeatability of storylets, internal structure of storylets, and

content selection architecture) along which such systems can vary; and classify several existing systems according to this taxonomy. Future work may extend this analysis by characterizing the relative advantages and disadvantages of storylet-based narrative systems, as well as some of the common challenges and design patterns involved in authoring content for storylet-based narrative games.

## References

- Alliot, F.: The casual (but regal) swipe: creating game mechanics in Reigns. [https://www.gdcvault.com/play/1024278/The-Casual-\(but-Regal\)-Swipe](https://www.gdcvault.com/play/1024278/The-Casual-(but-Regal)-Swipe). Accessed 25 Jul 2018
- Failbetter Games: Fallen London. <http://fallenlondon.storynexus.com>. Accessed 25 Jul 2018
- Failbetter Games: StoryNexus. <http://www.storynexus.com>. Accessed 25 Jul 2018
- Kennedy, A.: Echo Bazaar narrative structures, Part two. <http://www.failbettergames.com/echo-bazaar-narrative-structures-part-two>. Accessed 25 Jul 2018
- Kreminski, M.: Epitaph. <https://mkremins.itch.io/epitaph>. Accessed 25 Jul 2018
- Kreminski, M.: History generation in Epitaph. <https://mkremins.github.io/blog/history-generation-epitaph>. Accessed 25 Jul 2018
- Kreminski, M.: Starfreighter. <https://mkremins.itch.io/starfreighter>. Accessed 25 Jul 2018
- Mateas, M., Stern, A.: Façade. <https://games.softpedia.com/get/Freeware-Games/Facade.shtml>. Accessed 25 Jul 2018
- Mateas, M., Stern, A.: Structuring content in the Façade interactive drama architecture. In: Artificial Intelligence and Interactive Digital Entertainment (2005)
- Mateas, M.: Introduction to content selection architectures (unpublished lecture slides)
- Mateas, M.: More content selection architectures (unpublished lecture slides)
- Nerial: Reigns. <http://nerial.co.uk/reigns-original>. Accessed 25 Jul 2018
- Reed, A.A.: Changeful tales: design-driven approaches toward more expressive storygames. Diss, UC Santa Cruz (2017)
- Reed, A.A., Garbe, J.: The Ice-Bound Concordance. <http://www.ice-bound.com>. Accessed 25 Jul 2018
- Samuel, B., et al.: Leveraging procedural narrative and gameplay to address controversial topics. In: International Conference on Computational Creativity (2017)
- Sharp, D.: Story vs. game: the battle of interactive fiction. <http://web.archive.org/web/20040404061317/www.channelzilch.com/doug/battle.htm>. Accessed 25 Jul 2018
- Sharp, D.: The King of Chicago. <https://classicreload.com/the-king-of-chicago.html>. Accessed 25 Jul 2018
- Short, E.: Beyond branching: quality-based, salience-based, and waypoint narrative structures. <https://emshort.blog/2016/04/12/beyond-branching-quality-based-and-salience-based-narrative-structures>. Accessed 25 Jul 2018
- Short, E.: Glass. <http://inform7.com/learn/eg/glass/index.html>. Accessed 25 Jul 2018