Genres, Structures and Strategies in Interactive Digital Narratives – Analyzing a Body of Works Created in ASAPS

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Abstract. The Advanced Stories Authoring and Presentation System (ASAPS) has been used to build 60 interactive digital narratives (IDN) so far. The paper briefly discusses several salient aspects of the system, including the bottom-up approach of the project and observations from using the tool for teaching in an academic setting, as well as related work. Next, we describe several outstanding examples of ASAPS narratives before analyzing visual styles, narrative genres, and structural aspects, as well as identifying additional narrative strategies.

Keywords: Interactive Storytelling Authoring System, Interactive Digital Narrative, Content Analysis, Narrative Design, Narrative Genres, Narrative Strategies, Teaching Interactive Narrative.

1 Introduction

In continuous development since 2007, the Advanced Stories and Presentation System (ASAPS) [1] is a specialized software suite for creating and presenting interactive digital narratives (IDN)[1]. ASAPS is built with three broader goals in mind – ease of use for authors, extensibility, and interoperability. Additionally, the platform serves as the practical complement to an evolving theoretical framework for IDN [2][3]. ASAPS is built on top of ASML, a markup language created to describe interactive narratives; furthermore the system includes a cross-platform authoring tool and a cross-platform playback engine. ASAPS offers authors familiar narrative elements like characters, props and scene backdrops and adds branching structures and procedural elements to the mix for the creation of compelling interactive experiences. ASAPS in its current form can also be described as a lightweight specialized 2D game engine with support for several common graphics formats, z-layering, animations, video, and three-channel sound support.

So far, ASAPS has not been released to the broader public but is available by request from the project's homepage [4] and has been used in university settings in

[1] We prefer "narrative" to "storytelling" since the later implies an act of storytelling by a storyteller which foregrounds the "telling." In contrast we are interested primarily in narrative experiences that are not "told" in a traditional way.

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teaching IDN and to create 60 interactive digital narratives so far. This body of works is available for a comparative analysis, with the distinct advantage of having all elements exposed and well known.

We briefly describe specific aspects of authoring and teaching with ASPAS, before we present an overview of narratives created with the system. Then, we analyze visual styles, genres, structural similarities, and narrative strategies.

2 Aspects of ASAPS

ASAPS foregrounds a bottom-up approach, based on the idea of giving non-expert authors access to "building blocks", and letting them combine them into IDN works. The design of the system is meant to impose as little pre-determined structure as possible and let creativity run free. The users' suggestions along with an analysis of their works then form the basis for the next expansion of the system. In this way, much additional functionality like new beat types and sound support has been added to ASAPS. The overall goal is to iteratively build a more powerful system in this way, one that reflects the needs and wishes of a community of authors. More advanced computational functions are planned to be integrated by means of standards-based interfaces, for example via TCP/IP communication.

2.1 Authoring in ASAPS

An important motivation in the design of ASAPS is to ease the transition from traditional to interactive storytelling and to make the procedural power of digital media accessible to non-experts. The authoring tool is targeted at individuals who are interested in IDN, but often have only limited knowledge of this subject. Consequently, the application utilizes terminology familiar to this group (*story* for the overall product, *settings*, *characters*, and *props*) and only introduces IDN concepts in the "narrative design" section. Here, authors combine narrative building blocks, or *beats* to form the overall narrative structure. The 14 different beat types include static elements like a title screen, as well as flexible elements, which contain an author-determined number of choices in a conversation, for navigation, or for adding items to an inventory. Finally, procedural beats allow authors to manipulate counters, global variables, inventory items, and timers. Any of these dynamic conditions can be checked at later points in a narrative and used to track character or narrative development or to steer the narrative in a particular direction.

2.2 Procedural Branching

With its arsenal of static, flexible, and procedural beats, ASAPS combines static branching with procedurally determined narrative progress. In more concrete terms this means that while branches have to be pre-determined by an author, the concrete decision on which branch to take can be determined at runtime depending on the state of a particular counter, the inventory system, or a variable. These procedural elements

can be changed as the result of actions taken by an interactor; for example each choice in a conversation can change a counter representing a character trait such as *aggressive*, *timid*, and *reasonable*. Once the conversation has finished, a combination of condition-checking beats can be used to determine which trait has been the most prominent and the narrative can branch accordingly.

This combination of branching with procedural aspects also results in a dramatic reduction of the need for branch and beat production. In this example (Figure 1), the optimized narrative structure applies the inventory system, local variables, and counters to record interactors' choices in picking an item and selecting a direction path. In this way, the system keeps track of the development of the narratives main character. Applying these techniques allows ASAPS authors to be more productive by reducing the time needed to produce an interactive digital narrative. In addition each work becomes more manageable by reducing visual and logical complexity. In this way, the system takes into account issues raised by Andrew Stern in his warning about the unmanageable nature ("linearity hell") of large linear branching systems. [5]

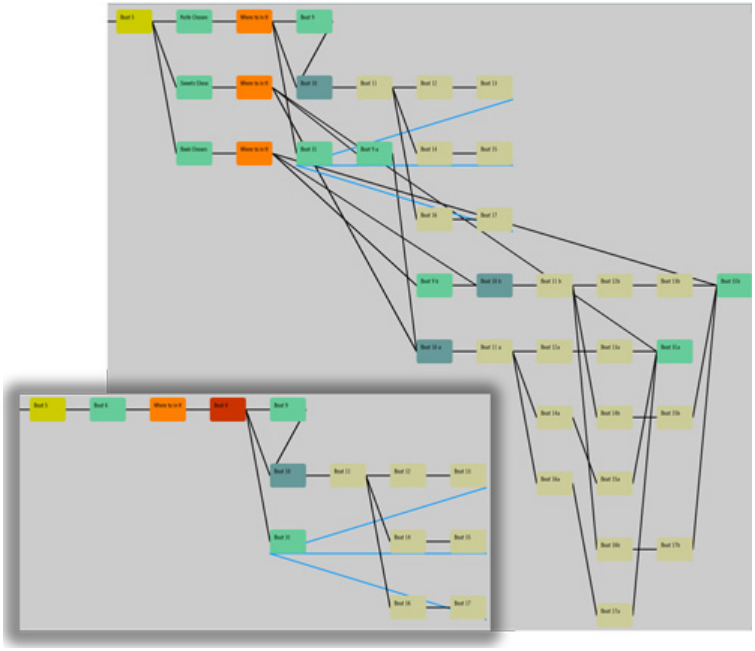


Fig. 1. The same content as a linear branching structure (large graphic) and by applying ASAPS's procedural functions (insert)

2.3 Teaching IDN with ASAPS

ASAPS has been used in teaching interactive narrative for several years now. The authoring tool was generally well received by students, whose biggest complains have

been early issues with stability. Beyond that, this group of users has suggested new features, many of which – such as z-layering support or a way to group beats together - have been implemented in subsequent versions.

A particular difficulty in teaching ASAPS – and by implication IDN in general – is in getting students to understand and make use of the procedural features in the system. We have observed a tendency to initially build a purely branching story with no procedural elements, a behavior, which we intuitively understand as influenced by the hyperlinked structure of the WWW and the structure of children's build-your-own-adventure books. In our experience, extra emphasis in the class schedule needs to be devoted to this topic along with specific examples like the one displayed above to illustrate the advantages and possibilities of using procedural elements.

2.4 Related Work

While many IDN authoring systems exist – such as Art-E-Fact [6], the authoring part of the IS engine [7], DraMachina [8], and Scenejo [9] (for a more extensive list, see [1]), many do not encompass all aspects of interactive narrative authoring - as Magerko and Medler have also argued [10] - and for example specialize on dialogue creation. We position ASAPS as a general authoring tool that – giving its growing body of works – aspires to be compared to systems like the IF authoring tool Inform [11] and the Japanese NSCRIPTER [12] system for the creation of virtual novels. What sets ASAPS apart from these two systems is a significantly lower requirement for expertise in programming on the side of its users, as both require learning a specialized scripting language, while ASAPS does not. Finally, we see the bottom-up approach and the related commitment of not imposing specific forms (like textual IF in Inform) as another differentiating factor of the platform.

3 Analyzing ASAPS Narratives

With the number of IDN works created in ASAPS having reached 60, it is warranted to speak of a body of works, which provides an initial basis for analyzing and understanding commonalities like visual styles, genres, narrative structures, and strategies. Furthermore, the shared underlying architecture provides two key advantages for narrative analysis:

- all elements are known, nothing is hidden
- the structural view of narratives can be compared across all narratives, since it is created automatically by the same algorithm

These advantages stand out even more if we take into account that the exact structure and internal workings of many commercial IDN examples, especially contemporary narrative computer games like Heavy Rain [13] or LA Noire [14] are considered trade

secrets and are not directly available for analysis, which force researchers into gleaning the internal structure from observations, promotional material, and developer interviews (for example [15] [16][17]).

We conducted a preliminary content analysis in order to identify commonalities in the existing ASAPS narratives. In this analysis we are looking at visual aspects (section 3.2), genres (3.3), structural aspects (3.4), and additional narrative strategies (3.5). The sample consisted of the 60 narratives created by students and fellow researchers. In order to give an impression of the analyzed narratives we start by describing several outstanding examples.

3.1 Outstanding Examples

At this stage of the development, works created in ASAPS cannot be expected to measure up to IDN milestones like *Façade* [18], *Madame Bovary* [19], or *The Prom* [20]. This is due in a large part to the emphasis on a bottom-up approach, which entails a preference of ease of use and extensibility over computational sophistication. However, where these works reach high, and stand out as singular examples, ASAPS reaches wide and in this way has enabled the creation of many intriguing narratives. In particular, several works with more than 100 beats are exemplary for their narrative complexity expressed in many choices, and in longer narratives to explore.

The Ship, a work by Charlie Stafford with 367 beats, is the current record holder in beat count. In this extensive narrative, which combines motives from Greek mythology with elements from strategy games, the protagonist wakes up on a ship with no memory about getting there. By exploring the space and talking to the other passengers, the interactor slowly uncovers what kind of special ship she is on, what forces are at play and if there is a way to escape. In the office life parable *Breaking Points* by Digdem and Tonguc Sezen, (257 beats) the interactor puts the desolate protagonist on a path that might change her life by making seemingly incongruous decisions like what dress to wear or what task in the office to do first. *Imprisoned* by Andrew Chappell (157 beats) leads us from a start in striking black and white with the sounds of a hospital room onto an exploration of a maze-like prison that can lead to freedom or death and also reveal the protagonist's mysterious identity during the journey. Finally, Thomas Bauer's *Day in the Life* (115 beats) takes the interactor on an extensive exploration of a real-life cityscape in search for clues of last night's memories, combined with a maddening soundtrack that perfectly complements the frantic action.

Many smaller works have their strong points, too. For example, Crista Harrington's *A Superhero Story* lets the interactor explore the result of questionable moral choices in the familiar look of super hero comic books. And Jacob Harkey's *The Heist* lets an interactor experience the stress of a bank heist by putting her under time pressure to act quickly or go to jail.

Fig. 2. A selection of visual styles in ASAPS narratives

3.2 Visual Style and Perspective

IDN works created in ASAPS encompass a wide spectrum of visual designs (Figure 2). The authors have applied photo-realistic presentations, hand-drawn imagery, comic-style graphics, and pseudo 3D presentations. More specifically, the visual presentations have been influenced by established styles such as black and white film-noire, high contrast music videos, super hero comic books, and children's picture books. Aside from these influences from more traditional narrative media forms such as books, movies and videos, many narratives are also influenced by computer games, especially the appearance of adventure-like games. While 3D presentation is a goal for a future version of ASAPS, it is interesting to note that only a handful of authors have asked for 3D capabilities, whereas most were content with the 2.5D[2] capabilities available in ASAPS.

Video and animation are used in 14 of the works, or about 23% of the total sample. Given the additional complexity of creating animations and shooting video, this number seems fairly high and documents an interest in integrating these forms in IDN works.

[2] A 2D presentation style, which has z-layering support and often also features visual depth-cues like shadows or perspective.

In terms of perspective, a 3rd person view with a visible avatar representing the interactor is the most prevalent form, encountered in exactly 70% of the narratives. 1st person view is present in 15% of the sample. In the remaining 15%, the perspective changes between 1st and 3rd person throughout the narrative. Intuitively, we link the clear dominance of 3rd person perspective to the influence of the dominant visual presentation form in TV drama and computer games.

3.3 Narrative Genres

Since IDN is still an emerging form of narrative expression, any discussion of genres is preliminary to a degree, especially if compared to the established disciplines of literature studies and film studies. However, we feel our sample of 60 narratives is big enough to recognize similarities with existing forms as well as provide a tentative identification of new genres.

There are eight types of narrative genres in the sample: adventure game/hero quest, detective story/mystery, role-playing game, alternate history scenario, amnesia/escape room, situational challenge, character development, and complex topic scenario. The first four categories (adventure game, detective story genre, role playing game, alternate history) show many similarities with existing genres in computer games and older forms of narrative; the remainders are genres specific to IDN. In several cases, a particular narrative combines aspects of different genres. Here, we have identified the dominant type and categorized the narrative accordingly. 88% in the sample are original works, while the remaining 12% extend existing stories in the manner described by Jenkings [21] for transmedia narratives. They share the underlying narrative world with TV series such as *Star Trek*, or *Seinfeld*, or *Community*.

Adventure – in this type of narrative, the interactor is on a quest to solve a specific problem, or find a particular item. 17% in the sample are narratives of this kind. The narrative here is focused on unfolding events, while the interactor is engaged in completing a quest.

Detective Story/Mystery – here, the interactor is in the role of a detective charged with solving a crime. In the sample, 8% are narratives of this kind. The narrative of the crime is uncovered by the interactor through spatial exploration, collecting cues, and interviewing suspects. Although similar to the adventure category in regards to interaction, the focus on events that have already happened in the past and are being uncovered warrant a separate category.

Role Playing Game - this kind of narrative has the interactor build up a character through challenges and decisions to gain more power and abilities. A single narrative is in this genre, however several more use some of the role-playing mechanics, especially an initial selection from a range of items to determine the traits of a character.

Alternate History – Two of the narratives in the sample fall in this category. One presents a character in an unfavorable state, which the interactor is asked to change by reversing decisions in the past. The second example allows the interactor to change a part of ancient Greek history.

Amnesia/Escape Rom – in this type of narrative, which is found in 13% of the sample, the interactor starts with little or no knowledge of the narrative context and is most commonly (over half of the narratives in this category) placed in some sort of a prison/escape room situation. In these cases, the interaction is engaged in a dual activity of finding a way out and uncovering the prior narrative that lead to this situation.

Situational Challenge- This category is the most popular, with 30% of the sample. In this genre, the interactor hast to master a challenging situation, from finding the way to school, to overcoming the lure of distractions in the course of academic success, to navigating the pitfalls of dating or surviving as an intern in a business environment. This category has similarities with simulation games, but trades the large-scale world of games like *The Sims* or *Civilization* with a smaller episodic situation and a focus on narrative development and dramatic situations. A particular narrative focus in this genre is on the eventual consequences of a number of decisions.

Character Development – 25% of the sample task the interactor with developing a character through choices in the narrative. The common starting point in this category is a blank character that turns good or bad, flirtatious or timid.

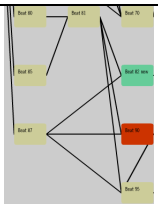
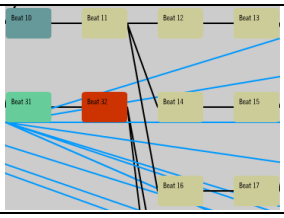
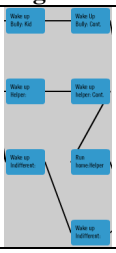
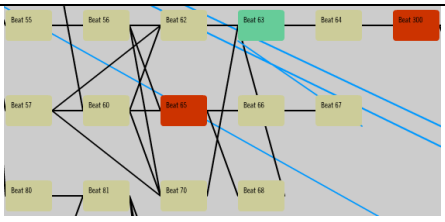
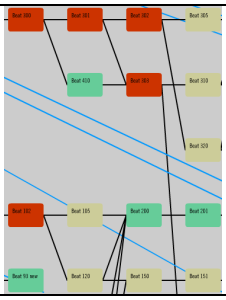
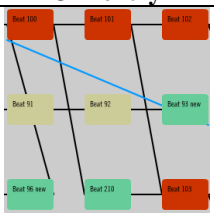
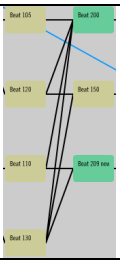
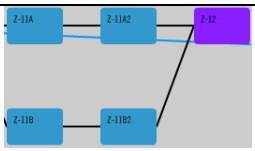
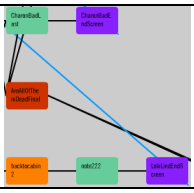
Complex Topic/ Multi Perspective – in this kind of the narrative – featured in 5% of the sample - the interactor encounters multiple divergent perspectives towards a single topic, either in the form of different characters to follow, or in a presentation of alternative opinions. In choosing a path amongst the perspectives, the interactor gains a deeper understanding of a topic. One example in this category is an IDN, which presents perspectives on the Occupy Wall Street movement.

3.4 Structural Aspects

At the beginning, the graph view of each ASAPS narrative, which is the visualization of the narrative structure, was screen printed and was defined as the unit of analysis. Since existing research on narrative structures in IDN, like Bernstein's observations regarding hyperfiction [22], did not provide a good fit for the content analysis for the ASAPS narratives, the coding scheme was constructed by emergent coding, namely, all the graph views were scanned to identify common traits. In this manner, ten dichotomous coding categories were constructed and divided according to structural similarities and narrative strategies. The results of this content analysis (N=60) are shown in Table 2 and 3 in percentages of the categories.

The analyzed structural similarities are: (1) branching structure (tree-like vs. web-like), (2) topic orientation (thematic vs. fragmental), (3) cluster distribution (uni-clustered vs. multi-clustered), (4) node entry (uni-entry vs. multi-entries), and (5) ending type (uni-end vs. multi-ends) (Table 1). We define nodes that are connected in sequence without backward links as tree-like branching while web-like branching contains links for returning to previous nodes. Narratives with an overarching thematic topic show a horizontal structure whereas fragmental topics tend to be vertical in the graphic view. The remaining categories of cluster distribution, node entry, and ending type, vary with the complexity and overall length of the narratives.

Table 1. Examples of structural categories

Tree-like	Web-like
	
Thematic	**Fragmental**
	
Uni-clustered	**Multi-clustered**
	
Uni-entry	**Multi-entries**
	
Uni-end	**Multi-ends**
	

The content analysis of our sample show that there are more stories with tree-like branching than stories with web-like branching, signifying that the flow of narratives tends to process from one node to another and that there are few options for going backward. The majority of these nodes have only one link originating from the antecedent nodes. In the sample, there are about the same number of narratives with one thematic topic and several fragmental topics. Narratives are either composed of a clear main topic or of several sub-topics. We also observed that narratives with multiple clusters and multiple endings outweigh those with a unique cluster and a single ending. This means that even though stories have an equal chance to be thematic or fragmental in topic orientation, they are more likely to be narrated in complex ways.

Table 2. Frequency of Structural Similarities

	Category	Frequency	Percent
Branching Structure	Tree-like	40	66.7
	Web-like	20	33.3
Topic Orientation	Thematic	32	53.3
	Fragmental	28	46.7
Cluster Distribution	Uni-clustered	15	25.0
	Multi-clustered	45	75.0
Node Entry	Uni-entry	39	65.0
	Multi-entries	21	35.0
Ending Type	Uni-end	18	30.0
	Multi-ends	42	70.0

3.5 Other Narrative Strategies

We also analyzed the following narrative strategies: (1) method of introduction (explorative vs. consecutive), (2) narrative world (parallel vs. interwoven), (3) narrative path (fixed-path vs. conditional-path), (4) narrative presentation (text-based vs. graphic-based), and (5) point of view (uni-character vs. multi-characters).

Explorative introduction means that the narrative starts with a character trapped in a mystery or that interactors encounter a narrative situation without any explanation, whereas consecutive introduction provide specific directions to lead interactors into the narrative world. In a parallel world type, several sub-narratives exist while in an interwoven world type an overarching narrative exists. Fixed path means that consequences of choices are entirely pre-determined by the author rather than influence by interactor's decision made through the story. Narrative presentation concerns the choice between text and graphics, while point of view indicates whether the interactor plays more than one role in the narrative.

In our sample, narratives more frequently employ consecutive introductions that give specific directions at the very beginning. There is smaller percentage of narratives with parallel worlds than with a singular interwoven world. In the sample, narrative paths are conditional more often than fixed by a wide margin. However, the fact that more than a third of the narratives are fixed path emphasize the difficulty in getting authors to understand the advantages of using procedural elements. As far as

Table 3. Frequency of Narrative Strategies

	Category	Frequency	Percent
Introduction	Explorative	23	38.3
	Consecutive	37	61.7
Narrative world	Parallel	27	45.0
	Interwoven	33	55.0
Narrative path	Fixed-path	22	36.7
	Conditional-path	38	63.3
Narrative presentation	Text-based	19	31.7
	Graphic-based	41	68.3
Point of view	Uni-character	36	60.0
	Multi-characters	24	40.0

text vs. graphics is concerned, a majority of stories use a graphic-based narrative presentation, which foregrounds the visual presentation of stories with the aim to be more direct and user-friendly than text-based narratives. Finally, a majority of the narratives allow the interactor to play only one character in the narratives rather than multiple characters.

4 Conclusion

Our content analysis of 60 ASAPS narratives yields interesting results in several areas and provides starting points for further research. We have tentatively identified four IDN specific narrative genres – *amnesia/escape room, character development, situational challenge,* and *complex topic/multi perspective*. Our analysis of structural elements show a tendency towards an overall consecutive and directed flow of narrative, while the complexity - as signified by clustering and multiple endings - is high. In regards to other narrative strategies, a majority of authors prefer to introduce interactors first to a narrative, and then have them explore a complex and dynamic but consistent narrative world. The results of the content analysis also back our experience in regards to the difficulty of teaching authors to use procedural elements.

We will use these results in extending the ASAPS system and as a basis for a better theoretical understanding of IDN works. More concretely, we have finished a first version of ASAPS for a mobile platform (iOS) and we plan to include sensor support (accelerometer, GPS, etc.) in new beat types. It will be interesting to see how such "physical" narratives will compare to the present analysis. On the theoretical side, we plan to follow up on this overview with an analysis through the lens of protostory and narrative design [2]. Finally, we intend to make the ASPAS narratives available on the project website [4].

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