Abstract

A video game's plot is one of its defining features, and prior research confirms the importance of plot metadata to users through persona analysis, interviews, and surveys. However, existing organizational systems, including library catalogs, game-related websites, and traditional plot classification systems, do not adequately describe the plot information of video games, in other words, what the game is really about. We attempt to address the issue by creating a controlled vocabulary based on a domain analysis involving a review of relevant literature and existing data structures. The controlled vocabulary is constructed in a pair structure for maximizing flexibility and extensibility. Adopting this controlled vocabulary for describing plot information of games will allow for useful search and collocation of video games.

Keywords

Video Games, Interactive Media, Plot, Narrative, Metadata, Controlled Vocabulary, Thesaurus

1. Introduction

A video game's story is one of its defining features, especially within plot-heavy genres such as RPG (Role-Playing Game), Visual Novel, and Action-Adventure, where the narrative may be a core reason people are attracted to a particular game. For some users, it is the most important aspect of the game—the key reason for deciding what to purchase or play, and even for tolerating poor gameplay.[1] However, existing organizational systems including library catalogs or game-related websites do not sufficiently describe the plot metadata.

[1] Jin Ha Lee et al., "User-Centered Approach in Creating a Metadata Scheme for Video Games and Interactive Media" (paper presented at proceedings of the 13th ACM/IEEE-CS Joint Conference on Digital Libraries, Indianapolis, IN, July 22-26, 2013: 229-238).

Library catalogs excel at providing reliable information, but catalog records are often sparse in information about a work's content. Almost no subject access points for video games are currently available in such systems. The systems tend to focus on providing descriptive information such as platform, title, publisher, and price. Genre is the only commonly used metadata element in catalogs and game-related websites that may be considered a subject access point.[2] Genre labels may help players make their selection, but often lack standards and detail. Moreover, current genre labels are of little use to game studies researchers interested in specific subject areas. For example, no scholarly system currently exists for easy collocation of thematic concerns such as apocalyptic imagery, survival, or insanity. On WorldCat, the records of video games sometimes show the brief summary transcribed from the container or secondary source (e.g., Amazon.com, Allgame.com). In other cases, the summary has strong commercial tone (e.g., "The Reclaimer Saga begins… The universe will never be the same." [*Halo 4]*), or it is used to describe information other than the plot (e.g., "*Beautiful Katamari* is the fourth game in the Katamari series of games following *Katamari Damacy*, *We Heart Katamari* and *Me & My Katamari*"). Furthermore, summary information is completely missing in many of the records. Similar observation can be made on the use of Library of Congress Subject Headings on catalog records for video games; they have been applied inconsistently and thus, many records simply do not contain any subject information.

Some commercial game-related websites and online encyclopedias do provide a detailed summary of the plot of the game. However, they are provided as part of the description rather than being used as an access point. Internet fan sites and Wikipedia also offer summary information, but provide neither the rigor nor comprehensiveness required by scholars researching these topics. Although lists of styles, concepts, or subject headings may occasionally be found in some systems, they are also undefined or inconsistently used which makes it difficult for users to effectively use such metadata to search or browse games. For example, Valve software is currently experimenting with Steam Tags. Every game

[2] Jin Ha Lee et al., "Facet analysis of video game genres" (paper presented in proceedings of the 2014 *iConference, Berlin, Germany,* March 4-7, 2014: 125-139).

indexed on its Steam platform has a collection of standardized metadata, which is supplemented with user-generated tags. The stated goal of the system is "helping everyone discover products through a new set of genres, themes, and attributes".[3] However, Steam is limited to Mac, PC, and Linux games and weighted toward commercial transactions. We aim to provide consistent metadata for game players, academics, and other stakeholders who view video games not only as consumer products, but also as part of our cultural heritage and objects of academic research. The objective of our research is to create a controlled vocabulary for the plot/narrative element in video games. This will enable 1) catalogers to provide a more standardized description of plot/narrative in games with increased clarity, and 2) the plot/narrative element to be used as an access point to search/browse games. In particular, we attempt to answer the following research questions: 1) can existing literary plots be used to describe plots in video games, and 2) can we use the plot metadata for meaningful collocation of games? This is part of a larger research agenda with a goal of creating a standardized metadata schema and encoding schemes for describing video games and interactive media across multiple organizations in different domains. This project started in 2011 as a joint research effort between the GAme MEtadata Research (GAMER) group at the University of Washington (UW) Information School and the Seattle Interactive Media Museum (SIMM), and is currently in its third phase.[4] The objective of SIMM is "to aggregate, research, exhibit, and preserve interactive media culture and the physical, digital, and abstract artifacts therein."[5] In order to accomplish this, a robust and media-specific metadata schema that can serve a wide variety of use cases is essential.

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[3] "Introducing Steam Tags, A Powerful New Way to Shop for Games," Valve Corporation, accessed July 19, 2008, http://store.steampowered.com/tag/.

[4] "Constructing a Metadata Schema for Video Games and Interactive Media: Creating a Metadata Schema that Captures the Essential Information about Video Games and Interactive Media in a Standardized Way," GAme MEtadata Research Group, accessed July 20, 2008, http://gamer.ischool.uw.edu/.

[5] "Mission," The Seattle Interactive Media Museum, accessed July 20, 2008, http://www.thesimm.org/.

2. Relevant Work

2.1. Categorizing Basic Plots in Literature

Previous literature suggests that there are two primary methods for describing and organizing plots: appeal elements and keywords. The former draws on a combination of insights from Saricks and Card. Saricks presents the case that all genre fiction attracts fans through one of four factors: by appealing to them with 1) adrenaline, 2) emotions, 3) intellect, or 4) landscape.[6] Alternatively, Card suggests a "MICE Quotient" stating that all stories have one of four dominant structures that matters most to the author: 1) milieu (world) , 2) idea, 3) character, or 4) event.[7]

On the other hand, the keyword method uses words or phrases to describe the content of a story, such as in work by Polti, Friedman, Aarne and Thompson, Foster-Harris, Tobias, Booker, Uther, Reich, Parker, etc. For example, themes from these sources included "voyages and returns," "rags to riches," and "stories about the Devil." We reviewed these plot classification systems in order to determine how relevant and applicable they would be for describing plots in video games. Certain plot descriptors seemed to be more applicable (e.g., Self-sacrificing for an ideal, Rags to Riches) than others (e.g., The Action Plot, The Quest, Enchanted Relatives) due to scope and/or level of granularity. However, even many of the seemingly useful categories may be too broad when applied to video games (e.g., "Rags to Riches" in Booker's *The Seven Basic Plots*[8] since most RPG games involve the protagonist accumulating money and experience over time) or the classification system is too expansive and complicated for

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[6] Joyce G. Saricks, *The Readers' Advisory Guide to Genre Fiction* (Chicago: American Library Association, 2001), 3-5.

[7] Orson S. Card and Writer's Digest Books, *The Writer's Digest Guide to Science Fiction & Fantasy* (Cincinnati, OH: Writer's Digest Books, 2010), 77.

[8] Christopher Booker, *The Seven Basic Plots: Why We Tell Stories* (London: Continuum International Publishing Group, 2004).

catalogers to easily apply them (e.g., Uther's *The Types of International Folktales* described in three volumes).[9]

The Aarne-Thompson tale type index offers a useful perspective at classifying discrete plot elements; however, its division between types and motifs are more analogous to the UW/SIMM Video Game Metadata Schema's "Theme" element, which is defined as "a common thread, motif, subject, or idea that recurs in the game".[10] Thompson (1951) explains, motifs are "the smallest element in a tale having a power to persist in tradition".[11] In general, they cover character types, objects or processes, and incidents. They are not necessarily what a character does, which is the focus of our interest. For example, "The Maiden Without Hands (Type 706)," "The Lazy Boy and the Industrious Girl (Type 822)," and "The Ogre's (Devil's) Heart in the Egg (Type 302)" could all be elements of a game's story, but they do not express the central plot. Types are composed of several motifs, and can form complete story-units. Tracking this level of plot is important in dealing with folktales, which mutate as they are retold, but less important with video games, whose stories are generally set after publication.

Table 1 presents an overview of these different approaches along with examples and reasoning for why, individually, they have limited applicability to describing video game plots. The thirty-six dramatic situations categorized by Polti[12] are another good example of why most extant plot classification systems fall short in classifying video games. Each of the thirty-six plots breaks into two to six sub-classifications, each of which are broken down into further sub-classifications. However, despite their specificity, these units are, at best, guidelines: "Murder, for instance, may be reduced to a wound, a blow, an attempt, an outrage, an intimidation, a threat, a too-hasty word, an intention not carried out, a

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[9] Hans-Jörg Uther, *The Types of International Folktales: Animal Tales, Tales of Magic, Religious Tales, and Realistic Tales, with an Introduction* (No. 284) (Helskinka: Suomalainen Tiedeakatemia, 2004).

[10] UW/SIMM Video Game Metadata Schema (available at: http://gamer.ischool.uw.edu/wp-content/uploads/2014/04/UWSIMMschema_v2.0.pdf).

[11] Stith Thompson, *The Folktale* (New York: The Dryden Press, 1951), 415.

[12] Georges Polti, *The Thirty-Six Dramatic Situations* (Boston: The Writer, Inc., 1916), 119.

temptation, a thought, a wish, an injustice, a destruction of a cherish object, a refusal, a want of pity, an abandonment, a falsehood".[13] In video games, these actions are different enough that classifying them together would be at odds with users' goals.

[Table 1. Overview of Keyword Methods]

For this paper, the authors specifically focus on exploring the keyword method of cataloging plots in literature, while another paper is currently under preparation to address ideal appeal elements. In order to catalog stories, the authors first sought to clarify what exactly is meant by "story." Different disciplines treat plot, story, and narrative in similar, but conflicting fashion. The *Oxford English Dictionary* provides a solid starting point, from which we built our catalog-specific operational definition. Here, plot is defined as "the plan or scheme of a literary or dramatic work; the main events of a play, novel, film, opera, etc., considered or presented as an interrelated sequence; a storyline."[14] Story is defined as "succession of incidents, 'plot' (of a novel, poem, or drama)."[15] Finally, narrative is described as "the part of a text, esp. a work of fiction, which represents the sequence of events, as distinguished from that dealing with dialogue, description, etc. [...] *narrative* is sometimes used to refer to the story as it is supposed to have taken place, whereas *plot* is used to refer to the way in which the story is revealed."[16] In other words, the narrative is a diegetic sequence of events, plot is how the reader accesses these events, and story fits somewhere in between.

Richard Boon's definition, specifically written about video games, provides a contrasting view:

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[13] Polti, *Thirty-Six Dramatic Situations*, 119.

[14] "plot, n.". OED Online. Last modified March 2014. Oxford University Press. http://www.oed.com/view/Entry/145915?rskey=SgK1cq&result=1&isAdvanced=false.

[15] "story, n.1". OED Online. Last modified March 2014. Oxford University Press. http://www.oed.com/view/Entry/190981?rskey=LkSmDy&result=1&isAdvanced=.

[16] "narrative, n.". OED Online. Last modified March 2014. Oxford University Press. http://www.oed.com/view/Entry/125146?rskey=coVhG0&result=1&isAdvanced=false.

> A story may be defined as a collection of events which, when collated, provide some degree of meaning. A plot is a means by which to collate the events of a story, to allow it to make sense to its audience. Causality is of primary importance here. Characters must have motivation, events must display cause and effect, themes must arise from the elements of the story – or the story will not appeal to human beings. [...] Narrative is a term which describes the act of telling a story. A given story with a given plot may still be told in many different ways. Cinema ably demonstrates this – *The Seven Samurai* recreated as *The Magnificent Seven* or *Battle Beyond the Stars*, for instance. In each movie, the basic story (warriors are amassed to defend the downtrodden; they do so for their own reasons; a proportion of the warriors die whilst doing so) is the same, and the plot (naïve non-combatant seeks out and recruits the warriors in series before amassing them for the final battle) is also very similar. But the narrative (including aspects of setting, cinematography (dictating tone), character and pace) may be very different.[17]

Our system is concerned with Boon's definition of story, rather than any of the framing elements of the narrative. For example, it views *The Iliad* as the story of an epic war between the Trojans and the Greeks. The scheme does not refer to the narrative's flashbacks or multiple points of view (or, for that matter, any of the complex human dramas that populate the work). It would also be more accurate to consider our work as describing the story rather than the plot due to the fact that preserving causality and/or the sequence of events is not the primary focus. Although what our element is trying to describe is Boon's definition of story, in the metadata schema, the researchers decided to keep the name of the element as "plot" rather than story. This was based on the principle of user warrant[18] as "plot" was the term most often used by game players who were interviewed for developing the UW/SIMM Video Game Metadata Schema.[19]

2.2. Prior Work on Access to Video Games

As previously discussed, the work described in this paper is part of a larger project aiming to create an ontology and metadata schema for video games and interactive media, led by the GAMER Group at

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[17] Richard Boon, quoted in Chris Bateman, "Story, Plot, & Narrative," *Only a Game* (blog), August 18, 2005. http://onlyagame.typepad.com/only_a_game/2005/08/story_plot_narr.html.

[18] National Information Standards Organization, *ANSI/NISO Z39.19-1993 Guidelines for the Construction, Format and Management of Monolingual Thesauri (*Bethesda, MD: NISO Press, 1994).

[19] Jin Ha Lee et al., "A Qualitative Investigation of Users' Video Game Information Needs and Behaviors" (under preparation).

University of Washington Information School and SIMM (Seattle Interactive Media Museum).[20] [21] The motivation for the project was to provide a framework for standardized description and organization of video games and interactive media. This is necessary because other existing schemas and standards such as Dublin Core (DC), FRBR (Functional Requirements for Bibliographic Records), Resource Description and Access (RDA), Cataloging Cultural Objects (CCO), CIDOC Conceptual Reference Model (CIDOC CRM) are often too broad and/or not as relevant for describing specific information objects such as video games.[22] [23] [24] [25]

In response to this need for domain-specific Knowledge Organization (KO) solutions for description, organization and preservation of video games, several other research initiatives were also launched. In the LIS domain, The Preserving Virtual Worlds project, which focused on investigating issues in and establishing strategies for game preservation,[26] and Winget's video game preservation project, targeted for artifacts from the video game creation process[27], are prime examples. Both projects heavily center on preservation issues, leaving the need for addressing the description issue.

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[20] Jin Ha Lee et al., "Developing a Video Game Metadata Schema for the Seattle Interactive Media Museum," *International Journal on Digital Libraries* 13(2) (2013): 105-117.

[21] Jin Ha Lee et al., "Empirical Evaluation of Metadata for Video Games and Interactive Media," *Journal of the Association for Information Science and Technology (JASIST)*, in press.

[22] Liddy Nevile and Sophie Lissonnet, "Was CIMI Too Early? Dublin Core and Museum Information: Metadata as Cultural Heritage Data," *DCMI International Conference on Dublin Core and Metadata Applications* (2005): 31–38, accessed July 1, 2014, http://dcpapers.dublincore.org/pubs/article/view/801.

[23] Murtha Baca et al., *Cataloging Cultural Objects: A Guide to Describing Cultural Works and Their Images* (Chicago: American Library Association, 2006).

[24] Canadian Library Association et al., *RDA toolkit: Resource Description & Access* (Chicago: American Library Association, 2010).

[25] Jin Ha Lee et al., "Facet Analysis of Video Game Genres" (paper presented in proceedings of the 2014 *iConference, Berlin, Germany,* March 4-7, 2014: 125-139).

[26] McDonough et al., "Preserving Virtual Worlds Final Report," technical report, University of Illinois at Urbana-Champaign, 2010, accessed July 1, 2014, http://hdl.handle.net/2142/17097.

[27] Megan A. Winget and Sampson W. Walker, "Game Development Documentation and Institutional Collection Development Policy," *Proceedings of the ACM/IEEE Joint Conference on Digital Libraries* (2011): 29-38.

Other examples of best practice guidelines also exist, but with limitations. For example, Intner and Studwell suggested classifying video games as a subgenre of videos using Library of Congress Subject Headings (LCSH). However, they also accede to the creation of specialized classification schemes under special circumstances when there is an evident need for additional descriptors due to the size or composition of a particular collection.[28] Robare's video game cataloging guidelines at the University of Oregon provide increased focus on descriptive metadata but limit it to a short, objective description, and in the guidelines, it also indicates that it will not be possible to find appropriate subject headings to record in the 65X field of the MARC record.[29] Donohue also suggests local supplements to LCSH in the 690 (local topical term) field,[30] but these are limited to number of players, game console, and genre. Librarians including Lyons and Tappeiner focus on small, specific audiences, and explore ways to use tags and controlled vocabulary for improving users' access to video games.[31] In "Game Genres Demystified," McCann also acknowledges the lack of standardized criteria for defining game genres, stating that the unofficial list is contentious and changing.[32] Nevertheless, he identifies major categories for use in collection development and event programming. GAMER and SIMM intend to go beyond genre to provide the careful, nuanced, and internally consistent cataloging backbone that can form the foundation of efforts such as Lyons and Tappeiner's and find a logical place for McCann's contentious games. We aim to fill the gaps between preservation-focused systems, descriptive systems that

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[28] Sheila S. Intner and William E. Studwell, *Subject Access to Films and Videos,* (Lake Crystal, MN: Soldier Creek Press, 1992).

[29] Lori Robare, "Cataloging Guidelines for Video Games," *University of Oregon Libraries,* last modified 2008, accessed on July 21, 2014, https://scholarsbank.uoregon.edu/xmlui/handle/1794/5762.

[30] Nanette Donohue, "Subject Cataloging of Video Games" [PowerPoint slides], ALA TechSource, last modified 2008, retrieved from http://www.box.net/shared/ivj57x09rj.

[31] Catherine Lyons and Elisabeth Tappeiner, "Cataloging 2.0: Metadata Research and Initiatives at a Community College Library," *Journal of Library Metadata* 8(2) (2008): 155-157.

[32] Shawn McCann, "Game Genres Demystified," *Library Journal* 134.1 (2009): 56.

shoehorn games into pre-existing library categories, and guidelines on best practices. This project concentrates specifically on creating an ontology and metadata schema from the perspective of general video game users.

Multiple sub-projects were carried out, related to different elements and/or issues regarding the UW/SIMM schema creation. The sub-project that is particularly relevant to this study is Lee et al. reporting their work on facet analysis of video game genres.[33] As previously stated, subject access to games in commercial game-related websites tends to primarily focus on genre. However, empirical analysis of genre labels that are currently used on such websites revealed that the labels are overloaded with information representing multiple dimensions.[34] In fact, Lee et al. were able to identify 12 different dimensions expressed in these labels: gameplay, style, purpose, target audience, presentation, artistic style, temporal aspect, point-of-view, theme, setting, mood/affect, and type of ending.[35] Each of these dimension represents some type of information that can help users better find the games they may want, understand the content of the game, and determine if they will indeed purchase/play the game. Certain dimensions are more closely related to what we are describing in this paper; in particular, temporal aspect (i.e., how time passes in the game), theme (i.e., the common thread or idea that recur in the game), setting (i.e., the environment where the game takes place), mood/affect (i.e., the pervading atmosphere or tone of the game that evokes certain emotion), and type of ending (i.e., the characteristics describing how the game ends). Most of these dimensions were incorporated to the revised version of metadata schema[36] as independent elements (e.g., Theme, Setting) or attributes of elements (e.g., gameplay and style represented under "Genre"). The Plot controlled vocabulary

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[33] Lee, et al., "Facet Analysis," 125-139.

[34] Ibid.

[35] Ibid.

[36] UW/SIMM Video Game Metadata Schema Version 2.0 (March 31, 2014). Available at: http://gamer.ischool.uw.edu/official_release/.

described in this paper is to be used for the element "Plot" in the schema. Along with other 39 elements, we envision that the schema will provide rich data about video games that would be useful for a number of use cases by different stakeholders (e.g., entertainment, research, preservation). Ultimately, we aim to create an ontology expressing the relationships among different entities in the video game domain and these metadata elements as attributes of these entities.[37]

2.3. Importance of Plot/Narrative to Game Players

In order to create a user-centered metadata schema and encoding schemes, we conducted a number of user studies to improve our understanding of what kind of information game players value and how they refer to particular concepts in the video game domain. Multiple methods including personas, semi-structured interviews, and survey were employed in these studies.

During the first phase of the joint research effort, the researchers identified six user personas (archetypes representing the needs, behaviors, and goals of a particular group of users)[38] likely to seek information about video games: game players, parents of young players, collectors, scholars, game developers/designers, and librarians/curators.[39] Later, three additional personas were added: casual gamers, teachers/educators, and industry professionals (in addition to game developers/designers). Different user scenarios based on these personas served as a basis for determining an initial list of core and recommended metadata elements. Although the plot information will be most useful to game players and parents of young gamers, other personas can also benefit from it, especially if there were an organizational system that describes the plot or narrative of the game allowing selective searching/browsing of plot elements. For example, a parent looking for a game about the courtly ideal

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[37] Jacob Jett et al., "A Conceptual Model for Video Games and Interactive Media," *Journal of the Association for Information Science and Technology (JASIST)* (under review).

[38] Alan Cooper, *The Inmates Are Running the Asylum* (Sams: Indianapolis, 1999).

[39] Lee et al., "Developing a Video Game Metadata Schema," 105-117.

of knighthood, rather than the straightforward hack-and-slash of many games with medieval themes could deprioritize concepts such as "kill," "battle," and "conquer." Curators could put together exhibits of games with similar stories, and librarians could design a thematic display matching a video game to novels, movies, and nonfiction books with the same plot elements. Scholars and game developers could use the scheme to trace the history of themes in gaming, such as small town development, the apocalypse, and interactions with the American West. They will be able to answer questions such as "Why are there no games that handle a theme in a certain way?" or "What does it mean that only indie developers are writing game stories that handle certain topics?" Not all of these questions can be answered solely within the plot metadata field; however, incorporating such a metadata field in an organizational system will lay the groundwork for interaction with other elements, such as genre and visual style. Users will be able to mix-and-match metadata elements for reasons as diverse as trend analysis and suggestions on what to play next.

Following the analysis of personas, a total of 56 users representing a variety of personas were interviewed.[40,41] Researchers asked about multiple aspects of their video game playing experience and sought their opinions on the usefulness of the metadata elements. The interviews included sets of questions on their experience with video games, their video game collection and how they organize it, and their general game searching behavior, such as "What kinds of information about games are most important to you when you are searching for new games to play?" This helped us understand the terms that are typically used in the video game domain, and also the types of game-related information frequently sought by individuals with an interest in video games.

Analyzing the transcripts revealed that 21 of the 56 interviewees mentioned story/plot/narrative as an important factor, many naming it one of their top five, but no one knew of an effective way to search

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[40] Ibid.

[41] Lee et al., "User-Centered Approach," 229-238.

video games by it. One avid gamer (participant 14) said her major motivation for playing video games was that she really liked stories, especially the stories you can participate in, yet when asked what would help her search by plot, she conceded,

> *I think it is one of those hard things, because if you go too detailed then you are kind of giving away parts of the game, but if you go too general, I would say that these examples would be slightly too general for me to be particularly interested in the game. Particularly because lots of games are where the protagonist explores the world… So I think, maybe adding in something like, this is what they are kind of trying to do and this is how they're doing it. So the characters prevent the apocalypse by gathering all these orbs or something.*

This comment did have an impact on the granularity of the controlled vocabulary we designed. This same person described her impression of the difference between known and unknown item searches as follows:

> *I think if you are looking for games you've already heard of, title and series or franchise/universe are all important, but I think if you are looking for games that you haven't heard of that kind of plot and narrative and theme and point of view are probably ones that are going to be more important… it makes more sense to have something that is also searchable and has lots of terms for like style and plot and narrative and theme, because I think in the same way someone searches for movies, you do kind of look for those things as well, at least I do, in a video game. Like, oh, does this have an interesting story?*

An interviewed librarian (participant 40) declared that a brief description of the story would be especially useful for providing readers' advisory service. A high school teacher (participant 56) interviewed referred to creating an educational opportunity within the game, "*where you're taking something that's hugely popular to begin with, and now tying it into education,*" and gave the example of Project WOW:

> *Several schools have been very successful in implementing a curriculum for language arts and that revolve around World of Warcraft… And part of what they're doing is journaling about their hero's experience in the game, but also comparing it to a hero in a novel that they're reading.*

Such lesson planning would be easier if video games could be searched by plots to complement the literature included in the curriculum. Another interviewed gamer (participant 20) described an

experience similar to when readers are pleasantly surprised by a crossover into a different genre than what they typically read:

> *I'm not a big fantasy-setting person. I like settings that are historically accurate or -- if a game is set in medieval times, I like it to be like medieval Europe or whatever. That being said,* Skyrim *is not set on the planet Earth at all, but what it lacks on that side, it makes up for in story and graphics.*

When seeking suggestions of new games to play, searching by plot could allow for users like such to be enticed into a different setting or genre than usually preferred and thereby discover a new favorite game they otherwise might have missed if left up to chance or current search options. That same interviewee stressed the importance of a good story in a game: "[it] *will create an emotional attachment to the character. A good story will make them almost take on a life of their own.*" Although knowing the appeal elements may help find a game with a story that would provoke the player's emotions, being able to filter by plots that dealt with inner struggles, relationships, and the like would provide a means to find new satisfying titles to play. The description of the game *D* by one of the gamers interviewed (participant 28) exemplifies this well:

> *What, so, a very tiny horror, first person horror game about a girl and her Dad, like that's really interesting to me, and that's not the way most people would describe D, but that's really what it is. It's just very overlooked. But that kind of story is really relevant to me, because I love my Dad and the whole Dad - daughter relationship is very unexplored in games, I think. So, to find a commercial game for the PlayStation that focused on that, that doesn't like over explain it or anything, but that's just there, that fascinates me.*

She goes on to describe current cataloging failings stating *"a lot of people wouldn't ascribe that kind of subject matter to* D*; they would, if you were to tell people, 'I'm making a game library, categorize this game for me,' here's what they'd do: they go to PlayStation, survival horror, first person, maybe something like castles, but like, that doesn't mean much."* In some cases, a good story can be perceived to be more important than other critical elements of video games such as gameplay: "*if the story is good I'll play it regardless of the type of gameplay." (Participant 13)*

The importance of plot information to users was also confirmed in the survey results. A total of 1,257 participants who interact with video games completed the online survey with a similar set of questions asked to the interviewees. One of the questions the survey participants were asked was to rate the usefulness of 43 different metadata elements; "Plot/Narrative" was ranked as the seventh most useful element with positive responses from 71% of all participants.[42]

3. Method

Domain analysis and card sorting design methods were employed in creating the controlled vocabulary. Hjørland identified eleven ways domains can be studied and understood, one of which was to create "special classifications and thesauri (especially the facet-based approaches) [to] organise the logical structures of categories and concepts in a domain as well as the semantic relations between the concepts."[43] Mai explains "the core of the domain analytic approach is to study the activity and products of domains to gain insights into 'already there' structures and meanings."[44] The notion of what constitutes as a domain is not completely clear in Hjørland and Alberchtsen,[45] but Mai defines it as "an area of expertise, a body of literature, or a group of people working together in an organization."[46] Pejtersen designed the Book House computer program according to similar principles, creating a multi-

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[42] Lee et al., "Empirical Evaluation of Metadata" (in press).

[43] Birger Hjørland, "Domain Analysis in Information Science. Eleven Approaches—Traditional as well as Innovative," *Journal of Documentation* 58(4) (2002): 422-462.

[44] Jens-Erik Mai, "Analysis in Indexing: Document and Domain Centered Approaches," *Information Processing & Management* 41(3) (2005): 605.

[45] Birger Hjørland and Hanne Albrechtsen, "Toward a New Horizon in Information Science: Domain-Analysis," *Journal of the American Society for Information Science* 46 (1995): 400–425.

[46] Mai, "Analysis in Indexing," 605.

dimensional classification scheme reflecting users' reading needs.[47] The project analyzed user's desires within a specific domain and mapped them to document content, which could be encoded as metadata.

As the first step in our domain analysis, we collected candidate terms from various games and game-related websites. The initial candidate terms were collected from a broad cross section of RPGs. The authors drew upon the games' instruction books, in-game text, package descriptions, and fan-created online descriptions. Then we examined numerous game-related commercial, hobby, and review websites, wikis, and encyclopedias (e.g., GiantBomb, Wikipedia, RPGamer, GameSpot, Steam, and IGN) as well as examples of video games. At this stage, any term that was used at least once was included in the master list.

The initial list of terms was massive and unwieldy. During the second stage of vocabulary control, the authors used card sorting technique[48] to organize the terms into more manageable categories and conceptualize a framework for describing the different types of plots in video games. Patterns and common themes started to emerge among the unfiltered mass of terms. Infrequently used terms were evaluated based on their relevance: many became non-preferred terms or were removed as irrelevant outliers. Functionally similar terms were merged while overly-specific terms (such as "Pokémon") were broadened and made more accessible. Terms that already existed, wholesale or as synonyms, in a related controlled vocabulary (such as genre) were culled, but noted in the "commonly paired with other terms/words" column to aid later cataloging.

The terms were further evaluated based on the following criteria: accuracy, understandability, and comprehensiveness. Accurate terms ensure a strong link between the descriptors and the concepts described. The terms are either taken straight from game descriptions or slightly altered to create

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[47] Annelise M. Pejtersen, "A Library System for Information Retrieval Based on a Cognitive Task Analysis and Supported by an Icon-Based Interface," *SIGIR '89 Proceeding of the 12th Annual International ACT SIGIR Conference on Research and the Development in Information Retrieval* 23 *(1989): 40-47.*

[48] Gordon Rugg and Peter McGeorge, "The Sorting Techniques: A Tutorial Paper on Card Sorts, Picture Sorts and Item Sorts," *Expert Systems* 14(2) (2002): 80-93.

intuitive, compartmentalized distinctions, such as the difference between “battle” and “confront.” Additionally, the scope notes are provided to improve the understandability of each preferred term. Altogether, the terms in the current controlled vocabulary provide a fairly comprehensive set of options for describing plots in video games. However, we also recognize that ensuring comprehensiveness of terms is an ongoing process, as video game writers constantly explore new plots.

During this stage, we developed key terms in the controlled vocabulary concurrently with a verb-object structure for contextualizing plot (further discussed in Section 4). Our goal was to account for the variety of games that currently exist, trusting the flexibility of the pair structure to help construct categories for future plot trends as they occur.

4. Discussion on the Controlled Vocabulary

4.1. The Pair Structure

We use a pair structure to meaningfully describe and represent common narrative themes within games, inspired by a faceted approach.[49] Unlike a simple list or a hierarchical structure, our faceted structure provides a way to put together multiple terms in different combinations to represent the plot information. The mix-and-match structure system is flexible enough to cover a wide range of plots and narrow enough in scope to capture the narrative essence of individual games. The use of controlled term lists for each pair element allows for collocation along similar narrative themes.

Each pair consists of a VERB and OBJECT, each with its own controlled vocabulary. The full controlled vocabulary is provided in Appendix A (VERB) and B (OBJECT).

> VERB: a transitive verb (that is, a verb that requires a direct object) that describes a primary narrative action within the game. Examples from our controlled list include “seek,” “alter,” “battle,” and “solve.”

[49] Louise F. Spiteri, “The Use of Facet Analysis in Information Retrieval Thesauri: An Examination of Selected Guidelines for Thesaurus Construction,” *Cataloging & Classification Quarterly* 25(1) (1997): 21-37.

OBJECT: a noun that acts as the object of the verb, describing a person, place, thing, or idea that is central to the narrative action. For example, "seeking **treasure**," "escaping **a dystopia**," or "restoring **order**."

All pairs also have an implied SUBJECT element that describes the player-character(s). The VERB and OBJECT controlled vocabularies are continually being revised even at the time of this writing. Currently, the controlled vocabularies focus primarily on narrative themes commonly found in Western and Japanese role-playing games. This is because unlike other games, which may or may not have plots, role-playing games always have a readily identifiable narrative component. Moreover, these plots are often complex, and provide a powerful stress test for the pair structure. As the thesaurus is expanded, it will need to incorporate terms that cover plots from other genres, such as shooters, survival horror games, computer adventure games, and so on.

Since the narratives in RPGs can be quite elaborate, encompassing multiple plot points and goals, each game was restricted to three plot pairs within the SIMM catalog. Providing for any greater number increases the temptation to catalog every side story, regardless of its impact on the overall game. Catalogers are encouraged to use all three available pairs, pushing descriptions of games beyond the singular most evident plot element. Otherwise, many RPGs could simply be described by **(Characters) save world**. For example, *Chrono Trigger,* a game about traveling through time, righting wrongs, and defeating an alien parasite could be summarized as **(Characters) save world**. However, the narrative field for *Chrono Trigger* would be more useful if it contained three pairs:

(Characters) alter time.
(Characters) battle greater being.
(Characters) prevent disaster.

Table 2 shows the plot metadata for five additional sample games in order to illustrate how the controlled vocabulary can be applied.

[Table 2. Sample Video Games and Their Plot Metadata]

4.2. Testing the Applicability of the Controlled Vocabulary

In order to further test the applicability of the controlled vocabulary, the authors cataloged a sample of 74 video games, mostly focusing on RPGs with elaborate narratives. These sample records are available in their entirety in Appendix C. In addition, several examples are listed in Table 3 below to illustrate how the plot element can aid in game collocation:

[Table 3. Illustration on How Games Can Be Collocated Using the Plot Element]

As additional games are cataloged at SIMM, it would be possible to collocate more games with similar plot elements. Collocation based on plot elements can complement genre categorization and create interesting sub-categories. Note that most of these games are RPGs and therefore would most likely appear under the single "RPG" category on typical game-related websites. Once we have a significant number of games categorized, it would also be possible to do various analyses; for instance, a historical analysis investigating how the narratives delivered by games have changed over time or a co-occurrence analysis exploring which plot elements most frequently appear together in video games. Furthermore, a comparison of common plot elements in video games with those in other types of media may be possible.

5. Issues and Limitations

5.1. Granularity

The most significant challenge of any attempt to summarize a story is the issue of granularity. How does one distill a complex storyline to something reasonably simple? Generally speaking, a large percentage of video games will have a storyline that involves "a hero saving the world," leaving that broad of a scope meaningless in a catalog setting. On the other hand, a storyline like "a tycoon builds roller coasters" would be applicable to an insignificantly small number of games, so that level of specificity would also be ineffective.

Even moderate granularity poses challenges if a game contains side quests and non-linear content. Many RPGs contain optional storylines which, if completed, change the game's narrative. Williams explains, "Well designed role-playing games are replete with missions to be ignored or embraced. Before his date with destiny and a mysterious girl at the fair [...] Crono can see the world around him."[50] Such optional exploration can reveal background information that recontextualizes character actions, such as the post-game content in *The World Ends with You*. Optional storylines also offer points of divergence for the central narrative. *Valkyrie Profile* is about training dead warriors for Ragnarok, but the player is allowed to rebel against this mission to establish romance and a stronger sense of self for the protagonist. Following the second path opens up new stages and stories, while limiting others. Player choice complicates the division between a game's core plot content and supplemental information. This issue is also complicated when the players are provided with moral choices in video games (e.g., *Fable, Star Wars: Knights of the Old Republic*). Depending on the player's choice, the plot/narrative in parts of the game can turn out to be significantly different.

The constantly evolving landscape of video games means that any attempt at a controlled vocabulary must be flexible enough to incorporate any new game. However, with enough adjustment to the scope of granularity, every story can be traced back to the archetypal stories identified by the literature analyses mentioned above. Evaluating the granularity so it is neither too fine nor too coarse is a constant process which must incorporate cataloger's judgment as well as user testing.

5.2. Varied Roles of Plot in Games

The cataloging process is also complicated by the importance that fans and creators assign to a game's plot. The distinction between a game's story and its mechanics is not always easy to separate without masking a game's unique traits. Conversely, it is important to guard against describing features of the game when the intention is to describe the story. Features such as "6 hours of gameplay? Try 6 billion,"

[50] Michael P. Williams, *Chrono Trigger* (Los Angeles: Boss Fight Books, 2014).

or “classic roguelike play re-imagined as a unique single-screen puzzle game sort of thing!” give information about gameplay but do not give a good sense of the “aboutness” of the game.[51]

Catalogers should aim to encapsulate what happens in the game and not how a user plays it. For example, many RPGs feature combat with monsters. However, frequently the monsters are only incidental to the plot; they are a mechanism for the player to interact with the game between “plot scenes” where the only action is pressing a button to forward the dialogue. In cases like this, the plot may be more about finding love (or knowledge, redemption, etc.) than fighting the monsters that stand in its way.

Just like in other forms of media, not all video game plots are created equal. *Myst* is famous for its clever puzzles, but the story is about exploring an environment and discovering the secrets behind books and their missing owners. In playing the game, the plot seems incidental to the compelling atmosphere and challenge of solving puzzles. Nevertheless, the exploration and monographic detective work are worth cataloging; other metadata fields, such as genre, address the logic puzzles and core mechanics. At the other end of the spectrum, some games have no plot (e.g., *Tetris*) or have a more or less irrelevant plot (e.g. *Mortal Kombat*). If no plot exists, the field must remain empty; however, even the most irrelevant-seeming plots may be of interest to scholars and fans. A professor teaching game design (participant 51) put it this way in his interview, “*For me, as much metadata as possible is better than too little. Or, even if I’m never going to use it, somebody else might, right?*” When it is unclear if a particular plot element should be described for a game or not, the authors found it helpful to think about the issue from the general users’ perspectives (i.e. would a typical user find it helpful to search for games using plot element X and see game Y in the results?).

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[51] QCF Design, “Desktop Dungeons,” accessed January 12, 2014, http://store.steampowered.com/app/226620/?snr=1_200_200_253_203.

5.3. Catalogers' Background Knowledge

There are also challenges in any classification system used to describe aspects of the story in a metadata record. Does the cataloger need to have played the video game to adequately describe the storyline? Many RPG games take 40-70 hours for a single complete playthrough. Even just watching the plot scenes on YouTube could take up several hours per game. Since that seems unfeasible, the cataloger would often need to consult secondary sources. Which sources should be considered authoritative? How much investigation should a cataloger do to uncover the story of obscure games, or games with complex narratives with multiple endings? Most of the information in a library catalog record is taken from the item itself[52] (Baker et al., 2008). However, plot (like genre) requires a greater degree of effort to determine than simply examining the title frames. This difficulty suggests that crowdsourcing the plot information, to complement the cataloger's judgment, might prove to be useful in reducing the burden on the cataloger.

As for the secondary sources, although the authors of this paper primarily drew upon their personal knowledge of the games and consulted official game websites and Wikipedia in order to assign plot metadata, there are many possibilities. Other potentially valid sources for information are official strategy guides and marketing/distribution platforms such as Xbox Live and Steam. These sources have a vested interest in accurately representing their games. If a game's plot tags cannot be aligned with creator-influenced content, the gaming press can assist. Long-running game-related websites such as IGN, Gamespot, and Allgame can be trusted to fill the missing gaps.

5.4. Spoilers

The level of scrutiny required of accurate plot representation has one major casualty: spoilers. Users have varying degrees of sensitivity to spoilers, and it is important to accommodate these needs. This

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[52] David Baker et al., "Lessons Learned from Starting a Circulating Videogame Collection at an Academic Library," in *Gaming in Academic Libraries: Collections, Marketing, and Information Literacy*, edited by Amy Harris and Scott E. Rice (Chicago: Association of College and Research Libraries, 2008), 26-38.

concern can be dealt with at the interface level, similar to the "last words" feature at LibraryThing.com. Here, the last several words of the book can be accessed after clicking a protective link. For example, the instruction book and promotional materials for the 1996 release of *Final Fantasy III* obscure a major plot point: halfway through the game, the villain nearly destroys the world. The narrative jumps forward several months to one of survivors, who must gather her companions and defeat the villain. Some users, who value novelty and surprise, would not want to know right away that *Final Fantasy III* is tagged with "Survive Disaster" and "Restore Order." To accommodate these users, those two pairs could be hidden by the interface of the information retrieval system utilizing the plot metadata. Users would need to make a conscious decision to view the masked information.

5.5. Need for Additional Free-Text Fields for Summary Information

Another potential issue is that many games present their narratives in ways that are initially fragmentary and confusing. Story cues come from many places, including "on the package, in the manual, or in intro-sequences, placing the player's playing in the context of a larger story (back-story), and/or creating an ideal story that the player has to realize."[53] Therefore, it seems optimal to have an additional free-text field where the summary from the publisher (back of the box, manual, publisher's site, etc.) is presented in full, available for users to read and for the system to parse for keywords. This will also especially help with handling new games that have important story elements not covered in the controlled vocabulary.

Expanding on the idea of a free-text field, an even more complete picture of a game could be achieved by adding a separate free-text summary prepared by the actual cataloger. In library cataloging, provisions are given for free-text summarizing of content in both AACR2 (1.7B17) and RDA (7.10). In MARC, the optional 520 field is the place to record a summary of the item's content "unless another part of the description provides enough information." (AACR2 2.7B17). This field is frequently used in

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[53] Jesper Juul, "Game Telling Stories? A Brief Note on Games and Narratives," *The International Journal of Computer Game Research*, 1 (1), last modified 2001, accessed December 5, 2012, http://www.gamestudies.org/0101/juul-gts/.

bibliographic records for audiovisual materials. For example, a description for the film *Raising Arizona* was given this summary: "An ex-convict and a police officer decide to get married and start a family. To their dismay, they discover that they can neither have nor adopt children. Desperate, they resort to kidnapping one of the newborn quintuplets of the wealthy Arizona family. However, their attempt at living a normal life is complicated by neurotic co-workers, two fugitives, and a mysterious bounty hunter."[54]

This type of free-form field would provide a way to flesh out the representation of a game within a catalog. While the VERB-OBJECT example would allow easy user discovery of similar games, a free-text summary field would allow more thorough description of those games that do not easily fit into established categories. The summary would likely prove attractive to gamers and non-gamers alike, but especially those who are not familiar with typical video game tropes but trying to determine the appropriateness of materials for their needs. The flexibility to describe a game using both controlled vocabulary and free-form text would give catalogers the power to describe aspects of a game which cannot be accounted for anywhere else in the record. Although we can see several individual examples of catalog records in WorldCat that use the summary field for these purposes, they need to be applied in a more consistent manner. This again highlights the importance of crowdsourcing such data, as this information will be significantly easier for people who actually played the game to describe. Exploring how to effectively incorporate crowdsourced data into catalog records and still maintain the reasonable level of accuracy would be crucial for successfully populating the summary data.

6. Conclusion and Future Work

The paper presents our first step in creating a controlled vocabulary for the plot element to represent the aboutness of video games. Combining the plot elements with the rich vocabularies of other metadata elements such as theme, setting, genre, visual style, and mood should provide an invaluable

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[54] OLAC Cataloging Policy Committee, “Summary Notes for Catalog Records,” Online Audiovisual Catalogers, Inc., last modified August 2002, http://www.olacinc.org/drupal/?q=node/21. 2002.

method of identifying, discovering, and recommending a video game. These subject metadata fields in our schema can provide a useful map for the vast and ever-expanding realm of video games that will enable meaningful exploration of game content as well as discovery of new games.

The pair structure sets the stage for further refinement, which we hope will ultimately aid gamers' advisory service, recommending new games for library users. In future iterations of the scheme, catalogers can potentially weigh plot elements based on their importance to the game's story. This tiered ranking of plot pairs would allow librarians to recommend games with more certainty and provide gamers with more relevant data to aid their browsing. For example, if a gamer was interested in discovering more games about self-discovery and friendship, games where these topics were primary concerns rather than tertiary ones would be best. If a gamer is tired of saving the world by preventing apocalypse, but sees it only plays a minor part in a game's overall plot, he or she may be willing to try it. Weighted pairs also help distinguish between games that share the same basic plots but emphasize certain elements differently. This level of cataloging precision offers many exciting opportunities, but would also invite more subjective judgments than those with which some catalogers are comfortable. Within UW/SIMM catalog, in order to ameliorate this problem, we are exploring various options such as working in partnership with commercial game websites (e.g., Mobygames) as well as setting up an online database for crowdsourcing the data relying on game experts and enthusiasts, following a union catalog model.

Furthermore, in order to support the reuse of our metadata schema and controlled vocabularies, we also plan to collaborate with the GAMECIP (GAme MEtadata and Citation Project),[55] led by UCSC Library, UCSC Computer Science, and Stanford University Library, and submit our controlled vocabulary to SKOS (Simple Knowledge Organization System).[56] Through collaboration, ultimately we aim to establish an ontology to describe the entities and relationships in the video game domain in

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[55] "Game Metadata and Citation Project," accessed July 28, 2014, https://gamecip.soe.ucsc.edu/.

[56] "Simple Knowledge Organization System," accessed July 28, 2014, http://www.w3.org/2004/02/skos/.

common standards such as RDF (Resource Description Framework) and OWL (Web Ontology Language) for maximum reuse in the library and information science community. The future versions of our metadata schema will also continue to be published on the UW GAMER Group's official release page.[57]

[57] "UW Gamer Group," accessed July 28, 2014, http://gamer.ischool.uw.edu/official_release/.

Acknowledgements

The authors would like to extend special thanks to Violet Fox and Alison Lane for contribution of ideas and research for this paper and in creating the controlled vocabularies, and to INFO498/INFX598 participants for their valuable feedback.

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