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Pacman's Canon in C#: A Quantum Interpretation of Video Game Canon

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Abstract The topic of what constitutes canon with a video game is an under-explored topic in critical discussion. We rely, as a field, on largely intuitive and insubstantial parameters for the elements that we choose to analyse. This paper outlines the role of canon in the creation of popular media franchises, and the specific complexities that arise from treating video games as part of the same broad spectrum as more passive media such as books and movies. It puts forward a theory of canonicty that allows for all expression of player agency to be canonical simultaneously for the purposes of analysis and discussion—this is a kind of quantum interpretation. It concludes with an argument as to why what we consider to be viable canonical elements within video games must be tightly constrained if we are to give ourselves the best intellectual base from which to function.

Keywords Canon · Criticism · Game Crticism · Popular Culture

1 Introduction

The definition of a body of work within an established universe of a franchise as constituting 'canon' is an important element of setting and constraining the scope of meaningful discussion. Within literary criticism, the term canon has a fixed meaning—a body of texts selected by experts to be representative of a genre or broad critical trend. It is an emergent collection, collaboratively constructed as a result of debate, discussion, and analysis. Within popular culture, an area within which video games are situated, canon has a more complex and oft-times insubstantial meaning. It deals with, among other things: internal consistency of fictive universes; character and

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characterisation; and the facts, such as they are, of history (Chaney and Liebler 2007). The canon of popular culture is also peculiarly accessible—academic expertise is not a necessary prerequisite for participation in its ongoing construction and contextual-isation. Canon is a topic that has been ill-explored in gaming literature. As a consequence our ability to collaboratively analyse the depths of a video game text are hampered due to a lack of definitional boundaries. Traditional, passive forms of media and literature, such as movies, books, and television offer a reasonably solid framework from which canonicity may be derived, however imperfectly. Tensions always arise however within the interfaces between adaptions of literature from one form to another. There is though a generally understood convention as to what elements of the production may be considered canonical for the purposes of discussion. These conventions are not inflexible—they may be played with, inverted or even discarded entirely for the purpose of making an interesting argument. In the process of doing so we acknowledge their existence and importance. We explicitly subvert our often intuitive understanding of canon and in doing so we implicitly recognise its overarching eminence in critical analysis.

Within the field of video games studies canonical scope is less defined. Partially this is a result of the fact that video games are cybertextual (Aarseth 1997) and what constitutes an individual title is constantly in flux. Within games, we often *act upon* the world rather than have the world act upon us. This difference in the locus of the experience is of profound impact, even if authorial intention of artists working in different medium may be very similar. It is also a consequence of the relative immaturity of the field as an academic medium. We have not yet formed a consensus view on what is and is not part of a game canon, and popular discourses that offer critical views of gaming titles are often confused and unfocused as a result. Indeed, as a discipline we even lack formal, or even informal, frameworks within which the conversation can occur. Consider as a comparison the conception of canon as expressed in formal literary theory, and the textures and flavours that inform and meaningfully shape debate. Within games, this lack of definition leads to a wide-ranging and often ad-hoc adoption of 'canonicity from convenience', which we will address later in this paper. As an example of this, consider the Indoctrination Theory (CleverNoobs 2012), an extensive fan-made documentary exploring alternative interpretations of the Mass Effect series (BioWare and Demiurge Studios 2007; BioWare 2010; BioWare 2012). At first widely lauded for its attention to detail and insight, it became equally widely derided as later downloadable content rendered significant portions inapplicable. In some respects, this is inevitable when attempting to offer an interpretation of a video game that is explicitly engineered to contradict the one offered in the text itself. In large part it was also a natural outcome of relying too heavily on too many elements that could not realistically be considered canonical.

Within video games we also encounter a complication that is without mainstream parallel in any other form of media—the role of the player in shaping the canonical form of a game story. Outside of live and participatory theatre, there are few examples of popular entertainment in which the intended audience can be said to have a pivotal role in constructing the narrative. This particular issue is one that arises continually when attempting to critically discuss the larger narrative trends within a video game title. Those games with highly structured, linear storylines

yield more easily to analysis than those with complex branching narratives and highly interactive ludic elements. In many cases though it is the latter that gives us the greatest scope to explore the true value of video games as an active, participatory form of entertainment.

In this paper, the author argues that our gaming conventions with regards to canonicity are insufficient. The paper argues that certain parts of a video game production must be considered out of scope for critical discussion if we are to build analysis upon solid intellectual ground. It also argues that we must also be willing to 'ring-fence' individual titles within a series as being explicitly non-canonical. Video games are a product produced at the intersection of many clashing sensibilities: aesthetic, engineering, business, narrative and more. It is inappropriate, this paper argues, to consider the overarching canon of a video game series to be binding in areas when these conventions overlap or clash. In order to properly set the context of the discussion, the first sections of the paper are focused on explaining the role and construction of canon across multiple popular media formats, before bringing the discussion back primarily to the topic of video games. We do not examine or discuss the technical definition of canon in areas outside of popular culture, as these fall heavily outwith the scope of the paper. This paper is intended as an introductory step in helping the nascent field of game studies to deal with the paradoxes of the form.

2 The Nature of Canon in Popular Culture

Traditional forms of entertainment media involve a passive role for the audience. We watch a movie or television show. We read a book. We have a role in building our own personal interpretation of the motivations and meaning of a story, but the events that occur are entirely without our control. This allows for a defined narrative arc that permits for coherent criticism, without having to account for the choices the audience may have made as the story progressed. With only a few exceptions (for example, the Rand (1971) production 'Night of January 16th', a participatory play in which the ending is dependent on the jury judgement of audience members), or the branching narratives common to choose your own adventure books (Heron and Belford 2015), everyone in the audience of a traditional media output sees the same events play out in the same way at the same time. This lack of agency in terms of story branches, decision points and narrative pacing creates an environment that obviates the need for a negotiated agreement on 'what happened' within a particular title. However, this is not true of video games—our role as a player is critical in shaping the way in which we encounter the elements of a story. Consider even a theoretical game where our only role is to 'press X not to die' at mandated points within the game: our control over the timing of those key presses has an impact on the pacing of a story. After all, the secret of comedy is timing and it would be churlish to pretend that it wasn't equally important in other endeavours. As discussed in Heron and Belford (2015), even when player agency is tightly constrained, we can have a powerful effect on the story that is told.

Critics of traditional media then have a greatly simplified job when it comes to understanding what is canonical within a particular title. Even so, it is only rarely and only for larger fictional franchises, that canon is ever truly formally defined. Instead, we usually operate through an ad hoc and intuitive understanding of what canonicity involves. However, there are certain elements that offer the broad strokes of a consensus definition of the concept itself.

Canonicity defines the set of 'keystone works' that are considered to be sanctioned, either *de jure* or *de facto*. These are usually the originator texts, situating the initial canonical assumptions within written or filmed conventions. In this respect, canonicity in popular culture directly parallels the concept of canonicity in theological studies. Works of devotional literature can be defined as belonging to either the scripture or the apocrypha, or whatever equivalent specific terms are used for any given faith. Official sanction may be something formally defined and handled by the owner or steward of a piece of intellectual property. It may also be something that is informally assigned by the audience, such as in the case of authorial credibility (Reagle 2007) or 'moral ownership'. We might be willing as a fan community to take 'unofficial work' of the original author as being more canonical than 'official work' of a property owner when they are considered to be an interloper. These author interjections are sometimes informally known as the 'Word of God'. Debates can rage regarding canonical status within edge cases, but the role that canon itself plays is relatively uncontroversial.

Works may be produced which are explicitly non-canonical, and these must be ring-fenced so as to be excluded from any sensible critical discussion of the wider universe. For this, consider the Star Wars Christmas Special, or video games titles such as Super Mario Kart (Nintendo EAD 1992). Titles like this make few, if any, attempts to connect with the wider body of established canon within a franchise. However, even taking into account their explicitly engineered off-canonicity, these in themselves can contribute to a wider 'meta-canon' where fan attempts are made to reconcile these whimsical additions as somehow connecting coherently to the broader universe. This allows for an emergent and extended intertextuality which can be entirely dominant in the mind of its adherents, even if it is not 'officially' sanctioned.

Canonical works have precedence, which is usually informally defined and influenced by the originator form of the franchise. Thus, the Harry Potter books are more canonical than the Harry Potter movies, whereas the Star Wars movies are more canonical than the Star Wars novels. Clashes of canon are inevitable when large numbers of people are working on a single franchise—a phenomenon often known as the 'shared universe'. Where such clashes occur, it is the work with higher precedence that is used to resolve the inconsistency. It is perhaps this that results in such fan discomfiture when George Lucas changes canonical elements of the Star Wars movies (Lyden 2012)—such interferences violate the first, original source of canonicity for the franchise. Even leaving aside directorial interventions, the scale of transmedia franchises can make deciding precedence a challenging task. The Mass Effect series, to take one example, is now a property that spans an animated feature; books; graphic novels; board games; and more. Defining the precedence of

multiple layers of this franchise is challenging, and one of the key areas in which critics may differ over how clashes are to be resolved.

Unsanctioned use of a setting or the characters within a setting is non-canon. Knox (1920) for example uses the term 'canonical' to distinguish the Sherlock Holmes of Doyle as being a separate, and more 'real' Holmes than that of later writers. This however is not a universal rule—these 'fanon' elements, or the fans themselves, can sometimes make their way into the formal, established canon either as a kind of narrative Easter egg, or as an explicit acceptance of reality as it has been portrayed in unsanctioned media (Gray 2010). For example, the popular World of Warcraft (Blizzard Entertainment 2004) memetic video 'Leeroy Jenkins' resulted in a character with that name being included in the Warlords of Draenor expansion pack as a garrison follower. It also generated explicit references within the game text itself in the form of achievements; cards within the collectible card game Hearthstone; and elements of in-game flavour text. Fanon may also serve to provide context for the meta-discussion that accompanies appreciation for popular culture, allowing for critical reinterpretations of history and characterisation. Consider for example the feminist re-appropriation of the Batman character Harley Quinn, which serves to create a context within which the character is not abused and disempowered, but instead actively empowered in the expression of her own sexuality (Roddy 2010).

We may find these conventions being subverted in critical work—sometimes playfully, sometimes mistakenly, and sometimes in order to make a larger analytical point about the wider themes of a franchise. We usually find them however largely accepted, at least implicitly, in observance.

Sometimes we must explicitly confront violations of these ad hoc canonical conventions as is increasingly becoming the case when works are 'rebooted'. This is especially true when this reboot occurs at the same level of canonical precedence as the originator works. Such reboots often explicitly sever the canonical links with earlier franchise elements. This tends to create multiple, largely separate, spheres of internally consistent canon. However, when no attempt is made to do this the accumulated historical canon can become almost useless as an analytic tool— consider for example the reboot of the show Doctor Who (BBC Wales 2005), where the new version is treated as a direct successor to the original. Christopher Eccelston, who played the Doctor in the first season of the new reboot, is officially considered to be the 'ninth doctor', referencing the doctors that came before him in the earlier versions of the series. This creates an explicit link from what is known as 'New Who' to the older canon of 'Classic Who' (Booth and Kelly 2013). However, few attempts are made to resolve the many canonical inconsistencies that occur as a result. In this specific case, we might discount all canonical clashes as a result of the Doctor's habit of messing with space and time, but other franchises don't have such a convenient way to hand-wave away the problem.

For those franchises that adopt a clean break between spheres and reboots, each conflicted level of precedence may adopt its own internal canonicity and be considered entirely in isolation from the other layers. For example, we may view the Dune movie (Lynch 1984) as having a canonicity that is lower than the Dune novel (Herbert 1965). We can also view it as having its own 'movie canonicity' that need

not be incompatible with the original because we never attempt to directly compare. In this, we acknowledge that *adaptation* is in itself a creative task shaped by the interface of the conventions and limitations of the source and destination mediums. Some will always take issue with deviations from the canonical text in an adaption, but the wider audience tends to be forgiving. Within the video game Dune II (Westwood Studios 1993) we find a second example of canonical clash. The game is a kind of adaptation of the central conflict presented at the heart of the Herbert work—that of the war for Arrakis and the control of the Spice. The war between House Atreides and House Harkonnen lends itself neatly to a video game adaption but the developers also included a third house, the Ordos, to offer a triadic format of factional conflict. The status of House Ordos then is canonical within the video game series, but the Ordos are never mentioned in any of the novels. Within both the movie and the novels, Ordos are non-canonical. For Dune in particular, given how the many adaptations often alter the book's major thematic and narrative elements, this encapsulation and firewalling of canon can sometimes be the most satisfactory way to resolve conflict.

When clashes are encountered at equal levels of precedence it can be more troubling from an analytical perspective, requiring one or more of:

1. The demotion of one or both pieces of clashing information. When information is presented diegetically within a text, this can be done through stressing that such information sources are not necessarily always correct. They may not be in possession of all the facts; they may be expressing a view that is the result of their own interpretation of the facts; or they may simply be lying.
2. Resolving the conflict with a creative explanation. For example, consider the classic line from Star Wars (Lucas 1977): 'It's the ship that made the Kessel Run in less than twelve parsecs'. This would seem to clash with the fundamental definitions on which the Star Wars movies capitalise: parsec is a unit of distance, not a unit of speed. To deal with this, subsequent transmedia texts have provided multiple interpretations of the line. One common solution is to say that the Run was a set route through which ships could travel, and the Millennium Falcon had cut six parsecs off this by skirting a black hole— something only a skilled captain and reliable ship could risk. Another popular interpretation is that Han Solo, something of a scoundrel, was simply attempting to bluff a pair of unsophisticated rubes. As a diegetic source, Han's comments are subject to interpretation, revision, and can be discarded as being entirely wrong without violating franchise canon.
3. Revise the canon so that the conflict never occurred at all. Within the Discworld series the author explicitly resolves the many canonical and thematic clashes with a diegetic fracturing of space and time (Pratchett 2008), thus rendering any complaints about inconsistency of canon as entirely irrelevant. This is an option not available to all franchises.
4. Simply ignore the clashing canonical statements. This is the least satisfying from a critical and creative perspective, but also the easiest. Sometimes this is accomplished through extra-diegetic misdirection or mystique, by implying that the clash *has* a resolution but it can't be disclosed because of future revelations.

This has the added bonus of outsourcing the work of developing a suitable explanation to the fan community—a group that will often find the clash unpalatable.

Thus, within canon we must take into account the *precedence* of canonical elements and whether these elements are presented *diegetically* within a text.

For traditional media the most significant defining factor for canonicity is the direction from which it flows—it flows from the author(s) to the audience. The producer creates the canon, and the consumer absorbs it. Consumers of canonical elements may differ as to their understanding of the implications or their meaning. They may disagree even as to their status as canon. However, all consumers share the basic set of information as to what has been said, done and experienced by the key players within a franchise universe.

Traditional media products too, with the exception of instances such as George Lucas and the enhanced editions of the original Star Wars trilogy, tend to have the benefit of being 'fixed' once they are completed. Once the canon has been established, its original expression is rarely altered—this means that we can restrict our canonical challenges to that which comes later. Newer work contradicts earlier work—we rarely consider the possibility that it is the original work which may be more correctly considered non-canonical. As a consequence of this, we tend to view fictive works in traditional media formats as being largely 'atomic'.

We do not often consider the means of production that went into the creation of a fictional work, seeing these as falling rightfully outside the scope of what is canonical and relevant to critical discussion. That is not to say that the means of production are completely irrelevant—Hemmingway's distribution of work via the telegraph is widely considered to be one of the reasons why it is such terse, evocative prose (Tichi 1987). Similarly, Stephenson's Baroque cycle of novels was written with a fountain pen rather than a word processor to help create an appropriate atmosphere for the construction of his Newtonian epic. However, while we may acknowledge and remark upon the means of production, we do not consider them to be embedded into the text in such a way as to merit inclusion in canon.

Canon is important because it helps us contextualise discussion and 'rope off' irrelevant elements. When we discuss the movie Goodfellas (Scorsese 1990), we need not incorporate what Ray Liotta may have done on set while playing the part of Henry Hill. We know that's non-canonical—it might be interesting, it might offer a lens into both the making of the movie and the way he played the character, but it is explicitly not part of the Goodfellas movie. It is important that we know that that the way in which a director uses a camera to build the narrative is canonical, but the model of the camera itself is not. Constraints can rankle because of the restrictions they place, but it is important to set the scope of critical discussion if we are to have any hope of offering real illumination. We do not need to agree on what canonical elements *mean*, but we do need to agree upon common ground with regards to what the canonical elements *are*.

3 A Quantum Interpretation of Video Game Canonicity

Within the field of video game studies we cannot rely on many of the casual conventions of canonicity that other critics can call upon to codify context. While the broad stroke definitional elements above hold broadly true for all kinds of fictive work, the other assumptions fall apart in the face of the way that video games are constructed.

By far the largest issue with building a coherent view of video game canonicity is the issue of player agency, as briefly alluded to above. Within a video game, we are active participants in shaping the story—we may do so within narrative constraints (Heron and Belford 2015) but we have the ability to drastically alter, at a minimum, the pacing and tension of any story. Usually we can alter the story itself to some degree, even if that alteration is in the form of ordering rather than substantive branching of story elements (Heron and Belford 2015). Often we can interject an element of ourselves into the game through personal choice in dialog or problem solving. Often, we have an ability to customise race, gender, and a character's physical attributes. Only rarely do these have a significant impact on the game to follow, and even then portrayal of race and gender issues in video games remains primarily a theme explored most heavily in independent games.

Much of what we take away from a video game is constructed in our own heads—those who played text adventures (Heron 2013) in the early days of home computing may remember dank, dangerous ruins and taut, tense exploration. Coming back to them in the modern era can be strangely disorienting, with little of what made it such an absorbing experience present in the game itself. We project much of ourselves into a game when we are allowed agency. As a result, we take an active role in the construction of a video game experience, and in a large part this modifies the traditional relationship in building canon. Within video games, canon flows from producer to consumer but it is also generated within the consumer and spreads out from there.

Modern games too are rarely delivered in a fixed form, and our expectation is such that we rarely treat a video game as a finished entity. We expect new game features and environments will be added, either through patches or through downloadable content. We expect that bugs will be fixed, and we are accepting of the fact that sometimes these fixes may change story elements. We understand, although often resent, that our favourite strategies for playing the game might become less effective as balance fixes are included. We understand this even when that might dramatically alter the conception we have of how our character behaves within the game. Whole new environments might be added, along with new non-player characters (NPCs) that reconstruct and re-contextualise the game world as we have previously known it.

We are also often compelled, as a result of developer actions, to discard the canonicity of events that we know happened within the game. Consider for example the assassination of Lord British (Day 2001) within the game Ultima Online (Origin Systems 1997). This was an event that was never supposed to happen, and when it did the result was a canonical reboot by the developers to change the in-game reality

so that it never did. Things that 'weren't supposed to happen' happen every day in complex software projects, and video games present us with questions of canonicity as a result. Specifically, we must address the question of to what extent developer intention should override player experience in the exercise of what is *de facto* a collaborative construction of canon.

Really, all of this argues for a trifurcation of canon in video games. We are willing, as consumers of video game content, to accept a level of fluidity in canon as a necessary consequence of the way video games are built, distributed, and played. We have no choice. The technical requirements and business case that goes along with the development and production of video games is such that we are necessarily seeing a game that is a snapshot of organisational *realpolitik*. This snapshot represents the game as it was when multiple warring sensibilities (creative, technical and business) reached an accord long enough for a game to release or a patch to deploy. The canonical state of a game is dependent on two things—the role we have played in constructing the canonical experience of what we have done, and the technical architecture of the game as it exists in terms of facilitating and supporting that role. This then creates three separate layers of canon:

1. Individualised player canon, represented by the actions that we have taken within the game. It is the sum of our game actions, dialog choices, and customisation throughout the playing of a title. In this, all player experiences are equally canonical. Walker using the white phosphorous rounds on civilians in Spec Ops: The Line (Yager Development 2012) is canonical. So too are all those incidences in which players refused to commit a war-crime and died on the platform as a result (Heron and Belford 2014a, b). Commander Shepherd both saved the universe and stood for the rest of time on the threshold of entering the Collector base when the player abandoned the game. Every play-through represents *one* incident of *one* player taking *one* particular path through the possibility space of a game. Personal canon is often difficult to precisely articulate, as we must be willing to accept the possibility that our characters and the game that we see are, implicitly or explicitly, unreliable narrators. Consider for example the narrators in Dear Esther (Chinese Room 2012) and the Stanley Parable (Galactic Cafe 2013) who are offering us questionable, even incoherent, commentary on the actions of the player and the state of the main character's sanity. We are never really given a description of whether these narrators are functioning diegetically or not, and so they are inherently unreliable as sources of insight into what's actually happening. One ending in the Stanley Parable explicitly confronts this, highlighting the possibility that the narrator is simply the output of Stanley's own insanity. Within Spec Ops: The Line we see periods of the game that are clearly fantastic, often highlighted by a 'fade to white' transition to reflect a questionable relationship between on-screen events and the reality hidden behind the world as the game presents it. Similarly, player canon also includes those elements that we ourselves have injected into a play-through—our role playing, the motivations to which we have assigned our characters, and the meaning we ascribe to events that occur.

2. Franchise canon, which represents one typical play-through of the possibility space of the franchise. It is not inherently any more canonical, in real experience terms, than any individualised player canon—it is just one possible way that the events depicted could have unfolded. Often the franchise canon is highly influenced by a kind of artistic necessity—the franchise canon must be sufficiently open-ended to accommodate most likely player play-throughs while also being structurally fixed enough to serve as the baseline for other stories in the game universe. This can be difficult given the level of customisation in many games. When even the choice of gender is in the hands of the player, sequels and derivative works can struggle to encompass even a small minority of individual canonical experiences. This layer too suffers from issues of unreliable narration—as with player canon, we must be prepared to accept that sources we find within the game may be of questionable veracity. The Elder Scrolls: Skyrim (Bethesda Game Studios 2011) includes many diegetic elements that present historical and contemporary events from an obviously skewed perspective. World of Warcraft (Blizzard Entertainment 2004) likewise makes use of comic historian characters as a source for in-game mythologizing. The result is that any canonical clash can be discounted as being from a biased or faulty source. In many series the use of audio logs or personal journal pages is a common way to flesh out the back story of the game. In all cases, the originator of these logs cannot be accepted as having sufficient veracity to qualify as unquestionable authoritative sources.

3. Mechanical canon, which is that which derives from the physics and rules of the game we are playing. There are freedoms we are permitted as players, and freedoms we are not. The mechanics of a game can be argued to represent a moral judgement engine on the part of the developers (Heron and Belford 2014a) and this has a corresponding impact on the canonicity of in-game actions. Similarly, we must also accept that the parameters of agency we are permitted constrain the possibility space of narrative exploration. Within Fallout 3 (Bethesda Game Studios 2008), it is canonical that no player has killed a child—the mechanics of the game prevent it entirely.

In terms of meaningful discussion, player canon is all but irrelevant except in cases where one is reporting on our own response to a game title such as in Keogh (2013). It is too individualised, too specific, and too bound up in the context of an individual. Franchise canon represents common ground for the discussion of what happened within a title, but it is too narrow and too fixed a lens to offer any real opportunity for critical reflection on the emotional resonance that accompanies the playing of a video game. Mechanical canon is absolute and inviolable, but does not offer a view on the *meaning* of player actions and narrative context except in the negation of options and what those themselves may imply about the developer (Heron and Belford 2014b).

None of these layers then are truly appropriate sources in isolation for canon as a tool. Instead, we must look at the context in which these layers function—the possibility space of all potential play-throughs. It is here where we offer something akin to a 'quantum' framework for interpreting video canon. Within this possibility

space we find both the constraints that help guide analytic dissection and the wider themes and concepts facilitated by the game architecture. There is franchise canon that discusses what happened to Darth Revan after the events of Knights of the Old Republic (BioWare 2003) but that canon does not permit a meaningful discussion of the implications presented in Light Side Revan versus Dark Side Revan. It is in this whole possibility space that we can find all potential play-throughs, and collapse any one that is relevant to the lens through which we wish to analyse a title. Individualised player canon plays an important role in the relationships we have to fictional universes. Franchise canon plays an important role in building continuity between titles in a series and in the wider promotional literature of a title. However, it is the set of canon permitted within the possibility space that gives us the tool we need for critical discussion—it allows for all play-throughs to be canonical without hampering our ability to penetrate deep into the interlocking layers of narrative, player choice, and mechanics that define a game title. This, the author argues, is the only coherent way to adopt video game canon into critical analysis—to adopt a quantum interpretation that allows for all things to be true until we wish to collapse a particular combination of elements through observation and discussion.

4 The Source is Not a Source

Within the field of video game studies it is also important that we define which elements of a video game are suitable candidates for inclusion in canonical discussion. In this we cannot simply adopt the conventions of the wider world of media production because video games exists within a context which is a less tightly encapsulated package. When a movie is released to the public, it usually doesn't come with all the individual shots and frames that went into its construction other than as it is presented as part of the work. It usually doesn't include vestigial elements that were intended to be included but never fully incorporated and thus abandoned. While certain assets may be included as extras for a 'special edition' release, they are never used to actually directly produce the experience on the screen. Likewise when a book is released—it doesn't come in Wiki format, with a full revision history included for casual inspection. Plays are not performed with the auditions fully intact.

This isn't true of video games, which are provided as audio and graphical assets along with a software architecture that can assemble these into an interactive experience. A game is not the unit of which we take delivery—we take delivery of a large collection of files, some of which may yield themselves to inspection or even alteration by an interested party. Software arrives in kit form, and is assembled into a user experience by the computer system that executes it. It is those composite elements that form the game, but are *not the game*, to which we refer here.

This instantly creates a canonical issue—we need to decide to what extent the data that makes up a video game is truly a part of the game. In one respect, it's all that matters—in a real, technical sense that is what the game is. However, from an analytical perspective it's not an ideal candidate for relevance. It's the video game equivalent of the camera, the scripts, and the sets. However, from a critical

perspective it's also important to note that it represents an intersection of subcultural conventions—here we are in the realm of software engineering, and artistic assumptions do not hold true. The issues discussed here are true of any software product, but most applications do not have an expectation of canonicity to come with them. We don't have a conception of the grand, overarching story of a Microsoft Word document. We care not for the senseless slaughter of data during the great DROP TABLE massacres of MySQL. This is not an abstract or indulgent point—many fan theories of video games make use of in-game assets to justify counter-cultural interpretations of video game canon. The Indoctrination Theory (CleverNoobs 2012), which is to an extent being unfairly singled out in this paper, is one example of an analysis based in part on the structural meta-data that defines the game. Much of the interpretation within this (admittedly fascinating) documentary is informed, or perhaps misinformed, by the nebulous nature of what we might consider canonical within a video game.

It is not a simple or easy thing to discard this route of critical canonical analysis, because it is a difference in kind rather than difference in degree in comparison to how other media formats are presented to an audience. However, there are strong arguments for separating this body of information from that which we consider canonical:

1. The conventions of software engineering encourage, at least in principle, the practise of structural re-use. This extends through all levels of a system—from the source code, to the music, to the art assets. This requires either duplication of resources (a cardinal sin) or for a single fixed reference point to be provided for all re-use to access. The name of a function or file is likely then to be either derived from its original context, or some kind of compromise identification that fits, as far as is feasible, all possible use-cases. It is likely that there will rarely be a truly clean mapping of the name to the context of its deployment. When we use a function called 'roulette_wheel_selection', we are referencing a particular weighted form of selecting random elements. We are not implying the presence of gambling or that luck, in a strict sense, disproportionately factors into the outcome.
2. As the structural complexity of a piece of software increases, so does the cost of changing any element of it—the more critical an element it is, the greater the cost of modifications. Thus, in many ways developers become bound to the conventions adopted at the beginning of a project even if their sensibilities and desired outcomes changed completely. Even something as comparatively straightforward as changing the name of an asset may lead to a disproportionate amount of refactoring for no clearly identifiable aim. Thus, we cannot assume an intentionality of meaning in the naming, presence or ordering of assets that are not encountered within the game.
3. Software code is subject to *technical drift*, in which subsystems of code slowly drift apart from each other as expectations, technology and development teams change. The longer a project, and the more complex the technical architecture, the more likely some degree of drift will be experienced. Inconsistencies or

incompatibilities between structural elements are often unintentional, and should not be taken as evidence that there is active meaning in their presence.

4. Much of what defines software is, in the best cases, human-readable meta-data that is intended to be ignored by the compiler. This includes technical documentation, descriptions of intention in coding structures, and may also include some notes regarding the context in which the code is expected to function. However, these notes are not binding on the system and exhibit what is commonly known as 'comment rot'—over time, the code to which documentation relates will change. It is common that the comments will not be changed in line with these modifications. The result is, after a relatively short period of time, the comments refer to a chunk of code that is no longer extant, or has an entirely different expectation of deployment.

It may be possible within individual gaming titles to point to a single asset used in a single context and assert an interpretation of canon based upon that relationship. When one sees a texture in game called 'dream.png' it implies a certain intentionality of use, and this assumed intentionality might indeed offer an illumination of the deeper themes within a title. However, for something to be an effective element of canon it must be universal, rather than situational. Critically, its status as canonicity cannot be so fragile as to be rendered inapplicable by such a simple act as, for example, using the same texture in a new area. Not only does this lack solidity as an analytical precept, it also requires an almost constant curation of game meta-data to ensure that the relevance of an observation remains in place. The use of asset identification as an indicator of canonical intention relies too much on the serendipity of a genuine intersection of asset uniqueness and developer narrative expectations. A similar argument applies to movies—the PKE Meter is seen in both Ghostbusters as a device for finding supernatural activity, and in They Live to track down aliens. The iconic golden idol from Raiders of the Lost Ark is also used in The Majestic. Body armour from Starship Troopers is reused in the TV show Firefly. We accept that these props are not unique and it doesn't imply that wildly different franchises share a common universe.

It's necessary for us to address, in a similar way, the canonical status of structural software assets such as in-game art, the name of running processes, source code, or filenames. Indeed, this paper argues that they have no real canonical status and should be excluded from any meaningful analysis of a game text. That is not to say they have no interest in and of themselves—they remain the products of individuals and as such they are a valid topic of discussion. This is only to argue that they should be omitted from what we consider to be canonical within a title. This also includes meta-data and game content and references that cannot ever be encountered within any collapse of possibility space. For example, dialogue which cannot be triggered or enemies which will never spawn are, this paper argues, non-canonical elements because they cannot ever be experienced within the context of the game itself. They may speak as to an original creative intention, but we cannot hold that as binding on a product which does not deploy them.

This also extends to the popular practise of data-mining game assets (Drachen et al. 2013) for the purposes of gaining early indicators of future game content. As

part of the preparatory work for a new expansion pack, many games will begin patching modified content to all existing installations of a title ahead of release. When such content becomes available on the user's hard-drive it is very tempting to explore it to see what is revealed about the expansion to come. New weapons, abilities, quests, dialogs and more can be discovered with the appropriate tool and an eye for methodical dissection of material. However, unless this new content can be encountered within a play-through of the game it can only be considered suggestive, rather than canonical. We need the context of how something is encountered before we can offer a meaningful interpretation of its role in the game. If the aforementioned dream.png asset is discovered in a dream sequence, we can ascertain the role of the texture by our own exposure to the story (and not the filename). However, if we encounter the same texture in a night-club called 'Dream', it puts an entirely different inflection on what the asset represents. Filenames and assets by themselves, lacking situation in the wider narrative of the title, can be deeply misleading and lack the applicability and coherence we would need to be able to use them as canonical indicators. Similarly with file sizes—the Indoctrination Theory makes much of the difference between expected and actual file size of updates. However, it is not traditionally the case that the only thing contained within a game patch is new content—it may include modified content, bug-fixes, reskinned assets already in place, and so on. Often, it is necessary or simply convenient for a file to be overwritten in its entirety even if only a handful of bytes have been changed.

On occasion, we see the frivolities of asset naming promoted to game content, at which point the name itself becomes canonical. If the asset is later renamed, the canonicity is derived from the inclusion in the game, not the asset itself. One example of this is the central character at the heart of the Secret of Monkey Island (1990). The protagonist was originally drawn using a package called Deluxe Paint, which used the file extension.brush to indicate a sprite. Lacking a name for the character, the artist had simply titled him 'guy', which became 'guy.brush', which then became 'Guybrush Threepwood'. This story tells us something interesting about the stage of development at which the character art was being drawn, the technology used to build the game, and something of the whimsical nature of the team. It tells us nothing about the game canon and we should make sure we do not imply more than is reasonable from the assets that are used to construct a gaming experience.

Discrepancies in the meta-context of a video game are interesting, yes. This paper argues though that they cannot be considered canonical. That is not to say that there is no scope for analysing what may lie beyond canonical restrictions. Consider the Beginner's Guide (Everything Unlimited Ltd. 2015) which considers fictive prototype environments within the conceit of a game designed to demonstrate them. In one section, the narrator of the game removes all the walls that constrain the player to show that there are miles of inaccessible corridors that were programmed into the game, but never seen while it executes. Within the context of the Beginner's Guide, this is canonical—we are allowed to experience them directly within the game play-through. Outside of this context, such author constructs cannot be

considered canonical even if their presence may tell us much about the creator and their mind-set.

5 Conclusion

Canon is a useful tool for video game analysis because it constrains the parameters of debate to those elements which may be considered unquestionable. It allows for a common ground upon which meaningful discussion can build. We need not agree upon what canonical elements mean, but only that they *are* canonical. They shape the interpretations we may place on the unfolding events. However, canon within video games is more complicated to derive than in traditional, passive media. The player takes an active role in the production of a game experience, and every player experience is as canonical as every other. This is a tension that few other forms of media have to address. The technical architecture of a computer gaming product too introduces a need to explicitly delineate from where canon may and may not be derived—we have yet as a discipline to evolve a truly consistent critical view as to what elements make up the actual unit of a game. The result is a lot of misdirected energy going into the construction of complex, elaborate franchise deconstructions that are built upon highly contentious data-points.

This paper presents an overview of a potential way in which computer gaming canon can be viewed from multiple interlocking 'quantum' perspectives. The first of these is individual player canon which represents a collapsing of narrative possibility space around the actions taken by a player in their own personal play-through. This is turn is flavoured by the player's own role-playing choices, assumed motivations, and interpretation of events. The second is franchise canon which represents a utilitarian 'representative' collapse of the possibility space—one which takes into account the needs of the developers in building games around the franchise in the future. The last is mechanical canon, in which the restriction placed on player agency as a result of game mechanics is treated as a way to constrict and confine the possibility space of player actions.

None of these in isolation, this paper argues, are truly sufficient for making use of canon as a tool in narrative discussion. Instead, we argue that it is the possibility space itself that represents the most effective lens through which to view the larger themes and messages within a video game. The author argues that all organic exploration of possibility space is valid, and no one play-through, even the 'official' one represented by franchise canon, is more canonical than any other.

However, in order to fully underpin this definition, we must also be firm in how we treat the canonical status of game elements. This paper argues too that the clash of convention that occurs at the intersection of video games and software engineering is too significant a cultural shift for anything within this conjunction to be a valid element of canon. As such, game assets; source code; metadata and developer comments and commentary are all interesting, but must be discarded as viable elements for defining what is canonical within a video game title.

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Pacman's Canon in C#: A Quantum Interpretation of Video Game Canon

Michael James Heron[1]

Abstract The topic of what constitutes canon with a video game is an under-explored topic in critical discussion. We rely, as a field, on largely intuitive and insubstantial parameters for the elements that we choose to analyse. This paper outlines the role of canon in the creation of popular media franchises, and the specific complexities that arise from treating video games as part of the same broad spectrum as more passive media such as books and movies. It puts forward a theory of canonicty that allows for all expression of player agency to be canonical simultaneously for the purposes of analysis and discussion—this is a kind of quantum interpretation. It concludes with an argument as to why what we consider to be viable canonical elements within video games must be tightly constrained if we are to give ourselves the best intellectual base from which to function.

Keywords Canon · Criticism · Game Crticism · Popular Culture

1 Introduction

The definition of a body of work within an established universe of a franchise as constituting 'canon' is an important element of setting and constraining the scope of meaningful discussion. Within literary criticism, the term canon has a fixed meaning—a body of texts selected by experts to be representative of a genre or broad critical trend. It is an emergent collection, collaboratively constructed as a result of debate, discussion, and analysis. Within popular culture, an area within which video games are situated, canon has a more complex and oft-times insubstantial meaning. It deals with, among other things: internal consistency of fictive universes; character and

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characterisation; and the facts, such as they are, of history (Chaney and Liebler 2007). The canon of popular culture is also peculiarly accessible—academic expertise is not a necessary prerequisite for participation in its ongoing construction and contextual-isation. Canon is a topic that has been ill-explored in gaming literature. As a consequence our ability to collaboratively analyse the depths of a video game text are hampered due to a lack of definitional boundaries. Traditional, passive forms of media and literature, such as movies, books, and television offer a reasonably solid framework from which canonicity may be derived, however imperfectly. Tensions always arise however within the interfaces between adaptions of literature from one form to another. There is though a generally understood convention as to what elements of the production may be considered canonical for the purposes of discussion. These conventions are not inflexible—they may be played with, inverted or even discarded entirely for the purpose of making an interesting argument. In the process of doing so we acknowledge their existence and importance. We explicitly subvert our often intuitive understanding of canon and in doing so we implicitly recognise its overarching eminence in critical analysis.

Within the field of video games studies canonical scope is less defined. Partially this is a result of the fact that video games are cybertextual (Aarseth 1997) and what constitutes an individual title is constantly in flux. Within games, we often *act upon* the world rather than have the world act upon us. This difference in the locus of the experience is of profound impact, even if authorial intention of artists working in different medium may be very similar. It is also a consequence of the relative immaturity of the field as an academic medium. We have not yet formed a consensus view on what is and is not part of a game canon, and popular discourses that offer critical views of gaming titles are often confused and unfocused as a result. Indeed, as a discipline we even lack formal, or even informal, frameworks within which the conversation can occur. Consider as a comparison the conception of canon as expressed in formal literary theory, and the textures and flavours that inform and meaningfully shape debate. Within games, this lack of definition leads to a wide-ranging and often ad-hoc adoption of 'canonicity from convenience', which we will address later in this paper. As an example of this, consider the Indoctrination Theory (CleverNoobs 2012), an extensive fan-made documentary exploring alternative interpretations of the Mass Effect series (BioWare and Demiurge Studios 2007; BioWare 2010; BioWare 2012). At first widely lauded for its attention to detail and insight, it became equally widely derided as later downloadable content rendered significant portions inapplicable. In some respects, this is inevitable when attempting to offer an interpretation of a video game that is explicitly engineered to contradict the one offered in the text itself. In large part it was also a natural outcome of relying too heavily on too many elements that could not realistically be considered canonical.

Within video games we also encounter a complication that is without mainstream parallel in any other form of media—the role of the player in shaping the canonical form of a game story. Outside of live and participatory theatre, there are few examples of popular entertainment in which the intended audience can be said to have a pivotal role in constructing the narrative. This particular issue is one that arises continually when attempting to critically discuss the larger narrative trends within a video game title. Those games with highly structured, linear storylines

yield more easily to analysis than those with complex branching narratives and highly interactive ludic elements. In many cases though it is the latter that gives us the greatest scope to explore the true value of video games as an active, participatory form of entertainment.

In this paper, the author argues that our gaming conventions with regards to canonicity are insufficient. The paper argues that certain parts of a video game production must be considered out of scope for critical discussion if we are to build analysis upon solid intellectual ground. It also argues that we must also be willing to 'ring-fence' individual titles within a series as being explicitly non-canonical. Video games are a product produced at the intersection of many clashing sensibilities: aesthetic, engineering, business, narrative and more. It is inappropriate, this paper argues, to consider the overarching canon of a video game series to be binding in areas when these conventions overlap or clash. In order to properly set the context of the discussion, the first sections of the paper are focused on explaining the role and construction of canon across multiple popular media formats, before bringing the discussion back primarily to the topic of video games. We do not examine or discuss the technical definition of canon in areas outside of popular culture, as these fall heavily outwith the scope of the paper. This paper is intended as an introductory step in helping the nascent field of game studies to deal with the paradoxes of the form.

2 The Nature of Canon in Popular Culture

Traditional forms of entertainment media involve a passive role for the audience. We watch a movie or television show. We read a book. We have a role in building our own personal interpretation of the motivations and meaning of a story, but the events that occur are entirely without our control. This allows for a defined narrative arc that permits for coherent criticism, without having to account for the choices the audience may have made as the story progressed. With only a few exceptions (for example, the Rand (1971) production 'Night of January 16th', a participatory play in which the ending is dependent on the jury judgement of audience members), or the branching narratives common to choose your own adventure books (Heron and Belford 2015), everyone in the audience of a traditional media output sees the same events play out in the same way at the same time. This lack of agency in terms of story branches, decision points and narrative pacing creates an environment that obviates the need for a negotiated agreement on 'what happened' within a particular title. However, this is not true of video games—our role as a player is critical in shaping the way in which we encounter the elements of a story. Consider even a theoretical game where our only role is to 'press X not to die' at mandated points within the game: our control over the timing of those key presses has an impact on the pacing of a story. After all, the secret of comedy is timing and it would be churlish to pretend that it wasn't equally important in other endeavours. As discussed in Heron and Belford (2015), even when player agency is tightly constrained, we can have a powerful effect on the story that is told.

Critics of traditional media then have a greatly simplified job when it comes to understanding what is canonical within a particular title. Even so, it is only rarely and only for larger fictional franchises, that canon is ever truly formally defined. Instead, we usually operate through an ad hoc and intuitive understanding of what canonicity involves. However, there are certain elements that offer the broad strokes of a consensus definition of the concept itself.

Canonicity defines the set of 'keystone works' that are considered to be sanctioned, either *de jure* or *de facto*. These are usually the originator texts, situating the initial canonical assumptions within written or filmed conventions. In this respect, canonicity in popular culture directly parallels the concept of canonicity in theological studies. Works of devotional literature can be defined as belonging to either the scripture or the apocrypha, or whatever equivalent specific terms are used for any given faith. Official sanction may be something formally defined and handled by the owner or steward of a piece of intellectual property. It may also be something that is informally assigned by the audience, such as in the case of authorial credibility (Reagle 2007) or 'moral ownership'. We might be willing as a fan community to take 'unofficial work' of the original author as being more canonical than 'official work' of a property owner when they are considered to be an interloper. These author interjections are sometimes informally known as the 'Word of God'. Debates can rage regarding canonical status within edge cases, but the role that canon itself plays is relatively uncontroversial.

Works may be produced which are explicitly non-canonical, and these must be ring-fenced so as to be excluded from any sensible critical discussion of the wider universe. For this, consider the Star Wars Christmas Special, or video games titles such as Super Mario Kart (Nintendo EAD 1992). Titles like this make few, if any, attempts to connect with the wider body of established canon within a franchise. However, even taking into account their explicitly engineered off-canonicity, these in themselves can contribute to a wider 'meta-canon' where fan attempts are made to reconcile these whimsical additions as somehow connecting coherently to the broader universe. This allows for an emergent and extended intertextuality which can be entirely dominant in the mind of its adherents, even if it is not 'officially' sanctioned.

Canonical works have precedence, which is usually informally defined and influenced by the originator form of the franchise. Thus, the Harry Potter books are more canonical than the Harry Potter movies, whereas the Star Wars movies are more canonical than the Star Wars novels. Clashes of canon are inevitable when large numbers of people are working on a single franchise—a phenomenon often known as the 'shared universe'. Where such clashes occur, it is the work with higher precedence that is used to resolve the inconsistency. It is perhaps this that results in such fan discomfiture when George Lucas changes canonical elements of the Star Wars movies (Lyden 2012)—such interferences violate the first, original source of canonicity for the franchise. Even leaving aside directorial interventions, the scale of transmedia franchises can make deciding precedence a challenging task. The Mass Effect series, to take one example, is now a property that spans an animated feature; books; graphic novels; board games; and more. Defining the precedence of

multiple layers of this franchise is challenging, and one of the key areas in which critics may differ over how clashes are to be resolved.

Unsanctioned use of a setting or the characters within a setting is non-canon. Knox (1920) for example uses the term 'canonical' to distinguish the Sherlock Holmes of Doyle as being a separate, and more 'real' Holmes than that of later writers. This however is not a universal rule—these 'fanon' elements, or the fans themselves, can sometimes make their way into the formal, established canon either as a kind of narrative Easter egg, or as an explicit acceptance of reality as it has been portrayed in unsanctioned media (Gray 2010). For example, the popular World of Warcraft (Blizzard Entertainment 2004) memetic video 'Leeroy Jenkins' resulted in a character with that name being included in the Warlords of Draenor expansion pack as a garrison follower. It also generated explicit references within the game text itself in the form of achievements; cards within the collectible card game Hearthstone; and elements of in-game flavour text. Fanon may also serve to provide context for the meta-discussion that accompanies appreciation for popular culture, allowing for critical reinterpretations of history and characterisation. Consider for example the feminist re-appropriation of the Batman character Harley Quinn, which serves to create a context within which the character is not abused and disempowered, but instead actively empowered in the expression of her own sexuality (Roddy 2010).

We may find these conventions being subverted in critical work—sometimes playfully, sometimes mistakenly, and sometimes in order to make a larger analytical point about the wider themes of a franchise. We usually find them however largely accepted, at least implicitly, in observance.

Sometimes we must explicitly confront violations of these ad hoc canonical conventions as is increasingly becoming the case when works are 'rebooted'. This is especially true when this reboot occurs at the same level of canonical precedence as the originator works. Such reboots often explicitly sever the canonical links with earlier franchise elements. This tends to create multiple, largely separate, spheres of internally consistent canon. However, when no attempt is made to do this the accumulated historical canon can become almost useless as an analytic tool— consider for example the reboot of the show Doctor Who (BBC Wales 2005), where the new version is treated as a direct successor to the original. Christopher Eccelston, who played the Doctor in the first season of the new reboot, is officially considered to be the 'ninth doctor', referencing the doctors that came before him in the earlier versions of the series. This creates an explicit link from what is known as 'New Who' to the older canon of 'Classic Who' (Booth and Kelly 2013). However, few attempts are made to resolve the many canonical inconsistencies that occur as a result. In this specific case, we might discount all canonical clashes as a result of the Doctor's habit of messing with space and time, but other franchises don't have such a convenient way to hand-wave away the problem.

For those franchises that adopt a clean break between spheres and reboots, each conflicted level of precedence may adopt its own internal canonicity and be considered entirely in isolation from the other layers. For example, we may view the Dune movie (Lynch 1984) as having a canonicity that is lower than the Dune novel (Herbert 1965). We can also view it as having its own 'movie canonicity' that need

not be incompatible with the original because we never attempt to directly compare. In this, we acknowledge that *adaptation* is in itself a creative task shaped by the interface of the conventions and limitations of the source and destination mediums. Some will always take issue with deviations from the canonical text in an adaption, but the wider audience tends to be forgiving. Within the video game Dune II (Westwood Studios 1993) we find a second example of canonical clash. The game is a kind of adaptation of the central conflict presented at the heart of the Herbert work—that of the war for Arrakis and the control of the Spice. The war between House Atreides and House Harkonnen lends itself neatly to a video game adaption but the developers also included a third house, the Ordos, to offer a triadic format of factional conflict. The status of House Ordos then is canonical within the video game series, but the Ordos are never mentioned in any of the novels. Within both the movie and the novels, Ordos are non-canonical. For Dune in particular, given how the many adaptations often alter the book's major thematic and narrative elements, this encapsulation and firewalling of canon can sometimes be the most satisfactory way to resolve conflict.

When clashes are encountered at equal levels of precedence it can be more troubling from an analytical perspective, requiring one or more of:

1. The demotion of one or both pieces of clashing information. When information is presented diegetically within a text, this can be done through stressing that such information sources are not necessarily always correct. They may not be in possession of all the facts; they may be expressing a view that is the result of their own interpretation of the facts; or they may simply be lying.
2. Resolving the conflict with a creative explanation. For example, consider the classic line from Star Wars (Lucas 1977): 'It's the ship that made the Kessel Run in less than twelve parsecs'. This would seem to clash with the fundamental definitions on which the Star Wars movies capitalise: parsec is a unit of distance, not a unit of speed. To deal with this, subsequent transmedia texts have provided multiple interpretations of the line. One common solution is to say that the Run was a set route through which ships could travel, and the Millennium Falcon had cut six parsecs off this by skirting a black hole— something only a skilled captain and reliable ship could risk. Another popular interpretation is that Han Solo, something of a scoundrel, was simply attempting to bluff a pair of unsophisticated rubes. As a diegetic source, Han's comments are subject to interpretation, revision, and can be discarded as being entirely wrong without violating franchise canon.
3. Revise the canon so that the conflict never occurred at all. Within the Discworld series the author explicitly resolves the many canonical and thematic clashes with a diegetic fracturing of space and time (Pratchett 2008), thus rendering any complaints about inconsistency of canon as entirely irrelevant. This is an option not available to all franchises.
4. Simply ignore the clashing canonical statements. This is the least satisfying from a critical and creative perspective, but also the easiest. Sometimes this is accomplished through extra-diegetic misdirection or mystique, by implying that the clash *has* a resolution but it can't be disclosed because of future revelations.

This has the added bonus of outsourcing the work of developing a suitable explanation to the fan community—a group that will often find the clash unpalatable.

Thus, within canon we must take into account the *precedence* of canonical elements and whether these elements are presented *diegetically* within a text.

For traditional media the most significant defining factor for canonicity is the direction from which it flows—it flows from the author(s) to the audience. The producer creates the canon, and the consumer absorbs it. Consumers of canonical elements may differ as to their understanding of the implications or their meaning. They may disagree even as to their status as canon. However, all consumers share the basic set of information as to what has been said, done and experienced by the key players within a franchise universe.

Traditional media products too, with the exception of instances such as George Lucas and the enhanced editions of the original Star Wars trilogy, tend to have the benefit of being 'fixed' once they are completed. Once the canon has been established, its original expression is rarely altered—this means that we can restrict our canonical challenges to that which comes later. Newer work contradicts earlier work—we rarely consider the possibility that it is the original work which may be more correctly considered non-canonical. As a consequence of this, we tend to view fictive works in traditional media formats as being largely 'atomic'.

We do not often consider the means of production that went into the creation of a fictional work, seeing these as falling rightfully outside the scope of what is canonical and relevant to critical discussion. That is not to say that the means of production are completely irrelevant—Hemmingway's distribution of work via the telegraph is widely considered to be one of the reasons why it is such terse, evocative prose (Tichi 1987). Similarly, Stephenson's Baroque cycle of novels was written with a fountain pen rather than a word processor to help create an appropriate atmosphere for the construction of his Newtonian epic. However, while we may acknowledge and remark upon the means of production, we do not consider them to be embedded into the text in such a way as to merit inclusion in canon.

Canon is important because it helps us contextualise discussion and 'rope off' irrelevant elements. When we discuss the movie Goodfellas (Scorsese 1990), we need not incorporate what Ray Liotta may have done on set while playing the part of Henry Hill. We know that's non-canonical—it might be interesting, it might offer a lens into both the making of the movie and the way he played the character, but it is explicitly not part of the Goodfellas movie. It is important that we know that that the way in which a director uses a camera to build the narrative is canonical, but the model of the camera itself is not. Constraints can rankle because of the restrictions they place, but it is important to set the scope of critical discussion if we are to have any hope of offering real illumination. We do not need to agree on what canonical elements *mean*, but we do need to agree upon common ground with regards to what the canonical elements *are*.

3 A Quantum Interpretation of Video Game Canonicity

Within the field of video game studies we cannot rely on many of the casual conventions of canonicity that other critics can call upon to codify context. While the broad stroke definitional elements above hold broadly true for all kinds of fictive work, the other assumptions fall apart in the face of the way that video games are constructed.

By far the largest issue with building a coherent view of video game canonicity is the issue of player agency, as briefly alluded to above. Within a video game, we are active participants in shaping the story—we may do so within narrative constraints (Heron and Belford 2015) but we have the ability to drastically alter, at a minimum, the pacing and tension of any story. Usually we can alter the story itself to some degree, even if that alteration is in the form of ordering rather than substantive branching of story elements (Heron and Belford 2015). Often we can interject an element of ourselves into the game through personal choice in dialog or problem solving. Often, we have an ability to customise race, gender, and a character's physical attributes. Only rarely do these have a significant impact on the game to follow, and even then portrayal of race and gender issues in video games remains primarily a theme explored most heavily in independent games.

Much of what we take away from a video game is constructed in our own heads—those who played text adventures (Heron 2013) in the early days of home computing may remember dank, dangerous ruins and taut, tense exploration. Coming back to them in the modern era can be strangely disorienting, with little of what made it such an absorbing experience present in the game itself. We project much of ourselves into a game when we are allowed agency. As a result, we take an active role in the construction of a video game experience, and in a large part this modifies the traditional relationship in building canon. Within video games, canon flows from producer to consumer but it is also generated within the consumer and spreads out from there.

Modern games too are rarely delivered in a fixed form, and our expectation is such that we rarely treat a video game as a finished entity. We expect new game features and environments will be added, either through patches or through downloadable content. We expect that bugs will be fixed, and we are accepting of the fact that sometimes these fixes may change story elements. We understand, although often resent, that our favourite strategies for playing the game might become less effective as balance fixes are included. We understand this even when that might dramatically alter the conception we have of how our character behaves within the game. Whole new environments might be added, along with new non-player characters (NPCs) that reconstruct and re-contextualise the game world as we have previously known it.

We are also often compelled, as a result of developer actions, to discard the canonicity of events that we know happened within the game. Consider for example the assassination of Lord British (Day 2001) within the game Ultima Online (Origin Systems 1997). This was an event that was never supposed to happen, and when it did the result was a canonical reboot by the developers to change the in-game reality

so that it never did. Things that 'weren't supposed to happen' happen every day in complex software projects, and video games present us with questions of canonicity as a result. Specifically, we must address the question of to what extent developer intention should override player experience in the exercise of what is *de facto* a collaborative construction of canon.

Really, all of this argues for a trifurcation of canon in video games. We are willing, as consumers of video game content, to accept a level of fluidity in canon as a necessary consequence of the way video games are built, distributed, and played. We have no choice. The technical requirements and business case that goes along with the development and production of video games is such that we are necessarily seeing a game that is a snapshot of organisational *realpolitik*. This snapshot represents the game as it was when multiple warring sensibilities (creative, technical and business) reached an accord long enough for a game to release or a patch to deploy. The canonical state of a game is dependent on two things—the role we have played in constructing the canonical experience of what we have done, and the technical architecture of the game as it exists in terms of facilitating and supporting that role. This then creates three separate layers of canon:

1. Individualised player canon, represented by the actions that we have taken within the game. It is the sum of our game actions, dialog choices, and customisation throughout the playing of a title. In this, all player experiences are equally canonical. Walker using the white phosphorous rounds on civilians in Spec Ops: The Line (Yager Development 2012) is canonical. So too are all those incidences in which players refused to commit a war-crime and died on the platform as a result (Heron and Belford 2014a, b). Commander Shepherd both saved the universe and stood for the rest of time on the threshold of entering the Collector base when the player abandoned the game. Every play-through represents *one* incident of *one* player taking *one* particular path through the possibility space of a game. Personal canon is often difficult to precisely articulate, as we must be willing to accept the possibility that our characters and the game that we see are, implicitly or explicitly, unreliable narrators. Consider for example the narrators in Dear Esther (Chinese Room 2012) and the Stanley Parable (Galactic Cafe 2013) who are offering us questionable, even incoherent, commentary on the actions of the player and the state of the main character's sanity. We are never really given a description of whether these narrators are functioning diegetically or not, and so they are inherently unreliable as sources of insight into what's actually happening. One ending in the Stanley Parable explicitly confronts this, highlighting the possibility that the narrator is simply the output of Stanley's own insanity. Within Spec Ops: The Line we see periods of the game that are clearly fantastic, often highlighted by a 'fade to white' transition to reflect a questionable relationship between on-screen events and the reality hidden behind the world as the game presents it. Similarly, player canon also includes those elements that we ourselves have injected into a play-through—our role playing, the motivations to which we have assigned our characters, and the meaning we ascribe to events that occur.

2. Franchise canon, which represents one typical play-through of the possibility space of the franchise. It is not inherently any more canonical, in real experience terms, than any individualised player canon—it is just one possible way that the events depicted could have unfolded. Often the franchise canon is highly influenced by a kind of artistic necessity—the franchise canon must be sufficiently open-ended to accommodate most likely player play-throughs while also being structurally fixed enough to serve as the baseline for other stories in the game universe. This can be difficult given the level of customisation in many games. When even the choice of gender is in the hands of the player, sequels and derivative works can struggle to encompass even a small minority of individual canonical experiences. This layer too suffers from issues of unreliable narration—as with player canon, we must be prepared to accept that sources we find within the game may be of questionable veracity. The Elder Scrolls: Skyrim (Bethesda Game Studios 2011) includes many diegetic elements that present historical and contemporary events from an obviously skewed perspective. World of Warcraft (Blizzard Entertainment 2004) likewise makes use of comic historian characters as a source for in-game mythologizing. The result is that any canonical clash can be discounted as being from a biased or faulty source. In many series the use of audio logs or personal journal pages is a common way to flesh out the back story of the game. In all cases, the originator of these logs cannot be accepted as having sufficient veracity to qualify as unquestionable authoritative sources.

3. Mechanical canon, which is that which derives from the physics and rules of the game we are playing. There are freedoms we are permitted as players, and freedoms we are not. The mechanics of a game can be argued to represent a moral judgement engine on the part of the developers (Heron and Belford 2014a) and this has a corresponding impact on the canonicity of in-game actions. Similarly, we must also accept that the parameters of agency we are permitted constrain the possibility space of narrative exploration. Within Fallout 3 (Bethesda Game Studios 2008), it is canonical that no player has killed a child—the mechanics of the game prevent it entirely.

In terms of meaningful discussion, player canon is all but irrelevant except in cases where one is reporting on our own response to a game title such as in Keogh (2013). It is too individualised, too specific, and too bound up in the context of an individual. Franchise canon represents common ground for the discussion of what happened within a title, but it is too narrow and too fixed a lens to offer any real opportunity for critical reflection on the emotional resonance that accompanies the playing of a video game. Mechanical canon is absolute and inviolable, but does not offer a view on the *meaning* of player actions and narrative context except in the negation of options and what those themselves may imply about the developer (Heron and Belford 2014b).

None of these layers then are truly appropriate sources in isolation for canon as a tool. Instead, we must look at the context in which these layers function—the possibility space of all potential play-throughs. It is here where we offer something akin to a 'quantum' framework for interpreting video canon. Within this possibility

space we find both the constraints that help guide analytic dissection and the wider themes and concepts facilitated by the game architecture. There is franchise canon that discusses what happened to Darth Revan after the events of Knights of the Old Republic (BioWare 2003) but that canon does not permit a meaningful discussion of the implications presented in Light Side Revan versus Dark Side Revan. It is in this whole possibility space that we can find all potential play-throughs, and collapse any one that is relevant to the lens through which we wish to analyse a title. Individualised player canon plays an important role in the relationships we have to fictional universes. Franchise canon plays an important role in building continuity between titles in a series and in the wider promotional literature of a title. However, it is the set of canon permitted within the possibility space that gives us the tool we need for critical discussion—it allows for all play-throughs to be canonical without hampering our ability to penetrate deep into the interlocking layers of narrative, player choice, and mechanics that define a game title. This, the author argues, is the only coherent way to adopt video game canon into critical analysis—to adopt a quantum interpretation that allows for all things to be true until we wish to collapse a particular combination of elements through observation and discussion.

4 The Source is Not a Source

Within the field of video game studies it is also important that we define which elements of a video game are suitable candidates for inclusion in canonical discussion. In this we cannot simply adopt the conventions of the wider world of media production because video games exists within a context which is a less tightly encapsulated package. When a movie is released to the public, it usually doesn't come with all the individual shots and frames that went into its construction other than as it is presented as part of the work. It usually doesn't include vestigial elements that were intended to be included but never fully incorporated and thus abandoned. While certain assets may be included as extras for a 'special edition' release, they are never used to actually directly produce the experience on the screen. Likewise when a book is released—it doesn't come in Wiki format, with a full revision history included for casual inspection. Plays are not performed with the auditions fully intact.

This isn't true of video games, which are provided as audio and graphical assets along with a software architecture that can assemble these into an interactive experience. A game is not the unit of which we take delivery—we take delivery of a large collection of files, some of which may yield themselves to inspection or even alteration by an interested party. Software arrives in kit form, and is assembled into a user experience by the computer system that executes it. It is those composite elements that form the game, but are *not the game*, to which we refer here.

This instantly creates a canonical issue—we need to decide to what extent the data that makes up a video game is truly a part of the game. In one respect, it's all that matters—in a real, technical sense that is what the game is. However, from an analytical perspective it's not an ideal candidate for relevance. It's the video game equivalent of the camera, the scripts, and the sets. However, from a critical

perspective it's also important to note that it represents an intersection of subcultural conventions—here we are in the realm of software engineering, and artistic assumptions do not hold true. The issues discussed here are true of any software product, but most applications do not have an expectation of canonicity to come with them. We don't have a conception of the grand, overarching story of a Microsoft Word document. We care not for the senseless slaughter of data during the great DROP TABLE massacres of MySQL. This is not an abstract or indulgent point—many fan theories of video games make use of in-game assets to justify counter-cultural interpretations of video game canon. The Indoctrination Theory (CleverNoobs 2012), which is to an extent being unfairly singled out in this paper, is one example of an analysis based in part on the structural meta-data that defines the game. Much of the interpretation within this (admittedly fascinating) documentary is informed, or perhaps misinformed, by the nebulous nature of what we might consider canonical within a video game.

It is not a simple or easy thing to discard this route of critical canonical analysis, because it is a difference in kind rather than difference in degree in comparison to how other media formats are presented to an audience. However, there are strong arguments for separating this body of information from that which we consider canonical:

1. The conventions of software engineering encourage, at least in principle, the practise of structural re-use. This extends through all levels of a system—from the source code, to the music, to the art assets. This requires either duplication of resources (a cardinal sin) or for a single fixed reference point to be provided for all re-use to access. The name of a function or file is likely then to be either derived from its original context, or some kind of compromise identification that fits, as far as is feasible, all possible use-cases. It is likely that there will rarely be a truly clean mapping of the name to the context of its deployment. When we use a function called 'roulette_wheel_selection', we are referencing a particular weighted form of selecting random elements. We are not implying the presence of gambling or that luck, in a strict sense, disproportionately factors into the outcome.

2. As the structural complexity of a piece of software increases, so does the cost of changing any element of it—the more critical an element it is, the greater the cost of modifications. Thus, in many ways developers become bound to the conventions adopted at the beginning of a project even if their sensibilities and desired outcomes changed completely. Even something as comparatively straightforward as changing the name of an asset may lead to a disproportionate amount of refactoring for no clearly identifiable aim. Thus, we cannot assume an intentionality of meaning in the naming, presence or ordering of assets that are not encountered within the game.

3. Software code is subject to *technical drift*, in which subsystems of code slowly drift apart from each other as expectations, technology and development teams change. The longer a project, and the more complex the technical architecture, the more likely some degree of drift will be experienced. Inconsistencies or

incompatibilities between structural elements are often unintentional, and should not be taken as evidence that there is active meaning in their presence.

4. Much of what defines software is, in the best cases, human-readable meta-data that is intended to be ignored by the compiler. This includes technical documentation, descriptions of intention in coding structures, and may also include some notes regarding the context in which the code is expected to function. However, these notes are not binding on the system and exhibit what is commonly known as 'comment rot'—over time, the code to which documentation relates will change. It is common that the comments will not be changed in line with these modifications. The result is, after a relatively short period of time, the comments refer to a chunk of code that is no longer extant, or has an entirely different expectation of deployment.

It may be possible within individual gaming titles to point to a single asset used in a single context and assert an interpretation of canon based upon that relationship. When one sees a texture in game called 'dream.png' it implies a certain intentionality of use, and this assumed intentionality might indeed offer an illumination of the deeper themes within a title. However, for something to be an effective element of canon it must be universal, rather than situational. Critically, its status as canonicity cannot be so fragile as to be rendered inapplicable by such a simple act as, for example, using the same texture in a new area. Not only does this lack solidity as an analytical precept, it also requires an almost constant curation of game meta-data to ensure that the relevance of an observation remains in place. The use of asset identification as an indicator of canonical intention relies too much on the serendipity of a genuine intersection of asset uniqueness and developer narrative expectations. A similar argument applies to movies—the PKE Meter is seen in both Ghostbusters as a device for finding supernatural activity, and in They Live to track down aliens. The iconic golden idol from Raiders of the Lost Ark is also used in The Majestic. Body armour from Starship Troopers is reused in the TV show Firefly. We accept that these props are not unique and it doesn't imply that wildly different franchises share a common universe.

It's necessary for us to address, in a similar way, the canonical status of structural software assets such as in-game art, the name of running processes, source code, or filenames. Indeed, this paper argues that they have no real canonical status and should be excluded from any meaningful analysis of a game text. That is not to say they have no interest in and of themselves—they remain the products of individuals and as such they are a valid topic of discussion. This is only to argue that they should be omitted from what we consider to be canonical within a title. This also includes meta-data and game content and references that cannot ever be encountered within any collapse of possibility space. For example, dialogue which cannot be triggered or enemies which will never spawn are, this paper argues, non-canonical elements because they cannot ever be experienced within the context of the game itself. They may speak as to an original creative intention, but we cannot hold that as binding on a product which does not deploy them.

This also extends to the popular practise of data-mining game assets (Drachen et al. 2013) for the purposes of gaining early indicators of future game content. As

part of the preparatory work for a new expansion pack, many games will begin patching modified content to all existing installations of a title ahead of release. When such content becomes available on the user's hard-drive it is very tempting to explore it to see what is revealed about the expansion to come. New weapons, abilities, quests, dialogs and more can be discovered with the appropriate tool and an eye for methodical dissection of material. However, unless this new content can be encountered within a play-through of the game it can only be considered suggestive, rather than canonical. We need the context of how something is encountered before we can offer a meaningful interpretation of its role in the game. If the aforementioned dream.png asset is discovered in a dream sequence, we can ascertain the role of the texture by our own exposure to the story (and not the filename). However, if we encounter the same texture in a night-club called 'Dream', it puts an entirely different inflection on what the asset represents. Filenames and assets by themselves, lacking situation in the wider narrative of the title, can be deeply misleading and lack the applicability and coherence we would need to be able to use them as canonical indicators. Similarly with file sizes—the Indoctrination Theory makes much of the difference between expected and actual file size of updates. However, it is not traditionally the case that the only thing contained within a game patch is new content—it may include modified content, bug-fixes, reskinned assets already in place, and so on. Often, it is necessary or simply convenient for a file to be overwritten in its entirety even if only a handful of bytes have been changed.

On occasion, we see the frivolities of asset naming promoted to game content, at which point the name itself becomes canonical. If the asset is later renamed, the canonicity is derived from the inclusion in the game, not the asset itself. One example of this is the central character at the heart of the Secret of Monkey Island (1990). The protagonist was originally drawn using a package called Deluxe Paint, which used the file extension.brush to indicate a sprite. Lacking a name for the character, the artist had simply titled him 'guy', which became 'guy.brush', which then became 'Guybrush Threepwood'. This story tells us something interesting about the stage of development at which the character art was being drawn, the technology used to build the game, and something of the whimsical nature of the team. It tells us nothing about the game canon and we should make sure we do not imply more than is reasonable from the assets that are used to construct a gaming experience.

Discrepancies in the meta-context of a video game are interesting, yes. This paper argues though that they cannot be considered canonical. That is not to say that there is no scope for analysing what may lie beyond canonical restrictions. Consider the Beginner's Guide (Everything Unlimited Ltd. 2015) which considers fictive prototype environments within the conceit of a game designed to demonstrate them. In one section, the narrator of the game removes all the walls that constrain the player to show that there are miles of inaccessible corridors that were programmed into the game, but never seen while it executes. Within the context of the Beginner's Guide, this is canonical—we are allowed to experience them directly within the game play-through. Outside of this context, such author constructs cannot be

considered canonical even if their presence may tell us much about the creator and their mind-set.

5 Conclusion

Canon is a useful tool for video game analysis because it constrains the parameters of debate to those elements which may be considered unquestionable. It allows for a common ground upon which meaningful discussion can build. We need not agree upon what canonical elements mean, but only that they *are* canonical. They shape the interpretations we may place on the unfolding events. However, canon within video games is more complicated to derive than in traditional, passive media. The player takes an active role in the production of a game experience, and every player experience is as canonical as every other. This is a tension that few other forms of media have to address. The technical architecture of a computer gaming product too introduces a need to explicitly delineate from where canon may and may not be derived—we have yet as a discipline to evolve a truly consistent critical view as to what elements make up the actual unit of a game. The result is a lot of misdirected energy going into the construction of complex, elaborate franchise deconstructions that are built upon highly contentious data-points.

This paper presents an overview of a potential way in which computer gaming canon can be viewed from multiple interlocking 'quantum' perspectives. The first of these is individual player canon which represents a collapsing of narrative possibility space around the actions taken by a player in their own personal play-through. This is turn is flavoured by the player's own role-playing choices, assumed motivations, and interpretation of events. The second is franchise canon which represents a utilitarian 'representative' collapse of the possibility space—one which takes into account the needs of the developers in building games around the franchise in the future. The last is mechanical canon, in which the restriction placed on player agency as a result of game mechanics is treated as a way to constrict and confine the possibility space of player actions.

None of these in isolation, this paper argues, are truly sufficient for making use of canon as a tool in narrative discussion. Instead, we argue that it is the possibility space itself that represents the most effective lens through which to view the larger themes and messages within a video game. The author argues that all organic exploration of possibility space is valid, and no one play-through, even the 'official' one represented by franchise canon, is more canonical than any other.

However, in order to fully underpin this definition, we must also be firm in how we treat the canonical status of game elements. This paper argues too that the clash of convention that occurs at the intersection of video games and software engineering is too significant a cultural shift for anything within this conjunction to be a valid element of canon. As such, game assets; source code; metadata and developer comments and commentary are all interesting, but must be discarded as viable elements for defining what is canonical within a video game title.

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