

What is a Series, Really?

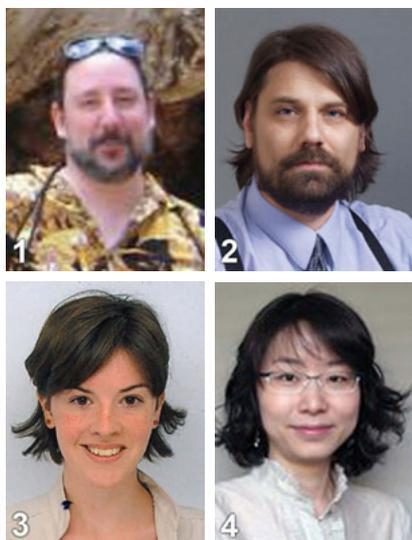
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Abstract: As library user needs become increasingly nuanced and technical, the lack of adequate metadata to meet user needs is creating a broadening gulf between library catalog functionality and library user expectations. One of the areas where the dearth of metadata is forming barriers is the idea of "series." While traditional bibliographic definitions of "series" have been adequate to meet user needs in the past, their inability to fully encompass more complex media types beyond simple text is forming barriers against the accessibility of non-traditional formats such as video games, artistic works, datasets, and similar information resources. This article explores the concept of "series" both as it is employed in bibliographic cataloging settings and encompasses actual works. The authors review the term's usage and general meaning across a large variety of media types beyond traditional journals and monographs. Examples are developed as counter-examples to the adequacy of the traditional bibliographic view of series. The authors conclude that the library and information science community as a whole needs to engage in a broader discussion of series cataloging practices and suggest alternate accounts of series that view them as aggregations (like collections) or as containers for intellectual content.

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1.0 Introduction

There has been a great deal of work analyzing the relationships among bibliographic entities over the years, much of which has primarily focused on equivalence relationships (Tillett 1992; IFLA 1998; Svenonius 2000; Smiraglia 2001). That focus was only natural as it gave information retrieval (IR) system designers improved means for allowing end-users to navigate through various intellectually equivalent content. The equivalence of editions and versions of documents has been especially discussed, and while the logical underpinnings of equivalence seem weak (Renear and Dubin 2003; Furner 2007; Renear and Wickett 2010), it is nevertheless a core functionality of IR systems. In contrast, very little work has been undertaken to more fully examine the nature of sequential relationships among bibliographic entities.

In particular, not much work has been done to reconcile all of the different manners in which the term “series” is employed with regards to the kinds of bibliographic entities collected by libraries. The long tradition of cataloging has developed two competing notions of series regarding monographs and journals (and other rapidly-paced serialized publications). But other formats, such as television, musical performances, and even data collection, which were once rare but are now commonplace thanks to the digital revolution also need to be examined to determine how well existing definitions for “series” accommodate their non-textual nature and how they fit into the overall ecosystem of bibliographic entities.

The goal of this paper is to more fully develop our notions of “series,” paying special attention to the sequential relationships that exist among their members. We will first explore the various ways that the notion of series is typically described in the literature with a special focus on the ideas of periodic/enumerated publication and serialized narratives that are familiar in traditional bibliographic cataloging contexts. We will then work through the apparent criteria that the traditional bibliographic idea of “series” adheres to in order to develop a working definition for the term. Finally, we work through real world counter-examples before concluding how current bibliographic definitions and cataloging methodologies fall short of providing adequate representation, and thereby access points, for sequential relationships.

2.0 Method

This study uses an entity analysis technique similar to that employed in the original *Functional Requirements for Bibliographic Records (FRBR)* study (IFLA 1998) and in similar subsequent studies (see for example, CIDOC 2011, Le Boeuf 2012, Riva et al. 2016, among others). Unlike these

previous studies, our approach is not intended to arrive at a singular strategy for representing “series” as a bibliographic entity. As Dubin et al. observe (2013, 1), “There are usually two ways to look at the consensus represented by a data model or architecture: as the interpretation of a domain and as a plan of action.” It is clear that organizational entities like the International Federation of Library Associations and Institutions (IFLA) and the International Council of Museum’s International Committee for Documentation (CIDOC) are very much engaged in producing conceptual models that are intended to act as plans of action. Our purpose here is not to replicate their work; rather, our intention is to closely examine the concept of “series” generally and produce an interpretation of its domain that is as precise as possible.

3.0 “Series” as defined by its context

3.1 “Series” in text

A very large portion of cataloging practices revolve around the traditions of how to describe text-based bibliographic resources. In text-based mediums, “series” usually take two forms: serialized publications (traditionally called “periodicals” by catalogers which comprise journals and newspapers) and monograph series (which are sometimes just a more specialized version of serialized publication, e.g. the *Hardy Boys* novels, and are sometimes a longer multi-part narrative, e.g., Ann Leckie’s *Imperial Radch* series).

In the greater context of cataloging practices, both of these kinds of “series” are called “serials.” For catalogers, the Resource Description and Access (RDA) practice standard defines the scope and nature of what is considered to be a serial. RDA defines a “serial” as “a resource issued in successive parts that has no predetermined conclusion usually bearing numbering (e.g., a periodical, a monographic series, or a newspaper). It includes resources that exhibit characteristics of serials, such as successive issues, numbering, and frequency, but whose duration is limited (e.g., newsletters of events) and reproductions of serials” (RSC 2015).

A serial is a structured type of resource representing both a hierarchy and a succession. While some resources can be considered as independent units and can be understood standing alone (e.g., a journal article), others can be understood only due to their relationships with other resources (e.g., different issues of the same journal). Supplements, annexes, or articles can either be described as one resource or described as part of a serial.

One question this immediately raises is whether or not a series and the particular parts of it are actually containers. In some respect this seems to be true of journals, newspapers, and similar serialized publications which contain mul-

multiple works that are often separated from their principal publication unit after some period of time for inclusion in the collections of an article database service. However, anthologies would also seem to fall within the scope of this containment question, especially since relatively recent standards like FRBR-LRM (“Library Reference Model” Riva et al. 2016) and Z39.29 (NISO 2005) group series and anthologies together with other kinds of aggregate entities.

Finally, serials have a strong temporal dimension. A serial is a resource which changes over time (e.g., new issues of a journal are published, an erratum is associated to an already published article, etc.). Bibliographic records that describe serials often capture the history of that serial (e.g., change of name, closing of a journal which is continued under another name, and so on).

3.1.1 Journals and newspapers

Serials cataloging practices in libraries are primarily concerned with the cataloging of and long-term access to journals. And in the case of academic libraries, this practice is especially focused on academic journals. In the general case of journals, while their content is topically linked together, only rarely do the narratives of the individual articles intermingle with one another. The evidence that a journal represents a series of resources is borne out through the shared name of its issues, which are typically also sequentially enumerated by volume (or annum) and issue. Newspapers share the same characteristics as they are constituted of continuing resources issued in a succession of small issues or parts. The narratives for each issue and the articles composing it are also different. Newspaper series can also include different types of resources such as supplements, annexes, and articles that can either be described as a separate resource or described as part of the newspaper.

One of the primary obstacles faced by serials catalogers is frequent changes in journal names and publication cycles. When great enough, these changes must be reflected in the metadata records that describe these journals (Black 2006). A complicating factor for catalogers is that competing methods for doing this exist (i.e., successive entry and latest entry cataloging).

In successive entry cataloging, journals are treated as new works and receive new catalog records that link back to their previous incarnation (via MARC field 780—preceding entry). One example of this would be Fitchett Brothers’ journal *Life: A Record for Busy Folk* which was published from 1904 to 1938 before changing names to *Life Digest*.

Under the latest entry cataloging approach, title changes are aggregated together and all holding entries are united beneath a single catalog record bearing the

journal’s original title. While this method has the benefit of aggregating a description of the whole work into a single metadata record, it can confuse library patrons by bombarding them with extraneous information. It is also unclear exactly what FRBR-level the title changes are representing. Is the journal gaining a new manifestation or a new expression? If either, then shouldn’t a new catalog record be created to better preserve the equivalence relationships between the things with different titles?

One of the complicating factors that journals present to our understanding of “series” is the continuity of numbering across multiple title changes. An example would be *Journal of the Association for Information Science and Technology* which started publication as *American Documentation* in 1950 and evolved into the *Journal of the American Society for Information Science* in 1970 before adding the “and Technology” in 2000, and finally obtaining its current name, the *Journal of the Association for Information Science and Technology*, in 2014. Another complicating factor is the issuance of special issues that do not fit within the journal’s normal numbering sequence. Both of these phenomena are also seen in other media like video games, although the fact that titles can vary across editions and localities may be an indicator that labeling practices and numbering practices are completely unrelated. These examples leave what exactly is being enumerated across these label changes something of an open question.

In the case of journals, we can state unequivocally that sequential enumeration is the primary evidence that something is a “series” or a “serialized publication.” However, while catalogers rely on its presence as the primary indicator, it is important to note that a journal’s enumeration practices change over time in accordance to its publication cycle.

A journal’s content and title also serve as important indicators. All journals possess an over-arching topical or genre-based cohesion among the articles contained within their issues. For instance, all of the articles within a given issue of *The Lancet* pertain to the medical domain. Uniformity of title also provides some evidence that a group of publications are a related “series”; however, as titles change more frequently over time than enumeration practices, the evidence that it is the essential nature of the series is weaker. Like for journals, sequential enumeration, cohesive content (e.g., contemporary events), and uniform title in newspapers all provide important evidence that a group of newspapers stands for a “series.” Like journals, newspapers are also vulnerable to sudden changes in how they are enumerated or in their title. Since traditional cataloging practices only rarely record enumeration information (and do it more commonly for journals through local holdings records); evidence for what parts were comprised by a newspaper’s title are often lost to the vagaries of time

(since they are only recorded on the individual issues themselves).

3.1.2 Monograph Series

Traditional monographic cataloging of fiction and non-fiction books would seem to enjoy a fairly straightforward concept of a series. RDA's definition of a series (RSC 2015) centers on "a collective title applying to the group as a whole." That would seem to separate them in a decisive manner from journals and newspapers (i.e., "periodical serials"). RDA (RSC 2015) breaks this broad category down further into *serials*, defined as being issued with no predetermined conclusion, and "multipart monographs," defined as "a mode of issuance of a resource issued in two or more parts, either simultaneously or successively, that is complete or intended to be completed within a finite number of parts."

The former is usually evinced in collections of materials put together under a common theme (a series of books on new directions in chemistry, for example) and can be published in numbered or unnumbered parts. The series, in this case, can be used by readers to explore other resources identified by the publisher as relevant to the topic covered by the series. However, beyond the broadly topical consideration, the resources are not often related. Multipart monographs, on the other hand, are more closely tied together, with the scope of the entire series including a distinct beginning, middle, and end. In fiction, this is often seen in a multipart narrative, such as Ann Leckie's *Imperial Radch* series, which tells one story across three books. Non-fiction multipart monographs may include extensive works, such as an encyclopedia, that would be physically impossible to contain in a single volume, or works with a defined scope, but published, for logistical reasons, at different times, for example, The University of Chicago's translation of the critical edition of *The Mahabharata*. The one consistent characteristic is that these series all have a named collective title overarching the individual parts (sometimes generated under the auspices of user warrant).

Confusion between series, works, and related works does, however, occur, especially within fictional works. This can be illustrated with the myriad ways that Proust's *À la recherche du temps perdu* is reflected in its various published states. Whether or not Proust's work is to be examined as one novel or a series of discrete works, is well beyond the scope of this paper, but it is an example of a series of individual volumes with individual titles that also have a "collective title applying to the group as a whole."

Yet, because each book (*Du côté de chez Swann*, *À l'ombre des jeunes filles en fleurs*, etc.) has been published individually, often with no mention of its relationship to the larger work, records for many editions of individual works make

no mention of *À la recherche du temps perdu*. Echoes of this relationship can be found in authority records for these works, where part/whole relationships are implied in "See From" tracing fields. Certain relationship designators in RDA define these relationships more explicitly (e.g., "sequel to," "in series," etc.), but they are not required.

More nebulous still are books that form a loose series based around a character or locale. Georges Simenon wrote seventy-five novels and several short stories about fictitious Commissaire Jules Maigret, but none include a comprehensive collective title. Likewise, Faulkner's extensive body of work that takes place in the fictional Yoknapatawpha County is not written under any collective title. In these cases, subject headings can facilitate collocation ("Maigret, Jules (fictional character)" and "Yoknapatawpha County (Imaginary place)" respectively). Additionally, catalogers may rely on the practice of user warrant to assign a collective title and such a case could be made for the "Maigret series" (See for instance: <https://www.goodreads.com/series/67800-maigret>).

The evidence that a group of monographs form a "series" is much less reliable than that for journals and newspapers. Like journals and newspapers, collective title and enumeration can provide evidence that a group of monographs is a "series" in some instances. However, this does not work for many cases. A topical or genre-based relationship among the monographs can be established but (as we will show) it is not sufficient evidence for a grouping to be a series by itself. Knowledge of narrative cohesiveness and collective titles provided through user warrant (who are likely to know more about the works themselves and also relationships of related works than catalogers can be expected to) are better sources of evidence that a group of monographs are parts in a larger whole.

3.2 "Series" in audio/visual media

Cataloging practices for audio or image intensive media are much less well developed and much more complex than those for text-based media. In the specific case of art, evidence that artistic works are related at all often depends on user warrant and the application of broader notions of relatedness in the forms of "shared universes" and "franchises."

3.2.1 Visual art

The term "series" in art criticism is often employed for a wide variety of groupings, ranging from works united by a time or a place to works created to be viewed in a narrative sequence. For instance, a gallery might curate several exhibitions around a "series" of pieces gathered under a uniting time or place (e.g., an early Americana art series, a

pre-Raphaelite painting series, etc.). In this case, the series is largely a critical construct, grouping disparate works around a critical perspective. However, “series” can also be used to denote a group of works arranged into a pre-defined sequence. In this case, a narrative sequence can be portrayed over several separate pieces, such as a depiction of the *Stations of the Cross* or Hogarth’s moral works (*A Harlot’s Progress* (1731), *Marriage à-la-mode* (1745)). Beyond narrative sequences, however, artworks may also be grouped around a certain subject matter or a plastic problem to be solved in the multiplication of similar patterns using different techniques (e.g., Van Gogh’s *Sunflower* series (1888), or Monet’s *Haystacks* series (1890-91) and *Rouen Cathedral* series (1894)).

Within art history and theory, series and seriality is often specifically concerned with a minimalist movement in the 1960s. This movement centers on repetition and concerned itself with the difficulty of representation (see Bochner 1967, Kaji-O’Grady 2001, Fer 2004, among others). This aspect of series is fundamentally theoretical, and not entirely concerned with how works are organized or presented. The movement (or method, as Bochner (1967) describes it) is concerned with laying bare the nature of repetition and the impossibility of uniformity within a sequence. Sometimes this leads to one work demonstrating seriality, like Agnes Martin’s *Leaf* (1965), a large grid drawn with graphite on a canvas, displaying, as Fer (2004, 47) puts it “infinitesimal differences in the lines and edges, but all of them subordinate to the repetition of the grid.” At other times, it produces several works presented as a series, for example Piero Manzoni’s *Linee* (1959), a series of tubes containing a length of paper with a solid line painted on it. “Making the ‘object’ invisible, making the packaging of the object to be looked at, revealed their place with a system of ritual commodity exchange” (Fer 2004, 35).

In any case, these conceptual concerns, are another example of the genesis of artworks being grouped together within a series. The fact that Manzoni’s *Linee* were presented as part of an installation (and potentially performance, if the purchasing, the “commodity exchange” of the tubes, is to be included in the totality of the art piece), demonstrates how difficult, again, it is to pin down series. Is each *Linea* its own work? Or is it a constituent part of the *Linee* installation? Even Hogarth’s series bring up this question. Is the artwork only the collection of paintings displayed together? Or does each individual painting in, say *Marriage à-la-mode* constitute its own work?

Cataloging practices such as the Categories for the Description of Art (CDWA) model (Baca and Harping (eds.) 2014) refers to series in art as comprising “a number of works that are created in a temporal succession by the same artist or studio. These series are usually intended by the creator(s) to be seen together or in succession as a

cycle of works.” However, in a context of exhibition the model allows each work to be considered independently. The CDWA model relies on characteristics such as a subject (e.g., the four seasons, labors in the year, the twelve labors of Hercules, etc.), or the same or similar media (series of prints) shared between works to define a series. However, the model insists on the intentionality of creating a series as the defining characteristic of series in art. The definition of series proposed by the CDWA seems to be too narrow to capture the progressive narrative that characterizes the most famous examples of series.

3.2.2 Comics

Comic books share all of the issues that journals have (i.e., name changes, special issues, unstable publication cycles, etc.). They also evince a number of additional challenges in the form of serialized narrative (or in some cases, the lack thereof). One example of this is the collected works featuring the Marvel Comics character Dr. Strange. Dr. Strange, a sorcerer with magical powers, first originated in Marvel’s anthology series, *Strange Tales* (in #110). Starting with #168, *Strange Tales* was renamed *Dr. Strange* and was no longer an anthology. Not only did the serial’s name change but its essential nature as a work also changed, yet it continued the enumeration sequence from its previous incarnation.

Marvel Comics is also famous for innovating the way in which a publisher’s stable of comic books relate to one another through the Marvel Comics multiverse. While the concept of a shared universe was not new to media (Universal Studios’ shared horror film universe being a famous example from the 1930s), Marvel writers perfected the use of cameos, crossovers, and when necessary, retroactive continuity (retcon) as narrative devices in the comic book medium during the 1960s. Tracing all the interwoven serialized narratives is a distinct challenge for catalogers today, especially since publishers like Marvel Comics are well known for printing brand-wide (or universe-wide) crossover events that interweave a single narrative through dozens of different titles.

Comic books display three disparate kinds of “series” or “serialization” characteristics. Like journals they are enumerated, although their volume number schemes do not tend to correspond to individual years like those of journals, instead tracing a title’s publication history (e.g., *Dr. Strange* Volume 1 (#169-183 [June 1968-November 1969]), *Dr. Strange* Volume 2 (#1-81 [June 1974-February 1987]), etc.). Through the use of the crossover narrative device, comic books display extremely dense and rich serialized narratives. An example of such a crossover is the “Fatal Attractions” storyline that ran through the many *X-Men* comics that were published in 1993 (i.e., *X-Factor* #92, *X-*

Force #25, *Uncanny X-Men* #304, *X-Men* [Volume 2] #25, *Wolverine* [Volume 2] #75, and *Excalibur* #71). Finally, publishers like Marvel Entertainment Group and DC Comics, Inc., as well as individual authors like CLAMP, maintain rich universes or multiverses that span across all of their individual works, providing a unified setting (sometimes of such an epic scale that it has a negligible effect on storytelling) that serves to interlink the many narratives that take place there (facilitating cameos and crossovers in the process).

3.2.3 Video games

Series information is considered highly useful for identifying games people might be interested in playing, especially for proxy users such as parents or teachers who want to discover games for other players (Lee et al. 2015). While there exist encyclopedia and dictionaries that define video game terms, such as Carreker (2012) or Wolf (2012), none of those resources specifically define the term “series.” Nonetheless, they do use various game series as examples in explaining other concepts, almost as if the concept of series is clear enough that it does not require additional explanation. A close examination of various examples of video game series reveals that this is not the case and the concept is much vaguer and more nuanced.

In the Video Game Metadata Schema (GAMER Group & SIMM 2015) developed by the GAME Research (GAMER) Group at University of Washington Information School and Seattle Interactive Media Museum, series is defined as “a set of related games, often indicated by consecutive numbering, continuing narrative, or similarities in game play and themes, to which the game being described belongs” (Lee et al., 2014).

As reflected in this definition, the criteria for determining a group of games as a series are vague and inconsistently applied in practice. For instance, here are some examples of properties that are shared by members of particular game series:

- Games with a consecutive numbering (e.g., *Final Fantasy I-IV*);
- Games that share part of the title (e.g., *Tales of...series*);
- Games that have continued narrative (e.g., *Kingdom Hearts* series);
- Games featuring the same character(s) (e.g., *Chocobo* series);
- Games based on the same set of mechanics (e.g., *Katamari* series); and,
- Games based on the same setting (e.g., *Vagrant Story*, *Final Fantasy Tactics*, and *Final Fantasy XII* are all set in the fictional kingdom of Ivalice).

The challenge is that these criteria are not consistently applied as a whole to determine whether a group of games is a series or not. There are numerous examples of game series that do not meet one or more of these criteria. Moreover, a particular criterion could apply to only part of the series. For instance, the *Valkyrie Profile* series consists of three games but not all of them are numbered—*Valkyrie Profile*, *Valkyrie Profile 2: Silmeria*, and *Valkyrie Profile: Covenant of the Plume*. The *Shadow Hearts* series also consists of three games (i.e., *Shadow Hearts*, *Shadow Hearts: Covenant*, and *Shadow Hearts: From the New World*) where the narrative continues in the first two games but not in the last. Therefore, it is difficult to clearly define which game series are based on which necessary condition(s) that a group of games need to meet in order to be determined as a series.

Additional challenges stem from the relationships that exist among different series. A series of games can have various sub-series (e.g., the *Donkey Kong Country*, *Donkey Konga*, *Donkey Kong Racing* series (among others) which are all sub-series encapsulated within the greater *Donkey Kong* series) and spinoff series (e.g., the *Persona* series which is a spin-off from the *Shin Megami Tensei* series). Each of the sub-series and spinoff series can have additional series spawning off of them; for example, the *Persona* series, which was a spinoff of *Shin Megami Tensei* series, now has its own spinoff series, *Persona 4 Arena*. Distinguishing between the main series from subseries and spinoff series can be extremely challenging for well-established series like *Pokémon*, which consists of over 50 different video games belonging to various sub-series.

Sorting the games within the series can also be difficult as the publication timeline does not always align with the timeline of the overall plot (a problem of narrative shared by the more traditional text medium—see for example Anne McCaffery’s *Dragonriders of Pern* series and Terry Brooks *Shannara* series, among others). For instance, the *Star Ocean* series consists of six games with the following publication dates and plot dates:

1. *Star Ocean: The Last Hope* (SD 10) (2009) (referred to as *Star Ocean 4* in North America (NA));
2. *Star Ocean* (SD 346) (1996) (referred to as *Star Ocean* [1] in NA);
3. *Star Ocean: The Second Story* (SD 366) (1998) (referred to as *Star Ocean 2* in NA);
4. *Star Ocean: Blue Sphere* (SD 368) (2001) (was never released in NA);
5. *Star Ocean: Integrity and Faithlessness* (SD 537) (2016) (referred to as *Star Ocean 5* in NA); and,
6. *Star Ocean: Till the End of Time* (SD 722) (2003) (referred to as *Star Ocean 3* in NA).

This mismatch between the publication and plot dates can make it difficult for users to navigate a collection of games belonging to a particular series and fully understand how every piece is connected to each other.

3.2.4 Animation, movies, and television

Series information is also an important factor in the identification of various kinds of works found on film. In the film medium, series and series-like superworks take on multiple forms that differ from one another in subtle ways. One of these differences is showcased in the difference between serialized narratives and episodic narratives. The former forms a cohesive, large-scale work similar to a multi-part monograph while the latter is more like a singular title applied to an aggregation of similarly themed or styled works that share characters and particulars of setting.

An example of the former would be George Lucas's *Star Wars* movies. Lucas's six films form a single overarching narrative in exactly the same manner that Ann Leckie's *Imperial Radch* series forms a single overarching narrative. In some cases, these serialized narratives form a complex, interwoven web linking works that are nominally distinct from one another through a shared narrative in a manner similar to the shared universe and cross-over narratives found in comic books and some video games. The Marvel Cinematic Universe is one instance of such a densely interwoven narrative. Its *Phase II* narrative comprises six movies, three television series, and two short films, all of which can be understood as distinct works capable of standing on their own but which when assembled contribute their narratives to create an overarching tale.

In stark contrast, an example of the episodic narrative format is clearly illustrated by the animated television series, *The Simpsons*. *The Simpsons* is a situation comedy (sit-com) that focuses on a relatively average "Middle American" family in the fictional town of Springfield. Across the twenty-five years the show has been broadcast, the characters have not aged and the setting has experienced very few changes. The narratives of virtually all of the *Simpsons* episodes are completely independent of one another (the two-part "Who Shot Mr. Burns" being one notable exception), sharing only characters and setting and only rarely referencing events that have occurred in earlier episodes.

Finally, in the last fifteen years a particularly challenging issue has begun to evolve—cross-medium narratives. While this kind of narrative has appeared on and off for decades it is only recently that publishers have begun to employ it as part of a coherent multi-media publishing strategy. One of the best known examples of this is the *.hack//* (pronounced "dot hack" by fans) series, which spans novels, manga (Japanese comics), straight-to-video

animation (typically referred to as original video animation (OVA) by anime fans), and animated television series. A complete chronological view of the overarching narrative that spans the multiple media entities of the *.hack//* series appears in the table below.

Title	Media Type
<i>.hack//AI Buster</i>	Novel Series
<i>.hack//SIGN</i>	Anime Series (broadcast)
<i>.hack//ZERO</i>	Novel
<i>.hack//INFECTIO</i>	Video Game (PS 2)
<i>.hack//MUTATION</i>	Video Game (PS 2)
<i>.hack//OUTBREAK</i>	Video Game (PS 2)
<i>.hack//QUARANTINE</i>	Video Game (PS 2)
<i>.hack//fragment</i> (re-implements above games)	Video Game (online-MMORPG)
<i>.hack//Another Birth</i> (parallels the games above)	Novel Series
<i>.hack//Liminality</i> (parallels the games above)	Anime Series (OVA)
<i>.hack//Firefly</i>	Manga
<i>.hack//Legend of Twilight Bracelet</i>	Manga / Anime Series (broadcast)
<i>.hack//ChupChopCase</i>	Manga
<i>.hack//Roots</i>	Anime Series (broadcast)
<i>.hack//Cell</i>	Novel
<i>.hack//Alcor</i>	Manga
<i>.hack//GnU</i>	Manga
<i>.hack//G.U./Rebirth</i>	Video Game (PS 2)
<i>.hack//G.U./Reminisc</i>	Video Game (PS 2)
<i>.hack//G.U./Redemption</i>	Video Game (PS 2)
<i>.hack//G.U. Trilogy</i> (retells the story of the G.U. games)	Anime (OVA)
<i>.hack//G.U.+</i> (retells the story of the G.U. games)	Manga
<i>.hack//G.U./Returner</i>	Anime (broadcast)
<i>.hack//Link</i>	Video Game (PSP)
<i>.hack//Link/Twilight Knights</i>	Manga

Table 1. Chronology of the *.hack//* series.

As Table 1 above demonstrates, not only does the story's events unfold serially across multiple media but sometimes the same events are told in parallel across multiple media. Other examples of this publication strategy include SyFy network's *Defiance* television series, which had a narrative that interconnected with the *Defiance* MMORPG, and *Sword Art Online*, which is an exploration

of the MMORPG phenomena that is thematically similar to the *.back//* series and is currently unfolding in the form of novels, video games, manga, and anime.

3.2.5 Musical works

A musical work, if one considers it at the moment of its performance, is an ordered series of simple or complex sounds (including silence), which may vary in pitch, timbre, rhythm, and other musical elements. In addition to the sounds that vary from moment to moment, a higher level of granularity also needs to be taken into an account for most musical works (Fingerhut 2016). One simple level to grasp is the melody which can have many more complex levels such as the tonality or the harmony. All these elements are combined into a sequence across time, usually in advance by the composer or at performance time by the musicians. Transformations at each level and the introduction of new elements participate in the evolution of the initial work. Since these transformations are not only happening within a performance context but also in a publication context, where the publication of the musical work may differ from the first performance intention, and thus we usually accept that variations of any particular musical work are considered to be *FRBR* expressions of that musical work rather than adaptations of that work (i.e., derivative works). But we would be remiss if we did not note that while we generally accept that this variation occurs at the intellectual level of *FRBR* expressions, it is not very difficult to make the case that intentional variations actually result in derivative *FRBR* works.

The definition of the series itself may be established according to structural criteria chosen by the composer, or by some random process. More recent trends in music theory have extended the notion of series to other elements such as pitch, rhythms, harmonies, or melodies.

Series also refers to a particular composition technique in which musical material, usually a melodic theme, is transformed through a series of variations that might alter any of the “parameters” of the original theme. The variations can occur within one uninterrupted musical form such as a “movement.” The J.S. Bach’s *Goldberg Variations* is a typical example with a theme, followed by thirty variations and ending with the original theme. Another pattern of variation can be illustrated by the famous theme of *Folia de la Spania* which has been used by more than one hundred fifty composers as a basis for variations (a full list can be found at <http://www.folias.nl>).

Finally, the series can refer to the “music suite” and “music cycle” that define ordered series of individual parts of a single work, such as the movements of a sonata, a concerto, a symphony, where each part can also be performed independently. These different parts are usually re-

lated by some unity criteria (e.g., thematic, tonal, instrumental, stylistic, literary). Some examples of music suites are J.S. Bach’s *Cello Suites* and Schubert’s *Die Schöne Müllerin*. However, the order is not always a recurrent characteristic of music cycle. It could happen that a composer published “sets” of works that were not necessarily intended to be performed as a series. They may bear the same catalog number (e.g., Corelli’s opera 1 to 5 consist each of twelve *Sonate*, and his opus 6 consists of twelve *Concerti grossi*) but not necessarily (e.g., Bach’s cello suites are numbered from 1 to 6 but do not share the same catalog number). On the other hand, some cycles were intended to be performed as a series but have rarely been performed as such. A famous example is Wagner’s *Der Ring des Nibelungen* (WWV 86), a.k.a. *The Ring*, a cycle of four operas that Wagner intended to be performed in a series.

These examples show again how series can be understood and characterized in different ways. Musical works may share similar aspects in their order or their narrative (musical elements they are composed of); there is no unique pattern that would define the notion of series for musical works. The context of publication or performance of the work may interfere with the primary definition of a work as a series.

3.3 “Series” in other contexts

3.3.1 Archival series

The General International Standard Archival Description (ISAD(G)) defines archives series (or records series) as a set of documents that are arranged according to a filing system or maintained as a unit because they result from the same accumulation or filing process, or the same activity, or because of some other relationship arising out of their creation, receipt, or use (ICA 1999). While the upper level of the “fonds” characterized the whole of the records, usually created or accumulated organically, an archival series represents a unit characterized by elements of “similarity” that the different items composing it share. Those characteristics belong to the context of production of the documents belonging to series, the context of creation of the series, and the context of reception and cataloging. However, even if the items composing the series might share the latter characteristics, the items are not always of the same nature.

Series in archives are usually organized according to an alphabetical, numerical, or chronological pattern. However, the intention behind the ordering is not always present: some series are clearly defined by a start and an end (close series) while others are continuous.

Archival series can be generally defined as an enumeration of resources. However, unlike the previous ex-

amples, the criteria that characterized the series and the resources it encompasses are vaguer and will be very dependent upon the organizational context of the archives itself. In this context it is therefore difficult to make a distinction between a series as a unit clearly defined by a particular ordering from a more general set or group of items that are unordered.

3.3.2 Series data

Scientific datasets also showcase the concept of series. While the term “series” most often appears in the context of time series data, conceptually, a series of data is any sequence of data points comprising successive data collection events over some time interval. In direct contrast to the other examples above, the serialized nature of series data depends not on some publisher established enumeration or subjective narrative continuity. Instead, it depends entirely on the temporal relationships that exist between the successive data collection events.

We have included series data in our discussion because of libraries’ expanding role with regards to data curation practice. As the need to document and curate the datasets resulting from scientific output and experimental outcomes continues to become more important, libraries’ missions are enlarging to accommodate that need. Series data can increasingly be found in institutional repositories, article databases, and other large-scale datastores where they are maintained as one of many first-class, citable bibliographic entities alongside the journal and conference publications that discuss them.

4.0 Defining “series”

4.1 The bibliographic definition

As seen from the examples above, there are many elements that serve as evidence for when something is a “series.” The evidence is helpful for answering questions like: How do we know when something is a part of a series? What are the criteria for its inclusion? However, the evidence alone does not sufficiently define the essential nature of what a series is. It becomes difficult to answer the most basic question: What is a series?

In this section, we propose and examine a generalized definition that describes the traditional bibliographic notion of what a series is. We examine how well it accommodates apparent counter-examples before finally suggesting a more generalized theoretical notion of what a series actually is.

Examining the many bibliographic approaches described above, it is apparent that traditional catalogers in library settings employ a definition for “series” that relies

upon certain kinds of evidence. Since they are primarily concerned with “series” with regard to publication practices and published works we might consider the following definition as a straw man:

Series =_{df} a group of individual publication units related to each other sequentially, either through enumeration or narrative.

Unfortunately, our straw man definition has a number of problems regarding intentionality, part/wholeness, orderedness, and its relationships to other, apparently similar abstract constructs.

4.2 Intentionality

One of the more easily identifiable problems with our straw man definition is the lack of intentionality represented in it. For instance, we can identify many game examples where neither are the units sequentially numbered, nor are the games parts of a continuing narrative, yet they are still considered parts of a series. The *Tales* series is one such example where the games belonging to the series (e.g., *Tales of Zestiria*, *Tales of Xillia*, *Tales of Graves F*, *Tales of Symphonia*, etc.) share similar gameplay mechanics and visual style, but with the exception of certain sub-series (e.g., *Tales of Xillia*, *Tales of Xillia 2*) the main *Tales* series is not enumerated. Similarly, with the exception of certain sub-series, (e.g., *Tales of Symphonia*, *Tales of Symphonia: Dawn of the New World*), the members of the *Tales* series do not compose a shared narrative.

In cases like these, one of the primary reasons these games are still perceived and accepted as part of a series seems to be the intention of the responsible corporate body. Because developers and publishers are releasing the games with an intention of grouping them together for marketing purposes or otherwise, people accept them and refer to them as series. We suspect this often happens due to financial reasons.

This is not an uncommon publishing practice and examples where enumeration has been combined with similarity of title in order to link together games that do not share a common narrative abound (e.g., the *Final Fantasy* series, part of the *Dragon Quest* series, etc.). The important factor is that publishers are now extending this principle to broader naming conventions as in the case of the *Tales* series.

Publishers are not the only source for this kind of series compilation. While corporations may choose not to market certain games as a series for various reasons, game players and fans can (and frequently do) disagree and sometimes refer to a group of games as a series based on some kind of user-perceived relevance. While enumeration and con-

nected narratives serve as basic evidence for series, it is necessary to examine naming conventions, usage by gamers, and similar features in order to verify that more nuanced evidence that one party or another intends some grouping of works to be understood as a series does not exist.

4.3 Narrative

That narrative can be used to link works into a series is uncontroversial; however, there are often more subtle examples where there is no apparent direct continuation or relevance in the narrative told across multiple works other than the fact they follow a chronological order and feature the same set of characters (e.g., the original trilogy of the *Professor Layton* video game series: *Professor Layton and the Curious Village*, *Professor Layton and the Diabolical Box*, and *Professor Layton and the Unwound Future*). In the video game medium especially, shared narrative often revolves around a shared setting as its focal point (e.g., *Fallout*) or a single character becomes the entity that ties together all the games that come from a variety of different genres (e.g., *Super Mario*) which challenge the traditional notion of “narrative” and what constitutes as a common or continued narrative.

This distinction seems to be true of most “episodic narratives.” In this case the linking device of that narrative seems to be audience expectations. Take the *Sherlock* series as an example. While many of the stories and books in the *Sherlock* series, or episodes of the *Sherlock* TV shows might feature disjoint narratives, just based on the fact that the character Sherlock appears in them, we can make a reasonable expectation of what will happen in the narrative: some crime will occur and Sherlock will solve the mystery, most likely with Watson’s help. *Doctor Who* is also a similar case where we can reasonably guess that the narrative of most episodes will feature some kind of time-traveling. In these cases, even though there is no direct continuation of the storyline between two books or episodes, the presence of the character or the setting, like the post-apocalyptic setting of *Fallout*, itself provides some sense of continuity for the narrative.

4.4 Mereological issues

Our straw man definition insists on the definition of series as a “group” formed by “individual units” related to each other. The definition leaves us to think that series are indeed characterized by their part/whole relationships. In the library world, a hierarchical or multilevel description is “a form of presentation of descriptive data based on the division of descriptive information into two or more levels. The first level contains information pertaining to the re-

source as a whole. The second and subsequent levels contain information relating to individual parts of the resources” (RSC 2015). Newspapers illustrate this idea of series as a compound object. Newspaper series can be both modeled as a hierarchy where the volumes, issues, and articles form a tree structure of the same or similar types of objects. A comparable situation is available in the music domain where a series of concerts is composed of individual concerts. The individual works performed can be envisioned as parts of the individual concerts. These hierarchies require the definition of horizontal and vertical relationships between the different levels within the tree. Vertical relationships often express a part-whole relationship between the composing parts while horizontal relationships sometimes order the parts into a sequence. It is important to note that hierarchy trees that are composed of entities of the same or related type might not necessarily be ordered.

One might think that hierarchical series should present multi-level relationships but looking at the various examples, it seems that the relationships occur mostly horizontally and at the same level, e.g., “parts” of the newspaper series are published sequentially across time. The relationships between the units composing the whole are more important than the relation to the whole itself. Multiple levels of hierarchical relationships occur in those few cases when a uniform title can substitute as the representation of the whole. Among periodicals, for instance, there might be a relationship between the title and the series and then between the components of the series. The sequencing or succession information seems to be the element that characterizes series rather than any multi-level hierarchy.

4.5 Order

Order plays an important role in the concept of “series.” As we can see from the evidence, sometimes order is asserted through a natural force, like the passage of time as in the case of a time series dataset or a longitudinal study dataset. Sometimes order is asserted through the effects of practice as is the case of a periodical journal or a newspaper. And sometimes order is not asserted but is rather a natural feature of coherent communication practices, as in narratives.

It is this final kind of order that provides one strong contradiction to our straw man bibliographic definition for “series.” A basic requirement of narratives is that they be coherent and one indispensable part of coherence is ordered hierarchical structure. For text-based bibliographic resources like books and other text-based documents, this hierarchical structure can be generally modeled using the Ordered Hierarchy of Content Objects (OHCO) model (DeRose et al. 1990).

Under the OHCO model, documents are modeled as discrete chunks of content that are arranged in a hierarchy. Thus, the content of a book can be modeled as a simple tree of content nodes having the book node as their root. Beneath the book node might be section nodes, which branch into chapter nodes, which branch into their own section nodes, and so on. This model can allow an extremely fine-grained picture of the document to emerge simply through the creation of a hierarchy that delves as deep as sentence nodes (or even phrases or words). It can also be applied to create a coarsely-grained picture by situating the “series” as the root node and the individual members of the series as the next layer of nodes in the hierarchy.

The use of the OHCO model is not without weaknesses. Unlike other uses of OHCO to model documents, the order of the content objects in a series can be rearranged into new configurations. (Indeed, some series are written in a sequence that moves back and forth across their chronological order.) One example of this phenomenon is the *Shannara Series* by author Terry Brooks (and other examples include Ben Bova’s *Grand Tour Series* and Anne McCaffrey’s *Dragonriders of Pern Series*). Set in a post-apocalyptic future filled with elves and magic, the *Shannara Series* is a series of fantasy novels that collectively follow the exploits of a particular family lineage through twenty-eight novels (and several short stories and graphic novels) and that spans several millennia.

While the story only follows particular characters across trilogies (or occasionally single novels, pairs of novels, or quartets), an overarching narrative describing the battle between good and evil emerges from the collective whole. The question for readers is whether or not the series’ story should be told linearly through time (i.e., in the chronological order of events within the story’s setting) or whether they should be told non-linearly through time (i.e., in the chronological order in which the books were published). From the reader’s perspective this can make a sizable difference in the overall nature of the story: is it one large history or is it a narrative that moves back and forth through time?

From the cataloger’s perspective, this distinction implies that there may be a difference in the works (i.e., that the chronological-arrangement of the *Shannara* series may be a different work than the publication-cycle-arrangement of the *Shannara* series). Of course, the fact that we have used the term “arrangement” in a manner that is easily separated from that of “series” provides a clue that whatever a “series” is, it is the kind of thing that, while sequential relationships obtain between its member objects, the precise ordering of the overall sequence (i.e., the particular values of those sequential relationships) can vary according to the reader’s preferences.

If we choose to conform to the OHCO model, then each ordering (i.e., each “arrangement”) is a different work. However, the proposed straw man definition only says that some sequential relationships must obtain among the series’ members. It is too coarsely grained to capture the particular values of sequences. It may be sufficient for use to identify a series like the *Shannara* series but is insufficiently equipped to distinguish among various arrangements of the members of that series where no prior form of enumeration or arrangement exists.

5.0 Conclusion and future work

Based on our discussion we propose a more robust definition of series that can address the particular issues identified:

Series =_{df} a group of bibliographic entities whose members are intentionally related to one another through one or more kinds of sequential relationships (e.g., temporal, narrative, or enumerated) and shared mereonymic traits (e.g., narrative elements, title parts, etc.)

From the examples, we can see that the true nature of “series” as a thing is much more complex than the relatively simple evidentiary markers that bibliographic traditions use to define it. Links through publisher-mandated enumeration or continued narrative are too simplistic to adequately capture all of the finer details. One of the challenges to the current accepted approach is that it frequently fails to capture cases where the publisher has intentionally created a series but has not bothered to enumerate its parts. One example of this phenomenon is the *Tales* series, discussed earlier.

Another challenge is the parthood relationship. The enumeration prevalent in many series and serialized publications, such as newspapers and journals, strongly indicates that series are multipart entities whose parts exist in some fashion of ordered relationship to one another; however, there are challenges both regarding the nature of the multipart entity itself and with regards to when and where precise instances of ordered relationships like “hasSequel” obtain. A similar challenge is that the nature of these sequential relationships (i.e., temporal, narrative, or enumerated) is fundamentally different, and in order to establish a model that truly works for representing these types of materials, a deeper investigation of the different types of serials is warranted which may result in more than one model.

In the case of newspapers and journals, the containment question we posed raises doubts about whether or not they exist at the same abstract level as a work, or whether they are just containers for multiple smaller works.

Similarly, the fact that different orderings (e.g., published order versus chronological order) exist for many series of novels and similar media also challenges our traditional sense that a series is something with a singular, canonical order.

The emergence of ever more substantial added-on content in the form of fan-fiction, fan-made mods, and downloadable content (DLC) expands an already complex landscape, rich with factors like crossovers and multimedia series. Traditional approaches in bibliographic metadata practice are ill-equipped to even admit that such things are a series in and of themselves. The temptation exists for a traditional cataloger to see a multimedia series like *.back//* as a brand rather than the sweeping cross-medium narrative that it is. The boundaries between concepts like brand, franchise, and series are being steadily eroded as it becomes easier and easier for consumers to directly engage with content and extend it in multiple dimensions.

Current approaches for providing bibliographic metadata describing series lack the fine-grained details that are truly helpful to end users who search for particular series in part or in whole. More steps need to be taken to identify when a serialized publication is acting as a container for works rather than a work in and of itself. The notion of order and how its variation impacts content needs to be better understood; after all, while Terry Brooks' *Shannara* series reads one way when experienced in the order in which it was published; it is a completely different informational experience when read chronologically. But is the difference a sufficient indicator that the reader is experiencing two different works? Such issues remain open questions for us.

Ultimately, there is a need for the library and information science discipline to more closely engage with the question of "what is a series?" One potential alternative to the straw man definition provided earlier is that series are a kind of aggregation, like a collection (CIDOC 2011). Unlike a collection though, where membership in the collection object is itself the primary feature of the collection (Wickett et al., 2011), it is the sequential relationships that obtain among the aggregation's members rather than the members themselves that are the primary feature of the aggregation.

Our future work will explore this question more fully by examining the essential nature of sequential relationships themselves. Among the issues to be explored is the consideration of whether or not all sequential relationships are time linear. The enumeration case would seem to indicate that it is possible that they are not, but the fact that dates figure so prominently in publishing and the assertion of copyrights argue that it may be the case after all. A further exploration of the intersection of brands, franchises, and series will also be undertaken in the future with special attention to how user-created content, like

fan-fiction, and extra content, like DLC, figures into the conversation.

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