JLIS.it
Italian Journal of Library and Information Science
Rivista italiana di biblioteconomia, archivistica e scienza dell'informazione

The Making of RDA

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Introduction

The initial release of *RDA: Resource Description and Access* through the *RDA Toolkit* in 2010 marked the culmination of an intensive period of development that had been formally launched five years earlier. The decisions taken at the April 2005 meeting of the Joint Steering Committee for Revision of AACR2 (JSCAACR) signalled a major shift in strategic focus for an initiative that at the outset had been centered on the somewhat more limited objective of producing a new edition of the *Anglo-American Cataloguing Rules*. Moving forward from 2005, the aim was to develop what would effectively be a new standard for resource description and access responding to an evolving digital environment in which both the production and dissemination of information resources and the technologies used to create, store, and access data describing those resources were being transformed.

Constituency responses to the draft of the first part of what was to have been that new edition of the *Anglo-American Cataloguing Rules* (dubbed AACR3), released for comment at the end of 2004, were generally supportive of the objectives and principles that had been established for the new edition, but expressed dissatisfaction with the way the rules had been organized

JLIS.it Vol. 7, n. 2 (May 2016)
DOI: 10.4403/jlis.it-11706

(JSCAACR 2005). As a necessary first step in accommodating the description of newly emerging forms of digital resources, that first draft of AACR3 Part I had effectively deconstructed the class of materials and type of publication categorizations around which Part I of AACR2 had been organized, and replaced them with a new organizational structure that essentially followed a plug-and-play model, allowing relevant aspects of content, carrier, and mode of issuance to be described independently on an as required basis for the description of any particular resource. Given that the new structure represented a major departure from AACR2, it is perhaps not surprising that it attracted a great deal of attention in the constituency review of the 2004 draft. Added to that was the fact that relatively little of the detail in the AACR2 rules had been revised in this first draft, which lead some to view it as little more than a repackaging of AACR2 and to question whether it would meet the expectations that had been set for the new edition.

The other dominant thread that emerged from the constituency responses to the 2004 draft was a call for alignment with metadata standards being used in other resource description communities, particularly those that were designed to operate in an online environment (JSCAACR 2005). It was largely this second thread in the responses to the 2004 draft that prompted the strategic refocusing of the development effort.

Following extensive discussion of the constituency responses at the April 2005 meeting of the Joint Steering Committee, the broad outline of a refocused development plan was incorporated into a revised version of the strategic plan that had originally been developed in 2002, centred on what at that time had been envisioned as a new edition of AACR. In the revised strategic plan for RDA the end product was envisioned as a "new standard

for resource description and access, designed for the digital world" (JSCRDA, "Strategic Plan," 2007). The shift in strategic focus was reflected in three key elements of the revised plan that would effectively set the course for development of the new standard: (1) more direct alignment of RDA with the structure, concepts, and terminology of the FRBR and FRAD models; (2) descriptions that would be readily adaptable to newly emerging database structures; and (3) an effective level of alignment with metadata standards used in other resource description communities (JSCRDA, "Strategic Plan," 2007). As a counterpoint to those three elements, there was one proviso in the strategic plan that would act as a significant constraint: the descriptions and access points produced by applying RDA instructions were to be compatible with those in existing databases that had been produced using AACR2 (JSCRDA, "Strategic Plan," 2007).

The interplay between the commitments in the strategic plan to alignment with new conceptual models, emerging database structures, and metadata developments in allied communities, on the one hand, and compatibility with AACR2 legacy databases on the other, would have a major impact both on the development process for the new standard and on the content of the end product.

Structuring RDA as a Resource Description Language

Developing RDA as a new standard entailed resolving structural issues of two distinct, and sometimes competing, kinds. First, there was the matter of developing a structure for RDA as a resource description language – addressing issues relating to its underlying ontology and semantics. Second, there was the

challenge of organizing RDA as a working tool – aligning it with practices and workflows involved in resource description. As a resource description language, RDA was being developed to operate within an evolving technological environment, and as such would need to be compatible with the structural requirements of that environment. As a working tool, as well as for training purposes, RDA was being designed to be "easy and efficient to use" (JSCRDA, "Strategic Plan," 2007).

With respect to structuring RDA as a resource description language, the key determinant was the decision taken at the April 2005 meeting of the Joint Steering Committee to align the new standard more directly with the conceptual models developed by the International Federation of Library Associations and Institutions (IFLA) that addressed functional requirements for bibliographic records (IFLA-FRBR 1998) and for authority data (IFLA-FRANAR 2009). Those two models, in combination, provided the underlying ontology for RDA as a resource description language – isolating and defining the key entities to be described and the entity attributes and relationships to be reflected in the description. As work progressed on developing RDA, the extent and details of the alignment of the new standard with the two IFLA models were documented in greater precision in a statement on the scope and structure of RDA (JSCRDA, "RDA Scope and Structure," 2009), and in mappings from RDA to FRBR and to FRAD (JSCRDA, "RDA-FRBR Mapping," 2009; JSCRDA, "RDA-FRAD Mapping," 2009).

Those mappings of RDA to FRBR and FRAD attest to the high degree of direct (i.e., one-to-one) alignment between the elements defined in RDA and the entity attributes and relationships defined in FRBR and FRAD. There were, however, a limited number of cases where the design of RDA as a fully developed

content standard required the scope of an attribute or relationship delineated in the FRBR or FRAD conceptual model to be refined or extended. There were also a few instances where a single RDA element (e.g., the element defined for the extent of a resource containing notated music) concatenated two FRBR attributes associated with different entities (e.g., extent of the expression and extent of the carrier). Much more frequent were instances where RDA defined an element (e.g., for content-specific or media-specific characteristics of a resource) for which no corresponding attribute or relationship had been defined in FRBR or FRAD.

The alignment with the FRBR and FRAD models was also instrumental in addressing the commitment made in the revised strategic plan that RDA descriptions would be readily adaptable to newly emerging database structures. A set of database implementation scenarios (JSCRDA, "RDA Database Implementation Scenarios," 2007), prepared by the RDA editor, illustrated how the RDA element set could be mapped to various types of database structures. The diagram for the first of those scenarios showed the RDA elements mapped to a relational or object-oriented database structure, where each element was stored in a record representing the FRBR or FRAD entity with which the element was associated, with links between those records reflecting the relationships between the entities. In other words, the database structure directly mirrored the FRBR and FRAD conceptual models, and the RDA elements were aligned cleanly with that structure. The other two scenarios presented in that document served to illustrate how the RDA elements could be mapped to legacy database structures holding AACR2 data in separate bibliographic and authority files aligned with the MARC record structure. Those scenarios, in turn, addressed the countervailing commitment in the RDA strategic plan to maintain

compatibility with existing databases containing records produced using AACR2.

As the work on aligning RDA more closely with the FRBR and FRAD models proceeded, another dimension to the structuring of RDA as a resource description language arose from the commitment in the revised strategic plan to engage with other resource description communities in "an effort to attain effective levels of alignment between RDA and the metadata standards used in those communities" (JSCRDA, "Strategic Plan," 2007). As follow-up to a meeting with representatives of the Dublin Core Metadata Initiative (DCMI) and the World Wide Web Consortium (W3C), in April 2007, a joint DCMI/RDA Task Group was set up to develop an open registry of the RDA element set and value vocabularies, using W3C specifications for encoding schemas in conformance with the Resource Description Framework (RDF) and the Simple Knowledge Organization System (SKOS). As input to that work, the RDA editor prepared an analysis of the RDA element set (JSCRDA, "RDA Element Analysis," 2009). In addition to serving as input to the development of the RDA registry, by documenting the alignment of the RDA element set with the DCMI Abstract Model the analysis served to ensure that the element set met the requirements of well-formed metadata. As such, the analysis served to complement the alignment of RDA with the FRBR and FRAD conceptual models as a means of validating the structure of RDA as a resource description language. Registering the RDA element set in conformance with RDF and SKOS specifications would also pave the way for the use of RDA data in the emerging Semantic Web environment.

Organizing RDA as a Working Tool

Alignment with the FRBR and FRAD models also played an important part in organizing RDA for use both as a working tool and for training purposes. Devising a solution to structuring the new standard as a working tool, however, proved to be somewhat more problematic than structuring RDA as a resource description language.

The rules for description in Part I of AACR2 had been organized around the formal areas of description set out in the *ISBD(G): General International Standard Bibliographic Description* (1977). The rules for the construction of headings, uniform titles, and references in Part II had been organized largely around the order of elements within those constructs, roughly paralleling the elements in the *Guidelines for Authority Records and References* (2001). In effect, then, it was the form in which the data created using the AACR2 rules were to be presented that served as the primary organizing principle for the rule book itself. Organizing the guidelines and instructions in RDA in a similar way was not an option. In adopting the new approach to be taken in developing RDA, the Joint Steering Committee had decided that in the new standard "instructions for recording data [would] be presented independently of guidelines for data presentation" (JSCAACR 2005). That would not necessarily impede the continued application of the syntactic structures that had been used to standardize the presentation of descriptive and authority data within the library community, but it would facilitate the use of RDA data by other resource description communities – as well as the re-purposing of the data by those within the library community itself – using different syntactic structures. In that respect, the separation of instructions for recording data from the guidelines for data presentation served to further the strategic

goal of producing a standard that would be amenable to adaptation by other communities (JSCRDA, "Strategic Plan," 2007). However, the separation of instructions for recording data from the guidelines for data presentation did effectively preclude the possibility of using syntactic structures for data presentation (such as ISBD(G) and GARR) for purposes of organizing RDA as a working tool.

The way forward to finding a viable means of organizing RDA as a working tool began to emerge in the first draft of what at the time was designated as Part I of RDA (RDA 2005). The scope of that part of the new standard roughly paralleled the scope of Part I of AACR2, that is, the description of the resource (or the "item in hand" – to use AACR2 terminology). As such, the RDA elements involved were primarily those associated with the FRBR entity *manifestation*, and to a lesser extent, the FRBR *item*, but there were as well a few elements associated with the entities *work* and *expression*. The instructions in that draft were not aligned strictly with the FRBR entities, but rather were organized around three of the user tasks supported by the data elements, as defined in the FRBR model: *identify*, *select*, and *obtain* (IFLA-FRBR 1998, 82). In effect, the function of the RDA elements vis-à-vis fulfilment of user tasks replaced the formal areas of description standardized by the ISBD(G) that had been used to organize Part I of AACR2. For that first draft of RDA Part I at least, function had superseded form as an organizing principle.

At the broader level of organizing RDA as a whole, the initial plan was to continue with the high-level structure that had been outlined in 2004 for the new edition of AACR. RDA was to be divided into three parts: Part I would cover description; Part II would cover the choice of access points; and Part III would cover the form of access points. Essentially, the proposed structure

mirrored that of AACR2, the rationale for which had been that it followed the sequence of cataloguers' operations: describing the item in hand, then determining and establishing the headings under which the description would be entered in the catalogue. However, after the initial draft of RDA Part I was issued at the end of 2005, it became apparent that basing its parameters on those of AACR2 Part I was problematic with respect to alignment with the FRBR model, primarily because the AACR2 distinction between description and access points blurred the lines between entity attributes and entity relationships in the FRBR model.

After reviewing the constituency comments on the draft of RDA Part I at the April 2006 meeting of the Joint Steering Committee, a decision was made to realign the overall structure of RDA by combining what had been planned as Parts I and II into a single part (to be designated as Part A) covering both description and the choice of access points (JSCAACR 2006). The form of access points would be covered in a separate part, as originally planned, but now to be designated as Part B. The rationale for the shift to the new structure – over and above the need to address the artificial split in the handling of FRBR relationships – was that the proposed two-part structure, essentially paralleling the established division between bibliographic records and authority records in library practice, would also serve to align RDA more closely with practice in other resource description communities (JSCAACR 2006).

The plan to restructure RDA into Parts A and B, however, was never fully realized. A first draft of the chapters on the choice of access points to be incorporated into Part A was distributed for constituency review in June 2006, and by September the RDA editor had produced a draft of Part B for review by the Joint

Steering Committee. Discussion of those drafts stretched out over the October 2006 and April 2007 meetings, and into the October 2007 meeting, but by the time the discussions were concluded the Joint Steering Committee had decided to take yet another tack on the overall organization of RDA. The new – and final – plan was to organize RDA into ten sections, the first four to cover recording attributes of the FRBR and FRAD entities, and the last six to cover recording relationships between those entities. In retrospect, the plan to align RDA with the division between bibliographic records (covered by Part A) and authority records (covered by Part B) was seen to be too closely oriented toward database structures that had been in place for decades, while the strategic focus of RDA was oriented toward emerging database structures. Organizing the standard around the division between attributes and relationships—paralleling the structure of entity-relationship and object-oriented databases—was seen to be more forward looking. The new plan would also serve to align RDA more directly with the FRBR and FRAD models, not only as a resource description language but as a working and training tool as well (JSCRDA, "A New Organization for RDA," 2007).

Within the new two-part structure for RDA, each section would cover a specific set of entities, and each chapter within a section would focus on a specific user task in relation to one or more of those entities. The order in which the entities were covered followed, in general, the order in which they were presented in the FRBR and FRAD models, but the ordering of the FRBR Group 1 entities was altered slightly, so that the attributes of *manifestation* and *item* were dealt with first (in Section 1), followed by the attributes of *work* and *expression* (in Section 2). The rationale behind that ordering was that it reflected the typical workflow involved in resource description, in which the attributes of the more concrete entities (*manifestation* and *item*) would be

recorded before proceeding to the more abstract entities (*work* and *expression*). Within each section, the focus on a specific user task in each chapter served to emphasise function over form, again in an effort to facilitate the use of RDA as a working tool in a wider range of contexts. The ordering of sections within each of the two major divisions of the overall structure, and the ordering of chapters within each section were also intended to parallel, in broad outline, increasing levels of adding value through the resource description process, moving from the relatively straightforward identification of the resource as an object, through a more in-depth description of its content, to an articulation of its relationships with other entities.

Refining Guidelines and Instructions for Recording RDA Data

To a large extent, the guidelines and instructions for recording RDA data were based on corresponding rules in AACR2. However, as the new standard was being developed, those guidelines and instructions were subject to significant refinement, driven both by the goal of improving precision and consistency, and by the strategic aim of attaining an effective level of alignment with metadata standards used in other resource description communities.

The analysis of the RDA element set (JSCRDA, "RDA Element Analysis," 2009) – in addition to its use in structuring RDA as a resource description language – played a key part in the refinement of RDA guidelines and instructions vis-à-vis the improved alignment of the new standard with metadata practices in the broader resource description community. By categorizing each RDA element, element sub-type, and sub-element according to its generic attribute type (i.e., *label*, *quality*, *quantity*, *type*, or *role*),

as defined in the <*indecs*> *Metadata Framework* (Rust and Bide 2000, 16-18), the analysis provided a means of assessing the generic form that would be most appropriate for recording its data value. The mapping of RDA elements to the type of value surrogate (i.e., *literal* or *non-literal*) and the type of value string (i.e., *plain* or *typed*), as defined in the *DCMI Abstract Model* (Powell et al. 2007), served the further purpose of specifying more precisely the type of data value required. The identification of the syntax encoding scheme or vocabulary encoding scheme used to record an applicable RDA element served to support interoperability between RDA and other metadata schema.

The RDA element analysis can also be viewed as a sort of index of the measures that were taken to achieve an increased level of compatibility between RDA as a metadata content standard and data recording practices in other resource description communities. For example, guidelines for recording elements associated with the entities *manifestation* and *item* that correspond to the <in*d*ecs> generic attribute type *label* and are recorded as *literal* value surrogates – elements used to record titles, statements of responsibility, publication statements, etc. – were reworked to be more flexible than their counterpart rules in AACR2 with respect to transcription, accommodating a wide range of practices relating to capitalization, punctuation, abbreviations, etc. In contrast to the loosening of guidelines for recording certain types of labels, instructions for elements corresponding to the generic attribute type *quantity* – those used to record extent, dimensions, playing speed, etc. – were tightened, where necessary, to ensure that they conformed to a specified syntax, in order to facilitate interoperability with related elements in other metadata schema. Similarly, instructions for elements corresponding to the generic attribute type *quality* – those used to record base material, applied material, polarity, etc. – were reviewed to ensure that they

incorporated appropriate value vocabularies, again to facilitate interoperability.

Developing vocabularies for the RDA elements corresponding to the generic attribute type defined in the <in*d*ecs> framework as *type* – i.e., "a categorization of one or more characteristics of an entity through which it belongs to a group of entities" (Rust and Bide 2000, 17) – proved to be somewhat more complex. The AACR2 antecedents to the RDA elements used to categorize content, media, and carrier by type were the General Material Designation (GMD) and the Specific Material Designation (SMD). An initial attempt to address anomalies in the way AACR2 categorized resources had been made in the first draft of AACR3 Part I, through the explicit separation of rules pertaining to aspects of content from those pertaining to aspects of the carrier. Shortly after the development of RDA had been initiated in 2005, the Joint Steering Committee established a GMD/SMD Working Group to identify and provide definitions for terms to indicate type and form of content and type and form of carrier. Concurrently, the Joint Steering Committee began discussions with representatives of the publishing industry in the United Kingdom, who were grappling with similar issues in the work they were doing on the ONIX metadata standard. As a follow-up to those discussions, a joint initiative was launched that resulted in the release of the *RDA/ONIX Framework for Resource Categorization* (2006). Based on the lists of terms proposed by the GMD/SMD Working Group, modified to align them with the RDA/ONIX framework, the RDA editor produced a draft set of instructions and terms for three new RDA elements for categorizing resources by content, media, and carrier (*RDA Categorization of Content and Carrier* 2006). The vocabularies that were produced as a result of the collaborative effort between the developers of RDA and of ONIX served not only to provide

solutions to complex metadata issues faced by both groups, but also to produce a key tool to support metadata interoperability.

The development of instructions for RDA elements corresponding to the generic attribute type defined in the <in*d*ecs> framework as *role* – i.e., "a part played or function fulfilled by an entity in relation to another entity or entities" (Rust and Bide 2000, 17) – involved complexities of a different kind. The alignment of the RDA element set with the FRBR and FRAD models had resulted in several sets of relationship elements being defined in RDA: one set to reflect the primary relationships defined in FRBR to express the inherent relationships between a *work*, its *expression*, its *manifestation*, and an *item*; another set to reflect relationships between the Group 1 (*work*, *expression*, *manifestation*, and *item*) and Group 2 (*person*, *family*, and *corporate body*) entities in the FRBR and FRAD models; a third set to reflect relationships between different instances of the Group 1 entities (*work*-to-*work*, etc.); and a fourth set to reflect relationships between different instances of the Group 2 entities (*person*-to-*person*, etc.). The guidelines and instructions for recording those relationship elements were developed somewhat differently for each set. For the primary relationships (the relationship between a *work* and an *expression* of the work, etc.), three options were provided: (1) recording an identifier for the related entity; (2) recording an authorized access point representing the related *work* or *expression*; or (3) combining elements identifying the *work* and/or *expression* with the description of the *manifestation*. For relationships between Group 1 and Group 2 entities (*work*-to-*person*, etc.), two options were provided: (1) recording an identifier for the related *person*, *family*, or *corporate body*; or (2) recording an authorized access point representing that related entity. For relationships between different instances of the Group 1 entities (*work*-to-*work*, etc.),

three options were provided: (1) recording an identifier for the related entity; (2) recording an authorized access point representing the related *work* or *expression*; or (3) recording a description – either structured or unstructured – of the related entity. For relationships between different instances of the Group 2 entities (*person*-to-*person*, etc.), two options were provided: (1) recording an identifier for the related *person*, *family*, or *corporate body*; or (2) recording an authorized access point representing that related entity.

The complex sets of options for recording the various relationship elements in RDA were the direct result of the need to accommodate conventions used in all three types of database structures that had been outlined in the RDA database implementation scenarios (JSCRDA 2007). For a fully developed scenario 1 implementation – in a relational or object-oriented database – all relationships would be recorded using an actionable identifier for the related entity (e.g., a record control number, a standard identifier such as an ISBN, or a URI). In a scenario 2 implementation – with linked bibliographic and authority files – actionable identifiers, in the form of record control numbers, would be required to support the links between bibliographic records and authority records. However, scenario 2 implementations would also require authorized access points to be recorded in authority records to support the display of access points in bibliographic records. In addition, scenario 2 implementations would use the composite record technique to reflect the primary relationships among the Group 1 entities, as well as embedded descriptions for related works, etc. In a scenario 3 implementation – using unlinked flat files – identifiers would be superfluous; the composite record technique would be used to reflect primary relationships; and all other relationships would be recorded using either authorized access points encoded

directly in the bibliographic record or embedded descriptions of related works, etc. It is important to note, however, that all of those conventions are dealt with in RDA as options for recording data within a relationship element, not as elements in their own right. That is, RDA as a resource description language is consistent in its handling of all relationships through defined relationship elements, all of which were designed to support fully developed scenario 1 implementations, and by extension, the use of RDA data in an open linked data or Semantic Web environment. The corollary is that the articulation of the various options for recording those relationships served to provide an implicit mapping of AACR2 conventions to the RDA element structure – mapping that could be used to facilitate the migration of legacy data from scenario 2 and 3 database structures to a scenario 1 database.

Ongoing Development of RDA

The initial release of RDA in 2010 did not, of course, mark the end of its development. Following a brief hiatus, the Joint Steering Committee resumed its work on issues that had been deferred pending the initial release, reviewing proposals for additions and changes, and continuing to liaise with representatives of other resource description communities. Those post-2010 developments lie outside the scope of this article, but there are three aspects of the ongoing development of RDA directly linked to strategic initiatives discussed earlier in the article that merit noting by way of conclusion.

The first relates to the alignment of RDA with the FRBR and FRAD conceptual models. It is important to note that when that work was first begun in 2005, the FRAD model itself was still under development, and a third model centred on functional

requirements for subject authority data was just at the initial stage of development (IFLA-FRSAR 2011). Since 2011, the IFLA FRBR Review Group has been working toward a consolidation of the three models, and a world-wide review of the consolidated model is scheduled for early in 2016. Judging from the broad outlines of the consolidated model that were presented at the IFLA World Library and Information Congress in 2015 (Riva and Žumer), the consolidated model could have significant implications for the ongoing development of the RDA element set, particularly with respect to the subject entities that had been mapped into the RDA element set as placeholders (*concept*, *object*, and *event*), as well as the partially developed entity *place*. There could also be implications for the RDA entity *family*. Maintaining the direct alignment of RDA with the IFLA model could pose some challenges.

The second ongoing development linked to strategic initiatives discussed earlier relates to the collaboration with the DCMI community to develop an open registry of the RDA element set and vocabularies. That work is continuing, and reached an important milestone in 2014 with the publication of the RDA elements, relationship designators, and value vocabularies in the *RDA Registry*. A significant feature of the registry is that it includes an overlay of "unconstrained" elements that parallel the RDA elements but are detached from the entities in the underlying FRBR and FRAD models. That effectively allows other resource description communities to make use of a "dumb-down" version of the RDA element set in application profiles that are not based on the FRBR and FRAD models. As such, it represents a furthering of the strategic commitment to an effective level of alignment with metadata standards used in other resource description communities.

The third ongoing development of strategic significance is the work being undertaken currently to extend and refine RDA elements used to categorize resources in line with the RDA/ONIX Framework. In 2014, the Joint Steering Committee established an RDA/ONIX Framework Working Group to review the application of the RDA/ONIX Framework in RDA and to make recommendations for the development of RDA in the area of resource categorization (JSCRDA 2014). In addition, the working group was tasked with developing a proposal for registering the RDA/ONIX Framework elements and vocabularies, and the results of that effort have now been published as part of the RDA Registry. The registration of the RDA/ONIX elements and vocabularies is a significant step forward in facilitating the use of the framework by other resource description communities. Perhaps even more importantly the registration of those elements and vocabularies has the potential to serve as a hub through which Web applications will be able to map category data from one metadata schema to their equivalent in another schema, thereby supporting semantic interoperability.

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ABSTRACT: The author revisits the development of RDA from its inception in 2005 through to its initial release in 2010. The development effort is set in the context of an evolving digital environment that was transforming both the production and dissemination of information resources and the technologies used to create, store, and access data describing those resources. The author examines the interplay between strategic commitments to align RDA with new conceptual models, emerging database structures, and metadata developments in allied communities, on the one hand, and compatibility with AACR2 legacy databases on the other. Aspects of the development effort examined include the structuring of RDA as a resource description language, organizing the new standard as a working tool, and refining guidelines and instructions for recording RDA data.

KEYWORDS: RDA; resource description; entity-relationship models; metadata element sets; metadata content standards.

Date submitted: 2016-01-31

Date accepted: 2016-02-16

Date published: 2016-05-15