ONTOLOGY FOR MEDIA CREATION

PART 3: ASSETS

VERSION 2.5

Motion Picture Laboratories

May 10, 2024

Contents

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1 Introduction

What is an asset? It was originally an Anglo-Norman legal term for a sufficient estate,[1] applicable to the discharge of debts and legacies. Over time, it took on the broader meaning of property in general, especially property that could be converted to money; this meaning is still used on accounting and finance. From there, it progressed to mean generally something valuable, and by extension, something useful.

When the creative industries meet information technology, there are two common meanings. Asset has a similar meaning in cybersecurity: "anything that has value to an organization, including […] computing device, information technology (IT) system,"[2] which is not the meaning this Ontology covers.[3]

The second use is generally much fuzzier, though intuitively understood, and encompasses media and other digital artifacts used in the creative process, whether it be advertising, movies, or political campaigns. There is an entire industry built around Media Asset Management and Digital Asset Management to cover this. MAMs and DAMs deal with digital assets, such as images, videos, sound files, and some documents. More specialized ones manage the components used for computer-based animation and effects work.

However, managing a software-defined workflow requires managing physical assets as well as digital ones. The production of a filmed Creative Work has physical components, such as printed scripts and props used on set, and even a fully computer-generated Creative Work can have physical components, such as hand-drawn sketches and storyboards.

The following sections cover some of the general concepts that must be addressed when defining a general notion of Asset for the production ontology.

1.1 Scope

What, out of all the things used in a production, is an Asset? Certainly, video and audio, props, computer graphics data, and various sorts of documents (scripts, notes) and images (digital photographs, sketches on napkins.) But what about the computer on which the VFX process runs? The animation and accounting software? The bus that the crew takes from one location to another? The lights and cameras? While certainly assets in the accounting sense, they could also be considered infrastructure.

The dividing line is murky, and, as discussed in the *Ontology Overview*, we have to choose wisely. Therefore, the ontology draws a distinction between Assets, which are used in the production of a *particular* Creative Work, and Infrastructure, which covers the underlying systems and framework used for productions *in general,* but which are not tied to a particular Creative Work.

[1] From Latin *ad satis* "to enough" or "to a sufficiency."

[2] NIST Special Publication 800-160

[3] To paraphrase Obi-Wan Kenobi, these aren't the assets we're looking for.

1.2 Physical and Digital

Captured images and sound are Assets, and Creative Works use Assets in Depictions of narrative elements and for producing Concepts for the narrative elements.[4] Creative Works can use a combination of digital and physical Assets for all of these. Even in a production process filled with special effects and computer-generated magic, real, physical assets still have their place.

At one end of the spectrum, in *Casablanca*, Rick puts stolen letters of transit inside a physical piano, and in *Indiana Jones and the Last Crusade* the hero chooses between two physical cups – one gold, one clay – where the effects were mostly traditional, with some digital Assets resulting from digital processing of footage of physical props.[5] Moving forward, in *Indiana Jones and the Crystal Skull*, many of the effects were done with a mix of physical and digital Assets.[6] The trend is also apparent as the "cast of thousands" from epics such as *Ben-Hur* (both the 1925 and 1959 tellings) is replaced, in whole or in part, by CG Assets in films such as *Gladiator* and *The Lord of the Rings* trilogy.

What people loosely refer to as "digital assets" are really just information (or "data"). Sometimes this information is best thought of as something more specific – video or audio, for instance – but independent of any specific properties, digital Assets have a few things in common: they are just a set of binary data; they remain the same no matter where they are actually stored – the cloud, a local PC, a USB stick, or a camera mag; and they don't change when they are copied. They are to be distinguished from analog assets, which: tend to encode waveforms rather than bits; are tied to a particular storage device – a vinyl disk or magnetic tape; and copying analog data usually results in some degradation.

To cover all this, our definition of Asset has to cover real, tangible things, and things that exist only as data. Some things, of course, may exist in both physical and digital form. In *Harry Potter and the Philosopher's Stone* there is a physical Golden Snitch[7] that is handled by the actor, and a digital version used for various special effects sequences. Both of these Assets depict the same Narrative Prop[8] but they are different Assets.

1.3 Structural and Functional

Assets have structural characteristics (e.g., "it is an image") and functional characteristics (e.g., "it is a VFX Plate" or "it is concept art"). We represent the first with a Structural Class, and the second with a Functional Class. The two are often independent of each other, and when combined provide full information about the Asset.

For instance, a printed copy of a Script and a PDF of the same text are in some ways functionally the same – they both have the same information, provide the same input for script breakdown, and so on. However, they are structurally different, and therefore the two are managed and used differently. A physical script will live in a filing cabinet or briefcase, and may have a physical asset tag; some cast and

[4] See *Context Ontology* for formal definitions of Depiction, Concept, and Narrative.
[5] https://www.ilm.com/vfx/indiana-jones-and-the-last-crusade/
[6] https://www.hollywoodreporter.com/business/business-news/indiana-jones-digital-fx-112647/
[7] https://en.wikipedia.org/wiki/Quidditch
[8] See Context Ontology for Depiction and Narrative Prop.

crew prefer using a paper script to a digital one. A PDF of the Script lives in a digital document storage system and is the appropriate script to deliver to someone who uses a tablet or other connected device. In this case, there is one instance of a functional class (the script with all its metadata, including its version), and multiple structural classes (one for the printed script, or even each copy, and one for the PDF).

It works the other way too. The same image can be used in multiple ways – as input for the art and costume departments, or as the source of a texture or material for computer graphics work. In this case, there is one structural image, included in different assets for different departments, with different functional characteristics.

Props provide another example. For a magic sword, the Functional Class might have a name ("Excalibur" or "Hrunting," for instance), a description, and relationships to the Scene(s) in which it appears. The sword exists in two forms – the physical sword and a digital CG model of the sword.

1.4 Appropriate Granularity

As with many other elements of the Ontology, the principle of appropriate granularity applies to Assets. This means that an Asset can be made up of other Assets, or broken down into components, each of which is also an Asset. For example, in the digital world a full representation of an Asset can be composed out of multiple pieces, each of which can be managed as a separate Asset if required to support a particular workflow or narrative concept. The ontology refers to these as Asset Groups.

For example, in the *Avengers* movies, the six individual Infinity Stones are used as separate assets, but are also brought together in the Infinity Gauntlet, which is itself an Asset. In the physical world, two items can be treated as separate Assets and together as a single Asset, e.g., the Sorting Hat and the sword of Gryffindor in *Harry Potter and the Chamber of Secrets*, which occur both separately and together. At a more technical level, sometimes a software-defined workflow needs to treat all the components of a CG model – meshes, materials, textures, etc. – as a single Asset, but other parts of the workflow need to consider all the components separately.

1.5 Relationships

Also, like other elements of the Ontology, individual Assets can be connected to other things. Assets can have formal Relationships to Tasks, e.g., as inputs and outputs; to other Assets, e.g., a piece of concept art for a character or prop is related to the eventual CG character or physical prop;[9] or even to less obvious things, such as a reference photograph used when constructing a set at a production location. In a very common case, the video captured by a digital camera is an Asset and the camera metadata is another Asset, which then has a relationship to the captured images. Many Assets are used to depict or portray Narrative Elements (see ***Part 2: Context***.)

As another sort of connection, some Assets, such as a Production Set or a Production Prop, can be included as components of a Production Context.

[9] This is expressed using a Concept, as defined in ***Part 2: Context Ontology***.

1.6 Notational Conventions

In documents generally:

- The definition of a term included in the Dictionary is in bold, followed by the definition, e.g., **Creative Work:** A uniquely identified production.
- When a defined term is used in the text of a document, it is capitalized, for example in "The Production Scene is usually derived from a numbered scene in the Script," Production Scene and Script are defined in the Ontology. (Note, a word that is part of defined term may sometimes be capitalized by itself as a shorthand, e.g., "Scene" may be used to indicate "Narrative or Production Scene.")
- References to other Ontology Documents are in ***bold italic***, e.g., ***Part 3: Assets*** or ***Part 3A: Camera Metadata***

For Sample Attributes in the concept documents:

- If a data field or attribute is formally defined in this ontology or a connected ontology, it is italicized, e.g., *Setup* as an attribute refers to a defined concept.
- Attribute […] indicates an attribute can appear more than once, e.g., *Identifier* […]
- →Thing means that an attribute is expressed as a relationship to a Thing, e.g., →*Script*
- A combination of the two indicates that the concept can have relationships to a set of things, e.g., →Components […]
- Many elements of the Ontology have a Context element. (See **Part 2: Context**.) Relationships declared in the Context are implied to have the item to which the Context is attached as their starting point. For example, Narrative Location→Context→Narrative Scene

  For clarity, contextual relationships that are especially important to the concept being defined are given in the sample attributes tables as C→target or C→target […] as appropriate, for example Narrative Location→Narrative Scene

  Some implementations (e.g. RDF) place these relationships directly on the class as well as allowing them in Context, and others (e.g. JSON) place all relationship in a Context.

2 Concepts and Terms

2.1 Asset

Assets are the things that a Creative Work is made from. Storyboards, camera footage, props, and 3D models are all examples of Assets.

Asset: A physical or digital object or collection of objects specific to the creation of a Creative Work.

Assets have one or both of a Structural Class and a Functional Class. The Structural Class describes the underlying nature of an Asset, independent of its use. For example, an image is always an image (its Structural Class), whether it is used as concept art, reference art, or a texture for computer graphics. The Functional Class describes how an Asset is used in the production process. A Script is always a Script (its Functional Class), but its Structural Class might be a physical document or a digital document.[10] The Ontology uses this pattern, rather than directly creating subclasses of Asset, in order to support a large and evolving set of different structural asset types and their uses in an additive rather than multiplicative way.

An Asset can be composed of other Assets – see *Asset Group* below.

Sample Attributes for Asset

Term	Definition
Identifier […]	One or more identifiers for the Asset. At least one of these should be resolvable within the production environment.
Name	The name of the Asset.
Description	A description of the Asset.
→ *Asset Structural Characteristics*	An instance of an Asset Structural Class (see below).
→ *Asset Functional Characteristics*	An instance of an Asset Functional Class (see below).
→ *Asset Group*	A set of Assets that, taken together, make up this Asset. See below.
Custom Data	Anything that is application or workflow dependent that can't be otherwise expressed in the Ontology or needs to be present in a particular format.
→ *Context* […]	Any Context for the Asset. See ***Part 2: Context***

[10] "Digital document" is shorthand for "the digital output of a piece of software."

Notes:

This structure describes a completely generic, embryonic Asset.

An implementation may keep the structural and functional characteristics of an Asset as completely separate entities, each with identifiers and so on, as in an RDF implementation. However, in some models, such as JSON, it is easier to keep the Functional Characteristics tightly coupled to the Asset. In the latter, the Asset and its Functional Characteristics can be thought of as "metadata" to be managed by some system. It is important to keep the Structural Characteristics as separate entities though - they represent the "essence" of the Asset's media, and the ability to separate an Asset's metadata from its essence is an important part of the MovieLabs 2030 Vision. It is also necessary when keeping track of Versions (**see Part 3B: Versions**.)

2.1.1 Asset Structural Class

Asset Structural Class: Describes the form of an Asset along with the attributes specific to that asset's form.

Film and television production have been moving for some time from the physical world to the digital world, but many Assets are still physical – cars, props an actor holds, and printed scripts, for example. Some Assets that were once physical (sound and video, for example) are now mostly "digital," which really means that they are just data. Data can be captured, recorded, or created in a completely digital form, as is the case for the output of a digital camera, but can also be captured in a more physical way, such as physical photographs or reels of film, which is traditionally called "analog." The Ontology separates things that are physical (including analog data, which is bound to its recording medium) and things that are digital.

An instance of Asset Structural Class defines the structural characteristics of an Asset.

Physical Asset: A physical asset is one where the tangible reality of the Asset is its defining feature.

Physical Assets include anything that can be touched or handled,[11] including things used to store digital data but excluding the data itself, for example a USB stick.

Analog Asset: The combination of the information represented by captured analog data and the medium on which it is recorded.

Analog Assets store analog signals directly on the recording medium, ranging from Edison's tinfoil cylinders to modern vinyl records (which store the information by physically changing the shape of the recording medium), and from wire recorders to magnetic tape and videocassettes (which store the information by magnetizing the medium).

[11] In the words of Rocky and Janet, "Touch-a-Touch-a-Touch-a-Touch Me," though in a less specific sense.

Analog Assets are a special case of Physical Assets. The data is generally tightly coupled with the medium on which it is recorded; capture and playback are done as a continuous waveform; copying an Analog Asset often results in some degradation of quality from the original source.

Analog Assets can be represented either with an attribute (as here) on or a subclass of Physical Asset.

Sample Attributes for Physical Asset

Term	**Definition**
Identifier […]	One or more identifiers for the Asset. At least one of these should be resolvable within the production environment.
Name	A name for the Asset.
Description	A description of the Asset.
isAnalog	True if the Asset is an Analog Asset.
Custom Data	Anything that is application or workflow dependent that can't be otherwise expressed in the Ontology or needs to be present in a particular format.
→ *Context*	Any Context for this Asset.

Notes:

Identifiers for Physical Assets are often carried on bar codes or with RFID.

See ***Part 9: Utilities*** for notes on using filenames – many Assets appear in a file system without the benefit of Identifiers – and the use of the word "file" in OMC.

Digital Asset: Information that exists as digital data.

Digital Assets have a looser coupling to the media on which it is stored. Digital Assets can be innately digital (e.g., a spreadsheet or JSON metadata) or the result of quantizing an analog or real-world source (e.g., digitally recorded audio or video.)

For most Digital Assets the physical nature of the medium on which they are stored is not important. Finding and retrieving digital data from the cloud – or any connected storage system – is an important problem, but it has little bearing on the Ontology and data structures. Rather, it is the purview of systems for querying for (based on attributes and properties of Assets) and for retrieving (based on identifiers and resolution mechanisms) Assets.

However, there are some special cases where the actual physical storage of a Digital Asset is important.[12] For instance, the day's takes may still be on the camera mag, in which case getting that data requires knowing where the camera mag is – once the data is in the cloud the mag doesn't matter,

[12] This is generally the case if the storage device is not connected to or accessible through a network, and it is generally not the case of the storage is network-connected.

even though the data is the same. Similarly, there are tape formats for digital data (e.g., DAT for audio) and knowing that a particular Digital Asset is on a particular tape can be important, especially for archival systems.

Sample Attributes for Digital Asset

Attribute	Description
Identifier […]	One or more identifiers for the Asset. At least one of these should be resolvable within the production environment.
Name	A name for the Asset.
Description	A description of the Asset.
->*File Details*	Optional. See ***Part 9: Utilities***
→ Carrier	For Digital Assets where the physical storage matters, this is usually a piece of Infrastructure, since it can be used across multiple productions. Common infrastructure (for example a USB storage device or a Camera Mag from a common pool) should be represented as Infrastructure for this purpose. See ***Part 8: Infrastucture***
Custom Data	Anything that is application or workflow dependent that can't be otherwise expressed in the Ontology or needs to be present in a particular format.
→ *Context*	Any Context for this Asset.

Notes:

The Digital Asset structural characteristics class is analogous to the concept of "essence" in many digital media standards: it is the set of bits that is viewable, playable, etc., independent of any metadata that goes with it.

File Details has two purposes*:*

- It can be used for Digital Assets that do not have a resolvable identifier, such as an asset management system that provides "bring your own storage" for asset essence. See ***Part 9: Utilities*** for a fuller discussion.
- It tracks file type and file extension, which can also be used by applications that are not file-based to know what application(s) can be used with the Asset.

Details for particular types of Digital Assets are found in the various type-specific OMC documents.

2.1.2 Asset Functional Class

Asset Functional Class: Describes the use or purpose of an Asset within the production process.

The functional class describes how the Asset is used, and often how the Asset is thought of within the production. Thinking of video files as dailies or an image as a VFX plate is more natural and useful to the participants in the production.

The attributes of a Functional Class are a mix of descriptive metadata and relationships to other things in the production, both of which depend on the particular Functional Class. A Script, for example, will have its version and relationships to the Scenes, Narrative Locations, and Characters it defines. See Asset Functional Classes below for things defined in other parts of the Ontology that are Asset Functional Classes.

Sample Attributes for Asset Functional Class

Attribute	**Description**
Identifier […]	One or more identifiers for the Asset. At least one of these should be resolvable within the production environment.
Name	
Description	
Custom Data	Anything that is application or workflow dependent that can't be otherwise expressed in the Ontology or needs to be present in a particular format.
→ Context […]	Context related to this Asset Functional Characteristic

Notes:

> If an implementation keeps the Asset Functional Characteristics tightly coupled to the Asset itself as discussed above under Asset, the Functional Characteristics do not have an Identifier and any needed Structured Data and Context information should go in the equivalent fields in the Asset.

2.2 Asset Group

Assets can be composed of other Assets, which in turn can be further comprised of other Assets. Asset Groups cover both composition and decomposition. The fact that an Asset is an Asset Group may not be known when the Asset is created; any Asset can be made into an Asset Group by adding an Asset Group element to it.

For decomposition, consider a 3D model of a Production Prop. It has geometry, textures, materials, and so on. The components can be made by different specialists, and managed separately in terms of approvals, asset management systems, and so on. And as they're ready they can be added to the Asset group in the Production Prop.

For composition in the digital realm, a space station is boring without lots of tanks, cables, antennae, and gadgets on its exterior. The basic geometry can be dressed up with items from a library of pre-

defined greebles.[13] The geometry asset is composed from its basic geometry and the external accoutrements, each of which may have different sources, rather than being decomposed. Street scenes and battlefields can be built the same way – lampposts and shell craters get reused.

In the physical world, Set Dressing is a good example of an Asset Group. Each individual element is an Asset, and can be purchased, on loan, or taken from a Prop warehouse, and will have different tracking and budgetary needs. However, on set, the important thing is that all the Set Dressing is there, so different parts of the production team can deal with the very different questions of "Is the Set Dressing ready?" and "Have the right pieces been returned to the prop library?"

Asset Group: Information about an Asset made out of other Assets, where the assemblage is treated as a single unit.

Sample Attributes for Asset Group

Attribute	Description
isOrdered	Indicates whether the order of the components matters or not. The actual mechanism for ordering is implementation dependent.
→ Components […]	The Assets that make up the Composite Asset.

Notes

In computer graphics, USD[14] layers work for both composition and decomposition. Some processes may want to track individual USD layers, and others may just care about the final composed USD scene.

See below under Digital Moving Image for applying this mechanism to OCF data.

2.3 Asset Structural Classes

This section defines some useful Asset Structural Classes. These are all subtypes of Asset Structural Class. Individual Structural Classes can be subclassed for a particular format, e.g., JPEG for Digital Image or MPEG-2, ProRes for Digital Audiovisual, and various formats for CG data, and will be added as separate documents, e.g., ***Part 3A: Camera Metadata*** or ***Part 3F: Images***.

2.3.1 Streams

"Stream" can mean three things in the production process:

- A way of acquiring data, which is then stored. In this case, "stream" is the acquisition method for the data, not part of its Structural Characteristics. Making note of this is not currently supported in OMC, but it can be put in an Asset's Custom Data field.

[13] https://en.wikipedia.org/wiki/Greeble

[14] Universal Scene Description (USD). https://graphics.pixar.com/usd/docs/Introduction-to-USD.html

- A way of delivering data. An Asset can be the source of data delivered over a stream. Making note of this is not currently supported in OMC, but it can be put in an Asset's Custom Data field.
- A streaming data source that is used in real time, but not stored. OMC will add this in a future release. In many cases, the result of processing the stream can be stored as an Asset. A streaming data source can also be described with a Procedural Asset.

2.3.2 Uses of Physical Asset

The most basic Physical Asset, as defined above, represents tangible, "real" things[15], for example, a sword or a volleyball.

Notes:

This can be represented by a subclass that requires isAnalog to be false.

Implementations that need to differentiate various kinds of Physical Assets, such as Cars and Boats, can create subclasses of Physical Asset.

2.3.3 Digital Data

This covers any digital data not otherwise covered in this document or other sections of the Ontology,

Digital Data: An Asset composed of digital data.

Notes:

This is used when a more detailed structural class has been defined, e.g. the Asset is a digital image. It is also used for Assets that are 'just data', such as Camera Metadata.

This is not intended to cover abstract intellectual property, e.g., Characters and Narrative Props.

2.3.4 Image

Image: A two-dimensional visual representation.

Productions use both digital and physical images. People often think of Images simply as "pictures."

Physical Image: An Image represented on physical media such as paper.

Example: a film negative print, or hand drawing.

Notes:

Represented as a combination of Physical Asset and Image.

Digital Image: An Image stored digitally with values representing color and transparency.

Example: An image captured with a digital camera or a digitized photograph

[15] We do not attempt to define "real." See Plato, Plotinus, Aquinas, Hume, Kant, and many others if you really want to.

Notes:

Most multi-channel image formats (e.g., OpenEXR) are standard Digital Images. If the individual channels are extracted and managed separately, they can be part of an Asset Group element, but this is not expected to be the usual case.

Represented as a combination of Digital Asset and Image.

See ***Part 3F: Images*** for more details.

2.3.5 Moving Image

This is what the production process is about, in the end.

Moving Image: A temporally ordered sequence of images.

Analog Moving Image: A temporally ordered sequence of Physical Images.

Example: 35mm film.

Notes:

Represented as a combination of Analog Asset and Moving Image

Digital Moving Image: A temporally ordered sequence of Digital Images.

Example: An MPEG file without Audio.

Notes:

Represented as a combination of Digital Asset and Moving Image.

The individual images are often packaged together, and individual images may not be separately accessible without playing though some preceding images first.

Use an Image Sequence for ordered lists of individual frames, e.g., for OCF or VFX Image Sequences.

Common formats include a mix of codecs and packaging structures; those details are covered in the more detailed type specifications.

2.3.6 Image Sequence

Image Sequence: A temporally ordered sequence of individual images which are the constituent parts of a Moving Image.

This is a special case (subclass) of Moving Image, in which each frame is an individual Image that can be accessed without reference to any preceding frame. These moving images are explicitly ordered lists of individual frames, e.g., OCF, and some parts of the workflow, particularly, VFX, need individual frames.

In general, an individual frame of an Image Sequence may be worked on separately from all the other frames, but it is never used except as part of the Image Sequence.[16]

If needed, the individual Images can also be made into separately managed Assets and collected into an Asset Group.

Sample Attributes for Moving Image

Attribute	Description
-> *Images* […]	An ordered list or array of Images

2.3.7 Audio

Audio: A representation of sound.

Analog Audio: Sound stored as a continuous waveform.

Example: 16-track audio tape or a vinyl record.

Notes:

Represented by a combination of Audio and Analog Asset.

Digital Audio: Sound stored as a set of digital values.

Example: An AIFF or WAV file.

Notes:

Represented by a combination of Audio and Analog Asset.

See ***Part 3C: Audio*** for more details

2.3.8 Audiovisual

Audiovisual: A Moving Image with Audio synchronized to the images.

Analog Audiovisual: An Analog Moving Image with synchronized Analog Audio.

Example: "…glorious Technicolor/Breathtaking Cinemascope and stereophonic sound."[17]

Notes:

Represented by a combination of Audiovisual and Analog Asset

Digital Audiovisual: A temporally ordered sequence of Digital Images with synchronized Digital Audio.

[16] An individual frame can be extracted from the Image Sequence and used for other purposes, such as for a poster or other artwork, but then it takes on a new life outside of the Image Sequence.

[17] Cole Porter, *Silk Stockings* (in which Peter Lorre dances, and which also observed "You know what prestige means?" "Yeah, pictures that don't make money.")

Example: An MPEG file with Audio.

Notes:

Represented by a combination of Audiovisual and Digital Asset.

2.3.9 Document

The production process uses lots and lots of documents – Scripts, notes, and many more.[18]

Document: A human readable object containing text and/or images.

Physical Document: A Document that can be viewed without an electronic device.

Example: A printed script or a book.

Notes:

Represented by a combination of Document and Physical Asset

Digital Document*:* A Document that requires an electronic device to make it readable by a human.

Example: A PDF file.

Notes:

Represented by a combination of Digital Asset and Document

2.3.10 Structured Document

Some documents are completely free form, but many documents have some underlying structure that makes it easier for humans or computers to understand them. The structure may be very tightly defined, or be a set of well-understood conventions.

Structured Document: A Document structured according to a set of rules which are used to parse or understand the document.

Physical Structured Document: A Structured Document that can be viewed without an electronic device.

Example: A telephone book or a printed script.

Notes:

Represented by a combination of Structured Document and Physical Asset

A Script is an example of semi-formally structured document; conventions vary across the industry and between countries, but in general, scripts are structured.

[18] Not all are of equal value, and maybe not all of them become Assets. “Some…are to be tasted, others to be swallowed, and some few to be chewed and digested.” – Francis Bacon, *Essays* (1625) “Of Studies”

Digital Structured Document: A Structured Document that requires an electronic device to make it readable by a human.

Example: A spreadsheet or digital script.

Notes:

Represented by a combination of Digital Asset and Structured Document

There is a grey area between Digital (Structured) Document and Digital Data. For example, an XML file can be thought of as a Digital Structured Document, but can also be thought of as Digital Data. A spreadsheet can be a Digital Document, a Digital Structured Document, or Digital Data. In these cases, the intended use of the Asset is a good differentiating factor. For example, an xslx spreadsheet is probably intended to be used by people, and so is a document, but a CSV file is probably for a machine consumption, and so is more likely to be data. JSON and YAML files should be though of as data, rather than documents. However, it is up to individual workflow to decide how to manage this, ideally with clarity and consistency within the workflow.

2.3.11 Procedural Assets

Some Assets do not exist independently of the means used to generate them. We call these Procedural Assets. Procedural Assets are usually produced by a piece of software (which may be a Service in the sense used in this Ontology), but could also be generated by, for example, real-time sampling from a source.

Procedural assets are common in computer graphics work, where they are used for rigging, animation paths, environmental features, models of terrain, and so on., e.g., a fractal noise generator for producing a height map for a mountain range. They can be used in other circumstances, for example drones with programmed flight paths to display corgis in the sky, or to generate visual effects algorithmically.

An Asset that has independent existence once it is generated is not a Procedural Asset.

Procedural Asset: An Asset that produces data that does not persist outside of its immediate use.

Sample Attributes for Procedural Asset

Attribute	Description
Identifier […]	One or more identifiers for the Asset. At least one of these should be resolvable within the production environment.
Name	A name for the Asset.
Description	A description of the Asset.
Custom Data	Anything that is application or workflow dependent that can't be otherwise expressed in the Ontology or needs to be present in a particular format.

Attribute	Description
→ *Context*	Any Context for this Asset.

Notes:

OMC does not define any standard properties for Procedural Assets beyond the usual base fields. Procedural Assets are highly variable, and information to a particular Asset or workflow should be included in the Custom Data field.

Some streaming data sources (e.g. a data stream from a Camera pointed at a lava lamp to produce random numbers[19]) can be thought of as Procedural Assets.

Assets that are produced by Procedural Assets and retained are not Procedural Assets.

Procedural Assets are often included in Compositions.

2.4 Asset Functional Classes

The fact that something is an Asset Functional Class is generally less interesting than what the functional class itself means and represents. For that reason, Functional Classes are defined where their underlying concepts fit best.

This section lists important combinations of those Functional Classes with various Structural Classes. Structural Classes followed by an asterisk are superclasses that will eventually be subclassed into more domain-specific things.

These sections are organized by the document in which the Functional Class is defined and will expand as the Ontology grows.

NOTE: This section is up to date as of OMC 2.1. OMC 2.5 Functional Classes will be added in a future version of this for easy reference; they are of course covered in the various parts of OMC that define them, e.g. ***Part 3D: CG Assets***.

2.4.1 Asset Functional Classes in Contexts

These Asset Functional Classes are defined in ***Part 2: Context***.

Asset Functional Characteristics	Asset Structural Characteristics	Notes
Script	Physical Structured Document	A paper script.
Script	Digital Structured Document	A digital script, e.g., a PDF.

[19] See https://www.lavarand.org/what/index.html, https://en.wikipedia.org/wiki/Lavarand and https://patents.google.com/patent/US5732138 as well as various commercial offerings.

Asset Functional Characteristics	Asset Structural Characteristics	Notes
Production Prop	Physical Asset	A snow globe.[20]
Production Prop	Digital Asset (eventually subclassed into some CG-specific Structural Classes)	A CG model of a snow globe.[21]
Set Dressing	Physical Asset, optionally with an Asset Group – see above.	Pictures hanging on the wall of a set.
Set Dressing	Digital Asset optionally with an Asset Group – see above.	Pictures as seen on the wall of a 3D model of room.
Costume	Physical Asset, optionally with an Asset Group if individual pieces sometimes have to be managed separately	A blue and white checked gingham pinafore and cream blouse (ruby slippers optional.)
Greenery	Physical Asset, optionally with an Asset Group	A single flower, or a set of potted ferns
Greenery	Digital Asset, usually with a CG-specific subclass	As above, but rendered wth computer graphics
Vehicle	Physical Asset	Chitty Chitty Bang Bang
Vehicle	Digital Asset	
Production Hair	Physical Asset	A wig
Production Hair	Digital Asset	CG assets used to render oddly windblown-hair in VFX
Production Makeup	Physical Asset	This may be an Asset managed by the production, but is more likely to be thought of as Infrastructure or a consumable[22].
Production Makeup	Digital Asset	CG assets used to render looks that would be done by makeup in a physical setting.
Production Prosthetic	Physical Asset	A physical fake nose
Production Prosthetic	Digital Asset	A digital fake nose, e.g. for use with a stunt actor

[20] The most famous one is probably in the opening scene of *Citizen Kane.*
[21] More common than one might expect, see for example, *Coraline*, *Knick Knack,* and *The Santa Clause.*
[22] Consumables will be added to the Ontology in a future release.

Asset Functional Characteristics	Asset Structural Characteristics	Notes
Production Set	Physical Asset	The Tenth Doctor's Tardis
Concept Art	Digital or Physical Image	
Storyboard	Physical Image, usually with an Asset Group for the individual Images	A series of drawings of a plane chasing a man through a cornfield.
Storyboard	Digital Image, usually with an Asset Group for the individual Images	
Animated Storyboard	Image Sequence	
Creative Reference Material	Digital or Physical Image	These will tend to be Images, but there is no reason for them not to be Moving Images or even Physical Assets. See the Context document for examples.
Technical Reference Material	Digital or Physical Image	A picture of how the light falls on the Production Location for a particular Take
Technical Reference Material	Digital Data	Data representing the settings of on-set lights.
Capture	Digital Moving Image	The Asset Structural Characteristics depend on the output of the device doing the capture.
Capture	Image Sequence	
Capture	Digital Audio	
Capture	Digital Audiovisual	
Capture	Digital Data	LIDAR, for example
Shot	Digital Moving Image	This works for all the subclasses of Shot.
Shot	Image Sequence	This works for all the subclasses of Shot.
Shot	Image	For example, if a single image is used as a placeholder when building a sequence.
VFX Image Sequence	Image Sequence	The individual images/frames can themselves be Assets and

Asset Functional Characteristics	Asset Structural Characteristics	Notes
		included in an Asset Group, if the workflow requires it.
Sequence Chronology Descriptor	Digital Structured Document	An EDL file, which is essentially human readable
Sequence Chronology Descriptor	Digital Data	An OTIO file, which is not really human-intelligible.

2.4.2 Defined in Part 3A: Camera Metadata

Asset Functional Class	Asset Structural Class	Notes
Camera Metadata	Digital Data	
Lens Metadata	Digital Data	
Recorder Metadata	Digital Data	

Notes:

These Assets can exist without referencing the Structural Characteristics if the original digital data from the device is not present. This can happen when the information is constructed by hand – rather than being extracted from the device - during or after the capture. This also allows sending the information even if the underlying “essence” is not available.

2.4.3 Defined in Part 8: Infrastructure

Asset Functional Class	Asset Structural Class	Notes
Camera	Physical Asset	
Lens	Physical Asset	
Recorder	Physical Asset	
Mag	Physical Asset	

Appendix A External Definitions

These are terms defined elsewhere in the Production Ontology, included here for ease of reference.

Media Creation Context: Informs scope within the construction process of a Creative Work.

See Part 2: Context

Asset: A physical or digital object or collection of objects specific to the creation of the Creative Work.

See **Part 3: Assets**

Camera Metadata: Capture-specific details and information about the Camera itself.

See **Part 3A: Camera Metadata**

Participant: The entities (people, organizations, or services) that are responsible for the production of the Creative Work.

See **Part 4: Participants**

Task: A piece of work to be done and completed as a step in the production process.

See **Part 5: Tasks**

Creative Work: A uniquely identified production.

See **Part 6: Creative Works**

Relationship: Describes and defines the connections between elements of the Ontology, such as Assets, Tasks, Participants, and Contexts.

See **Part 7: Relationships**

Infrastructure: The underlying systems and framework required for the production of the Creative Work; it is generally not specific to a particular Creative Work.

See **Part 8: Infrastructure**

Utilities: Common data models and data structures used in multiple places and in multiple ways in a larger system.

See **Part 9: Utilities**

Identifier: An identifier uniquely identifies an entity within a particular scope.

See **Part 9: Utilities**