The Printer Working Group

Semantic Model Workgroup

August 24, 2016

Camus, Washington

Daniel Manchala (Xerox)

SM Meeting Agenda

When	What
1:30-1:45	Administrivia, Introduction, Agenda
1:45-2:00	Project Status and Activities
2:00- 3:15	3D Printing Modeling Efforts
3:15-3:30	Break
3:30 -3:45	SM 2 Approach
3:45- 4:15	SM 2 Issues
4:15- 4:30	SM3
4:30- 5:00	Next Steps and Action Items

Administrivia

- Welcome
- Confirm Minutes Taker
- Policy on Non-disclosure of Proprietary Information
- Semantic Model Workgroup Officers
  - Chair: Daniel Manchala (Xerox)
  - Vice-Chair: Paul Tykodi (TCS)
  - Secretary: Bill Wagner (TIC)
  - Document Editors:
    - Daniel Manchala (Xerox) – SM2, SM3 Schema
    - Paul Tykodi (TCS) – Example of PWG 3D Print Job Ticket
    - Ira McDonald (High North) – JDFMAP (awaiting prototype)
    - Rick Yardumian (Canon) – JDFMAP (awaiting prototype)
- Acceptance of Previous Meetings Minutes
  - **ftp://ftp.pwg.org/pub/pwg/sm3/minutes/SMWG-sm3-Minutes-20160808.pdf**

- The current Semantic Model workgroup is the latest in a series of PWG workgroups documenting and maintaining the Hard Copy Imaging System model.

- This model defines the semantic elements that constitute the imaging services and subunits of a network connected Imaging System, and the actions that operate on the objects and elements of the model, independent of a specific protocol or network environment.

- By the current workgroup charter, the primary function of the workgroup is to keep the model updated with additions and changes developed by other PWG workgroups, to make the model documentation accessible without the need for special software, and to provided for the review and approval of model updates by the PWG membership.

Project Status – Current Projects

- Mapping CIP4 JDF to PWG Print Job Ticket v1.0 (JDFMAP)
  - Current draft (ftp://ftp.pwg.org/pub/pwg/sm3/wd/wd-smjdfmap10-20150604.pdf) is at Prototype level, awaiting prototype reports.
  - Soliciting candidates to do prototyping in progress.
- Update and Finalization of Semantic Model 2
  - Produce an updated version of SM2, reflecting corrections and reasonable additions from IPP, but no Cloud or 3D aspects.
  - Finalize and document this version and subject it to an approval process.
  - Little progress made. There are continuing questions which should be resolved with IPP WG help.
- Creation of Semantic Model 3
  - Start afresh with SM3 to reflect updated view of MFD, with addition of Cloud aspects and 3D Print and Scan Services.
  - Although SM3 efforts were nominally to wait until after SM2 is finalized, preliminary work on the 3D Print Service has been started.

- The basic function of the Semantic Model Workgroup, as defined in the current charter, reduces to maintaining a general model consistent with the changes and additions made in the IPP workgroup. This provides for:
  - The elements of the complex IPP structure to be more easily viewed.
  - Considerations of additions and changes with respect to consistency with the overall model and extension to imaging services other than printing.
- The IPP workgroup is proceeding with the IPP 3D extensions specification, which is now in prototype.
  - The PWG is seeking to broaden its outreach, particularly in the area of 3D Printing. Previous outreach efforts sought to communicate the service capability and user intent concepts embedded in IPP by extracting them into a generic Service Capabilities and Job Ticket specification.
  - Incorporating IPP extensions in the Semantic Model is a chartered task of the SM Workgroup. Daniel is currently working on a 3D Print Service model which incorporates the 3D Print attributes from IPP. Although 3D Print is defined as an SM3 effort, to be done after SM2 is updated and approved, there is advantage addressing this before IPP3D is fully approved.

PWG 2D & 3D Printing Job Ticket Efforts

- The PWG/IPP approach to printing is most effectively presented in abstract Print Service Capabilities (PSC), Print Job Ticket (PJT), and Print Job Receipt (PJR)structures.
  - It is desirable to include sample versions of these structures when presenting the PWG Model to other standards bodies. It would be appropriate to include both 2D and 3D samples in the SM web pages.
- Set of 2D Printing Structures
  - Sample Print Job Ticket exists in PWG Print Job Ticket specification section 19. A short narrative describing the intended job features will be added.
  - A sample Print Job Ticket Capabilities exists in Section 20.
  - A Sample Print Job Receipt for the same job can be generated.
- Set of 3D Printing Structures
  - The SM Workgroup has started generating a 3D Print Job Ticket example. This will be supported by:
    - A sample 3D Print Job Description
    - A sample 3D Print Service Capabilities
    - A sample 3D Print Job Receipt.

PJT, PJR, PSC Efforts

- 2D PJT, PJR and PSC
  - Sample Print Job Ticket exists in PWG Print Job Ticket specification section 19
    - A short narrative describing the intended job features would be helpful
  - A sample Print Job Ticket Capabilities exists in Section 20.
  - A Sample Print Job Receipt for the same job can be generated.

    [Review current state of 2D Printing set]

- 3D Printing Job Ticket
  - Sample Job Description
  - Sample Service Capabilities
  - Sample Print Job Ticket
  - Sample Job Receipt
  - The SM Workgroup has started this effort in generating a 3D Print Job Ticket example.

    [Review current state of 3D Printing set]

- Questions and Issues in Examples

3D Print Service Efforts

- Because of the distinct differences between 2D Printing and 3D Printing Elements, 3D Printing in the Semantic Model is represented as a distinct service.

- The IPP 3D Extensions specification provides explicit information on the additional elements needed to support 3D Printing.

- The 3D Print Service Model is created starting with the existing Print Service Model and deleting and adding elements following the information in the IPP 3D Extensions specification.

- Although the 3D Print Service is to be included in SM3, a good first cut can be made at this time when the model can be better coordinated with the IPP 3D Print effort.

[Review current state of the 3D Print Service Model]

Break

Plan for Updating and Finalizing SM2

- The project is to update, stabilize and finalize SM2 as the basic model for an MFD providing one or more imaging services. This model will then be the basis for SM3, which will include Cloud, 3D Printing and the expanded finishing features.

- The approach is to correlate current IPP attributes, as registered in IANA, with Semantic Model elements, adding new elements and deprecating others. Elements specifically for Cloud, 3D Printing and the expanded finishing features will be removed.

- Once syntactical and format errors are corrected, the updated SM2 will be submitted for PWG approval in accord with the PWG Policy for Maintenance and Approval of Schemata.

- A compilation of IANA-registered IPP attributes has been made and potential corresponding element names were generated. (elements-IANA-registry-20160815.xlsx). The task is now to see if these elements (and their values) are in the model and if they are not, to add them in the proper position.

elements-IANA-registry-20160822.xlsx

- Attribute Table
  - Columns B-G are from IANA table
  - Column I is current guess at corresponding major Print Service type in the Semantic Model Major Print Service
  - Column J is current guess at the Model Type containing the Element
  - Column K is the element name
  - Column L is the sub-element name (if any)
  - Column M is the value
  - Column N is the syntax

- Spread Sheet is used for ease of Sorting, Searching, and Linking.

SM2 –Questions in mapping new IPP attributes to the Model

- It was agreed previously that recently IPP deprecated elements would not be removed from the model but would be flagged as deprecated in the description. However the Model includes a "PWGDeprecated.xsd file. How does inclusion in that file reflect into the overall model?

- IPP includes "collection" attributes for some aspects of Jobs and Documents, but has retained the original simple attribute, although in practice, both should not be used. Should the model retain both complex and simple elements or deprecate the simple element?

- It appears that the addition of "collection" attributes to expand the resolution may not have been uniformly implemented in IPP. Should the Model use the collection approach consistently wherever it makes sense?

- IPP uses the term "pages" in some attribute names. Should such attributes map to "impressions" in the model? In some cases this appears to conflict with other existing elements.

IPP to SM2 Mapping Issues –Collection Examples - 1

IPP Attribute	In	SM Element	In	?
'impressions-col'	Document Description	ImpressionsCol	PrintDocumentDescription	1
'job-impressions-col'	JobDescription	ImpressionsCol	PrintJobDescription	1
'job-impressions-completed-col'	Job Status	ImpressionsCompletedCol	PrintJobStatus	1
'impressions-completed-col'	Document Status	ImpressionsCompletedCol	PrintDocumentStatus	1
'media-sheets-col'	Document Description	MediaSheetsCol	PrintDocumentDescription	1,2
'job-media-sheets-col'	JobDescription	MediaSheetsCol	PrintJobDescription	1,2
'media-sheets-completed-col'	Document Status	MediaSheetsCompletedCol	PrintDocumentDescription	1,2
'job-media-sheets-completed-col'	Job Status	MediaSheetsCompletedCol	PrintDocumentStatus	1,2
'pages-col'	Document Description	PagesCol?	PrintDocumentDescription	1,3
'job-pages-col'	Job Description	PagesCol?	PrintJobDescription	1,3
'pages-completed-col'	Document Status	PagesCompletedCol?	PrintDocumentStatus	1,4
'job-pages-completed-col'	Job Status	PagesCompletedCol?	PrintJobStatus	1,4

- Note 1 - When a collection type is added in addition to the simple element, should the simple element be retained; or should there be an "all" subelement (or other rollup value) be added to the collection?

- Note 2 – Since there are collections for media sheets and media sheets completed for Documents and Jobs, should there also be collections for media sheets supported under Printer Description?

- Note 3 - The model does not count pages, but impressions (what are IPP pages? Traditionally within the PWG, pages refer to logical content groupings formatted in the defining file, while impressions refer to passes through the marker.) If the IPP attributes actually refer to impressions, the model already includes a simple Impressions (count).

- Note 4 -
    - Do IPP 'pages-completed-col' and ' job-pages-completed-col' correspond to count elements ImpressionsCompleted and ImpressionsCompletedCurrentCopy in the Model PrintDocumentStatusType and PrintJobStatusType ? And should these model elements be replaced by collections?
    - But IPP has deprecated 'impressions-completed-current-copy' from Job Status but not apparently from Document Status. How does the Model follow this?

- IPP provides a range of integers attribute of 'job-impressions-supported' in the Printer Description. This would appear to refer to support of the job-impressions-competed attribute in Job Status and in Notification?
  - Does it also relate to job-impressions-competed-col in Job Status?
  - Does it also relate to job-pages-completed, job-pages completed-col, job-pages-completed-current-copy? (There is no job-pages-supported attribute.)
  - There are no document-impression attributes, but there are pages attributes related to documents. (pages-completed, pages-completed-current-copy, pages-completed-col.) There is no "document-pages-supported" attribute.
- In reflecting this in the Model, the Model already includes an Impressions (bool) element in PrintDocumentDescriptionCapabilitiesType and the PrintJobDescriptionCapabilitiesType.
  - Assuming the Print Service pages are impressions, are the current Model elements adequate to indicate support of impression counts on both Job and Document levels?

What is the relation to the Model Print Counters

- The ImpressionsCompleted and ImpressionsCompletedCurrentCopy model types already include the element PrintCounters which separate counts of kinds of impressions into Impressions, MonochromeImpressions, BlankImpressions, FullColorImpressions' HighlightColorImpressions, ImpressionsTwoSided, MonochromeImpressionsTwoSided, BlankImpressionsTwoSided, FullColorImpressionsTwoSided, HighlightColorImpressionsTwoSided, and InputKOctets.
- This includes the 'full-color' and 'monochrome' kinds in the IPP 'pages-col' and 'job-pages-col' attributes.
- So, should there be any change to the model at all to reflect the 'pages-completed-col' and ' job-pages-completed-col' additions?
- Are there other places where IPP attributes should more reasonable map to the Model Counters element?

SM3 Approach

- SM3 starts with the SM2 model but would not necessarily maintain backward comparability to SM2, although gratuitous incompatibilities would be avoided. Specific examples of areas of incompatibility are:
  - "Light Services" (EmailIn, EMailOut, FaxIn) will be reclassified as Light services.
  - The System Control Service would be expanded to parallel the IPP System Service.
  - The Resource Service will incorporated into the System Service.
  - Deprecated elements will be removed.
- SM3 will include new features and Services.
  - Notification will be added.
  - The Cloud Model will be incorporated and discrepancies with IPP Infra resolved.
  - The 3D Print Service reflecting IPP 3DPrint will be added.
  - There will be provision for a 3D Scan Service, although details will follow the IPP 3D Scan development.
- Development will follow the Schemata Development Process and Approval will require the full voting process.
- Certain aspects of the model (such as the WSDL or the rigorousness of the XML) may be omitted

Other Issues and Next Steps

- Continuing the Semantic Model effort requires the participation of more PWG members, both for active generation of material and for review. Participation is dependent on:
  - An understanding on the part of both the participant and the supporting company of the value of the semantic model.
  - Presentation of the Semantic Model documentation in a form that is easily understandable, so that participation does not require either special knowledge or software.
- The Semantic Model Workgroup has been posting "browesable" forms of the model and the operations. We need to know if other PWG members find these forms of the documentation usable and sufficient to consider the content.
- Summary of Decisions and Action Items

More Info/How to participate

- ➢ **We welcome more participation from member companies**
- ➢ **Much of the discussion of issues will be on the SM3 mail list. You must subscribe to the list to be able to post to the list. See http://www.pwg.org/mailman/listinfo/sm3 to subscribe.**
- ➢ **The group maintains a Web Page for Semantic Model that includes links to the latest documents, schema and a browse-able version of the schema at http://www.pwg.org/sm3**
- ➢ **Next conference call: September 5, 2016; 12:00 – 1:00 Pacific Time / 3:00 – 4:00 PM Eastern Time.**

Call-in toll-free number (US/Canada): 1-866-469-3239

Call-in toll number (US/Canada): 1-650-429-3300

Call-in toll number (US/Canada): 1-408-856-9570

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