



Boeing Defense, Space & Security

Boeing Company-Wide Business Rules Layer: Customers and ICNs and Tools, Oh My!

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Agenda

What we are going to talk about

Business rules layers background

Making company-wide business rules decisions

Results of company-wide business rules decisions

Making the business rules decisions useful

Tools

Information Control Number (ICN)

Summary

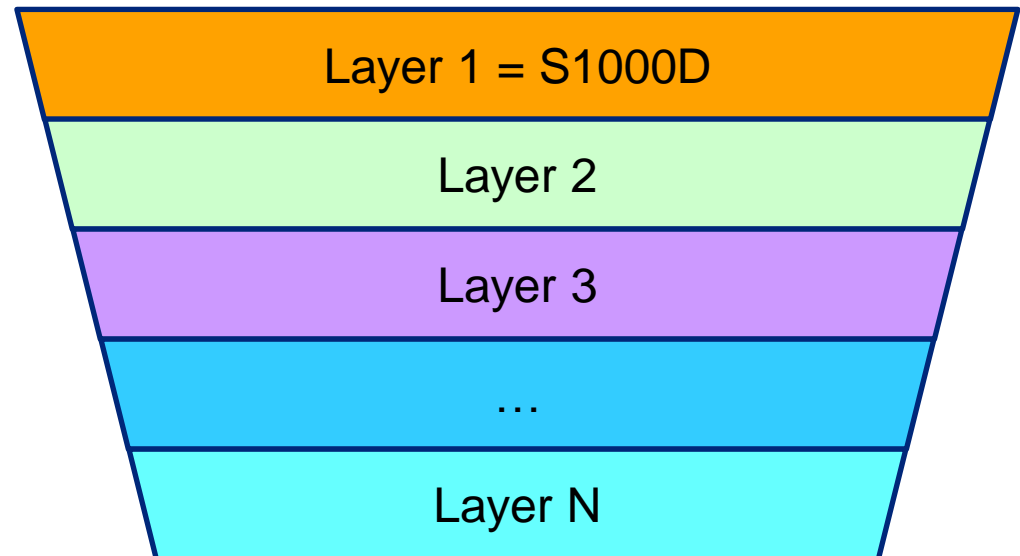
Questions and Discussion

Business Rules Layers

This is what the S1000D Spec says

S1000D Business Rules (BR) layered model (from Chap. 2.5.1)

- Each layer “inheriting”, “extending” and “profiling” the upper layer
- The uppermost layer of the model is always represented by S1000D
- A [layer] inherits all business rules from the upper layer and decides which of the remaining decision points are relevant at their level
- The project or the organization can add or define their own decision point at their layer
- Every available decision point must be considered at each layer

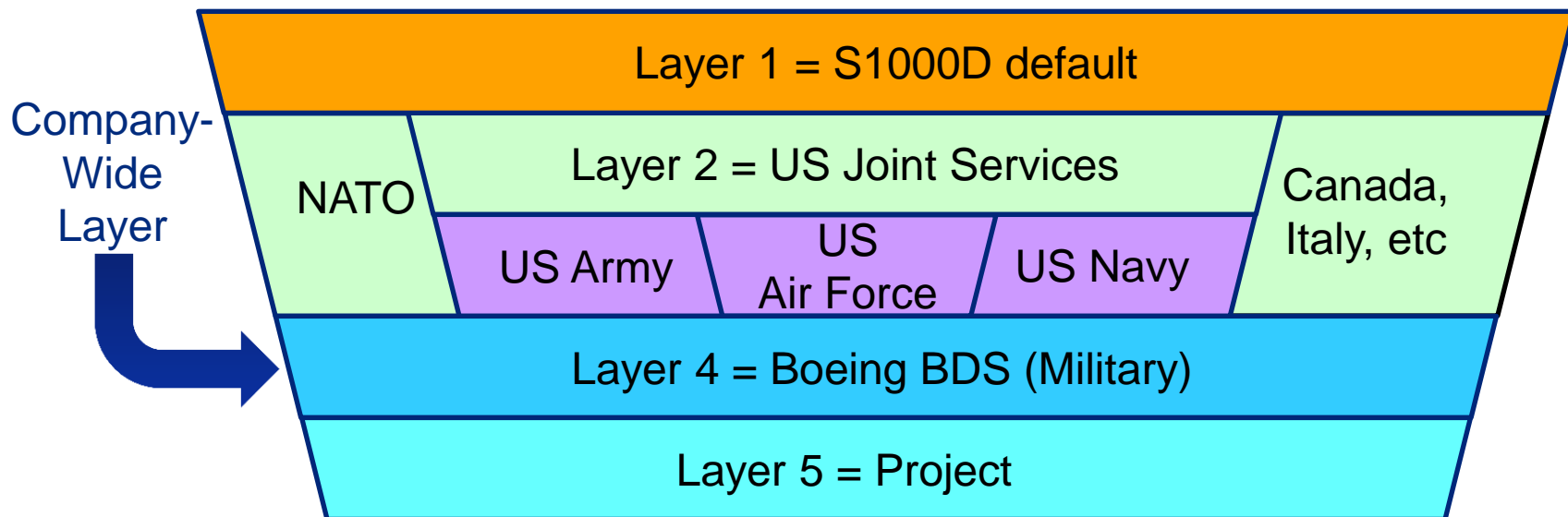


Business Rules Layers – Boeing Company Layer

This is what Boeing BDS is faced with

Boeing faces the following situation with BR layers

- S1000D default at the top
- US Joint Services layer over all Department of Defense (DoD) projects
- Individual US DoD service-specific layer
- Non-US country or organization layer

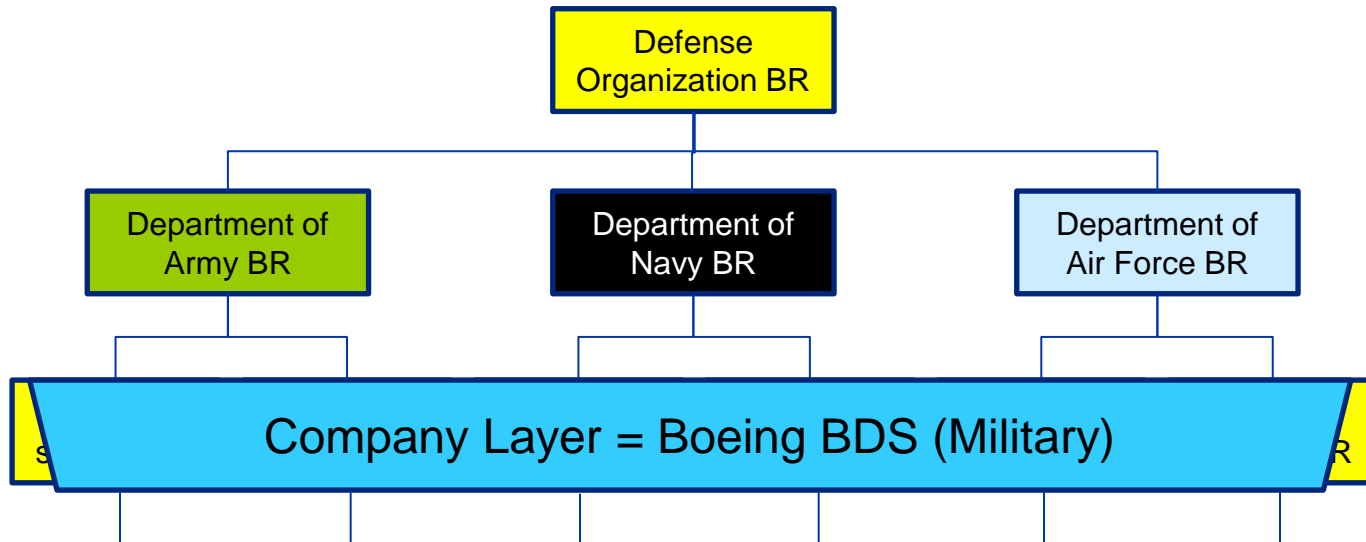


Business Rules Layers

Here is more of what the spec says

Alternate representation ... tree-like structure (from Chap. 2.5.1)

- "branches" representing various "parallel" departments/organizations with their own projects situated at the same level with their "counterparts" but having different "commitments"
- inherit business rules of the upper level and make their own independent decisions



Business Rules Layers

How you validate DMs

A Data Module (DM) must validate against each layer

- A DM must pass validation against every BR layer

Allowed rules/values must be allowed in each layer

- Example of the emphasisType attribute values:

Layer	em01 (bold)	em02 (italic)	em03 (underline)	em04 (overline)	em05 (strikethrough)	em06-em50 (not available)	em51-em99 (configurable)
S1000D							
Joint Services (no guidance)							
USAF (6-007)							
Company							
Allowed							

Making Company-Wide Decisions

Boeing is really big!

Boeing Military's Challenge

- Define and document a set of BR decisions for all Boeing BDS projects
- Be cognizant of and not contradict our various customer BR layers
- Gain consensus between numerous projects across several sites all using different authoring and publication tools
- Provide the decisions and tools to help projects manage BRs



Making Company-Wide Decisions

Gaining consensus is hard

Existing interest group created the decisions

- The task was taken on by an existing grass roots group called the Boeing S1000D Working Group (BSWG)
- The BSWG included technical publications subject matter experts from most of the projects adopting or considering adopting S1000D

Process of creating Boeing BDS Business Rules decisions

- Used the BR decisions from a specific project as a starting point, the project was considered the most mature at the time
- Each decision was evaluated whether it could be standardized across Boeing BDS projects, DoD customers and foreign customers
- Each decision was documented as either a specific Boeing BDS decision or to “follow the specification as written”
- Decisions are documented in MS Word for Issues 2.2, 3.0.1, and 4.0.1

Results of Company-Wide BRs

Is that all there is?

Only 6 Issue 4.0.1 company-wide rules are defined:

- Managing deleted data modules (Chap 3.9.5.1)
- Responsible partner company CAGE code (Chap 3.9.5.1)
- Originator CAGE code (Chap 3.9.5.1)
- Information Control Numbers (Chap 3.9.2.1)
- Subordinate hotspots (Chap 3.9.5.2.1.8)
- XML companion file for illustrations (Chap 3.9.5.2.1.8)

Recommendations are provided on about 10 rules

That leaves around 750 rules on which Boeing BDS is silent

Making the BR Decisions Useful

I want to use this on my project

The MS Word documents were difficult to use in practice

- They are “standalone” and not in context with customer and project rules
- Hard to search
- Provide a lot of guidance and examples copied out of the spec, hard to pick out actual decisions

MS Excel spreadsheets provided a better solution

- One large spreadsheet was created
- Includes the following:
 - S1000D BR
 - Joint Services decision (if any)
 - Individual service decision (if any)
 - Boeing BDS decision (if any)
 - Columns for the project decision

BR Spreadsheet Headers

21 columns and 765 lines makes for a very large spreadsheet

A	B	C	D	E	F	G
S1000D Specification						
Project BR Serial Number	Rule ID	* Project Decision, still required	Chapter	Para	Page	S1000D Project Decisions
	PD-	Open				

H	I	J	K
Joint Services		US Air Force - CAE (October 1, 2010)	
Business Rule Number	Business Rule Decision	Business Rule Number	Business Rule Decision

L	M	P	Q
US Army MIL-STD-3031		Boeing S1000D Business Rules (DMC-BOS-BR-00-00-0000-01001-022G-A)	
Business Rule Number	Business Rule Decision	Business Rule Number	Business Rule Recommendation

R	S	T	U
Project XYZ			
Comply with?	BREX?	Program XYZ Rule Decision	Rule Category/Type

NOTE:
The US Navy Air is
missing, it is being
added

BR Spreadsheet Example

Columns A-G provide the specification context

A	B	C	D	E	F	G
S1000D Specification						
Project BR Serial Number	Rule ID	* Project Decision, still required	Chapter	Para	Page	S1000D Project Decisions
	PD-	Open				
PID-PBR-S010	010	N	3.6	2.1.1	115	Definitions of security terms. The project or organization must decide on the definitions of security terms. Refer to Para 2.1.1.

BR Spreadsheet Example

Columns H-K provide the Joint Services and USAF decisions

H		I		J		K	
Joint Services				US Air Force - CAE (October 1, 2010)			
Business Rule Number		Business Rule Decision		Business Rule Number		Business Rule Decision	
(JS00017) Use of the element <security>		(JS00017) The attributes securityClassification and caveat on the element <security> shall contain the overall classification of the publication or data module as specified in DOD 5200 1-R.		(AF 4-001) Values for the attribute securityClassification		(AF 4-001) USAF projects shall use the security classification markings for classified and unclassified data modules and publications; these shall be identified in accordance with DoD 5200.1-R, DoD 5220.22-M, Executive Order 12958. and the Joint Service Business Rules. In all cases the highest security classification for an illustration, multimedia object, or the text contained in a data module determines the security classification of the data module.	
				(AF 4-002) Marking of security classifications		(AF 4-002) USAF projects shall not revise or modify the values and their definitions for the attribute securityClassification.	

BR Spreadsheet Example

Columns L-Q provide the US Army and Boeing BDS decisions

L	M	P	Q
US Army MIL-STD-3031		Boeing S1000D Business Rules (DMC-BOS-BR-00-00-0000-01001-022G-A)	
Business Rule Number	Business Rule Decision	Business Rule Number	Business Rule Recommendation
(5.9.2.2) Caveats.	Security code words applied to security classifications shall be defined within the project.		

What about commercial Business Rules management tools?

- Boeing has purchased licenses for a commercial Business Rules tool
- During BR development, we have found spreadsheets easier to populate and make quick changes
- Spreadsheets are easier to share between customer and Boeing
- However, configuration management of spreadsheet versions must be closely controlled, it is very easy to get out of sync
- Spreadsheets do not natively keep a history of the decision making process, if history is important then use a BR collaboration tool
- We use the commercial tool to document decisions once they are agreed
- We use the commercial tool to develop XPath statements and generate the Business Rules EXchange file (BREX)

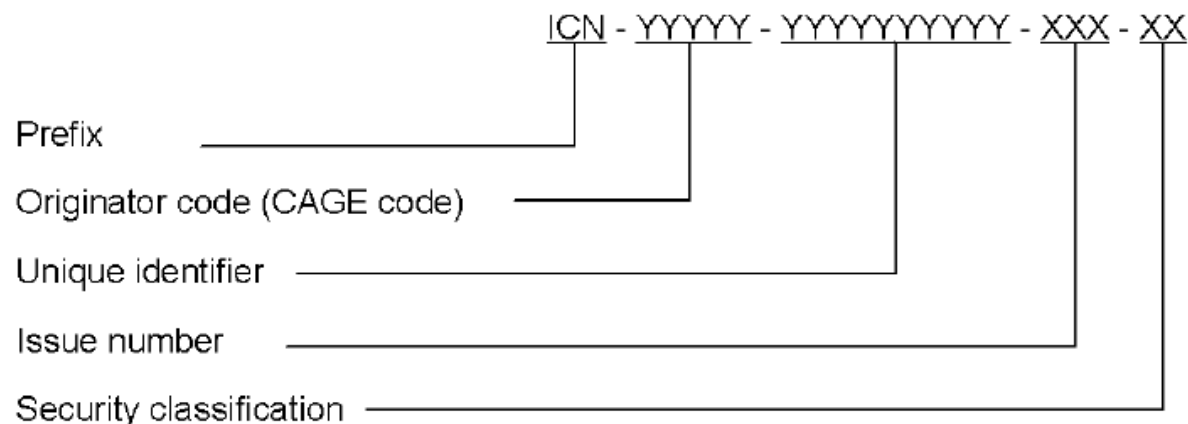
Information Control Number

What's so hard about ICNs?

The CAGE code based Information Control Number (ICN) structure must have a 10 character max unique identifier

- Presents a configuration management challenge for Boeing
- Each program has defined a different coding scheme using 8-10 chars.
- No room left for Boeing to identify the program / guarantee uniqueness
- Would have helped to retain the Model Identifier in the ICN

ICN – max 10 character unique identifier:



Summary on Business Rules Layers

What did I learn on this journey?

The Business Rules Layering concept introduced in Issue 4.0:

- Provides customer organizations an effective tool to document and convey their requirements and restrictions for S1000D options
- Is effective in consolidating multiple layers of requirements down to the individual project

BR layers appear to add complexity for a company

- Numerous BR layers for customers, product sectors, etc all appear to add complexity for a company trying to consolidate S1000D development

However, this problem has always existed!!!

**S1000D has provided the mechanism to document and identify this complex environment
No other mechanism existed in the past**

Summary on the Company BR Layer

What did I learn on this journey?

Boeing's diverse product line and extensive customer base makes it challenging to define BR decisions for the entire corporation

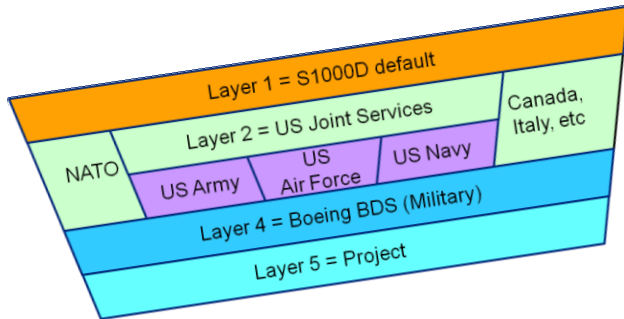
But still a useful exercise

- Provided a forum to discuss the issues and a learning experience bridging multiple sites and projects across the corporation
- Helped to build a network of subject matter experts across the corporation that now collaborate

Recommendation for diverse companies

- Consider defining multiple BR layers targeted at a specific business
 - Customer layer: such as Air Force, Army, Navy, NATO, etc
 - Sector layer: such as fighters, transports, rotorcraft, etc.

Questions and Discussion



Layer	em01 <i>(bold)</i>	em02 <i>(italic)</i>	em03 <u>(underline)</u>	em04 <u>(overline)</u>	em05 (strikethrough)	em06-em50	em51-em99
S1000D							
Joint Services <i>(no guidance)</i>							
USAF (6-007)							
Company							
Allowed							

