Developing Taxonomies

Tools for Navigating the Uncharted Seas of Information

Kathryn Breininger, The Boeing Company
kathryn.r.breininger@boeing.com

and

Mary Whittaker, The Boeing Company
mary.s.whittaker@boeing.com
Setting the Stage

- Information overload
- Users don’t know what terms to use for searching
- Individuals use multiple ways of organizing
- No control over terminology with full text searching
What is a Taxonomy?

- A controlled vocabulary
- Relationships are one step broader or narrower
  - Genus/Species
  - Instance
  - Whole/part
- Browsable hierarchical structure
- May include equivalent relationships
- Used to consistently categorize information
- Provides search terms for the user
### The Controlled Vocabulary Spectrum

- **Word list**
  - Ambiguity control
  - Synonymous relationships

- **Synonym Ring**
  - Ambiguity control
  - Synonymous relationships

- **Taxonomy**
  - Ambiguity control
  - Synonymous relationships
  - Hierarchical relationships

- **Thesaurus**
  - Ambiguity control
  - Synonymous relationships
  - Hierarchical relationships
  - Associative relationships

- **Ontology**
  - Ambiguity control
  - Synonymous relationships
  - Hierarchical relationships
  - Associative relationships
  - Complex relations (rules and axioms)
  - Machine readable

---

*Based on ANSI Z39.19-2005*
Taxonomy Considerations

- Avoid duplicating a vocabulary that already exists
- Construction methods
- Dimensions of a taxonomy
- Size of taxonomy
- Facets
- Intended use of taxonomy
Developing a Taxonomy

1. Determine requirements
2. Identify concepts
3. Develop draft taxonomy
4. Review with Users and SMEs
5. Refine taxonomy
6. Apply taxonomy to content
7. Manage and maintain taxonomy
Determine Requirements

- Scope
- Purpose
- Format of content
- Subject or facet coverage
- Depth
- Type of content
- Volume of content
- Target audience
- User needs
- Any technology requirements
Identify Concepts

- Identify source materials
- Gather concepts
- Analyze search logs
- Inventory content
- Analyze content
- Determine content types
- Interview SMEs
- Identify existing taxonomies
- Extract candidate terms
Develop Draft Taxonomy

- Establish common rules
- Reconcile terminology issues
- Use concepts universally
- Start broad, not deep
- Develop upper levels of structure
- Work from bottom up and top down
Review with Users and SMEs

- Provide draft for review
- Conduct usability studies
- Build consensus
- Keep a history of decisions
- Involve stakeholders, SMEs and users
Refine Taxonomy

- Incorporate refinements
- Review and refine cycle
- Know when to quit
  - Don’t overbuild
  - Low level of detail vs. value at the leaf node
- Establish test criteria
Apply Taxonomy to Content

- Provide guidelines for use

- Deploy
  - Navigate web sites
  - Tag content
  - Integrate with existing applications
Manage and Maintain Taxonomy

- Establish ownership
- Establish governance processes
- Create change control processes
- Develop maintenance plan
- Review content for new concepts
- Develop user feedback process for new concepts
- Maintain lifecycle (version control)
- Review success criteria
- Provide documentation
Keeping the Taxonomy Up-to-Date

- Review taxonomy periodically for currency
- Create a “candidate” list of terms for consideration
- Analyze items returned in error
- Sample newly added content
- Consider terms used excessively or infrequently
Testing the Taxonomy

- Does the taxonomy provide appropriate search results
- Does the taxonomy match user expectations
- Evaluation criteria
  - Should support Taxonomy purpose
- Testing methods
  - Heuristic evaluation (experts evaluate)
  - Affinity modeling (card sorting)
  - Usability testing (overall system)
Qualitative Methods for Testing

- Demonstrate to SMEs
- Conduct user satisfaction survey
- Perform usability studies
- Analyze items returned in error
- Tag sample content
- Test relevancy
Quantitative Methods for Testing

- How evenly does the taxonomy divide the content?
- How well does the taxonomy match the content?
- How well does the taxonomy cover the field?
- Is the indexing repeatable?
Engaging People

- Find a strong sponsor and champion
- Build a multi-disciplinary team
  - Terminology decisions – Information professionals (librarians, archivists)
  - Technology decisions – IT
  - Subject matter experts from across the company
  - End users
- Task IT with maintenance of the software
- Give SMEs, content owners and librarians responsibility for taxonomy
- Obtain end user buy-in
Process Flow for Term Suggestions

End User Identifies Term not in Taxonomy → End User Completes and Submits Suggestion Form → Librarian Researches Concept → Does Concept Already Exist in Taxonomy? (Yes) → Librarian Notifies End User With Explanation

Librarian Selects Form of Entry Based on ANSI Standard → Librarian Enters New Concept into Taxonomy Management Tool → Librarian Notifies End User That Concept Has Been Added → New Concept Available in Taxonomy → End of Process
Taxonomy Governance Processes

- Taxonomy Team reports to a Change Board
- Implement a comment handling process
- Provide an appeals process
- Use issue logs
- Develop a communication plan
  - Announcements of enhancements, releases, Board activities, etc.
- Apply a release schedule
- Create governance documentation
Governance Flow

**Taxonomy Team**
Develops and maintains the Taxonomy

**Taxonomy Change Board**
Reviews and approves major changes to content and structure. Reviews and approves changes to strategy and functionality, and elevates to Advisory Board.

**Advisory Board**
Provides strategic direction for the Taxonomy. Promotes the Taxonomy in the enterprise. Makes recommendations to the Change Board

**Communicate changes**

**Change approval, issue resolution**

**Direction**
Taxonomy Documentation

- Editorial rules and guidelines
- Training materials
- Processes and workflows
- Marketing materials
- Presentation materials
- Conflict resolution process
- Taxonomy metrics
- ROI analysis
Taxonomy Implementation Drivers

- Search inefficiencies
- Bottom line impacted by inability to find information
- IT pressured to find solutions
- Content Management Systems
- Knowledge Management initiatives
Taxonomy Strategy

- Assimilate with business strategy
- Incorporate with search functions
- Leverage strategically into applications
- Integrate multiple corporate taxonomies
- Embed into the information life cycle
- Use to tag content at creation
- Plan for extensibility over time
- Owned by those who do classification
Value of Taxonomies

- Provides consistent terminology
- Improves search and discovery of relevant information
- Shows relationships among terms
- Organizes content on web sites, file shares, desktops
- Provides navigational structure for websites
- Leads users to most specific terms in a particular domain
Productivity Benefits

- More time for analysis
- Less duplication of effort
- Fewer poor decisions
- More focus on information as a strategic asset
- More internal knowledge sharing
- Better understanding of terminology
Searching Benefits

- Creates structure in unstructured content
- Facilitates navigation among terms
- Provides powerful browse capabilities
- Provides standardized access
- Organizes fragmented content
Business Benefits

- Reflects scope of your business
- Assists learning in the domain
- Supports business goals
Taxonomies and ROI Considerations

- Building and maintaining a taxonomy is a cost
- Tagged content must be available and used
- Technology costs are associated with building a taxonomy
- Taxonomies must integrate with applications for maximum return on investment
Taxonomy ROI Examples

- Increased sales through improved access to online product catalog
- Improved efficiencies in Help or Call Centers
- Knowledge worker productivity
Best Practices

- Find a strong sponsor and champion
- Establish a team to manage taxonomies
- Start with an overall framework
- Use automatic approaches to facilitate manual development – need human review
- Develop taxonomies for multiple facets
- Establish quality control measures and metrics
- Implement a phased rollout
Things to Avoid

- Do not use corporate lingo
- Do not use departmental names
- Do not use undefined acronyms
- Avoid over thinking
- Avoid over-engineering
- Avoid developing unneeded sections
- Avoid using a proprietary system for taxonomy management
Critical Success Factors (1)

- Understand target audience, requirements
- Develop strong stakeholder and user relationships
- Assign responsibility for ownership and maintenance
- Research lessons learned from other companies
Critical Success Factors (2)

- Understand how tools and technology play
- Build, buy and re-use
- Build in flexibility
- Differentiate between the taxonomy and the metadata scheme
- Develop metrics on value and relevance of the taxonomy
- Plan for long term – have a vision and strategy
- Plan for maintenance resources
Questions?

Kathryn Breininger
kathryn.r.breininger@boeing.com

Mary Whittaker
mary.s.whittaker@boeing.com
Back-up Slides
Sample Taxonomy Team Charter (1)

Purpose
- Develop and maintain taxonomies

Scope
- Review, approve, and implement changes

Deliverables
- Process documentation
- Documentation of decisions and meeting minutes
- Documentation regarding authoritative standards used, guidelines and best practices
- User interface to the taxonomy
- The taxonomy itself!!
Sample Taxonomy Team Charter (2)

- Responsibilities
  - Review and manage requests for changes to the Taxonomy
  - Maintain a change log to track requests for changes
  - Work with subject matter experts
  - Communicate implemented changes
  - Educate users and projects about the Taxonomy
  - Develop and maintain the Taxonomy web site
  - Evaluate and recommend back-end taxonomy management tools
  - Attend meetings prepared to discuss items on the agenda
  - Complete assigned responsibilities in a timely manner
  - Promote Taxonomy activities in the enterprise
Sample Taxonomy Team Charter (3)

- Membership
  - Members must have expertise in vocabulary management

- Authority
  - Team receives its authority from Library Management

- Accountability
  - Team is accountable to Library Management and the Taxonomy Change Board

- Voting
  - Team strives for understanding, acceptance and support
  - Decisions reached by consensus whenever possible
  - When voting, each member has one vote and all will abide by the outcome. A quorum is required for voting.
Sample Change Board Charter (1)

- **Purpose**
  - Reviews and resolves issues related to the Taxonomy that are not resolved at the Taxonomy Team level. Reviews and approves major changes to the Taxonomy

- **Scope**
  - Reviews and approves major changes to content and structure of the Taxonomy. Reviews and approves changes to strategy and functionality. Elevates issues to Advisory Board for guidance.

- **Deliverables**
  - Process documentation for Change Board activities
  - Documentation for Taxonomy strategy and approach
  - Documentation of Change Board decisions and meeting minutes
Responsibilities

- Address and resolve issues on which the Taxonomy Team is unable to come to consensus
- Review and approve major content changes (for example new facets and high level structural changes)
- Communicate implemented changes to the Advisory Board
- Interface with Advisory Board members about the Taxonomy
- Attend meetings prepared to discuss items on the agenda
- Complete assigned responsibilities in a timely manner
- Promote Taxonomy activities in the enterprise
- Educate users and potential customers about the Taxonomy

Membership

- Voting members must have expertise in vocabulary management
- Representatives from business functions (non-voting)
- Taxonomy Team representatives (3 members)

Management
Sample Change Board Charter (3)

- Authority
  - Change Board receives its authority from management

- Accountability
  - Accountable to management

- Voting
  - Change Board strives for understanding, acceptance and support
  - Decisions reached by consensus whenever possible
  - When voting, each member has one vote and all will abide by the outcome. A quorum is required for voting.
Sample Advisory Board Charter (1)

- **Purpose**
  - Provide strategic direction and promote the taxonomy

- **Scope**
  - Provide guidance on strategy and functionality
  - Serve as a conduit between business and the team

- **Deliverables**
  - Documentation of Advisory Board minutes

- **Responsibilities**
  - Provide future strategic direction
  - Promote and support taxonomy in the enterprise
  - Act as a conduit between potential customers, users, and the taxonomy team
Sample Advisory Board Charter (2)

- **Membership**
  - Voting members must understand use and value of controlled vocabularies.
  - Should be opinion leaders in information management
  - Able to clearly communicate and promote the Taxonomy
  - Should be five members with representatives from the business units and one Library representative. Selection based on Advisory Board recommendations
  - Meet quarterly

- **Authority**
  - The Advisory Board receives its authority from the Libraries