TITLE: Reference Authoring
AUTHOR(s): R. David Lankes
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ABSTRACT: Discussion of how virtual reference output can be reused into new products.
KEYWORDS: digital reference, virtual reference, complexity theory, reference authoring
Agenda

• What We Know About Virtual Reference
• From One Researcher’s Perspective
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- What is Reference Authoring
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  • Reference Weighting
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- What is Reference Authoring
  - Transformation
  - Credibility
  - Reference Weighting
  - Complexity and Induction
“The use of human intermediation to answer questions in a digital environment”

- The Digital Reference Research Agenda
“The use of human intermediation to answer questions in a digital environment”

- The Digital Reference Research Agenda

An agenda to increase the technical knowledge (and capacity) of libraries and to build bridges (and respect) to the digital library and other communities.
Lankes’ Virtual Reference Perspective

• Reference is an Island of Chaos in a Sea of Library Order...That’s a Good Thing

• Virtual Reference is Different from Traditional Reference - It Creates Artifacts by Default/Design

• Virtual Reference is Beyond Libraries

• Virtual Reference Services are Complex Adaptive Systems
A Complexity Framework for Internet Information Services

R. David Lankes, Syracuse University
Virtual Reference
Virtual Reference

- General Digital Reference Model
Virtual Reference

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- General Digital Reference Model
- Digital Reference Research Agenda
Reference Authoring
The Use of Reference Interactions to Create Secondary Artifacts
WARNING: Exploration Ahead

- Work is Based on Theory, Exploration and Initial Experiments
- Later Work Lacks Evaluation and Rigorous Testing
- More Agenda than Results
Some Examples
Knowledge Bases

- Many Doubt their Usefulness
- Yet Used All the Time
  - Statistics
  - Patron Follow-Up
  - Evaluation
Inherent Problems in Deductive Approach

- **Context Dependencies**
  "I need a good restaurant in Austin for the lactose intolerant"

- **Metadata Creation**
  What’s the LC class for swimming pools in the Kremlin?

- **Chunking**
  "I need all the articles by Robert Taylor and Tefko"

- **Fact Shifting & Temporal Dependencies**
  "What is the height of Mount Everest?"
Transformation
Transformation
Transformation

Raw

Edited
Transformation

Raw

Edited

Refined
Transformation

- Effort: The Amount of Resources (Time, Money, Automation) Expended to Transform
Transformation

- **Effort:** The Amount of Resources (Time, Money, Automation) Expended to Transform

- **Effect:** The Utility of the End Result
Transformation

- Effort: The Amount of Resources (Time, Money, Automation) Expended to Transform
- Effect: The Utility of the End Result
High Effect, High Effort

- Each Requires a High Amount of Effort to Effect
Low Effect*, Low Effort

* Low Effect Simply Reflects Susceptibility to the Draw Backs of Deductive Knowledge Bases

• Requires Low or Distributed Effort to Effect
What has Low Effort and High Effect?

- Search Seems Promising
- High Use in the Internet
- Matches Reference Domain
- Preserves Patron Privacy
- URL Stripping
Credibility

- What Makes Information Credible on the Internet?
- Tool Based Decisions
- Methods of Determination
  - Checklist (accuracy, authority, objectivity, currency, and coverage or scope)
  - Cognitive (presentation, information, motives, reputation)

“Understanding How Internet Users Make Sense of Credibility: A Review of the State of Our Knowledge and Recommendations for Theory, Policy, and Practice” - Miriam J. Metzger
What if Librarians Built Google?

• Built Inductively from Actual Use

• Reference Weighting

  • Using “Citedness” as a Surrogate for Relevance like Google uses Page Ranking

• “Boost” Results by Use/Citation
- Raw Text File
- Extracted URL’s
- Frequencies
Reference Weighting
Reference Weighting

The graphs illustrate the reference weighting for various websites. The x-axis represents different websites such as google, dublincore.org, yahoo.com, vrd.org, about.com, vrd.askvrd.org, howstuffwork, loc.gov, nlm.ni, lii.org, etc. The y-axis shows the weighting values ranging from 0 to 140.

The first graph on the left shows a bar chart for Series 1, indicating the reference weighting for each website. The second graph on the right displays a line chart for the same Series 1, presenting a more detailed view of the weighting trend.
Reference Weighting

![Graphs showing reference weighting for various websites like google, duvlinccore.org, yahoo.com, vrd.org, howstuffwork, loc.gov, nlm.ni, lii.org. The graphs illustrate the relative weight of each website in a series.]
AskERIC Histogram
VRD Histogram
“Weighting Window”
Reference EXTRACT

- “What is the utility of a knowledge base?”
- High Effect, Low Effort, High User Privacy
- Low Context
- High Credibility?
Zones of Credibility?
Story Starters

- High Context
- Builds on Blogs
- Reference as Community
Inductive Knowledge Engine

- Each Response is an Agent
- Each Agent has: Rules, Resources, Tags, Detectors, and Effectors
- Compared in a “Space”
  - Geometry, Timing, Rule
Induction Example
Induction in 3D
Induction in 3D
Anticipated Benefits of a Complexity Approach

- Self Organization
- Integration of Diverse Agent
- Heuristic Rule Discovery
- Serendipitous Correlations
The Long and Winding Road
The Long and Winding Road
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Story Starters
The Long and Winding Road
So What - ILS
The Perceived Befits of Induction in Libraries

• Library Systems Based on Use
• Catalogs that Order Results by Circulation Data and/or Referrals
• STI and Readers Advisory (TiVO + Library...LiVO?)
So What - Metadata

- Automated Metadata Creation and Enrichment
  - Inheritance of Metadata from Like Objects
  - Metadata Agents Adopt Element Refinements from Like Objects - Viewing Metadata as an Interconnected Lattice of Elements

- Outlier Detection in Digital Libraries
  - The Problem of OAI Ingest
  - The Introduction of Dynamic Metadata Elements for Collection Development
So What - Credibility

• Using Tools to Make Credibility on the Internet a Tractable Problem
• Development of a “Credibility Measure” Akin to Relevance Ranking
• Heuristic and Comparable Profiles
Question?