VISUALIZING UNIVERSES OF KNOWLEDGE
past and future media and classification

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2. New Media and the Impact on Classification (end 19th – 21st Century)
3. The role of visualizations as interfaces to multiple universes of knowledge (two cases from the humanities)
1) UNIVERSES OF KNOWLEDGE:
   Historiographical Comment
Historiography: From the universe of knowledge to the universe of concepts?

“The first modern bibliographic classifications were top-down systems that started at the universe of knowledge and subdivided the universe downward to minute subclasses. After the invention of faceted classification by S.R. Ranganathan, the ideal was to build bottom-up classifications that started with the universe of concepts and built up to larger and larger facettted classes”

From the Universe of Knowledge to the Universe of Concepts: The Structural Revolution in Classification for Information Retrieval
Beghtol 2008, 131
“Thought is multi-dimensional. But we are one-dimensional beings – that is we still prefer all things to be handled to be arranged in one-dimension [...] This means that classification is essentially a transformation of a many-dimensional universe into a uni-dimensional, uni-directional one

Ranganathan 1951, 96
“The objects of knowledge are both material entities [...] and intellectual entities, ideas, concepts.”
“These two kinds of objects can be considered from two points of view: complete in themselves [and] in terms of their relations with other objects or as part of an abstract entity.”

Otlet, Regles pour les developpements a apporter a la Classification Decimale 1896 [transl. Rayward 1990, p. 64]
Elements and Theoretical Notions 1: Atomist – Atomic Theory - Universes

Atomist theories – Universe of Knowledge

- Richardson, Bliss and others
- Boltzmann - Ostwald - Otlet
- Monographie Prinzip – Monographic Principle

Atomic theories – Universe of Concepts

“The laws applicable to macro-physical objects are not applicable to micro-physical objects.”

Otlet, Monde 1935, 30
Elements and Theoretical Notions 2: analytic-synthetic classification

Otlet, Fundamental schemes 1908
Elements and Theoretical Notions 3: events and evolution

Left: Otlet discussing Alexander, Russell and Whitehead with notions of events (evenements and implications for synthesis – 1927
Right: Otlet discussing growth and development of element in place and time - 1931
Elements and Operations: Disintegration and Re-order

“a re-arrangement of their contents not along the lines of the special plan of a particular book, but according to the genus and species appropriate to each element does not make for any loss of substance.”

Otlet, Un peu de bibliographie, 1891-92 p. 17)

“The ultimate problem of scientific knowledge is to know all reality, its being, its phenomena, it laws that it is possible to desintegrate everything that exists, to reconstitute it and to reorder it in different ways. “

Otlet, Monde 1934, p. 390
Multidimensionality and Classification

“the relations of the sciences [...] can not be truly shown on a plane, but only in a space of three dimensions.”

Herbert Spencer, The Classification of the Sciences 1864, p. 26
Conceptualizations of space and dimensionality

“Metric space analogy is to some extent implicit in the many information retrieval studies that have ... multifactor analysis, and related “linear” methods. However, those studies have not emphasized the space concept, and they have led to little or no consensus even about the dimensionality, much less about the identities of the dimensions, of any such thing as “information space” or “semantic space” or the “space of knowledge.”

Licklider, Libraries in the Future 1965, 77
Linear methods: Dimension Reduction

Otlet 1908

Nelson 1980s

Ranganathan 1967
“The character of the book, being an « architecture of ideas », of intellectual data, requires a consideration of the enormous revolution architecture itself accomplished in our days.”

Paul Otlet, Traité de Documentation 1934 p. 100

“Here are some things the four us (Wright, Wells, Bucky and I) have in common. […] Each of us showed you spaces that no one had ever seen before.”

Conceptualizations of space and dimensionality in Library and Information Sciences

• Debates on classification of the sciences, evolution and atomist theory – Universe of Knowledge (19th century) – (Comte, Spencer, Darwin, Ostwald, Richardson, Bliss etc.
• Evolution of mental order (Baine, Wundt, Fouillée, Bergson)
• Relativity and Quantum theory: “timespace”
• Non-metrical projective geometry and relative events – Misplaced Concreteness- (Russell and Whitehead)
• Interaction: physical intermedium (Licklider)
• Beyond the Universe of Knowledge: SpaceXanadu (Nelson)
• The Fragmented Web (Barabási)
Multidimensional classification and visualization
Classifying intellectual space

P. Otlet: classification of the self (le moi)
G. Cordonnier: Classification et Classement 1944 pp. 31-32
Knowledge space and human interaction

Licklider (1965), knowledge fund and human computer interaction before (a) and after (b) implementation of (b) precognitive system

Otlet - Personal Documentation - Observations
2) NEW MEDIA & CLASSIFICATION

- Substitute of the Book - Otlet
- Automated Information Retrieval – CRG
- WWW – ontologies – folksonomies - UDCC
The future/end of classification

• Shera: There is no universal system of classification, no one pattern of human thought. Classification of idea content. “The librarian as the geneticist of our intellectual life.”

• Licklider: “to accept the notion for many years at least, we shall not achieve a complete integration of knowledge, we shall have to content ourselves with partial models of the universe.”

• Nelson: Escaping the universe and In 2020 hundred million simultaneous users, adding a hundred million documents an hour to the XanaduSpace system
The End of the Universe of Knowledge
Fragmented Web and Invisible Universes of Knowledge

Thus, the Web’s large-scale topology—that is, its true architecture—enforces more severe limitations on our behavior and visibility of the Web than [...] tinkering with the code.”

Albert-László Barabási Linked (2003) p. 175

Fragmented Web: directional web with “continents” and hierarchical modular growth
Interfaces as Events in a Multiverse of Documents

Nelson and Adamson, Back to the Future: Hypertext the Way it Used to Be (2007)
Parallel vision of documents linked by ‘lines of fire’ in Xanadu Space
3) INTERFACES TO UNIVERSES OF KNOWLEDGE

Two projects in the digital humanities

- Circulation of knowledge and Learned Practices in the 17th Century Dutch Republic. A Web-Based Humanities’ Collaboratory on Correspondences

- Idea Collider: elementary structures in knowledge organization (case arts)
CIRCULATION OF KNOWLEDGE AND LEARNED PRACTICES IN THE 17TH Century Dutch Republic
A Web Based Humanities Collaboratory on Correspondences
How can we combine and structure various sets of letters of 17th-century scholars and their correspondents in such a way that we can analyze and visualize the circulation and appropriation of knowledge production in a wider international context and recognize the development of themes of interest and scholarly debates in space and time? How can we make this information on knowledge production accessible to interdisciplinary research in the Humanities? How can this information be enriched by annotation?
huygens/3928

Metadata

1645  
Gautier, Jacques (fl. 1617-1652)  
Huygens, Constantijn (1596-1687)

Text

... Vous m'avez fait l'honneur de me commander de vous trouver un luth de Boulogne à neuf cottes. Je vous dirai, Monsieur, que tous les luths de Bologne à neuf cottes sont de Laux Maller qui est mort il y a six vingt ans, et sont tous la pluspart de moyenne taille et non propre pour chanter. Et croy qu'il n'y en a en tout le monde cinquante; pour icy je suis certain qu'il n'y en a pas six. Il y a eu deux autre maistres, l'un se nomme Anstrin l'autre Sigismon Maller, qui on fait un peu après plus grand cantié de luths et de grande taille, mais ilz ont honze cottes. Je me suis mis desja en devoir et fais chercheur tant qu'il m'est possible. Il y a bien icy d'autre sorte de luths qui pourront servir et peut estre ausy bien raynir pour le chanter, ausy bien qu'un luth de Bologne. Il en [est] de Sconuel (?) qui sont grands. S'il vous plais me mander de quelle façon le manche soit, et s'y vous voulez qu'il soit pour jouer des pieces et ausy pour chanter, je le feray accommoder ....

Analysis

Generated keywords: cottes luths chanter maller ausy bologne taille luth
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**Topic 68 - religion**

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- overall_john
- massis_g_of_eg
- hooft_pc
- pijnacker_cornelis_van
- bye_de_oude_nicolaas_de
- hooft_henrik
- reael_laurens
- muller_georg

**Topic 79 - nobility**

- boreel_johan
- bie_joris_de
- brasser_joost
- hessen-darmstadt_(landgraaf)_georg_ii
- bredero.ga
- blon_michel_le
- pijnacker_cornelis_van
- stadsbestuur_van_rotterdam
- colterman_david

**Topic 82 - scandinavian conflict**

- wael_van_moersbergen_adolf_de
- vondel_joost_van_den
- salm-kyrburg_johann_kasimir_von
- uytenbogaert_johannes
- pommeren_en_croy_anna_van
- gecommitteerde_raden_ter_admiraliteit_te_amsterdam
- reael_laurens
- brasser_govert
- muys_van_holy_arend
### Topic Key

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**Topical Changes**

![Graph showing topical changes over time]

Source: Scott Weingart UIA
IDEA COLLIDER
Elementary Knowledge Particles
Marijke Klasma – Who is afraid of God – poster commissioned by Archbishopric Utrecht (Netherlands)
Barnett Newman – Who is afraid of Red, Yellow and Blue III – 1966-67
Matthew Paul Cleary, Mysterium Magnum 2009
Who’s Afraid of Red, Yellow, and Blue

LYELL CRESSWELL

Fast \( \frac{\text{c.124}}{\text{pp}} \)
Iconclass 2100 Browser

The Iconclass system is accessible free of charge with the Iconclass 2100 Browser.

The multilingual Iconclass 2100 Browser has an educational and a practical goal, which is to show how Iconclass works. At the same time, it serves as a search tool that allows an indexer to find the concepts to tag an image. Needless to say, it can also be used to establish the correct meaning of a notation.

The Iconclass 2100 Browser contains English, German, French and Italian keywords and descriptions. Beside that, there are partial translations in Finnish and Norwegian and experimental translations in Chinese and Dutch (not yet online).

The RKD’s priority is to improve the accessibility of Iconclass online. The paper version and the CD-ROM version of Iconclass are no longer available. However, supplemental paper indexes for Iconclass can be obtained from: www.foleorpublishers.com.
WHO IS AFRAID OF the Big Bad Wolf
WHO IS AFRAID OF Virginia Woolf
WHO IS AFRAID OF Red Yellow and Blue
WHO IS AFRAID OF Red Yellow and Techno
WHO IS AFRAID OF Red Amber and Green
WHO IS AFRAID OF God
Visual discernments

Hypericonics+
Art.Similarities

Gerd Jan Nauta Leiden University

Visual Collaborative Filtering
Form – Color - Texture
Form/Composition – Color/Texture
Viewing Elementary Structures

Ted Nelson – Fire lines between view units in Xanadu Space
Conclusions

- No transition from a universe of knowledge to a universe of concepts. Ranganathan is not revolutionary but makes part of longer theoretical development (need for new histories)

- No data integration within a universal classification but interfaces to knowledge interaction in a multiverse (need for new theories)

- More emphasis on annotation and visualization in the sciences, in particular in the digital humanities requires different approaches in knowledge organization (need for new practices)
Thank You
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