

## Curriculum Vitae: Theodor Holm Nelson, PhD

email: tandm[at]xanadu.net

**Software Designer, Author, "Visionary"**  
**Designer-Generalist, The Internet Archive**  
**Visiting Professor, University of Southampton**

**CAREER SUMMARY SO FAR: Two main software designs, 8 books, over 50 articles (9 peer-reviewed), numerous academic positions, perhaps 750 former students. Coined various words in some degree of circulation [list at end].**

**Many believe the World Wide Web was based on my ideas.\* My ideas are very different.**

\* See citations in Tim Berners-Lee's original proposal for the Web at  
<http://www.w3.org/History/1989/proposal.html>  
 See also Berners-Lee's *Weaving the Web* (1999 edition), page 5,  
 and [hyperland.com/TBLpage](http://hyperland.com/TBLpage).

**COMPELLING MOTIVATION BEHIND MY WORK: In 1960, I had a unique vision of on-line publishing by the general public and a vast personal computing industry-- but with entirely different structure and spirit from what we see around us now.\* I have striven for decades, academically and commercially, to bring about this very different vision. This vision is laboriously detailed in my book *Possiplex*, as are various possible firsts in my early projects.**

\* See my autobiography, POSSIPLEX.

### PRINCIPAL DESIGNS

( • **BEST-KNOWN DESIGN:** the Back Button (HES Project, 1966-7). It's obvious now, but I had to fight for it. )

• **MAIN DESIGN 1:** Xanalogical hypertext, a radical generalization of documents: unbreaking links to stabilized content, remix with overlays, and quotations connected to their sources. (My particular buildout is called Xanadu®.)

Readings and demos listed later. Principal Xanadu collaborators listed at end.†

• **MAIN DESIGN 2:** Hyperthogonal structure, or crisscrossed lists in N dimensions. This is arguably the most general data structure-- regular arrays can be generated from irregular hyperthogonal structure but not vice versa. (My particular buildout is called ZigZag®)

Readings and demos listed later. Principal ZigZag collaborators listed at end.†

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**C.V. DETAILS FOLLOW.**

## Education

B.A., Swarthmore (Department of Philosophy), 1959.  
 Year at University of Chicago (Department of Sociology), 1959-60.  
 M.A. Harvard, Sociology (Department of Social Relations), 1963.  
 Ph.D. Keio University, Japan (Department of Media and Governance), 2002. Thesis:  
 "Philosophy of Hypertext," in English.

## Books

1959: *Life, Love, College, etc.* (Formerly *We Need a Sociology Department*.) TN's collected columns from the Swarthmore *Phoenix*.  
 1966: *Media 72*, privately published.  
 1974: *Computer Lib/Dream Machines*. 1987: updated Microsoft edition.  
 1977: *The Home Computer Revolution*. Translated also into Japanese and Swedish.  
 1981: *Literary Machines*. 1987: Major revision. 1993: most recent edition (Literary Machines 93.1.) Translated also into Japanese and Italian.  
 1997: *The Future of Information*. Published in Japan by Kay Nishi in a special limited edition.  
 2008: *Geeks Bearing Gifts: How the Computer World Got This Way*. Mindful Press, distributed by Lulu.com.  
 2010: *POSSIPLEX: Movies, Intellect, Creative Control, My Computer Life and The fight for Civilization*. Mindful Press, distributed by Lulu.com.

## PATENTS

United States Patent 6,058,381 (May 2, 2000)  
 "Many-to-many payments system for network content."  
 United States Patent 6,262,736 (July 17, 2001)  
 "Interactive connection, viewing, and maneuvering system for complex data."  
 This is a software patent for zzstructure (see Designs, below).

## PRINCIPAL SOFTWARE DESIGNS 1: XANADU HYPERTEXT

Radical literary structure and software architecture (described in TN's book *Literary Machines*). Often confused with the much-simpler World Wide Web, Xanadu is an ongoing family of software and document designs architected for side-by-side intercomparison, unrestricted re-use of content, and profuse overlapping links. I still believe this structure will have an important place in the electronic document world.

**Main reading:** peer-reviewed article for the Association for Computing Machinery, "Xanalogical Structure, Needed Now More than Ever: Parallel Documents, Deep Links to Content, Deep Versioning and Deep Re-Use." On line variously, including  
<http://xanadu.com.au/ted/XUsurvey/xuDation.html>  
<http://faculty.washington.edu/tabrooks/528.course/WebReadings/Xanadu.htm>

"Back to the Future: Hypertext the Way It Used To Be." Proceedings of Hypertext 2007, Manchester. On line at  
<http://xanadu.com/XanaduSpace/btf.htm>

**Video: XanaduSpace prototype shown by TN**  
[http://www.youtube.com/watch?v=En\\_2T7KH6RA](http://www.youtube.com/watch?v=En_2T7KH6RA)

## PRINCIPAL SOFTWARE DESIGNS 2: ZIGZAG DATA SYSTEM

ZigZag and hyperthogonal structure (also called ZZstructure), a generalization of data as visible crisscrossed lists in multidimensional space, offering unique forms of connection and visualization. ZZstructure projects have been underway in Australia, Japan, Russia, Finland, England and of course the USA, where it is trademarked as ZigZag® and patented (second U.S. patent above). This radical software mechanism should permit us to rebuild a different world of personal computing with far simpler programs and data.

**Main reading:** An excellent early review of ZigZag by Michael Swaine is to be found in the December 1998 issue of *Dr.Dobbs Journal*.

A peer-reviewed article for the British Computer Society, "A Cosmology for a Different Computer Universe: Data Model, Mechanisms, Virtual Machine and Visualization Infrastructure."

[http://www.global.asc.upenn.edu/docs/anox06/secure/july26/nelson/26\\_nelson\\_reading2.pdf](http://www.global.asc.upenn.edu/docs/anox06/secure/july26/nelson/26_nelson_reading2.pdf)

### Main videos:

TN demonstrates ZigZag (with genealogy xample)  
<http://www.youtube.com/watch?v=WEj9vqVvHPc>

Adam Moore demonstrates bioinformatics using ZigZag  
<http://xanadu.com/zigzag/ZZdnld/zzChemDemo-Moore.mov>

### Downloadable prototype:

Prototype package, ZigZag Starter Kit., is available at  
<http://xanadu.com/zigzag/zzStarterKit.zip>

## DERIVATIVE WORK

(Arguably, the World Wide Web is derivative of my work, as is the entire computer hypertext field, which I believe I founded.)

2001: Les Carr's multidimensional viewing system based on ZigZag. See "A Partial Implementation of Nelson's Zigzag® ideas for Web Browsers".

ON LINE AT

<http://users.ecs.soton.ac.uk/lac/zigzag/>

ca. 2003: Jason Rohrer's "Docuplex" is an independent implementation, for teaching purposes, of the Xanadu editing method. [see Google]

2003: Jason Rohrer's "TokenWord" is an independent implementation, for teaching purposes, of the Xanadu microsale method. [see Google]

2008: Nigel Treweeke's "Nzz" visualization system for chemistry is based on an independent implementation of hyperthogonal structure.

2009: Ian Anderson's ZigZag-based prototype for archival storage. See Anderson, Ian G., "From ZigZag to BigBag: Seeing the Wood and the Trees." Proceedings of ACM Hypertext 2009, Turin.

## HONORS

1968: Auburn Lecturer, Union Theological Seminary (shared with Kenneth Boulding).

1998: ACM establishes the "Nelson Newcomer Award," to be presented at each annual ACM hypertext conference. ("Papers that are rated among the best papers overall and are written solely by authors who have never published in earlier Hypertext proceedings are eligible for the Nelson Award.")

1998: Yuri Rubinsky Memorial Web Award, WWW7, Brisbane, Australia. ("... presented to an individual who has a lifetime of achievement in the 'care and feeding' of the global information infrastructure.")

2001: Knighted by France in 2001 as "Officier des Arts et Lettres." ("...presented to individuals achieving distinction in the arts and literature throughout the world.")

## ARTICLES. Probably not a complete list; more keep turning up from time to time.

### 1965-9

[peer-reviewed] "A File Structure for the Complex, the Changing and the Indeterminate." Proceedings of the ACM National Conference, 1965. (Note: this is the defining article for most of TN's work.)

"The Hypertext." Proceedings of the World Documentation Federation, 1965.

"Computer-Indexed Film Handling." Conference preprint of Society of Motion Picture and Television Engineers, Fall 1965.

"Suggestion for an On-Line Braille Display." Proceedings of the Society for Information Display, Fall 1965.

"New Media and Creativity Systems." Graphical brochure intended to expound computer graphics and related concepts, ca. 1966.

"Hypertext for History." (Approximate title, piece not presently in hand.) Unpublished paper on stretchable hypertext done at Harcourt (not proprietary), 1966.

"Hypertext notes." Ten brief essays on hypertext forms, 1976.

ON LINE AT <http://xanadu.com/XUarchive>

"Stretchtext," hypertext note #8, may be of special interest.

ON LINE AT <http://xanadu.com/XUarchive/htn8.tif>

"A Complete Computer-Based Editing System." Conference preprint of Society and Motion Picture and Television Engineers, Fall 1967.

"Computer Technology: Where It's At" (not TN's title). Jerome Agel's *Books*, ca.

1967.

"Getting It Out of Our System." In Schechter, *Information Retrieval: A Critical View*, 1967.

(With Carmody, et al.), "A Hypertext Editing System for the 360," in Faiman and Nievergelt (eds.), *Pertinent Concepts in Computer Graphics*, U. Illinois Press, 1969. This is a writeup of the Brown University Hypertext Editing System, of which TN was a principal designer. (See "Career Highlights," below.)

#### 1970-4

"No More Teacher's Dirty Looks." *Computer Decisions*, September 1970. Partially reprinted in *Electric Media* by Les Brown and Sema Marks (Harcourt, 1974); fully reprinted in TN's book *Computer Lib*.

"Barnum-Tronics." *Swarthmore College Alumni Bulletin*, December 1970. This is an overview of TN's agenda stated in popular terms.

"The Route to Half-Tone Image Synthesis" (not TN's title). *Computer Decisions*, May 1971.

"As We Will Think." Proceedings of Online 72 Conference, Brunel University, Uxbridge, England, 1972.

(With Tom DeFanti and Dan Sandin), "Computer Graphics as a Way of Life." Proceedings of first SIGGRAPH conference, 1974.

"Computopia and Cybercrud." In Levien, *Computers in Instruction*, The Rand Corporation, 1974.

"Data Realms and Magic Windows." Proceedings of ACPA-5 (1975 meeting of the Assn. of Computer Programmers and Analysts).

#### 1975-9

A piece which TN originally called "Explorable Screens" appeared with no title in a section called "Television," *Chicago* magazine, January 1976, 106.

"Those Unforgettable Next Two Years." Proceedings of West Coast Computer Faire, Spring 1977.

"A Dream for Irving Snerd." *Creative Computing*, ca. July 1977.

Column in *ROM* magazine for the run of the magazine, ca. 1977.

"Electronic Publishing and Electronic Literature." In Edward DeLand (ed.), *Information Technology in Health Science Education*, Plenum Press, 1978.

#### 1980-4

"John Mauchly" (obituary), *Creative Computing*, ca. Feb. 1980.

"The Atari Machine." *Creative Computing*, ca. June 1980.

Edited, and wrote much of, *Creative Computing* special issue on Object and Actor languages (issue of Oct-Nov 1980). This may have been the first mention of object-oriented programming in a public forum.

"Interactive Systems and the Design of Virtuality." *Creative Computing*, Nov-Dec 80. This rough piece was the only publicly-available writing on TN's theory of software design until *The Future of Information*.

"Replacing the Printed Word." In S.H. Lavington, ed., *Information processing 80* (Proc. IFIP 80 World Computer Conference), North-Holland Publishing Co., 1980, 1013-1023.

"Mail Chauvinism: The Magicians, the Snark and the Camel." *Creative Computing*, December 1981. This piece predicted rather well the development and issues of electronic mail.

ON LINE AT: <http://www.atarimagazines.com/creative/v7n11/MailChauvinism.php>

"A New Home for the Mind." *Datamation*, March 1982.

ON LINE IN ENGLISH: apparently removed recently by Datamation.

ON LINE IN HUNGARIAN at: <http://www.artpool.hu/hypermedia/nelson.html>  
Reprinted in *Computer Media and Communication - A Reader* (Oxford University Press).

"Smootherers of the Lost Arc." *Creative Computing*, March 1982.

"Why Computer Ease Is So Difficult." Proceedings of Control Data Software Design Conference, October 1982.

## 1985-9

"The Tyranny of the File." *Datamation*, 15 December 1986.

## 1990-4

"Virtual World Without End." Proceedings of Cyber Arts International Conference, Sept 1990.

[peer-reviewed] "The Secret of Human Life." *Journal of Economic and Social Intelligence* 3:2, 1993.

ON LINE AS TRANSCRYPTABLE TEXT AT: <http://tprints.ecs.soton.ac.uk/archive/00000005/>

ON LINE AS TRANSCRYPTABLE SCAN AT: <http://tprints.ecs.soton.ac.uk/archive/00000009/>

[peer-reviewed] "Xanadu: Document Interconnection Enabling Re-Use with Automatic Author Credit and Royalty Accounting." *Information Services and Use* 14:4 (1994), 255-265.

(Various columns in *NewMedia* magazine, 1993-4.)

## 1995-9

(Various columns in *NewMedia* magazine, 1995.)

[peer-reviewed] "The Heart of Connection: Hypermedia Unified by Transclusion." *Communications of the ACM*, 38:8 (August 1995), 31-33. The first publication of the transpointing windows idea in a refereed publication. Sequestered by ACM at <http://portal.acm.org/citation.cfm?id=208353><http://>

"Issues In Applicative Hyperization of Unwitting Systems." ACM Proceedings of the Second International Workshop on Incorporating Hypertext Functionality into Software Systems, 1996.

ON LINE AT:

<http://www.cs.nott.ac.uk/~hla/HTF/HTFII/Nelson.html>

[peer-reviewed] "Transcopyright: Dealing with the Dilemma of Digital Copyright." *Educom Review* 32:1 (January/February 1997), 32-5.

NO LONGER ON LINE AT: <http://www.educause.edu/pub/er/review/reviewArticles/32132.html>

TN'S VERSION ON LINE AT:

<http://xanadu.com.au/ted/transcopyright/transcopy.html>

"Transcopyright: A simple legal arrangement for sharing, re-use and republication of copyrighted material on the Net." Keynote at WWCA '97 conference, March, 1997, Tsukuba, Japan; published in Takashi Masuda, Yoshifumi Masunaga and Michiharu Tsukamoto (Eds.), *Worldwide Computing and Its Applications* (proceedings of the WWCA '97 conference, Tsukuba, Japan, March 10-11, 1997.) Springer-Verlag, Berlin, 1997. ISBN 3-540-63343-X. Pp. 7-14.

[peer-reviewed] "Embedded Markup Considered Harmful." In *XML: Principles, Tools, and Techniques* (*World Wide Web Journal* 2:4, fall 1997).

ON LINE AT: <http://www.xml.com/pub/a/w3j/s3.nelson.html>

This is a sweeping criticism of today's markup systems. (Not everyone is aware that the title alludes to Dijkstra's classic article, "Go To Statement Considered Harmful.")

[peer-reviewed] "Literature to Last: Design for a Universal Digital Medium." In Ute Hagel (ed.), *Labile Ordnungen: Netze Denken, Kunst Verkehren, Verbindlichkeiten*. Hans-Bredow Institut, Hamburg, 1997. ISBN 3-87296-0849. Pp. 98-102.

"Crush and Crash: Logic of a Terrible Tomorrow." *Communications of the ACM* 40:2 (February 1997), 90-1.

ON LINE AT: ACM site (members only).

"What's On My Mind." (Writeup of invited talk at 1998 Wearable Computer Conference.)

ON LINE AT: <http://xanadu.com.au/ted/zigzag/xybrap.html>

## 2000-2005

[peer-reviewed] "Xanalogical Structure, Needed Now More than Ever: Parallel Documents, Deep Links to Content, Deep Versioning and Deep Re-Use."

NO LONGER ON LINE AT ACM site,

[http://portal.acm.org/ft\\_gateway.cfm?id=346033&type=pdf](http://portal.acm.org/ft_gateway.cfm?id=346033&type=pdf)

ON LINE: a near-final version is available from Xanadu Australia at

<http://xanadu.com.au/ted/XUsurvey/xuDation.html>

ON LINE ALSO: a possibly different version at Brown University--

[http://www.cs.brown.edu/memex/ACM\\_HypertextTestbed/papers/60.html](http://www.cs.brown.edu/memex/ACM_HypertextTestbed/papers/60.html)  
and also at  
<http://faculty.washington.edu/tabrooks/528.course/WebReadings/Xanadu.htm>

"Philosophy of Hypertext." Ph.D. thesis, Keio University, February 2002. (Written and defended in English.)

[peer-reviewed] "A Cosmology for a Different Computer Universe: Data Model, Mechanisms, Virtual Machine and Visualization Infrastructure." *Journal of Digital Information* (British Computer Society, on-line only), Volume 5 Issue 1.

ON LINE AT:

[http://www.global.asc.upenn.edu/docs/anox06/secure/july26/nelson/26\\_nelson\\_reading2.pdf](http://www.global.asc.upenn.edu/docs/anox06/secure/july26/nelson/26_nelson_reading2.pdf)  
and other locations.

## 2006-Current

(With Robert Adamson Smith) "Back to the Future: Hypertext the Way It Used To Be." Proceedings of Hypertext 2007, Manchester. On line at  
<http://xanadu.com/XanaduSpace/btf.htm>

## FUGITIVE PIECES

TN has also been published (including letters to the editor) in *The Oxford Magazine*, *The Oxford Times*, *Penthouse*, *Omni*, *Mademoiselle*, the *American Journal of Sociology*, *MAD*, and *The Humanist Newsletter*; as well as school newspapers including the *Harvard Crimson*, the *Swarthmore Phoenix*, the U. of Illinois *Illini*, the *Browning Grytte* and the *Bentley Beacon*.

## FUGITIVE PIECES ON THE WEB

A number of TN's earlier web pages, from [xanadu.com](http://xanadu.com) and Keio University, may be found at Xanadu Australia,

ON LINE AT:

[xanadu.com.au](http://xanadu.com.au)

## EMPLOYMENT AND ENTREPRENEURSHIP

1962-3: Photographer and movie-maker, Communication Research Institute, Miami Florida. This was the well-known dolphin lab of Dr. John C. Lilly, to whom TN reported. For a brief period TN's office-mate was Gregory Bateson.

1964-6: Instructor in Sociology, Vassar College.

1966-7: Technology consultant and sometime assistant to President William Jovanovich, Harcourt, Brace & World Publishers.

1968-72: Proprietor of The Nelson Organization, Inc., New York City. Consulting clients included IBM, Brown University, Western Electric, University of California, The Jewish Museum, Fretheim Chartering Corporation, Deering-Milliken Research



Corporation.

1968-69: Consultant to Bell Laboratories, Whippany NJ, working on hypertext systems for defense purposes.

1968-9: Consultant to CBS Laboratories, Stamford CT, writing and photographing interactive slide shows for their AVS-10 instructional device.

1973-76: Lecturer and media maker, various departments and auspices, University of Illinois at Chicago Circle.

1976: Founding partner and advertising director, The Itty Bitty Machine Company (one of Chicago's first computer stores).

1977: Visiting lecturer, Swarthmore College, Swarthmore PA, teaching courses in text systems and interactive graphics. This is considerably before such systems were available at consumer prices.

1977-78: Founder, The Computopia Corporation, intended to create and market a line of personal software. For the infrastructure of this software, collaborator William Barus implements a version of the TRAC language, but licensing issues forced its abandonment.

1980-81: Editor, *Creative Computing* magazine.

1981-82: Chief designer of office software, Datapoint Corporation, San Antonio, Texas. TN's "Vortext" design (December 1981) is adapted as Datapoint's next-generation text system. Datapoint's Advanced Technology division bundles this design into their proposed "Road Runner" software package. The Road Runner design is submitted to Datapoint management in April 1982. Datapoint backs away from this project and abandons further technical development in general, leading to the company's speedy demise.

1983-4: Media specialist, Datapoint.

1985-87: Consultant and Designer, San Antonio, Texas.

1988-93: Distinguished Fellow, Autodesk, Inc, Sausalito, California, following Autodesk's acquisition of XOC, Inc. (half of Project Xanadu). TN's job is to publicize Project Xanadu world-wide, but TN is denied any further authority over either the Xanadu project or the Xanadu design. Others' designs, promised in six months, are not completed; and Autodesk abandons the project after four years.

1993-95: Editor-at-Large, *NewMedia* Magazine, 1993-5.

1994-96: Research Fellow, Sapporo HyperLab, Sapporo, Japan.

1995-96: Research Fellow, Hokkaido University, Sapporo, Japan.

1996-1999: Visiting Professor of Environmental Information, Keio University SFC Campus, Fujisawa, Japan.

1997-current: Visiting Professor, University of Southampton, Southampton, England. In residence Sep 2001-Feb 2002.

1999-2002: Project Professor of Media and Governance, Keio University SFC Campus, Fujisawa, Japan.

2000+ : Senior Fellow, the McLuhan Institute, Toronto, Canada

2003: Leverhulme Visiting Professor, University of Nottingham, England.

2004-9: Fellow and then Visiting Fellow, Oxford Internet Institute, University of Oxford, England.

2010: Designer-Generalist, The Internet Archive.

## **OTHER CAREER HIGHLIGHTS**

1957 (Junior year at college): Directed, wrote book and lyrics for what was apparently the first rock musical, "Anything & Everything", Swarthmore College, Nov. 1957 (running as scheduled for two nights).

1958 (Junior year at college): Wrote unusual term paper that in some ways anticipated knowledge representation and declarative programming. (This paper, entitled "Schematics, Systematics, Normatics", is included and discussed in TN's Ph.D. thesis.)

1959 (Senior year at college): Wrote and directed half-hour film comedy, "The Epiphany of Slocum Furlow".

1960 (Second year in graduate school): From October through December, gripped by and designs for an expanding vision of personal computing, interactive software and visualization, electronic documents and their manipulations and transformations, world-wide distributed anarchic publishing, with supporting business models. This vision sharply differs from the Web in several principal respects: a document is built from contents brought from elsewhere (including one's own collection of accumulated writings); this facilitates writing (much of which is collaging and rearrangement) and research (allowing original contexts to be seen easily), and lends itself to micropurchase of quotations under a different form of copyright. In addition, decoration and links ("markup") are represented in parallel planes, rather than embedded, allowing many selectable levels and links. TN still stands by this design. ("Early adopters never switch," it is said.)

1961-70: Designed, and applied for patents on, image synthesis systems and non-linear editing systems (Fantasm(tm) and Cinenym(tm)). Was unable to get funds to pursue the patents.

1963: Coined term "hypertext," not published until 1965 and not to enter general usage until the mid-eighties.

1967: TN's 1967 article, "Getting it Out of Our System", may have been the first comparison of software to movies.

1968: Wrote initial specs for, and was a principal designer of, the Brown University Hypertext Editing System (HES, described in paper by Carmody et al., above).

Ca. 1968: Consultant to Avco-Embassy film "Charly". Wrote some of the semi-

technical dialogue (official author: Stirling Silliphant).

1971: Banquet speaker, Rand Corporation invitational meeting on computer-assisted instruction.

1971-2: TN discovers "enfilade" family of data structures—rearrangeable tree structures with important search properties. The original ("Model T") enfilade is implemented in parallel— as intended prototype Xanadu infrastructure— by Cal Daniels (in Algol on the Nova) and Jonathan V.E. Ridgway (in Fortran on the IBM 1130). The enfilade is later further investigated and developed into General Enfilade Theory by Mark Miller, Stuart Greene and Roger Gregory; they then design the "xu88" version of Xanadu built of three different enfilades. In turn, K. Eric Drexler, inspired by enfilades, designed the "ent" structure (a walking tree with memory, as in *Lord of the Rings*, which later became the basis of the unfinished "xu92" version of Xanadu designed by Miller, Dean Tribble and Ravi Pandya.)

1974: Co-presented the second talk at the first SIGGRAPH (with Sandin and DeFanti).

1976: Evening speaker at the one and only World Altair Computer Conference, Albuquerque. This is the conference where both Bill Gates and I announced that we were forming software companies.

1976: Speaker at first Personal Computer Conference, Philadelphia.

1977: Banquet speaker, West Coast Computer Faire.

1978: Testimony before CONTU (Congressional committee on new uses of copyright).

1978: Speaking tour of Sweden with Portia Isaacson and Jim Warren. Sponsored by Jan Nilsson of Hobbidata.

1978: Inspired by Dawkins' *Selfish Gene*, TN contrives a new theory of psychology based on genetic benefit. Specifically, this hypothesizes an inner system of emotional mechanisms appearing to explain many puzzles of human behavior. Published in abbreviated form in 1993 as "The Secret of Human Life," cited above.

1979: "Swarthmore Design Summer": global redesign of Xanadu system with Roger Gregory, Mark Miller, Roland King and Eric Hill. The specs are laid down and accepted by all at the end of the summer; it takes about two years to complete the "xu88" design, whose implementation in turn takes two more decades.

1980: Invited speaker, IFIP World Computer Conference in (held in both Tokyo and Melbourne).

Ca. 1981: Consultant to Disney "Tron" film production.

1981-2: Designed "Vortex" system for Datapoint (with Stuart Greene) and implemented its prototype demos ("Thunder Hop'n'Pop," with Steve Witham). Vortex design is bundled into proposed "Road Runner" system, which Datapoint abandons prior to collapsing.

1982: Invited speaker, AFIPS Office Automation Conference, San Francisco.

1982: Invited speaker, Control Data conference, Minneapolis.

1983: Invited speaker, Computer Culture Conference, Avignon, France.

1983: XOC, Inc. founded to continue Xanadu development; XOC owns industrial marketing rights, leaving publishing rights to TN.

1988: Autodesk purchases XOC, Inc., and funds Xanadu development. Autodesk's acquisition includes the Xanadu trademark and software designs. By contract, TN is prevented from participating in design, development or product responsibility. In a catastrophic misdecision, the new design team throws out the almost-finished Xanadu design (xu88) and begins a new Xanadu design (xu92) based on entirely different principles— especially, Drexler's Ent structure. The xu92 software is never finished.

ca. 1989: Testimony by TN before Senator Al Gore's committee inquiring into the "Information Superhighway".

1990: "Ted Nelson World Tour." This consists of six keynote addresses (Las Vegas, Los Angeles, Linköping, London, Rome, Tokyo).

1992: Autodesk drops Xanadu project.

1992-present: wide-ranging collaborations with Marlene Mallicoat.

1993: TN personally gets the trademark "Xanadu" back from Autodesk.

1993-current: Redesign of Xanadu structure, with the same structure of interconnection and copyright, turning it inside-out for the Web. Aspects and components include:

- transpublishing (making content available for delivery by requested portions, which may be composited together despite differing rightsholders)
- transcopyright (legal doctrine to support transpublishing)
- VLIT(tm) Virtual Literary Format design work, 2001-current
- Hypercoin(tm) system (invisible-interface payment system for transpublishing).

While it's fine for contents to be free, a key Xanadu objective is for users to be able to combine content from free and for-sale sources, and this requires facilitating micropayment for microportions.

- transquotable server or TQserver (which delivers text content by portion request)  
TQSERVER ON-LINE DEMO AT: <http://ted.hyperland.com/TQdox/zifty.d9-TQframer.html>
- TQSERVER ON-LINE DEMO AT: <http://tprints.ecs.soton.ac.uk/archive/00000005/>
- TQSERVER ON-LINE DEMO AT: <http://tprints.ecs.soton.ac.uk/archive/00000011/>

1994-6: implementation of zipper lists at Sapporo HyperLab (with K.Ookubo), under the auspices of Yuzuru Tanaka.

1996-2000: implementation of various Xanadu concepts at Keio university, especially with collaborators Ken'ichi Unnai, Yousuke Igarashi, Yoshihide Chubachi, Ed Harter, Nobuo Saito, Hajime Ohiwa, Kenji Naemura and Marlene Mallicoat.

1997: first implementation of zzstructure (Azz ZigZag prototype) with Andrew Pam of Xanadu Australia.

1998: Invited talk at Wearable Computer Conference, Fairfax, Virginia.

1999: "Way Out of the Box." (Published in some Ziff-Davis weekly.)  
 TRANQUOTABLE ON LINE AT: <http://tprints.ecs.soton.ac.uk/archive/00000011/>

1999-2000: Collaborative implementation of open-source version of ZigZag (now called Gzz) with Tuomas J. Lukka and collaborators, University of Jyväskylä, Finland.

2001: TN presents First International Hyperstructure Workshop at ACM Hypertext Conference, Aarhus, Denmark. (Chaired by Les Carr.)

2001: Speaking tour of U.K. universities includes U. Southampton, U. Sheffield, U. Manchester, Open University, Napier University, U. Edinburgh, U. Bournemouth.

2002: With Chris Gutteridge, worked out a quotable delivery format now incorporated in Stevan Harnad's "Eprints" server software.

2003: Opening keynote, ACM Hypertext Conference; Nottingham, England.

2003: Speaking tour of U.K. universities includes Oxford, U. Southampton, U. Bournemouth, Napier University, U. Manchester, U. Huddersfield.

2004. Roger Gregory announces that the Xanadu xu88 software is at last working. Jeff Rush converts xu88 from C to Python.

2004: Talks by TN at Columbia University, The Royal Society (London), University of Essex, Media 2005 conference in Barcelona. Keynote speech, Association of Internet Researchers, Brighton.

2007: Long lecture by TN at the University of Southampton (the "70th birthday lecture"). On line at [wn.com/intertwingularity](http://wn.com/intertwingularity) and YouTube.

2007: Lecture by TN in French at Le Cube, Issy-Les-Molineaux, France, in a celebration called "Happy Birthday, Mr. Hypertext."

2010: Rollout parties for TN's autobiography, POSSIPLEX, at San Jose Tech Museum and The Internet Archive.

### **TELEVISION APPEARANCES, ON-LINE VIDEOS AND RECORDINGS. (Partial list; the number grows quickly.)**

1950: First television appearance.

ca. 1978: "Good Morning America".

ca. 1978: David Susskind show.

ca. 1979: "Fast Forward" TV series (Toronto, syndicated PBS).

1990: Douglas Adams' "Hyperland" (BBC-TV). Written by Douglas Adams, produced by Max Whitby.

1991: Featured in PBS TV series, "The Machine That Changed the World".

1998: TN featured on Japanese Anime, "Serial Experiments Lain"

1999: Featured in TV series "Revenge of the Nerds II".

2000: First interviewee on Japanese HDTV.

2001: Adam Moore demonstrates ZigZag for chemistry  
<http://xanadu.com/zigzag/ZZdnld/zzChemDemo-Moore.mov>  
 (Best to download and then watch, otherwise in small window.)

2007: Talk at Google: "Transclusion: Fixing Electronic Literature"  
<http://video.google.com/videoplay?docid=-8329031368429444452#>

2007: TN's 70th Birthday Lecture, University of Southampton, "Intertwingularity: When Ideas Collide."

On line in 15 sections at [wn.com/intertwingularity](http://wn.com/intertwingularity)  
 Also at YouTube. Also supposedly still served unbroken from University of Southampton.

2008: TN on Pernicious Computer Traditions  
<http://www.youtube.com/watch?v=zumdnI4EG14>

2008: TN demonstrates Xanadu 3D prototype  
[http://www.youtube.com/watch?v=En\\_2T7KH6RA](http://www.youtube.com/watch?v=En_2T7KH6RA)

2008: TN demonstrates ZigZag  
<http://www.youtube.com/watch?v=WEj9vqVvHPc>

2009: TN Seminars at U.Bologna, 2009  
[http://www.almanews.unibo.it/08\\_09/html/nelson.html](http://www.almanews.unibo.it/08_09/html/nelson.html)

2010: Readings from POSSIPLEX at Internet Archive rollout  
<http://www.archive.org/details/possiplexvideo>

## CONGENIAL WRITINGS BY OTHERS

"Nelson's the Name, and What He Proposes Could Outdo Engelbart." *Electronics*, 1968.

Section on TN in Howard Rheingold's *Tools for Thought*, 1985.

John Walker, "Sunrise on Xanadu." October 6, 1988. (Autodesk internal memo, ca. 1988.)

Belinda Barnet, "The Magical Place of Literary Memory™ : Xanadu" (2005),  
 ON LINE AT  
[http://www.latrobe.edu.au/screeningthepast/firstrelease/fr\\_18/BBfr18a.html](http://www.latrobe.edu.au/screeningthepast/firstrelease/fr_18/BBfr18a.html)

Largely on TN's work: Chapter 5 of *Histories of the Future* by Dan Rosenberg and Susan Harding (Duke University Press, 2005).

Section on TN in Paola Castelucci, *Dall'ipertesto Al Web* (from Hypertext to the Web). Laterza, 2009.

Ming-Yueh Tsay, "Citation analysis of Ted Nelson's works and his influence on hypertext concept," *Scientometrics* Volume 79, Number 3, 2009. (Springer-Verlag)

Mark Bernstein, "Possiplex: Ted Nelson '59 and the Literary Machine." *Swarthmore College Bulletin*, June 2011.

ON LINE AT

<http://media.swarthmore.edu/bulletin/?p=637>

## WORDS

Coined a number of words now used by others in various degrees. These include "hypertext" and "hypermedia" (1965); "zipper lists" (1965); "digitalia" (1965); "softcopy" (1967); "cybercrud" (ca. 1967); "image synthesis" (1970); "visualization" (first use in the computer field), as "electronic visualization" (1972– and thus the later "computer visualization", "scientific visualization"); "intertwined" and "intertwinedness" (1974); "dildonics" (1974); "compound document" (1976); "virtuality" (1977); "enfilade" (1972, published much later); "technoid" (1981); "docuplex" (1981); "docuverse" (1981), "transclusion" (1987); "structangle" (1987, said to be in use in France).

## PRINCIPAL COLLABORATORS ON XANADU AND ZIGZAG PROJECTS

† Principal Xanadu collaborators, in chronological order: Cal Daniels, John V.E. Ridgway, William Barus, Roger Gregory, Mark Miller, Stuart Greene, Eric Hill, Roland King, Marlene Mallicoat, Andrew Pam, Yuzuru Tanaka, K. Ookubo, Edward Harter, Nobuo Saito, Ken'ichi Unnai, Yoshihide Chubachi, Hajime Ohiwa, Kenji Naemura, Yousuke Igarashi, Hajime Ohiwa, Wendy Hall, Chris Gutteridge, Robert Adamson Smith. A much longer list is to be found in "Xanalogical Structure, Needed Now More than Ever," cited above.

†† Principal ZigZag collaborators, in chronological order: Marlene Mallicoat, Andrew Pam, Tuomas J. Lukka, Jeremy Smith, Adam Moore, Robert Adamson Smith. A number of others have contributed, notably Les Carr, James Goulding, Tim Brailsford, Benja Fallenstein.

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