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What is *Pliny*?

- *Pliny* is a piece of software that I developed over the past few years as a kind of thought-piece about tools for humanities scholarship.

- *Pliny* is about two things. It explores
  1. some of the potential that arises out of developing software that supports annotation and notetaking for the Humanities, and
  2. some of the issues for Graphical User Interfaces (GUI) that should be considered when developing modular software toolkits.

2005 Summit on Digital Tools in the Humanities

- “only about six percent of humanist scholars go beyond general purpose information technology and use digital resources and more complex digital tools in their scholarship”. (pg 4)

- “although humanists are on the verge of … a revolutionary change in the scholarship… that such a revolutionary change has not yet occurred”. (pg 5).
Jerome McGann: digital technology

"The general field of humanities education and scholarship will not take up the use of digital technology in any significant way until one can clearly demonstrate that these tools have important contributions to make to the exploration and explanation of aesthetic works."


Pliny: what is it?

- it is a thought-piece:
  - perhaps wrongheaded in various ways
    - ... although a time was spent on research into what Humanities scholarship was like before Pliny was built
  - Pliny is meant to promote discussion within the DH about this area.
What is Pliny? (I)

- A software tool to support notetaking and interpretation development in traditional humanities research.

- Pliny, as a piece of software, tries to be “Englebartian”.

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Douglas Englebart

- Englebart’s work in the 1960s and 70s was fundamental to how most use computers today. It provided foundational thinking about the “Graphical User Interface” and such technologies as the mouse.

- An important element of Englebart’s thinking related to thinking about how tools might assist human intellectual endeavour.
Douglas Engelbart and H-LAM/T

- H-LAM/T: “Human using Language, Artefacts, Methodology, in which he is Trained” (Augment Report, p. 11)

“He believed that the computer could support model-building and problem-solving by humans, could enhance or augment what humans can deal with in their own minds, and need not take away or reduce human’s involvement in the material that represents the problem.”


The Augment Project

- By “augmenting human intellect” we mean increasing the capability of a man to approach a complex problem situation, to gain comprehension to suit his particular needs, and to derive solutions to problems. Increased capability in this report is taken to mean a mixture of the following: more-rapid comprehension, better comprehension, the possibility of gaining a useful degree of comprehension in a situation that previously was too complex, speedier solutions, better solutions, and the possibility of finding solutions to problems that before seemed insoluble.

- ...We refer to a way of life in an integrated domain where hunches, cut-and-try, intangibles and the human “feel for the situation” usefully co-exist with powerful concepts, streamlined terminology and notation, sophisticated methods, and high-powered electronic aids. ... the first phase of [the] program [is] aimed at developing means to augment the human intellect. These “means” can include many things -- all of which appear to be but extensions of means developed and used in the past to help man apply his native sensory, mental, and motor capabilities...

(p.1)

H-LAM/T, when done properly, makes the tool itself disappear!

- “You’re probably waiting for something impressive. What I’m trying to prime you for, though, is the realization that the impressive new tricks all are based upon lots of changes in the little things you do. This computerized system is used over and over and over again to help me do little things – where my methods and ways of handling little things are changed until, lo, they’ve added up and suddenly I can do impressive new things” (p. 89)

  - Englebart, D. (1962)

Englebartian software: word processor

- The word processor
  - A tool to support writing
  - It operates in ways that fit so closely with the process of writing that it seems to add little or nothing to this process
  - Yet, almost all writers use a word processor.
  - Why?

- A word processor supports writing in an Englebartian way.
  - What would an Englebartian tool look like that would support research?
What to researchers do?

- “Until very recently, research methods were not widely discussed in English studies … – research was what you did, and the best you could hope for was a brief introduction to the vagaries of the library.”
- “significant numbers of English studies academics in the UK” are still “surprisingly in- or possibly non-articulate about what they do to achieve … results”

Reading and Scholarship

- "Users have been introduced to all sorts of interesting things that can be done with computer analysis or electronic resources, but very few of them have been asked what it is that they do, and want to keep doing, which is to study texts by reading them." (highlighting mine)

Characteristics of scholarly research

- For many researchers, scholarly research is:
  - Derived from extensive reading
    - Across a broad range of sources (primary and secondary)
    - Intensive reading of key sources
  - ... and involves notetaking and annotation.
  - Notes contribute to the thinking about the materials that have been read.
  - Notes contribute to the work involved in publication, although this involves some degree of organisation of notes.


Three Phases of Research

- Reading and annotation (note-taking)
- Organising notes to find relationships
  - this is usually a personal, internal activity
  - organising principles for the notes emerge from intensive and extending thinking about the material and one's reaction to it.
    - naming and relating.
  - how can the computer help here?
    - "meta-structure"
- Publishing (in an article)
  - making public what one has found
Interpretation development as a personal activity

Scholarly Reading involves potentially many documents

“The scholar who claims to be current and knowledgeable in a field must have read closely and be intimately familiar with a large number of particular works”


Quoted in Brockman et al p 7
Scholarly Annotation

- “If … I really have to study, learn and absorb what’s in [something I’m reading], I make a photocopy and I write in the margins. And I underline, too. But I almost never underline without writing in the margin…Otherwise, I can find myself simply underlining, rather than absorbing”
  - quote in Brockman et al. 2001
  - Also evidence of this in Catherine Marshall’s research

Notetaking: a hidden phase of knowledge transmission

- “Note taking constitutes a central but often hidden phase in the transmission of knowledge” (p. 85)
- “… Michel Foucault reportedly expressed a desire to study copybooks of quotations because they seemed to him to be ‘works on the shelf…not imposed by the individual’; they promised to give quasi-psychoanalytic insight into the thinking of the individual reader free to choose what was worthy of attention” (p. 88)
Notetaking: for web pages
Notetaking: Acrobat/PDF file

Notetaking for non-digital objects

Note Content: here a bibli reference to the article

Notes taken during reading of the article

Containment organises them into two topics
Reading and Interpretation

“reading as an involving process, not as interpretation or decoding. It is reading as an experience and not as mere collection of data: it can lead to interpretation, but only by way of generating reactions that we subsequently seek to describe or explain”


What is Pliny? (II)

- A device to help think about some aspects of what interpretation is about in the humanities.
- As a piece of research, then, it builds on the research of others:
  - Computer Science: Spatial Hypertext, digital annotation: C Marshall et al
  - Social Sciences: Qualitative Analysis Tools, Nud*ist, NVivo
Interpretation Modelling: Formal Models?

- Formal models for interpretations:
- Database modelling
  - CCH’s “Factoid prosopography” approach
- Ontologies and Topic Maps
  - Examples related to the humanities:
    - Dublin Core, a simple ontology for documents and publishing.
    - WordNet Lexical reference system.
    - CIDOC CRM (Conceptual Reference Model) - an ontology for "cultural heritage information".

CIDOC-CRM

(From Martin Doerr, Stephen Stead "The CIDOC CRM, a Standard for the Integration of Cultural Information" (ICS-FORTH) Vienna 2002)
Humanities research is “pre-ontological”, and the result is only “partly-ontological”?

- Even if the results of humanities research could be usefully modelled using these kind of formal methods …
  - ... the effort of doing the research is “pre-ontological”, and progresses before the model has appeared.
- Even so, some aspects of humanities research shares some characteristics of formal modelling
  - Develops new concepts, naming of concepts, relating concepts to each other, grouping of objects of interest in these concepts
- However, I suspect that humanities research is only partly “ontological” and has to deal even when “finished”, with ambiguity and contradictory materials that makes fully formal modelling impractical
- What representation on the computer can cope with this kind of thing?

What modelling strategy can be used to support Interpretation Development?

- Hierarchical
  - Simpler representation and less “fuzzy”
  - Like “point form” for an argument
  - A strategy I often use in preparing a presentation
  - Can lead to a classification/categorisation approach
- 2D spatial
  - There is a history of reference to using 2D paradigm to organise collections of notes on note-cards.
  - Supports “visualisation”
  - “nearness” as a (usefully) “fuzzy” relationship
- Pliny supports both somewhat – an area where references to notes can be layed out, plus the possibility to place references to notes inside other notes (containment).
- Pliny allows its user to start off with 2D modelling, and then move to a less spatial (more hierarchical?) modelling strategy as material begins to gel into an interpretation.
Visualisation and 2D space


Giambattista Vico’s New Science (1725)
Concept Map in Pliny

Modelling an Interpretation: recontextualisation, layout, containment, naming
Preparing a presentation with Pliny

The connection between Pliny object forms one or more large connected graphs

Can viewing the objects this way provide new insights to the user?

Can Network Analysis techniques help?
Pliny objects as a connected graph: a “Mind Map”

An example of a mindmap
Graham Burnett (2005)

Planning Papers

“recontextualising”
What is Pliny? (III)

- A way of thinking about software development for humanities tools that promotes interaction between tools
- ... and exposing a way of thinking about connecting DH software tools (say, a text mining environment) with personal scholarly interpretation.

Pliny’s “second agenda”

- Exploring the special significance of annotation with regard to modularity
- Exploring the “eclipse plugin” paradigm for modularity, and its implications
  - Allowing independently written tools to coexist in various intimate ways ...
  - ... including sharing the screen.
Pliny and software tool collaboration: significance of annotation

From show about damaged books (!) at Cambridge University Library

The page is at the “nexus”

Publishing Application
• Preparing text
• Book design and presentation
• Printing
• Distribution
• The printing press

Annotation Application
• Support dynamic text
• Support using of annotations
• The pen

The page is the nexus between publishing and annotation
The screen as the “nexus”

PDF Viewer
- Reading PDF file
- Layout on the screen
- Supporting page turning, etc

Pliny
- Support display of annotations
- Manage notes and anchors
- Support work with notes

Annotation and Modularity: Annotating Everything

- Scholars work with a great range of print (and now digital) materials
- If we want scholars to be digital tool users as well we must include digital tools among the set of resources they use
- They will need to be able to annotate in the tools as well.
Annotating Everything: images

Annotating other media

- Pliny could be extended to support annotation of video and audio resources as well.
- Pliny should be extended to support bibliographic data.
Annotating Everything: application output

Software output from: Bradley and Rockwell (1997). Simweb Correspondence Analysis Visualizer. URL: http://tactweb.mcmaster.ca/cgi-bin/simweb/simweb.bat

Annotating everything: process descriptions

Comments added by researcher while building the flow diagram
The Virtual Lightbox for Museums and Archives (VLMA) is a framework developed by University of Reading, the Max Planck Institute for the History of Science and Oxford Archaeology which gives a user access to an RDF server managing metadata about images, and the images themselves.

VLMA’s standalone application

VLMA as a plugin with Pliny Annotations

Resource Browser from the VLMA plugin

Object viewer from the VLMA plugin

Annotations from the Pliny plugin
Pliny and VLMA

Reference to a VLMA object

GoogleMap Annotation Tool

Sabratha: a World Heritage site in Northern Libya.
I am thankful for the help of my friend and colleague Hafed Walda at CCH.
KWIC Concordance Tool

THE INFLUENCE OF RAPIER FENCING ON HAMLET

There is a special procedure in the Box of a Speaker (BOS).

Vercingetorix’s announcement in Exile from London indicates the death of the once-great Roman legate and the end of the Gallic rebellion. The Roman army is defeated, the legate is captured, and the Gallic chieftain is executed. Despite these setbacks, the Gallic chieftain continues to fight on, seeking revenge for his people and the loss of their homeland. His determination is a testament to the resilience of the Gallic people, even in the face of adversity.

The presence of the Roman army in the city of Alesia is a result of a long and difficult battle. Despite the odds, the Gallic chieftain and his army continue to resist, hoping to secure their freedom and independence. Their perseverance is a symbol of the courage and determination of the Gallic people, who will not be discouraged by their losses.

In conclusion, the influence of rapier fencing on Hamlet is a complex and multi-dimensional theme that reflects the larger historical and political context of the time. The focus on the role of the fencing master as a mentor and guide to Hamlet highlights the importance of mentorship and the influence of the past on the present. The theme is also a reflection of the broader cultural, political, and social changes taking place in the Shakespearean era, and its impact on the development of the character and the play as a whole.
Annotation as a kind of “glue” between applications
Contribution model

- It is (relatively) easy to add new components (as plugins) into Pliny/Eclipse, and allow them to communicate with each other. This has lead to the language used in Eclipse of a plugin object “making a contribution” to the operation of another plugin.

- Examples for Pliny
  - contributing support for new data formats to Pliny:
    - An plugin could be developed for video or audio that stored its annotations in a Pliny format to allow them to appear on other Pliny screens.
    - A plugin could be developed to support Pliny-like annotation of XML/TEI documents directly.
    - A plugin could be developed to store bibliographic materials that integrated with Pliny
  - Pliny can contribute annotation support to other plugins (such as the VLMA example)

Tool Modularity: Pliny and Eclipse

- Pliny takes a modular approach to tool component design based on the Eclipse (http://www.eclipse.org) model.

- Eclipse (and Pliny) supports modularity in ways other than just file-sharing and/or pipe-lining (although, of course, it provides for these too).

- Much of Eclipse is designed to allow for a sense of integration at the GUI level – on the screen – between separately built components.
Plugins

- In Eclipse a plugin provides a package framework for a single tool.
- Plugins can contain GUI elements (called views or editors by Eclipse) that can display in panes on the screen.
- In Eclipse one simply places plugin objects in Eclipse’s (or Pliny’s) plugin folder to “install them.”

Other roles for Plugins

- Plugins represent points where software can be written independently and can be developed out of the expertise of others.

- So far, all the plugins have been focused on supporting new resource types, but plugins for other purposes are also possible, e.g.:
  - Network analysis of the Pliny database
  - Exporter of a note collection into a usefully ordered textual document
What is Pliny? (IV)

- Pliny, the software, is a Prototype.
  - .. Used as a way to explore issues related to computing and scholarship.
    - It has an element of “practice-led” research about it.
  - By developing Pliny and making it available for others to use I was hoping to promote some thinking and discussion about the things that Pliny tries to deal with.

- To have any hope of achieving this, it was necessary to make Pliny available (unlike prototype software developed within computer science research).
  - ... Perhaps in the same kind of way that, by producing an art-work from “practice-led” research, issues embedded in the object are meant to promote related thinking by others.

“Practice-led” research

“The Research Grants – practice-led and applied route provides funding for research where:
- practice is an integral component
- it is specifically undertaken with a view to generating outputs and outcomes with a defined application beyond the education sector; and/or
- It theorises contemporary practice in order to inform the Principal Investigator's own individual practice.”

- AHRC Research Funding Guide, Version 1.8, December 2009, p. 16

- The AHRC Practice-lead research model has been developed to fund artistic expression that is also research-oriented
- Can it be extended to something like Pliny?
Pliny as free software

- Can Pliny, the software, simultaneously be a free piece of software for people like you and me to use?
- Where is the infrastructure to support Pliny in this way to come from?

What kind of software is Pliny?

- Is it:
  - a tool in the open source paradigm, or
  - software like that produced in Computer Science: to explore ideas by me, the researcher?

- Clearly, by now, one can see that it is a bit of both. Can this be achieved?
Community Acceptance:
“But *Pliny* is not browser based!!”

- Will a user community take it up?

- well… scholars have learned to operate the word processor when it proved to be useful to them, and they now use both email and the browser itself.

- In each case there were originally complaints that these tools were not “natural” – not “user friendly”

- Pliny is built on top of the Eclipse plugin framework

- The Eclipse plugin model allows new tools to be easily added that share elements of interface design – making them at least somewhat easier to adopt.

Implications of Software Development in the DH

- The benefits of integration for modular and independent toolkit development are available within the Eclipse framework, and I believe are obvious.

- The benefits come at a cost, however:
  - Eclipse creates applications, not web sites. Tools such HTML, CSS, XML and XSLT provide only peripheral assistance to application development.
  - The Eclipse framework operates within Java, but is not built on the more familiar Sun-Java AWT/Swing/Applets platforms, and will therefore need to be learned by most Java programmers.
  - Development of tools in this way requires a highly professional attitude to software development, that might go beyond the resources available to many in the humanities.
Is Pliny failing?

- Pliny is too difficult and too foreign (!) for beginners
- Better interface design needed for Pliny?
- Pliny needs to support collaborative research.
- The Englebartian nature of Pliny means that it disappears.
- Pliny needs a marketing plan?

Try it yourself.

- Pliny software is available from: http://pliny.cch.kcl.ac.uk
- For developers:
  - the Pliny API and some developer documentation is published as well.
  - Source code for Pliny is available from SourceForge
- Let me know what you think: john.bradley@kcl.ac.uk