Enhancing Evidentiary Work through the Lens of Human Centered Computing

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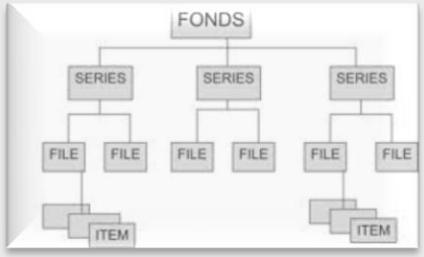
Collaboration with Luis Francisco-Revilla, UT iSchool

Augmented Processing Table

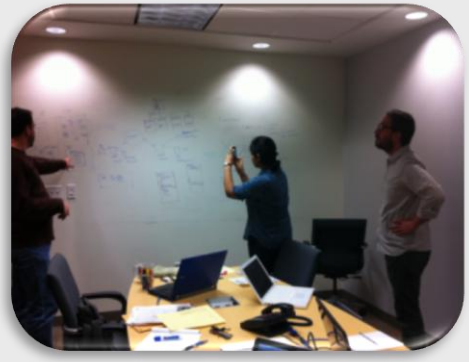
- APT is a collaborative research project bridging the fields of Archival Science and Human Computer Interaction (HCI), based at The University of Texas iSchool
- The project as a whole seeks to understand best practices and deploy surface-computing technologies towards the activity of archival processing.
  - Processing: How we prepare collections for use
- *Problem Statement*: Archival processing is costly, complex, time-consuming, and poorly understood in practice. How do archivists produce a physical and intellectual arrangement? How might technology enhance this process?



APT Web: *everest.ischool.utexas.edu/apt/*

- *Evidentiary work* involves:
  - Use of documents and associated supplemental constructs by those researchers engaged in evidence building
  - Preparation of the collection and associated supplemental constructs to support users in doing evidentiary work. Such arrangement work represents archivists' added value, and helps answer the questions: "What is it that arrangement *does* to a collection? Why arrange?"
- Arrangement creates *evidentiary layers*:
  - Archivists represent the relationships between records by constructing a hierarchical arrangement scheme
  - Places an object in a contextual relationship within the collection that reveals its value as evidence

Design and Implementation









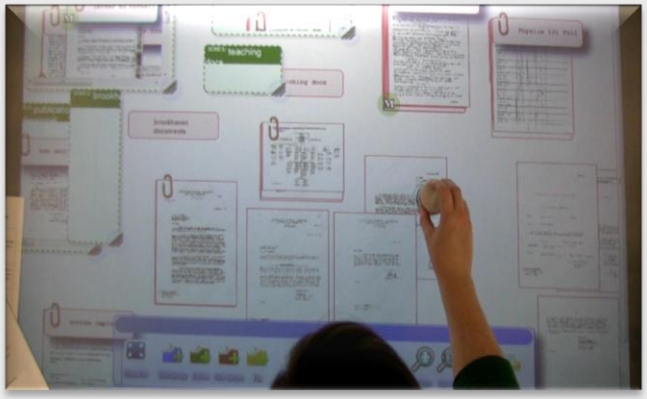
Hardware

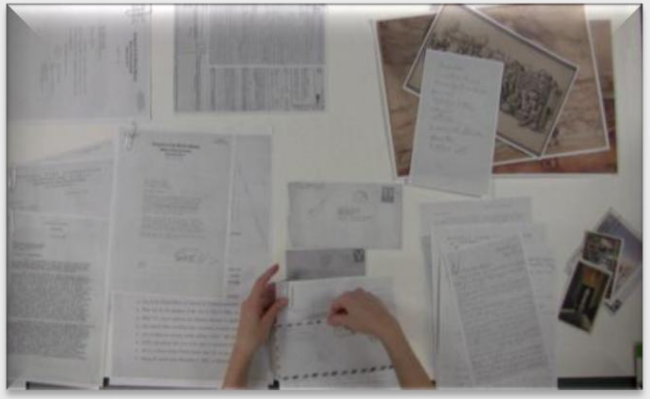
APT is a bespoke 5'x5' standing-height interactive tabletop (47" x 28" interactive area). APT uses the rear Diffused Surface Illumination (DSI) technique to provide multi-touch support.

Software

The client side of the application is written in JavaScript and HTML, utilizing the jQuery and Fabric.js frameworks, running in a touch-enabled web browser. It supports both touch and mouse input.

Processing using APT (images on the left) and the baseline (image on the right)





Augmented Processing Table

- Prototype I was completed Spring 2012 and evaluated via a pluralistic walkthrough
  - *[Jeff Crow, Luis Francisco-Revilla, April Norris, Shilpa Shukla, and Ciaran Trace, "A Unique Arrangement: Organizing Collections for Digital Archives and Libraries" in International Conference on Theory and Practice of Digital Libraries (TPDL 2012). Paphos, Cyprus. September 23-27, 2012, Lecture Notes in Computer Science (LNCS) 3232, Springer-Verlag, Berlin, Germany, pp. 335-344.]*

- Prototype II was evaluated in June/July 2012 via a lab-based comparative usability study involving 16 participants

APT Research Methods

- Study Design (APT 2.0):
  - Balanced experimental design with 8 conditions:
    - 2 systems: Baseline/Paper, APT/Digital
    - 2 collections: Estelle Ishigo, Samuel Goudsmit
    - 2 sessions: each 2-3 hours (+exit interview)

Group	Task 1		Task 2	
A	Paper	Ishigo	Digital	Goudsmit
B	Digital	Goudsmit	Paper	Ishigo
C	Digital	Ishigo	Paper	Goudsmit
D	Paper	Goudsmit	Digital	Ishigo

Findings

	QUALITY		TOPOLOGY		PROCESS		
	Errors	Scores	Description	Average	Phases	Styles	Time
PAPER	✔	✔	✔	✔	✔	✔	✔
DIGITAL	✔	✔	✔	✔	✔	✔	✔
CORRELA-TIONS	✔	✔	✔	✔	✔	✔	✔

Also have demographic/survey data and interview data

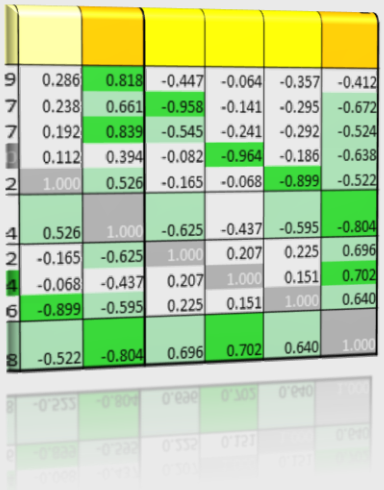
APT Results : a selection

- New metrics to understand arrangement: **Process**
  - Activity Phases
    - We identified five phases of activity completed during processing, from an initial collection review to a final presentation.
      - ***Collection Review [CR]***, ***General Document Examination [GDE]***, ***Iterative document examination [IDE]***, ***Organization [ORG]***, *and* ***Presentation [PRES]***
  - Processing Styles
    - The phase appearances clustered into five processing styles, each a “composite archivist” who completes some mixture of the above activity phases!

APT Results : a selection

- New metrics to understand arrangement: **Process**

Workflow <-> Time Correlation



more	**CR**	<-->	less	ORG
more	**CR**	<-->	less	Total Time
more	GDE	<-->	more	Total Time
more	GDE/ORG	<-->	more	Total Time
more	ORG	<-->	more	Total Time
more	Bugs	<-->	more	GDE
more	Bugs	<-->	more	ORG

APT Results : a selection

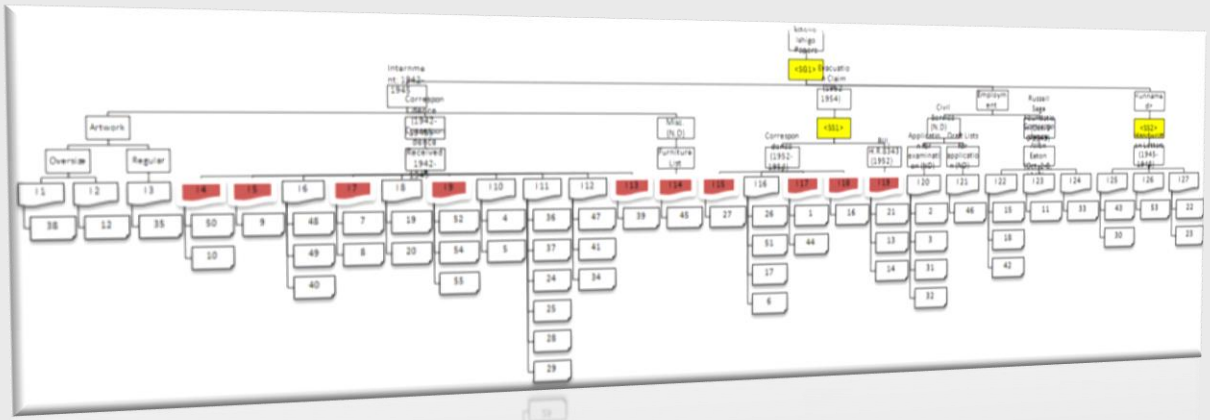
– **Quality**: Evaluated according to an arrangement's internal errors and its score. There are two types of matching errors: splits and merges.

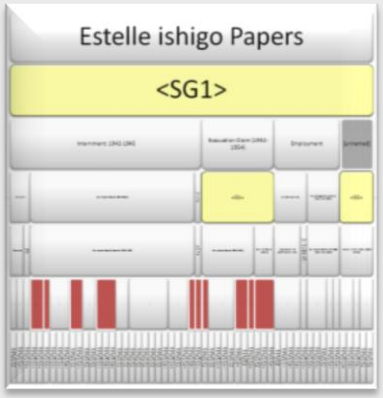
APT Results : a selection

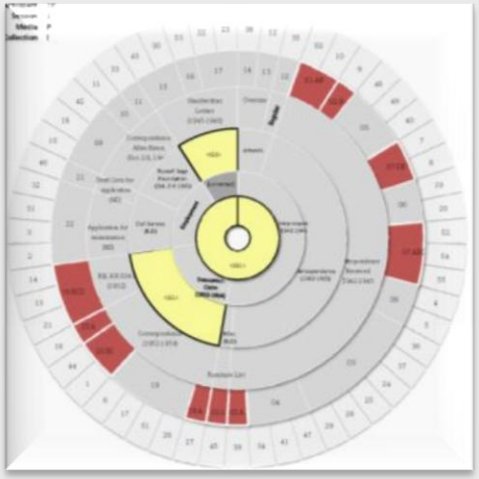
- New metrics to understand arrangement: **Quality**
  - We developed new metrics with which to **score** the quality of an arrangement:
  - Three of these metrics resulted in a ranking:
    - ***Narrativity*** (whether the arrangement accurately reflected the life of the creator)
    - ***Record-keeping*** (whether the arrangement reflected the record keeping practices of the creator)
    - ***Materiality*** (whether the arrangement expressed the types of material contained in the collection)
  - Two of these metrics resulted in an absolute value or score:
    - ***Perspective*** (whether the arrangement explicitly reveals the meta-level context of the materials)
    - ***Coherence*** (whether the arrangement follows the archival rules and established a coherent structure).

APT Results : a selection

- New metrics to understand arrangement: **Topology**







Statistical Significant Differences for APT:

- More real and total sub-groups ($p<0.02$)
- More phantom series ($p<0.02$)
- Less phantom sub-series ($p<0.04$)

APT Findings: Interview Data

- Preliminary themes identified in the course of arranging:
  - Strategies for completing an arrangement:
    - P5: “I look at the biography and the timeline, and I try to figure out what was important to that particular, in this case, person.”
  - *Meaning* of different activities (pile, clip, label, match):
    - P1: “I create piles according to, I guess type of document.”
  - Distorted principles?: Evidentiary layer or ‘subsequent user’
    - P2: "If there’s almost no original order … I’m thinking more along the lines of the researcher. If there’s some kind of original order, more the creator, because they put them in that order for a reason."
  - Better work through APT:
    - P16: "I could see dates. And like those, the three that I kind of got lazy about at the end, I could put those together correctly more quickly.”

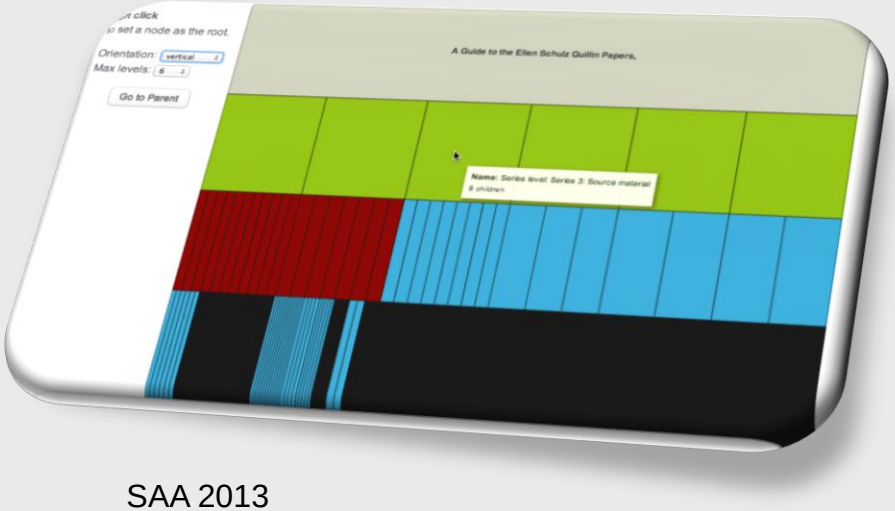
Conclusion: *"to err is human"*

- Opening the black box of arrangement:
  - A human activity performed imperfectly
  - Similar activity phases yet dissimilar outcomes
  - Ciaran's "subgroup crisis"
- Are archival principles observably put into practice?
  - High time to teach arrangement differently?
- Build technology to support these principles
  - Scaling up APT:
    - Very large collections
    - Regional repository level [VADA]
- **Ref.**: Crow, Francisco-Revilla, Norris, Shukla, Trace, "A Unique Arrangement: Organizing Collections for Digital Libraries, Archives, and Repositories," in *2nd Conference on Theory and Practice of Digital Libraries* (2012), pp. 335-344.

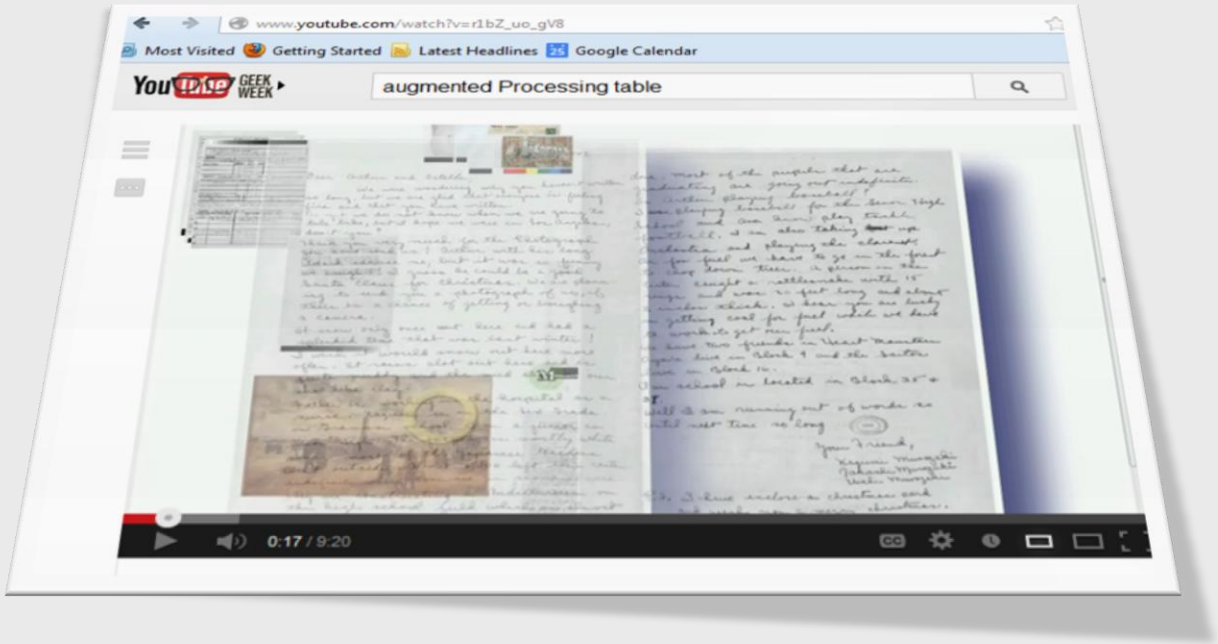
APT: Further Research & Next Steps

- Visualizing Archival Data (VADA)
- Capitalizing on an understanding of archival arrangements as hierarchical visualizations
  - At the level of a collection
  - At the level of an archival institution
  - At the regional consortia level through EAD conversions

A collection:



APT: Demo



Search "Augmented Processing Table" on YouTube