A workflow learning model to improve geovisual analytics utility

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context: Geovisual Analytics and G-EX Portal

goal: Successful Software

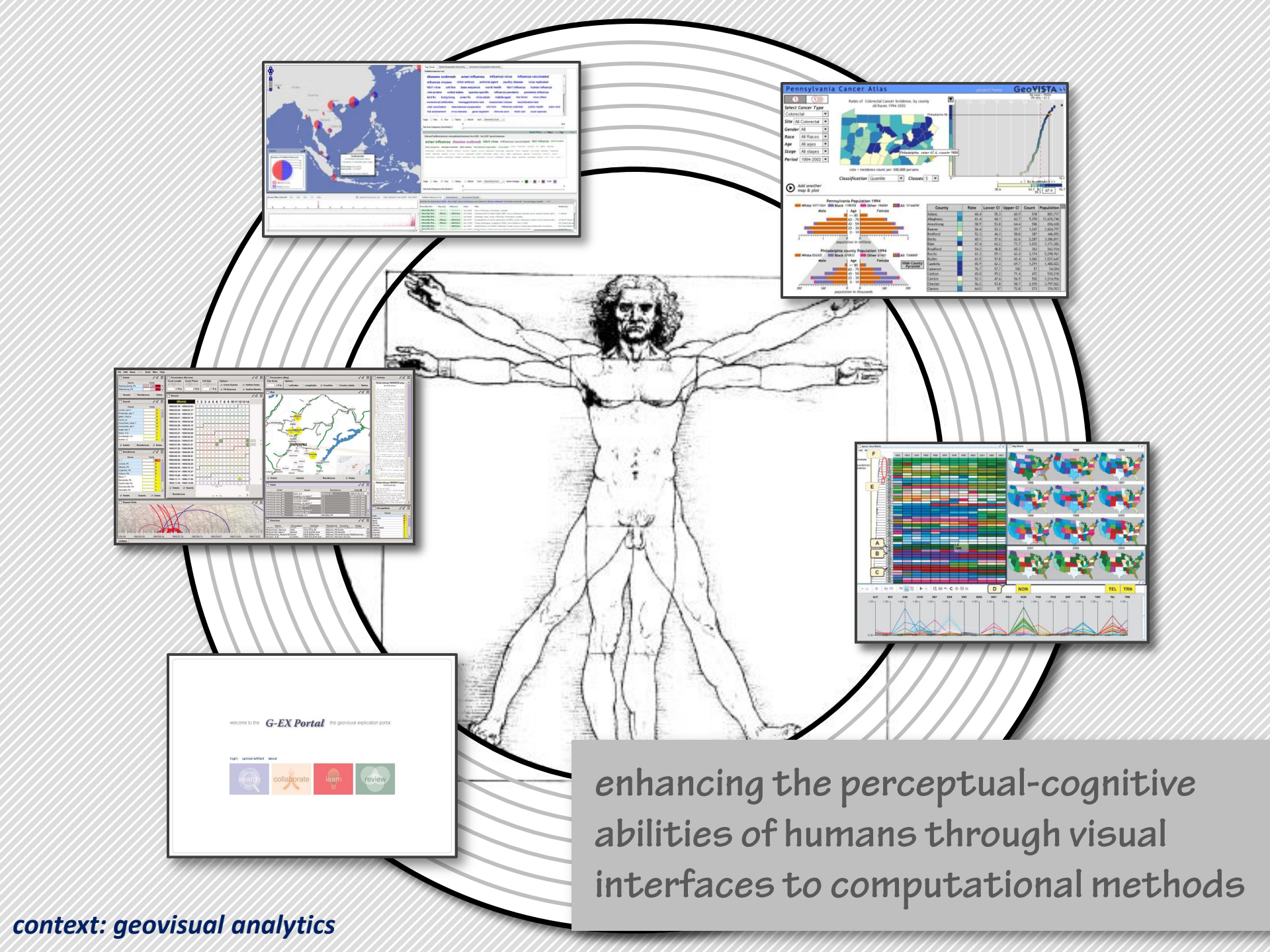
approach: Workflow Learning Model

context: geovisual analytics

vs. interactive cartography/geovisualization

human reasoning or *sensemaking*
of geospatial datasets that are:

1. voluminous
2. heterogeneous
3. spatio-temporal
4. multivariate



enhancing the perceptual-cognitive abilities of humans through visual interfaces to computational methods

context: geovisual analytics

G-EX Portal

Geovisual Explication Web Portal

The G-EX Portal: Web-Based Dissemination of Geovisual Analytic Results

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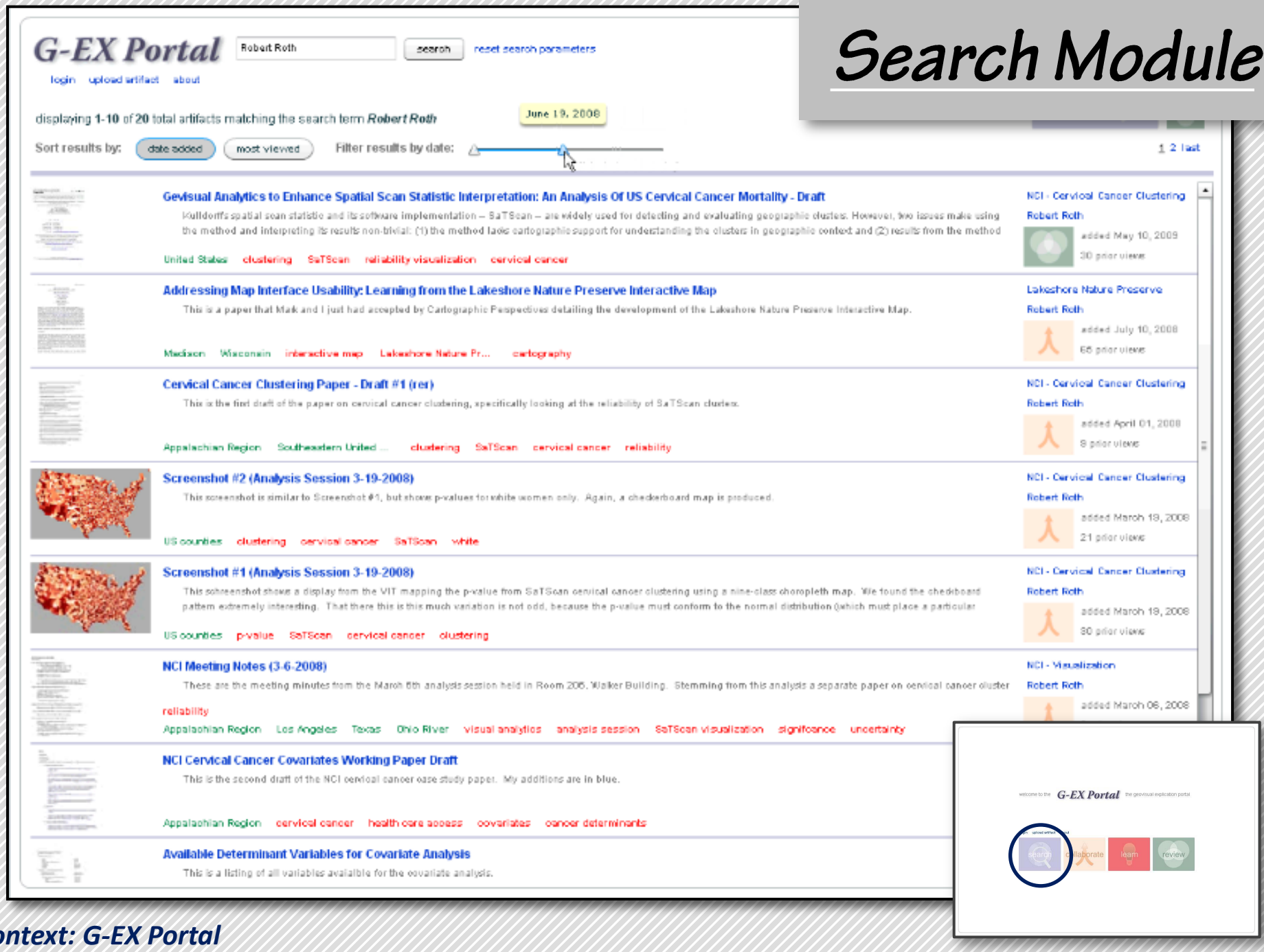
Abstract

Here we present work in progress on the G-EX Portal, a web repository designed to facilitate investigator-to-investigator research dissemination on the application of geographic exploration and analysis tools in cancer control and surveillance. The G-EX Portal is intended to serve four major tasks: to provide access to interactive tutorials for

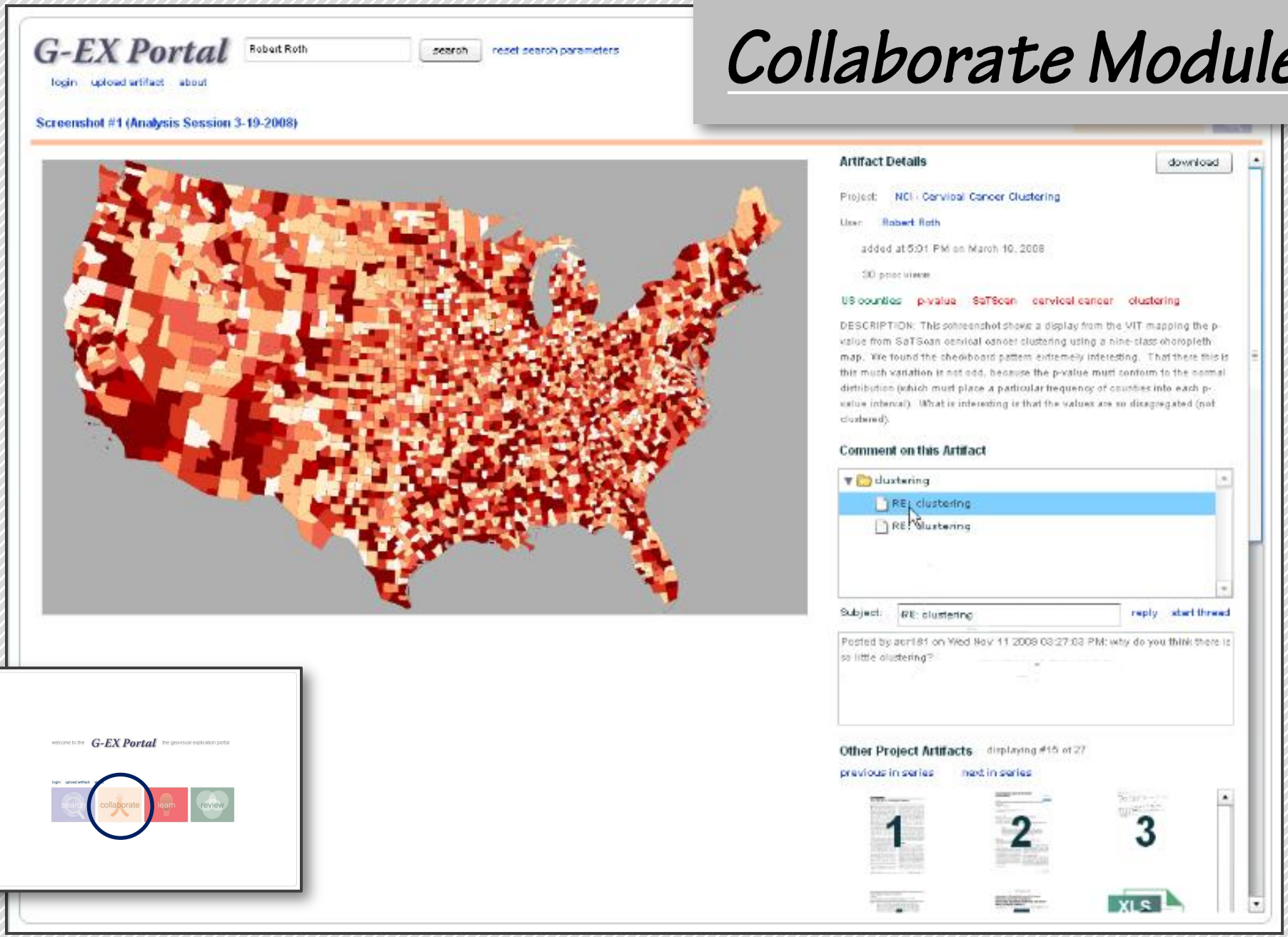
context: G-EX Portal

Search Module



context: G-EX Portal

Collaborate Module



context: G-EX Portal

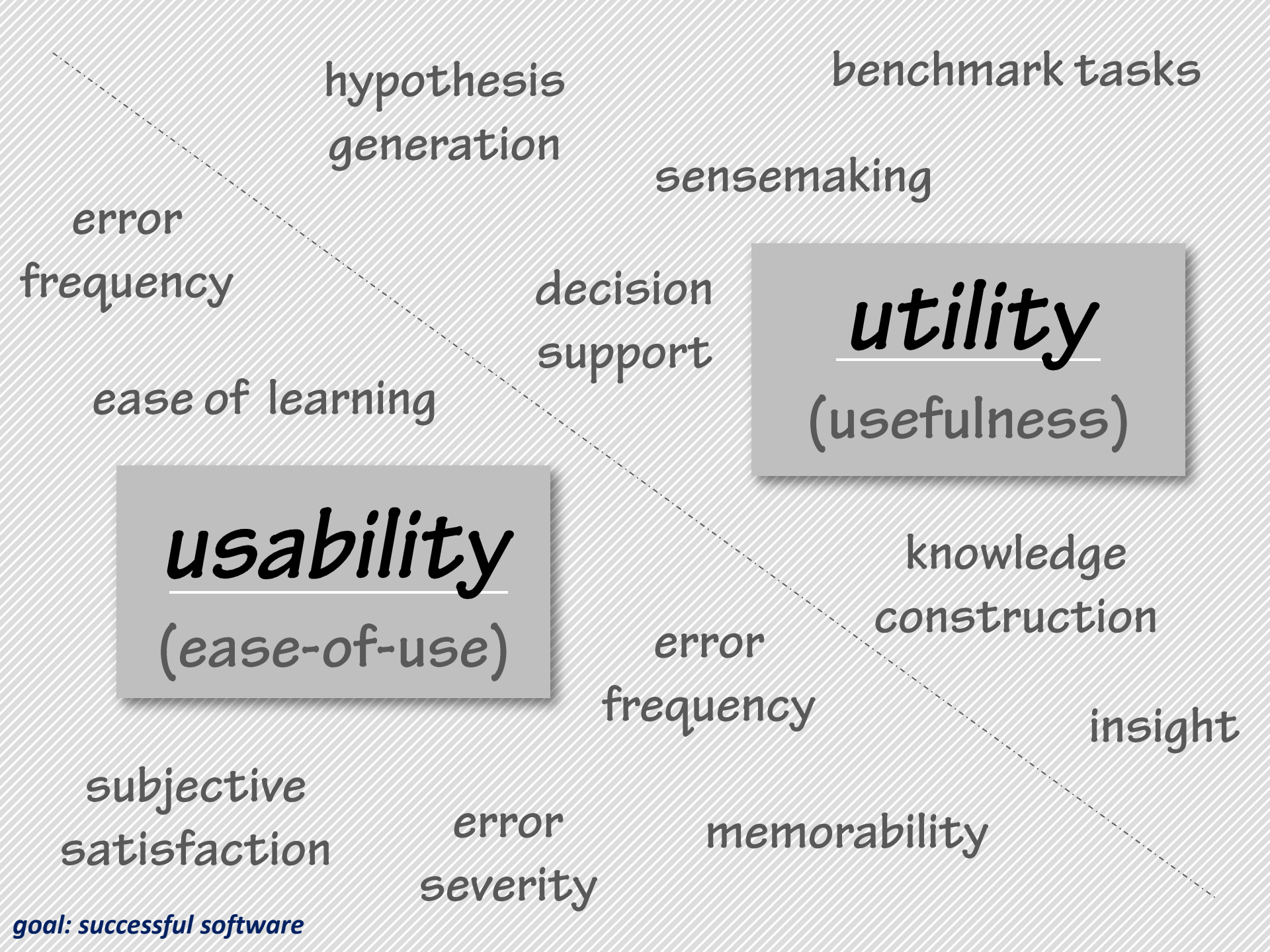
conceptual goal

techniques that successfully support geovisual analytics

implementational goal

software that successfully implement these geovisual analytics techniques

goal: successful software


hypothesis generation
benchmark tasks
sensemaking
error frequency
decision support
utility
(usefulness)
ease of learning
usability
(ease-of-use)
knowledge construction
error frequency
insight
subjective satisfaction
error severity
memorability
goal: successful software

iPod Shuffle

- transparently usable
- limited utility

RothPod Shuffle

- poor usability
- expanded utility

goal: successful software

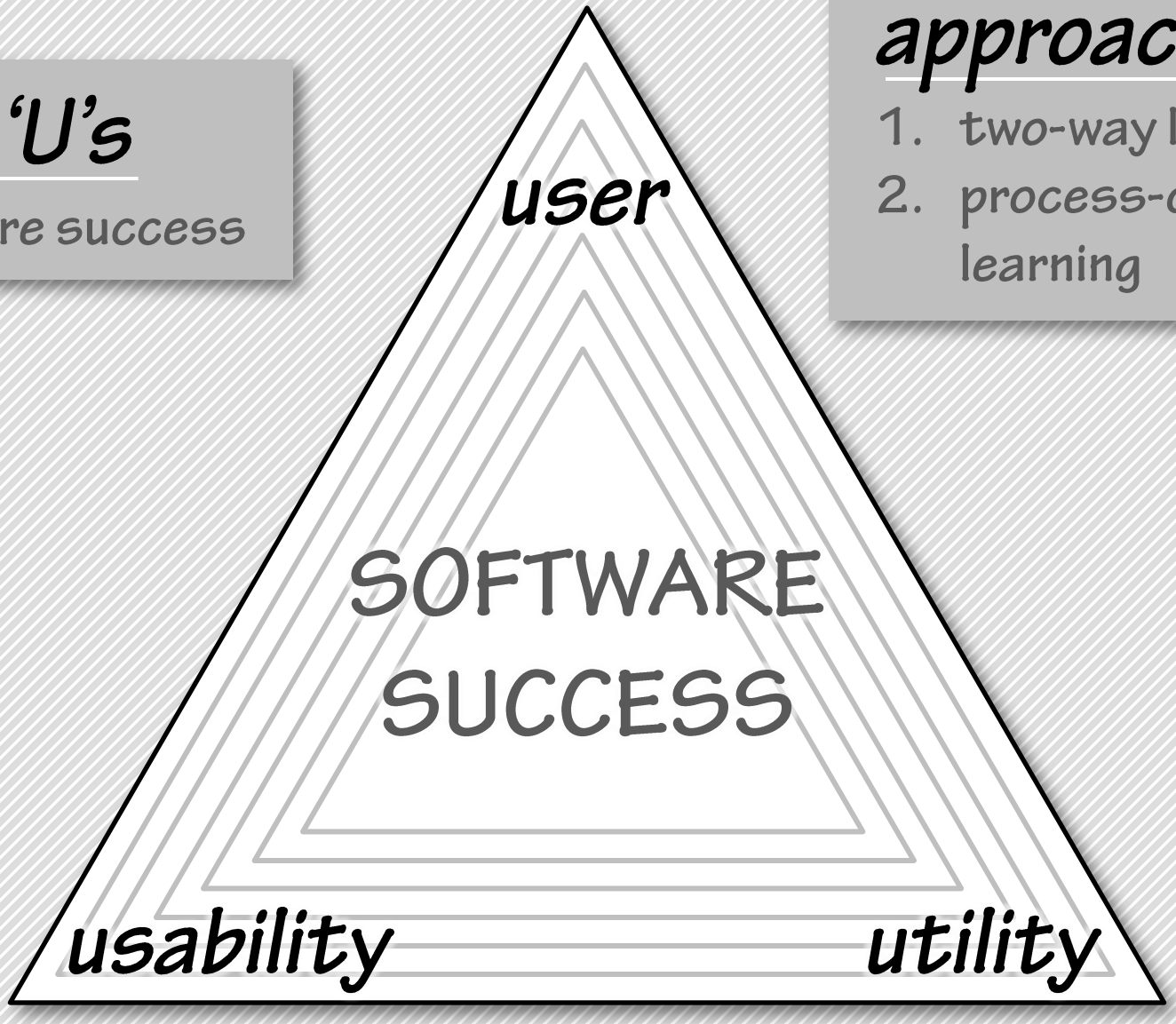
useful, difficult to use

Weaver et al. (2007)

goal: successful software

three 'U's

of software success

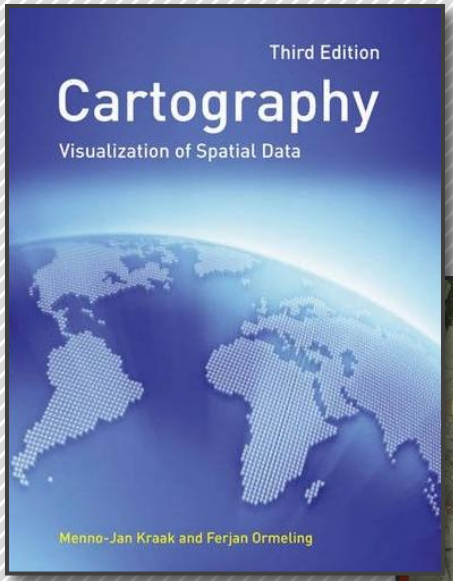


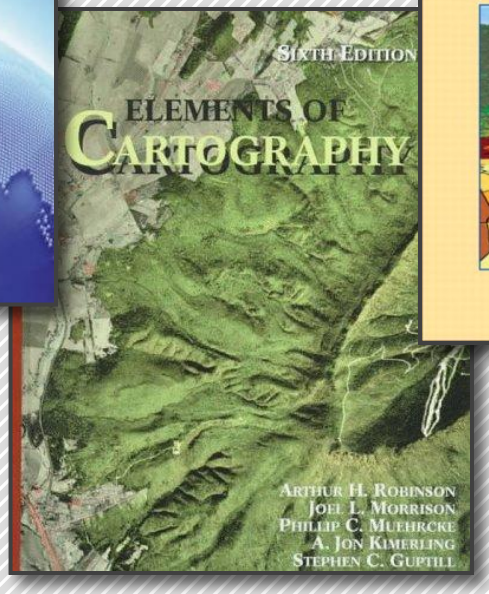
approaches

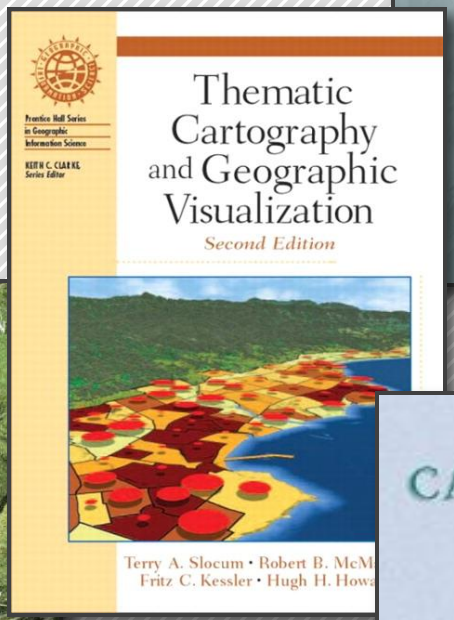
1. two-way learning
2. process-oriented learning

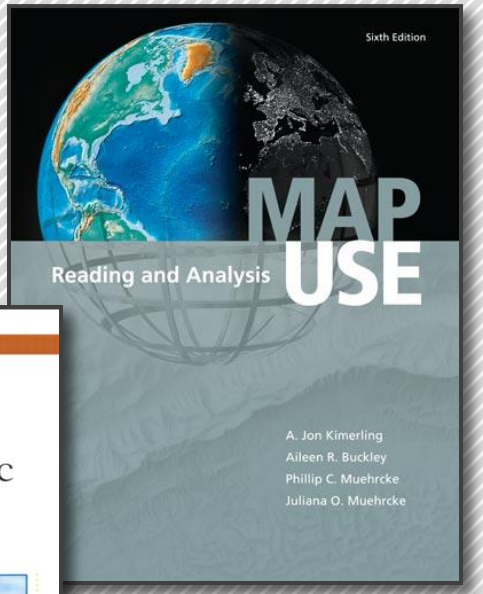
one-way learning

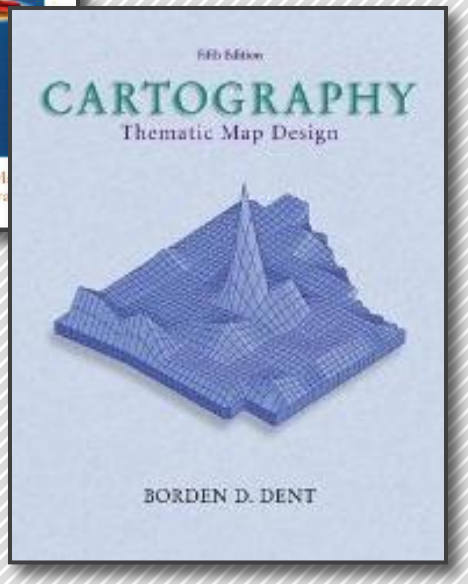
one teacher, many students, little interaction





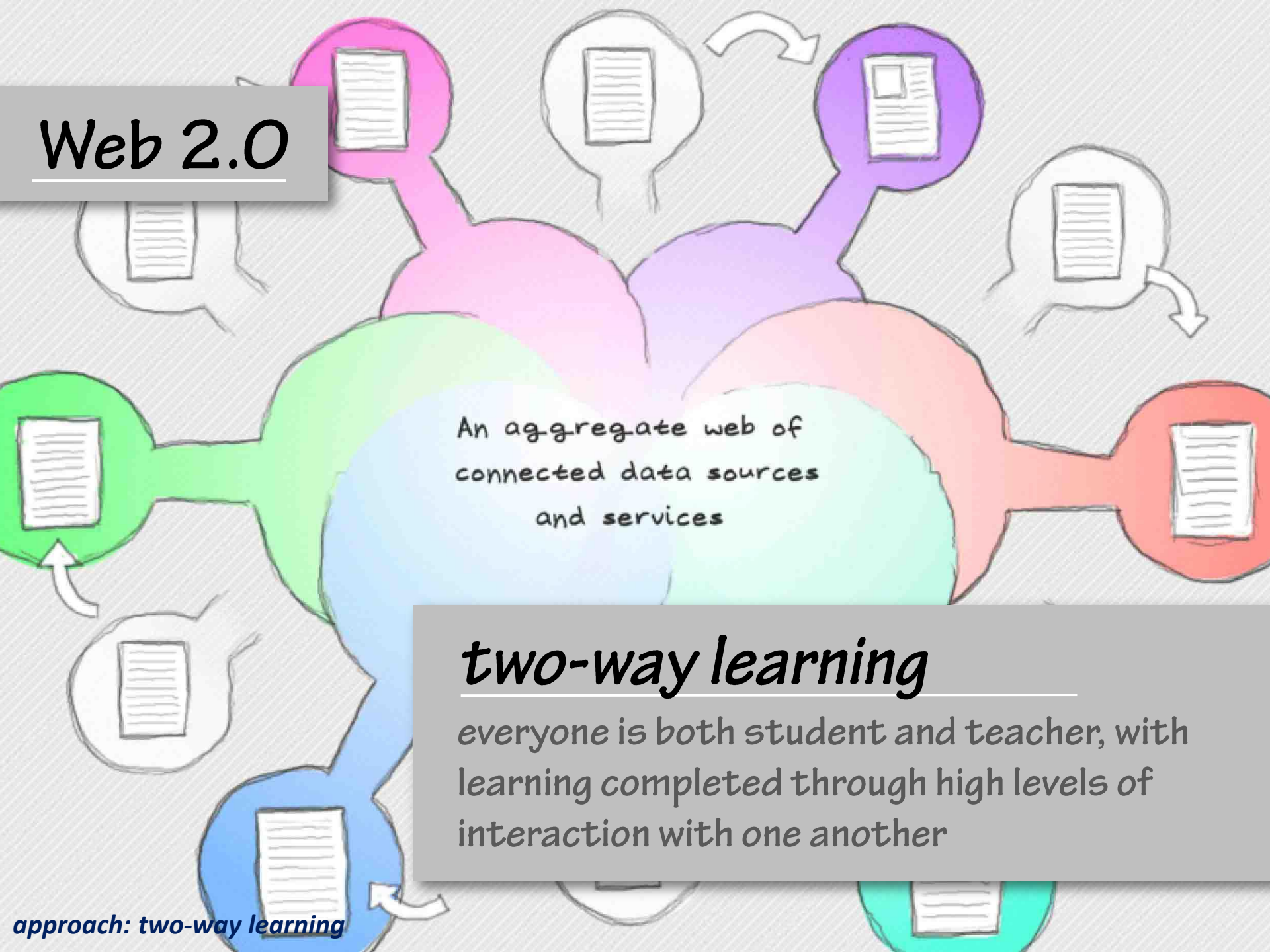






approach: two-way learning

Web 2.0



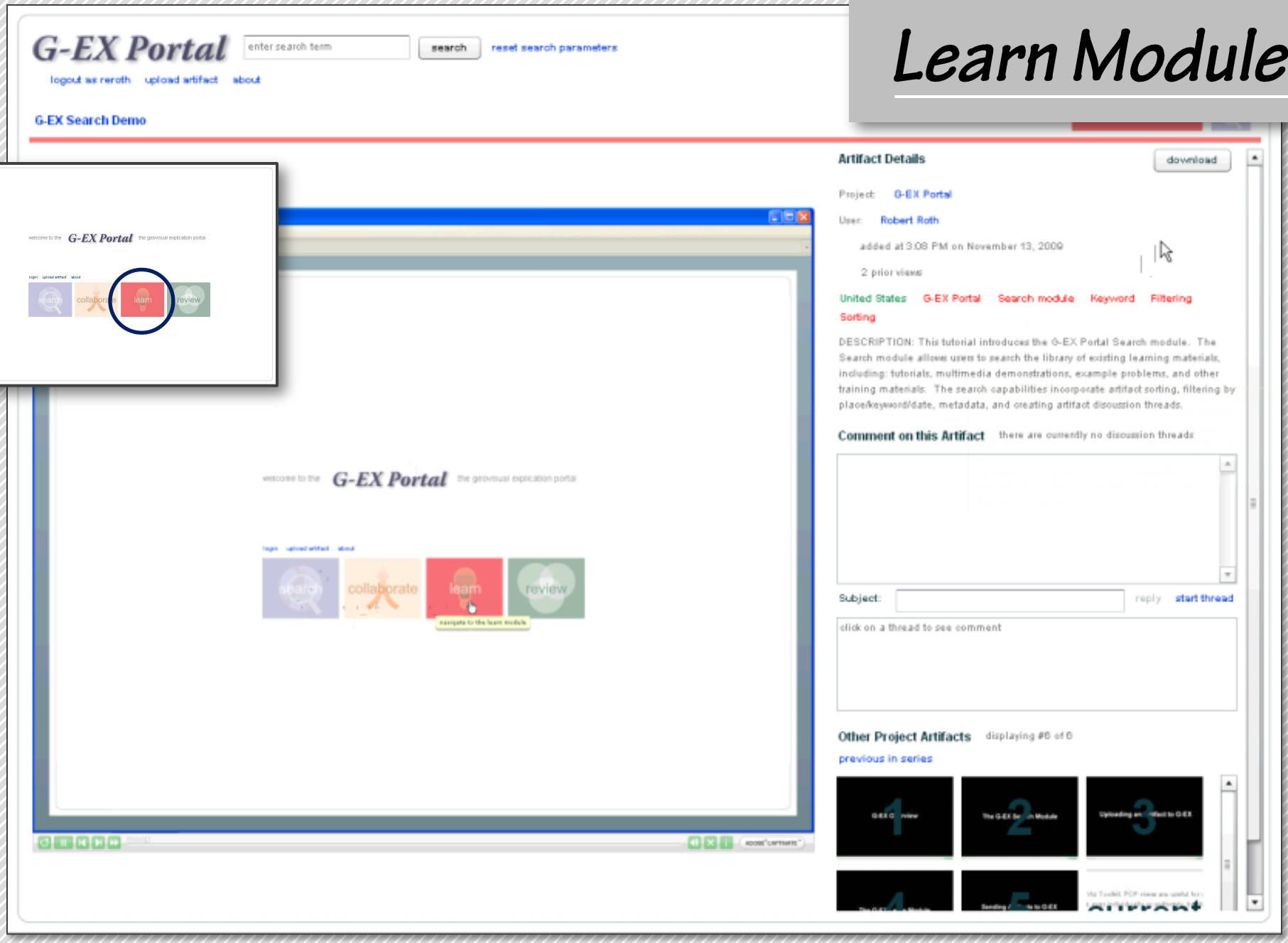
two-way learning

everyone is both student and teacher, with learning completed through high levels of interaction with one another

artifact upload

approach: two-way learning

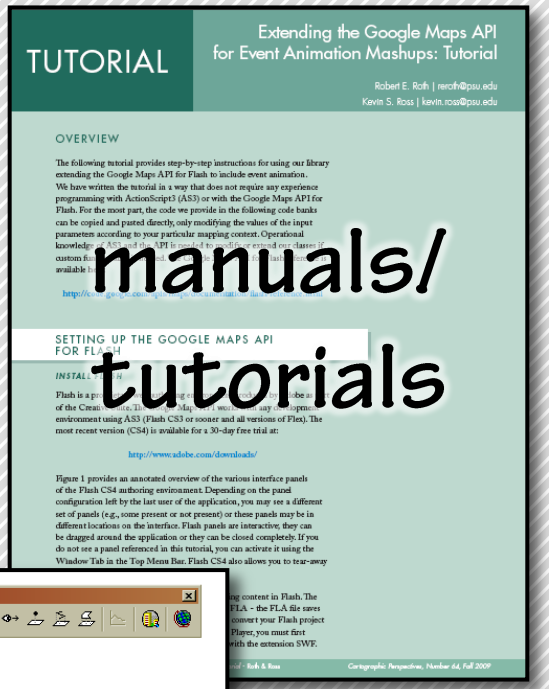
Learn Module



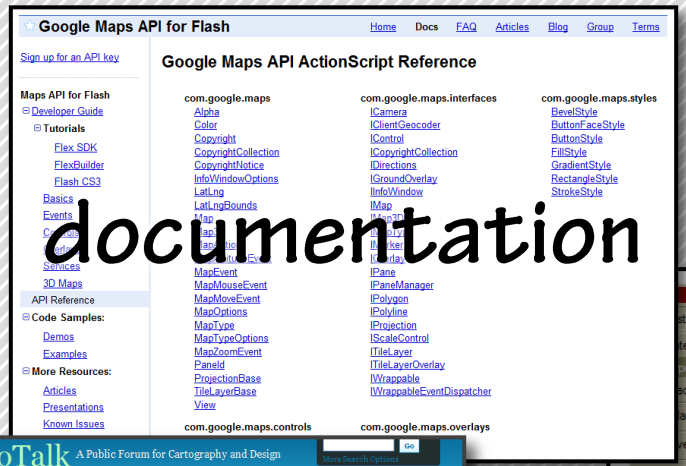
approach: two-way learning

task-oriented learning

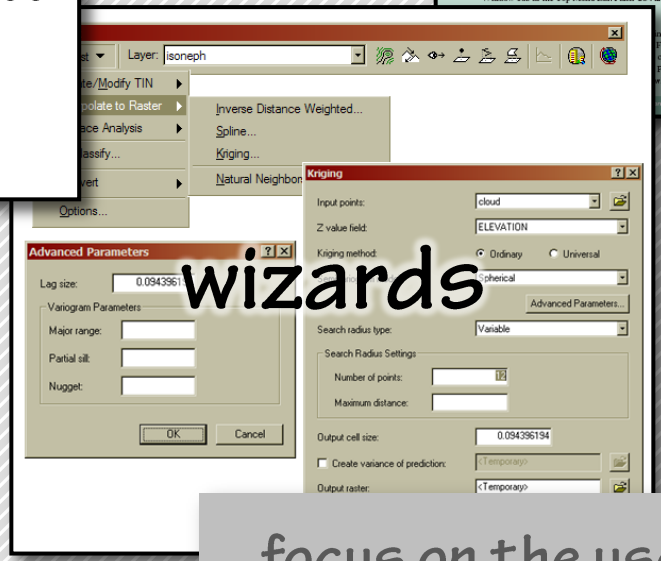
linear completion of learning modules



manuals/ tutorials



documentation



wizards

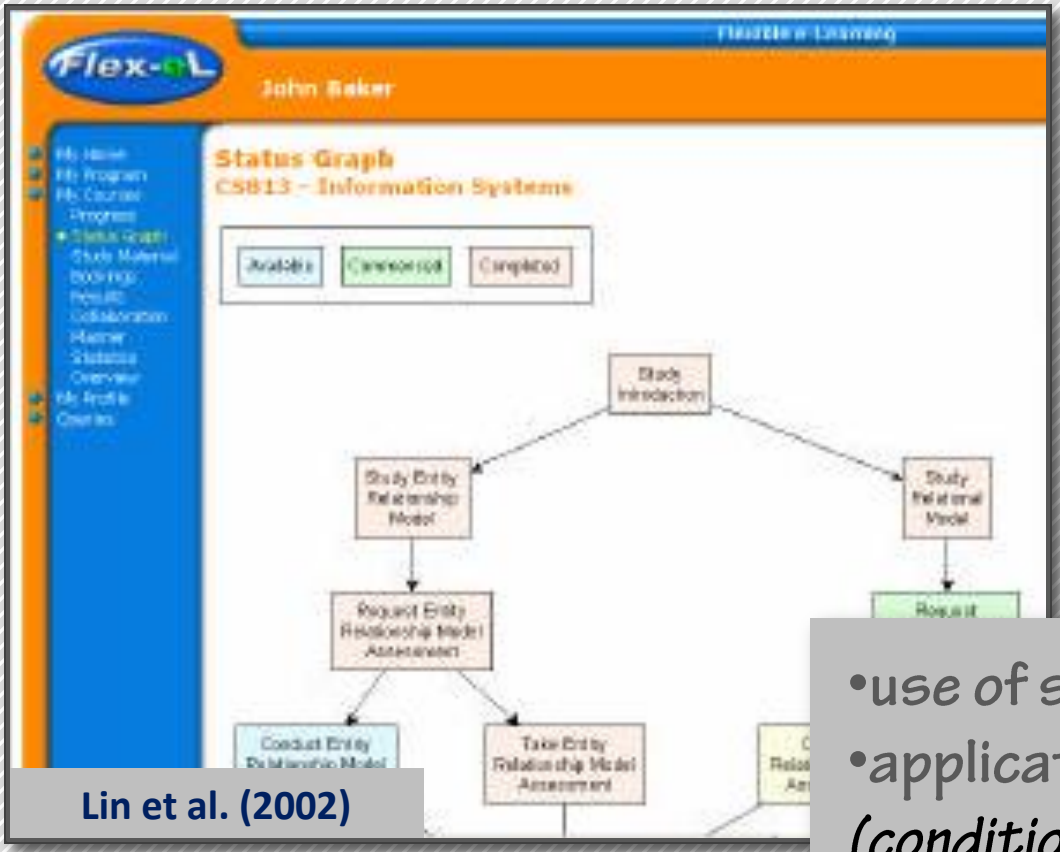
discussion boards

focus on the use of software (i.e., button clicking)

approach: process-oriented learning

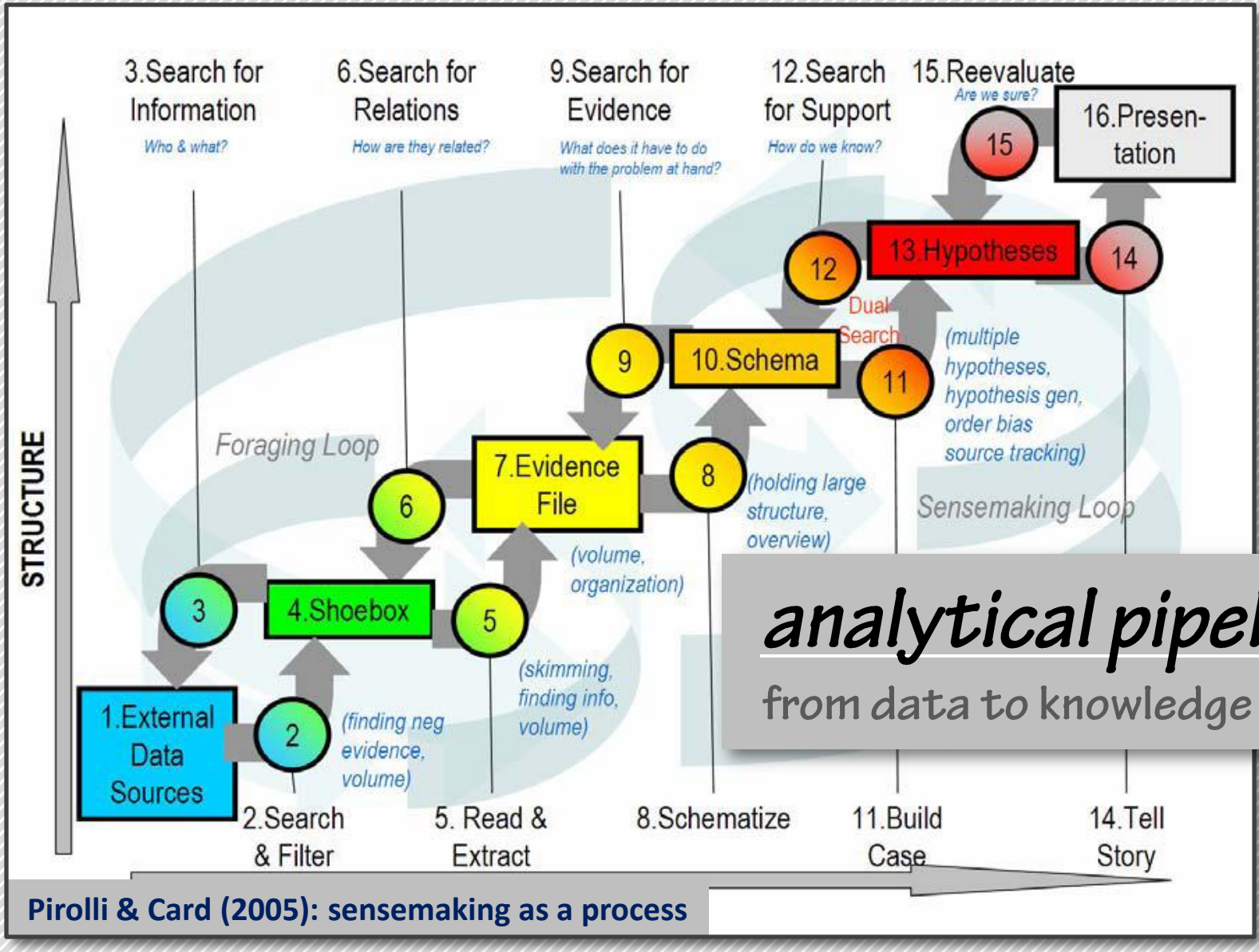
process-oriented learning

conditioned and iterative completion of learning modules in the workflow representation



Lin et al. (2002)

- use of software *(the nodes)*
- application of software *(conditionals & connections)*

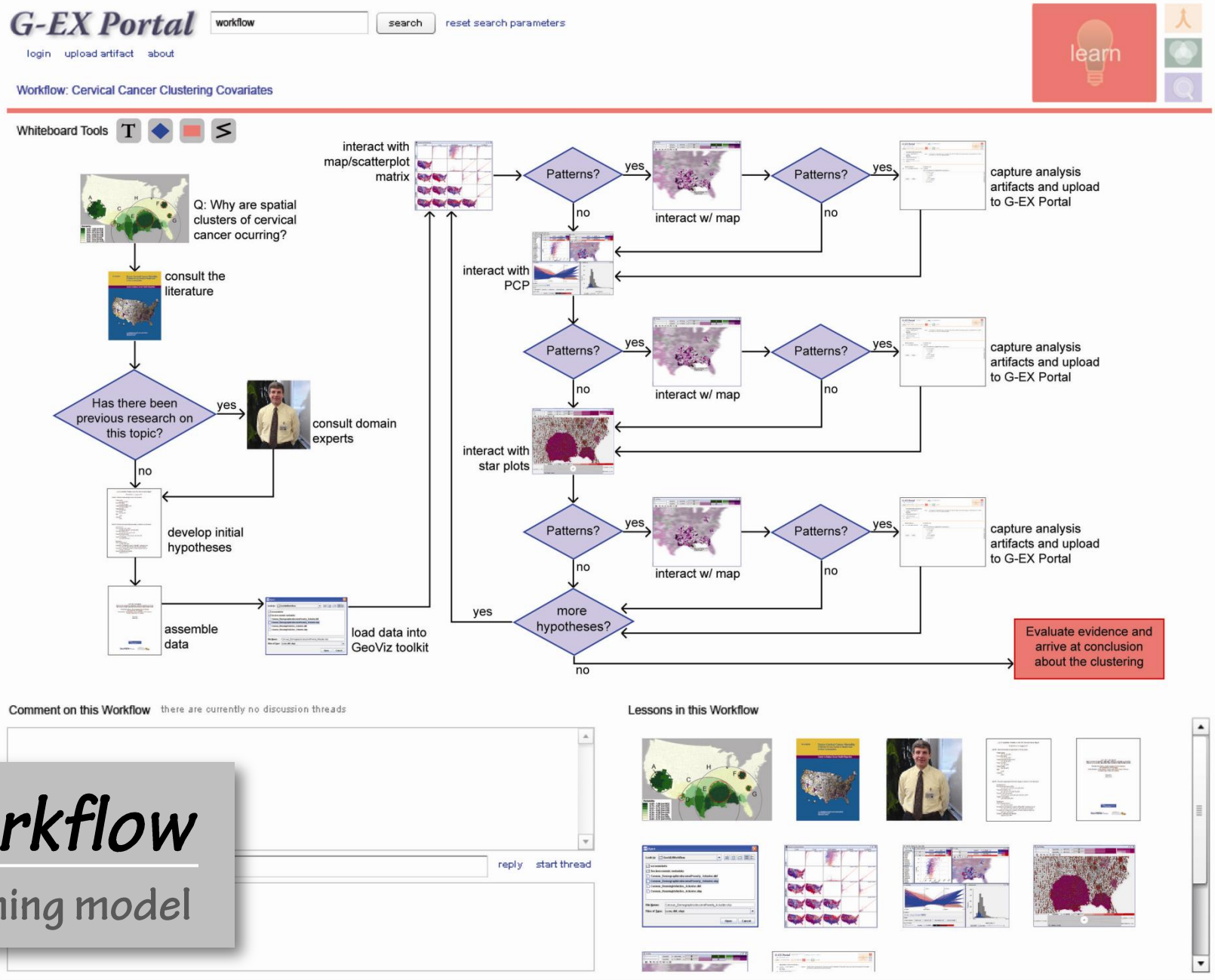


Pirolli & Card (2005): sensemaking as a process

analytical pipeline

from data to knowledge

approach: process-oriented learning



workflow

learning model

Questions?

http://www.geovista.psu.edu/G-EXPortal/

Further reading on the G-EX Portal:

•Robinson, AC, EL Koua, F Hardisty, J Chen, and AM MacEachren. 2007. The G-EX Portal: Web-Based Dissemination of Geovisual Analytic Results. In: *Proceedings of the ICA Commission on Visualization and Virtual Environments Workshop*. Helsinki, Finland.

•Roth, RE, AC Robinson, M Stryker, AM MacEachren, EJ Lengerich, and E Koua. 2008. Web-based Geovisualization and Geocollaboration: Applications to Public Health. In: *Proceedings of the 2008 Joint Statistical Meeting*. Denver, CO.

•Roth, RE, AM MacEachren, and CA McCabe. 2009. A Workflow Learning Model to Improve Geovisual Analytics Utility. In: *Proceedings of the International Cartographic Conference*. Santiago, Chile.

•Robinson, AC, RE Roth, and AM MacEachren. (accepted) Designing Web-Delivered Learning Materials for Geographic Visualization and Analysis in Public Health. *Health Informatics*.

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