

Design Research for a Context-Aware PIM System

Abe Crystal – abe@unc.edu

Metadata Research Center

School of Information and Library Science

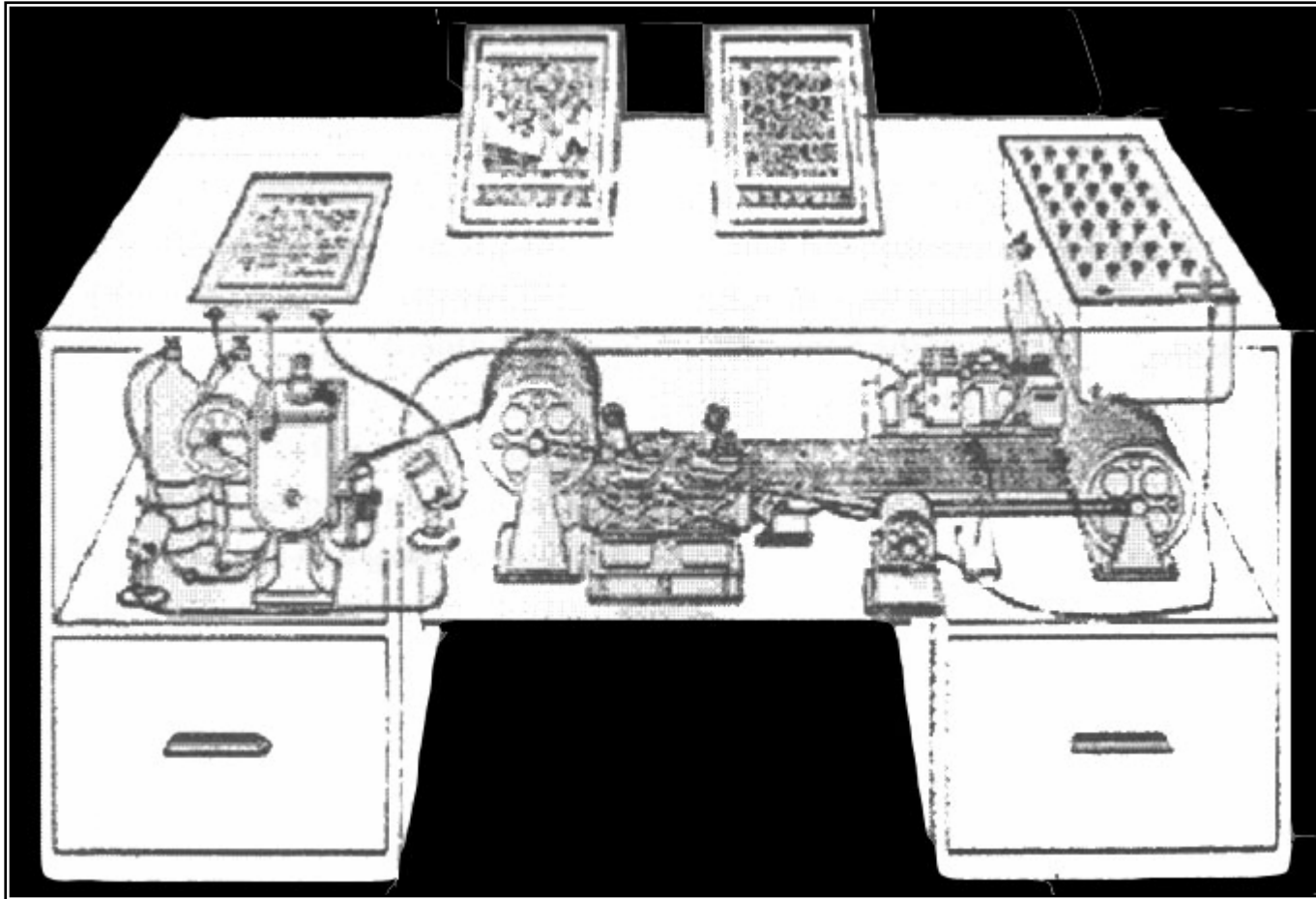
University of North Carolina at Chapel Hill

CRADLE colloquium ~ Friday, September 15, 2006

Agenda

- **Introduction**
- **Technology**
- **User studies**
- **Design**
- **Metadata**
- **Discussion**

Introduction

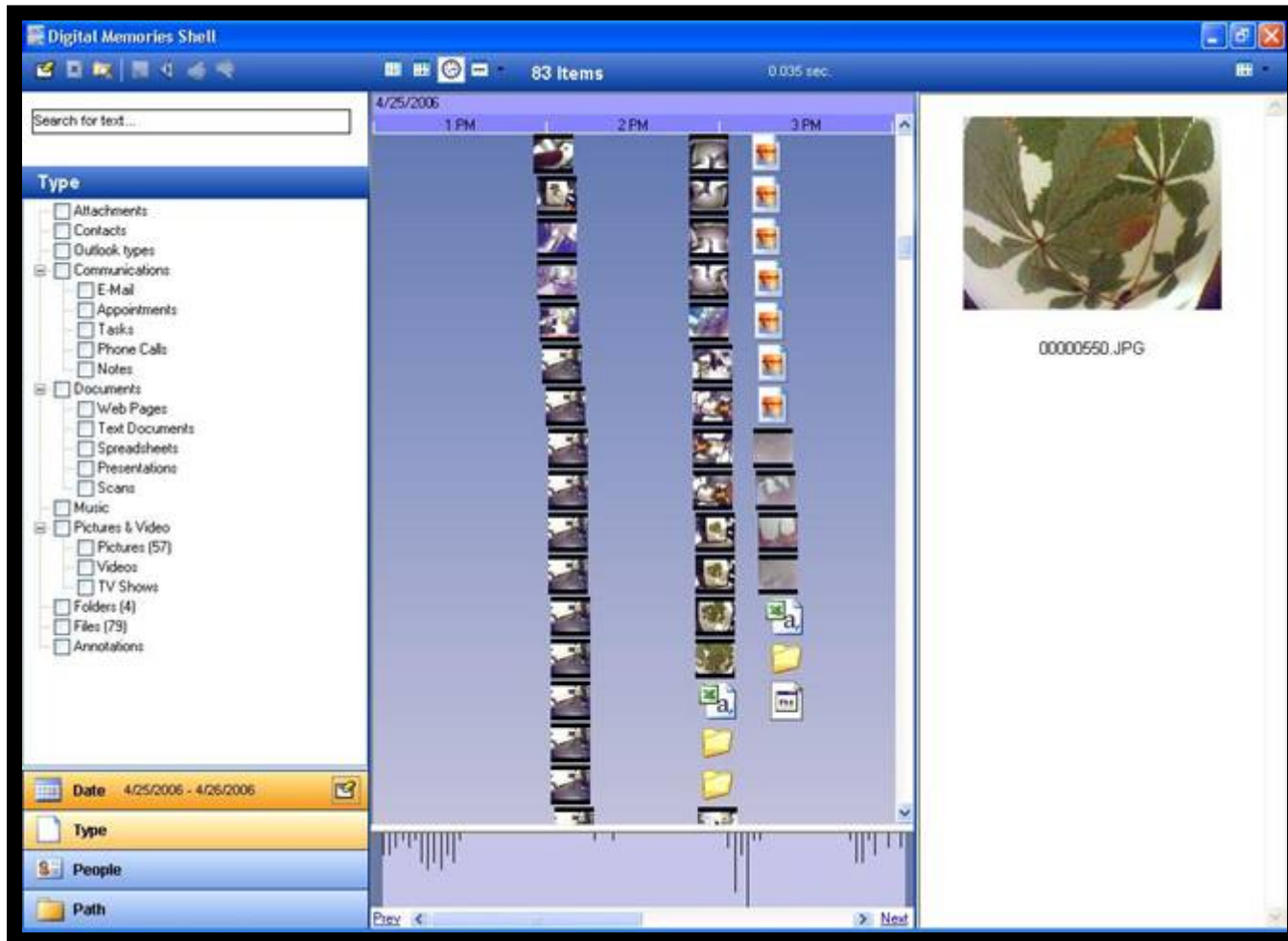


The Memex of the future... as envisioned in the 1940s

Technology



Technology



Technology

Digital Memories Shell
48 items 0.035 sec.

Search for text...

Date

Today	0
Yesterday	0
Last 7 Days	0
Last 30 Days	210

Year: [v] Choose Year: [v]

April, 2006

25	27	28	29	30	31	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	1	2	3	4	5	6

May, 2006

1	2	3	4	5	6	
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

Today: 5/2/2006

Date: 4/21/2006 - 4/22/2006

Type

People

Path

The Gymnosperm Database

Pinaceae

Pinus

Common names

Five-finger, KRF (Chinese)

Taxonomic notes

Sometimes treated as the sole family of Order Pinales Dumort. 163R. Syn. Abies has treated 11 genera and 232 families.

Pinaceae are listed in the basal record since the Coniferales. The family original position but is now considered a clearly monophyletic group united by character state codes. Small scale synapomorphies consisting of well-developed scales that are a supporting factor for most of their length. Two parallel veins on the abaxial face of a locally flattened seed wing translated from the cone scale (Sheue 1995). Core character further serve to discriminate the four subfamilies, as follows: (1) when (1) Subfamily Pinaceae: Cones with a distinct umbel base; (2) season growth, no base. Seedwing holding the seed in a pair of claws, no resin excretion on the (3) leaf or cones; or (4) subfamily Pinaceae: Cones without an umbel, scales with a broad base. No leaf or a long on the seedwing, no resin excretion on the seed. Microgypha flat absent (4) Subfamily Cupressaceae: Cones without an umbel, scales with a broad base. No leaf or a long on the seedwing, no resin excretion on the seed. Microgypha flat absent (4) Subfamily Podocarpaceae: Cones without an umbel, scales with a narrow base. (1) indistinctly long leaf to the seedwing, resin excretion present on the seed to about 1/3rd. *Abies, Cedrus, Keteleeria, Nothofagus, Pseudotsuga, Tsuga*

Description

Tree: trees, occasionally shrubs, woody (primarily deciduous in East and Far East and southern hemisphere)

The Gymnosperm Database

Pinaceae

Pinus

Common names

Five-finger, KRF (Chinese)

Taxonomic notes

Sometimes treated as the sole family of Order Pinales Dumort. 163R. Syn. Abies has treated 11 genera and 232 families.

Pinaceae are listed in the basal record since the Coniferales. The family original position but is now considered a clearly monophyletic group united by character state codes. Small scale synapomorphies consisting of well-developed scales that are a supporting factor for most of their length. Two parallel veins on the abaxial face of a locally flattened seed wing translated from the cone scale (Sheue 1995). Core character further serve to discriminate the four subfamilies, as follows: (1) when (1) Subfamily Pinaceae: Cones with a distinct umbel base; (2) season growth, no base. Seedwing holding the seed in a pair of claws, no resin excretion on the (3) leaf or cones; or (4) subfamily Pinaceae: Cones without an umbel, scales with a broad base. No leaf or a long on the seedwing, no resin excretion on the seed. Microgypha flat absent (4) Subfamily Cupressaceae: Cones without an umbel, scales with a broad base. No leaf or a long on the seedwing, no resin excretion on the seed. Microgypha flat absent (4) Subfamily Podocarpaceae: Cones without an umbel, scales with a narrow base. (1) indistinctly long leaf to the seedwing, resin excretion present on the seed to about 1/3rd. *Abies, Cedrus, Keteleeria, Nothofagus, Pseudotsuga, Tsuga*

Description

Tree: trees, occasionally shrubs, woody (primarily deciduous in East and Far East and southern hemisphere)

The Gymnosperm Database

Gymnosperms

Common names

Gymnosperm (Latin genus) 'naked', (Greek species, 'seed')

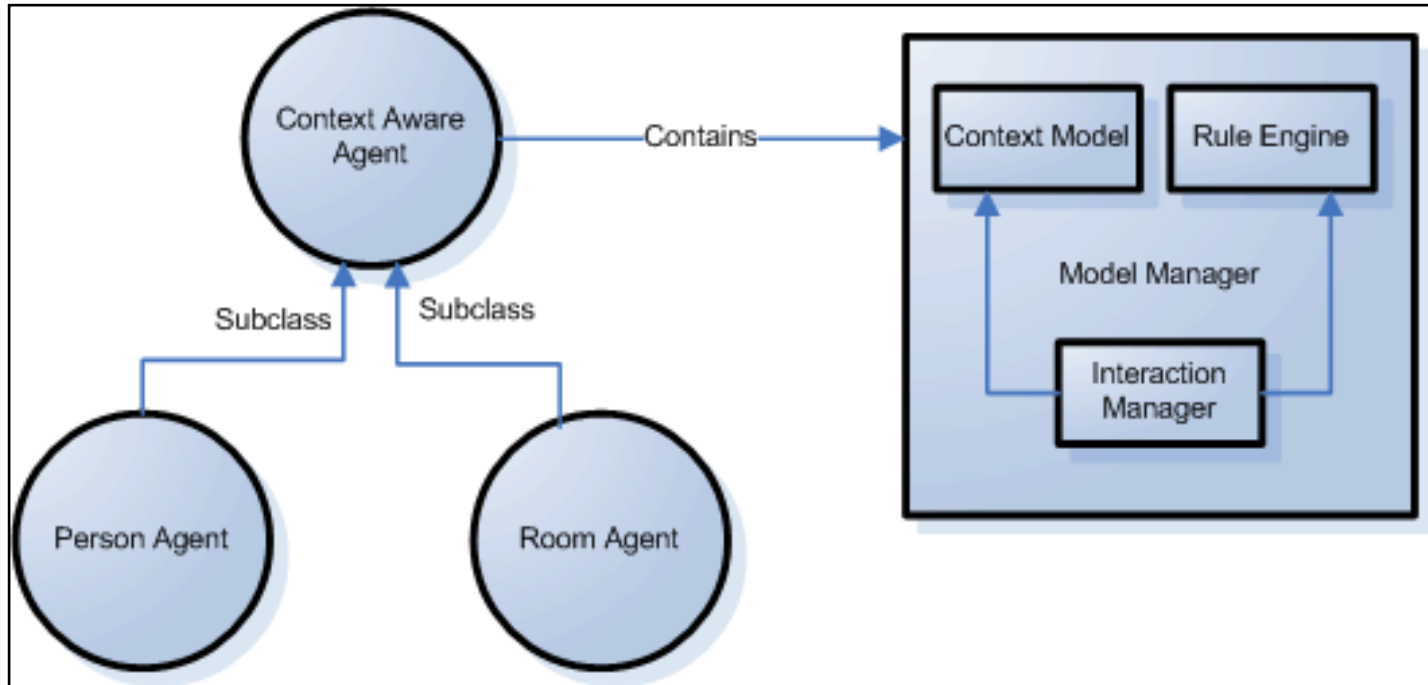
Taxonomic notes

This database provides information on taxa belonging to the gymnosperms. It is a database about whether the principal groups within the gymnosperms share a common ancestor, whether that common ancestor is or is not shared with the flowering plants, or angiosperms. (1) Why do these common ancestor, distinct from the flowering plant gymnosperms are a unique lineage of plants. Otherwise, the term "Gymnosperm" is significant in any event, the term "Gymnosperm" has practical significance because relatively small and highly distinctive synapomorphies of plants that are for the most part large and reduced to a largely arboreal distribution, but which nevertheless had a biological importance of a global scale is significant for greater than their species wealth (1995).

The gymnosperms have been subdivided along a variety of different lines and the 4 information on fundamental taxonomic characters back on (Sheue 1995) has 4 answers. One recent treatment (Sheue 1995) subdivides them into 4 divisions, 3-6 and 14 families, as shown in the chart at left (note that the term "Pinophyta" is the regional with the term "Gymnosperm" but since I have never adopted this current Pinophyta is, refers only to the conifers, subfamily Pinaceae). The formal name chosen in the chart are parenchyma.

The principal point of contention between various schemes for defining gymnosperm family rank seems to lie, at other points in the hierarchy should distinctions be made on leaf distribution above the level of Pinaceae, including the gymnosperms to Cupressales, Cycadales, and Gnetales. Each of these is recognized as a distinct group, Cycadales, Gnetales, and Cupressales, and one distinct (2) Cupressales, Pinaceae, and Gnetales. However, the more traditional, I will name habits of generic analysis to produce a reasonably conclusive analysis of gymnosperm group. However, in the absence of growing regions with a historical

Technology



Goals

- **To understand students' PIM practices, and thereby determine how to design a Memex-type system to support students' needs.**
- **To understand how MyLifeBits/Memex works in practice, in the context of actual classes and through independent learning.**
- **To inform basic research on metacognition and technological support for learning.**

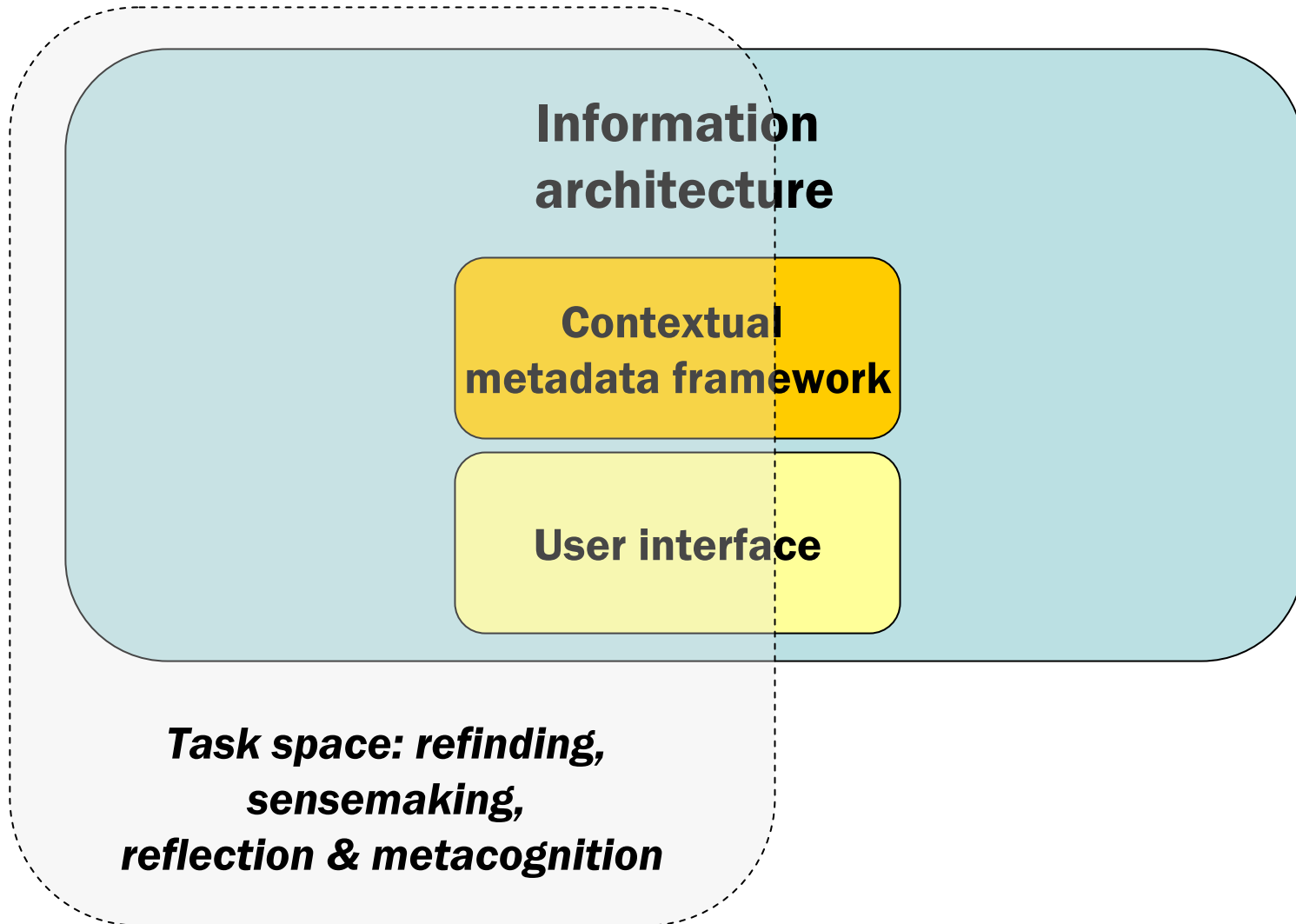
User studies

Spring 2006	Interviews with students and faculty; class observations. <i>Initial version of metadata schema.</i>
Fall 2006	Usability testing with field biology task. Pilot testing of Memex system with students in 2 – 3 classes. Assess stability, usability.
Spring 2007	Deployment in one biology class, with ethnographic observation and interviews.

User studies

Usability studies	<ul style="list-style-type: none">• What are the strengths and weaknesses of the current Memex implementation?• What are the design directions for improvement?
Class observations	<ul style="list-style-type: none">• What types of information are being disseminated and capture in classrooms?
Interviews	<ul style="list-style-type: none">• How are students capturing and managing personal educational information?• What PIM systems, tools, strategies are they using?• What are the breakpoints and opportunities?

Design



Metadata framework

Main tasks

- Determine students' educational context. Address questions such as: What is the student's location? (Physical location, from country to campus room number)
 - ≈ What activity are they engaged in? (A meeting, study group, class, lecture, lab)
 - ≈ Who they are with? (Students, faculty, staff)
 - ≈ What is the student's cognitive state and personal behavioral characteristics (Examples: Happy, Sad, Stressed, Busy, Early, Late)

Object types

- Activities: Lecture, Conversation, Project
- Documents: Slides, Handouts, Student notes Quizzes, Exams, Papers,
- People (Student, faculty, staff profile)
 - ≈ Current emphasis is on biology students in field and lab biology classes, but the implementation can be extended to university students, faculty, and staff in other disciplines.

Object formats

- Audio, video, images

Metadata schema

Key

Generation methods

A = Automatically

generated

D = Derived

H = Harvested

M = Manually generated

Requirement

R = Required

O = Optional

metadata

*The R/O designation only refers to manually generated metadata

Element Name	Description	Example	Code
Name/Title:	Short label/description of data type.	Gymnosperm Identification	A or M, R
Description:	Longer description of data type.	This purpose of this lab is to collect and identify various gymnosperm species that reside in Coker Arboretum.	M
Assigned Date	The date the data type is assigned by instructor.	mm-dd-yyyy	A
Due Date	The date the data type is due to the instructor.	mm-dd-yyyy	M, R
Group Members	Lists members of class who are working together on data type, if any.	* Members are tagged to assignment using links to their profiles in a user database.	M
Grade	Numerical evaluation of data type.	0-100	M
Object collector/ owner	Name of person who will store memory in MLB	Doe, Jane	D
Class Dept. Code	Four letter department code	BIOL, INLS	M/R
Class Number	Three digit class number	096, 156, 157	M/R
Class Section	Two digit code	01	A
Class Name	Course name	Local Flora	A
Professor	Last name and first name combination.	Smith, Paul	A
Scope Note	Automatic summary or keywords	Fieldtrip report from the arboretum tour (Automatically extracted from document text)	A,D, + H
Annotation	Field used by student at their discretion.	Focus of fieldtrip was gymnosperms	M/O
Starred Item	Designates an implied importance to the content	Binary value: Star or no star.	M/O 14
<i>Location</i>	<i>Location where data type was created.</i>	<i>Derived using GPS or RFID</i>	A

Discussion

- Technology probe (inspiration) vs. realistic evaluation-in-context
- Role of capturable (sensor-based) context in PIM
- Students as PIM user group
- Studying and designing for “higher-order” tasks such as reflection