

## FALLBESKRIVNING – MODELLERING (MODL)

### Case Study: The University Archaeological Museum<sup>1</sup>

#### Transcript of a conversation between a systems analyst and the museum's director:

ANALYST: I enjoyed the tour, but somehow I think that looking at the objects you have on display is giving me an overly simplistic view of what your museum does.

DIRECTOR: Now that I think of it, you're right. We do many more things than just display the artifacts our researchers have discovered in the field.

ANALYST: Why don't you tell me about your other activities?

DIRECTOR: Well, first of all, we have a rather large slide collection. We record the history of all of our digs that way.

ANALYST: Who's in charge of the slide collection?

DIRECTOR: We have a graduate student working part time as the slide librarian. He labels the slides as they come in and is responsible for seeing that they are filed. Unfortunately, the collection has grown rather large. The graduate student changes every year and it's getting harder and harder to find things.

ANALYST: Just exactly how are the slides used?

DIRECTOR: Most of the time they're used as parts of lectures.

ANALYST: So it's the researchers themselves who later come for the slides taken at their digs?

DIRECTOR: Exactly. They're supposed to return the slides once the lecture is over – the slides do belong to the museum – but at this point, we really have no way of verifying that everything comes back.

ANALYST: Besides the slide collection, what other activities does the museum have?

DIRECTOR: We actually administer our own digs. The museum staff writes grant proposals. When we are fortunate enough to get one funded, we hire research staff, including the archaeologists, student help, and support staff.

ANALYST: Are there any other activities I should know about? I haven't forgotten your artifacts, but let's leave them for last.

DIRECTOR: We do maintain a small library. It has copies of all the papers and books our researchers have written about our digs as well as several thousand books about archaeology. The library also carries subscriptions to the major archaeological journals.

ANALYST: Do you have a librarian?

DIRECTOR: Not full time. A graduate student from the Library School works there 20 hours a week. You see, the collection doesn't grow very fast. A card catalog gives us access to the books. We keep the journals in alphabetical order by journal title and then by date. Usually, when someone is looking for a journal article, they already have the citation. The student catalogs new books as they come in, files the magazines, and checks books in and out. Actually, the library works very well right now.

ANALYST: OK. Now we ought to talk about your artifacts. Tell me, are all of them on display?

DIRECTOR: Hardly. We have an entire floor in the archaeology classroom building full of

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<sup>1</sup> From: Harrington, Jan L.; Relational Database Management for Microcomputers; Holt, Rinehart and Winston, New York, 1988; pp. 350 – 360

items that we either don't have room to display or that aren't ready for display. Actually, it's the state of that lab of ours that prompted me to call you. I'm not concerned with the problems with the slide collection, or the amount of work it's taking to generate weekly accounting summaries, as I am with what appears to be a loss of valuable artifacts.

ANALYST: Loss? Do you think artifacts are being stolen, or are they simply being misplaced?

DIRECTOR: I'd like to think they're being misplaced, but there's no way to tell until we come up with a better way to keep track of them.

ANALYST: How are they handled now?

DIRECTOR: Artifacts are tagged and numbered in the field. For each artifact, someone fills out a card, indicating the item's number, where it was found, and when it was found. The cards are supposed to be brought back to the lab with the artifacts. Then they're filed numerically by dig. Somehow, not all of the cards get back. We end up with artifacts with no cards, which means the artifacts are nearly useless, since we don't know anything about the environment in which they were found. What's worse, we often have cards without artifacts. Even more seriously, researchers will insist that a particular specimen was found for which we have neither the card nor the artifact.

ANALYST (thoughtfully): A computer isn't necessarily going to solve the problem of disappearing artifacts, especially if the computer is located here at the museum. If it merely replaces your card file, it's not going to help you much, except in reducing the amount of paper you keep over in the lab. At least on the surface, it sounds like you need to bring your controls closer to the dig. You may wish to consider using laptops at dig sites. However, no computer by itself can force your field personnel to record data as it is generated.

DIRECTOR: I see your point. I like the idea of taking computers to the dig and recording data about the artifacts as the artifacts are unearthed. But we're also going to have to redefine our field procedures and institute some fairly tight controls. That's my job, isn't it?

ANALYST: Primarily. But we certainly can work together on it.

**Transcript of a conversation between the systems analyst and the slide librarian:**

ANALYST: Could you show me how you organize the slides?

SLIDE LIBRARIAN: Well, each slide gets a number. That number has two parts. The first part identifies the dig on which it was taken. The second part is just a sequence number. Look at this one; its number is 14-089. That means that it came from dig number 14 and is slide number 89. Once the slides are numbered, I just file them by number.

ANALYST: Do you keep some record of the subject of the slides?

SLIDE LIBRARIAN: Yes, here in this notebook. You see, there's an entry for each slide. I write a few words describing what's in each slide right by the slide number.

ANALYST: OK. Now, tell me what happens when someone comes to you and wants to borrow a slide. SLIDE LIBRARIAN: First, we go to the notebook I just showed you to find the slide's number.

ANALYST: That must take a while.

SLIDE LIBRARIAN: You bet. If the person doesn't know exactly what slide they want, then it means looking through all the descriptions. You know what we could really use? – some sort of index! Then we could find slides not only by dig, but by topic.

ANALYST: That's a big project, but certainly something that could be done.

SLIDE LIBRARIAN: I think it would be worth it, especially since I'm not here all the time. I mean, I wrote the descriptions of slides that came since I've been here, and those are the only ones I really know well. I wouldn't mind taking the time to put standardized subject terms on all the slides.

ANALYST: Be sure you know what you're volunteering for!

SLIDE LIBRARIAN: I hear you.

ANALYST: Now, let's assume that you've identified the slides that someone wants to borrow.

SLIDE LIBRARIAN: I go to the drawer and pull out the slides. Then I make a note in this other notebook about who's taking what slides.

ANALYST: And when the slides come back?

SLIDE LIBRARIAN: I check them off.

ANALYST: How do you determine when slides are "overdue"?

SLIDE LIBRARIAN: I just sort of look in the notebook. But it's a mess; sometimes I can't read my own writing. And, as you can see, there are so many entries that it's really hard to tell what's been returned and what hasn't.

ANALYST: Just one more question. Can people get into the slide library when you're not on duty?

SLIDE LIBRARIAN: No, they have to wait for me.

ANALYST: Good. That at least eliminates one source of possible problems.

**Transcript of a conversation between the analyst and the museum librarian:**

LIBRARIAN: I don't know why you want to talk to me. Everything works just fine here.

ANALYST: Do you have a backlog of work?

LIBRARIAN: Heavens, no. I get the cataloging done right away. For most books I can either order catalog cards from a library supply house or use the cataloging in publication data in the book itself. It only takes a few minutes to process new books. As for the journals, I just stick them on the shelf as they come in.

ANALYST: What about keeping track of what people borrow? The slide library seems to have problems.

LIBRARIAN (with a shrug): We work on an honor system. Journals don't leave the library. We've got a copy machine so that if people need a copy of an article, they can just make one. If they want to take out a book, they put their name on the card and stick the card in a box.

ANALYST: What happens if a person wants a book that isn't on the shelf?

LIBRARIAN: Then I look in the box to see who has the book. I call that person and ask for the book. Sometimes we have to negotiate a bit, but it works. You have to understand that there's only 30 or so people who use this library regularly, so it's not a big problem.

ANALYST: Aren't there any archaeology students?

LIBRARIAN: Sure there are – lots. But they don't use this library. Most of this collection is duplicated in the main university library. We support this little library with grant funds for the convenience of the researchers.

ANALYST: Ah...

**Transcript of a conversation between the analyst and a field researcher:**

ANALYST: I'm curious about what happens when an artifact is recovered.

RESEARCHER: Why? What does that have to do with a computer system for the museum?

ANALYST: At this point, I'm not sure. The Director is concerned about losing track of artifacts. Until I know how artifacts are handled, I can't even decide if the problem is one that can be helped by a computer or whether it's a procedural problem.

RESEARCHER: I see what you mean. Well, I can tell you how I manage my digs. Not everyone does it exactly the same way though.

ANALYST: OK.

RESEARCHER: Before we start the dig, I hold a meeting with the students who will be doing the work. The dig is laid out in a grid. I show the students how to identify anything they find by the grid co-ordinates and also by the depth at which the item was found.

ANALYST: How is that data recorded?

RESEARCHER: I use 3-by-5 cards. Each artifact gets a number, usually it's written on a tag tied to the artifact. The number is put in one corner of the note card. Then the date and location of the find is written on the card. There's also room to write notes about the item.

ANALYST: Does the card include a description of the artifact?

RESEARCHER: Not usually.

ANALYST: Hmm. Just a suggestion, perhaps a description would make it easier to match cards and artifacts if an artifact lost its tag.

RESEARCHER: That's a thought... So far no computer, eh?

ANALYST: Not yet. Tell me, do you have trouble keeping track of the cards?

RESEARCHER: Well, one or two always get lost along the way. We're not talking about your standard laboratory here; we're talking about people living and working in tents in remote, primitive locations.

ANALYST: Are cards always written?

RESEARCHER: Except in rare instances. If we find out that a student isn't following the procedures for logging in an artifact, we'll fire the kid from the dig.

ANALYST: I've talked to the Director about using laptops at the dig sites. From what you tell me, it might help you in a couple of ways.

RESEARCHER: How's that?

ANALYST: You can store your artifact data on disk rather than on cards. If you keep a couple of backup copies of the data on floppy disk, there's little chance that you'll lose any data. In other words, data won't go astray in the same way individual cards are prone to. Computers also have a strong motivating effect on young people; a student who thinks it's too much trouble to fill out a 3-by-5 card is likely to look forward to entering the data into a computer. So a computer at the dig may also cut down on the number of artifacts that are never recorded.

RESEARCHER: I like the idea. We just need to work out the logistics, I suppose. What about power?

ANALYST: It's less of a problem that you might think. You can run a laptop computer off solar cells. Two of them, each about a foot square, will do the trick.

RESEARCHER: All right... I'm game to try it. I think I'm going to take another look at my grant budget to see if I can squeeze out enough money for the equipment!

ANALYST: I'm glad you're enthused, but hang on for a bit. We've got a long way to go in the design process before we come up with software that's going to work well for you.

**Transcript of a conversation between the analyst and the supervisor of the archaeology lab and warehouse:**

ANALYST: I see that you store artifacts on these open shelves. How do you keep track of what's where?

SUPERVISOR: The shelf locations are numbered. When we get artifacts in from the field, we assign each one to a location. The location is written on the card that comes with the artifact.

ANALYST: Where do you store the cards?

SUPERVISOR: In drawers. We bought card catalog cabinets – like they use in libraries – because we have so many cards.

ANALYST: How are the cards organized?

SUPERVISOR: In two ways. The original cards are filed by dig. We also make a copy of the card which we file by shelf location.

ANALYST: How, then, do you locate a specific artifact?

SUPERVISOR: Usually, it's a researcher who comes in looking for something. He just plows through all the cards for his dig until he finds what he's looking for. Then he can go to the shelf and get the thing. It's too bad there isn't some way to use a description of the artifact to make finding the card easier.

ANALYST: I've been talking to one of the field researchers about that very thing. It should be possible to come up with a set of descriptive words that can be applied to most artifacts. If all the researchers assign descriptions from a standardized list of terms as well as numbers to the artifacts, then those descriptions could be used to speed the search for one artifact.

SUPERVISOR: Could the computer system you're going to put in do that?

ANALYST: Yes, it could. In fact, that's one of the things computers do very well. If you were to work with descriptions in your card system, you'd have to make a third copy of each card. However, it's reasonable to expect a computer to locate information about an artifact based on its location here in the warehouse, the number assigned to it at the dig, its description, the date and place where it was found, or any combination of those characteristics.

SUPERVISOR: Y'know, so much of what the Director thinks is "lost", isn't really. It's all here in the warehouse; we just can't find it.

ANALYST: I'll tell you what I told the Director. A computer can't solve procedural problems; all it can do is help you keep good records. If you don't insist that artifacts are returned to their assigned locations on the warehouse shelves, the best computer system in the world can't help.

SUPERVISOR: I understand. Could we set up some sort of system where each time an artifact is taken from its shelf, we record the destination in the computer?

ANALYST: You mean, is it in the museum or in the lab?

SUPERVISOR: Exactly. And I'd like to know who took it, as well.

ANALYST: There's no reason we couldn't do that. Remember, though, that the computer will be only as good as the people who put data into it. A computer isn't going to insist that a lazy person enter data nor can it prevent intentional theft.

SUPERVISOR: We used to think that a computer would solve all our problems, but I really see what you mean. The computer can keep our records and give us access to them in ways we could never have with our card file system, but it's up to us to design procedures to control human behaviour.

ANALYST: You've just expressed an attitude that virtually ensures that a database system will work well for you.

I'm looking forward to designing a database system for your museum.

**Book Loans**

Life Amongst the  
Yorta Yorta  
- D. A. YATES  
C1926

Date	NAME
14/9/00	P. Braybrook

Kinship Systems in  
Central Australian  
Aboriginal Tribes  
- Colin WEATHERBY  
1989

DATE	NAME
14/7/98	P. Braybrook
18/8/99	F. Koomen
3/5/00	PODUCÉ

Slide Loans

BORROWED SLIDES

SLIDE No.	DATE OUT	NAME	DATE BACK
14-027	2/5/99	Peter ROBINSON	
14-028	2/5/99	" "	
14-029	2/5/99	" "	
8-111	3/5/99	Mary PHILPOT	4/5/99
7-30739	6/6/99	Peter ROBINSON	
3-159	17/6/99	Joseph LIM	20/6/99
3-048	21/6/99	Joseph LIM	22/6/99
10-129	25/6/99	P. Robinson	
3-171	30/6/99	Joseph LIM	2/7/99
14-50775	13/7/99	Peter ROBINSON	
5-3	11/8/99	Cynthia LAW	13/8/99
5-122	13/8/99	" "	15/8/99

Slide Catalogue

SLIDES

No.	DESCRIPTION OF SLIDE
15-001	The area of the new dig at Pont Welshpool before the dig began. Shows sandy beach in foreground and dunes and vegetation in background.
15-002	Pont Welshpool dig after <del>beginning</del> having grid lines put up.
15-003	Dig team at P.W. Left to right: Tom Dixon, Cynthia LAW (Team leader), Mary Kostakidis, Unknown, Bruce Staples, Forseto.



Specimen Cards

Genolon Caves  
Item 22  
Grid: B/73  
Depth: 22 cm  
**SHELF  
77B**

Found by Peter Robinson  
on 3rd August 195

63. Daintree forest  
depth: 2.5m  
H13  
**SHELF  
28C**

DIG: KAKADU  
ITEM NO: ● 1115  
DEPTH: 125 m  
GRID: A ~~11~~ x ~~11~~ C  
**69B**

31/1/1995

KAKADU DIG  
ITEM 243 2/3/86  
GRID: AC/17  
DEPTH: 1.6m  
**SHELF  
124/A**