Usability Case Study:
Facilitating Web-based Information Retrieval

(Outline & Handout)

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ingenix
A division of **UntitedHealth Group**

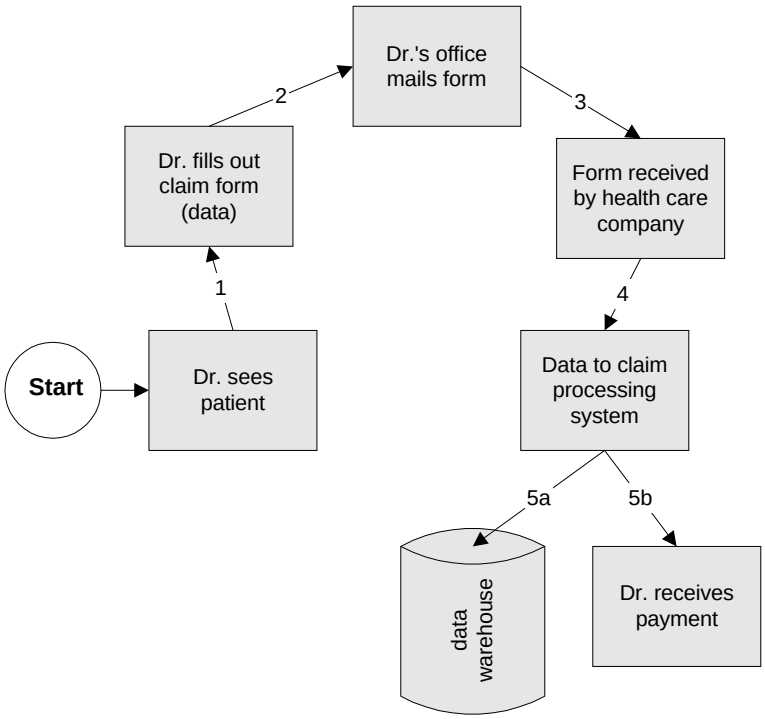
I. What is in a data warehouse?

A data warehouse holds data (pieces of information) that are:

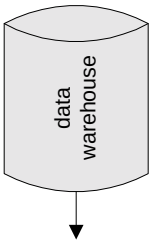
- Purposefully organized
- Arranged to facilitate retrieval, analysis, and reporting
- 'Fed' to the warehouse from various locations (e.g., company systems, files, etc.)

A. Where does the data first come from?

Usually, the original data are created during, or as a result of, business processes. For example:



B. How is the data used?



A health care company, for example, uses data in many ways, among them:

- Business decisions
- Trending
- Transplant programs (Centers of Excellence)
- Mandatory state and federal reporting
- Physician, hospital quality assurance
- Identifying fraudulent claims from providers (physicians, hospitals, etc.)
- Determining staffing needs
- Management reports
- Clinical trials
- Disease management
- and much more . . .

C. How is data in the data warehouse organized?

Data are organized into tables, which in turn are organized into columns/fields.

Tables have names like:	**Columns** have names like:
D5812MCN.M_MBR_PCP	MCD_CD
QDSPR.XXXHSPCON	PROV_SPCTY

Data in the tables are called **values**. Some sample values:

C.	1408
MCS	SRG
NY	Smith

A sample four-column table:

M_MBR_PCP table

PROV_NM	PROV_CTY	PROV_SPCTY	MDC_CD
Lopez	NY	ON	04
Lee	CN	GEP	24
Walker	LA	HEM	18
Guiles	HD	OTO	04
Smith	OR	SRG	25

Actual tables have *many* more columns and *millions* of rows.

Data can be difficult to understand. A data warehouse often has thousands of data items. The *only* way users can understand all the data items is by using a **data dictionary**.

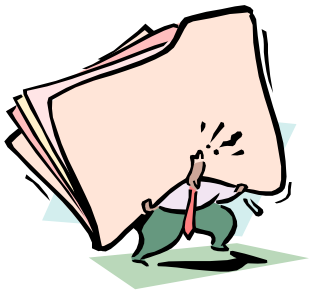
II. What is a data dictionary?

C. Description and use

- Like a regular dictionary, a data dictionary describes/defines words, names, concepts, etc.
- In particular, a data dictionary describes the data (including data items such as column names), relationships, allowed values, etc.
- Without a data dictionary, users usually don't understand the meaning of the data items. Not understanding the meaning of the data essentially renders the data warehouse unusable
- The data dictionary is critical to the tasks users perform in their work

B. Problems with the hard copy data dictionary

- Out-of-date as soon as published
- Cumbersome
- Costly (published twice/year)
- Cross-referencing difficult



C. Solution? Web-based data dictionary

Advantages:

- Always up-to-date
- Cross-referencing easier
- Ability to supply as much information as users need—no concern about the cost of too many pages

But . . . designed without usability practices, so . . .

User Complaints

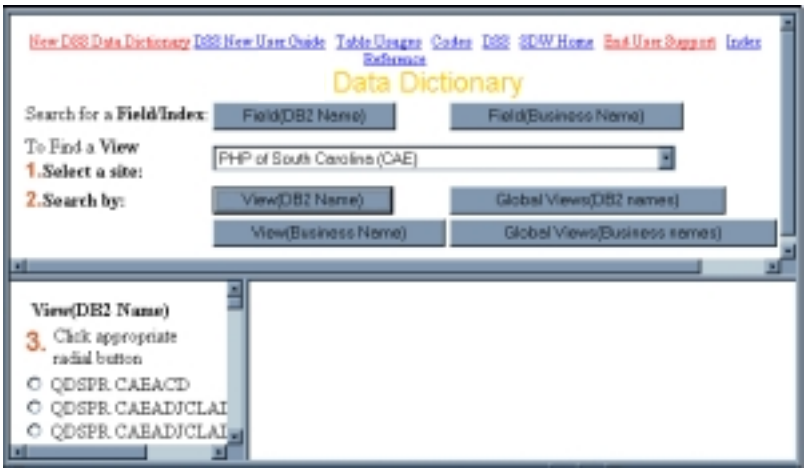
- "Too hard to use"
- "Can't find anything"
- "I don't use it; I use my old hard copy version" (which is out of date)

III. Next Steps (redesigned *with* usability practices)

A. Step One: Survey

Some typical survey responses:

- "Not worth the effort"
- "Problems looking up fields and searching for definitions"
- "Hard to find information if you don't know exactly where to look"
- "Interface too complicated, labels confusing"



Responses, continued . . .

- "Very repetitive. If more than 1 column needs to be checked, it is very time-consuming"
- "The back arrow doesn't work"
- "It's clunky to move around in"
- "I can't browse a complete table and see all its information at once"

B. Step Two: Task Analysis

Surveys gave a general picture of users' problems, but needed more specifics. To analyze tasks, used:

- Interviews (phone)
- Contextual Inquiry (at user's workplace)

(See *Appendix* for Task Analysis questions.)

Results of task analysis

Some additional problems emerged that had been missed by the survey. It turned out that among the problems, the most serious one was a fairly simple one, but was only picked up with task analysis.

The problem: users often didn't know the name of the data item for which they needed information.

C. Step Three: Rapid Prototyping

- Developed paper prototypes with users
- Tested prototypes for usability
- Developed Web prototype

D. Step Four: Usability Testing

Conducted usability testing using:

- Notes from task analysis to develop task list
- Think-aloud protocol
- Post-test questionnaire
- Post-test 'debriefing'

(See *Appendix* for *Post-test Questionnaire*.)

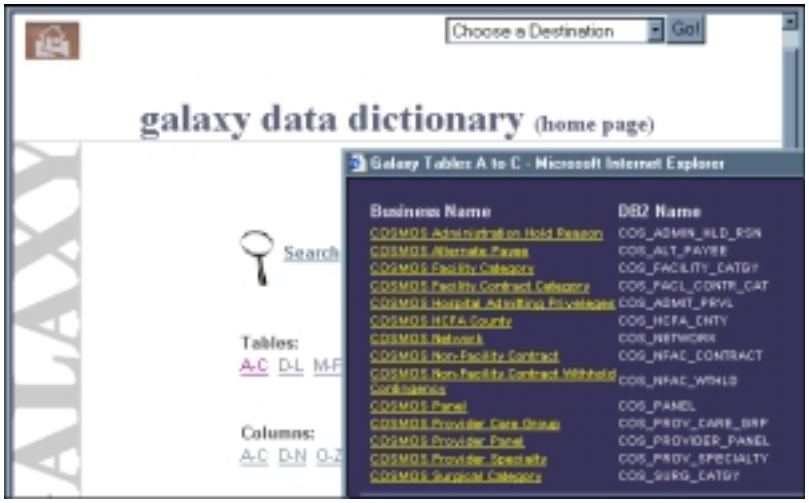
IV. Final Results

A. Redesigned interface

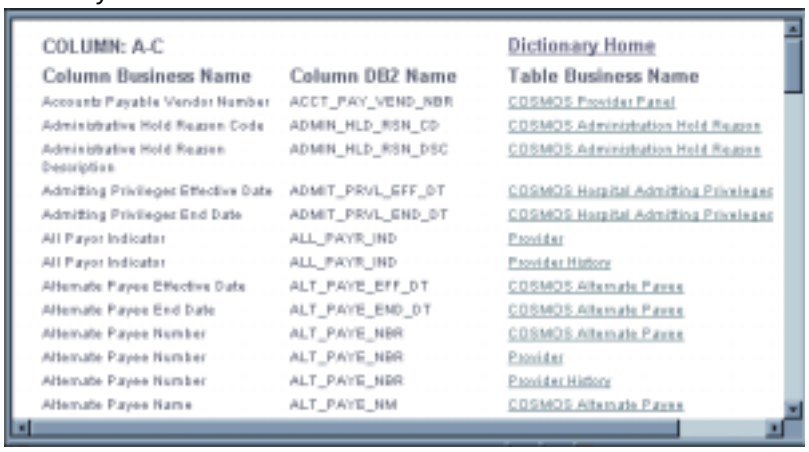
Less clutter:

B. New ‘look-up’ system

Look up by table . . .

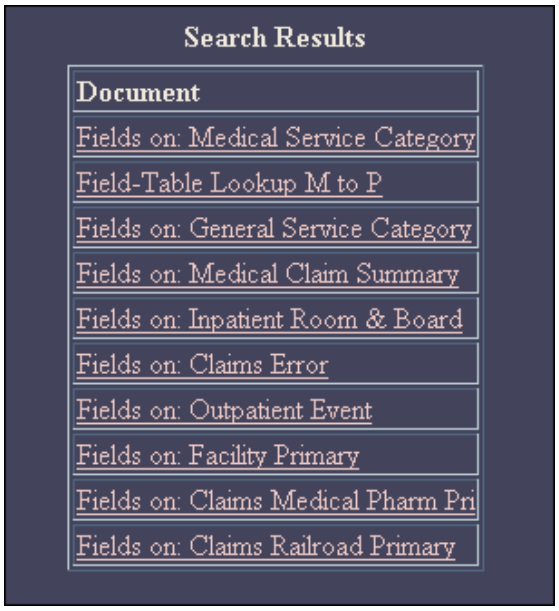


. . . or by column . . .

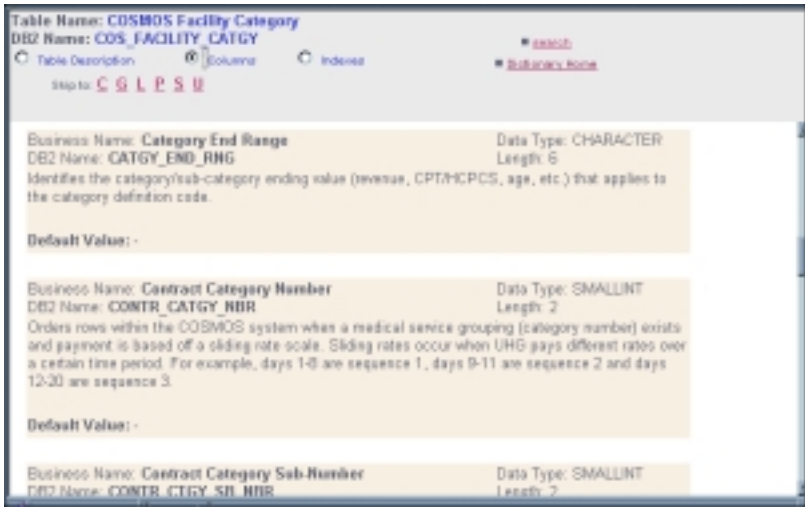


. . . or by searching:

Simple, 'user-friendly' search results:



All descriptions per table on one page:



Results of 'makeover':

- Users were delighted with the new web-based data dictionary
- Programmers and others saw the benefits of usability methods
- We provide data services to another health care company. The VP of that company wrote the following to our senior management:
  "I want to make you aware of excellent service and response by your staff. Our staff was very dissatisfied with the online data dictionary. RKH, GW, and JM met with [Company] users to understand our issues. They responded by testing different features and layouts. Our staff reviewed the latest online version and is very impressed. This will be a great benefit. [Company] users are very grateful for this change."

Typical user (internal customers) comments:

- "Easy-to-use"
- "I can find the information I need, and I can find it quickly"
- "Very,very helpful"
- "I like the new design"
- "I threw away my hard copy version"
- "It's so easy to understand"

Appendix

Task Analysis

The following are some of the questions asked during interviews and/or contextual inquiry. (DD = data dictionary)

Goals	Tasks & Sub-Tasks	Other
1. Last time you used the DD, **what** were you working on? Was this a **typical** project? **2**. How/by whom was this project **assigned**? What are their **expectations** in terms of accuracy, currency, speed of completion, etc.? **3**. Who will **receive/use** it? What are their **needs** in terms of accuracy, currency, etc. **4**. What were/are your **time constraints** for this project? **How** are **deadlines** determined? **5**. If this was **not a typical project**, what would be? (Then same qs for that project). **6. Other** types of projects?	**1**. When you started the **project**, what was the **first** thing you did? What did you do **next**. . . ? **2**. What **info** did you need in the DD? Did you **find** it? **3.** For ***each*** task: ▪ How **long** did it take? Acceptable? How long did it take w/ **the hard copy version** of the DD? ▪ How **easy or difficult** was this task? Acceptable? ▪ Did you run into any **problems**? What? **How** did you **solve** them? **How long** did it take to solve them? How did they **affect your work**? ▪ **How often** do you perform this **task**? **4**. While we both have the DD open, **walk** me through each step you took to look for this info. **5**. Has there been a time when you were **unable to complete your work** because of problems with the DD? How?	**1**. When you look at the DD Web **page**, is anything **unclear or confusing**? **2**. Are all the **words and terms** familiar to you? Are any confusing? **3**. What, if anything, about the DD **helped** you complete your work? **4**. What **other problems** have you encountered using the DD? **5**. For you, what would make the DD **easier** to use? **6. Rate** in order of **importance to you**: ▪ How fast the DD is ▪ How up-to date the data in the DD is ▪ How easy the DD is to use

Post-test Questionnaire

Name_____ Date_____

Please answer the following questions based on your experience, **today**, using the Web-based data dictionary.

1. Overall, I found the data dictionary easy to use. (Place an 'x' by one:)
Strongly Disagree
Disagree
Neither Agree or Disagree
Agree
Strongly Agree

2. I was confused about what to do next. (Place an 'x' by one:)
Strongly Disagree
Disagree
Neither Agree or Disagree
Agree
Strongly Agree

3. Information was easy to find. (Place an 'x' by one:)
Strongly Disagree
Disagree
Neither Agree or Disagree
Agree
Strongly Agree

4. The Web-based data dictionary is harder to use than the hard copy version. (Place an 'x' by one)
Strongly Disagree
Disagree
Neither Agree or Disagree
Agree
Strongly Agree

5. Using the Web-based dictionary was a pleasant experience. (Place an 'x' by one)
Strongly Disagree
Disagree
Neither Agree or Disagree
Agree
Strongly Agree

6. I was annoyed by the number of steps it took to find information. (Place an 'x' by one:)

Strongly Disagree
Disagree
Neither Agree or Disagree
Agree
Strongly Agree

7. Please underline the number that most closely matches your feeling about the dictionary:

Simple	3	2	1	0	1	2	3	Complex
Friendly	3	2	1	0	1	2	3	Unfriendly
Clear	3	2	1	0	1	2	3	Confusing
Helpful	3	2	1	0	1	2	3	Not helpful
Quick	3	2	1	0	1	2	3	Slow

8. Data Dictionary Experience:

Place an 'x' by one:
(1=minimal, 5=extensive)
1.
2.
3.
4.
5.

9. Web experience

Place an 'x' by one:
(1=minimal, 5=extensive)
1.
2.
3.
4.
5.

Thank you!

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