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A Data Dictionary Approach To Meeting User Requests For Accounting Information

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Abstract

In this era of massive data accumulation, dynamic development of large-scale databases and interfaces intended to be user-friendly, there is still an increasing demand on analysts as actual user access to databases is still not a common practice. A data dictionary approach, that includes providing users with a list of relevant data items within the database, can expedite the analysis of information requirements and the development of user-requested information systems. Furthermore, this approach enhances user involvement and reduces the demands on the analysts for systems development projects.

Introduction

In a business environment where information needs and the systems to support them change rapidly, organizations have experienced enormous growth in the amount of information available to them. Yet, even with better and more sophisticated databases, actual user access to database information is still an uncommon practice (Er 1986; Davis and Bostrom 1993). For many companies with large-scale database systems and report-generator facilities, data is being accumulated but not effectively utilized. Consequently, current practices within information systems (IS) departments related to information requirements analysis and systems design are being criticized for not enhancing user access to databases (Shemer 1987, Byrd et al. 1992). In addition, the heavy consumption of analyst time and other system resources have led

IS departments to develop facilitative approaches to information requirements analysis and systems design.

The purpose of this paper is to illustrate how user-department requests for database information can be facilitated with a data dictionary approach. The data dictionary becomes a tool for eliciting the user's analyses of the information requested, providing the user with relevant data items within the database, and developing a system that meets the user's needs. The data dictionary is a common tool of the analyst (Colter 1984); yet, current practices for information requirements analysis do not include it as a technique for identifying user needs or for informing the user of possible system-generated solutions. An inherent benefit of the data dictionary approach is that it requires information needs to be clearly communicated between user and analyst.

Readers with comments or questions are encouraged to contact the authors via e-mail.

Data Dictionary Approach

The data dictionary approach to systems analysis and design is especially suited for the rapid development of small-scale systems within an existing database system. The data dictionary approach can be effectively implemented with three steps. First, the user describes the purpose, reasons and logistical characteristics for the desired report. Second, the analyst provides the user with relevant data items from the data dictionary. Third, the user submits an example of the desired report with its requirements.

Information request example

The ABC car dealership is faced with decreasing sales and profitability. The problem has been traced to the departure of many of ABC's experienced and productive sales people to other car dealerships offering better financial incentives. After several meetings with division managers, the executive committee of ABC authorized a plan that would compensate "Outstanding Sales Employees" with a 4% bonus commission for sales greater than their monthly quota. The personnel department manager was given this responsibility. The personnel department submitted a request to the systems department outlining information needs. In response, the systems department will use the data dictionary approach in meeting personnel's request.

Step 1: User completes report request

Completing the User Report Request form (Exhibit 1) is the first step in the data dictionary approach. It requires the user department to specify its information needs. The report request form includes a statement of purpose, logistical information and the general features of the desired system output. User responses on the exhibits are noted in italics.

In the statement of purpose, the user provides a description of the report's purpose and its expected affect on the organization. The

user should clearly indicate the expected economic benefits to be gained by the affected departments. The date the requested information is needed is noted next to the date of the request form.

The user department provides logistical information about the proposed report, such as the desired output medium, location, frequency and whether the report is to be initiated by the user or systems department. The user department identifies individuals that should have access to the report. Furthermore, the user department is asked whether it is willing to incur costs in the development of the requested report.

The User Report Request form provides information to the systems department or a steering committee in prioritizing systems requests and the scheduling of staff. Approval from the systems department for continued development is noted and an analyst assigned.

Step 2: Provide relevant data items to user department

Since IS departments maintain a comprehensive data dictionary, it is a straightforward task for them to provide a parsing of relevant data items as a step in meeting the user's request for specific information. Furthermore, an analyst that provides additional related data items can expand the user's awareness of available information. Hence, the analyst often leads the user to more accurate needs identification and better system solutions (Winer 1984). On the other hand, users should be aware that their requests for information are not constrained to the list of data items.

As illustrated in Exhibit 2 for this example, the data items provided by the information systems department relate closely to the personnel department's request. It is very likely that the personnel department already is very familiar with most of the data items. Hence, the personnel department will probably recognize

Exhibit 1
User Report Request

User Report Request: # 0192-4 Date Requested: December 10, 1998
 Date Needed: December 31, 1998 IS Dept. Approval: Clark
 Requested by: Pat Wallace Date Approved: December 14, 1998
 Department: Personnel Analyst Assigned: Smith

PURPOSE OF REPORT
 In the space below, clearly state the purpose and reasons for this request.

To identify employees with monthly sales in excess of their quota. The executive committee wants to reverse declining sales and employee turnover by compensating sales people that exceed their monthly quota with a 4% bonus commission.

LOGISTIC INSTRUCTION AND REPORT FEATURES
 Will this report replace an existing report? (If so, please attach a copy and provide a revised user list.)

No existing report.

How would you like the report to be output?
 your printer MIS printer screen ASCII decide at run time

How often will the report be generated?
 daily weekly monthly on demand other (explain below)

At the end of each month.

Report will be initiated by: user IS department
 List users who should receive or have access to the report.
 Pat Wallace
 Terry Banks

Are you willing to incur costs in the development of the requested report?
 yes no (explain below)

that its requested information can be obtained from the data items listed. In particular, the difference between data items SALEMP and QUOTA from the SALES file identifies those employees that have exceeded their sales quota for the month.

Step 3: User submits sample report with requirements

The final step of the data dictionary approach requires the user to prepare a sample report with its supporting requirements that identify data items and the selection criteria. The

personnel department prepares the Sample Report in Exhibit 3. It shows the desired placement of all data items, along with titles, headings and other textual information such as the use of upper or lower case, dollar signs, number of decimal places and underlining.

Exhibit 4 is a completed Report Requirements form. The form has four sections: selection criteria, header, body and footer. The first section requires the user to specify the selection criteria using data items available in the database. The selection criteria for this example requires employees to have exceeded their quotas

Exhibit 2 Data Items Report			
Data Items Report			
USER:	<u>Pat Wallace</u>	DATE:	<u>12/16/98</u>
USERID:	<u>WD05PW01</u>	ANALYST:	<u>Smith</u>
USERDEPT:	<u>Personnel</u>	REQUEST #	<u>0192-4</u>
File:	EMPLOYEE		
<EMPCODE>	employee's social security number		
<EMPLAST>	employee's last name		
<EMPFIRST>	employee's first name		
<DEPTCODE>	employee's four-character department code		
<ADDRESS1>	employee's street address, first line		
<ADDRESS2>	employee's street address, second line		
<STDATE>	employee's start date		
File:	DEPARTMENT		
<DEPTCODE>	four-character department code		
<DEPTNAME>	department name		
<DIVCODE>	two-digit numeric division code		
<DEPTMGR>	department manager's employee code		
File:	DIVISION		
<DIVCODE>	two-digit numeric division code		
<DIVISION>	division name		
<DIVMGR>	division manager's employee code		
File:	SALES		
<EMPCODE>	employee's social security number		
<SALYEAR>	year in which the sales occurred		
<SALMONTH>	two-digit code with the value of 1 for January, 2 for February, etc.		
<SALEMP>	monthly sales of the employee		
<QUOTA>	expected sales of the employee as determined by department manager		
Other available fields:			
<CURDATE>	current date		
<CURTIME>	current time		
<PAGE>	numbers page on report		
Important: If you need information not available from the above list, please provide a description of the item and how the information can be obtained.			

of sales for the month (i.e., {<SALEMP>-<QUOTA>} > 0).

The header section identifies the titles for each heading at various levels of reporting.

The body section requires the user to identify data items that should be included in the report. These items are then arranged in the desired order with column and row headings. The footer section identifies totals or any other statistical calculations with text describing them.

Benefits of the Data Dictionary Approach

The data dictionary approach is a simple technique that has several inherent benefits when used to meet requests for information in database systems. By shifting many of the development responsibilities to the user, the data dictionary approach enhances user involvement and reduces the demands on the analyst for systems development. These changes have been consistently associated with improvement in information system success (Ives et al 1983, Ein-Dor and Segev 1978).

Enhances user involvement

The data dictionary approach places top priority on the user's perspective and redefines the user's role from that of "involvement by advice" to that of "involvement by doing" (Ives and Olson 1984). The high level of active participation increases the likelihood of the end-user's acceptance for the developed information system (Doll and Tork-

zadeh 1991, Etejadi-Arnoli and Farhoom 1991, Gallagher 1974, Swanson 1974, Tait and Vessey 1988). For example, the sample reports allow the user to work with the end product of the proposed system. With its emphasis on non-

Exhibit 3 Sample Report Outstanding Sales Employees Bonus Commissions December 1998					
Employee Name	Soc. Sec. Number	Monthly Sales	Sales Quota	Bonus Amount	
<u>Division: 01 Cars</u>					
New					
Harris, David	736-92-2278	75,000	65,000	400	
Juechter, Dan	735-47-3725	70,000	60,000	400	
Bruce, Harold	718-37-8276	65,000	60,000	<u>200</u>	
	New total			1,000	
Used					
Fishkin, Bill	528-88-3847	40,000	30,000	400	
Fahler, Mark	011-48-3817	35,000	30,000	<u>200</u>	
	Used total			600	
	TOTAL: Cars			1,600	
<u>Division: 02 Trucks</u>					
New					
Coles, Jeri	583-12-3948	90,000	75,000	<u>600</u>	
	New total			600	
Used					
Rogers, John	528-78-8378	60,000	45,000	600	
Smith, Jack	411-38-5867	60,000	45,000	<u>600</u>	
	Used total			1,200	
	TOTAL: Trucks			1,800	
<u>Division: 03 Service</u>					
Repairs					
Griner, Anna	234-57-9844	25,000	20,000	200	
Johnson, Lonnie	748-53-2734	23,000	20,000	<u>120</u>	
	Repairs total			320	
Body Shop					
Long, Matt	527-17-8349	18,000	15,000	<u>120</u>	
	Body Shop total			120	
	TOTAL: Service			440	
<u>Division: 04 Parts</u>					
Retail					
Fellenstein, Marla	230-18-8472	15,000	10,000	<u>200</u>	
	Retail total			200	
Supplier					
Tompkins, Holly	532-99-2837	15,500	12,500	120	
Ellison, Jonathan	529-77-3827	15,000	12,500	<u>100</u>	
	Supplier total			220	
	TOTAL: Parts			420	
	TOTAL BONUS COMMISSIONS			4,260	

perfunctory user participation, the data dictionary approach significantly reduces the users anxiety level normally associated with the introduction of new systems (Hirschheim and Newman 1991; Newman and Sabherwal 1991).

The shifting of responsibility to the user invites opportunities for creativity in development that can lead to innovative solutions and ultimately to more effective information systems (Cougar 1990, Borthick et al 1990). The data

dictionary approach provides a direct, unfiltered expression of user needs with the completion of the sample report. The user's individual preferences and needs are not replaced by consensus building, which often erases important and useful differences.

Users in organizations are generally unaware of the information that is available to them. The data dictionary approach informs users of pertinent data items available in the database. While users may begin with an unclear understanding of their information needs and available resources, the data dictionary approach focuses their need analysis even while using an expanded set of data items.

The data dictionary approach also benefits the users through their understanding of the task at hand. An underlying problem to systems development is that end-users often do not fully understand what information they need. Hence, systems analysts begin with an incorrect needs assessment that is not detected until later. By requiring the users to complete a sample report with the selection criteria identified, the data dictionary approach assures that the user will think through the decision-making process and clarify information needs in a structured manner.

Reduces the demand on the analyst

As a consequence of increased user involvement, the analyst plays a much smaller role in systems development when the data dictionary approach is used. The approach is especially useful to the analyst when the essential data items needed to meet the request already exist in the database. The analyst helps the user to examine and clarify information needs before the development project begins and before any substantial analyst time is expended.

The amount of time that is required to complete a systems project is significantly reduced with the data dictionary approach. The user determines specifications and delineates the

desired output with the report requirements form and sample report. The data dictionary approach greatly improves user-analyst communication. It leads to more accurate assessment of information requirements and it increases the speed with which the developed system and requested information are delivered to the user.

Limitations of the Data Dictionary Approach

The data dictionary approach is suited for information requests that can be addressed using data already existing in a database. Hence, it can constrain the generation of alternative systems, especially when such systems require data not in the database.

There is the ever-present risk that increased user involvement of the data dictionary approach may not match well with the computer skills within the user department. Uninformed user involvement may compound the inherent challenges of meeting requests for database information. In some situations, increased user involvement may even lead some user departments to avoid making systems requests, which would have a detrimental effect on overall organizational performance. The level of computer expertise within the user department must be considered before adopting the data dictionary approach for a project.

Summary

The data dictionary approach is a simple and easy-to-use systems development approach. It is suited for requests of information that can be met using data already existing in a database. The most important benefits of the data dictionary approach are enhanced user involvement and reduced demands on the analyst. The data dictionary approach facilitates users in developing their own system specifications and reports. By shifting primary responsibility for systems development to user departments, the data dictionary approach leads to increased user acceptance, reduced time spent by analysts, and reduced

systems development costs. 

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