ACTIVITY 8: ANSWER

The tacit component

Knowledge consists of explicit data, that can be recorded and subjected to structured analysis, and tacit information, that provides context, meaning and purpose. Your partner has discovered an explicit pattern but has incorrectly inferred a meaning. Instead of placing the pattern into the correct context, your partner uses personal experience to assume a context, which is inappropriate.

Knowledge discovery in databases

The 'data life cycle' idea suggests that data can enter an organisation and become useful for purposes beyond those for which they were originally recorded. By gathering operational data in a data warehouse, for example, data recorded in the transactional databases of different business units, consolidated analyses become possible. Thus, not only can summary results be presented, but also results can be explored by drilling down to details. Moreover, once many detailed data sets are combined and compared, it may be possible to detect patterns and trends that were not evident at the detailed level.

Reading: Chapter 9, pages 441-443.

The correlation between supermarket sales of disposable nappies (diapers in the USA) and canned beer is often quoted as an example of successful data mining. When beer was relocated next to disposable nappies in stores, sales of both increased. The inference is that young male parents who enter a store to buy nappies also buy beer on impulse. As we have seen, however, inferences from patterns are made within an assumed context. This leads to the following question.

ACTIVITY 9: QUESTION

Who is best placed to decide whether a pattern in data is meaningful or spurious?

ACTIVITY 9: ANSWER

The general answer to this question is that we should understand the context in which data were captured in order to interpret such results.

OLAP versus OLTP

The textbook discusses both **on-line transaction processing** (OLTP) and **on-line analytical processing** (OLAP). The next reading explains about OLAP.

Reading: Chapter 10, pages 442-448.

You may be wondering why there is a need for two forms of accessing information from databases. The next activity enables you to compare the two approaches.

ACTIVITY 10: QUESTION

Relational databases are designed to save data as efficiently as possible. Data are stored in tables that are related by common fields, such that no duplication of information occurs. Examine the four tables (PRODUCT, ORDER, ORDER DETAIL, and CUSTOMER) shown below, from a simplified relational database. Note that the columns (or fields) with underlined titles are the 'key fields' which uniquely identify each row in a table.

Then answer these questions.

1. Examples of OLTP would be to produce an invoice, for example, for Harris Electric, or to report all the recent order values by all customers in the last quarter, organised by region and showing regional totals. Consider how this might be done, in principle.

2. An example of OLAP would be to present the value of orders in any two-way combination of the following dimensions: by Region, by Product type, by Month and by Quarter, such that the user could flip the workstation display between dimensions by clicking a mouse. Why is this more difficult?

PRODUCT

Product #	Product type	Price
2001	Video	100.00
2002	Video	200.00
…		
3010	TV	120.00
3011	TV	240.50
…		

ORDER

Order #	Customer #	Order date	Despatch date
…			
990001	112	2000-09-21	2000-10-01
990002	301	2000-09-21	2000-09-30
…			

ORDER DETAIL

Order #	Product #	Quantity
…		
990002	2001	200
990002	3010	200
…		

CUSTOMER

Customer #	Name	Address	City	Region	Post code
…					
301	Harris Electric	1 High Street	Wexwood	West Yorkshire	WW9 XY2
…					

ACTIVITY 10: ANSWER

Transaction processing versus analytical processing

If we consider how the invoice is generated, we see that first the data need to be assembled, as follows. From the ORDER table, the row with Harris's recent order contains the unique customer number (301) that points to a row in the CUSTOMER table with the address for the invoice. The same row in the ORDER table contains the order number (990002), which points to all the relevant rows in the ORDER DETAIL table. Each of these rows contains a product number that points to the relevant rows in the PRODUCT table, with descriptions and prices.

Now we know where to get the data, we can retrieve it. Simple computations allow the quantities to be multiplied by prices to give the value of the order. If we wished to report all recent order values, similar data would be assembled and again the computations would be repeated sequentially to enable a report to be generated. There is not much flexibility about this report: it is a long list of results. Each row would contain the order information and summary rows would show totals for each of the regions.

Although the data for the OLAP computations are also in the relational database tables, the results are to be placed into a virtual multi-dimensional matrix. For example, one cut through the matrix would show sales values in a table with Regions along the rows and Product type along the columns. (See pages 447-448 of the textbook.)

We need results to fill a table like this for each month. All these values need to be computed because we also need to display tables with other combinations, such as region by month, or product type by month. Thus, to give a manager the flexibility to view the data in many dimensions, much pre-processing is required.

In summary, OLTP is the natural on-line way to process reports and queries directed at a relational database. A relational database, which may belong to a business unit, or may be a consolidated data warehouse, is designed with the objective of efficient and non-redundant storage of detailed transactional data. In contrast, OLAP is designed to support managers. Its objective is **effectiveness**, not **efficient** data storage. Considerable pre-processing of data is needed, to give a manager the flexibility to see data in any way he or she chooses, if those data come directly from a relational database such as a data warehouse. An alternative is to save the data of interest to a management team in a local **data mart** which is designed to function as a multi-dimensional database. Gray and Watson (1998) is a good source if this subject interests you.

Interactive knowledge

Refining and sifting through masses of data are not the only ways to generate valuable information. Another form of organisational information exists as social networks: who knows whom. Putting people in touch with one another, so that they can share the products of their work, their intellectual capital, is another aspect of knowledge management.

Reading: Chapter 10, pages 456-459.

Arthur Andersen's knowledge base is an example of a knowledge network. If you have experience of such a system, or if you might consider implementing one in your organisation, there are some issues to consider.

REVIEW ACTIVITY: QUESTION

Use the next reading to check over the key terms in Chapters 9 and 10. These terms cover the major points you have studied in this unit.

Reading: Chapter 9, Key terms on page 418; Chapter 10, Key terms on page 461.

Concept map

In this final activity, you develop your personal map of the relationships between key ideas. Take a blank sheet of paper. Start with one term - management support system (MSS) - and write it in the middle of the sheet and circle it. Next, identify any of the other terms that are related to the first. For each related term, draw a line from the circle and write the name of the related key term at the end of the line. Label the line with a word that summarises the relationship. Draw further lines to other related terms. Stop when you have exhausted the relationships. If some key words have been missed, repeat the process by starting with another term not yet included, that seems to play a central role.

REVIEW ACTIVITY: ANSWER

There is no unique answer to this activity and the important thing is to create a map of concepts with links that are meaningful to you. However, you might have started like this:

Management support system (MSS)
[an example is]
Decision support system (DSS)
[may perform]
Goal seeking, Sensitivity analysis, VIM, VIS, What-if analysis
[includes]
Model base management system
[an example is]
Personal information manager (PIM)
[an example is]
Executive information system (EIS)
[is the same as]
Executive support system (ESS)