LINKING DATA PROCESSING AND OFFICE AUTOMATION

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This paper discusses the problems of being able to effectively-link data processing (DP) installations with computing facilities in an office environment (OA). It is, of course, not a new scenario, as can be illustrated by the following story.

In 1976, an accountant at an automobile manufacturer in Great Britain moved into a job where he had to report the sales market share, on a DAILY basis, to upper management. The procedure already set up was that an external system sent data to the company system, which then output a daily report. This daily report was a little cryptic and needed some interpretation. The raw data was then combined with analysis and typed up (cut and pasted) by the secretary. Then the report would be hand-delivered to each manager (well, at least into the "IN" basket!).

A pretty basic informational task you'd think: the provision of data to management on a regular basis in a readable form. In time, improvements were made to the process by using a report writer to set up a better report. And an Apple IIe (remember them?) was used to maintain a spreadsheet from which the final daily report could be generated automatically. It was still delivered by hand to each office though.

No doubt, you have similar stories to tell about information transfer in your organizations. And, no doubt, things have improved over the last 12 years. Or have they? What does Data Processing and Office Automation mean in most companies today?

DP: THE IMPLEMENTATION OF BUSINESS TRANSACTIONS

Data processing can be defined as the implementation and maintenance of an application, either packaged or bespoke. These applications work at a transactional level, produce regular production reports and deal with decisions such as "IF credit-limit > ord-total THEN accept ELSE reject".

Database(s) used in the applications are designed with these application decisions in mind. Usually, some reporting considerations are also reflected in the database design. However, that is restricted to the production reports and the sort of reporting and data presentation that business people require is not a priority. In fact, at the time of application design, these needs may not even be known. A product manager at HP, for example, uses statistics from databases that were designed many years ago and are, for the type of analysis now required, almost inaccessible.

In summary, the data being maintained and the decisions being made in the DP environment are purely OPERATIONAL. And the operational data is mostly limited to single applications. But there are other information needs within a company. These can be described as TACTICAL and STRATEGIC. These three types of data are described in Figure 1.
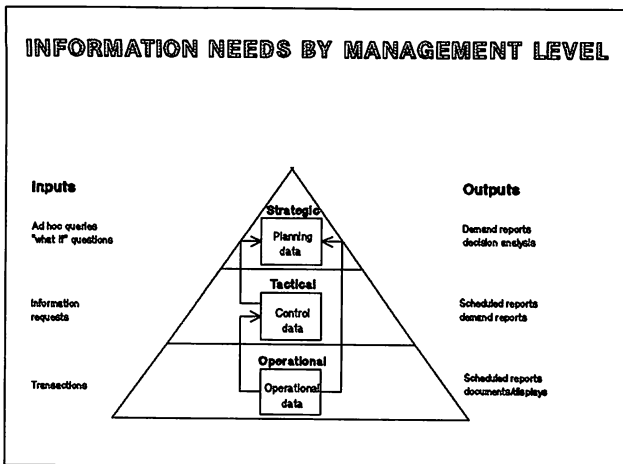
INFORMATION NEEDS BY MANAGEMENT LEVEL

Inputs

Ad hoc queries
"what if" questions

Information
requests

Transactions

Strategic

Planning
data

Tactical

Control
data

Operational

Operational
data

Outputs

Demand reports
decision analysis

Scheduled reports
demand reports

Scheduled reports
documents/displays

Figure 1.

An example of tactical data, using the credit limit example from above, is a report of how much of a credit limit is being utilized by a dealer.

A related strategic decision would be the evaluation of possible new credit limits to reflect a pending new product which will cost 30% less than the current one.

INFORMATION IS A RESOURCE!

The competitiveness of a company is directly related to its ability to make tactical and even strategic decisions. For example, a company that depends heavily on the market price for a certain commodity must be able to react very quickly if external factors, such as politics, affect the price. Currently, it probably requires several months to collect enough data to support a strategic decision -- expect this time to be reduced to a few days by the 1990s (which doesn't mean, however, that a company will make 2 or 3 strategic decisions per week!).

The battle to reduce the time taken for operational decisions can be considered as being over, at least on minicomputers. It occurs when companies move from batch applications to online. And at the mainframe level, there is now a strong trend to implementing On-Line Transaction Processing (OLTP) for applications that were previously only available in batch.

Tactical and strategic decisions require analysis based on operational data PLUS possibly data from other applications, or even from external sources. Linking DP and OA should address THIS need.

When examining the types of tools available today for DP professionals, you will find that they concentrate mostly on the presention of operational data. These are mainly report-writer tools, although some of the tools also have limited graphics capabilities.

However, with few exceptions, these report-writer tools are really batch list-writer tools; they process operational data into a printed listing which is then used a source for manual analysis. Some companies callthese listings "tabs", they are printed on computer paper and can be hundred of pages long. You can even buy special binders to keep these tabs tidy.

Expense reporting and controlling still means, in most companies:

1) Printing a report
2) Splitting the "tab" into the separate cost center details (using a 12-inch rule perhaps)
3) Putting the individual reports into envelopes
4) Mailing the reports to the managers via an in-house postal service.

Sometimes, separate reports are printed within one job to save the manual splitting task.

Usually , the listings report just one application at a time -- the tools are usually purchased as part a toolset for the application package. And another package, written in another toolset requires separate reports. Only a few of the tools can combine data from several applications on one report.

OA: THE PRESENTATION OF DATA FOR TACTICAL AND STRATEGIC DECISIONS.

Office Automation, in the context of this paper, is now quite easy to define. It is the presentation of data for strategic and tactical decisions. Important in this respect is the following:

* The ready access to operational data,
* The ability to combine other data with this operational data
* The capability to present the consolidated data.

Hewlett-Packard's view is that the integration and presentation of such data is most effective when accomplished on the personal computer. Many companies have set up "information centers" using PCs and PC software to produce spreadsheets and graphics. And HP is undoubtedly one of the leading vendors in linking PC users to databases through the HP INFORMATION ACCESS product.

However, most companies' operational databases are proving too complicated for end users to be able to get the information they require. One hears comments like:

* "The data is too dirty for end users to use"
* "End users are hogging valuable resources"

from MIS staff involved in such projects.

By "dirty data" they mean that data is sometimes stored in a form which, although perfectly understandable to a programmer, does not make much sense to end users reporting from it.

One example is a user who, when analysing product sales statistics from a file containing delivery data, obtained sales results far larger than expected. It took much research to find out that this was because deliveries of promotional items, such as pens sold at a large discount with every third unit sold, were included in the sales statistics.

Another example is a user creating a report which then printed various date items in "days since 1990"!

And of course, a common critisism of end user access to operational databases is that the user sometimes sets up queries that then take up far too many computer resources.

LINKING DP AND OA

So, some companies are now coming to the following conclusions about implementing a better link between DP and OA:

1) CHANGE THE USE OF REPORT WRITERS
   Report writers could be used not only for production reporting but to reduce operational data to a form that can be of direct use in an office.

   It is for this reason that some report writers can now output their data directly in spreadsheet formats. As well as generating listings of data, report writers should be able to FILTER operational data for office use. Not only filter but also TRANSFORM the data -- the report writer should be able to process "dirty data" and provide several file formats.

2) USE ELECTRONIC MAIL SERVICES
   Electronic mail (E-MAIL) should be used to transmit data as well messages. It is an obvious extension of such a system with two advantages: once an E-Mail service is established, then so is the necessary networking; and users have a ready-built interface to be able to handle deal with the data.

   A popular enhancement request for HPDESK, for example, has been programmatic access to the product. One of the reasons that many customers request this is to be able to link their own programs to the product and send data around the network.

3) LINK DP AND OA TOOLS
    The DP and OA tools should be able to talk to each other.

    There are report writers for programmers and applications
    developers. And there are report writers for end users. The two
    product types are similar but they do have distinct differences in
    style and capabilities. But, ideally, they should be able to
    communicate data to each other. The data output by production
    report writers should be accessible from the preferred office
    tools.

Hewlett-Packard has now addressed these concerns and implemented the
following product enhancements:

*   HP BUSINESS REPORT WRITER (HP BRW)
    Under the project name, "HP BRW -- OFFICE", HP BRW has been
    enhanced to link it closer to both E-MAIL services on the HP3000
    and to HP's PC report writer. These enhancements are described in
    more detail on the following pages.

*   HP DESK
    HP DESK intrinsics are now available to enable you to better
    integrate your applications with the services. These intrinsics
    are described in a separate paper being presented at this
    conference and they have been implemented in HP BRW as part of the
    HP BRW -- Office project.

    In addition, HP DESK has been enhanced to allow the browsing of
    BRW reports within the IN TRAY, with all the scrolling features
    available today on HP BRW's online review screen.

*   HP INFORMATION ACCESS
    HP INFORMATION ACCESS has been enhanced to be able to read files
    which were output by HP BRW.

INTRODUCING " HP BRW - OFFICE "

HP BRW is HP's report writer for DP staff and has been installed at over 1,500 sites since its release over 2 years ago.

HP BRW can be used to produce reports across many applications and its data access, processing and formatting capabilities have ensured that it is used for tasks that were only possible, till now, with a programming language like COBOL. It also defines high-performance reports because of its report tuning features.

Now functionality has been added to HP BRW in the following areas:

1) BRW-DESK
   Through this add-on product, HP BRW can be instructed to deliver a report ELECTRONICALLY, using HPDESK to one or more IN TRAYs. The HP DESK user(s) can read the report directly from the IN TRAY as well as print it out like any other message.

   The HP DESK addresses are defined as part of the BRW report via a new function in HP BRW. A single report can also be split electronically, at a certain sort level, and distributed to a list of HPDESK users.

2) New Output File Types
   HP BRW can output files in a list of possible formats including those of PC spreadsheet programs or graphics packages for direct use in these OA tools.

3) Intermediate Report File (IRF)
   Data can now be passed between HP BRW, the DP report writer, and HP INFORMATION ACCESS, the end-user report writer on the PC.

   This is because HP BRW's Intermediate Report Format (IRF) can now be read by HP INFORMATION ACCESS. The converse is also true: files can be output from HP INFORMATION ACCESS in IRF formet which can be read by HP BRW. This means that HP BRW reports can include data from foreign database systems via HP INFORMATION ACCESS CULLINET LINK.

4) Complete Reporting System
   HP BRW and HP INFORMATION ACCESS now share the same dictionary. This fact, along with the possibility to move data between the products, means that the purchase of HP BRW and HP INFORMATION ACCESS serves as a complete reporting solution:

   *   HP BRW for the MIS area
   *   HP INFORMATION ACCESS for the office environment.

The following pages list just some of the implementations you could now consider with the addition of these products.

LINKING DP AND OA -- 1 (see Figure 2)

An expense report is specified, with HP BRW, within the regular
month-end routines. This report is sorted by cost center and shows the
expenses versus budget. Automatically, each individual cost center
listing is separated out and sent to the reponsible manager, with a
carbon copy to the accounting manager. Via HP DESK, the CC manager can
review the expenses report online and/or print it out as with any HP
DESK message.

An exception list of all cost centers with greater than 20% variance is
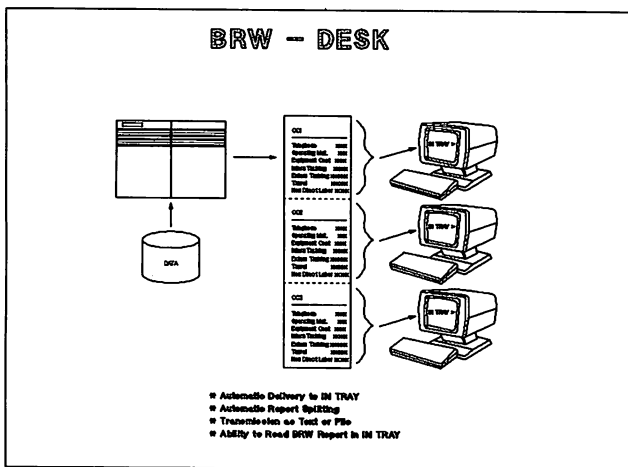also collected and sent to the accounting manager, from the same
report.

Figure 2.

LINKING DP AND OA -- 2

An orders report is run, with HP BRW, at the end of each month, listing
the units and revenues sold for various products. The report is split
electronically, by HP BRW, into individual product reports and each
component is sent, via HP DESK, to the responsible product manager.
The data is sent in DIF format which means it can be imported directly
into spreadsheet and graphic packages on the product manager's PC.
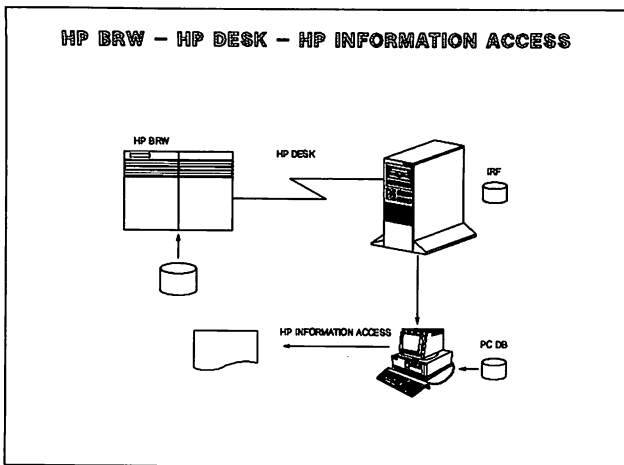
Figure 3.

LINKING DP AND OA -- 3 (see Figure 3)

A business analyst needs to produce a report combining the latest order statistics with a some market analysis data. Order statistics are received on a regular basis, in Intermediate Report Format (IRF) via HP BRW and HPDESK. The market data is held on a PC database. Using HP INFORMATION ACCESS, the business analyst produces the required report in a matter of moments.

LINKING DP AND OA -- 4

In the US, HP produces order status reports, via HP BRW, on a monthly basis which are sent to a network of its major customers via HP DESK.

LINKING DP AND OA -- 5

The accounts payable department prints payment instructions for the company bank on a weekly basis. These payment instructions are output via a HP BRW report and sent electronically to the bank using HP DESK and HP TELEX.

The financial budgets for a new year are due. The Controlling
department run an HP BRW report which lists the previous years data
plus a recommended multiple for the new year. The report is output
directly in a spreadsheet format and sent to all managers via HP DESK
plus HP ADVANCE MAIL. The file is now imported into a spreadsheet
program and the new budgets are created online.

CONCLUSION

These are some of the possibilities with the "HP BRW -- OFFICE"
features. We are confident that all of these features mean that a
combination of HP BRW, HP DESK and HP INFORMATION ACCESS is now the
ideal toolset to move data between production applications and an
office environment.

The above functionality is available in Fall, 1988 and will definitely
help you to forge better links between data processing and office
automation.