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*Many companies with data processing installations are vaguely dissatisfied with them but don't quite know why. Here's a rating system through which EDP efficiency can be measured in seven major areas —*

## **EVALUATE YOUR COMPUTER INSTALLATION**

*by William C. Ramsgard*

*Crouse-Hinds Company*

**T**HE EVALUATION of your electronic data processing department—its people, its procedures, its problems, and its potential—can be vital to your company. Is your computer installation any good? Let's see if we can answer that question.

Pick up any magazine or newspaper oriented toward business or a particular profession and read the ads. Big computers, minicomputers, terminals, languages, software packages, and consultants by the dozen offer the best of everything required to develop the ideal computer center. And you must have a magnetic schedule board, a tape reel truck, and a shredder

to make your operation up-to-date.

Now, if you read the articles in that same magazine, you find that something is wrong! Issue after issue contains the bold documentation of a myriad of grand successes by others in information processing. But your organization doesn't seem to measure up to these grand designs. Obviously something is wrong. Are the data processing personnel inept? Could the equipment be inadequate? With such a diverse selection of services and equipment, it just might be that the computer world is passing you by.

Wait a minute! A shredder or a software package won't make this

computer operation run correctly. It takes good people, hard work, and a lot of time to develop a smoothly functioning organization.

It takes more than a product covered with Madison Avenue glamour to make all this run right.

What does it take? How does your group measure up? What you do need is a way to evaluate your existing data processing installation simply and effectively.

As you control an obviously expensive organizational resource, should you not be able to measure the quality of your computer products? There is, of course, no direct way to value the information product itself. One man's information is

another man's. In a computer resource evaluation must be made in the subjective terms of operation and information techniques and controls.

Following is the Dragsmar\* Evaluation, a rating system designed to guide the measurement of your computer operations. The Dragsmar Evaluation is best adapted to a business computer environment of no more than three separate (or combined) computer systems. There are seven major areas of evaluation:

1. Software
2. Hardware
3. Documentation and organization
4. Planning
5. Testing
6. Personnel
7. Protection.

The Dragsmar Evaluation allows both positive and negative values. Some common practices are clearly bad and are rated accordingly. Scores will range from a -53 to a +147 and may be judged as follows:

130 to 147	Superior
115 to 129	Satisfactory
90 to 114	Average
60 to 89	Poor
Below 60	Take immediate corrective action.

A high evaluation indicates that the computer installation is well organized and managed. It fails to indicate whether the user is receiving the most appropriate quantity and quality of data to do his job, just as good accounting practices and financial reports do not mean a profitable operation. The computer output must be timely, meaningful, and even well used by the recipient.

A poor rating *does* indicate that the data processing function planning and control are such that it *cannot* deliver a good product.

On pages 38-39 you will find the Dragsmar Evaluation. You will need the assistance of the data

\* Dragsmar—the author's name spelled backward.

	Yes	No	Your Total
<b>Software</b>			
1. Are there fewer than 300 active programs, excluding sorts?	10	0	
2. Are there more than 50 computer sorts?	5	0	
3. Are any programs run in simulation, emulation, or compatibility modes?	0	5	
4. Are any major computer files organized randomly?	5	0	
5. Are most new programs written in COBOL or PL/1?	5	0	
6. Do outside software or consulting firms now write any of your production programs?	-5	0	
<b>Hardware</b>			
7. Does your company have gross sales of less than \$20 million and two computers or gross sales of less than \$100 million and three computers at a single site?	-5	0	
8. In the last 36 months have you made over five additions to core and/or more or faster peripherals?	-4	0	
9. Have you had more than three different models or brands of mainframe (CPU) in the last ten years?	-3	0	
10. Are productive meter hours equal to or greater than 96% of total meter hours?	5	0	
11. Excepting source data entry equipment, subtract one for each piece of unit record equipment now used (-10 maximum).	-10	0	
<b>Documentation and Organization</b>			
12. Review the program folder of some popular, frequently run program.			
A. Using some section of the material in this folder, can you follow <b>exactly</b> how the <b>problem</b> is solved—including how all calculations take place?	12	0	
B. If NO to A above, can you generally understand how the problem is solved?	7	0	
C. If NO to A and B above, can the DP manager explain <b>clearly</b> how the program works?	4	0	
D. If NO to A, B, and C above, is there a program folder with something in it?	2	-10	
13. Can you normally locate master flow charts indicating the total program series and requirements to accomplish this job?	3	0	
14. A. Is there a book, folder, file, etc. containing layouts showing the exact position and content of information within your tape or disk records?	7	0	
B. Is this set of records up-to-date?	4	0	
C. Is this set of records indexed?	1	0	
D. Are record layout copies kept in the program folder?	2	0	
15. A. Do you have a master report book or file with one copy (or sample) of every computer report?	7	0	
B. If NO to A above, is there a sample report in each program folder?	4	0	
16. Are most sample reports the latest reliable version?	4	0	
17. A. Is there a book, folder, file, etc. of card (or input document) layouts showing the exact position and content of information on each card?	6	0	

processing personnel to obtain some of the answers. Take the test. How does your existing data processing organization rate?

On this and following pages you will find comments relating to the reasons for and the point evaluation for some of the questions.

**Software**

1. Well organized systems and programing will easily capture all information systems appropriate to automate. While each organiza-

tional environment is unique, the problems and solutions of a business are generally quite similar.



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B. Is this set of records up-to-date? 4 0  
 Some computer installations are run effectively without such thorough documentation, but they haven't necessarily survived any crisis. Documentation reduces vulnerability sharply.

**Planning**

- 18. Do you have an annual procedure that formally plans, evaluates, and develops priorities for new automated applications in the coming year? 6 0
- 19. Is there a formal system for request evaluation and review of new requests for computer services? 4 0
- 20. Is there a charge-back or memo billing system so that both the user and chief executive can evaluate the worth of the output? 3 0
- 21. Does Data Processing document for corrective action all reruns? 3 0
- 22. Is Data Processing overtime proportionally equal to the overtime generally worked in other departments 0 -3

**Testing**

- 23. Is there a written procedure indicating either a plan or requirement to desk-check problem solution logic prior to programming? 5 0
- 24. Is there a written procedure indicating either a plan or requirement to test a program? 5 0
- 25. Are programs tested? 0 -5
- 26. Are program test results examined most of the time by someone in Data Processing other than the programmer? 5 0
- 27. Are programmers allowed to run their own tests on the computer system? 0 3

**Personnel**

- 28. Does the person who studies the problem (the analyst) also write the program? 0 10
- 29. Does your organization have any type of planned training program for the data processing personnel? 3 0
- 30. Were more than 1/3 of the data processing personnel originally unit record or computer operators in your organization or elsewhere? -4 0
- 31. Are 3/4 or more of your analysts originally programmers? -4 0
- 32. Have at least 60% of your total DP staff been in this department four or more years? 5 0

**Protection**

- 33. Are computer room doors locked, or is access restricted? 2 0
- 34. Is the maintenance department cleaning the room carefully so as not to raise dust? 2 0
- 35. Are filters changed regularly? 1 0
- 36. Are master tape and disk records made in duplicate and stored where fire, riot, or storm would not destroy both sets? 3 0
- 37. Are all preprinted forms stored so that fire or a ruptured sprinkler head will not ruin all of them? 2 0

TOTAL SCORE \_\_\_\_\_

More than 300 basic programs, except in a very large installation, often indicate poor systems planning, fragmented processing, and low-grade solutions per program. An exception must be made for autonomous divisions using your central computer system. Increase the base by 10 per cent for each geographically separated generally independent division.

2. Sorts indicate that information recorded and retained can be used over again for multi-information purposes. Lack of computer sorts indicates pre-first-generation off

line methods and/or poor information structure and retention. The minimum acceptable limit is one sort for each six basic programs.

3. Only native language processing allows full hardware utilization.

4. Most computer manufacturers will advertise random processing yet advocate that you practice various forms of sequential file organization processing. While almost all business environment transactions take place in a random fashion, few computers are able to process data that way. Normally the master

records in the computer conform to tape-oriented, second generation sequential arrangement. Such organization of data is optimum only for some program processing time and offers the programmer grave problems in set-up, maintenance, and overflow. Credit your staff when they are able to work with random files to any extent and make the machine operate like the business.

5. The higher-level languages usually offer documentation, control, and flexibility not found with lower-order languages, although many installations use PLC effectively and even more can't justify COBOL or PL-1 economically.

6. This is the most expensive kind of data processing; you pay dearly for each line of code. You must justify the expense by the urgent demand for results. But you must also ask yourself two questions. First, how did the crisis arise? Where were the management planning, direction, and data processing staff training and retention program to avoid the crisis? Secondly, can you live with the consultant's solution? It's been our experience that these gentlemen are necessarily "results now" oriented. Was the system studied? Was the program documented? Will it stand up to the test of years of processing? Perhaps not, and your own retained staff will not be able to decipher the consultant's notes and program logic.

If you've answered "YES" and consultants do write programs, subtract five from the score.

**Hardware**

7. A YES to this question indicates your computer salesman wins the prize in his company's sales contest—thanks to you!

8. YES to this question demonstrates lack of requirements planning and/or our zealous computer salesman again. Can he really solve problems with more hardware. It is possible that your configuration planning is so good that five or more additions are actually appro-

appropriate and economical. Such exceptional cases will find that their scores are over 115 without this question. The proof is in the final score.

9. Over three again indicates poor long-range planning and/or capable computer salesmen.

10. Meter hours are lost for several reasons such as operator error, machine malfunction, sequence of data or programs, etc. All sources should not total more than 4 per cent of total meter hours.

11. This type of equipment by design and function is older than most of your organization personnel. It is also very expensive. Your requirements for these pieces of equipment are somewhat proportional to the capabilities of the entire operation. In the 1970's information processing environment you need NONE of it. It's like riding a horse to work on a freeway—it will get you there—but very slowly!

#### **Documentation**

12. The question on program folders (or whatever you choose to call the documentation of a computer program) allows you to select one of six possible numeric ratings. Select only one.

Since the program folder explains HOW a particular job is run on your computer, it is extremely important to your operation. If you cannot understand some portion of it, you must employ a specialist to decipher it. If no program folder exists or it can't be easily explained to you, then the problem gets worse. Imagine running the accounting department without an updated chart of accounts! Or even worse, no chart at all! What then of the documentation of vital business routines now submerged in a vast complex machine? A score of less than eight indicates you've lost control of your organization systems! What happens in that machine, how it happens, whether or not it was correct, can be anybody's guess.

13. Master flow charts indicate interrelationships among programs.

Like an audit trail, they indicate how information develops from program to program. Master flow charts also serve as a safety device for program changes. By tracing the uses of proposed changed information or structures of data through a series of programs, we can detect impact of the changes upon other facets of the data processing product.

14. While Question 12 looked for relevant documentation of computer solutions, this question seeks suitable recording of the structured information that machines process.

Information organized in a computer is commonly called a "file." Files in turn have elements of information commonly called "fields." Exact, up-to-date record layouts of files are essential to accurate information processing. If labels do not indicate field content, decimal placement, or the meaning of codes, you are in trouble. How can the programmer (or his next replacement) figure out what the unlisted codes mean? How can he treat dollar-and-cent or per cent fields accurately? How can you rely on your report data?

15. The master report book indicates what information is available on a standard basis. In a vital, growing organization, with frequent promotions and turnover, information requests are duplicated over and over as new people request information contained in old reports. But the new people are not aware of the old reports, or similar versions of them.

We find also that long-term, stable organization managers will request what appears to be new information. A master reports book frequently can provide existing report sources or the basis for an easy modification without extensive and expensive reprogramming.

#### **Planning**

18. This is a very expensive resource. Books have been written on how to formulate plans and establish priorities. Read them!

19. New requests and demands

***Since the program folder explains HOW a particular job is run on your computer, it is extremely important to your operation. If you can't understand some portion of it, you must employ a specialist to decipher it. If no program folder exists or it can't be easily explained to you, then the problem gets worse.***

cannot always be planned for. Your system must have a system to accommodate continual change.

20. Once the user sees what it costs, he may decide he can operate successfully without it. A "free" computer installation is an expensive luxury.

21. Question 10 pointed out several types of unproductive meter hours. If you know how many hours are lost, then a firm, positive reporting system is a strong tool to eliminate repetitive errors. Be aware that, regardless of your answer, it may be possible to do better! Both hardware devices and software are available to measure productive hardware-meter-hour utilization.

### **Testing**

This entire section of questions offers a guideline to the speed and accuracy of program implementation. Consider your own impatience when you read what you've written. Frequently, you think so fast (and know what you mean) that you write and proofread through your own errors. The programmer is just as impatient—and frequently pressed as hard as you are. Verification prior to actual program testing is essential and must be done by or with someone other than the principal program writer.

A programmer will normally test all proper solutions and all calculations in his program. Quite frequently he will not test all possible real world business conditions or sequences of conditions that will actually take place in his program. Failure to test a wide variety of line organization transactions means eventual program deficiency. Failure to test all possible error conditions will cause innumerable delays and even quicker program problems.

### **Personnel**

28. A good programmer is a person dedicated to the development of perfect problem solutions in terms of computer equipment utilization.

must, however, be balanced by an organization generalist—a systems analyst.

This systems analyst is similar to an internal consultant. He too is dedicated—but to total organization success. He seeks success by efficient results for humans—sometimes at the expense of the machine.

It is not possible to have the best of both worlds. The organization generalist (systems analyst) and the dedicated programmer cannot be the same person. Do your draftsmen also do your product development engineering? If you allow machine specialists (programmers) to design your business systems, then beware! You've placed the very life blood of your organization—your information—in the hands of dedicated technicians.

30 & 31. Promotion from machine operations to programming to programmer analyst to systems analyst is *not* a normal individual growth pattern. Each area requires certain talents which are not necessarily admission requirements to another level. A good accounting clerk can, but normally does not, become controller. The close association of work does not normally make a clerk into an accountant. So, too, in data processing. High percentages of upward mobility within the data processing department suggest low potential from the current incumbents.

32. A poor score on this question and low scores on Questions 30 and 31 normally indicate your unwillingness to meet the salary standards of the computer profession. Sometimes a supervisor's abrasive personality causes an equally bad score for this question.

### **Protection**

Society and our environment are a hazard to data processing. Big glass windows facing the street, a disgruntled data processing employee, or the cigarette all pose a danger to this vital organization function.

Protect yourself!

*Frequently, you think so fast  
(and know what you mean)  
that you write and proof-  
read through your own  
errors. The programmer is  
just as impatient — and  
frequently pressed as hard  
as you are . . .*