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Letters

R. P. Haynes

Donald Hart Shuckett

Brenda Steinke

Richard M. Story

Martin K. Magid

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Authors

R. P. Haynes, Donald Hart Shuckett, Brenda Steinke, Richard M. Story, Martin K. Magid, and Richard G. Canning

Improvement

The article on the freight payment plans ("Freight Payment: Cheaper by the Bank" by Sidney W. Hall, March-April '68, p. 45) omitted a recent improvement:

The Cass Bank and Trust, St. Louis 63106, pays all (not just those of members of the plan) freight bills submitted by carriers who have been instructed to send bills to them. We find it eliminates about 50 per cent more checks than the conventional plan we used previously.

R. P. Haynes, *Controller*
Berg Electronics, Inc.
New Cumberland, Pennsylvania

Apology

Dr. Edward J. Mock and I recently published an article ("Decision Models for the Acquisition of Treasury Stock") in the March-April, 1968, issue of Management Services (p. 49).

I inadvertently omitted a footnote reference to the outstanding article by Charles Ellis, "Repurchase Stock to Revitalize Equity," which appeared in the July-August, 1965, issue of *The Harvard Business Review*. The omitted reference appeared in the last three sentences of the article.

I deeply regret the oversight . . . The reference was omitted in typing the second draft, and [the omission] was never discovered in the proofing and preparation of the final draft.

Donald Hart Shuckett
Whittaker Corporation
Los Angeles, California

Puzzled

The article, "The Use of Simulation to Solve a Queueing Problem" by Richard M. Story (January-February '68, p. 58), has left the data processing students here at Eau Claire Vocational, Technical and Adult School somewhat puzzled. A report was given in our data processing applications class, and in the discussion that followed questions were raised concerning the example of simulation given in the article.

In the example the operator waiting time was reduced by 378 minutes (389 minutes with one inspector minus 11 minutes with two inspectors). This time could be used for increased production, greater efficiency, and better quality. Was this taken into consideration when determining the cost of the added inspector?

The second question pertains to the cost of labor. What exactly was included in the example? Both overhead and direct costs?

Brenda Steinke
Vocational, Technical and
Adult School
Eau Claire, Wisconsin

Clarification

[The] first question asks whether the increased production, greater efficiency, and better quality resulting from the reduced operator waiting time was taken into consideration when determining the cost of the added inspector. This certainly shows that the students studied the article with great care.

In answer, may I say, first, that greater efficiency and better quality are not a function of operator working time but rather of operator training and motivation, methods analysis, machine capabilities, supervision, and other factors. As to increased production, this may well be, under certain conditions, quite germane to the problem.

If the manufacturing situation were continuous rather than intermittent, then the cost of lost production could well over-ride the additional expense of an added inspector. However, the situation portrayed involves intermittent manufacture to stock, which presumes the operator has completed his production quota for the work in question before having the lot inspected. Consequently, no production loss ensues. There is, however, a delay in starting his next job, and this results in a cost equal to his pay for the time he spends waiting. Since the next job is presumably also manufacture to stock, no cost is attributable to a delay in completion of the lot.

In answer to [the] second question, only direct costs of labor were considered, since it was assumed that no actual change in overhead

occurred in the situation described. Had an actual change in overhead costs been involved in the selection of an alternative, they would have to be taken into account.

RICHARD M. STORY
The School
of Business Administration
The University of Connecticut
Storrs, Connecticut

Dangers of simplification

As an example of how queueing theory can be applied to everyday problems without reference to the Greek alphabet or high-powered mathematics, Richard M. Story's article ("The Use of Simulation to Solve a Queueing Problem," M/S, January-February '68, p. 58) was excellent. However, he raised a few questions and illustrated some of the dangers characteristic of a simplified approach.

An admittedly short study period of ninety minutes was used. This would be sufficient for illustrating the point if the rules were carefully followed. However, in the first simulation (Table 2, p. 60), the last operator arrived at 9:18 a.m., twelve minutes before the end of the study period. Figures 1 and 3 (p. 59) show that the longest possible time between arrivals is nine minutes. Therefore, the effect of at least one additional operator was not included in the analysis.

As the author stated, more than two iterations would normally be made before a decision would be reached. If at least fifty iterations were conducted for each situation, as he suggested, it would probably not matter that they were all different. However, in the case under discussion, one set of simulated data was used for the one-inspector situation while another set was used for the two-inspector situation. The very least that should have been done, in the absence of many iterations, would be to use the same set of simulated arrivals and service times for both situations. This can be shown by the fact that if only Simulation Number 2 had been used, the opposite conclusion would have resulted, using the author's decision criterion.

Perhaps most crucial of all was the decision criterion employed to justify the one-inspector system. The cost of the operators' waiting time with only one inspector, expressed in terms of wages only, was measured against the wage cost for an additional inspector plus any operator waiting time with two inspectors. This effectively minimized indirect labor cost, but it certainly did not optimize the firm's earnings. The cost of operator idleness must also include, in addition to the operators' wages, the loss of company earnings suffered as a result of the idleness. (The company's cost accountants, its CPA firm, or a work sampling study can quickly determine the earnings per direct labor hour.) Depending on the industry, an equally important factor could be the cost of idle machines while operators are waiting. The revenue produced, or the earnings, per machine hour may be the most relevant factor of all. If these (and other) factors were considered in the example, rather than suboptimizing by considering only payroll costs, I suspect the decision might have gone the other way, to two inspectors.

MARTIN K. MAGID
Management Services Department
Rutten, Welling & Company
Detroit, Michigan

Means of presentation

[Mr. Magid's] two initial statements have merely to do with my means of presenting a noncomplicated explanation of the subject. His own statements are prefaced with a referral to the article's recognition of the necessity of more extensive study and analysis . . . My . . . reply to Miss Steinke's letter answers his remaining statements.

RICHARD M. STORY

Correction

We very much appreciated the references to our publication, *EDP Analyzer*, in the March-April issue of Management Services. (See "New Generation EDP Control Considerations" by Robert F. Moloney, footnote 2, p. 18, and footnote 4, p. 19.)

But the references to our company name were incorrect, and I thought I should call this to your attention. It was listed as "Corning Publications, Inc." in Mr. Moloney's article.

The article was a good one. Keep up the good work.

RICHARD G. CANNING, *Publisher*
Canning Publications, Inc.
Vista, California