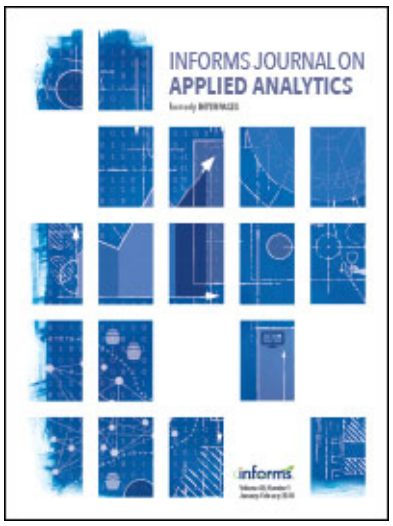

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Letters to the Editor

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LETTERS TO THE EDITOR

To the Editor:
Re: Schonberger, Richard J., 1981, "Why Projects Are 'Always' Late: A Rationale Based on Manual Simulation of a PERT/CPM Network," *Interfaces* Vol. 11, No. 5, pp. 66–70.

I have just read the October, 1981 issue of *Interfaces* and felt that a letter to the Editor-in-Chief was appropriate.

Taking the nonacademic approach (the down and dirty approach), I am glad to see we are now stressing simulations rather than analysis. I specifically refer to the article on p. 66, "Why Projects Are 'Always' Late: A Rationale Based on Manual Simulation of a PERT/CPM Network." Why bother using analytical methods to understand the intricacies of the problem when one can simulate and not understand the problem at all.

I look forward to your editorial support to the nonthinking man's approach to Operations Research. May we be forever numb.

W. H. Bleuel
Barber-Colman Company, 1300 Rock Street, Rockford, Illinois 61101.

To the Editor:
Re: "De Novo Programming": The Emperor's New Clothes?†

This letter has its roots in a tale told recently by Zeleny [1981], who postulates the two-item product-mix problem summarized in Table 1. The profit margins for items x and y are, respectively, $400 and $300 per unit. Judging from Zeleny's description, the availabilities of the resource types, given in the last column of Table 1, were determined by some modern form of witchcraft. The important fact, however, is that some other form of witchcraft has specified a total budget for resources of $2600, and the limits on individual resource availabilities are fictitious.

†*Ed. Note:* It is an unbelievably frustrating experience for an editor to pull out of an envelope a promising looking submission, smartly typed, illustrated, and referenced, and then discover that this is the second — or fifth — author who has devoted a complete article to rebutting the same previously published piece. (It must understandably be considerably *more* frustrating for the author who finds himself in this inadvertantly duplicated situation.) Please, if you wish to reply to a previous article, prepare a brief letter, or call the Editor and place "first dibs" on preparing a response if you wish to write an article-length piece. Or, as a third alternative, take the original paper as a point of departure but submit substantial new material so that it will stand by itself. The incoming Editor-in-Chief, Gary Lilien, is in wholehearted agreement with this plea.

Gene Woolsey

TABLE 1.

Price ($ per unit)	Resource type	Units needed to produce a unit of x	Units needed to produce a unit of y	Total available
30.00	Golden thread	4	0	20.00
40.00	Silk	2	6	24.00
9.50	Velvet	12	4	60.00
20.00	Silver thread	0	3	10.50
10.00	Nylon	4	4	26.00

After costing out the resources per unit of each product, the following simple linear programming formulation is evident:

$$\begin{aligned} \text{Maximize} \quad & 400\,x + 300\,y \\ \text{subject to} \quad & 354\,x + 378\,y \leq 2600, \\ & x \geq 0, \qquad y \geq 0. \end{aligned}$$

One hardly needs a "personal microcomputer" to determine that the solution yields total profits of \$2937.84 with $x^* = 7.3446$ and $y^* = 0$. For some reason, Zeleny calls the process arriving (approximately) at this solution *de novo programming*, as distinguished from linear programming. Now, really!

REFERENCE

Zeleny, M., 1981, "On the Squandering of Resources and Profits via Linear Programming," *Interfaces* Vol. 11, No. 5, pp. 101–107.

Donald Erlenkotter
Graduate School of Management, University of California, Los Angeles, California 90024.

Essentially the same points made by Professor Erlenkotter concerning Professor Zeleny's paper were mentioned by several others. Lawrence D. Stone, of Daniel Wagner Associates in Sunnyvale California, pointed out "Surely it is no surprise that using the wrong constraints in a linear program may lead to the wrong solution, and the concept of cost effectiveness is not new." W. L. Pr[illegible], of Universit´e Laval, Qu´ebec, commented "Linear programming is not the culprit in Zeleny's Resource Allocation Problem, bad model building is."

Ronald V. Hartley, of Bowling Green State University, says in summary that he is

> not at odds with Zeleny's premise that the analyst should be looking for a global solution. However, to label this as a limitation of LP is not justice . . . There is continuing evidence that accountants and accounting concepts are ignored in the Management Science approach . . . It is one problem that results from putting disciplines in neat little pigeon holes, at universities and elsewhere, and setting up all sorts of roadblocks preventing a true team effort of analyzing problems.

The Author Replies:

I feel that it should not be necessary to further discuss an already published solution to the problem presented in my recent article [*Interfaces* Vol. 11, No. 5, October 1981, pp. 101–107]. In my opinion, all that was discovered in the letter above amounts to an LP restatement of what was more clearly and efficiently stated in the section entitled "Counter-Act" on page 106 of the article in question. There "an MIS whiz kid from MIT," recognizing a trivial continuous knapsack problem, costed out 4($30) + 2($40) + 12($9.5) + 4($10) = $354. Then $2600/$354 = 7.34 for x.

What else would one reply to the writer who so diligently worked out the same solution to four decimal places? I feel it necessary to emphasize that the above process is not the real issue either here or in Operations Research as a whole. Rather, we see that an LP formulation is *not* needed to arrive at *that* solution. It would appear that the powerful but subtle message of the Counter-Act has been lost on some readers. As stated therein, in the anticipation of things to come,

> a whole new story had started unfolding and it just cannot be the beginning of a beautiful friendship.

Happy laughter aside, I think that the issues are much too important to be slighted by a quest for status quo and additional decimal places.

The message of the article is: "Design optimal systems, do not merely optimize given systems." "Counter-Act" demonstrates that LP does not stand up to the task; it produces a single-product "mix" in design problems characterized by a budget constraint and yet-to-be-determined resource availabilities. LP can only "optimize" a given system (with resource availabilities determined by modern witchcraft); if it attempts to design a system, it collapses into a noninteger knapsack problem and thus puts itself out of business. The right question to ask is: What is the economic and business justification for LP limiting the variety of production by the number of constraints?

The "de novo" label, by the way, refers not to a particular computational technique, but rather to the redirection of emphasis from the "givens" to the design of a new, optimal system.

Of course the emperor does not have new clothes: since there is no emperor, he can't have *any* clothes.

Milan Zeleny
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