



Linear programming is the use of a computer to figure out the most profitable combination of various factors that make up an essential phase of your business, to produce a desired end result.

- *For the oil refiner, it can be decision on how much of each stage of refining shall be used to produce the most profitable product-mix, in accordance with market demands at any particular time.*
- *For the food processor, it can be selection of ingredients for a product with a particular combination of nutrients and caloric value, produced at minimum cost.*
- *For a paper maker or wholesaler, it can be decision on the cutting of large sheets into required smaller sizes with minimum waste.*
- *For a shipper of merchandise, it can be selection from among various plants, from the stocks in various warehouses, from routes to reach a given market. Similar selection is involved in distribution of electric power.*

From these four examples, it can be seen that there are numerous areas in modern business where linear programming can increase efficiency. It's a matter of properly planning the relationship of parts to a whole. The machines of a production facility, the ingredients of a product, the segments of a market—elements such as these are the threads and fabric of linear programming.

Wherever applied, in these or other business applications, linear programming uses the speed of an electronic computer to run through the various alternatives that are open to you and ascertain which most closely approximates the objective that will be most profitable to you.

WHAT IS LINEAR PROGRAMMING?



Linear programming brings optimal performance to the following operations:

Oil refining	Machine scheduling
Feed mixing	Distribution and transportation
Food processing	Product-mix planning
Paper cutting	Electric power distribution
Evaluation of advertising media	

If your business or a phase of your business is included in the listing above, you are either using linear programming today or will be doing so within the next few years. How soon you will introduce this computer-age approach to operating efficiency depends on three simple factors:

- 1 How competitive is business in your field?
- 2 When can you afford the investment in modernizing your way of doing business?
- 3 When can you and your associates, in the day-to-day press of present activities, get around to this major improvement?

In some industries, such as oil refining, the level of competition and the close tie-in between profitable operation and operating efficiency is such that use of linear programming is already a widespread operating procedure. In other areas, its introduction is coming more slowly. Sometimes it's the biggest company in the field that leads the way. Often it's a small alert outfit that surges ahead by seeing the advantages of optimal efficiency before even The Big Boy gets around to it. In any case, it will be just a matter of time before everyone has to follow the leader to keep up.

WHEN WILL LINEAR PROGRAMMING HELP YOUR BUSINESS?

"Total" production line suitably symbolizes General Mills, user of probably the most advanced adaptation of linear programming techniques conceived to date. The CONTROL DATA® 3600 Computer at Control Data's Minneapolis Data Center has provided to General Mills the capacity for large-scale planning of production and distribution for all their packaged foods and flours to meet market requirements forecast for some 40 states. General Mills' Operations Research Group has developed specialized mathematical techniques and worked with the Programming and Analysis staff at Control Data's Center in developing and implementing this planning system.





**YOU CAN
AFFORD TO
COMPUTERIZE NOW**

One factor makes it feasible for medium and small businesses in fields where linear programming is valuable to benefit from it as readily as the largest manufacturers: Control Data's nationwide Data Centers bring computerized operations within the reach of anyone.

A firm need not be large enough to have full-time need for a computer of its own. Instead, anyone can lease time from any one of Control Data's six Data Centers strategically located in major cities throughout the country. Linear programming is available not only to firms actually located in the areas of New York, Washington, Minneapolis, Houston, Los Angeles and San Francisco. Through the use of DATAPHONES,* your firm can profit from this computerized efficiency no matter where you are.

If needed, even the powerful CONTROL DATA® 3600 is at your service. Without capital outlay, you have the use for a few hundred dollars of computer power that would require millions to buy outright and more than a quarter million a year to lease full-time.

**Now, Data Centers Offer
The Bonner and Moore System**

One approach to linear programming is ideally suited to the medium or small firm. Devised by the consulting firm of Bonner and Moore, it is now made available by Control Data in all of our Data Centers. This system offers decided advantages at every stage of its use:

EASILY ESTABLISHED: It's easy and fast to get under way with Bonner and Moore, thanks to an unequalled method for establishing input to the computer. Right from the first, your people enjoy a minimum of effort.

ACCESSIBLE, EASILY REVISED DATA: Ease of establishing the system carries through to the handling of your basic data. The data is retained on magnetic tapes filed in your name. No need to regenerate your whole program for repeated use or for revisions.

USABLE REPORTS: Finally, your reports are delivered to you in forms that are most useful to your profitable planning. Their format, moreover, can easily be revised to make them still more useful as your judgment dictates.

For further information about the application of linear programming to your operations, write or call to the Data Centers Department at your nearest Control Data office.

*DATAPHONE is a registered trademark of American Telephone and Telegraph Co.

Data Center at Control Data's corporate headquarters in Minneapolis was the first to install one of the company's large-scale 3600 Computer systems. With its core-memory expanded to a capacity of 131,072 48-bit words, this installation makes the Minneapolis Data Center the most powerful computer facility commercially available anywhere. The Center is used not only by customers in Minneapolis but also by DATAPHONE to customers in other cities.

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