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CORPORATE MODELING AND PLANNING POLITICS AT CONRAIL

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A careful analysis of the corporate planning process in a given company will generally provide valuable insight to any group charged with the responsibility of developing corporate planning models. The location of decision-making authority (herein referred to as the politics of corporate planning or corporate politics) is one of the most important factors to consider when developing a corporate planning model.

I. INTRODUCTION

Corporate politics, as used in this paper, refers to the location of decision-making authority in the planning process within the corporate organization structure. This paper provides guidance in what to do, given a common planning political structure, when asked to develop planning modeling capability. This paper does not deal with the positive or negative impact or issues of how to develop and keep planning political power, nor does it address the micro-level nuances of politics and modeling.

Frequently, corporate planning is decentralized, with a single organization given the responsibility of coordinating the planning process. Corporate Planning at Conrail is performed in this manner. The principle behind this approach is that a specific department that is given the authority to manage its functional responsibilities should participate heavily in the planning process. The advantages are a deeper knowledge of a functional area available during the planning process and a commitment to carry out the plan by the organization vested with the necessary resources and authority. A Corporate Planning group is established to coordinate the planning process.

If, in an analysis of planning politics, a decentralized approach is observed, then the traditional bottom-up or top-down approach to corporate modeling won't work due to the fact that when planning responsibility is decentralized the modeling approach is also decentralized.

Some years back, the inside-out approach to modeling began appearing in the literature and in industry. The key to this approach is a decentralization of model building, with emphasis on limiting model boundaries and complexity to the actual problem at hand. Conrail's approach to modeling draws heavily upon these concepts, and organization structure and planning politics provided the necessary guidance that led to a coordinated inside-out approach which is in agreement with the corporate planning process.

2. THE CONRAIL APPROACH

2.1 Background

Conrail's coordinated modeling capability is shown in Figures 1 through 7. Before explaining the figures, four points should be made.

First, the capability as shown is subject to changes over time as requirements change. Thus, this figure must be considered as being illustrative, and not necessarily a plan for application elsewhere in the railroad industry.

Second, other models are used at Conrail which are not part of any coordinated modeling capability. These are inside-out models, where the model boundaries do not overlap any other model, and thus they truly can stand alone.

Third, not all of the capability shown has been completed.

Fourth, although the explanation is organized from the bottom up, the modeling capability is not limited to bottom-up analysis; indeed, bottom-up use has never taken place.

2.2 Business Forecasting (Figure 1)

Historical traffic records (1) are maintained which include revenue, origin, destination, commodity and many other historical items. Using an econometric approach, traffic volume and revenue by commodity is forecast up to five years out (2) with the major emphasis on the first year. Using the traffic forecast (2) with auto-correlative methods, a forecast of traffic by commodity, origin and destination is made (3). To get the best possible accuracy when forecasting in the very near term, Sales personnel input major known future events such as auto plant shutdowns (4). Forecasted traffic by commodity, origin and destination (3) is further processed to become a forecast of supply and demand of empty cars by cartype by location(s). To provide a quick-turn sales forecasting capability, sales input (4) and sales history (6) are processed auto-regresssively to provide a sales macro forecast of sales by district (7).

Each of these forecasting functions is a free-standing module with the ability to run independent of, or in conjunction with, other forecasting functions. This is accomplished in one of two ways.

The first way is to have independent approaches. For example, the sales macro forecast (7) can be developed independent of the traffic forecast (2). The most recent result of parallel, but independent, forecasting gave less than three percent difference in results, which was considered too small to reconcile.

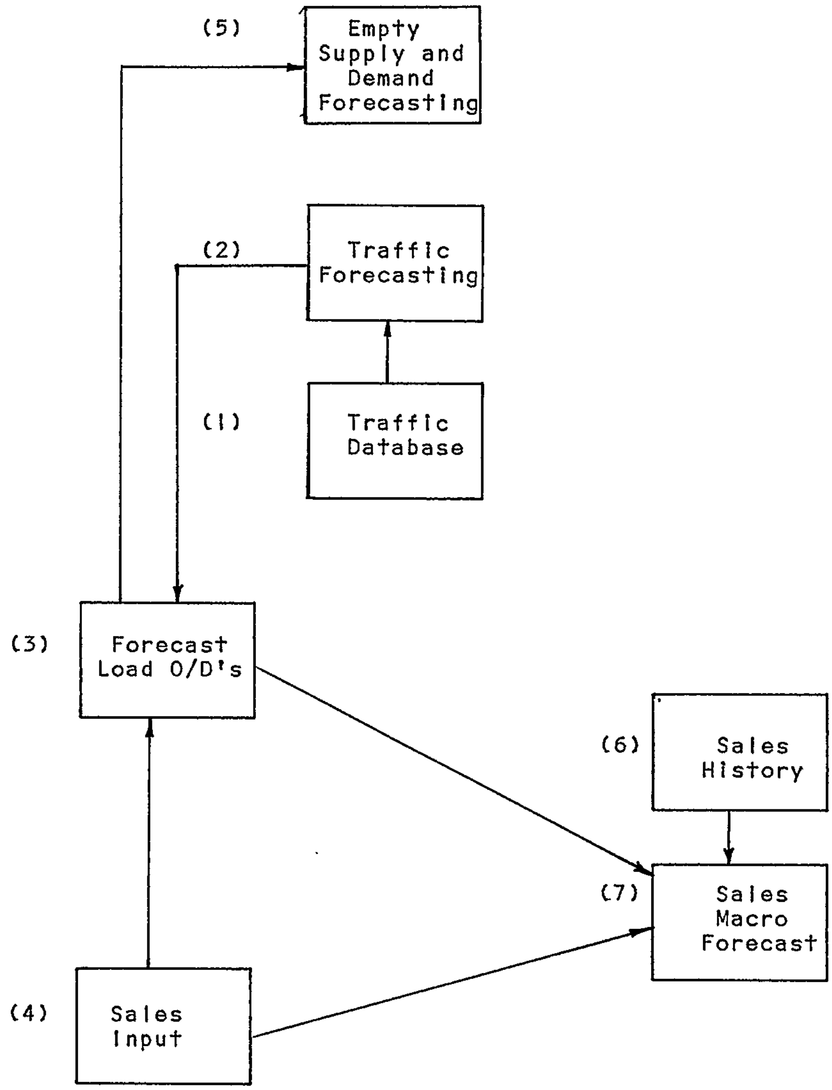
The second way is to employ modularity and use a starting "seed" in one forecasting function that was generated from another forecasting function. This "seed" is used over an extended period of time until it becomes obsolete. For example, forecasting loads by commodity, origin and destination (3) can use the forecast of traffic by commodity (2) as a "seed". Typically, the former is made over a shorter time frame than the latter, such that one "seed" provides many iterations.

2.3 Car (Asset) Management (Figure 2)

Two functions exist to aid car management. The Empty Distribution Model (8) is an optimizing model used to help manage the movement of empty cars from point of supply to points of demand with excess empties belonging to other railroads moved to their owners. The Product Plan (9) is an information system with analytical capabilities to help manage the use of freight cars. The Distribution Model (9) is tactically oriented while the Product Plan (9) is intended for economic analysis. Both can be driven by the Empty Supply and Demand Forecasting function (5).

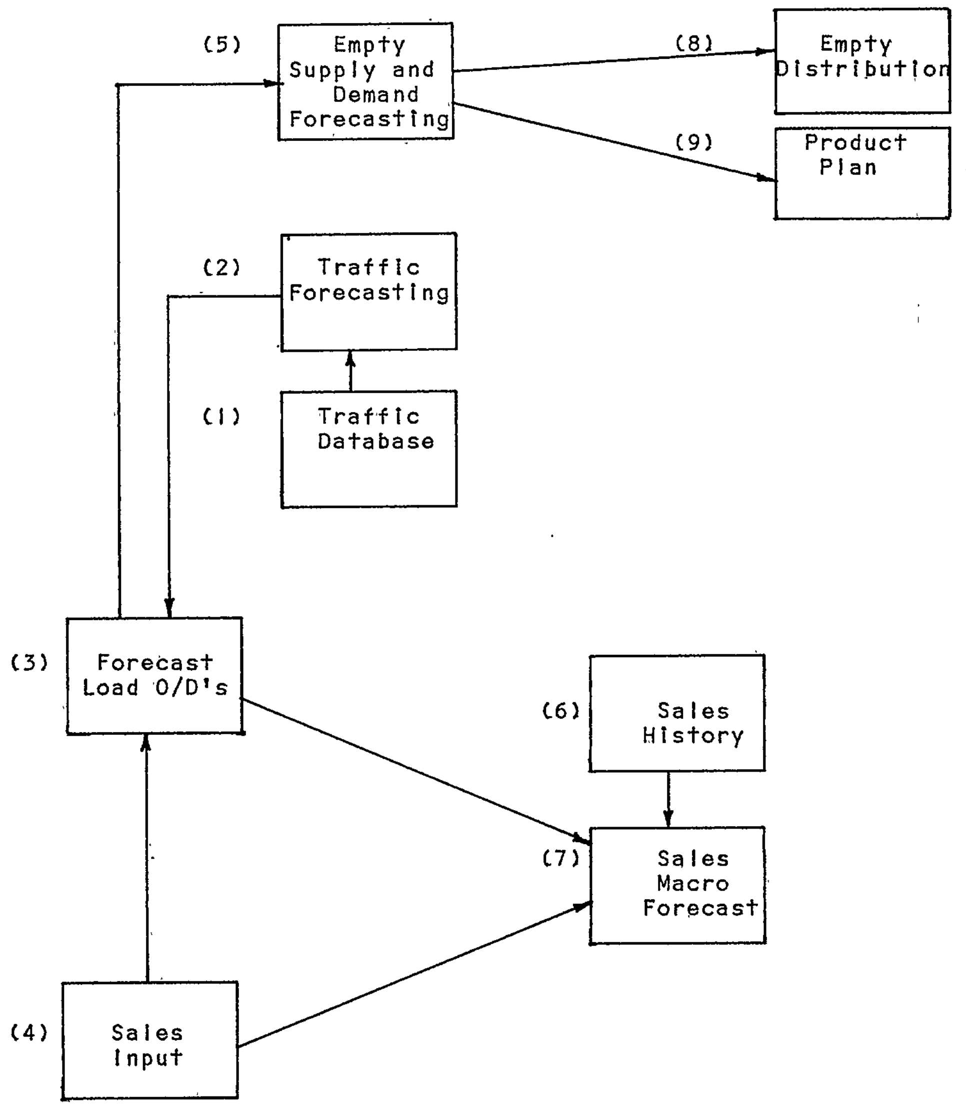
2.4 Equipment Planning (Figure 3)

The Carday Utilization Model (10) takes historical utilization data and projects revised car utilization as a result of various capital investment and operations improvement programs. It is essentially a spread sheet calculator with certain analytical capabilities, including goal setting achieved by inputting a target objective and calculating the conditions necessary to achieve the objective.



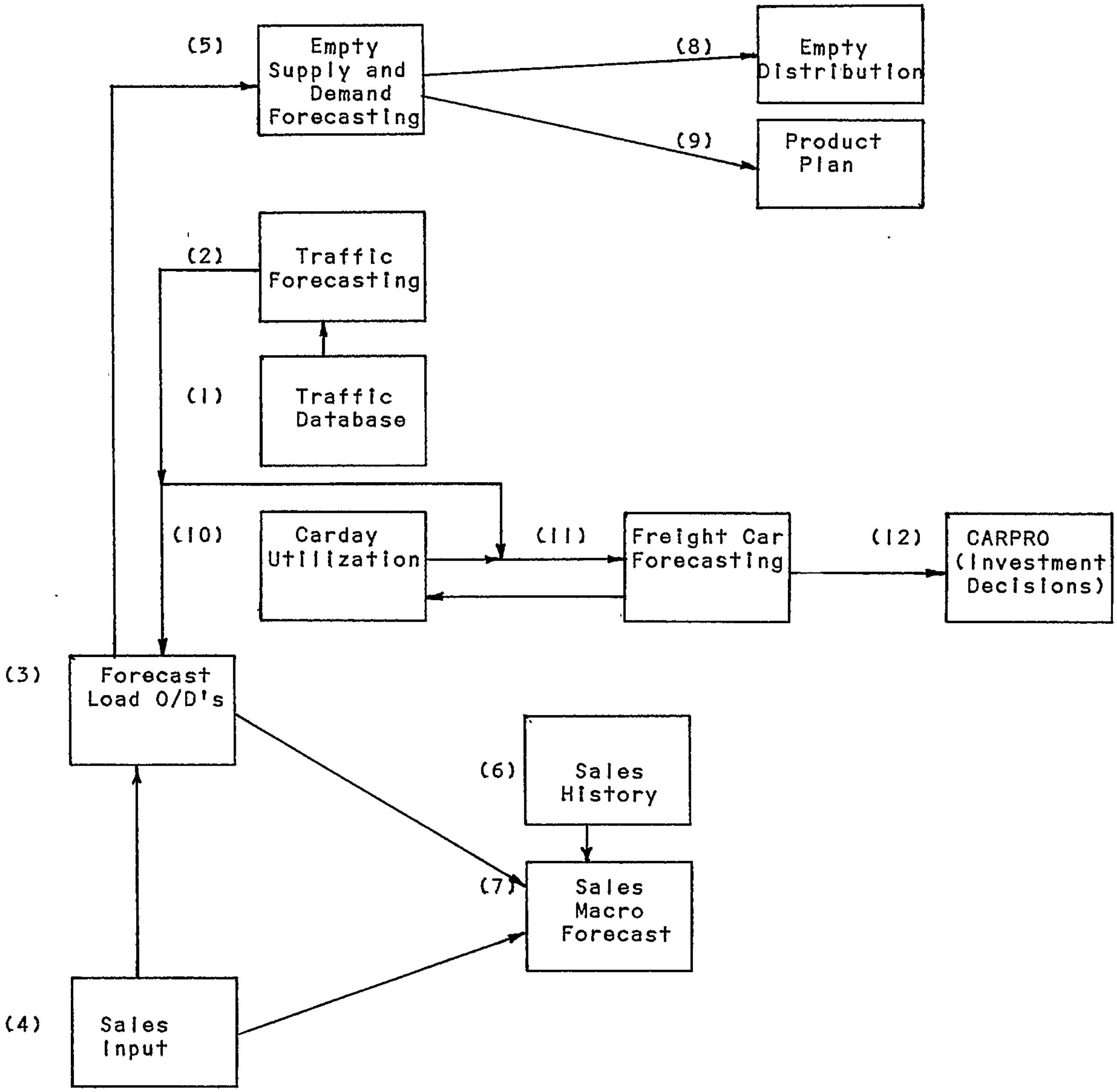
CONRAIL'S APPROACH TO MODELING
BUSINESS FORECASTING

Fig. 1



CONRAIL'S APPROACH TO MODELING
CAR (ASSET) MANAGEMENT

Fig. 2



CONRAIL'S APPROACH TO MODELING
EQUIPMENT PLANNING

Fig. 3

The utilization data from the Carday Utilization Model (10) and a traffic forecast (2) can be input to the Freight Car Forecasting Model (11) which projects equipment repair and replacement programs.

The model has a sizeable amount of analytical capability and many options on how it is used, including goal setting.

The car requirements scenario from the Freight Car Forecasting Model (11) can be input to CARPRO (12), an investment analysis tool used to evaluate equipment investment alternatives.

These models can be run stand-alone or in conjunction with each other.

2.5 Network Analysis (Figure 4)

Conrail's Network Model (13) simulates the movement of traffic (from the Traffic Database (1) or Forecasted Traffic by origin and destination (3)) according to the plan contained in the Network Database (14). It carries extensive output options, and is modular in design, such that only that portion of the computer program required for a specific analysis need be run.

For detailed analysis of freight yards, the Yard Model (15) can accept traffic requirements at a specific location generated by the Network Model (13) as input. The Yard Model simulates the ability of a yard to process traffic according to user-defined physical layout and assigned resources.

The Commodity Flow System (16) requires input from the Network Model (13) which specifies how traffic flows over the network. It has analytical capability regarding line of business, revenue and historical costs.

The Network Cost Model (17) accepts a sizeable amount of operations statistics generated by the Network Model (13) and performs volume variable incremental costing.

Each model can be run independent of the others. However, the most practical way to obtain detailed operations data for the Yard Model (15), Commodity Flow Model (16) and Network Cost Model (17) is from the Network Model (13).

2.6 Rates Analysis (Figure 5)

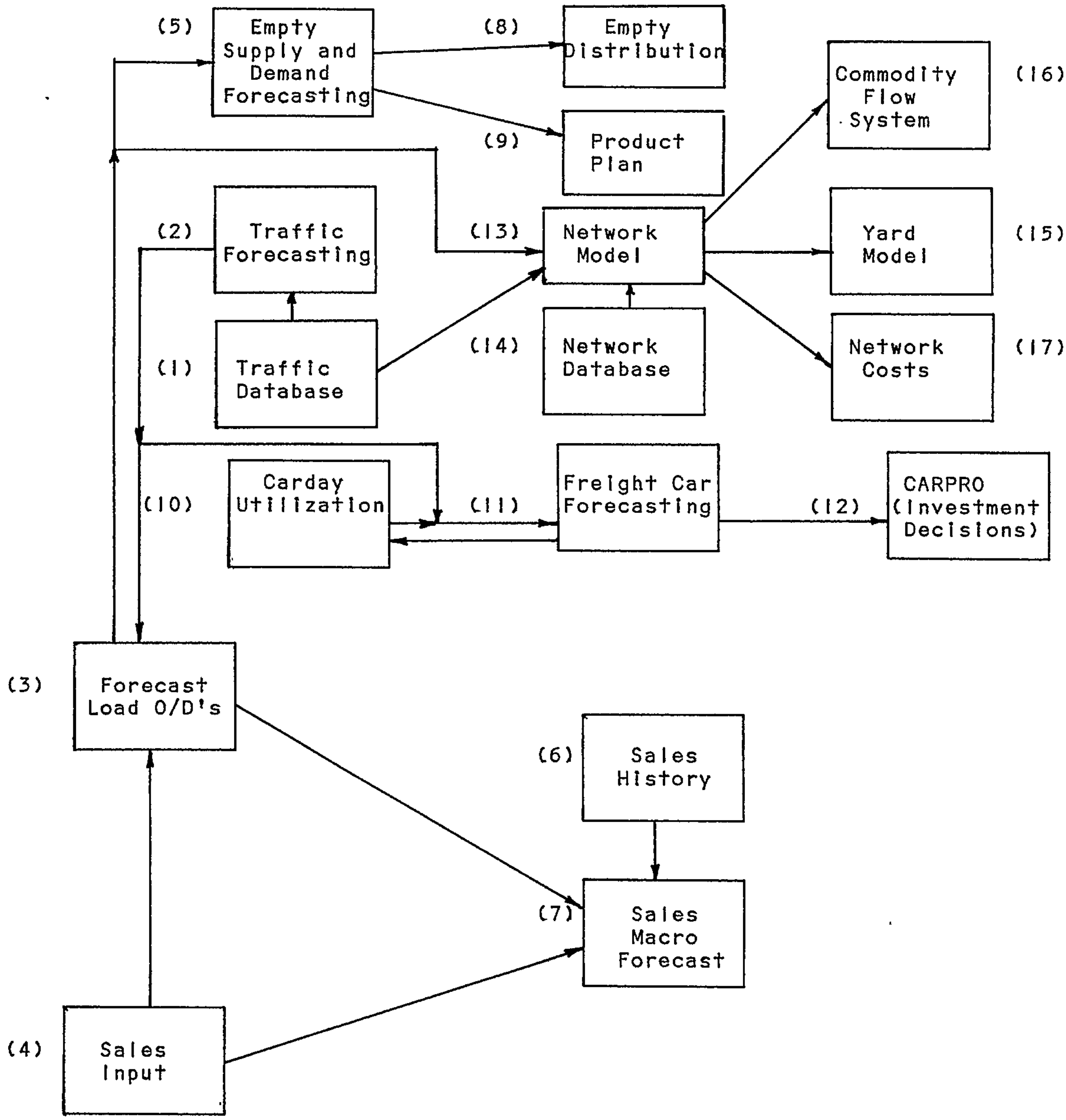
Railroad freight rates are very complex. A Rates Analysis Model (18) was developed to simulate alternate rate structures and make comparisons with the competition. This sophisticated analytical tool can accept traffic forecasts for a commodity or group of commodities by origin and destination (3) as input. It also can be run alone.

2.7 Sales Management (Figure 6)

A system to analytically generate sales quotas and provide information for sales management (19) accepts either a Sales Macro Forecast (7) or Forecasted Traffic by Commodity, Origin and Destination (3) as input. Although this flexibility exists, the Sales system requires a forecast.

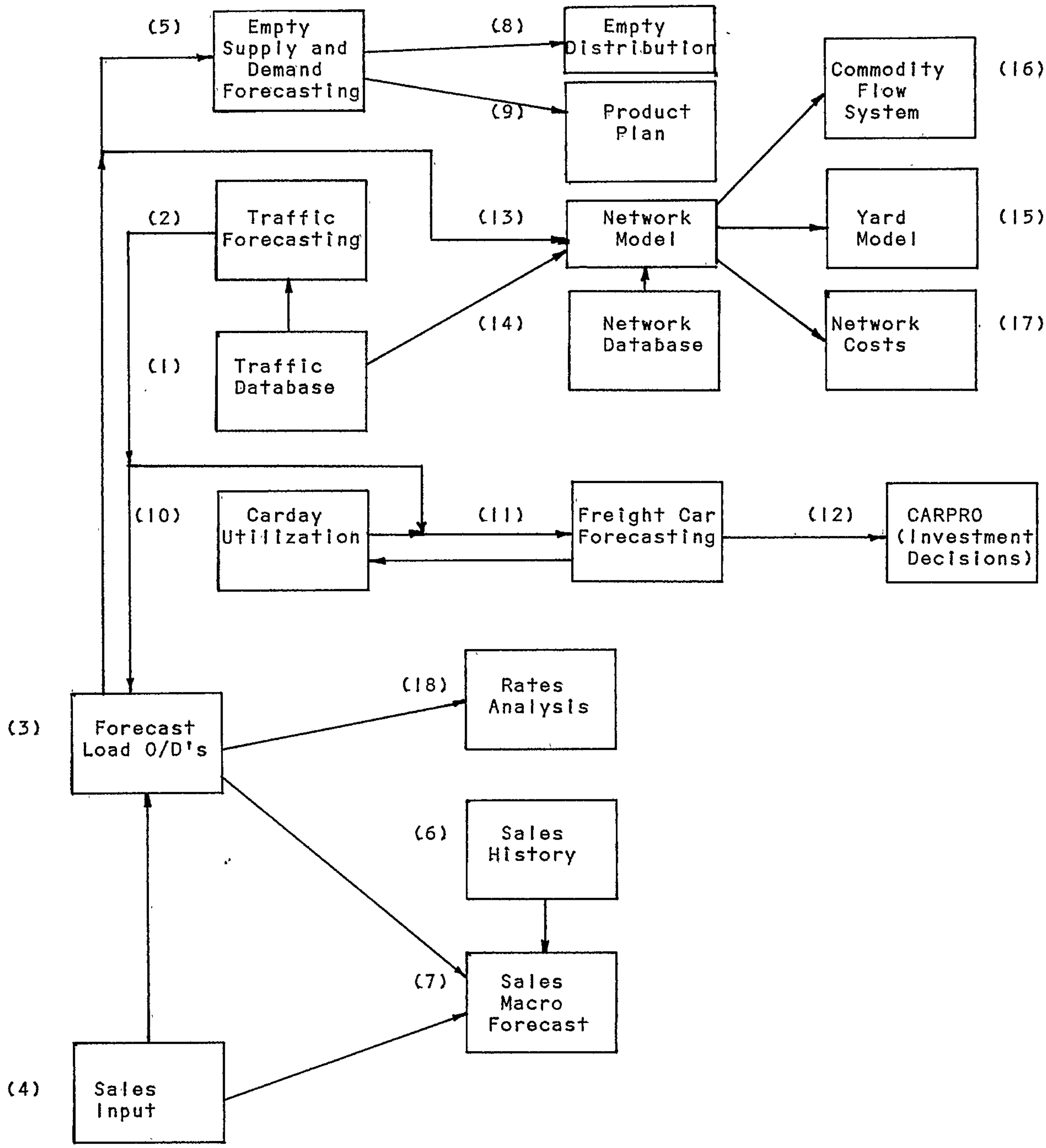
2.8 Financial/Corporate Planning (Figure 7)

Information from many models and other sources can be used to drive the Financial Planning Model (20), which produces pro-forma statements based on input parameters and economic/financial assumptions. This model also can be run independent of all other models.



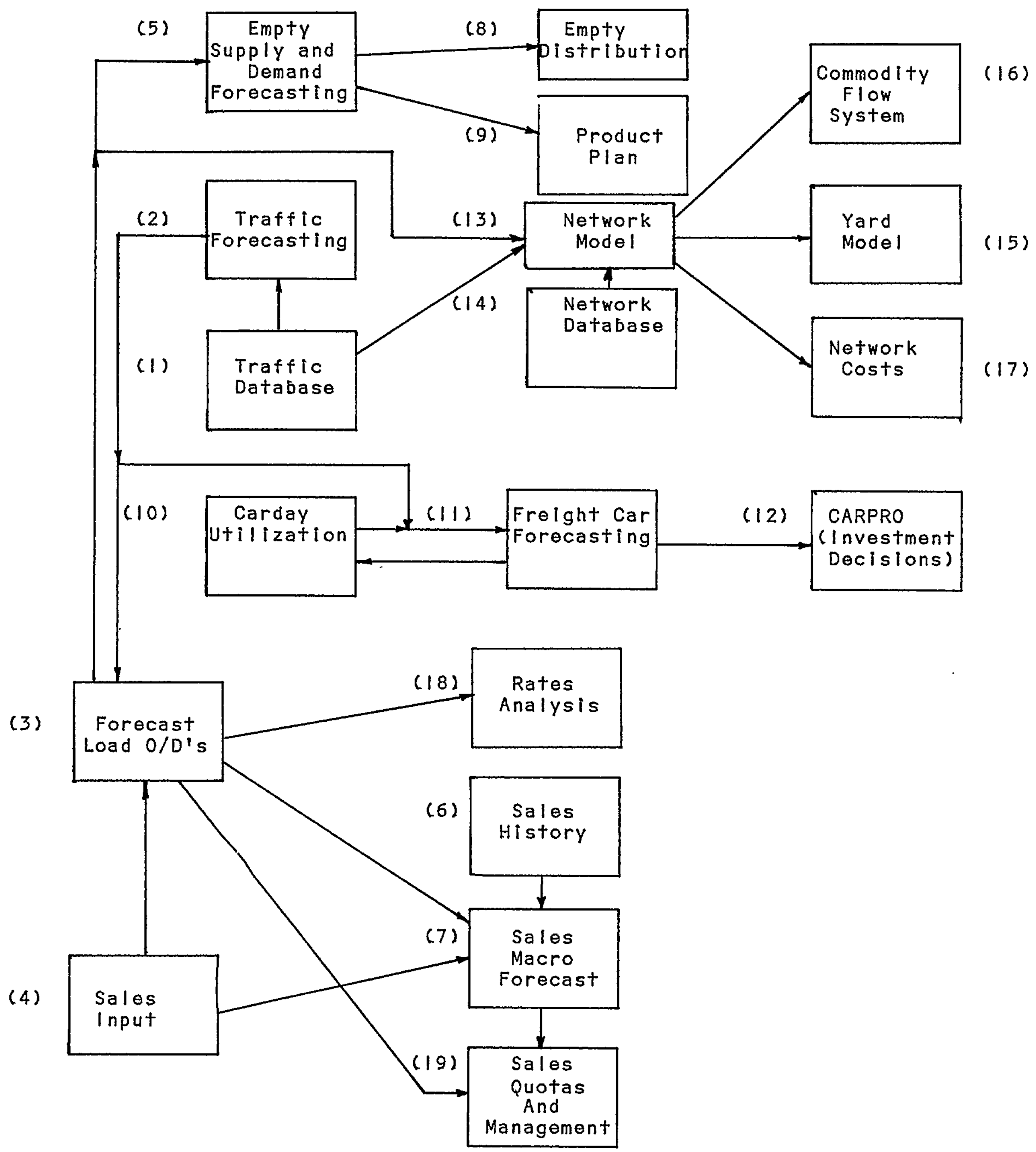
CONRAIL'S APPROACH TO MODELING
NETWORK ANALYSIS

Fig. 4



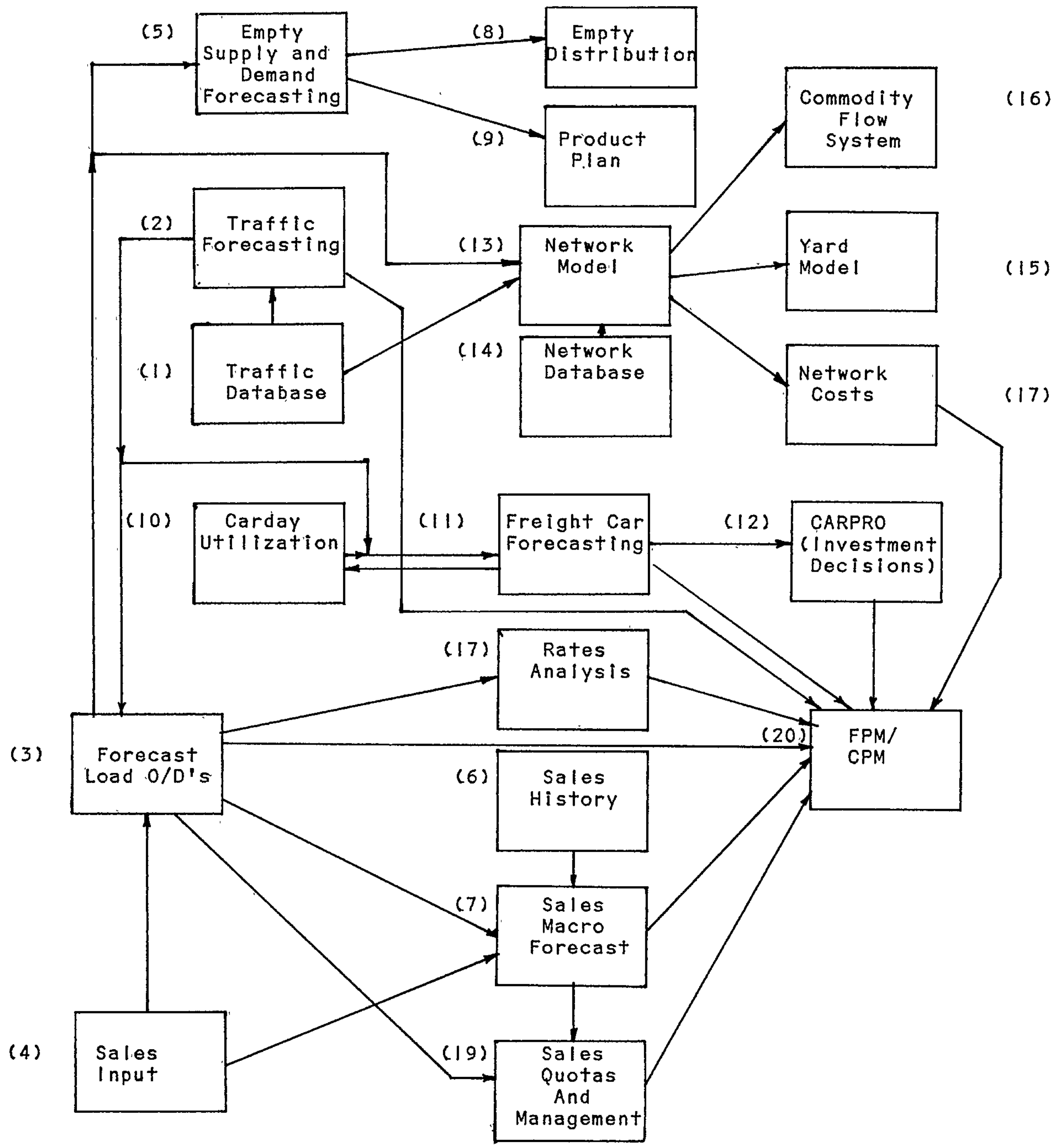
CONRAIL'S APPROACH TO MODELING
RATES ANALYSIS

Fig. 5



CONRAIL'S APPROACH TO MODELING SALES MANAGEMENT

Fig. 6



CONRAIL'S APPROACH TO MODELING
FINANCIAL/CORPORATE PLANNING

Fig. 7

3. WHY THIS APPROACH WAS TAKEN

3.1 Politics and Approach

The only sort of model actually used by a decision-maker is one which:

- is no bigger than the problem being solved;
- has math and logic relationships that are completely understood by the user;
- has been developed with a high level of user involvement, possibly as a joint effort with a modeling professional;
- is as easy as possible to use;
- runs as quickly and inexpensively as possible.

This suggests small, simple models under direct control and ownership of the users.

However, not all problems are created equal. In fact, frequently the political boundaries of a particular problem can span more than one small, simple model. Thus, it is desirable to allow small models to talk to each other, even if it is nothing more than a manual transfer of data and/or results.

Considering each small model as a module in a coordinated planning system addresses both of the above needs. The most important factor to consider is to keep parameters in a common set of units (e.g., obtain agreement on how car utilization is defined and measured).

BEFORE A PLANNING SYSTEM IS DESIGNED, THE LOCATION OF PLANNING DECISION-MAKING AUTHORITY MUST BE DETERMINED. This is in caps because most schools don't teach that very well, being far more interested in pushing technology to higher plateaus. In fact, for most business problems, state-of-the-art technology is already developed beyond the capability of a decision-maker to understand.

One can place politics and modeling in a 2 x 2 matrix with the cell entry being a statement of feasibility of approach.

		Modeling Approach	
		Bottom-up or Top-down	Inside-Out
COPORATE PLANNING	DECENTRALIZED	Not Feasible	Feasible
	CENTRALIZED	Rarely Feasible	Feasible

UNLESS CORPORATE PLANNING IS TOTALLY CENTRALIZED WITH ALL DECISION-MAKING AUTHORITY CENTRALIZED AS WELL, THE INSIDE-OUT APPROACH IS THE ONLY FEASIBLE ONE. However, most companies, including Conrail, have at least some level of decentralized planning. Most companies, including Conrail, also have a corporate planning function and department which involves a high degree of coordination among departments. A coordinated inside-out approach to modeling can facilitate corporate planning in this environment.

3.2 Politics and Problems

As I reflect back on the Conrail story as I've related it, utopia comes to mind. However, we're located in Philadelphia, not Shangri-la. There are holes in Conrail's modeling system; we have had failures we'd rather forget.

Virtually all of the problems Conrail has encountered with modeling have been with identifying the true seat of planning decision-making (with the exception of the universal problem of data availability). The problems of technique have been solvable.

One very important box in the figures hasn't been developed, even though the technology exists. This is because the on-going use of the model represented by the box requires a sizeable support commitment from a department which gains little utility from the model. It may be several years before this political problem is resolved.

One box in the figures spans at least two departments in terms of organizational responsibility and three departments in terms of political interest. The model represented by the box requires massive amounts of managerial energy to keep in use.

The lines in the figures represent information flow. Politics tend to impede this information flow for at least two reasons. First, someone has to pay to develop the information flow capability. The question of which department budget gets impacted, when a stand-alone model is sufficient for departmental needs, requires major attention. Second, not all department heads want others to have easy access to information about their turf. Managing the problem of a protective department head requires a great deal of sensitivity, understanding and patience.

Dealing with the politics of modeling in a decentralized planning environment has been made easier at Conrail with an in-house modeling consulting group which works closely with decision-makers to design models, puts derived analytical frameworks into working computer code, educates users in aspects of model use, and coordinates between departments to help resolve political problems. Such a group must be located in a department which is independent of the corporate planning process, such as the Systems Department, to maintain user department neutrality.

4. CONCLUSION

In just a few years, much decision-making at Conrail has shifted from intuitive guesswork to subjective decisions based on intensive analysis of alternatives. The coordinated inside-out approach to modeling has worked well.

It is primarily the politics of planning that has dictated the Conrail approach. A careful analysis of planning politics is mandatory before embarking on a model development plan.

Unfortunately, most schools don't seem to teach planning politics to management science students very well. Every serious modeling professional, manager and instructor should invest some time researching the politics of planning and modeling with as much interest as exists in technology.

If the head of the management science function in a corporation can't become proficient at the politics of planning, a career change is in order, for success will not take place.