

FORECASTING FOR INDUSTRIAL PRODUCTS

by

David WEINSTEIN

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Directeur de la Publication :

Jean-Claude THOENIG

Associate Dean: Research and Development
INSEAD

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David Weinstein,

Associate Professor, INSEAD

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INTRODUCTION

Forecasting the sales of industrial goods is of critical importance for a great many organisations. Furthermore, within the firm, forecasting serves as a basis for production, finance, personnel, research and development (R+D) and other related activities. Even though industrial sales forecasting is no different from any other type of prediction - in theory, at least - the use of statistical forecasting methods in this respect is problematical. The majority of industrial sales forecasting activities remain intuitive, complex, and quite often, highly political.

Review of the relevant literature, and extensive field-research, involving interviews with numerous managers, show that the likelihood of changing the present practice of industrial forecasting is low. Since personal objectives, and in turn, rewards for achievement are derived from the forecast, salesmen and executives are reluctant to "formalise" forecasting methods. Moreover, the present forecasting procedure provides for information exchange and performance review at various hierarchical levels. These discussions are regarded as an important by-product of the forecasting process, that are vital for organisational perception of changes in the external and internal environments. Thus, the process itself is as important as the forecast, which explains why the managers interviewed felt that drastic changes in industrial forecasting practice were inconceivable.

Although they reject the use of statistical methods, managers are nevertheless not insensitive to the biases and gamesmanship in their present practices. But, rather than drastically change their approach, they prefer to identify its weaknesses and make improvements wherever possible. In other words, they are willing to accept the weaknesses in their own system, since although a change-over to the "statistical alternative" may result in greater forecasting accuracy, the costs in doing so - in terms of existing benefits

that would be lost by a change - are prohibitive. The challenge, then, is to help preserve the strengths of current practices, and find remedies for issues that are problematic.

The purpose of this chapter is to identify these concerns and propose some practical solutions. In the following sections, the industrial sales forecasting process will be identified more specifically. This stereotype will facilitate the reader's understanding of both the concepts proposed, and their applicability. The "universal weakness" - i.e., concerns which are general for most industrial situations - will then be discussed, and some practical help proposed. A framework for analysis will subsequently be provided, which is designed to identify and assess specific sources of bias in a given sales forecasting system.

THE TYPICAL FORECASTING SYSTEM

The typical forecasting system for industrial products comprises three major components : the salesforce composite subsystem, headquarters subsystem and reconciliation subsystem (13). The first two subsystems provide their respective inputs into the third, which then assesses both vantage points and combines them into a forecast. As can be seen by the solid lines in Figure 23, the process may be iterative. If the reconciliation subsystem fails to yield a forecast (whether by consent or by decree), further rounds of discussion will take place until a forecast is finally obtained. The dotted lines in Figure 23 represent informal flows of information and feedback which influence the inputs into the reconciliation subsystem. Explicit information (the solid lines) flowing from headquarters staff to the salesforce may include economic and industrial statistics, likely competitive development, capacity constraints, new product information and promotional

programmes. Explicit information flowing from the salesforce to headquarters staff may include developments observed at the level of end users, tactical competitive moves, (prices, promotion, etc.,) and manpower constraints. However, a great deal of implicit information flows between the three subsystems, which includes both formal and informal feedback - an example of the latter being perceptual impressions from past experience of working members of other subsystems.

A distinction should be made between two forecasting situations in which the subsystems in Figure 23.1 play rather different relative roles : the strategic and tactical forecasts. The first involve new projects (e.g., new product or new territory), whereas the latter relate to an on-going activity. Another distinction is that a "strategic" forecast usually implies a change in the allocation of resources (e.g., investment or divestments), and is long-term oriented (see Lassere and Thanheiser's chapter in this handbook). Tactical forecasts, on the other hand, are aimed at optimising the utilisation of resources in the short term (e.g., cash flow, product-mix, etc.,). Strategic forecasting is generally under the control of headquarters, and is derived from strategic scenarios and information such as (a) selected salesmen and executive opinion (b) macro-statistical projection of useful variables (e.g., regional surveys of buying power or sales, by Standard Industrial Classification (3)), and (c) feedback from local test markets.

The role of the salesforce is rather limited where strategic forecasting is concerned, and approaches adopted are more analytical, based on methods which are discussed both in this handbook and elsewhere (1,5,22). However, tactical forecasts are based on opinions of both headquarters staff and salesmen with field experience - all of whom are deeply involved in the sales process. The salesforce would usually rely on an intuitive approach

yielding a "salesforce composite". This forecasting activity provides the basis for plans in production scheduling, finance, and other functions; and it also determines, to a large extent, personal objectives for the salesforce - i.e., sales quotas. Achievement of the latter is the basis for personal evaluation, financial bonus and stature in the organisation, but at the same time, this encourages biases in forecasting - as discussed later in this chapter.

A brief discussion of the salesman's role may be of some help in the assessment of the strengths and weaknesses of the "salesforce composite" in industrial marketing. The determinants of this role are the product and the market. The typical industrial salesman deals with a mix of complex products and a restricted number of clients. The latter require not only different technical specifications and logistical services, but also, in this environment, a deep understanding of the client's business and organisation. Thus the salesman should be technically competent, having a good personal rapport with members of the customer organisation. Reliance on the salesman's intimate knowledge of his territory is indispensable in industrial marketing, and because of this invaluable experience, the salesman's judgement is very influential.

There is evidence that the performance of statistical forecasting routines is superior to that of human judgement (35,20,21,9). However, while the former would only detect and evaluate structural changes a posteriori, the salesman may be able to identify such changes on a more timely basis - once enough evidence of impending change has been accumulated. More importantly, the salesman's credibility vis-à-vis his superior is high, as the former is held personally responsible for his actions. For these reasons, the sales forecasting process for industrial products has resulted in a

"bottom-up" procedure which is well-rooted and difficult to change. One obvious strength of such a system is the benefit of the salesman's alertness and ability to interpret phenomena he encounters in the field. However, another advantage of the salesforce composite is the scrutiny to which the information is subject as it travels through the system via different parties each with their own vantage points. These two strengths are the basic reasons for the longevity of salesforce composites in the forecasting of industrial sales.

The remainder of this chapter is based on an investigation of numerous salesforce composites in a cross-section of industries and countries (13). The research methodology involves a careful analysis of the systems, based on three waves of interviews across numerous organisations (18), thereby resulting in identification of the actual operating system.

ISSUES OF CONCERN

The salesforce composite is a product of human judgement. While Taylor (elsewhere in the handbook) discusses in detail the problems it entails, in this chapter the primary concern is with the interaction between the individuals responsible for this judgement. Such interaction includes exchange of information, on the one hand, and negotiation and gamesmanship on the other. Clearly, since the sales forecast influences the outcome of the negotiations for objectives, and thereby various rewards, the parties will tend to introduce their own biases. The nature of such biases depends on the particular business, its reward system, the individuals involved, and the nature of their interaction. A systematic framework of analysis is proposed below, which helps the manager to identify and assess the problems specific to his own situation. However, three universal problems with industrial sales forecasting systems will first be considered, and an attempt

will be made to provide some practical answers. These three issues are : (a) Expertise and Contagion Errors ; (b) Loss and Distortion of Valuable Information ; and (c) Confusion between forecasts and objectives.

(a) Expertise and Contagion Errors

The cornerstone of the forecasting process is the individual salesman's experience and insight into his client's territory. The salesman prepares his forecast on this basis, and discusses it with his superior, who will then prepare a more aggregate forecast, as a function of his own experience and observations of past forecasting errors by his subordinates. The individual errors of judgement at every level are called "expertise" errors. Staelin and Turner (30) have shown that the smaller the "building blocks". of the forecast, the smaller the aggregate error, as at the territory level errors in different directions will mutually cancel.

The assumption in the above case is that every salesman prepares his forecast independently. However, this is not always the case, since salesmen communicate with each other, and are also exposed to common information provided by staff at headquarters and other sources. In particular, data on the macro-economic outlook, capacity constraints and promotional plans might be disseminated by corporate planners. This could cause a "contagion" error (30) i.e., a common forecasting error at individual territory level by all salesmen receiving the same information.

Since the design of sales territories is subject to other concerns, treatment of expertise errors by disaggregation is not always possible. Thus the salesman's analysis can only be improved by training and consulting activities. The isolation of systematic individual biases, as will be

described later, is also of considerable importance. These activities may be carried out on a continuous basis, within the interaction of the salesman and his superior, in the form of evaluation of past forecasts. Furthermore, headquarters staff may provide periodical training programmes or conferences which are aimed at reducing expertise errors.

Contagion errors should be considered in light of the common information which is disseminated. Consider, for example, the case of production capacity constraints when communicated to the salesforce. A common reaction by the salesman is to try to change his sales mix in order to avoid negotiations with those responsible for allocation and possibly disappoint his clients. Thus, the communication of capacity constraints may eventually cause overcapacity and restrict previous expansion plans based on strategic market potential. Contagion errors may be caused by pessimistic industry and economic forecasts, thereby creating "self-fulfilling prophecies. A similar effect may be caused by the "reputation" of other parties to the sale. For example, past problems of quality control or customer service may be extrapolated by the salesforce, causing a downward bias in the forecasts of the affected products.

Sensitivity to contagion error-causing formal and informal information is essential. In discussing this problem with managers, it was noticed that the amount of formal attention to contagion errors varies. One practical approach is for every manager who collects his subordinates' forecasts to aggregate them and communicate his perception of percentage contagion error and possible causes. As the process moves up the system, more evidence may be accumulated regarding contagion errors.

Another approach to the problem involves sequencing and experimentation. Corporations have been studied which require every salesman and manager to

provide his independent forecast, before he is exposed to common information after which he is allowed to correct his forecast. In one case, at a time when contagion errors were suspected to be serious, an organisation withheld information from a sample of salesmen and managers in order to provide a "control" for these errors. This approach is clearly extreme, but it does show the amount of concern and effort which some firms are willing to invest.

(b) Loss and Distortion of Information

A system of humans who are collecting, transmitting, transforming and interpreting information is expected to filter and distort information. Senior executives, when interviewed, were content to "live with the problem", since too much information flowing directly to them would clutter their overview. However, the same executives complained that there are some data which salesforce composites lose. Retention of this data, they say, would improve decisions which are based on the sales forecast. More specifically, these concerns may be divided into three categories : absorption of uncertainty, loss of data for segmentation analysis, and loss of timely strategic information.

Absorption of uncertainty : The end result of a salesforce composite forecast is usually a predicted value for future sales. Since this is the outcome of numerous deliberations, it is considered by the users (i.e., senior executives) to be fairly reliable. However, they also know that uncertainty is associated with the forecast, and awareness of the extent of such uncertainty is invaluable, as it is this factor that represents the risk of the strategy being pursued. This is important in two ways, as both overestimates and underestimates result in either real or opportunity costs which management has to take into consideration.

Three different approaches may be utilised to conserve risk information within the system : conditional forecasting, three-point forecasts and key-account reporting. Under the first approach, rather than submit forecasts, salesmen and their superiors present scenarios in which explicit assumptions are made about customer behaviour and needs, competitive activity, environmental forces and internal company resources. The combination of these variables into several possible scenarios allows management to assess the up or down side risk involved. The second approach requires the submission of three estimates (pessimistic, most likely, and optimistic), rather than a single sales figure prediction. There are two benefits of this approach; the immediate one being that the possible risk is determined by the range of variation. The second is the possibility of simulating various scenarios and obtaining the "risk profile" of the periods' sales using the Monte Carlo simulation. This profile would allow management to trade off reward and risk according to their risk preference (16).

Finally, a "key-account" approach might help ascertain the possible risk. Under this method, certain accounts are monitored closely and their unexpected behaviour is "flagged". Accounts in this category may be opinion-leading companies, or disproportionately large customers whose behaviour may considerably influence sales. In order to utilize the information from such accounts, past experience must be accumulated before explicit extrapolations can be made.

Lack of Data for Segmentation Analysis : The forecasting system generally follows an on-going segmentation based on past strategies (e.g., by-product geographic region or end use.). Due to changes in the competitive environment it is in the interest of product managers to study possible scenarios under alternative segmentation schemes (for example, in terms of

the account size, purchasing organisation types, technology, etc.,). As seen in Figure 23.2, the salesman prepares his forecast by aggregating forecasts of individual accounts. In turn, his manager aggregates the forecast across the sales territories. Concern has been expressed, particularly by product managers, that after this aggregation they no longer have access to the raw data at a disaggregate level. However, unless they undertake a special research project, a study of the consequences of alternative segmentation schemes is impossible. If raw data by accounts were available on a timely basis, management could anticipate the emergence of new segments and act upon it earlier than is presently the case. This problem may be solved by retention of account characteristics, sales records and forecasts in a data bank accessible to management. The data would be collected from forecasting forms, call reports and purchase orders which are periodically filled out by individual salesmen.

Although the principles behind such a data bank are simple, its successful utilisation has several prerequisites. First, the notion of segmentation analysis and periodical forecasting by various segmentation schemes should be a "way of life" for managers, so that demand for the service will persist. Second, the salesforce should be motivated to provide the information periodically, since the resulting analysis would eventually be to their benefit. Finally, the proper infrastructure for building and maintaining this computer-based system should be available.

Loss of strategic information : As industrial marketers rely heavily on salesforce composite forecasts, they take the risk of failing to detect certain strategic changes that might be taking place in the field. Two research experiments may be cited here. In one, the appearance of a new, significant and competitive product was not reported by many salesmen who had been formally trained to do so (25). In the other, information which

salesmen obtained from their customers was not correct, and in fact, systematic changes in client perception had been taking place, with salesmen being unable to detect them (14).

The measures companies may take to correct these flaws are mainly in the form of positive and constructive feedback to the salesforce, coupled with periodical training. Whereas rewards for especially valuable information may be offered, a system could also be designed to provide for the flow of qualitative information alongside quantitative forecasts. In other words, a "strategic observation" section may be required as an appendix to each quantitative forecast. This section would include the manager's observation, and in addition, significant subordinate observation. Clearly, some information will always be suppressed or distorted ; however, the importance of this problem can be minimised by providing the format for reporting strategic observations and giving positive feedback when such information is actually transmitted. The more isolated and helpless the salesman feels, the less motivated he will be to help the organisation change in the face of phenomena he can actually observe in the field.

(c) Confusion Between Forecasts and Objectives

The forecast is an integral part of the management system, as it serves to set targets and objectives for the individuals concerned. However, as the literature shows, objective-setting is a rather complex process (24,25). The more related it is to the forecast, the more difficult it is to avoid bias in anticipation of objectives (8,20). Furthermore, the greater the role of the individual in setting his own objectives, the higher the likelihood of his bias (35). The amount of bias and its direction depends on the way objectives are used by the organisation. In practice, then, an understanding of one's use of objectives would help identify the bias

introduced by subordinates into their forecasts. The following represents a brief discussion of the three purposes of setting objectives i.e., to reduce fluctuation and ambiguity, determine performance norms, and provide motivation. (8).

(i) Reduction of Fluctuation : This phenomenon generally takes place by the superior delegating, and the subordinate committing himself to a pre-specified achievement. As the forecasting process makes its way up the system, more aspects of the external and internal environment are considered, and possible responses are given to various uncertainties. Moreover, the process of aggregation hopefully causes a mutual cancellation of the "expertise effect" errors, thus smoothing out the forecast. Finally related to this benefit is the opportunity for sharing opinions about the business, evaluation and feedback (6).

(ii) Norms of performance : Both the subordinate and his superior, by knowing what is expected of them - each at their respective level - can reduce their role ambiguity. Since in many cases good performance is rewarded, whereas failure may entail penalties, there is a need to determine precisely what is meant by "good performance". (12,32,33).

(iii) Motivation : The level at which an objective is set is in itself of motivating value. For example, a sales quota just above a salesman's own estimation might stimulate him to work harder, whereas one set far beyond his abilities might be demoralising. Likewise, given a progressive bonus structure, a target just under the salesman's capability might stimulate him, whereas one set too low might result in complacency (10,11).

Finally, the response of individuals to the objective-setting process will depend on their culture and individual profile (6,7). Furthermore, their forecasts will be affected by the nature of their interaction with others. In other words, the salesforce composite process is one of "rolling negotiations" (salesman with his superior, and the latter with his own

superior). The next section provides a framework for assessing some of the biases involved in the process.

FRAMEWORK FOR ANALYSING BIAS

The "bottom-up" nature of the process for industrial sales forecasting, coupled with the inseparability of forecasts and objectives necessitates a need for negotiation at every interface in the system. Replications of studies of salesforce composite system in the U.S., Europe and South America show that at every subordinate-superior interface, the process follows five steps (23,24) (see Figure 23.3).

1. Benchmark Forecast Preparation

The "Benchmark Forecast" is the individual's assessment, based on four types of input : (1) formal system inputs ; (2) raw disaggregate forecasts ; (3) information search ; and (4) past forecasting experience. Once such a benchmark is determined, bias behaviour and negotiation tactics enter the process.

Formal System Inputs : The individual communicates on a continuous basis with parties, in and out of the organisation, who assimilate, transmit and manipulate information (28). The routing of this information, and its content, will depend on the organisational structure and the strategy it pursues. For example, multi product-market oriented organisations usually use some form of matrix organisation, with managers of products or markets relating laterally to the salesmen and providing strategic information.

Raw Disaggregated Forecasts : At every level, there is an input of disaggregate data that was compiled at an earlier stage. Salesmen will first obtain or perform forecasts for their largest clients or key accounts.

Similarly, a sales manager will obtain forecasts for the salesman reporting to him, as well as for accounts he handles directly. The reason this category should be distinguished from the previous one is that it is used as a filter for the former, as shown in Figure 23.3.

Information Search : Interviews with numerous salesmen and their managers reveal that each individual searches for information beyond these formal organisational interfaces. The more experience an individual has, the larger his informal network of information. This may include colleagues in competing firms, professional associations, trade publications, and so on. The more uncertainty the individual faces, the more he will rely on such an informal search.

Past Forecasting Experience : The way the individual processes information also depends on his past experience with the procedure. On the one hand past forecasting performance bears on the process in terms of the size of past errors and their direction (however, "error" in this case is the difference between the Benchmark Forecast in the previous period and actual results, rather than the formally agreed forecast). On the other hand, the individual's formal training is also part of the experience. Salesmen who receive such formal education may utilise certain information and methods quite differently from those who do not. This variance may be observed across different companies, as well as within the same organisation.

2. Individual Bias Behaviour

As we have seen above, three factors will contribute to individual bias which is applied to the Benchmark Forecast: the need for reducing fluctuations; norms of performance, and motivation. There are also two types of bias which influence behaviour, and these are: income-maximising (31) and

approval seeking (8). Obviously the profile and experience of the salesman will influence his behaviour. Our investigations show that younger, inexperienced salesmen displayed greater optimism than their more mature and weathered counterparts.(19). Similarly, within multinational corporations, Italian forecasters, for example, were found to be more optimistic than their French colleagues. Finally, the initial forecast may be used as an "opening position" in a negotiation process whose end result may be influenced by many non-market or customer-oriented factors.

3. Superior Counterbias Behaviour

When a subordinate or an executive submits a forecast to this superior, the latter will naturally evaluate the prediction. The criteria which he will inevitably seek are his own observations on the territory or product in question. Variation between the subordinate and superior's forecast will trigger a comparison of analyses, and attempts to reach a consensus on "what will happen". However, the superior also inspects the submitted forecast from another vantage point : in terms of past forecasts from this person. Thus, if the subordinate has shown signs of overoptimism in the past, the superior will try to temper it, and vice versa.

4. Resolution

Bridging the gap between a supervisor's and his subordinate's forecasts differs across companies and cultures. Consensus-seeking has been observed in some companies, in comparison with downwards imposition in others. Moreover, a systematic difference emerges according to the role of

the salesman. The salesman in industrial marketing is a "boundary person" with his role extending to the organisations of both his employer and clients (29). Thus role gives him power over the performance of his function. The more important the role of the salesman in the mix of marketing activities, the more complex is his task ; hence the greater is the power he possesses.

5. Authorisation and Adjustment

Following the resolution, any changes in objectives must be disaggregated down to individual salesman level. Most companies interviewed felt that consensus-seeking is desirable; however, as the forecasting process is rather time-consuming; downwards imposition may have to take place at some point in time. Some companies, once they impose forecasts from the "top down", take steps to explain the forecasts provided and offer formal qualitative feedback, while others do nothing of the sort.

Thus model of the interface between a subordinate and his superior during the forecasting process is of a "rolling" nature. It applies to all interfaces as the process flows up the hierarchical system. The framework is useful for analysis of the interface in relation to past forecasting performance. Thus certain systematic deviations may be identified as a function of untempered pessimism or optimism. Similarly, the analysis may identify good quota negotiators (who minimise sales quotas in order to maximise their bonus) as a source of variance between sales forecasts and actual performance. Clearly, different sources of bias will play different roles in various industries, companies, cultures and times. The role of this framework is to help both the superior and subordinate to analyse their past forecasting (either separately or together) with the help of a

systematic agenda. Efforts to implement this model in quantitative estimation of bias for various individual situations is under way.

The Forecasting Manager

As a result of universal weaknesses, specific biases may be treated in a different way. Rather than consider the issues in isolation, the forecasting process may be seen as a clear organisational responsibility. Since forecasting errors, especially those caused by "contagion", are somewhat costly, minimising them justifies an organisational investment. One corporation with which the author is familiar has appointed a "forecasting manager". The task of this executive is to improve the system, information flow, and training of salesmen, as well as to train managers in the use of forecasting methods - both statistical and intuitive. A major side-benefit which has occurred in this case is the on-going feedback to individual forecasters on the quality of their forecasts, which can thus point to personal biases. Another reaction reported in the literature (15) is the active reward to the salesman for good forecasting performance. However, more experience is needed before these findings can be generalised for all organisations.

CONCLUSION

This chapter has shown that due to the importance of the process of forecasting in an industrial product's company, statistical forecasting methods are not practical or attractive to management. The salesforce composite system, which is actually the dominant method for short-term forecasts, contains numerous situation-specific biases as well as several universal weaknesses. Several ways of treating the weaknesses in order to

minimise their inputs have been proposed, together with a framework which models the interface, occurring at various levels, between the forecaster and his superior. This framework should help in the analysis of a particular situation, and the assessment of some of the biases present. Having observed numerous systems of industrial sales forecasting, the author is convinced that not all biases and weaknesses have been captured by his analysis. However, since the advantages of this forecasting practice override the weaknesses, it is felt that industrial forecasts are condemned to continue the struggle with this double-edged sword. If an organisation attempts to correct weakness, and continues its effort to treat biases systematically, methods of improvement will emerge, and the "faults" of using humans rather than statistical routines will be minimised.

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Figure 1

The Typical Forecasting System for Industrial Products

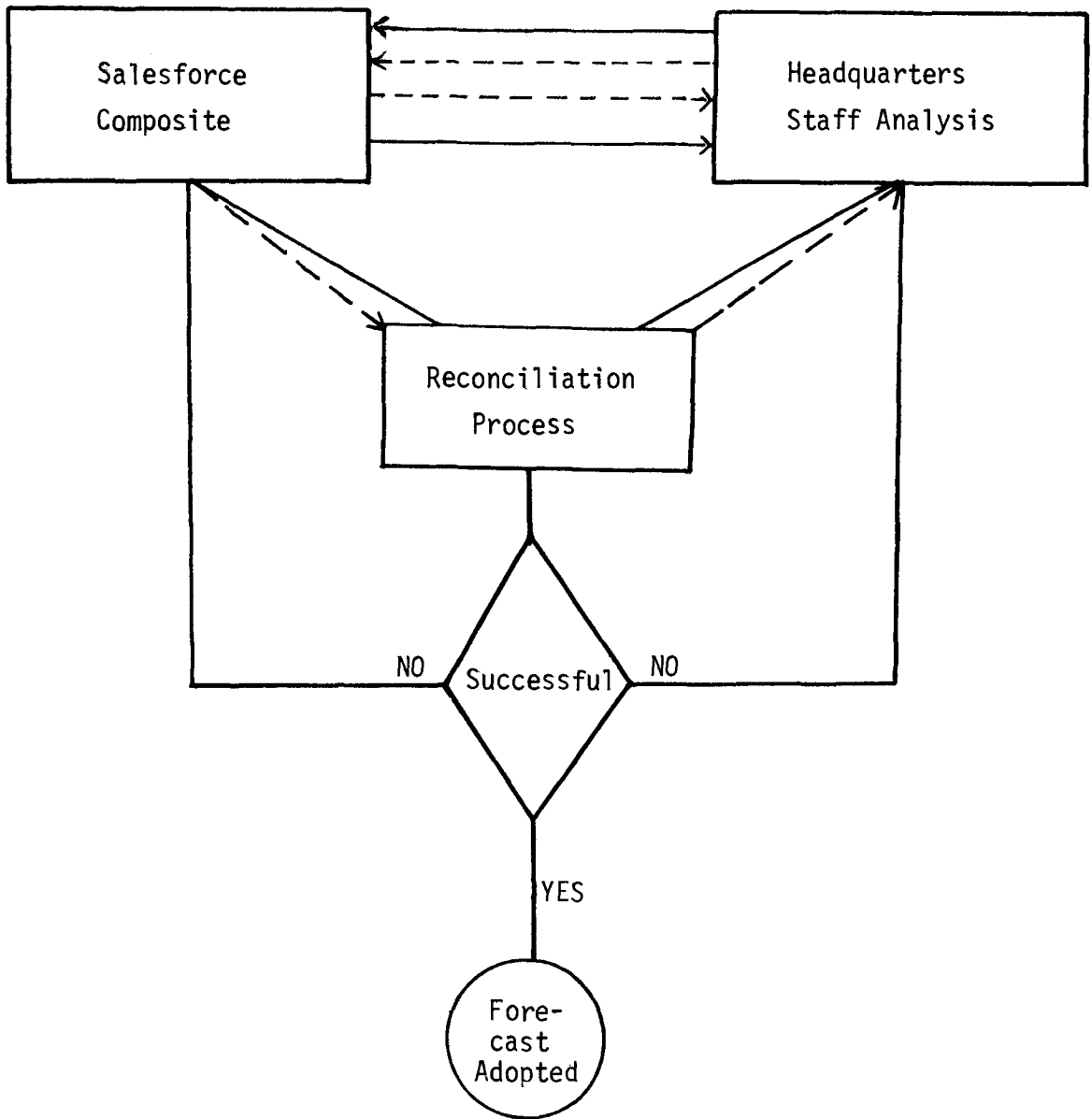
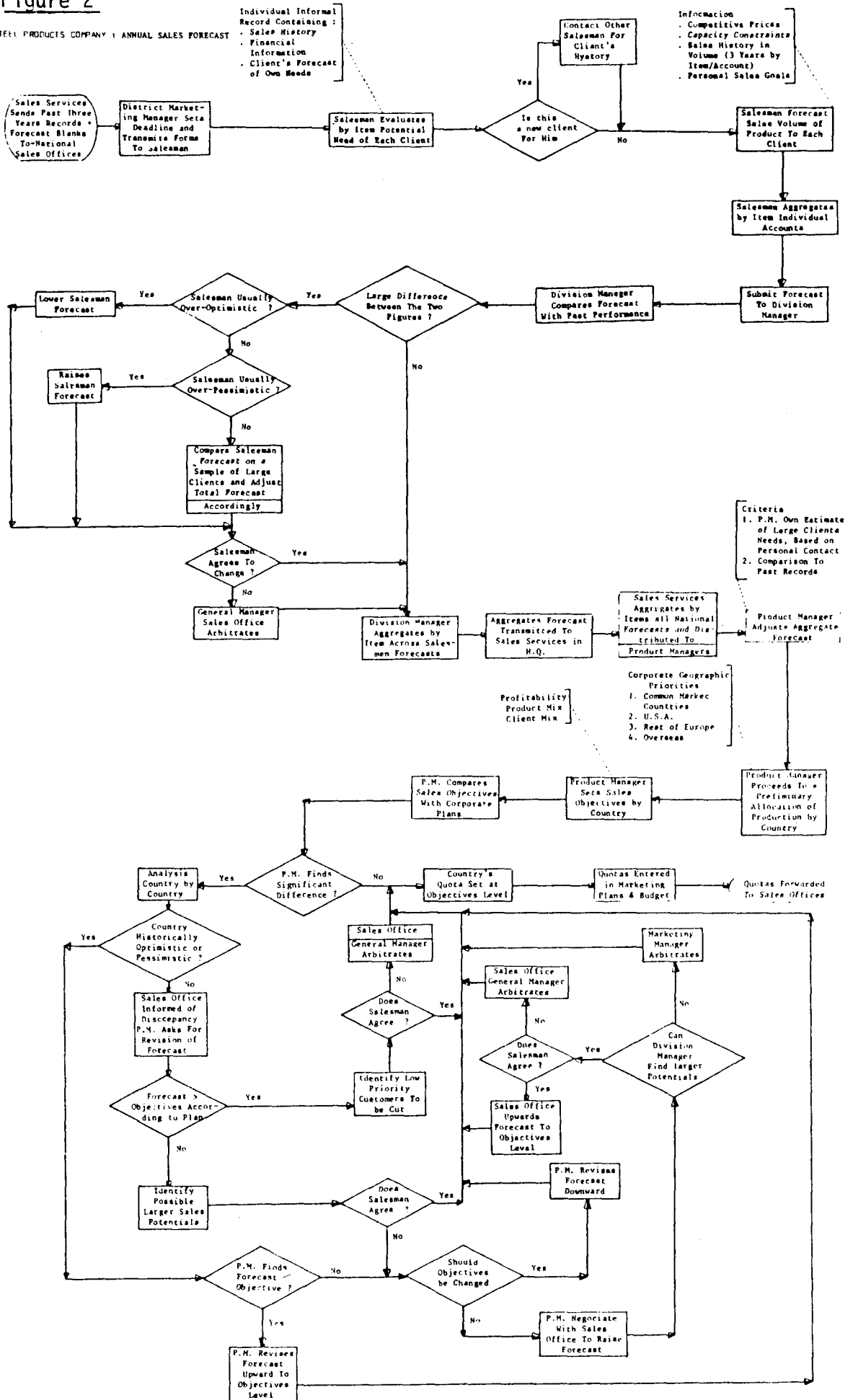


Figure 2

STEE PRODUCTS COMPANY - ANNUAL SALES FORECAST



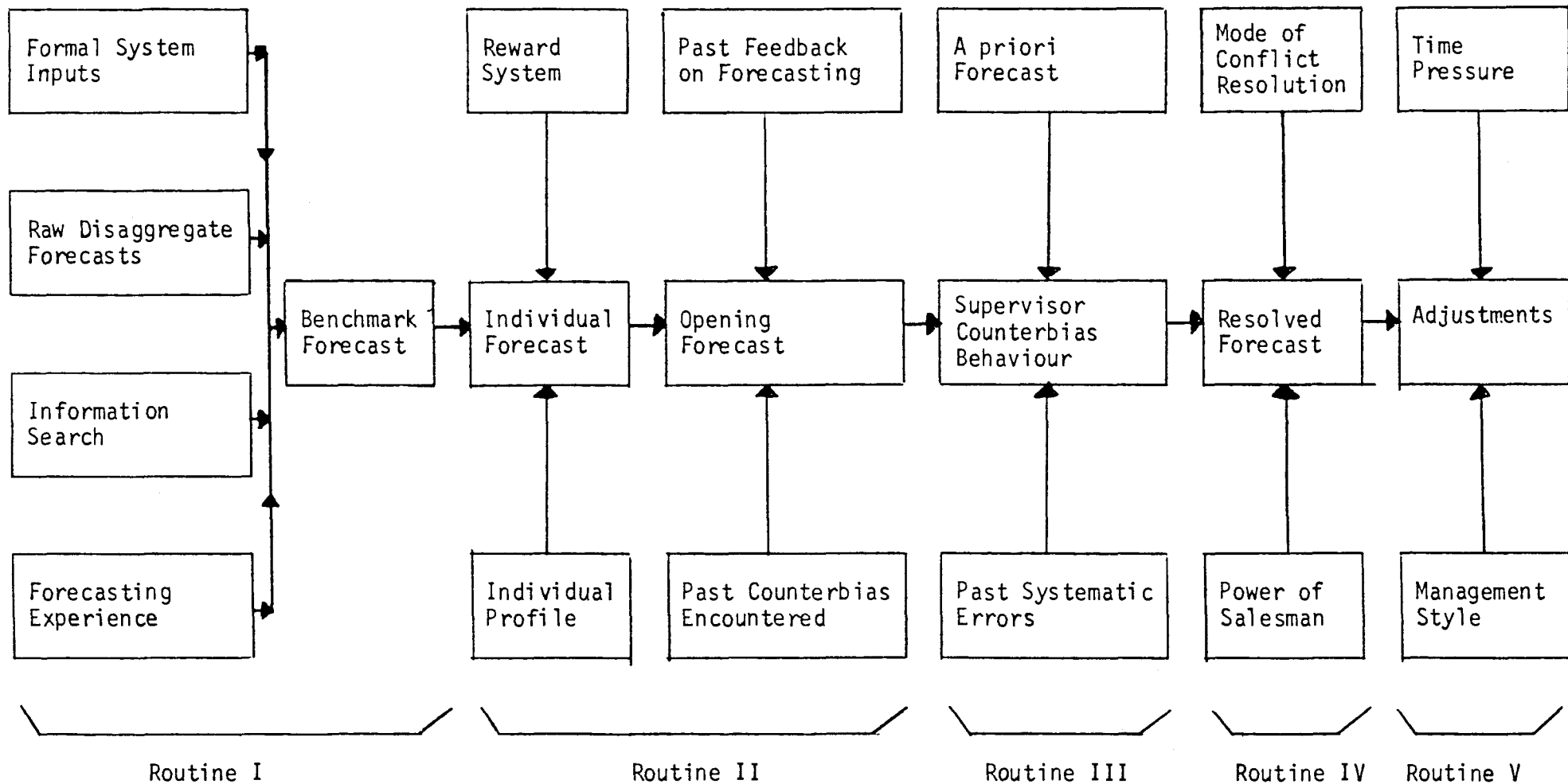


Figure 3: The Rolling Negotiation Concept

MANAGERIAL GLOSSARY

1. Absorption of Uncertainty : risk information as the forecast process travels through the organisation.
2. Benchmark Forecast : a forecast based on objective data inputs prior to personal bias and negotiation.
3. "Bottom up": a process initiated at the bottom of the hierarchy in the organisation.
4. Contagion Effect in Forecasting Errors : the part of the forecasting error relating to having been influenced by common information like forecasts of gross national product.
5. Expertise Effect In Forecasting Errors : the part of the forecasting error relating to one's own independent evaluation of his sales territory.
6. "Flagging": drawing one's attention to the unexpected behavior of an account.
7. Key Account : a customer whose demand fluctuations have an important impact on total sales.
8. Macro-Statistical Projections : a forecast of major economic indicators which are frequently used as proxy for economic climate of business activity.
9. Reconciliations of Forecasts : the use of forecasts prepared by various sources to extract one final forecast.
10. Rolling Negotiations : a process by which the salesmen negotiate their aggregate results with their own superiors and so on.
11. Salesforce Composite ; a forecast prepared by the salesforce as a result of observations and customer contact.
12. Sales quote : a sales objective which the salesman or executive agrees to achieve. Usually this objective would be used as a basis for performance approval.
13. Segmentation : the disaggregation of the market or customer body to smaller homogeneous groups allowing simultaneity of more "tailored" marketing activities.
14. Standard Industrial Classification : a convention for classifying business activities which provides a framework for classifying secondary statistical and economic data.

15. Strategic Forecast : long term oriented forecast, taking into account new and structural development.
16. Survey of Buying Power : periodical surveys of economic activity (number of employees, sales volumes, etc.) which help estimate market potentials.
17. Tactical Forecast : a short term oriented forecast assuming no major structural changes.
18. Top-down : a process initiated at the top of the hierarchy in the organisation.

PROBLEM SOLVING INDEX

1. Identify the flow of information and the communication from the moment the forecasting process starts to its end.
2. Identify the possible sources of bias due to personal profiles, past errors reward system, etc...
3. Identify the relative power of the salesman in forecast negotiation, based on the importance of his personal observation and interpretation of phenomena in the field.
4. Isolate sources from contagion effects in forecasting errors.
5. Assess the uncertainty involved with the forecast.
6. Identify the role of objective setting in the company. Is it used for reducing fluctuation, establishing norms, motivation or any combination of the above.
7. Identify cultural bias patterns.
8. Identify the role of the forecasting manager.

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