CONTEMPORARY ISSUES IN FORECASTING AND PLANNING

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ABSTRACT

The present review of remarkable developments in the forecasting/planning field aimed to provide highlights of conceptual and applied contributions that recently benefited scholar research and practice. The paper balanced conceptual and technical developments to show both qualitative and quantitative challenges forecasting/planning face. The study identified future research areas for academia and practice to pursue for achieving improvements in planning/forecasting and resulting leverage in business performance.

Key words: Planning, Forecasting, Modeling, Scenario Planning, Efficiency of Planning.

SCENARIO PLANNING METHODS

To address insufficient accuracy of spreadsheet forecasting techniques, Schoemaker (1991) developed a heuristic planning approach then empirically tested. The key reasons for inadequate planning are uncertainty and complexity. The Schoemaker's algorithm consists of two main elements: identification of trends relevant to planning, and uncertainties. Then, trends and uncertainties should be paired to form scenarios covering various developments. Schoemaker (1991) also emphasized development of relevant administrative links between the planning process and implementation at a firm. Schoemaker (1991) showed an example of Monte Carlo simulation use for assessing performance from the scenario planning point of view. Schoemaker (1991) elaborated a sequence of steps in scenario planning and advised to develop firstly two contrasting, or forced, scenarios (positive and negative) through grouping negative effects on business in one scenario and positive ones in the second scenario. Schoemaker (1991) developed a key-success-factor (KSF) matrix to integrate scenario planning into managerial and strategic decision-making. The KSF matrix integrated scenarios, competitor analysis, and strategic vision of the firm. The essence of the method is to rank-order KSFs in the two-dimensional (strategic segments vs. scenarios) matrix. KSFs are a plausible and implementable phenomenon well-accepted by managers.

IMPORTANT DEVELOPMENTS IN FORECASTING/PLANNING

Qualitative Aspects

Armstrong (1983) argued that planning is a strategic process with its own framework, not a technical skill. It consists of several stages (specify objectives, generate strategies, evaluate strategies, monitor results). Armstrong (1983) highlighted sincere elaboration of parameters for various scenarios and accented on its strategic nature. Overall, he emphasized the complex and comprehensive nature of

planning/forecasting. He separated planning and forecasting as different phenomena, although they may have common features and techniques. Importance of selecting appropriate predictor variables is required for accurate forecasting. For instance, Shumway (2001) showed that changing the set of variables used for forecasting bankruptcy can statistically significantly improve forecasting accuracy and precision. The research showed that single-period models based on accounting ratios lose in prediction capability to his novel discrete-time hazard model based on both accounting ratios and market size, past stock returns, and idiosyncratic returns variability. Contrary to static model, the hazard model treats as its dependent variable the time a firm spent in the financially healthy condition. Static models simply consider firms healthy at the given time. The area of long-term forecasting is under-explored. Methods employed are time series, life cycle forecasting, causal techniques, and judgemental (such as the Delphi method etc.). Lapide (2009) emphasized importance of both qualitative and quantitative aspects in the long-term forecasting and planning versus only quantitative techniques. He produced a number of strategic forecasting recommendations. Holmstrom et al. (2002) presented a technique called "rank and share". The technique can serve for forecasting product quantities for e.g. replenishment in supply chains. It uses the category management concept. The emphasis is on collaboration among supply chain participants to reduce inefficiencies in planning and forecasting. The authors introduced the scheme of the collaboration process architecture. Transparency and simplicity might be key characteristics for effective implementation of the algorithm proposed.

Quantitative Aspects

The traditional quantitative approach arose after the computers gained substantial use in business. It has brought a variety of quantitative statistical methods featuring time-series analysis followed by development of a forecasted dataset. Winters (1960) and then Box and Jenkins (1970) emphasized a need of the time-series decomposition onto trends and seasonal coefficients with a following processing of the data. In particular, various forms of exponential smoothing models have been used for a wide range of forecasting applications with little modifications. However, the most known and broad used is ARIMA model that is an extension of the time-series models with autoregressive (AV) integrated (I) moving average (MA) algorithms. Groschwitz and Polyzos (1994) researched into application of ARIMA for forecasting and planning traffic problems with up to 2 year planning horizon. The contributions of the study were in introducing traffic stochastic demand according to various scenarios, non-stationary nature of the investigated problem, and the use of the time-series model. A more recent planning/forecasting method has emerged in the last three decades (Hill et al., 1994). It is called Artificial Neural Networks (ANN). ANNs are mathematical models which attempt to replicate the function of neurons. However, science still commands little knowledge about neuron performance in brain networks (Hill et al., 1994; Cho, 2003). Hill et al. (1994) compared forecasting accuracy and precision of Artificial Neural Networks versus forecasting capabilities of statistical techniques (regression-based etc.) and decision-making methods. Although ANNs may have substantial potential in future, they produce similar results at the current stage of knowledge about the brain function. Instances of ANN's better performance are not consistently regular but rather sporadic, concluded Hill et al. (1994).

CONCLUSION AND FUTURE RESEARCH

The persisting gap leaves an important and challenging future research area. To summarize the cited scholars, future research opportunities are in enriching and deepening scenario planning methods due to increasing complexity of business environment. Beyond conceptual methodological development, there is a large field for improving specific techniques, such as selection of variables, probability distributions, and amendment of existing models. Development of new models and techniques will also be highly welcome by the scholar and professional community. Another interesting and rewarding future research area is development of applied software packages incorporating latest scientific achievements to present them in the form of a simple, understandable for practitioners and user-friendly interface. A novel scholar

and practice field will be in-depth application of existing techniques to specific industries (customization of forecasting according to the selected industry needs). Such planning/forecasting customization may establish both a large research stream and a forecasting/planning software commercial market. Finally, development of planning/forecasting educational programs will be a big step ahead. Several streams may emerge in educational efforts to bridge the gap between current accuracy of planning/forecasting and desired predictive capability. These would be not only introduction of planning/forecasting courses into existing curriculum of business schools, but also the establishment of specialized forecasting/planning postgraduate programs, such as M.Sc. in Quantitative Forecasting and Business Resource Planning. Finally, development and enhancement of applicable professional designations and qualification requirements will raise demand for forecasting/planning education. We believe that the presented review of recent developments and research opportunities in forecasting/planning will increase interest in the topic among scholars and practitioners, raise awareness about some notorious developments in the field, and improve predictive capabilities of businesses and the public sector.

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