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MARKET INTELLIGENCE: THE KEY TO SUCCESS IN THE MARKETPLACE

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ABSTRACT

The article focuses on the market forces and the inherent ability of the markets to correct themselves. The representation encompasses the market intelligence within the flexible framework of algorithmic information theory and the matching of strategic input state vectors to the output states to develop a strategy for efficient market management. The sequence of actions in market scenario provides a uniform dynamic simulation of information. The article led through a case study is a self-contained exposition of a cybernetic approach to develop mathematical model of Indian National Market Index incorporating the discrete event industry-dependent state variables. The work presented here formalizes a specific dynamic situation, namely the construction of a finite dimensional process for daily movement of national market index. It has been clearly demonstrated with observed data that the flexibility of the algorithms is remarkably broad. Indeed, it is possible to choose free variables in such a way that the entire formal modelling process can be interpreted as a loop shaping problem, where the loops are the layers in the multi-layer selection process, and the loop-breaking takes place at the optimum layer through a certain specific choice of variables. The adaptation of input-output states in real time serves to maximize information transmission. Adaptation of market intelligence in a changing operation is not hard-wired but rather a dynamic process that occurs throughout in unison with other operating factors.

Keywords: *competitive advantage, flexibility, inflection point, large scale system, market intelligence,*

Introduction

Market Intelligence and Strategic Marketing Management comprise a market system. It has a number of sub-systems. Interconnection of Market Intelligence and Strategic Marketing Management is shown in the figure in the appendix. It works on a principle of observation, conjecture, analysis, modelling, synthesis and validation. Every sub-system, say, sensitive index, share price, brand equity etc. gives input to the process, Market Intelligence and Strategic Marketing Management. Data are mined, analyzed and synthesized to an adaptive process. Decisions are communicated to the sub-systems. Observations are made. Data are fed back to the process. Decisions are again obtained. Ever vigilant operation continues. The figure 1 in the appendix shows the principle of operation of a large scale system. The present article conceptually elucidates the composite process of Market Intelligence and Strategic Marketing Management within the flexible framework of algorithmic information theory and the matching of strategic input state vectors to the output states to develop a strategy for efficient market management.

Implementing a strategy is not an easy task for a marketing organization. Many companies

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survived in the past even though they did not have a clear sense where they are going, since the resource pool seemed to be unlimited. But today resource allocations are much different and competitions are often fierce for the scarce resources that exist. Firms today will not exist without a clear strategic direction. Regardless of company size, the planning process is the same. This process is a clear continuous process driven by market strategy that is dictated by customers and the portfolio mix of the customer (Warner, 1987). One of the drivers of both strategy and success in the marketplace is the role of market intelligence.

All businesses have strategies, which are the methods used to make and sell products or perform services. Often, strategies are determined by a company's reaction to events beyond its control rather than by solid market intelligence and strategic planning. But the question asked is why do firms plan? The answer is simple: competitive advantage (Day, 1984).

Several factors contribute to organizational growth in both size and complexity. Decision making gets more and more complex as the size of the business and market share decreases. This implies a critical need for strategic focus – focusing on customer/competitive analysis. Both elements are critically dependent on rigorous marketing intelligence (Bernhardt, 1994).

In order for companies to maximize opportunity, they must first assess their strategic position. Only then will management be able to decide where and how the company should position itself. Evaluations of past performance, marketing strengths and weaknesses, reputation for quality products, utilization issues and mission need to be addressed. All of these issues can be addressed by strategic planning and good marketing intelligence (Jaworski and Wee, 1993).

If a company utilizes marketing intelligence systems, the output can result in sound marketing decisions which can be one of the best sources of competitive advantage. The relative importance of planning and marketing intelligence is absolutely required if a firm wants to stay in step with dynamic market conditions. Marketing intelligence provides a meaningful input by providing firms with information that allows for sound decision making (Gilad, 1991). The goal of business is usually clear: maximize profitability and return on investment. Just as a team without a game plan is unlikely to win, a company without clearly defined strategies will not likely meet its objectives for growth and profitability (Halloway, 1986). A driving force in meeting strategic objectives is the marketing intelligence system.

The value of a marketing intelligence system can be substantial since decision making regarding strategy has a direct impact on the bottom line. If the intelligence system provides timely and relevant information, then the value added by the system can be measured in terms of risk aversion. Minimizing risk and maximizing profit are a natural extension of the system. A basic tenet can be drawn that MI adds value to strategic decision making and its importance has not diminished.

Illustration

To support this position, a survey of a cross-section of 50 consumers, industrial and service firms were surveyed in southwestern Pennsylvania. Over half the firms were industrial firms. Four key issues were evaluated in the effective deployment of a marketing intelligence system:

1) activity and value of MI in the support of customer/competitive analysis;
2) value of data sources integral to MI;
3) location of MI accountability in the organization;
4) level and trend of MI resources.

Regarding issue 1, MI activity and value to consumer/competitive intelligence, two thirds of

the companies indicted a dramatic increase in level of activity and nearly three-fifths (54 per cent) said the impact of MI contributes heavily to tactical and strategic decision making. One third said activity was level, while none indicated a reduction; 44 per cent indicated MI contributed somewhat to decision making and only 2 per cent felt MI contributed little. High ratings here are defined as percent of respondents rating MI value primary. Five of the ten functions received high ratings with No.1 providing focus on marketing and sales at 84 per cent No.2 determining market potential, and No.3 forecasting product demand at 67 per cent. Low rated functions include guiding production and distribution adjustments (27 per cent) and industry sales forecasting (23 per cent). The highly valued functions focus around the front end of planning, i.e. target market definition, while the low rated functions cluster around the back end of planning, i.e. implementation adjustments in production and distribution, and sales conversion improvement. This suggests that MI effectiveness needs to be increased in the back end planning functions (Precott and Bhardwaj, 1995).

Regarding issue 2, value of various data sources integral to MI, value was measured by a rating scale (5 – very important, 4 – important to 1 – not important).

Regarding internal data sources, the main players found on cross functional buying teams – customers, manufacturers and R & D – are universally rated at 4 or above. Following closely behind at a near 80 per cent rating is the sales force and physical product at 64 per cent. The remaining sources are all near 50 per cent – ranging from 58 per cent down to 43 per cent. Seven of the nine sources scored 50 per cent or better in high ratings.

Only five of nine external sources scored 50 per cent or better in high ratings. Clients, dealers and customers topped the list with a more than two-third high rating. Only half of market research projects garnered high ratings, while hard copy publications (periodicals and government sources) were at or below 40 per cent in high ratings.

Regarding venues of MI accountability, about half (46 per cent) of the firms assign MI accountability to marketing. A quarter assigns MI to sales. The remaining quarter is scattered among finance, planning, and other, i.e. corporate division management. This is surprising, given MI is a subset of the marketing function and perhaps is a proxy for dissatisfaction with marketing-housed MI on the part of corporate users (Precott and Smith, 1989).

About three-quarters of the sample companies have MI employees; 85 per cent of these are full time. Only one third of the companies' farm out their MI demands to outside consultants and in most of these cases the incidence was less than 10 contracts; 42 per cent of the companies reported that their MI expenditures had risen dramatically (over 25 per cent). The remainder reported flat expenditures with none reducing expenditure.

Many companies recognize the critical connection between strategic planning and MI. Two-thirds of those sampled have increased MI expenditures dramatically and three-fifths said MI had a heavy impact on their tactical and strategic decision making. Companies that realize the advantages to be gained through MI usually have a strong foothold in the market in which they operate, depending on the quality of the data and consistently updating the data. It is our belief that the trend to use MI will continue to rise and companies that fail to recognize the need for MI will lose their strategic and competitive advantage. The backward thinking firm that believes downsizing MI will increase profits through cost reduction will find just the opposite, as weak MI reduces its visionary capability, and therefore its market leadership. Furthermore, MI's highest contributions are to the front end strategic planning functions – market targeting, estimation of market potential and forecasting product demand. Research shows that strategic success is not highly dependent on strong planning capabilities in the front end (Gilad, 1991). To ignore the

potential of MI's contribution is to weaken this most critical input component of planning, thereby weakening one of the most important activities of the firm.

Flexibility and Market Intelligence

"Flexibility is a multidimensional" concept (Sushil, 2001). Eppink (1978) views flexibility as a characteristic of an organization that makes it less vulnerable to unforeseen external changes or puts it in a better position to respond successfully to such a change. Donaldson (1971) uses a broader term "financial mobility," which he defines:

"…the capacity to redirect the use of financial resources in a manner consistent with the evolving goals of management as it responds to new information about the company and its environment."

In his definition the dynamic open large scale system interaction between organization and its environment is identified in the case study that follows and flexibility is linked to strategic goals of management. The definition is however restricted to financial resources and focuses on the capabilities of management to the exclusion of organizational conditions. Volderba (1998) includes both these aspects in his definition of flexibility as the degree to which an organization has a variety of managerial capabilities and speed at which these can be activated, to increase the control capacity of management and improve the controllability of the organization. This definition concentrates the elements necessary for the implementation of flexibility.

The amended definition of flexibility that is used in this article is as follows:

> Flexibility is the process of being alert, reciprocative, and proactive to reposition the resources and functions of the organization in a manner consistent with the evolving vision, strategies and goals of management as they respond proactively or reactively to new information on unforeseen and predictable change in the dynamical environmental systems.

The definition encompasses the narrower definitions from operating, financial, strategic, marketing, manufacturing and behavioural perspective. It is based on a large scale system perspective of a dynamic relationship between the organization and its environment. It also incorporates Volderba's contention (1998) that flexibility has technical, managerial, organizational and human resource implications. The flexibility represents a process of continuous improvement that is adjusted through feedback – internal feedback on the efficiency of the process and external feedback on its effectiveness. The process, as illustrated in the case study on identification of the interactions of industry-dependent state variables on movement of National market index in India, is constrained by the time horizon within which it needs to be completed. The impact of the change may be discrete or continuous and the time horizon of the process may be short – term, medium – term or long – term (Upton, 1994).

Flexibility can be viewed as a function of change and uncertainty. The faster the pace of change, the more extreme its nature and the more unpredictable it is, the greater the necessity to plan for, manage and sustain high levels of the appropriate types of flexibility. Creating and sustaining such levels of flexibility is a continuous process that entails scanning the environment, creating alternatives and repositioning the product market in response to the rapidly changing circumstances.

The importance of becoming flexible in order to survive in a volatile and changing environment is well recognized. The complete impact of flexibility has however not yet been recognized in developing Market Intelligence. MI has recognized that flexibility forms an important element in the process, constrained with inadequacies in existing models and techniques. Just as an

investment decision is incomplete without taking flexibility into consideration, so the process of MI is incomplete without considering all levels of flexibility. If MI does not inculcate the central role of flexibility in surviving in volatile and changing times, it may progressively lose its relevance and utility. The following case study considers impact of flexibility on market system and the type of information that should be communicated to develop Market Intelligence in a Large Scale Market System.

Case Study: Identification of the Interactions of Industry-dependent State Variables on Movement of National Market Index in India

This case study is an attempt to identify the interactions of the industrial state variables in the form of daily share price indices of the operating industries such as cotton textiles, manmade fibres, basic metals, transport vehicles, engineering goods, fertilizers and chemicals, pharmaceuticals, cement, paper, tyres and tubes, food products, plantations and information technology, on all India index. It has been observed that deep-lying feedback paths exist in national market operation. To give mathematical description of daily national index movement as a function of a set of exogenous variables interrelated with one another through deep-lying feedback paths is a complex process. Theories based on differential or difference equations are not adequate to describe the process. In view of this difficulty, the method of modelling applied here uses a technique of self-organization. This GMDH algorithm (Ivakhnenko A.G. 1970), of self-organization involves generation and comparison of different regression polynomials by using all possible combinations of input variables and selection thereof the best possible ones according to the criterion of minimum integral square error. The GMDH is found to simulate adequately the input-output relationship of the complex process of daily market index movement as a function of industry-dependent state variables. Money market is one of the most exciting and sobering parts of business economics. It is marked by bubbles in which speculative prices are driven up far beyond their intrinsic values. Speculative bubbles always produce crashes and often lead to economic fear. It's only through Market Intelligence and strategic flexibility in marketing practices that speculation could be minimized. Market is a tool where country's resources are allocated. By proper utilization of resources a nation can command its economy decisively. Modelling with interacting market parameters increases our appreciation of macroeconomic analysis. This explores the exciting world where principles of cybernetics work on the theories of economics.

Methodology

The method of modeling applied here uses a technique of self-organization. This GMDH algorithm of self-organization involves generation and comparison of different regression polynomials by using all possible combinations of input variables and selection thereof the best possible ones according to the criterion of minimum integral square error. This self-organizing method is based on sorting-out of gradually complicated models and their evaluation by external criterion on data sample. It was developed for forecasting, extrapolation of multivariate processes, knowledge discovery and data mining, decision making by "what-if" scenario, diagnostics and pattern recognition. Computer finds structure of model, main parameters and laws, which act in the system itself. Any parameter, which has influence on the process, can be used as input variables. Linear or non-linear, probabilistic models or clusterizations are selected by minimal value of an external criterion. The selection algorithms are rather simple and they get information directly from data sample. It was proved that using GMDH for short, noisy or inaccurate data sample an optimal simplified model is found, accuracy of which is higher and structure is simpler than structure of usual full physical model. For good forecast simplified models becomes more effective. The GMDH is found to simulate adequately the input-output relationship of the complex process of daily market index movement as a function of industry-dependent state variables.

Mathematical Description for National Market Index

The input and output consist of data from The Economic Times (1999) for the short period from August 9, 1999 to September 30, 1999 for share price indices for cotton textiles, manmade fibres, basic metals, transport vehicles, engineering goods, fertilizers and chemicals, paper, tyres and tubes, food products, plantations, information technology, and all India national index on base year 1984. The complete data are given in Table 1 in the appendix. To get any missing data the necessary averaging has been done.

Formulation of Process Equation

Daily all India Share Index can be represented as

$$y(k) = f(y(k-1),y(k-2), \ldots , x_1(k-1), x_1(k-2), \ldots ,x_2(k-1), x_2(k-2), \ldots , x_{13}(k-1), x_{13,}(k-2) \ldots) \quad \ldots \quad (1)$$

where k, k-1, k-2, . . . , refer respectively to the current day, one day preceding the current day, two days preceding the current day and so on.. The arguments having correlation with y(k) are then selected for inclusion in the process equation on the basis of correlation functions for the time shift λ in day. The Table 2 in the appendix shows the correlation coefficients versus shift of instances on time in days ().

The process equation becomes

$$y(k) = f(y(k-1),y(k-2),y(k-3),y(k-4),x_1(k-1),x_2(k-1),x_2(k-2),x_3(k-1),x_3(k-2),x_3(k-3), x_4(k-1),x_4(k-2),x_4(k-3),x_4(k-4),x_5(k-1),x_5(k-2),x_6(k-1),x_6(k-2),x_7(k-1),x_8(k-1),x_8(k-2)) \quad \ldots \quad (2)$$

where , $y(.),x_1(.),x_2(.),x_3(.),x_4(.),x_5(.),x_6(.),x_7(.)$ and $x_8(.)$ are the indices for all India index, indices for cotton textiles, manmade fiber, basic metal, transport vehicle, fertilizers and chemicals, pharmaceuticals, food products and others(information technology) respectively. and k, k-1, k-2 , . . . , refer respectively to the current day, one day preceding the current day, two days preceding the current days and so on. The state variables have been denoted as follows.

$y(k) = y$, $y(k-1) = x_1'$, $y(k-2) = x_2'$,$y(k-3) = x_3'$, $y(k-4) = x_4'$, $x_1(k-1) = x_5'$,

$x_2(k-1) = x_6'$, $x_2(k-2) = x_7'$, $x_3(k-1) = x_8'$, $x_3(k-2) = x_9'$, $x_3(k-3) = x_{10}'$,

$x_4(k-1) = x_{11}'$, $x_4(k-2) = x_{12}'$,$x_4(k-3) = x_{13}'$,$x_4(k-4) = x_{14}'$,$x_5(k-1) = x_{15}'$,

$x_5(k-2) = x_{16}'$,$x_6(k-1) = x_{17}'$, $x_6(k-2) = x_{18}'$,$x_7(k-1) = x_{19}'$, $x_8(k-1) = x_{20}'$,

and $x_8(k-2) = x_{21}'$, the process equation then becomes,

$$y = f(x_1', x_2', x_3', x_4', x_5', x_6', x_7', x_8', x_9', x_{10}', x_{11}', x_{12}', x_{13}', x_{14}', x_{15}', x_{16}', x_{17}', x_{18}', x_{19}', x_{20}', x_{21}') \quad \ldots (3)$$

First Layer of Selection

There are $\binom{21}{2} =$ 210 possible combinations of selecting two arguments at a time out of nine. For every such combination, the partial regression equation is written as:

$$y_a = x_{0a} + x_{1a} x_b + x_{2a} x_c + x_{3a} x_b x_c + x_{4a} x_b^2 + x_{5a} x_c^2 \ldots \quad (4)$$

Where a = 1, 2. . . 210, while b and c are indices for all 210 combinations. This leads to 210 systems of normal Gaussian equations with matrices of the order 6x6. The coefficientsa's are then estimated by solving normal equation systems constructed from the data set. For estimating the coefficients, it is assumed that the equation error is very small, being distributed with zero mean, constant variance and also non-correlated with the inputs. The second assumption is that for the construction of the model the inputs and outputs are known exactly without any measurement error. The accuracy of every variable y_a is calculated by using the entire data set. From all variables twenty one more accurate ones are chosen which give low values of integral square error criterion.

Selection of Other Layers

Twenty one intermediate variables of y_a layer chosen from the first layer give 210 combinations of two arguments of y_a layer. Again in the second layer these becomes

$$z_a = \beta_{0a} + \beta_{1a} y_b + \beta_{2a} y_c + \beta_{3a} y_b y_c + \beta_{4a} y_b^2 + \beta_{5a} y^2_c \quad \ldots \quad (5)$$

where a = 1, 2,. . , 210 while b and c are indices of all 210 combinations. Calculation of the coefficientsb's and estimation of the accuracy of z_a are repeated as in the case of y_a.

The nine z_a variables are then chosen for the next layer u_a.

$$u_a = \Upsilon_{ca} + \Upsilon_{1a} z_b + \Upsilon_{2a} z_c + \Upsilon_{3a} z_b z_c + \Upsilon_{4a} z_b^2 + \Upsilon_{5a} z_c^2 \quad \ldots \quad (6)$$

In this was each layer, is tested for accuracy by using the entire data set and on the basis of minimum integral square error criterion explained on the left hand side of the equations are kept equal to the value of the output variable.

Results

It has been observed that as the layer increases, the integral square error decreases and comes to a minimum value and then it increases again. The integral square error is minimum at layer no. 3 and its value is 3.251256 E – 05.

The mathematical description for daily all India share price index on data supplied by The Economic Times has been identified by the polynomials shown below:

$y = w_{13}$

$w_{13} = 1163.472+0.8434412v_1 - 0.8787503v_{14} + 5.182434E\text{-}05v_1v_{64} - 9.692774E\text{-}05v_1^2 + 2.753534v_{14}^2$

$v_1 = 2376.994 - 1.16315u_1 + 5.602065E\text{-}02u_{13} + 1.712712E\text{-}04u_1u_{13} + 6.892982E\text{-}04u_1^2 - 3.9372E\text{-}04u_{13}^2$

$v_{14} = -6.20456 + 8.143944E\text{-}03u_2 + 0.9985639u_7 + 7.752693E\text{-}05u_2u_7 + 3.183393E\text{-}04u_2^2 - 3.9762E\text{-}04u_7^2$

$u_1 = - 4782.823 + 9.557607z_3 - 4.3281z_{17} - 2.992011E\text{-}03z_3z_{17} - 5.024977E\text{-}04z_3^2 + 0.0025597z_{17}^2$

$u_2 = 1896.956 - 2.093943z_2 + 1.403053z_6 + 7.119396E\text{-}04z_2z_6 + 2.4492E\text{-}04z_2^2 - 5.801658E\text{-}04z_6^2$

$u_7 = 2070.104 + 0.4386904z_2 - 1.279417z_{18} + 3.8783E\text{-}04z_2z_{18} - 1.391648E\text{-}04z_2^2 + 1.60351E\text{-}04z_{18}^2$

$u_{13} = 531.7393 - 1.101316 z_{12} + 1.613328 z_{17} + 9.853886E\text{-}05 z_{12} z_{17} + 3.121044E\text{-}04z_{12}^2 -$

$2.988489E\text{-}04z_{17}^{2}$

$z_2 = -88.614 + 0.9098606y_{13} + 0.142609\ y_{16} - 1.794636E\text{-}04\ y_{13}y_{16} + 2.381272E\text{-}05\ y_{13}^{2} + 1.497931\ y_{16}^{2}$

$z_3 = 451.8624 - 0.2214878y_{10} + 0.7902888y_{16} + 7.289356E\text{-}05y_{10}\,y_{16} + 1.589497E\text{-}04)y_{10}^{2} - 1.295267E\text{-}04\ y_{16}^{2}$

$z_6 = 665.6758 - 0.4396405\ y_9 + 0.802499\ y_{19} - 4.14365E\text{-}05\ y_9\,y_{19} + 2.817907E\text{-}04\ y_9^{2} - 8.878532E\text{-}05\ y_{19}^{2}$

$z_{17} = 13975.67 - 9.181525\ y_1 - 2.165217\ y_{17} + 1.04848E\text{-}03y_1y_{17} + 1.857497E\text{-}03\ y_1^{2} - 1.798011E\text{-}04\ y_{17}^{2}$

$z_{18} = -1395.187 - 0.9482392\ y_2 + 3.151357y_{19} + 4.099536E\text{-}04\ y_2\,y_{19} + 1.864161E\text{-}04)y_2^{2} - 8.55489E\text{-}04\ y_{19}^{2}$

$y_1 = 8231.044 - 6.271294\ x_1' + 0.5783342\ x_7' + 1.96111E\text{-}03\ x_1'x_7 + 1.502876E\text{-}03\ x_1^{2} - 1.184225E\text{-}02\ x_7'^{2}$

$y_2 = -3100.556 + 3.981116\ x_1' - 1.559856\ x_6' - 1.823539E\text{-}04\ x_1'\,x_6' - 6.601387E\text{-}04\ x_1'^{2} + 3.593875x_6'^{2}$

$y_{10} = 7287.82 - 5.492228\ x_1' + 0.1811733\ x_{14}' - 1.193298E\text{-}04\ x_1'x_{14}' + 1.470595E\text{-}03\ x_1'^{2} + 7.804503\ x_{14}'^{2}$

$y_{13} = -7696.565 + 0.8734651\ x_1' + 9.400627\ x_{12}' - 8.352436E\text{-}05x_1'\,x_{12}' + 6.047932E\text{-}05)x_1'^{2} - 2.759949E\text{-}03\ x_{12}'^{2}$

$y_{16} = -3844.715 + 6.932042E\text{-}02\ x_{19}' + 2.188516\ x_{20}' + 4.603777E\text{-}05x_{19}'\,x_{20}' - 7.012712E\text{-}06x_{19}'^{2} - 2.620741E\text{-}04\ x_{20}'^{2}$

$y_{17} = 31523.96 - 31.29749\ x_1' + 1.944254\ x_{17}' - 1.309424E\text{-}04\ x_1'x_{17}' + 7.280358E\text{-}03\ x_1'^{2} - 1.587774E\text{-}04\ x_{17}'^{2}$

$y_{19} = 1806.733 - 1232893\ x_5' + 4.268856\ x_{16}' + 1.947787E\text{-}02\ x_5'x_{16}' + 5.018126E\text{-}03\ x_5'^{2} - 6.50797E\text{-}03\ x_{16}'^{2}$

Interpretation of Results

The all India daily share price index is found to depend on the following state variables:

$x_1(k\text{-}1)$, cotton textile price index preceding one day of the current day

$x_2(k\text{-}1)$, $x_2(k\text{-}2)$, manmade fibres price index preceding one day and two days of the current day

$x_3(k\text{-}1)$, $x_3(k\text{-}2)$, $x_3(k\text{-}3)$,basic metals price index preceding one day, two days and three days of the current day

$x_4(k\text{-}1)$, $x_4(k\text{-}2)$, $x_4(k\text{-}3)$, $x_4(k\text{-}4)$, transport vehicles price index preceding one day, two days, three days and four days of the current day

$x_5(k\text{-}1)$, $x_5(k\text{-}2)$, fertilisers and chemicals price index preceding one day and two days of the current day

$x_6(k\text{-}1)$, $x_6(k\text{-}2)$, pharmaceuticals price index preceding one day and two days of the current day

$x_7(k\text{-}1)$, food products price index preceding one day of the current day

x_8(k-1) , x_8(k-2), information technology and others price index preceding one day and two days of the current day, and

y(k-1), y(k-2), y(k-3),and y(k-4), are all India share price index preceding one day, two days, three days and four days of the current day

Outcome and Discussion

Commonly, the term market intelligence is used for indicating that it is an organized activity and an interpretation of the business environmental events, rather than sheer information about them. To put it another way, market intelligence is actionable, processed, and organized information (Barndt, 1994). Another characteristic of market intelligence is that it is future oriented. By using market intelligence a business might forecast how relevant parts of the environment will develop in the future (Svensson-Kling, 1999). In the literature the term intelligence is often used to capture the process and organization of transforming information into something that makes sense (Weick, 1995) and that could be used in decision-making. Almost all global companies have Market Intelligence units today (Pagels-Fick, 1999). The purpose of MI is proactively to support information to decision-makers for their actions.

The GMDH is a computer aided self-organization of spontaneous emergence of order of optimum complexity from the initial featureless states. One of the goals of the theory of cybernetics has been to capture major elements of a dynamical process under the umbrella of a formal mathematical synthesis. Analysis has been done to find relationship between different parameters of stock market indices of different stock exchanges (Rolf W. Banz, 1981, Andrew C. Christie, 1982, Sanjoy Basu, 1983, Stephen J. Brown and Jerold B. Warner, 1985, Lawrence E. Harris, 1986, James M. Poterba, Lawrence H. Summers, 1988, Marc R. Reinganum, 1990, Roger D. Huang and Hans R. Stoll, 1996, Terence C. Mills, 1997, Greg Filbeck and Patricia Hatfield, 1999) But the present investigation is indeed unique in its own nature. The work presented in here formalizes a specific dynamic situation, namely the construction of a mathematical description for a finite dimension process of the daily all India share price index. It has been clearly demonstrated that the flexibility provided by the multi-layer group method of data handling algorithm is remarkably broad. In fact, it is possible to choose free variables in such a way that the entire formal modelling process can be reinterpreted not as a least square error minimization problem but as a “loop shaping” problem where the loops are the layers in a multi-layer selection process and the loop-breaking takes place at the optimal layer via certain specific choice of variables. Thus it may be justifiably asserted that LQG/GMDH is a practical comparison of LQG/LTR (G. Stein and M. Athans, 1987). It is evident from the mathematical description of the all India share price index that all new financial information is quickly understood by the market state variables and the information itself becomes immediately incorporated in the model. The operating principles of an efficient market hold that market prices contain all available information. The price movement in organized sector follows a definite pattern. Thus it can be safely concluded that Indian market is in an efficient self-monitoring equilibrium state incorporating market intelligence within the flexible framework of algorithmic information theory and the matching of strategic input state vectors to the output state.

Conclusion

Strategy is about making choices, trade–offs; it is about deliberately choosing to be different. There are many opportunities for strategic differences in nearly every industry; the more dynamism there is in an economy, in fact, the greater the opportunity. And a much more positive kind of competition could emerge if managers thought about strategy in the right way. The underlying principles of strategy are enduring, regardless of technology or the pace of

change. Sound strategy starts with having the right goal; the only goal that can support a sound strategy is superior profitability. Strategy must have continuity. It can't be constantly reinvented. Strategy is about the basic value the organization is trying to deliver to customers, and about which customers the organization is trying to serve. That positioning, at that level, is where continuity needs to be strongest. Otherwise, it is hard for the organization to grasp what the strategy is. And it is hard for customers to know what the organization stands for. Continuity of strategic direction and continuous improvement should be absolutely consistent with each other. In fact, they are mutually reinforcing. The ability to change constantly and effectively is made easier by high – level continuity. The more explicit one is about setting strategy, about wrestling with trade–offs, the better one can identify opportunities that support the value proposition.

Inflection points force an organization to revisit the core strategies. The fact is, inflection points are very rare. Discontinuous change is not as pervasive as we think. It is not that it does not exist, but words like 'transformation' and 'revolution' are incredibly overused. The catch is this: Sometimes the environment or the needs of customers do shift far enough so that continuity does not work anymore and the essential positioning is no longer valid. But those moments occur very infrequently for most companies.

The development of the construct of flexibility along more formal lines of market intelligence allows market operators to explore the possibility of adding long – term value to a market by creating and sustaining certain levels and types of flexibility in response to different changes in the environment. Flexibility is, however, not a static condition, but rather a dynamic process (Volderba, 1998). This implies that creating and sustaining a flexible organization is a continuous process too.

What we learn from looking at actual competition is that winning companies are anything but simple. Strategy is complex. The good news is that even successful companies almost never get anything right upfront. Change brings opportunities. The appropriate method of finding a firm–wide strategy is basically just a succession of incremental experiments. It's something a company is continually getting better at – so they can create a sense of urgency and progress while adhering to a clear and much sustained direction. In great companies, strategy becomes a cause. That's because a strategy is about being different – bringing something new to this world.

Future Research Direction

The underlying theme of the article is the author's unassailable faith in the market forces and the inherent ability of the markets to correct themselves. The representation encompasses the market intelligence within the flexible framework of algorithmic information theory and the matching of strategic input state vectors to the output states to develop a strategy for efficient market management. This establishes the unification of market intelligence with goods and services market, market parameters, nation's GDP, relationship of sensex and equity price of commodities and capital goods, long term strategy of markets (example oil market), the dominance of markets by global parameters (WTO effect) and the International and National e-market through the Internet. The sequence of actions in market scenario provides a uniform dynamic simulation of information. The adaptation of input-output states in real time serves to maximize information transmission. It has been observed in a stable economic system as obvious in the present system any bubble in economic indices quickly adapts in a stable input-output relation restoring any potential ambiguity in adaptive loop in well-timed incremental tightening of policy frameworks (agricultural subsidy in WTO at Cancun). The article shuns this ambiguity. Adaptation of market

intelligence in a changing operation is not hard-wired but rather a dynamic process that occurs throughout in unison with other operating factors. Analysis and synthesis of Market Intelligence and Strategic Marketing Management have been adequately covered in the present article with feed forward and feedback mechanisms having strongly interlinked parameter vectors. In this article the influence of flexibility on developing Market Intelligence has been considered. The framework developed in analyzing the case can be used as a basis to study the multidimensional and complex construct in financial and marketing enterprises, as well as for the development of information on flexibility and flexibility indicators.

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Appendix I: Economic Data Base Year 1984 for the Period 09.08.99 to 30.09.99

	(1) National Index 83-84 100	(2) Cotton Textile	(3) Manmade Fibre	(4) Basic Metals	(5) Transport Vehicle	(6) Fertil. & Chem.	(7) Pharma Product	(8) Food	(9) Others
1	2236.1	257.7	197.8	2949.6	1781.9	614.5	4996.6	6616.6	4561.6
2	2226.0	259.7	240.1	2937.1	1755.5	608.2	4961.1	6636.6	4524.1
3	2207.0	259.9	202.7	2905.8	1687.9	600.8	4932.1	6604.0	4477.9
4	2204.6	267.2	206.3	2974.8	1674.6	607.5	5038.1	6605.2	4426.2
5	2196.4	272.5	208.9	3047.2	1651.3	614.9	4894.2	6575.3	4424.7
6	2203.5	273.8	210.1	3075.8	1657.8	616.9	4898.0	6681.0	4425.9
7	2210.5	275.1	211.4	3104.4	1664.3	618.8	4901.9	6786.8	4427.1
8	2226.6	277.7	213.9	3161.5	1677.2	622.7	4909.5	6998.2	4429.4
9	2243.5	277.1	221.2	3276.1	1702.1	624.5	5009.5	6948.4	4467.0
10	2271.2	274.2	220.6	3215.0	1745.5	647.7	5061.9	6978.4	4542.0
11	2247.8	265.7	211.1	3107.9	1677.4	649.7	5122.1	6944.2	4449.8
12	2261.2	268.9	214.0	3102.6	1695.1	641.7	5285.3	6941.6	4438.6
13	2281.7	273.9	216.8	3135.6	1704.9	652.3	5248.6	6954.4	4497.9
14	2283.7	275.6	224.9	3167.9	1733.2	667.6	5278.9	6962.1	4567.1
15	2308.9	272.3	225.4	3196.4	1741.7	665.4	5325.9	6959.2	4610.8
16	2308.4	280.6	232.7	3171.9	1752.9	685.2	5260.9	6972.6	4592.6
17	2267.7	272.9	221.9	3099.4	1736.2	691.3	5010.6	6946.0	4488.7
18	2296.2	274.5	227.7	3082.5	1732.2	727.2	5107.5	6966.4	4552.4
19	2310.2	271.4	236.3	3082.7	1706.3	767.8	5206.6	6997.3	4581.4
20	2314.7	273.3	239.6	3115.9	1733.4	756.1	5284.6	7035.0	4561.9
21	2322.4	273.5	244.6	3137.9	1742.8	748.5	5369.7	7070.5	4558.5
22	2327.3	275.0	246.4	3116.9	1757.7	744.9	5401.7	7081.7	4568.5
23	2325.2	272.4	247.8	3181.1	1737.4	744.6	5422.7	7094.7	4545.2
24	2307.1	267.5	236.9	3209.9	1753.0	731.8	5411.9	6980.2	4513.6
25	2280.1	261.7	231.0	3146.1	1723.0	702.5	5304.6	6951.3	4469.5
26	2266.7	260.0	236.0	3126.5	1712.6	691.3	5251.9	6938.9	4410.4
27	2284.0	263.9	240.6	3146.0	1738.0	698.9	5360.8	6963.8	4447.3
28	2291.0	265.9	242.9	3152.5	1751.4	699.4	5415.8	6966.2	4452.2
29	2298.4	267.3	245.9	3185.6	1742.0	700.2	5447.7	6969.0	4468.8
30	2290.9	266.7	249.3	3125.8	1774.3	699.1	5438.9	6965.8	4440.4
31	2290.3	262.9	246.4	3145.3	1789.5	689.6	5498.2	6971.4	4432.2
32	2280.1	262.8	245.3	3114.7	1744.2	679.9	5433.7	7050.9	4407.1
33	2273.4	260.1	245.3	3116.3	1735.6	696.8	5397.8	7050.9	4475.7
34	2269.4	262.1	239.5	3077.7	1752.3	701.6	5314.5	7036.5	4404.8
35	2253.9	261.1	237.4	3079.2	1754.3	706.9	5330.8	7044.9	4404.2
36	2261.7	261.9	237.3	3066.8	1759.0	709.5	5268.0	7029.8	4386.6
37	2270.2	262.4	238.6	3043.5	1779.4	720.5	5282.2	7041.4	4377.1
38	2253.8	259.9	233.6	3036.3	1749.8	709.0	5194.4	7003.2	4360.3

39	2222.0	253.9	227.2	3005.2	1698.2	699.8	5049.0	6972.1	4287.5
40	2217.2	253.5	232.5	3006.2	1686.9	708.5	5058.2	6758.9	4263.2
41	2207.3	253.4	227.7	2997.4	1675.4	700.9	5046.7	6866.6	4236.6
42	2199.1	252.6	226.3	2991.7	1663.9	698.8	5042.1	6867.4	4204.1
43	2204.9	253.4	225.9	3011.8	1680.0	699.6	5063.6	6768.0	4238.0
44	2185.1	251.4	225.2	2965.8	1636.4	695.9	5015.9	6967.5	4137.8
45	2216.3	251.7	229.7	3033.8	1630.8	698.9	5229.1	7003.1	4216.8
46	2224.4	251.2	234.7	2950.7	1605.9	730.5	5462.4	6997.9	4193.9
47	2224.4	251.2	239.9	3021.6	1597.3	715.9	5394.2	7034.0	4198.5
48	2222.6	249.1	239.9	2983.2	1596.3	716.2	5420.3	7023.3	4193.0
49	2222.1	248.6	241.2	2991.3	1593.9	712.6	5409.8	7029.7	4192.8
50	2220.1	251.3	238.0	2991.9	1555.6	713.2	5422.0	7027.8	4201.5
51	2221.6	243.0	247.1	2968.7	1626.7	705.4	5402.6	7033.8	4178.2
52	2230.3	244.2	253.1	2998.2	1598.5	704.0	5537.0	7011.3	4157.9
53	2228.7	243.0	249.2	2986.9	1608.9	710.5	5427.8	7009.9	4173.9

Appendix II: 9 August to 30 September, 1999: Correlation Coefficients

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	01.0000	.5702	.4266	.7121	.4384	.1507	.4524	.1791	.1009	-.2446	.3302	.3622	-.3308	.4231
1	.9277	.4762	.4267	.6117	.4516	.1398	.4551	.4807	.1494	-.1769	.2648	.3196	-.2529	.3675
2	.8435	.3869	.4031	.5246	.4769	.1628	.4293	.4388	.0983	-.0939	.2026	.2807	-.1750	.3219
3	.7680	.3212	.4016	.4232	.4728	.1621	.4519	.3894	.1053	-.0380	.1317	.2511	-.0850	.2766
4	.6781	.2735	.4034	.3708	.4669	.1505	.4573	.3477	.1638	.0309	.0899	.2582	-.0161	.2859
5	.6083	.2384	.4047	.3427	.4675	.1421	.4399	.2954	.0879	.0092	.0705	.3318	.0702	.3905
6	.5313	.2230	.4314	.2943	.4453	.1274	.4242	.2595	.1009	-.0113	.0901	.3160	.0556	.3875
7	.4308	.1972	.4159	.2650	.4251	.1174	.3818	.2217	.0588	-.0337	.1096	.2809	.0424	.3769
8	.3492	.1485	.3958	.2495	.4080	.1354	.3560	.1778	.0532	-.0556	.1293	.2466	.0265	.3641
9	.2471	.0636	.3556	.2267	.4467	.2420	.3151	.1860	.0588	-.0851	.1548	.2366	-.0006	.3493
10	.1012	-.0751	.3376	.1428	.3533	.1694	.2404	.2305	.0221	-.1422	.2041	.2538	-.0508	.3428
11	-.0285	-.1866	.3042	.0641	.3322	.1933	.1465	.2246	-.0629	-.1854	.2415	.2681	-.0979	.3233
12	-.1350	-.2683	.2812	-.0425	.2694	.1664	.0790	.2490	-.1228	-.2405	.2862	.3088	-.1598	.2881

(1) Indices-Indices
(2) Indices-Cotton Textiles
(3) Indices-Manmade Fibre
(4) Indices-Basic Metals
(5) Indices-Transport Vehicle
(6) Indices-Engineering Goods
(7) Indices-Fertilisers and Chemicals
(8) Indices-Pharmaceuticals
(9) Indices-Cement
(10) Indices-Paper
(11) Indices-Tyres and Tubes
(12) Indices-Food Products
(13) Indices-Plantation
(14) Indices-others

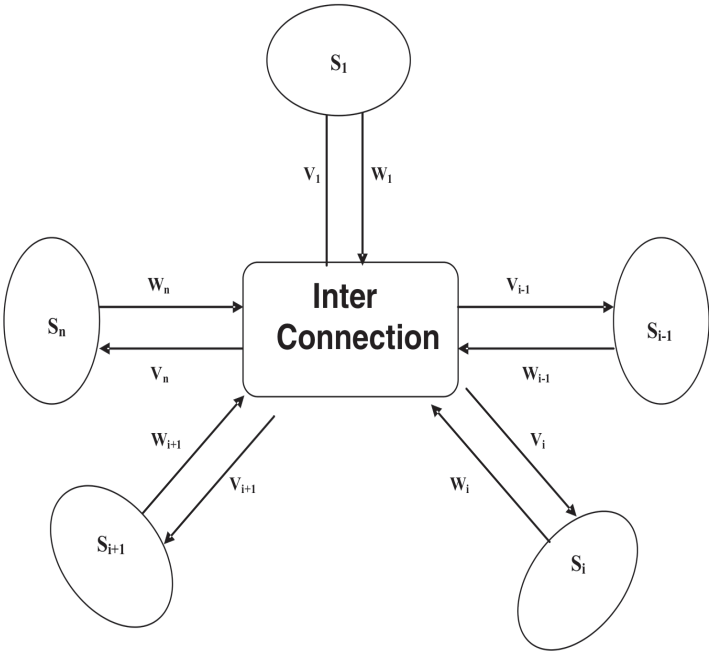

Figure 1: Expanding Construction of a Large Scale System
Key: $S_{(.)}$, sub-system ; Interconnection, Market Intelligence and Strategic Marketing Management
$W_{(.)}$, input to interconnection; $V_{(.)}$, output from interconnections