

Performing “Zero-Base Systems Analyses” (ZBSAs) to Maximize Strategic Planning Effectiveness and Develop a “Learning Organization on Steroids”

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This article describes analytic processes wherein detailed outlines (checklists) of variables are used to perform comprehensive, in-depth, improvement-oriented “zero-base” meta-systems analyses. When performed within the context of a strategic planning process rather than during ad hoc problem-solving and decision-making processes, this approach maximizes organizational learning through the development of two types of strategic planning knowledge bases. The first is a *qualitative information base* (QIB) of essentially tacit information that has been “harvested” from participants’ minds onto a checklist-oriented spreadsheet. The second is a *diagrammatic knowledge base* (DKB), which displays a visual integration of a full-blown qualitative analysis (of entities and factors or variables) with quantitative data associated with them.

DEFINITION AND DESCRIPTION

Zero-base analyzing is somewhat similar to *zero-base budgeting*—that is, developing budgets “from scratch” or “from the ground up,” rather than simply increasing budgets by some percentage each year (Pyhrr, 1977). When compared to systems thinking (Senge, 1990), action learning (Revans, 1966), and other analytic approaches, what we call *zero-base systems analysis* (ZBSA) has both similarities and differences.

ZBSA is very similar to what consultants do when, for example, they (a) analyze and diagram a complex information system, (b) analyze and diagram business processes (e.g., regarding sales and operations), and (c) develop complex econometric models.

However, ZBSA differs from systems thinking and standard problem-solving approaches in several significant ways.

First, many if not most managers and leaders generally use systems thinking and other analytic approaches to *analyze and solve problems that have already occurred*. The first or analytic phase of the basic approach involves *working backward*, first identifying problem symptoms, then identifying the obvious or immediate causes, and finally going further back through chains of causes and effects to identify the system of real, underlying causal or influential variables. The second phase involves formulating a system of alternative solutions to deal with the system of causes. During the third or decision-making phase, alternatives are evaluated (tested and compared) and then chosen for implementation. During almost all of these ad hoc problem-solving processes, different bits and pieces of various aspects of operations are analyzed at different times. Seldom if ever are all the pieces of an entire operational puzzle assembled into some integrated whole (or meta-system of interacting sub-systems and their more finite variables).

On the other hand, *zero-base systems analyses* are most effectively and beneficially performed within the context of the *analysis phase of the entire strategic planning (or managerial) process* shown in *Figure 1*. They involve using very comprehensive and detailed checklists of factors involving, for example, (a) the operations of major functional units (e.g., marketing, operations, and finance), and (b) behavioral phenomena within and among organizational units and levels. [One-page examples of our much longer, proprietary checklists are provided here as *Tables 1 and 2* on pages 6 and 7. Even these abbreviated lists should help many organizations begin to develop their own more detailed lists by adding more finite factors to them.]

Second, in the zero-base approach, managers, leaders, and their staffs *work forward* (as if from scratch), identifying the systems of variables, sub-systems of factors, and very finite factors that are exerting, might be exerting, or may in the future exert significant influences on individual and organizational activities and performance. Taking each major category of factors, sub-category, or finite factor on the list in its

Figure 1: The Managerial (Integrative) Process



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Note: “Program or Plan” involves formulating (broad) strategies, (more specific) tactics, (broad) programs, (more specific) projects associated with programs, and (detailed) action plans.

turn, analysts ask one or more of the following questions. The first is, “Does this category, sub-category, or specific factor exert a significant direct or indirect influence on operations and performance?” If the answer is either “yes” or “possibly,” they ask several questions that attach facts and/or data to the factor: “What is our/the situation with respect to this factor or group of factors, and is its influence functional or dysfunctional for the organization’s success?” The answers lead to a third set of questions: “What can we do to improve this factor and its influence on the organization, or, what can we do to correct the manner in which it is actually causing or contributing to one or more organizational problems?”

In other words, while this process usually helps uncover and solve a substantial number of previously unrecognized problems, it is far more oriented toward identifying those factors or variables whose improvement would significantly contribute to enhancing individual and organizational performance. It is conducted in a highly objective, *exploratory* manner, with care taken not to blame a particular individual or group for mistakes or poor performance.

A CASE EXAMPLE

The following example describes the analysis phase of a strategic planning process that the author facilitated for a rather small but major manufacturer of a home-related product costing from \$1,000 to \$1,500 (including installation). While *Figure 2* illustrates the most basic analytic steps of that planning process, it also shows the subsequent standard goal-setting, planning, and decision-making phases, which will not be discussed in any detail here.

As shown in *Figure 2*, the analytic process actually began with the development of a strategic planning database. The next step was to develop the *qualitative information bases* (QIBs) for various areas. The development of marketing and external business environment QIBs is described below.

Analyzing the Situation and Developing a Qualitative Information Base (QIB)

The marketing and sales managers were walked through a spreadsheet-based, 186-page, 4- to 8-level outline of approximately 3,500 industry, marketplace, and marketing mix factors. (The entire process also involved going through a very comprehensive checklist of external technological, economic, governmental, financial, socio-cultural, environmental, and global forces or variables.) Participants each had a printed copy of the checklist on 11" x 17" greenbar paper. Their copies were broken down into these sub-checklists: (a) the industry and its competitors; (b) products and/or services; (c) customer or consumer segments; (d) channels of distribution; (e) general, pull, and push promotion; (f) pricing; and (g) packaging. In addition to the first or left-hand column containing the checklist, the pages of each sub-checklist were divided into an appropriate number of columns (to the right) regarding, for example, major types of competitors (or specified competitors), major consumer segments, specified distribution channels, or types of promotional media.

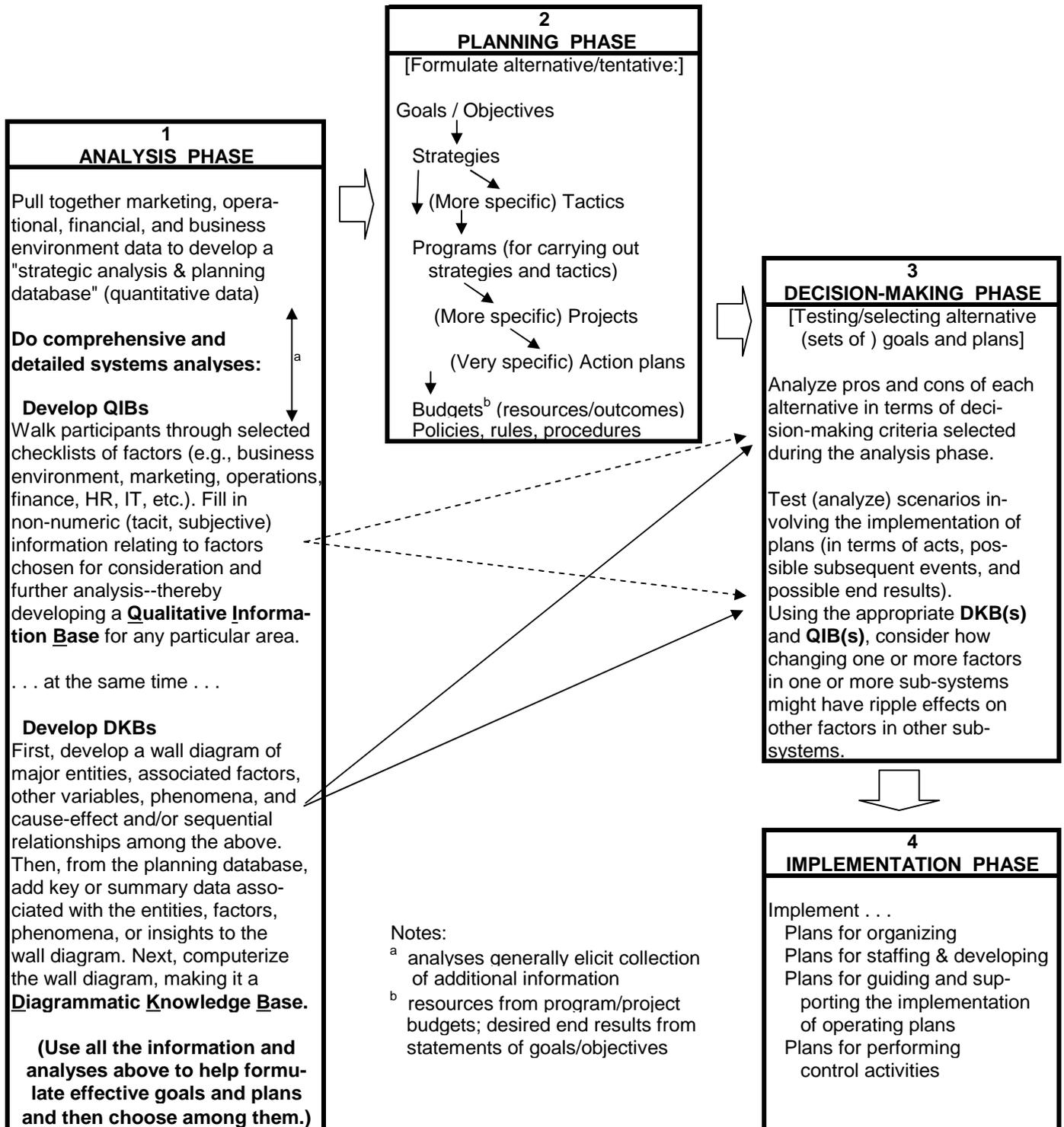
Starting with the industry sub-checklist (and then taking the others one by one), and in a very systematic, orderly, and disciplined manner, participants walked through the categories, sub-categories, and finite factors (in the column on the left side of each page) in their turn. For each of the factors they identified as being worth consideration—and in the appropriate column(s) to the right—they wrote a phrase or very brief sentence that described the situation and/or influence being exerted. For example: With respect to a specific factor such as a particular type of *purchaser's decision-making process*, they said, "Highly influenced by spouse's opinion or desires." Or, regarding a particular competitor's *ability to enter a niche market*, they said, "Not enough financial resources to enter this niche."

Of course, not all 3,500 factors on the generic marketing checklist applied to that company or its industry. So, as in most cases, not all factors were addressed and not every straw and needle in the haystack was closely scrutinized. Nonetheless, each category, sub-category, or finite factor chosen for consideration was at least briefly discussed in terms of improvement (or possible correction). It should be noted that at one point participants said, "We don't need to go through the consumer sub-checklist because we sell directly to several distribution channels." Upon agreeing that they would spend at least thirty minutes on that checklist, they began to think about and recognize things that they had never thought about before. As a result, they went through the entire outline with heightened curiosity and interest. It should also be noted that participants in this and other projects ask, "Is going into so much detail really necessary?" The answer is, "Yes, absolutely—if you care about discovering the needles in the haystack (the possible threats and problems and the competitive insights and advantages) that hopefully your competitors haven't yet noticed or figured out. Remember that the devil's in the details."

Using checklists to analyze variables and record information about them has four major advantages.

First, a checklist is an *analytic tool*. It gets participants thinking about factors or variables that they otherwise would not have considered. In fact, since human beings cannot know everything, their analyses are generally hampered by a limited knowledge of all the factors that could be analyzed. Their analyses are also influenced—and often limited and sometimes distorted—by their values, interests, attitudes, biases, and goals, which influence what they think is important enough to consider (or not). And they are

Figure 2: Basic Relationships Between Zero-Base Analysis and Subsequent Planning Phases



also influenced by the unavailability of pertinent data and many other variables. Thus, checklists help to overcome, minimize, or compensate for several very human mental limitations and attitudinal filters.

Second, using a checklist helps keep the analytic process *more disciplined and orderly*. It keeps participants from jumping around willy-nilly from one category of factors to another. It gets them to drill down from a broad or general category to a more specific sub-category and to even more detailed or finite factors, thereby leading them to discover deeper insights into their situation. And it also helps keep participants moving forward rather than wasting time in unproductive discussions.

Third, a checklist is also a *knowledge management tool* for harvesting the tacit information that resides in participants' heads. Such information is mostly qualitative—e.g., observations, insights, gut impressions, feelings, opinions, conclusions, and similar information, which electronic search applications cannot always glean from documents and e-mails. Writing down brief statements about variables—in the manner described above—gets such information out of participants' heads and into a searchable *qualitative information base* or QIB (Cecil and Rothwell, 2006). After the printed out checklist is filled in, the information can be transcribed to the spreadsheet version, making the information easily updatable and then readily accessible when needed.

Fourth, due to the first and third reasons, a factor checklist is also a very important *learning tool*. In order to write down a clear, concise phrase on the printed version, participants must crystallize their initially vague or ambiguous impression, clarify it by putting it into words that they and others can understand, and evaluate and validate it by comparing it with other participants' impressions. Equally as important, in the process of working through various detailed outlines of variables, they share among themselves an enormous amount of information that is not in quantitative databases.

The importance of the third and fourth benefits is highlighted by two observations resulting from the Delphi Group's research: (1) "On average, organizations believe that 42 percent of corporate knowledge is housed exclusively in the brains of employees." (Koulopoulos, Spinello, Toms, and Toms, 1997); and (2) About 80% of top management decisions are based on qualitative rather than quantitative considerations.

During the analytic process, participants used a column on the far right side of checklist pages to write down what could or should be done to improve or correct the factors they addressed. At the end of the entire market and business environment analysis, participants wrote their ideas concerning (marketing) goals, strategies, tactics, programs, projects, solutions, or planned actions on post-it notes for use during the goal setting and planning phase. (Refer again to *Figure 2*.) Statements of possible improvements in goal statements, strategies, and tactics were used as inputs to formulating alternative goals statements, strategies, and tactics. Other improvements, ideas, or solutions were used as inputs to formulating alternative programs, specific projects, and detailed action plans. The latter were (a) reviewed for feasibility, (b) costed for decision-making and budgetary purposes, and (c) prioritized. Then, before beginning the decision-making phase, the group placed the notes (with appropriate time and cost information on them) on a whiteboard having columns for each of ___ years. Placement on the board indicated when and in what sequence the projects should be implemented over time (taking into account matters such as priorities and human resource and budgetary constraints). [It should be noted that the marketing goals and plans were reviewed by operations, finance, human resources, and other organizational areas and, as a result, were modified to take account of those units' analysis and planning outputs.]

Developing a Meta-System Wall Model

In essence, the marketing group was performing a *micro-analysis* of the company's industry, marketplace, business environment, and marketing goals, strategies, tactics, programs, projects, action plans, budgets, and policies and procedures. However, while this analysis was appropriately detailed for marketers' and salespersons' purposes, it was too detailed for corporate-level strategic planning purposes. [Similar detailed checklist-based analyses can (and should) also be performed by operations, R&D, financial, human resources, and other units to determine what is going on, why, and how to improve or

Table 1: Major Industry and Marketplace Variables

Industry/Market Definition/Scope

Type of industry or business (SICs)
Types or classes of goods or services
Size or scope of total market
Total sales
Geographic area
State of market segmentation
Position on life cycle of market
Basic cost structure

Structure of Industry

Types or classes of competitors
Number of competitors
Extent of horiz. and vert. integration
Competitors' product mix
Competitors' shares of market
Basic traditions and practices
Entry (requirements, barriers)

Consumer or User Profiles

Demographics
Reasons for purchasing or consuming
Consumption or usage patterns
Purchasing patterns
Information needs
Influences on purchase decisions
Influencers of purchase decisions

Competitive Marketing Phenom'a

Product or service groupings
Product or service descriptions
Basic marketing strategies
Basic marketing tactics

Marketing Mix Factors:

Product(s)/Service(s)

Descriptions
Product mixes
Features
Technical sophistication
Performance
Usage benefits and advantages
Bases of product differentiation
Bases of brand differentiation
Substitutability of other products
Patents, trademarks, copyrights

Channels of Distribution

Types of channels
Services provided by channels
Warehousing
Sales
Physical distribution

Channel practices
Channel performance
Inventory turnover
Delivery
Channel risks and needs
Incentives to channels

Promotion

Promotional strategies, tactics
Pull (advertising) media used
Push (sales) media used
Promotability of products
Promotability of brands
Pull media practices
Push media practices
Sales force practices
Point of sale practices
Push and pull media costs

Pricing

Supply and demand situation
Consumer price sensitivity
Life cycle of products
Costs and break-even points
Profit margins
Pricing strategies and tactics
Pricing structures
Pricing practices and policies
Contract pricing practices

Packaging

Design and materials
Costs

Market Research Practices

R&D / Engineering

Technological sophistication
Patents
Facilities and equipment
Coordination with production

Production Factors:

Productive capacity
Technology involved
Processes involved
Capital vs. labor intensity
Facilities
Plant and warehouse sizes
Plant and warehouse locations
Machinery and equipment
Capabilities
Flexibility
Maintenance

Resources and parts inputs
Quality and quantity standards
Productivity
Production costs
Materials and resources
Direct labor
Indirect labor
Allocated costs

Transportation

Patterns of receipts, shipments
Modes used
Rates or costs

Sources/Suppliers

Locations
Quality
Reliability
Pricing

Financial

Operating data and ratios
Profitability
Return on investment
Cash flows; liquidity
Accounting practices
Debt and equity structures
Capital sources
Capital costs

Organizational

Objectives and priorities
Values
Traditions
Structures
Degree of centralization
Departmentation
Levels and spans of control
Managerial styles
Management Systems
Goal setting and planning
Decision making
Information and control
Evaluation and reward

Human Resources

Management skills
R&D skills
Work force skills
Sales force skills
Salary and wage scales
Working conditions
Attitudes and motivation
Turnover

Table 2: Significant External Factors Affecting Organizations

Economic	Government spending Defense Social welfare Revenue sharing Budget deficit or surplus	Optics Psychology
General Employment Inflation or deflation	Political, Governmental	Resources
Consumer-Related Job market Disposable income Consumer savings Consumer debt Consumer price index Consumer spending Durable goods Services Consumables Consumption patterns	(Federal, state, local) Executive Branch Departments and agencies Legislative Branch Legislation Incorporation Anti-trust Unions Taxation Dept./Agency Regulations: IRS; OSHA; EPA; EEO Federal Trade Commission Interstate Commerce Comm. Codes	Raw Materials Reserves Energy Petroleum reserves Refining capacity Production capacity Nuclear and other sources
Business/Industry Production Shipments Inventories Raw materials Work in process Finished goods Finished goods prices Wholesale prices Distribution mark-ups Profits Dividends Employment Spending on . . . Capital projects Services Labor Raw materials Energy	Judicial Branch International Relations Treaties and agreements Political Parties	Social and Cultural
Financial Interest rates Discount rate (Fed) Mortgage rates Prime rate Consumer loan rates Money supply Velocity of money Multiplier Markets . . . Stock and bond prices Commodities prices Foreign exchange rates	Technological	Other Factors/Variables
Government-Related Monetary policies Fiscal policies Trade policies Taxes	Agricultural Medical Engineering Aviation Computers Robotics Materials Catalysis Semiconductors Plastics Fiber optics Mathematics Sciences Physics Chemistry Bioengineering Biology Biophysics Neurophysics Astrophysics Electronics Genetics Climatology Mechanics Metalurgy	Population demographics Population growth Population migration Social norms and customs Morality and ethics Work ethic Socialization of the young
		Foreign Entities Governments Domestic policies Monetary policies Fiscal policies Trade policies Competitors Products Marketing practices Costs and prices
		Sources/Suppliers Transportation Modes Facilities
		Communications Modes Facilities
		Labor Work force (number, skills) Unions
		Industry Associations Special Interest Groups Environmental Political action
		Natural Phenomena Weather Geography

influence the many external and internal variables affecting their own and organizational effectiveness and success.]

Therefore, as major observations and insights were generated while walking through the detailed marketing and business environment sub-checklists, the facilitator—with participants' inputs—was diagramming the following factors on a large wall surface: (a) the most significant insights and information regarding major marketplace entities (such as competitors, suppliers, customers); (b) business environment entities and variables (such as governmental agencies and technological and economic phenomena); (c) factors associated with those entities and phenomena; and (d) both qualitative information and numeric data corresponding to the factors. Developing this wall model was the initial stage in the development of a marketing *Diagrammatic Knowledge Base (DKB)* mentioned toward the bottom of the analysis phase in *Figure 2*. Lines and arrows indicated sequential and cause-effect relationships among the industry, marketplace, and business environment sub-systems of factors involved in the company's entire business meta-system or meta-construct. Not only did visually illustrating entities, factors, phenomena, their relationships, and the associated facts increase the effectiveness with which participants' minds could handle and analyze all that information, but it also increased how well they learned it—that is, recorded it in their memories for future use.

This was not the author's first or largest wall model to date. The first, measuring about 160 square feet, was developed in 1976. More recently, the largest was 32 feet wide by 8 feet high (in some places 10 feet high)—or slightly more than 256 square feet. On it were approximately 1,000 objects—such as entities, associated factors, etc. It was an illustration that *visually integrated* both qualitative and associated quantitative information. It enabled the participating managers to look at and consider literally hundreds of times more strategic information than they had ever been able to handle before. [Since the author does not make business clients' analytic diagrams public, the example of a wall model in *Exhibit 1* is for an Illinois county's 1992 long-range economic development planning project analysis.]

Exhibit 1: Wall Diagram of a Zero-Base (Meta-)System Analysis



Some might ask, “Don’t these detailed analyses and analytic diagrams violate the KISS (Keep It Simple, Stupid) Principle.” Yes, they certainly do—intentionally. Given complex global businesses and increasingly more complex organizations, can managers and leaders win the war against complexity by running off the battlefield shouting, “KISS, KISS, KISS”? Of course not. With complexity constantly increasing, and with managers trying to handle and make sense of ever-growing amounts of information, they must develop and use technology to help them deal with it all. And computer-aided visualization of integrated qualitative and quantitative information is a powerful tool for doing so.

Developing a (Computerized) Diagrammatic Knowledge Base (DKB)

The above process need not end with the development of a large, detailed analytic (and planning) wall model. Various types of software can be used to computerize such a diagram, thereby generating a *diagrammatic knowledge base* or DKB (Cecil and Rothwell, 2006). A DKB enables researchers, analysts, planners, policy makers, problem solvers, and decision makers to do all the following:

- a. record their analyses and insights in computer memory—for more reliable retrieval, use, and subsequent update;
- b. see the big picture—that is, the major aspects of their entire business or operational world;
- c. see complex relationships among players, specific factors, and sub-systems of factors that they have never recognized before;
- d. click on objects and drill down into either a qualitative information base or a quantitative strategic planning database;
- e. click on a object and pop up a map or graph of associated data;
- f. during planning processes, better identify what might happen if “x” is changed, and how its change might ripple across sub-systems and the entire meta-system, thereby affecting organizational performance in some way and to some degree;
- g. identify many previously unrecognized opportunities, threats, and problems, so that they can more effectively make preparations for taking advantage of the opportunities and for dealing with the threats and problems; and
- h. click on an object and view the status of a program or project aimed at improving or dealing with some variable or phenomenon.

Therefore, in addition to being an exceptional analysis, learning, and knowledge management tool, a DKB is also a very powerful *executive information system tool*—a “GUI”—for accessing and viewing the complexities of, and information associated with, an organization’s “external and internal theaters of operation.”

Once a DKB has been generated by computerizing the initial wall model, it can be projected back onto a wall or rear projection screen. This enables real-time, interactive modification and updating of analyses, goals, plans, possible scenarios, and decisions in a “strategic thinking (analyzing, planning, and decision-making) warroom.” In fact, computerized DKBs can be viewed at multiple sites using today’s more sophisticated web-based conferencing systems and facilities.

QIB and DKB Inputs to Subsequent Planning and Decision-Making Phases

Again, the discussion above only described the analysis phase of the planning processes shown in *Figures 1 and 2*. However, it should be kept in mind that the quantitative databases, qualitative information bases, and diagrammatic knowledge bases developed during the analysis phase all provided inputs to the planning and decision-making phases. For example: During the planning phase, they helped managers use the major insights developed during the analysis phase to focus on the most important goal statements and the strategies, tactics, programs, and projects that initially seemed most efficacious. Then, during the

decision-making phase, all knowledge bases were inputs to choosing among (testing and selecting) the alternative goals and plans developed during the planning phase. Because DKBs indicated sequential and cause-effect relationships among systems, entities, and factors, they were especially useful when testing scenarios involving the implementation of alternative plans. They enabled decision makers to trace how a change in (improvement of or solution for) any particular variable in any particular sub-system (e.g., marketplace or business environment) might directly or even indirectly (through chains of causes and effects) affect one or more factors in one or more other sub-systems (e.g., marketing, R&D, and operations units). They also enabled the planners and decision makers to identify possible obstacles and ways to either avoid or surmount them. In other words, DKBs enabled participants to determine which alternatives were most likely to bring about the desired end results—while causing the fewest problems and least significant adverse effects or unintended consequences.

RESULTS ACHIEVED

Two types of results occurred as a result of this particular project: certain performance-related results, and several organization development or learning-related results.

Performance-Related Results

For reasons explained below, the positive performance-related results of the above process were more anecdotal than quantitative. First, as a result of the marketing micro-analysis, 35 pages of very specific ideas, improvements, or changes were identified (products, 5 pages; channels, 12 pages; consumer segments, 11 pages; and salesforce, 7 pages). Second, as a result of all that information, the company completely modified its objectives, strategies, tactics, programs, and projects. For example: Recognizing that their major distribution channel was quickly being displaced by mass marketers, and that their profit margins would be dramatically reduced as a result, they began a planned transition toward “more functional relationships” with mass marketers. In addition, recognizing how they could more effectively and profitably use various distribution channels to reach their newly identified and targeted consumer segments, they completely revamped their marketing and sales strategies and tactics. Third, they developed action plans and program/project budgets that far surpassed anything they had ever developed before.

Unfortunately, the benefits that implementing the above planning outputs could have helped to achieve never had a chance to materialize. Because the company was more capital-intensive than labor-intensive, it was financially and competitively disadvantaged during economic downturns. Therefore, since there was actually a major economic recession at the time, the company was not financially able to implement the more strategically potent and more costly plans that otherwise would have strengthened its bottom line the most. In fact, largely as a result of the insights mentioned above, the company’s chairman “saw the writing on the wall” and soon sold the business while it still had the greatest value to a prospective buyer.

Organization Development (Learning-Related) Results

In addition to the think-work results listed on page 9, the following methodological activities all resulted in a great deal of beneficial organizational learning. But if the company had chosen to perform the same process for all its major units (which it had not), it could well have become a “**learning organization on steroids**”:

- a. having every unit/department use very detailed checklists of factors to do extraordinarily thorough analyses—during which time more qualitative and quantitative information is learned (and inter-related) about more causal/influential factors or variables than ever before;

- b. using that process to enable cross-training or “cross information sharing” among the unit’s/department’s participants (and in other units across the organization);
- c. developing marketing, operations, financial, human resources (etc.) Qualitative Information Bases (of tacit information);
- d. developing marketing, operations, financial, human resources (etc.) Diagrammatic Knowledge Bases that visually present, interrelate, and integrate the most important qualitative and quantitative information identified and discussed during the process; and
- e. finally integrating all the most significant information mentioned above—including goals and plans formulated and (tentative) decisions made—in a visual manner for the top managers and executives to share as they interrelate and integrate all they have considered and to use those insights to finalize decisions.

SUMMARY

Emphasis must be placed on several major advantages of performing improvement-oriented “zero-base analyses” within the context of a strategic planning process: First, using very detailed factor checklists and wall-size analytic diagrams helps participants analyze their situation in greater breadth and depth and with greater mental effectiveness than ever before. Rather than overlooking many minute but truly significant influences that could be hampering the maximization of organizational performance, they are able to identify and deal with many factors that can stand improvement, thereby significantly improving performance in many areas. Second, by developing qualitative and diagrammatic knowledge bases that increase knowledge and aid its retention and use, participants increase organizational learning—not in disjointed bits and pieces (as occurs during ad hoc problem-solving and decision-making processes), but in an organized, orderly, systematic, meta-systemic, and *integrated* manner.

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References:

- Cecil, R. D., and Rothwell W. J. (2006). *Next-generation management development: The complete guide and resource*. San Francisco: Wiley/Pfeiffer.
- Koulopoulos, T. M., Spinello, R., Toms, W., & Toms, W. D. (1997). *Building a knowledge enterprise for the 21st century*. Hoboken, NJ: Wiley.
- Pyhrr, P. (1977). *Zero-base budgeting*. New York: Wiley.
- Revans, R. W. (1966). *The theory of practice in management*. London: McDonald.
- Senge, P. M. (1990). *The fifth discipline*. New York: Doubleday.