

**From Strategic Plans
to
Information Systems**

**An
Introduction to
Strategy Reengineering**

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Introduction

Organisations today face a myriad of problems as they try to run their businesses. Not only is change a constant problem, but the rate of change is so much faster. Many organisations turn to strategic planning to help them plan for change. It has long been recognised as an essential business activity for all organisations and rose to prominence in the 1940s and 1950s as organisations grew and became more complex. During this time various facets of management activity became more scientific in their approach. These included such areas as statistics, time and motion studies and various activities under the general heading "Operations Research". Today however with the rapid rate of change, organisation can no longer cope by using traditional long-winded and laborious strategic planning methods.

Thousands of books have been written about strategic planning. Many of them talk about methodologies, disciplines etc. None of them has been able however, to transform the activity of strategic planning from a fuzzy art form into a concise and well ordered activity. Research has shown that most organisations handle strategic planning poorly¹. The main problems range from poor preparation of managers involved and faulty definition of the business units concerned, to vaguely formulated goals and inadequate linkages of the strategic plans with other control systems.

The result is that strategic planning, if its done at all, is done in a very piecemeal fashion by many organisations. It is long winded, tedious and usually degenerates into financial planning, more accurately referred to as financial planning or budgeting. In addition the strategic plan is usually developed with little review or analysis and is then cast in concrete and placed on the shelf to gather dust. Where strategic plans are implemented, the lead time for their implementation can take years. And when information systems are designed and implemented based on these fuzzy plans, they too are fuzzy, not meeting management's requirements for providing the necessary timely, accurate and appropriate information. In most organisations therefore its not so much a case of the successful organisation being the one that has planned well, but the one that has made the least number of catastrophic errors.

The Problems

In preparing a strategic plan organisations face numerous problems: changing economic conditions including the effects of the political climate of the day; new and constantly changing technology; global activities which encompass the organisation's environment; and most importantly the changing corporate culture of the organisation - its people, their behaviour and attitudes. For commercial organisations there is the added concern of the five competitive forces²: industry competitors, buyers, suppliers, substitute products and services, and new entrants to the industry.

In order to be best prepared for all this constant change the organisation needs information. And if the organisation wants to answer the question "What will happen?" rather than "What did happen?" it needs far more information. This additional information is needed so that it can monitor, anticipate, plan and hopefully promote change, thus being proactive instead of reactive. Most importantly, this information needs to be captured, stored and processed in such a way that it can be readily accessed by management and staff when needed. And most importantly, its not just information about the organisation's customers, products, orders, etc. but also information about the correct processes and procedures needed to capture, store and analyse that data.

As such, a vital component of any strategic plan is information feedback to ensure that the strategic plan is first of all being implemented correctly and, post implementation, is working according to plan. Properly designed information systems, both computerised and manual, can provide this feedback. However, there's a problem: the implementation of information systems to support the strategic plan can also take many years. This is especially true if the information systems are designed to allow the company to be proactive rather than be traditional passive or reactive record-keeping systems. Today's organisations need systems which contain not only information but the expert knowledge of its management and people.

The major problem with developing information systems however is highlighted by the computer industry's long history of developing systems that do not meet all the requirements of management. Custom developed information systems are prone to errors and take typically twice as long as estimated by data processing management to complete³. In addition there is the significant problem of developing information systems to match the strategic plans of the organisations. This problem is continually identified as the biggest single problem facing data processing departments and their organisations in the annual Price Waterhouse Urwick/The Australian computer survey.

There is also a phenomenon known in the computer industry as "The Application Backlog". It is a euphemism for correcting the gaps caused by poor strategic planning and the subsequent interpretations of the information requirements based on these incomplete plans by data processing staff. This leads to data processing staff being unable to completely and comprehensively ascertain all the management information requirements during the initial phases of analysis and design which in turn filters down through to the implementation of the information systems. And its not just the information but the processes and procedures surrounding them that are not identified, analysed and implemented in the information systems. The Application Backlog phenomenon exacerbates the data processing workload with typically 60%-80% of data processing resource being allocated to this task.

In an attempt to identify and analyse the required processes and procedures many organisations have turned to a new technique known as Business Process Reengineering (BPR). The technique was first postulated by Michael Hammer in his landmark article in August 1990⁴. In it Hammer emphasised the need to not just automate processes for the sake of automation, but to obliterate them where they were not needed. He also advocated using information technology as an active part of the organisation rather than just a passive repository of information. In his article Hammer quoted impressive productivity improvements achieved by organisations who had successfully used the BPR techniques.

Unfortunately, the reality is that up to 70% of organisations who undertake BPR do not achieve anywhere near the same level of success, a fact admitted by Mr Hammer in a recent interview and acknowledged in a recent Harvard Business Review article in December 1993⁵. The main reasons cited for failure were:

- A lack of commitment by management
- Management held on to "sacred cows"
- The scope of the project was too narrow or too shallow
- The goals and objectives were not clearly defined
- Information technology was not used effectively.

All of these point to inadequate planning, not only of the BPR project, but also in many cases to poor strategic planning within the organisation itself, and a failure to come to grips with the overall problems facing the organisation.

To overcome these problems numerous software tools and techniques have been developed. Each has been able to demonstrate some success, but the failures far outweigh them. In almost all cases the tools and techniques treat the signs and

symptoms of the problems, not the underlying causes. Or they may increase efficiency, but without any appreciable increase in effectiveness. In the case of information systems development tools, they increase the *quantity* of information systems, but not the *quality*. Each tool and/or technique only solves part of the problem. The operation is a success but the patient dies.

What is needed is something which looks at the whole problem, not just bits of it. Something which takes a top-down view addressing the fundamental problems which are affecting every part of the organisation, and then flowing the solution down from there.

A Solution - Combining Information Engineering and Strategic Planning

A solution that was first theorised in the mid 1980s was to use the principles of Information Engineering in a strategic planning environment. It was felt that, as the core of most strategic planning was information or the use of information, the techniques could assist management to achieve a substantial improvement in their strategic planning in a similar way that Information Engineering has been able to improve the quality of information systems. The techniques were refined by Farrell & Associates during the early 1990s based on current management practice and the results of their continued research and actual use in several organisations, both in Australia and overseas.

The results were dramatic. Using these latest techniques in actual situations with large organisations, project teams were able to reduce the strategic planning process from months to weeks and in some instances to days. The techniques were found to have universal applicability across all industries and at all levels of the organisation, from top management level through divisional, branch, departmental, and workgroup. The techniques provided for rapid iteration of SWOT analysis to refine and expand the strategic plan. In addition the techniques were expanded to include a way of graphically representing the strategic plan in what is called a strategic blueprint. This blueprint allows for a pictorial analysis of the strategic plan which further improves the quality of the strategic plan and the ability to comprehensively analyse it. It allows for the rapid identification of gaps and opportunities in the plan as well as the ability to quickly identify areas of potential problem, concern, conflict or overlap.

The results of this research has led to the formulation of a set of techniques which today are known as Strategy Reengineering. Strategy Reengineering is essentially a blend of Strategic Planning, Information Engineering and Business Process Reengineering. The dramatic improvements are achieved by using a modeling

approach, but one which does not depend upon computerized financial models. Instead, the organisation is modeled in terms of its data resource, and the goals, objectives, policies and strategies established by management. As an architect uses sketches and plans of a building to define its broad design and then its detailed construction, so also Strategy Reengineering establishes a *blueprint* of the organisation. This blueprint is a schematic representation of the data resource. It is sometimes referred to as a data model. Just as the architect's blueprint schematically represents construction details for the building, so the data model represents resource details needed by the organisation.

Key Organisational Resources

There are four key resources on which an organisation depends:

- Personnel
- Plant & Equipment
- Finance
- Data

The first three are well managed in most enterprises, at the highest management levels. But the data resource is rarely managed effectively. Only in the best run organisations do managers have all the information they need for decision-making. These organisations ensure their information is accurate and managed centrally (as are personnel and finance), yet made available as needed. In contrast, most organisations leave responsibility for information with the functional areas (departments, branches or sections) which use that information. This leads to information duplication, with consequent problems of management and control.

The data resource of an organisation is far more stable, and subject to less change than the processes and procedures which capture, store and use that data. While a building may change little during its life, how it is used may change dramatically. Many buildings were never designed for their current use. So also, the processes and procedures used by an organisation may change more frequently than the data. Some may no longer even be needed. Yet they continue to be used – often for no reason other than, "*we have always done it that way!*" An example of changed processes and procedures can be drawn from banking.

Twenty years ago we took a passbook with us to the bank. The bank teller wrote our savings deposit or withdrawal transaction directly into the passbook.

Ten years ago the passbook was still used. But instead of writing the transaction by hand, the bank teller placed the book in an online computer terminal. This printed the transaction in the passbook under computer control.

Today, however, we rarely use the bank teller at all. Instead, with automated teller machines, we enter the entire transaction ourselves. We use not a passbook but a plastic banking card. We key in the transaction details directly.

The processes and procedures for personal banking have changed dramatically over time. The information, however, is still essentially the same. Similar examples can be found in many other industries. An organisation's processes and procedures may change many times.

Business Process Reengineering has come into fashion over the last few years as a way of identifying all the processes and procedures used and/or needed in an organisation. When used properly it can substantially improve the productivity of the organisation. Unfortunately up to 70% of organisations fail to use Business Process Reengineering successfully. To overcome this the concepts of Business Process Reengineering have been blended into Strategy Reengineering, linking them back to the strategic plan. How this is done is covered in another section.

Unlike the process and procedures, data changes only as the organisation itself changes. When it moves into new markets, or a new industry. When it introduces a different type of product or service, or a different method of distribution. With a blueprint we can represent an organisation – its business, its products or services, its markets – in terms of its data. We will see that the blueprint allows management to evaluate different policies, objectives and strategies. They can rapidly evaluate strategic alternatives in weeks, and often in days.

THE STRATEGIC PLANNING INPUTS

The strategic planning aspect of Strategy Reengineering draws heavily on management theory – particularly Peter Drucker,⁶ and Michael Porter.⁷ It uses an expression of an organisation's directions as a starting point, in terms of the strategic statements:

- Mission
- Policies
- Goals and Objectives
- Concerns and Issues
- Strategies and Tactics

The statements are used by Strategy Reengineering for modeling of strategy and the formulation of the strategic blueprint. All of the strategic statements are linked in a cascading manner. For example, the Mission statement will define goals and objectives which in turn will define strategies and tactics. Figure 1 below illustrates this interlocking nature of the Strategic Statements, cascading from the inner portions of the "onion" to the outer portions.

Each organisation can be divided into three levels of operation - Strategic, Tactical and Operational. The Strategic level is typically made up of the chief executive and his or her executive management. This group has the prime responsibility for all aspects of the organisation. They define the overall Mission statement for the organisation, setting its focus and direction. They set strategic level Goals and Objectives, which will be fleshed out at the Tactical and Operational levels. And they set strategic level strategies which will set the organisation on its chosen course.

At the next level, Tactical, are the major divisions and/or departments of the organisation. These may include personnel, sales, marketing, engineering, etc. At the third level, Operational, are the workgroups of the organisation which either deal directly with the customers or clients of the organisation, or provide support to those workgroups. These may include customer service, shipping, order entry, etc.

At each level strategic statements should be formulated. The Strategic level statements should be formulated first to avoid possible conflicts and/or gaps caused by unconnected or "dis-integrated" planning at lower levels of the organisation.. From these Strategic statements will come the Mission statements for each of the Tactical level areas in the organisation. And because they have been formulated top-down, each division/department will not only be in harmony with the overall objectives of

the Strategic level, but be in harmony with the other divisions/departments at the same level.

As the Tactical level areas formulate their strategic statements they will in turn define the Mission statements for the Operational level areas under them. Also, most importantly, they can test the strategic statements of the Strategic Level for feasibility and provide essential feedback to top management while they are still in the formulation phase of their strategic planning. Similarly at the Operational level, the workgroups can formulate their strategic statements, providing further essential feedback to upper management on the feasibility of the strategic plan during its initial stages, rather than discovering that the plan is unworkable during the latter implementation stage.

The Strategic Statements at all levels set directions for the future. They establish a proactive corporate stance, rather than reactive. The organisation becomes aware of emerging changes in the environment. This enables it to assess appropriate changes necessary to respond to the changed environment.

STRATEGIC PLAN FORMULATION

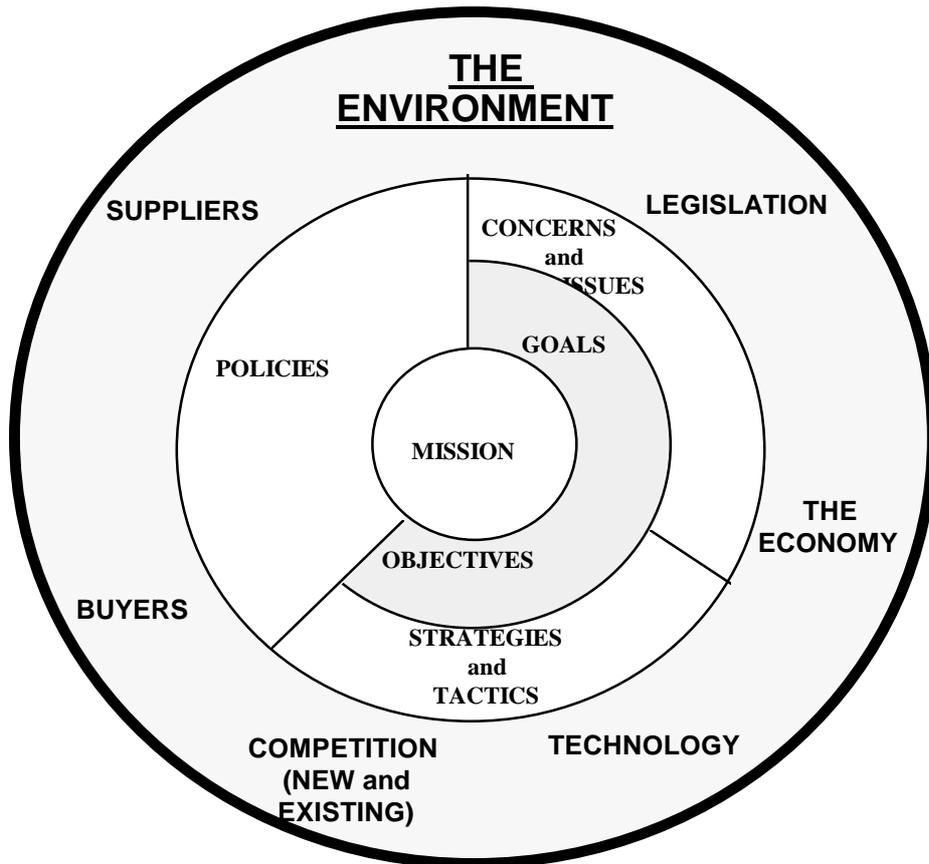


Figure 1: The Strategic Statement Interaction Diagram

The Strategic Statements

Mission: The Mission statement defines the fundamental reason for the organisation's existence. It defines the organisation's present and future direction and answers the three basic questions that every organisation must be able to answer:

- What is our business?
- What will it be?
- What should it be?

The Mission statement should have relevance for a three to five year timeframe and should remain unchanged until there is fundamental change in the type of business conducted. (It is sometimes referred to as the prime objective.). This is not to say that the Mission statement must remain the same for five years (unfortunately this

happens in many organisations causing them to fall behind the market). The Mission statement should be reviewed at least every twelve months to ensure it remains relevant to the desires, wants and needs of the owners.

Each part of the organisation at every level should have a Mission statement and each statement should be aligned and concordant with the overall organisation's Mission statement. A Mission statement at the Tactical level for example will have its origin in a Strategic level Objective, which in turn will link back to the overall Mission statement.

In answering the questions outlined above the Mission statement must also answer the three fundamental questions about what the organisation does:

- What are the organisation's Products and Services?
- What are its chosen Markets?
- How does it deliver its Products and Services to those Markets (What are the Channels)?

This then makes each Mission statement unique to the organisation, distinguishing it from every other organisation.

Goals and Objectives: Goals and objectives define the results to be achieved by the organisation, and its personnel. They ensure the directions set for the future are achieved. Goals are a broad statement of need for achievement e.g. higher productivity, lower expenses, etc. Objectives on the other hand are a specific statement of a requirement for achievement which specifies the:

- Item for achievement (Measure)
- Target amount to be reached (Level), and
- Timeframe within which the Level is to be achieved (Time)

Goals can be defined at all levels of the organisation. At the Strategic level the Goals are typically broad e.g. higher sales, while at the Tactical and Operational levels they are more specific, e.g. Increased sales of Product X.

Policies: Policies set guidelines, establish boundaries of responsibility, and define the conduct of the organisation. The policies set by management determine the corporate environment, its culture and its ability to change.

Policies are typically set for one of four reasons:

- Legislation
- Code of Conduct
- Standards
- Executive Decision

In essence Policies are timeless objectives - something the organisation wants to achieve *all* the time. They may focus on certain concerns and issues. They can establish the capability of the organisation to compete, to innovate, to survive. Policies are qualitative. They can ensure that the organisation meets or exceeds certain minimum levels of quality in its products and services and provide direction for staff in carrying out their tasks.

Concerns and Issues: An organisation may not have a formal corporate planning process. It may not have clear objectives. But the Concerns and Issues are usually well-known by management. An analysis of the organisation's environment - both internal and external is vital to identify what potential internal barriers (Concerns) and external barriers (Issues) there may be that could prevent the organisation from achieving its mission, goals and objectives. Examples of such barriers could be: lack of funds, obsolete equipment, changing or new technology, competitive pressures, etc. To overcome or at least minimise these weaknesses and threats management needs to establish policies, and set goals and objectives, strategies and tactics.

Strategies and Tactics: While goals and objectives define *what* is to be achieved, they may be achieved in many ways. These alternatives detail *how* the objective can be reached. They are called strategies. The detailed tasks, or steps, in carrying out those strategies can then be defined.

These steps are called tactics. Tactics are the detailed implementation of the strategy. They provide a step by step approach to carry out the strategy and achieve the objective. It is a manager's job to select the most appropriate strategy and tactics to achieve each objective. These lead to the definition of processes and procedures which detail the sequence of tasks to be carried out. They also identify the resources and the distribution channels needed to carry out the strategies and achieve the objectives. For example if an objective is to increase sales by 15% it may be necessary to hire 4 new salespeople, or appoint a new distributor.

Products, Markets & Channels

The strategic statements define the focus and direction of the organisation for the long-term. In particular the Mission statement will define the Products, Markets and Channels appropriate for the organisation. These will be further defined and refined as the Goals and Objectives, Strategies and Tactics statements are formulated, beginning with the Strategic level statements, and progressing through the Tactical and Operational levels.

Markets: A statement of the markets identifies the customers or clients of the organisation, and its reason for existence. It may describe the population segments or parts of the government served by a government department. It may define a specific industry or environment served by a commercial organisation. The markets addressed may change over time. New segments may emerge. The mission and purpose and the policies in the strategic statements provide guidance. They indicate the criteria to be observed in selecting new market segments to be addressed.

Products and Services: These are the outputs of the organisation, produced to satisfy its market segments. For a manufacturer or a distributor the products are easy to identify. For a government department, university or hospital identification is more difficult. Consequently, the term Service is also used. A university provides educational services. A hospital offers health care services. A government department provides specific services for various population segments. A manufacturer or distributor may also provide services – such as warranty or repair services, or delivery services.

Channels: An organisation needs structure and resources to deliver its products and services to its markets. It needs people, money, machines, components – to build its products or provide its services. The channels statement describes these resources. It defines how the organisation is structured to satisfy the needs of its customers or clients, and achieve its objectives. It details how resources are acquired and how they are utilised to make the product. Products and services need to be distributed. The channels determine how they are sold or delivered, the distribution mechanisms used and/or the warehousing and transportation systems needed.

During the same period, the researchers also developed a software product to automate the techniques used for the building of information systems. Following the success of the application of these techniques to the strategic planning process, the researchers modified the software to enable it to be used for strategic planning. This also proved extremely successful. It provided the ability for the first time to automate the strategic planning process. The software, using expert systems and artificial intelligence techniques, was able to automatically identify gaps and

opportunities in the strategic planning, ie. to automate SWOT analysis. Most importantly, any changes to the strategic plan could be reflected quickly in the software. The software could then be instructed to re-analyse the strategic plan and in a matter of minutes report the implications of those changes on the entire strategic plan. The software was also able to build, define and create relational database structures for any relational DBMS. It provided the ability for prototyping the information systems to ensure that they do in fact reflect the required information needs of management.

The software was also able to automatically produce the strategy blueprint in a variety of forms. This enabled additional pictorial analysis to be carried out by management using their in-depth knowledge of the business. It also provided the ability for management to pictorially analyse the strategic plans to ensure that all gaps and opportunities for the organisation were identified, and all business rules for the organisation had been identified and documented.

Because these techniques had been developed from techniques already used for the development of information systems, it was a simple task to, for the first time, complete the bridge between strategic planning and information systems. Once the strategic plan had been built using the software, it could then automatically identify the necessary information systems, create the physical database structures and provide all the necessary project information to build the information systems. The information systems thus developed could completely and comprehensively support those strategic plans.

The techniques described above were based on a methodology known as Information Engineering and are similar to those used widely around the world in various forms. The techniques developed by IES however were an advanced form of Information Engineering and it was these techniques that were fully embodied in the software.

The techniques have been used successfully by organisations both in Australia and overseas. In particular the U.S Navy and U.S. Marine Corps have not only adopted them for the development of their information systems but have also used them successfully in the analysis and development of military strategy.

The techniques and software have been proven over several years in the field and provide a far greater increase in productivity than that group of software products generally referred in the market place as CASE (Computer Aided Systems Engineering). These products merely provide automated support to the manual techniques of analysis, design and implementation of information systems. At best

they provide the ability to generate information systems rapidly. However these information systems still require large amounts of maintenance as they do not capture all the users requirements in the initial analyses.

Although this form of Information Engineering was a comprehensive and powerful methodology, it still had several gaps and limitations. In several areas the methodology was unable to properly reflect the way the business operated. It also lacked the ability to effectively capture *all* the policies and procedures of the organisation.

Farrell & Associates had been successfully carrying out research in this field for some time. They found that, even with sophisticated tools such as Information Engineering and software tools that automate such methodologies, organisations still had to capture the procedural logic for the information systems by other means. What was lacking was a way to capture not only all the data requirements of the organisation, both in terms of content and structure, but at the same time capture *all* the processes and procedures which apply to the data of the organisation, and thus accurately reflect the organisation's strategic plans. Out of this research Farrell & Associates evolved additional sets of techniques which overcame these deficiencies.

With this in mind Farrell & Associates acquired all the rights to the Information Engineering Methodology from IES in 1990 along with the software developed by IES. Farrell & Associates then set about using the results of their research to enhance the Information Engineering Methodology and its associated software.

In addition Farrell & Associates blended into the enhanced techniques the concepts of Business Process Reengineering. This, together with the strategic planning and Information Engineering techniques already successfully proven, was able to completely and precisely identify, analyse and relate all the information needs, information relationships, processes and procedures for the organisation.

This enhanced set of techniques is now known as Strategy Reengineering. It completely and precisely captures all the organisation's procedures in the form of business rules. It blends in with the techniques of Information Engineering but goes far beyond them to provide a complete strategy blueprint. It includes detailed specifications for building information systems which completely and precisely support the strategic plans of the organisation. It identifies the data, the relationships between the data, and most importantly all the business rules which apply to the data, and the processing of that data according to the particular needs of the organisation.

In essence Strategy Reengineering involves the crystallisation of the key elements of the strategic plan. The first step is to identify the "things", or entities, about which the plan is concerned. These include such items as customers, products, markets, personnel, offices, distribution channels, etc. The next step is to identify and clearly define the policies, strategies, tasks, etc which relate to these entities, e.g. "products are sold to customers in specified markets via certain distribution channels using personnel in various offices". Out of this analysis the business rules are also identified, documented and included in the strategy blueprint along with the data.

Although this may sound like a typical planning session its not. The crystallisation process mentioned above when combined with the techniques of identification and definition, form a very powerful set of techniques to rapidly and exhaustively carry out strategic planning, from analysis and identification to complete implementation.

Using Strategy Reengineering organisations can build strategic plans in days and weeks instead of months and years. All gaps and opportunities can be identified, all information needs identified and analysed and all business rules identified. Information systems can then not only be rapidly developed but will also support the strategic plans and have the flexibility to be changed quickly, both at the strategic planning level and the information systems level. This will enable organisations to gain and sustain competitive advantage in the market place, and become a proactive organisation rather than a reactive one.

The concept of Strategy Reengineering, blending Information Engineering, Strategic Planning and Business Process Reengineering, ensures that all the data, structures, processes and procedures, and business rules of the organisation are completely and precisely specified, and are in the one place for easy review and maintenance. It provides for the first time the ability to guarantee a link between strategic plans and information systems. It enables the organisation to use the computer as a strategic ally rather than just as a passive repository of corporate data. The computer supports the business of the organisation rather than vice versa. Management can thus get on with their primary task - the business of managing the organisation.

As part of its strategy to provide organisations with the complete solution including automated software tools, Farrell & Associates has continued to enhance the software developed by IES and acquired by Farrell & Associates in 1990. At present the software is able to provide automated assistance for all the strategic planning and Information Engineering aspects of Strategy Reengineering, and most of the other techniques. Farrell & Associates is currently developing the software so that it will

fully automate all the techniques. When released it will enable organisations for the first time to be able to truly carry out Computer-Aided Strategic Planning (CASP) with automated SWOT analysis, PMC analysis, process and procedure analysis, business rule identification and automatic identification of all the necessary information systems required to support the plans. The software itself will be highly automated, containing all the rules for Strategy Reengineering and providing organisations with a high level of intelligent support in the use of the techniques.

Summary

Using Strategy Reengineering and the software that automates it, strategic planning can, for the first time be regarded as a concise and well ordered scientific method and not just an art form. In addition, information systems can be developed which completely and comprehensively support the strategic plan satisfying all the users requirements. They can also have inbuilt flexibility enabling Management to react quickly to changes in the market place. Because the information systems completely and accurately reflect the strategic plan, when the strategic plan changes, the information systems can also be changed rapidly.

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⁷ M. E. Porter, *"Competitive Strategy"*, The Free Press, MacMillan Publishing: New York (1980).