FUTURE INNOVATION STRATEGIES

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ABSTRACT

Rigid functional management models fail to deal successfully with rapid technological change. This has led increasingly to the recognition that process innovation is not the sole domain of engineers and scientists and in fact must be an inherent management skill. The computer as a driver of innovation has thus created significant opportunities to use innovation for growth and profit in organisations that must be regarded as **living**.

The future of business therefore lies with accelerated supply chains in product and process and service development. The focus must be on the value added steps in innovation and elimination of the non-value added ones. It is essential to have continuous feedback to all processes to reduce the time to market for new ideas, new products, new services and new ways to market them.

Hence innovation must saturate the strategic plan for all processes. In essence this means that product and service innovation will be interwoven with process innovation.

Worldwide, leading manufacturers are finding that it may be necessary to actually build their own production equipment to achieve greater flexibility in satisfying customer needs. The reduced time to market over conventional systems resulting from such revolutionary techniques is very substantial.

As a consequence of this changed focus, marketing strategy and production capability are inseparable and strategic plans which do not link **direction** with **capability** will fail. This strong link between marketing strategy and production capability and design can lead to significant strategic advantages when these were linked to SPED teams for innovation.

Global business in the future will be more competitive than ever before and the winners will be those that grab the innovation advantage of the inherent creativity of all their employees and recognise that operational processes, including research and development must be controlled and strongly customer focused. This in turn means that frequent use will be made of **22 special creative tools** presented here.

These tools should be used in conjunction with the **7 Strategy Maps** proposed, to drive the creative process in making companies more competitive and provide the essence of future innovation strategies.

1. INTRODUCTION

The failure of rigid functional management models to deal with rapid technological change and the burden this places on people and process, has increasingly led to the recognition that innovation is not the sole domain of engineers and scientists. It belongs to everyone and must be incorporated in all functions and themes of a business. In particular the computer has created significant opportunities to use innovation for growth and profit in all areas when enlightened use is made of the knowledge databases it can readily access and reconfigure.

Accurate and reliable information is now available in real time as never before. Successful companies in the future will innovate and employ cross functional teams which are strongly customer focused, using tightly controlled processes as they compete in the global marketplace. The future therefore will lie with an accelerated supply chain which focuses on the value added steps in innovation.. This means that it is essential to provide continuous feedback to all processes to reduce the time to market for new ideas, new products and new services as well as new ways to market them. Hence innovation must saturate the strategic plan for all processes. In essence this means that product and service innovation will be interwoven with process innovation. This is best understood using a process management model with interconnected **strategy maps** (see later).

Worldwide, leading manufacturers are finding that it may be increasingly necessary to actually build their own production equipment to achieve greater flexibility in satisfying their customer needs. Hence manufacturing process innovation has become a precursor to rapid deployment of new product innovations into the marketplace.

Whilst globalisation will tend to even out many consumer demands, others which are intrinsic in the culture will remain for a long time. Using the car as an example this means currently that an ideal car for one market, say Europe, will have different dimensions and characteristics from the ideal car for the American market which in turn may be different from the ideal car for the Japanese market. Hence there has to be a strong link between marketing strategy and production capability to satisfy these differing needs in a cost effective way. In particular SPED teams linking:

- **S**ales
- **P**roduction
- **E**ngineering
- **D**evelopment

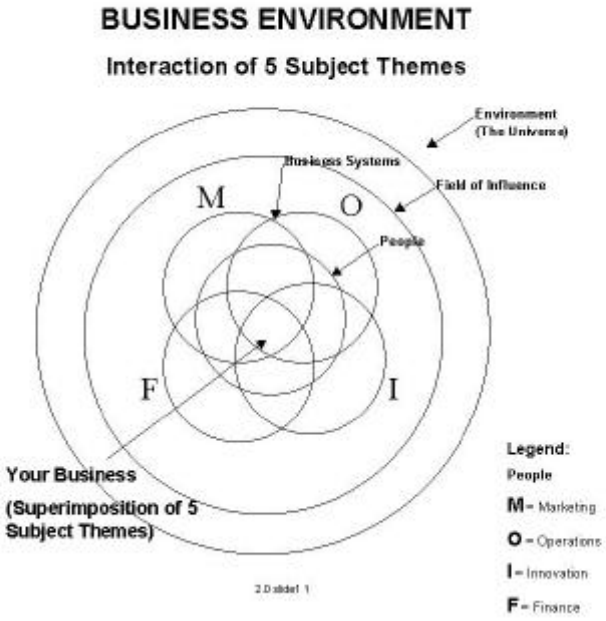
can be used to advantage to lead international companies to greater profit.

Global business in the future will be more competitive than ever before and the winners will be those that take advantage of the inherent creativity of all of their employees and recognise that processes including research and development must be tightly controlled and strongly customer focused. Innovation leaders in the future will be the profit and productivity winners.

2. UNDERSTANDING BUSINESS

The essence of the development of effective future innovation methodologies revolves around a recognition that the old rigid, functional management models of business are no longer appropriate, therefore we need to change the way we manage, the way we use information, the way we innovate and the way we deploy strategy in the business. Instead of a functional model of business therefore, we propose a **theme** model as illustrated in figure 1.

Figure 1



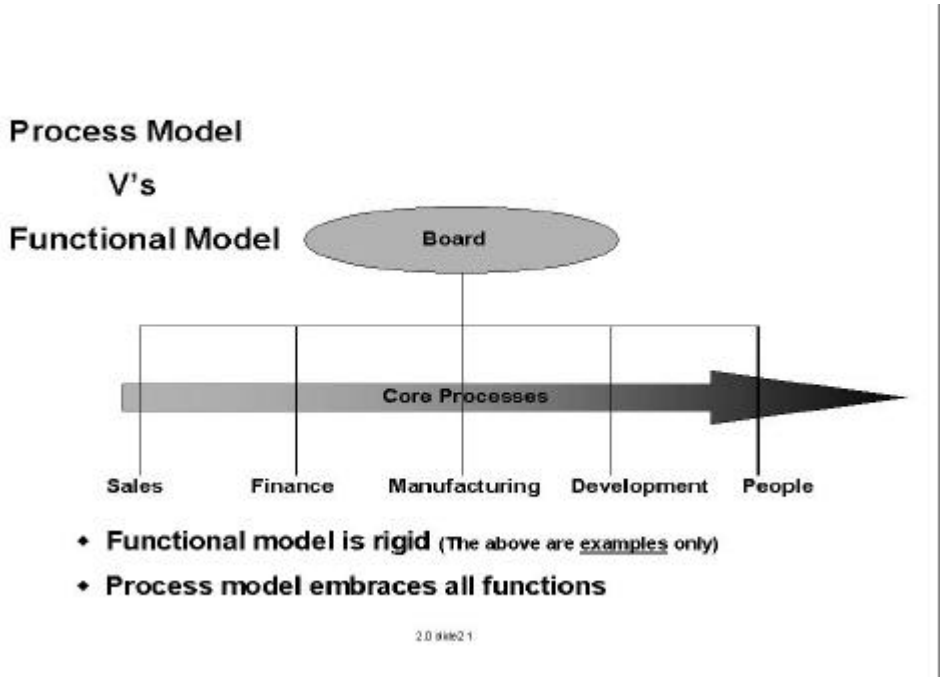
There are five themes in this model all of which are overlapping. These themes recognise that a business strategy can be best understood and changes made most effectively if they are process based not functionally based. It recognises that strategy is about innovation and processes cut across functions.

The five basic themes are:

- People
- Marketing
- Operations
- Innovation
- Finance.

The people theme overlaps all other parts of the business as do all of the others. Another way of clearly illustrating the importance of a process model compared with a functional model is shown in figure 2.

Figure 2



The overall functional model is rigid and generally results in poor communication between various departments. Information flow and teamwork are generally poor. The process model however, indicates that anything that happens in any one theme will have an impact on all the others. The process model actively encourages the usage of cross functional teams and in particular in innovation, SPED teams for problem solving and improvement inside the business.

2.1 Innovation

Innovation may be defined as the **taking of opportunities and the creation of newness to improve existing services, products and processes**. It involves:

- The use of advanced concepts
- Continuous improvement of existing processes
- It applies to marketing, operations, service, products, finance and all parts of the business.

Innovation is in fact **newness** and **originality** in doing things. It includes "eureka ideas", research and development, commercialisation and Kaizen. To be successful in the future all parts of the business must undergo **continuous innovation**. A company's ability to innovate will depend on its capability, how it measures the opportunities both in the market internally and externally and the general creativity that business can apply to a particular problem. It is incumbent on the people in the industry to use all idea generating tools that are available. In particular frequent use must be made of:

- 22 creative tools (see table 2)
- Knowledge data bases
- SPED teams (Honda Sayama Works [1994])
- Staged innovation strategies with continuous measurement
- Risk management (Bernstein P.L.[1996])
- TRIZ techniques (Altshuller H. [1946] [1992])
- Rapid prototyping and tooling
- Business process reengineering
- Six thinking hats (de Bono[1985])
- Reverse engineering

Some sources of new ideas can be:

- Patents
- Trade shows
- Customers
- Journals
- Competitiors
- All people
- Internet
- Overseas trips
- Brainstorming/Imagineering
- Annual reports of competitors
- Suggestion boxes

One of the biggest problems with ideas is evaluating them in terms of their **probability of success**. Numerous techniques have been devised to assist in this but some of the essential elements that must be continuously measured for products and services and processes to enable implementation of the best innovation strategies are::

- Lifetime of products
- Processes
- Number of ideas generated
- Number of new products developed
- Total expenditure on R & D
- Number of new processes developed
- New technologies introduced
- Measurement against state of the art
- Sources of innovation data
- Surveillance methods.

2.2 Marketing

In determining the marketing direction of the company, there are two questions that must be asked:

(1) "What is the status of our services and products and processes in the market now"?

(2) "What services and products and processes and markets should we concentrate on in the future"?

In the process of analysing market data we must determine opportunities and our competitive advantage. We need to continuously monitor and measure both market opportunities and competitive position. To measure **opportunities** in the market we need to consider:

(1) Market needs now
(2) Market needs that can be created
(3) Potential market size, share, growth
(4) Gross margin (price that could be obtained)
(5) Quality levels (risk of defectives)
(6) Investment needed
(7) Stability, legal matters, ability to pay
(8) Product or process synergy

To determine our **competitive position** we need to measure:

(1) Newness (innovation)
(2) Network of competitors
(3) Brand name strengths
(4) Uniqueness patents and copyright
(5) Quality levels
(6) Packaging
(7) Promotion
(8) Distributor network
(9) Opposition strengths

2.3 Operations

The major strategic operational issues are probably:

(1) Service process
(2) Information technology
(3) Supply chain integration
(4) Quality

As far as any operation is concerned the overall level of technology and systems control is vital in determining the process effectiveness of organisational effectiveness of the business. The level of technology can be studied in terms of the technology with respect to state of the art, in terms of hardware and software, whether the recording and control system is manual or electronic. Whilst the control systems can be measured in terms of:

(1) Error rate
(2) Delays
(3) Waste
(4) Set up
(5) Clean up
(6) Idle time
(7) Process linking.

This in turn can be translated to "Sigma Levels" (after Motorola and GE). (It is important to note that the "6σ" levels of Motorola and GE (USA) allow for a 1.5σ shift in the measure)

2.4 Finance

The major financial issues in determining the strategic operation of the business are:

(1) Profitability
(2) Liquidity
(3) Gearing
(4) Funding for growth
(5) Innovation
(6) Gross margin
(7) Net profit.

The minimum measurements that should be monitored are **gross margin** and **net profit**, by product and service group. The capital to labout ratio is another critical measurement. Sufficient funds must be allocated to continuous equipment upgrades and R & D.

2.5 People

As mentioned earlier, in the process theme approach, the five subject themes are integrated and overlapping. The people theme overlaps all other themes, marketing, operations, innovation and finance. What this means is that anything that happens inside the business is effected by and will have an effect on the people in the organisation and externally. **People are the most important part of the business.** People performance is highly variable and this means that they have to be supported by:

(1) Good training, leadership, motivation and discipline
(2) Good technological processes
(3) Good systems
(4) Good inputs

Hence we must create a ***"learning organisation"*** (after Royal Dutch Shell see Senge P.M. [1990]) or as Arie de Geus states, "The Living Company" (after de Geus[1997]). Overlapping of all of these are the five discipline that create the learning organisation. These are:

(1) Systems thinking
(2) Personal mastery
(3) Mental models
(4) Shared vision

(5) Team learning.

For any company to work successfully, it must be continuously developing the capability and achievement level of its people.

3. FUTURE DIRECTIONS OF BUSINESS – TECHNOLOGIES FOR THE NEXT CENTURY

Globalisation and the speed of the microprocessor are accelerating the rate of change of business as never before. As the world suddenly expands from nation state to global village virtual companies are created overnight. The resulting revolution in data interchange has increased the speed of supply chain to the customer and the flow of capital between links. It has also however, increased the complexity of decision making and magnified the risk of errors. To combat this, business leadership will need to be **more inventive, more creative, more highly skilled and capitalise on mind capital.**

3.1 INFORMATION TECHNOLOGY

Currently microprocessors are doubling in speed every 1.5 years. In fact they are now three times faster than had been predicted in the early 1980's. However improvements in processing chips are ineffectual unless they are matched by similar gains in memory chips. The capacity of random access memory (RAM) has increased fourfold every three years but memory speed has not been able to keep up and the gap between the top speed of processors and top speed of memory is widening. Use of the cache partially solves this problem since it holds those segments of the program that are most regularly used and therefore allows the process to avoid calling on external memory chips. However computing technology can be revised suddenly by some **strategic chaotic input**. In the not too far distant future, microprocessors will be appearing in practically everything that is technological. The range of applications will be mind boggling. They will involve voice recognition, virtual reality, light switches and even pieces of paper. In addition it is possible that in the future, the microprocessor memories could merge in a technological blending operation. Today's microprocessors are almost 100,000 times faster than those made in the 1950's and yet cost 1,000 times less. The implications of such breathtaking advances are purely limited by our own imagination. Robots may be able to think and "marry"!

3.2 ARTIFICIAL INTELLIGENCE

The computer has already shown us that many actions that we thought were very difficult can now be readily automated and speeded up. On the other hand at present, many of the tasks that are easily carried out by people cannot be done by computers. For example, computerised reasoning has some very narrow strengths and some very wide weaknesses. As well, predictions of achievement of artificial intelligence have been overly optimistic. Some people now believe that artificial intelligence is on the brink of success however given a very simple problem beyond the expertise of an AI program, ridiculous answers can currently turn up.

As palm top computers, smart cards and interactive television proliferate, the gap between users and non users will become even more noticeable. The digital world will start dictating our behaviour. This is a wonderful opportunity for innovation of business in everything we do.

Software agents programs have been born. These know the users interests and can act autonomously on their behalf, they "remember". The social impact of this will be enormous.

3.3 VIRTUAL REALITY

Computers will become extensions of our own bodies using virtual reality. This permits people to behave as if they were somewhere else. This place may be fiction, a recreated environment from another place or another time. The current bulky head mounted stereoscopic displays used in VR will be replaced soon with lightweight glasses that can superimpose images on the real world**. It will therefore be possible to simultaneously use a large number of perceptive skills to interpret information for the first time.**

Virtual Reality will make little distinction between body and mind.

3.4 SATELLITES

Satellites in the future will provide almost universal access to the information cyberspace. Doctors and specialists and others in remote areas will suddenly have access to information that they could only dream of before. Combine this with the power of digitised compression of information available at the speed of light, all of which is instantly accessible, then the full power of this can be appreciated. What a revolution! **Suddenly there will be an explosion of awareness.**

A probable most important consequence of satellite communications may be that it will help to stem the large scale migration of people from the country to the cities and densely populated urban areas.

3.5 TECHNOLOGY BLENDING

The blending of the basic digital technology of the computer with the television has already begun. This will mean that differentiation between computer and television set will become increasingly blurred until they merge into one.

3.6 ENVIRONMENT

The waste makers of society must be tackled right at the fundamentals of generation of industrial, agricultural and energy waste. This means more recycling and more reuse and smarter use of what is freely available – sea, wind and tide.

Solar Power

The earth's surface receives ten times as much energy from sunlight as is contained in all of the known reserves of uranium, oil, natural gas and coal. The beneficial effect of the use of solar energy in reducing air pollution and global climatic change is well documented.

Fusion

It has been one of man's most ardent dreams to recreate nuclear fusion. Fusion uses atoms present in ordinary water as a fuel and therefore harnessing this process could ensure future generations of inexhaustible electric power.

Fusion has so far failed to deliver. The problem is basically containment of the reaction. However, new materials, higher melting points – who knows?

Industrial waste

There is a significant shift already to not only recycling and reusing what was previously thought to be waste product, but strongly looking at its creation in the first place. **The future will be about clean industries**. Automobile recycling is now one of the most successful examples of the reuse of manufactured product. The steel body can be remelted in a blast furnace, lead from batteries can be recovered, plastic bumper bars and components can be disassembled and recycled, sump oil can be recycled as can the coolant. Reactive extrusion techniques can now be used to reuse mixed plastic waste.

The Future of Agriculture

The farmer has to go high tech. Technology has already been the most reliable force in increasing farm productivity. In the future integrated pest management will be used to control harvest and satellites will guide us to massive gains in productivity and harvested products.

3.7 MATERIALS, MANUFACTURING AND MACHINES

The future of machines, materials and manufacturing will involve:

- Increased use of robotics
- Microscopic machines
- The use of advanced composites and intelligent materials and self assembling materials (SAM)
- Custom manufacturing in higher temperature, superconductors.

Robots

Simple processes can already be automated with great success. The important lesson though is that only processes under tight control with zero defects or approaching zero defects should be made robotic. Honda in Sayama, Tokyo have automated automotive manufacture to a level where a whole

car framework can be welded together in one operation in 45 seconds whilst previously vacuum formed large plastic parts can now be injection moulded – 2 revolutions in process.

Microscopic Machines

New electronic fabrication processes can currently produce such things as data storage chips or even a chemical factory on a microchip. Researchers in microelectronics have already built motors that can be deployed to move atoms. The advances in technology and technical peripherals will be enormous as we couple mechanical and electronic microsystems.

Micro Electro Mechanical Systems (MEMS)

These have already been born. Engineering of small machines and sensors will allow new uses for conventional ideas. MEMS will give micro electronics an opening to the world beyond simply processing and storing information. Imagine a chemical factory on a chip. Such a calculator size device could reconstitute freeze dried drugs and perform DNA testing continuously if included on the body.

Advanced Composites

Much of the promise of advanced composites in providing greater strength, lower weight and hence greater fuel efficiency for moving vehicles has not been realised, mainly because of their total complexity and lack of understanding of their properties and performance – but this can change.
The America's Cup yacht "One Australia" sudden catastrophic failure is evidence of our lack of knowledge in this area as is the unpredictable failure of yacht spars.

Intelligent Materials

Scientists are now creating materials that can **predict failure** and **repair themselves** and materials that can **adapt to the environment** in which they are being used. Imagine buildings that reinforce themselves during an earthquake. Many researchers have already demonstrated the feasibility of such living materials. Steel "work hardens" but little use has so far been made of this.
The name **actuator** has now been used for materials that allow structures such as ladders to adapt to their environment.
The four most common actuator materials are:

- Peizoelectric ceramics
- Magnetostrictive materials
- Shape memory alloys (Nitinol)
- Electro rheological and magneto rheological fluids.

Self Assembling Materials

Complex machines of the future cannot be built with current methods. It will be necessary for them to almost make themselves. Self Assembled Monolayers, called a SAM, is a simple prototype that exemplifies the design principles that people are investigating with self assembling materials.

Superconductivity

Superconductivity may be regarded as the path of zero resistance. It is well known that the path of least resistance is the one that nature prefers, but such a path is not always readily revealed. When superconductivity was discovered in 1911 with liquid helium at 4° kelvins it was observed that mercury would suddenly transmit electricity without energy loss. Temperatures up to 93° kelvin have already been observed in YBCO (ytrium, barium, copper oxide).

3.8 BIOLOGY/MEDICINE

The 21st Century will see innovative solutions to some of the world's most important medical problems. Severe Combined Immuno Deficiencies (SCID) are already being treated with gene therapy. Diseases to be treated in clinical trials are cancer, AIDS, arthritis, peripheral vascular disease, haemophilea and cystic fibrosis, **this list goes on**.

Artificial Organs

Already medical science has moved beyond the practice of **transplantation** into the area of manufacture and fabrication.

3.9 LOGISTICS AND TRANSPORTATION

Some of the immediate advances in this area will range from magnetically levitated high speed rail, to huge single wing flying aircraft, to driverless cars and tiny spacecraft.

All of the above massive changes create an exponential growth in opportunities. Innovation in business is limited **only** by our imagination

FUTURE INNOVATION STRATEGIES

What are the best strategies to deal with this technological explosion of ideas?

The ability of man to adapt to change has always been a problem. The rate of technological change today is increasing continuously and this change has not really been matched by our ability to adapt to it. This exponential growth in technological change is a result of the scientific method and the inherent ability of the scientific process to build on firm foundations. These arguments don't appear to apply to the same degree to social development, politics and in some cases human resource development.

The difference between change in the past and change now, is that now we have many of the tools to deal with it. In addition globalisation is firmly telling us that the status quo, particularly in Australia, is not good enough. In addition, as more and more of the 220 countries in the world become liberal democracies, the rules for business are starting to equilibrate. In fact the principles underlying the liberal democratic process will in future have more and more influence on the overall principles of business management. In addition, if we look at the commercialisation of innovation, the gap between invention and payback is narrowing distinctly as improved processes involving SPED teams are put in place.

In the future, the ability of business to grow will depend increasingly on its ability to innovate and create and drive the market as new technology and innovations and opportunities appear. Companies are already using innovation and change management as a **strategic weapon**. The best illustration of this was the Honda Yamaha war in Tokyo in the mid 80's was a wonderful example of how Honda could use its superior innovative and process innovation skills to demolish the market for Yamaha motorbikes (see Blakemore [1995])

The major elements of change today have been analysed and can be prioritised as shown in table 1.

Table 1

Major Elements of Change

1.	Globalisation
2.	Technological Explosion
3.	International Consumerism
4.	Brain not labour
5.	Systematic Networks
6.	Electronic Data Bases/Data Interchange
7	Triumph of Fact over Fiction
8.	Supremacy of Knowledge Based Decision Making
9.	Team Creativity
10.	Teamwork and Synergy

This list could be expanded with lower priority items **up to 250 elements** (analysis of data in Gibson [1997]).

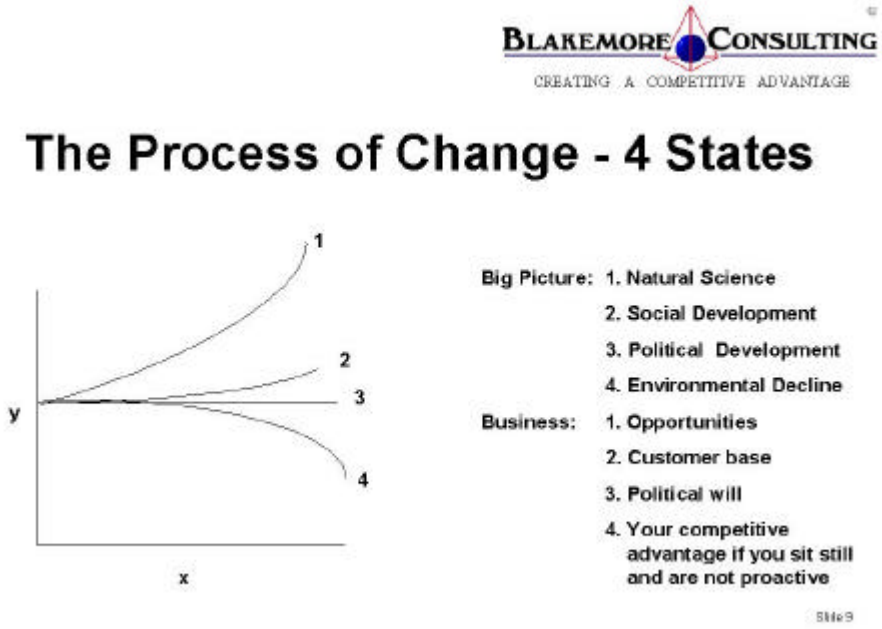
For companies to be successful in the global marketplace they must be equipped to be able to respond quickly to changes **in perceptions of the customer**. The change process in the company itself, must be able to respond to chaotic inputs, quality and therefore the internal business.

Rapid change in commercialisation and electronic data interchange puts greater emphasis on companies to be globally competitive.

4 CHANGE

The process of change could possibly fit into four particular mathematical models as shown in figure 3. From this figure we believe that the are four types of different relationships.

Figure 3.



1. **Natural Science –** The explosion of the exponential growth of knowledge and technology.
2. **Social Development –** An exponential growth but not at the same rate as natural science
3. **Political Development –** This could be regarded as linear improvements are marginal
4. **Environmental Decline –** negative exponential

If the same analogy is adopted for business the 4 trends are:

1. **Opportunities** - rapid and exponential growth
2. **Customer Base** - less rapid exponential growth
3. **Political Will** - marginal improvement
4. **Competitive Advantage** - negative exponential if company believes its competitive advantage remains **sustainable** and it does not take advantage of new technologies as they become available.

What this means is that we must take advantage of the latest technology, be extremely innovative and recognise opportunities or create them.

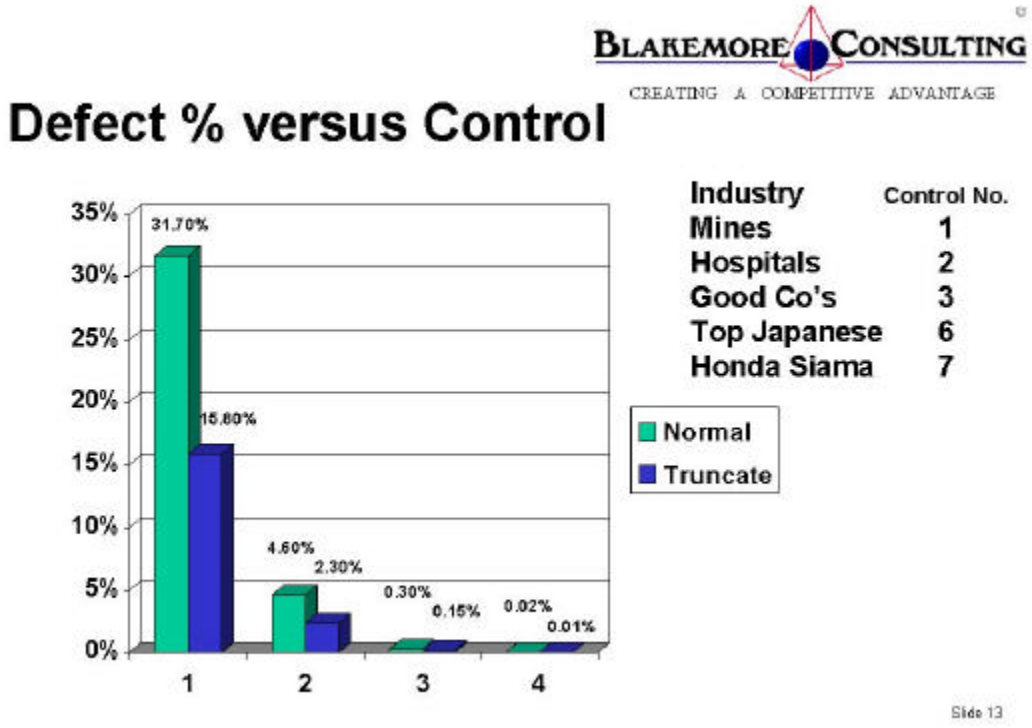
The question now is; "Where do we focus our effort to achieve our vision and objectives"? To aid in sharpening this focus, we have devised the following 7 Strategy Maps methodology.

5. ACTION – The Role of People (Board to Operators)

5.1 Strategy Maps

Business can win if it takes advantage of the new opportunities created daily by new technology and new ways to configure it. Therefore the business approach has to change so that innovation becomes part of everything we do. **Therefore the board in the future, of most businesses, will have to be much more strategic in its thinking and to achieve this it means that the operational aspects of the business must be under tighter control and be reported in real time**. In a nutshell, the board must become increasingly strategic and less operational. The processes in the company must be 7σ, ie zero defects, see figure 4 where σ is expressed as "control number" and this is plotted on the x axis against defect % (y axis).

Figure 4



Strategic thinking is about recognising the opportunities and ensuring that the correct tightly controlled processes are in place so that the board can concentrate on the bigger tactical and strategic decisions. Also **business must be able to change direction as quickly as a pitstop in Formula 1**. To do this they must know where they are in relation to the **seven basic measurements of the business.** These basic measurements can be expressed in terms of strategy maps mentioned earlier. These maps are defined as follows:

Strategy Map 1 - Marketing and Sales 1

This is a plot of market opportunity versus sales (of products and service groups).

Strategy Map 2 - Market Opportunity and Sales 2

A plot of competitive position of the sales or service product versus sales

Strategy Map 3 - People

A plot of capability of the people versus their level of achievement

Strategy Map 4 - Operations

A plot of technology versus control

Strategy Map 5 - Innovation

A measurement of age of product or service versus sales

Strategy Map 6 - Finance 1

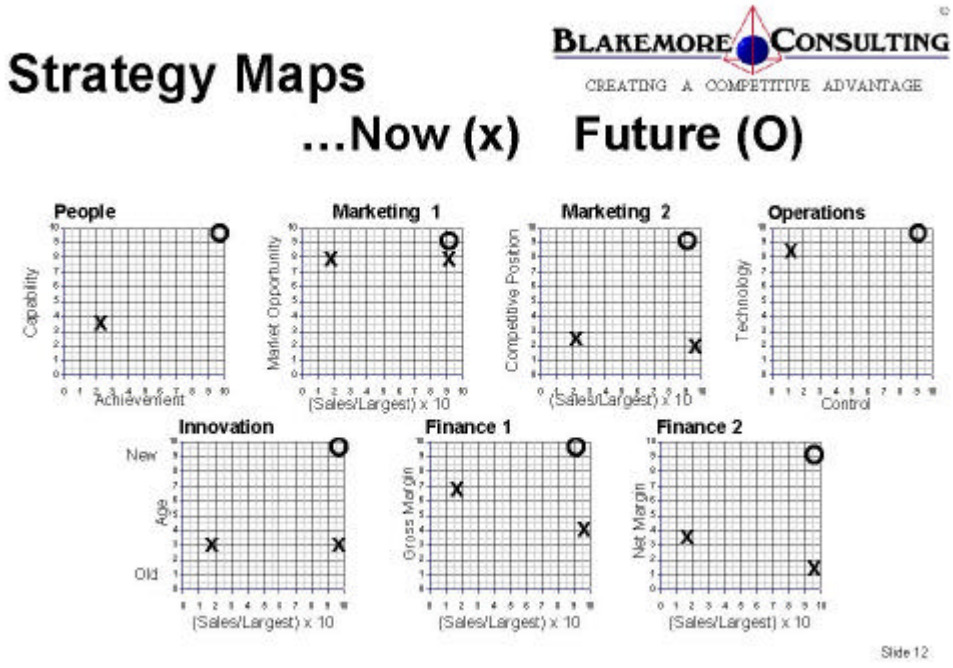
Gross margin or gross profit versus sales (or gross profit = (revenue-raw material costs)

Strategy Map 7 - Finance 2

Net margin (correct allocation of all overheads to product or process involved ie NPBT).

Hence in this model the five subject themes of business have been translated into seven strategic measurements, linking strategic thinking with operational effectiveness as illustrated in figure 5. Instantly we see the gap between where you are (x) and where you could be (o).

Figure 5.



5.2 Creating New Opportunities

To define new opportunities we need to employ all the creative tools at our disposal. Those used by the author over the last 40 years are summarised in Table 2, while the steps to determine the creative output are given in the flowchart in figure 6.

Table 2.

22 CREATIVE TOOLS

To use this table when you wish to find an innovative solution to a problem, ask the question **"how can I make use of a change in the item in column A to achieve a new and unique outcome to solve the problem".**

	A	B	C
	Change	**Example**	**Result**
1	Properties	Bimetallic strips	Different coefficient expansions of metals enables temperature to activate switch
2	Space	Fill sunken objects with foam to displace water	Steel ship recovery from ocean floor
3	Order	High purity materials create new ordered structure	Self Assembling Materials (SAM's)
4	Energy	Use pre energy in pre loaded spring to overcome high loads	Self activated doors with a minimum force to open
5	Shape	Offset impellers for mixing chemicals/cakes	Better and faster and more uniform mixtures
6	Movement	Energy from falling object used to feed another	Lifts
7	Friction	Overcome friction with cushion of air or use point contact	Hovercraft (cushion) or sharp contact point (ball bearings)
8	Magnetism	Ferromagnetic iron becomes paramagnetic at Curie point	High temperature switch
9	Gravity	Inertia reels in seat belts	Retractable belts that tighten under load
10	Dissecting	Analysing causes of lack of tone quality – piano	Stuart piano has more precise tone
11	Fragmenting	Modular computers	PC upgrades/plug and play
12	Self Service	Eliminate action steps in process	JIT
13	Copying	Resin copying of CAD/CAM	Stereolithography
14	Coatings	Zinc/Aluminium coatings on steel	Strength of steel corrosion resistance of Al/Zn
15	Blending Technology	Microprocessors/memory	High speed devices
16	Phases	Heat treat alloys in critical phase transformation zones	Special Zinc coatings on intricate steel parts
17	Solvent	Organic solvent added to polystyrene	Volume decreases markedly
18	Oxidation	Use nitrogen instead of steam to strip liquid zinc off steel	BHP buys worldwide processes
19	Potential	Use sacrificial anodes	Steel hulls protected
20	Combination	Combining functions	Multipurpose pen
21	Multi use	Hang glider become parachute	Life saver
22	Prevention	Asymmetric plugs	3 pin plugs/prevents loss of life

Figure 6.

5 STEPS TO CREATIVITY

1. Define current/product/service/process and prioritise elements that you believe can be changed to advantage

↓

2. Flowchart the process of delivery and define the desired outcome

↓

3. Refer to 22 Creativity Tools and select the "BEST" technique that can be cost effectively changed

↓

4. Ask "is there an analogy elsewhere"?

↓

5. Define solution

5.3 Future Competitive advantages

In the past, a competitive advantage was often related to the size or product differentiation, price or quality level. All of these can be copied, reengineered or cloned and with modern technology and improved process control none of these remain in place for very long.

As can be seen all over the world, competitive advantages which are related to product features or characteristics can be readily copied since many of them, even technical innovations, can only be protected for a short time. **Hence the need to be more innovative and use the 22 creative tools to secure a strategic advantage.**

In the future, this strategic advantage will based on knowledge and human skills, control and technology, logistic capabilities, speed and strategic interpretation of data in real time.

Future competitive advantages can be created by your strategic advantage……your strategic advantage for winning (SAW)

6. STRATEGIC ADVANTAGE FOR WINNING (SAW)

This will be the ability of the company to learn faster and be more innovative than the opposition and so create a living organic organisation. It will involve the use of tightly controlled and integrated processes and will lead to fast generation of opportunities and a recognition of these opportunities or creation of them. To become a winner, the latest technological advances in machines , vehicles and

processes must be used. Therefore there must be a regular plan to upgrade microprocessor technology software and hardware. Depreciation laws need therefore to change to allow industry to invest and reap rewards sooner as the capital employed to labour cost ratio escalates.

This means that management must change to accommodate this new approach. The operational aspects leading to organisational effectiveness must be taken out of the board's responsibility and the board should concentrate on strategic elements of the process. The role of the board, with regard to organisational effectiveness, will be to ensure that the latest techniques are in place. Some of the immediate change to allow industry to invest and reap rewards sooner as the capital employed to labour cost ratio escalates. This new innovative management style is summarised in table 3.

Table 3

MANAGEMENT

Plan	Strategic Thinking – at all levels, **Key Performance Measures linked to the Strategic Plan**
Lead	Leadership based on facts, **discipline with empathy, direction with numeracy, creativity with motivation, teamwork with good communication.**
Organise	Synergy of accountability with cross-functional teamwork and flexibility
Control	Defects and error rates and rework reduced to that of 7σ companies based on prevention
Measure	Facts accuracy, statistical thinking, forecasting, proactivity
Habits	Teamwork, process orientation, factual evidence, creativity, innovation, proactivity, continuous learning

Strategies for Success

There are a number of strategies which can assist in meeting the challenges posed by radical technological advances and the opportunities you can create and some of these are given in table 4.

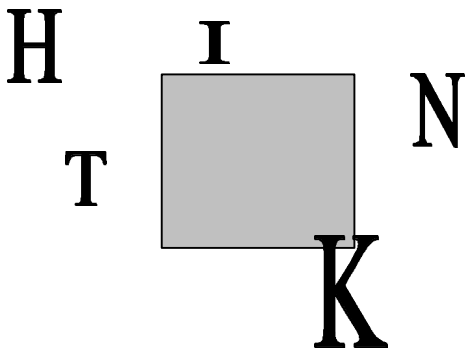
Table 4

STRATEGIES FOR SUCCESS (Creating the Future)

1.	Constantly monitor the market and competitors and technological advances for perceptions, trends and ideas and chaotic inputs – collect and analyse data in real time
2.	Improve process and system control to become a 7σ company
3.	Maximise use of technology, knowledge and computers
4.	Reward people in value added not hierarchal positions
5.	Use knowledge based interactive marketing
6.	Take advantage of new technology before competitors
7.	Become super professional by continuous learning
8.	Be agile and service flexible, drive the market, move at warp speed
9.	Develop a capability for supporting change
10.	Encourage creativity and innovation and create value

CREATING THE FUTURE

If we align our business Strengths and create Opportunities, we are ready to bounce into the unknown and create the future. In addition, if we align our Weaknesses with Threats, we have a number of strategic options open to us and these need further evaluation this can in turn lead to further opportunities. Fundamentally we need to 'Think outside the square'.



Thinking outside the square means you must assume a leadership role:

Service and product leadership

1. Sources of Customer Value

Innovative product features

Product/brand image

Level of product finish

Attention to product detail

2. Pro-active improvements focus on:

New market features (ahead of the market)

Early incorporation of new product technologies

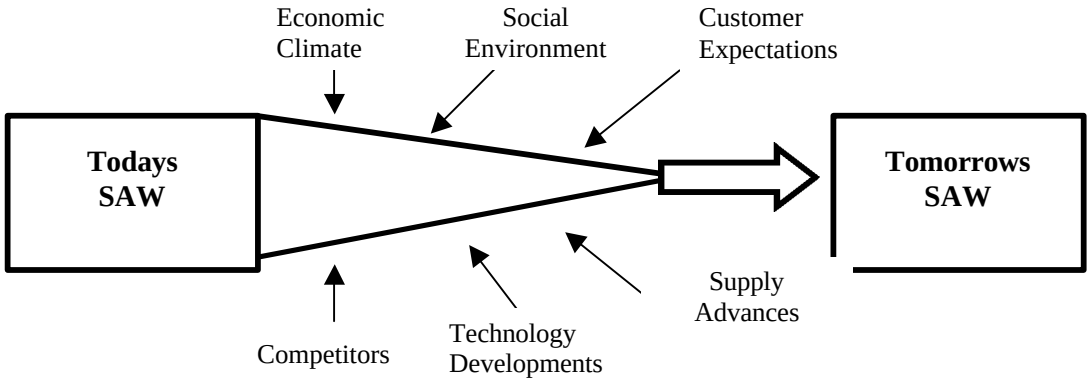
Strong marketing with emphasis on branding and positioning

Process for capturing new product ideas (creativity)

Processes for product commercialisation

Quality, features, financial benefits – a strategy to suit the times

THE BRITTLENESS OF STRATEGY



A SAW may not be sustainable for long in a global economy. Therefore the business must continuously revisit the 7 Strategy Maps and plot the competition on them as well.

STRATEGIC ADVANTAGE FOR WINNING – Examples

Some SAW options worth considering are:

- Consistently improving product and service for greater efficiency and speed using the latest technology.

  Consistently exceeding customer expectations.

  Continually reducing cycle time for all business processes and integrating processes.

  Continually eliminating waste from all business processes.

  Continually improving all business processes.

  Delivering on time, every time.

  Delivering faster than anybody else.

  Moving technology, control and decisions to the customer/service interface.

8. CONCLUSIONS

Future innovation strategies will involve:

(1) The creation of new business opportunities by using the latest technologies before others and building business on mind capital to create organic enterprises at peace with their environment.

(2) Continuously increasing the capital to labour ratio of the business

(3) Continuously analysing the newly presented market opportunities and linking them with created strengths of the enterprise.

(4) A synergistic use of the 7 strategy maps linking market opportunities / competitive position / technology and control / innovation / and people skills capability and achievement. These will be continuously monitored using gross profit and net profit with correctly assigned overheads.

(5) Greater, fiercer competition. This means that the winners will be those who take advantage of the inherent creativity of the employees and recognise that processes linking R & D must be tightly controlled and strongly customer focused.

(6) The frequent use of

- Knowledge databases
- 22 creative tools
- SPED teams
- Innovation strategies continuously monitored
- Risk management
- TRIZ techniques
- Creativity tools
- Rapid prototyping and tooling
- BPR

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SUMMARY ABSTRACT

Rigid functional management models fail to deal successfully with rapid technological change also, the computer as a driver of innovation has thus created significant opportunities to use innovation for growth and profit in organisations that must be regarded as **living**.

Innovation therefore must saturate the strategic plan for all processes. In essence this means that product and service innovation will be interwoven with process innovation.

Global business in the future will be more competitive than ever before and the winners will be those that grab the innovation advantage of the inherent creativity of all their employees and recognise that operational processes, including research and development must be controlled and strongly customer focused. This in turn means that frequent use should be made of **22 special creative tools** presented here. These tools should be used in conjunction with the **7 Strategy Maps** proposed, to drive the creative process in making companies more competitive and provide the essence of future innovation strategies.