If the enterprises of the Third World are to survive intense competition and thrive in a globalized economy, they will have to go beyond importing Western and Japanese technologies and management models to innovation. Rapid and widespread induction of structured management tools imported from the West and Japan may raise the operating standards of these enterprises but may not translate into superior financial performance because they would not confer competitive advantage vis-à-vis domestic competitors that also have inducted the same tools. Besides, there may be cultural and other impediments to their effective institutionalization. Innovation is a superior option because it is homegrown and confers the first mover advantage. If the enterprise learns to be innovative so that it can generate a continuing string of successful technical and managerial innovations, it can garner sustainable competitive advantage and grow and thrive even in a hyper-competitive environment.

Innovation is applied creativity and, therefore, the principles of creativity need to be kept in mind in seeking to be innovative. Innovation can come in a great variety. Most innovations have three characteristics: they are executed in the face of much uncertainty; they have economic implications; and they have a political dimension. These aspects make the management of innovation quite challenging.

The major blocks to enterprise innovativeness are internal: conservative and bureaucratic cultures and structures, communications problems, and administrative inflexibility. In enterprises that have grown up in conservative cultures and protected economies, the required mindset change in the stakeholders can be daunting. As a first step to stepped up innovativeness, an organizational design needs to be adopted that is innovation friendly. Such a design is briefly outlined.

A number of management tools can enable the enterprise to leapfrog to a much higher plateau of innovativeness. Sixteen tools are briefly discussed with real life applications. They are: creativity training; innovation training; creativity thinking network; creative scenario building; creative surveys; creative experiments; creative benchmarking; reverse brainstorming; exnovation; multiplication of change agents; kaizen; creative overload; data mining; stakeholders’ councils; intrapreneurship; and parallel groups. These tools deliver a number of value propositions and facilitate:

- an innovationist mindset in the organization
- a ‘stretch’ vision of the future that can spur innovations
- vital intelligence that stimulates innovations
- dumping of obsolete activities that creates space for changes and innovations
- widespread change and innovation throughout the organization
- continuous improvements and innovations
- high potential new innovation leads
- ‘breakthrough’ innovations.

In conclusion, the author suggests that becoming much more innovative is a high priority for the Third World enterprises. It is also suggested that the organization design that facilitates innovations and management tools that help an enterprise generate a continuing stream of successful innovations need to be incorporated into the core of management curriculum.
Liberalization and globalization have come of age in most Third World economies, including India, China, and the ASEAN countries. These economies have significantly liberalized their once statist economies and greatly decreased tariff and other barriers so that they have increasingly become hyper-competitive. To survive and prosper in such economies, companies need to catch up rapidly with international standards of productivity, product/service quality, customer orientation, ethical conduct, and corporate social responsibility. One study, for instance, indicated that Indian manufacturing productivity was a tenth of world standards (Sharma, Nair and Suny, 2000), and India and China, not to mention Indonesia, Thailand, etc., rank far below Western countries and Japan on various enterprise-related competitiveness indicators (Cornelius, 2003). India, for instance, ranked 45th on capacity for innovation, 49th on product/process sophistication, and 59th on customer orientation against the 6th or higher ranks for both Japan and the US in each of these areas.

There are two options for laggards to catch up rapidly with world leaders. The first is imitation and the second is innovation. A seemingly quick way of catching up is wholesale borrowing of Western/Japanese technology and tools of management. If, for example, Indian companies quickly modernize their technologies and implement such tools as TQM, TPM, Six Sigma, JIT, ERP, EVA, Balanced Scorecard, and so forth, they should narrow the gap with the West/Japan. But, would that translate into superior financial performance? This is a moot issue.

There are two reasons for this doubt. First, if all or most firms in an industry implement the same technology or tool, none may be able to gain a competitive advantage. This could happen if the tool is highly replicable because its implementation is highly programmable. The second is that each tool rests on certain stated or unstated assumptions and critical success factors, particularly those relating to acceptance of the tool by the staff, the information requirements for the effective deployment of the tool, the management’s commitment to employing the tool, the human and financial cost of implanting the tool in the organization, and the competence with which it is emplaced. Available evidence does not indicate benefits from the adoption of such management tools in every or even a majority of the cases in which they are tried out, not only in the Third World contexts (Tripathi, 2005), but also in the First World contexts (Staw and Epstein, 2000).

The second option available to the Third World enterprises for quickly catching up, possibly surpassing the world leaders, is sustained technical and managerial innovation. Both the US and Japan provide good examples of the power of homegrown and contextually adapted foreign innovations. After the Second World War, the US improvised a whole lot of management innovations such as profit centres and divisionalization, various tools for the effective management of marketing, finance, operations, and control, and various behavioural science tools for motivation, conflict resolution, attitude change, and problem solving (George, 1972). Japan borrowed quality control from the US but contextualized it and developed a number of culture-specific tools like the ringi system of decision-making, kaizen, and kanban that helped it catch up rapidly with Western productivity and quality standards and even surpass some of them (McMillan, 1996). Learning to be innovative can be very worthwhile to the Third World enterprises because it can provide them with the first mover advantage again and again. This can translate into sustainable competitive advantage and rapid growth in a very competitive environment.

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**ENTERPRISE INNOVATIONS**

In the enterprise context, innovation is applied creativity, often involving the coordinated efforts of several groups of people for giving rise to something that is both relatively novel and useable for pursuing the enterprise’s goals (Utterback, 1971). The creative idea need not necessarily have originated in the organization but it is taken up by the organization, developed, tested out, and implemented so that it is relatively unique in its final form. Indeed, a majority of the ideas successfully developed and implemented by the enterprise could come from outside. In one American study of 157 innovations in firms, 98 of the ideas were picked up from outside
the firm and developed (Utterback, 1974).

**Types of Enterprise Innovation**

Enterprise innovations come in highly variable impact magnitudes (Gluck, 1985). There are the so-called ‘big bang’ innovations, such as the transistor radio and the microprocessor-based computer, that revolutionize the entire industry or sectors of activity. The others are ‘suggestion box’ or ‘kaizen’ innovations. These suggestion box innovations can contribute immensely. According to one study, 25 million innovations and improvements were suggested by the Japanese workers in 1980 and these contributed $10 billion to Japanese corporations (McMillan, 1984).

Some innovations are technical in nature while others can be labelled managerial. Technical innovations can be product-related or process-related. Thus, while microprocessor is a technical process innovation, word processor is a technical product innovation. Technical innovations may have contributed a very substantial portion (as much as 40%) to the improvement in productivity and, therefore, in living standards in the West (Kendrick, 1979).

An interesting development is inter-organizational innovation. Rivals in the same high-tech industry are increasingly collaborating on R&D-based innovations. In the telecom industry, for instance, in the early 1980s, Italtel (the Italian telecom major) entered into a joint venture with US-owned GTE and Telelettra of the Fiat Group to develop digital public switching systems and market them worldwide, and later, teamed up with the French company, Cit Alcatel, the German company, Siemens, and the British company, Plessey, to develop the hardware and software modules of the digital switching systems (Bellisario, 1985). A related development is network product innovation. The network may include not only rivals but also vendors, licensors, joint venture partners, and customers. Network innovation in home banking is an example (Pennings and Harianto, 1992). In an American study of 49 banks that implemented home banking (versus 103 that did not), the home bankers had to synchronize financial services, telecommunication technology, and IT. The network created by the home banker company had to include not only its customers who wanted to avail banking services from their homes, but also the sellers of goods and services and other local banks in the network.

Management innovations are those relatively novel changes in problem solving, decision-making or implementation procedures that improve one or more functions such as better control of operations, greater efficiency, better coordination, greater capacity to cope with environmental changes, better staff motivation, greater accountability, and better mission accomplishment (Kimberly, 1981). These range widely from innovative missions, styles of management, growth strategies, functional management, and organizational structures to flexi-time, TQM, and staff participation in decision-making (Kimberly, 1981).

Management innovations are, at times, difficult to implement and institutionalize, that is, get the whole-hearted acceptance of the stakeholders. Those comfortable with the status quo tend to resist such innovations because of the fear of becoming redundant or of losing out to brash youngsters with the right know-how. Many organizations introduce such innovations with great fanfare only to abandon them shortly. Management by objectives, for instance, survived in only half of the Indian companies in which it was introduced (Maheshwari, 1980). Since many management innovations are hard to assess in profit and loss terms, they are hard to introduce in a commercially-oriented enterprise but, once institutionalized, they are hard to get rid of for the same reason even if they appear to be obsolete. Periodically, therefore, bureaucratic and conservative enterprises tend to get saddled with a plethora of removal-resistant policies, practices, structures, and systems that may have been useful innovations in the past but are albatrosses round the neck now.

**Features of Enterprise Innovations**

Most significant enterprise innovations need to cope successfully with uncertainty; allocate substantial human and financial resources appropriately; and neutral-
ize opposition by stakeholders and gain their support.

An innovation, by its very nature, faces uncertainty on various fronts: technical (the right approach needed to get to the innovative product or activity); the preferences of the intended users of the innovative product or service; and the costs and benefits of the innovation. Such uncertainties need to be tackled with gusto and ingenuity if a creative idea is to turn into an innovation.

Enterprise innovations, especially ‘breakthrough’ technical innovations, are frequently not cheap. Some of the high-tech US enterprises spend more on research and development than the total sales of India’s largest private sector enterprises. In view of uncertainties, it is difficult to estimate and control the costs and benefits of innovations. Too tight a control could impede creativity; too lax a control could result in runaway costs.

Management of Innovation

Innovation implies change in the status quo, especially when the innovation has a broad and/or deep impact on the established structures and processes of the enterprise. Some people who have a big stake in the status quo may get hurt while those having a stake in the innovation may benefit. This political nature of innovations implies that those entrusted with an innovation must have the skills of influencing others. They need to be able to neutralize opposition through persuasion and build support for the innovation. Without powerful support, however rational the innovation, it has a poor chance of success.

Management innovation especially can get highly adversarial. The technological innovation’s costs and benefits are usually easier to quantify than those of a management innovation; so, there is more rational debate within the organization on the merits or demerits of a particular technological innovation. But, whether a new budgeting or HRD system or a new structure will benefit the organization in absolute performance terms is usually a matter of judgement and may elicit sharply differing points of view. Besides, a management innovation, such as a new performance management system, may directly affect the career prospects of a number of people. While technological innovations can be quite expensive in money terms, the psychological costs of management innovations can be higher. Therefore, management innovations require a number of ‘political’ skills in their sponsors such as the capacity to identify a coalition that will support the innovation, proper timing, effective internal marketing of the innovation, etc.

Since most innovations are very interactive, how the human relationships are managed can be a key success factor. In an American study involving 169 managers, the biggest predictor of innovation success was the quality of human relations management (Service and Boockholdt, 1998).

Mindset differences within the enterprise can impede innovations. Sizeable enterprises tend to get departmentalized, divisionalized, and decentralized to realize the benefits of specialization, focus, and accountable autonomy. But, these also create inter-departmental, inter-divisional, and inter-level mindset differences (Lawrence and Lorsch, 1967). Such mindset differences can lead to difficulties in implementing innovations. A study of 18 new product initiatives in five large US corporations illustrates the organizational facilitators and barriers of new product introductions (Dougherty, 1992). Only four of the 18 new offerings realized their profit targets while seven were clear ‘failures’ (the products were launched but then cancelled). The remaining seven were in-between cases. Interviews with some 80 staff members from different functional areas revealed large mindset differences. Business issues (segments, competition, forecasts, etc.) figured frequently in interviews with people in market research but much less frequently in interviews with manufacturing, field, and technical personnel. Issues related to selling were rarely mentioned by technical and manufacturing staff as compared to field personnel, and so on. There were strong mindset differences relating to new product development. For instance, the technical people focused on specifying what the product could do, and what the users wanted in terms of product speci-
fications, while the manufacturing people were primarily concerned about the product’s durability, quality standards, etc., and the salespersons were concerned about how quickly the product could be changed to meet customer requirements. These were, however, complementary concerns. Had there been joint problem solving and decision-making, the launches might have been more successful.

Small teams for spearheading innovations may be very useful. Research efficacy can go down in teams with more than seven members (Martin, 1984). Even large organizations can, however, be innovative if they use small teams for developing innovative ideas (Peters and Waterman, 1982). Successful large high-tech enterprises like 3M and Hewlett-Packard have many ‘skunk-works,’ each dedicated to a specific innovation through a small, highly committed team of professionals who play a variety of roles without losing focus (Roberts, 1977).

Innovation generally has two distinct phases. The first phase involves the conceptualization and design of the innovation; the second involves its execution and institutionalization. The conceptualization phase is marked by much brainstorming for alternatives and this requires administrative flexibility, high interactivity among all concerned, and expert-based decision-making (Burns and Stalker, 1961).

The implementation phase requires a different mode of management: a lot of careful estimation of costs and benefits of alternatives, planning, control, and monitoring (Khandwalla, 1977). This requires the coordination of many groups of specialists and an attempt to motivate all the innovation stakeholders. The links between basic research, development, manufacturing, and marketing of the innovative product need to be carefully established (Moss, 1985). If any of these is weak, the innovation could fail. All this requires considerable ‘professional’ management.

In the business sector, innovative ideas have high mortality. In the US, only 2 per cent of the new product ideas eventually become commercial successes and only one in seven products undergoing development succeeds in the marketplace (Booze, Allen and Hamilton, 1980). Thus, a very large number of innovative ideas need to be generated to step up the rate of innovation. Secondly, to raise the success rate, especially of product innovations, planning, coordination, monitoring, and sharp customer focus become indispensable. Product innovations need to be tailor-made to clearly identified gaps and needs of the customer. Collaboration with the customer in the form of joint prototype testing, specification, development, evaluation, marketing, etc., can be quite helpful. In the British medical equipment industry, continuous interaction between the producer and the user led to a 65 per cent success rate as against the 20 per cent rate without such interaction (Shaw, 1988).

**ORGANIZATIONAL DESIGN FOR INNOVATIVENESS**

In a hyper-competitive environment, it is not enough to institute an occasional innovation. Competitive advantage can be sustained if the enterprise comes up with a continuing stream of successfully implemented innovations. For this to happen, the organization needs to be designed for innovativeness. This, however, is not easy. At the enterprise level, frequently, there are major blocks to innovativeness and these are mostly internal to the organization (Burns and Stalker, 1961). These take the form of internal barriers to communication and action, coordination difficulties, poor control and follow-up, poor definition of objectives, inadequate business analysis, inadequate creativity, a work culture that resists change, etc. (Utterback, 1974). Since organizational barriers to innovation tend to be greater in large organizations than in smaller ones, an American study indicated that small firms produced over 20 times as many innovations per R&D dollar than large firms (Rastogi, 1987). In a study of 50 ‘breakthrough’ innovations of the 20th century, every advance came from a relatively small firm (Klein, 1977). Large enterprises need to adopt an organizational design that avoids the pitfalls of large size and also enhances innovativeness.

Thus, the key for enterprise success in the competitiveness sweepstakes in a globalized economy is developing an organization for sustained and successful innovativeness (Hamel, 2006; Khandwalla and Mehta, 2004; Ravasi and Lojacono, 2005; Voelpel, Leibold and Tekie, 2005). The organization’s growth and competitive
strategies, its organizational structure, the style of management, the management systems, especially human resource management and so forth, need to be designed for sustained and successful innovation and aligned for this purpose.

The organizational design that is required is quite different from the textbook prescriptions for professionally managed organizations. The growth strategy needs to emphasize opportunism and risk-taking over ‘focus’; the competitive strategy needs to emphasize learning, networking, and a constant stream of innovative products and services over such defensive strategies as pushing ‘power brands,’ or one of the ‘pure’ strategies advocated by Michael Porter (1980); the structure needs to be highly divisionalized, decentralized, and flexible with numerous cross-functional project teams that supplement regular functional departments; human resource management needs to induct from outside as well as identify from within the organization numerous change agents and potential innovators, groom them, ensure that they have enough operating space to innovate, and reward them when they deliver; the top management needs to get engaged in the planning and monitoring of innovations; and so forth. Such a design has been found to be associated with superior corporate performance (Khandwalla and Mehta, 2004).

**PRINCIPLES OF CREATIVE PROBLEM SOLVING**

Besides instituting an innovations-friendly organization design and processes, there are several tools that can stimulate innovations in an enterprise setting. These tools are not programmed ‘how-to-do-it’ kits but, rather, broad approaches that can accommodate a lot of contextual modification and adaptation and value addition by organizational actors. Most of them are derived from ‘principles’ of creative thinking and problem solving.

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- Logical thinking is not the only effective mode for solving real life problems. Associative thinking (A reminds one of B, B of C, C of D, etc.), empathic thinking (putting oneself in the shoes of another or even of a thing), bisociative thinking (examining an issue from two or more quite different perspectives and then trying to integrate the ideas yielded by the different frames of reference), metaphoric thinking (seeking an arresting metaphor for the problem situation and then working out its implications), fantasy thinking, and dialectical thinking (a series of statements and rebutting or questioning counter-statements) are some of the other modes of thinking that can yield useful insights.
- Both ‘convergent’ thinking and ‘divergent’ thinking need to be utilized for creative problem solving. Convergent thinking involves such processes as defining key terms, a clear statement of the problem, its analysis into various components, identification of the criteria for judging the efficacy of the solution, choosing among alternatives on the basis of these criteria, etc. Divergent thinking is much more exploratory and has a ‘trial-and-error’ in its operation and involves an unconstrained listing of options, fantasying, coming up with arresting metaphors, getting into out-of-box thinking that may sound impractical or even crazy, etc. Convergent and divergent thinking frequently proceeds in cycles of logical and out-of-box thinking until a solution is found that is both novel and effective.
- For encouraging divergent thinking, it is necessary to keep one’s critical faculties in abeyance for the time being and adopt a more playful, open, and experimental mindset.
- Creative thinking is inhibited by defensiveness and fearfulness and stimulated by curiosity, openness, independence, and adventurousness.
- Questions, not answers, are the creative acts of intelligence. Questions widen search; answers freeze search.
- There are different forms of creativity and somewhat different skill-sets are required to manifest
each form. Essence creativity manifests as novel ideas, points of view, paradigms or angles. It requires excellent abstraction skills and some of the most notable examples are to be found among the works of great scientists, mathematicians, and pioneering artists. Elaborative creativity manifests as innovative elaborations of ideas or paradigms that otherwise may be familiar. It requires the ability to visualize the implications of ideas, link perspectives together, transform a concept into a fully developed programme or activity or event or product, and weave complex and unique designs. Expressive creativity is novelty in the way the commonplace is presented be it through word or paint or music or through any other medium. It requires felicity with off-beat and vivid use of a medium. Entrepreneurial creativity requires calculated risk-taking and the ability to spot and seize opportunities and convert an idea or a piece of information into a viable enterprise. And, some of the most fascinating examples are to be found among the ranks of such Indian entrepreneurs as Jamsetji Tata, Ghanshyamdas Birla, Dhirubhai Ambani, Azim Premji, and Narayana Murthy. Existential creativity is the ability to grow and develop one’s own self in distinctive ways so that the emerging human is unique and is frequently found notably in creative professionals. Empowerment creativity manifests as activities that empower others in unique ways such as those of empowering leaders like Mahatma Gandhi.

MANAGEMENT TOOLS THAT STIMULATE INNOVATIVENESS

Tools have been developed that enhance an enterprise’s innovativeness (Khandwalla, 2003, chapters 9 and 11). To be fully innovative, the enterprise needs to have a mindset of innovation at all levels and in all the functions of the organization. Those with a yen for innovation need to interact with one another freely so that something like an innovation movement gets started.

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Creating an Innovationist Mindset in the Organization

The following three tools can help generate an innovationist mindset in the enterprise and also diffuse widely the skills needed for innovation: creativity training, invention training, and creativity thinking network.

Creativity Training

Many people think that creativity is God-given. However, a review of over 140 studies of creativity training programmes has clearly indicated that creativity can be taught (Torrance, 1987). Another survey of over 100 studies indicates that creativity training is generally effective: performance improves on tasks that are similar to those used during the training (Westberg, 1996). By the early 1990s, over half of the US Fortune 500 companies had given their staff creativity/creative problem solving training in some form or the other (Ford and Harris III, 1992).

Creativity training works best when it seeks to strengthen those forces that promote individual, group, and enterprise-wide creativity and weaken those forces that impede creativity at all the three levels (Khandwalla, 2003). The forces that promote creativity are the right kind of working environment (diverse tasks, flux, autonomy with accountability, encouragement from boss figures to innovate, tangible rewards for successful
innovation, etc.); strengthening of the motive to innovate for the benefit of the organization and its stakeholders; raising the capacity for divergent, off-beat, out-of-box thinking and problem solving; stronger presence in the enterprise of those with a fire in the belly, curiosity, risk-taking ability, independent thinking, etc.; and a good grounding in such techniques of creative thinking as brainstorming, questions checklist, attributes grafting, synectics, and reverse brainstorming (Khandwalla, 2003, chapter 4). The forces that impede creativity are excessive fear in people such as the fear of failure, aversion to ambiguous situations, fear of humiliation, fear of social ostracism that manifests as conformity, etc.

Sometimes, especially in relatively old, conservative organizations, the biggest blocks to creativity and innovation are not at middle and junior management levels but at senior levels. In these enterprises, it is useful to subject senior executives first to creativity training to remove blocks and convince them about the practicality of creativity. At the least they would desist from opposing innovations. This strategy has worked for several enterprises in which I have provided creativity training to top and senior level management.

As an example, in the late 1970s, I provided creativity training to batches of senior managers of an Indian subsidiary of a British MNC in the gas business. A number of innovative actions followed (Mukherjee, 1989). A team effectiveness survey improved teamwork and communications. The CEO informally met managers at all levels once a month and so did division heads. Formal committees were set up to tackle productivity, safety, HRD, housing, etc., and action was initiated for improving the MIS, cost reduction, better capacity utilization, personnel management, PR, growth strategy, and work culture. Training programmes were organized for strengthening many skills. There was a clear tilt towards decentralization and participative decision-making.

A number of innovative moves followed. The holding company’s shareholding was reduced to enable the Indian subsidiary to avoid the restrictions on growth and diversification imposed by the government on MNCs. Specific and ambitious targets were participatively set and vigorously pursued. One whole level of management was eliminated and SBUs were created for new, innovative ventures. Many bright young managers were identified and given challenging responsibilities. New markets were explored. Several product innovations and modifications were made. The company entered into contracts with other enterprises to manage their gas plants and market their products. It also entered into joint ventures with SOEs. Exports were increased, plant capacity was augmented, R&D was stepped up, ancillaries were developed, marketing was professionalized and so forth. In 1982, profits reached four times their level in 1979.

Structured creativity training programmes such as Future Problem Solving can be quite useful at lower levels. It is a six-step process (Kurtzberg and Reale, 1999). In the first step, fuzzy situations are presented to trainees such as customers switching to a competing brand. Next, the trainees generate several alternative problem statements of the situations and identify the components of each problem. Further, they work out a single problem statement and brainstorm for solutions.

Table 1: Value Propositions and Tools for Delivering Them

<table>
<thead>
<tr>
<th>Value Propositions</th>
<th>Delivery Tools</th>
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<tbody>
<tr>
<td>Creating an innovationist mindset in the organization</td>
<td>Creativity training, Innovation training, Creativity thinking network</td>
</tr>
<tr>
<td>‘Stretch’ vision that spurs innovativeness</td>
<td>Creative scenario building</td>
</tr>
<tr>
<td>Vital intelligence to stimulate innovations</td>
<td>Creative surveys, Creative experiments, Creative benchmarking, Reverse brainstorming</td>
</tr>
<tr>
<td>Dumping of obsolete activities</td>
<td>Exnovation</td>
</tr>
<tr>
<td>Bringing about widespread change</td>
<td>Multiplication of change agents</td>
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<tr>
<td>Continuous small innovations</td>
<td>Kaizen, Creative overload</td>
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<tr>
<td>High potential new leads</td>
<td>Creative data mining, Stakeholders’ councils</td>
</tr>
<tr>
<td>Securing ‘breakthrough’ innovations</td>
<td>Intrapreneurship, Parallel groups</td>
</tr>
</tbody>
</table>

8 TOOLS FOR ENHANCING INNOVATIVENESS IN ENTERPRISES
Then, they agree on the evaluation criteria and apply them to each solution. Finally, they identify the ‘optimal’ solution.

**Innovation Training**

It is not enough for an enterprise to generate many creative ideas. These have to be transformed into useable innovations. Several models of innovation training have been developed such as the three components McCormick model (McCormick, 1984). Trainees are initially presented with a problem faced by an early innovator. Next, they study the personality and lifestyle of early innovators. In the third, they are given assorted junk material to invent a product or a process.

There is an even more elaborate eight-stages programme (Lillrank, 1995):

- Trainees are made much more aware of the impact of innovations.
- They learn how to maintain an innovator’s log of their innovating efforts and how to utilize junk to invent a new device for a function.
- They learn to identify a poorly met need and create a ‘bug list’ of present irritants.
- They master a checklist of questions called SCAMPER.
- They learn how to research, evaluate, and select solutions and also to generate criteria for evaluating solutions.
- They experiment with designs and tools or get technical assistance for creating a model.
- They learn ways of naming the innovation and marketing it.
- They produce the device and explore outlets.

In an experiment with 700 kids, it was found that those who underwent all eight lessons produced more inventions than those who had only one lesson (Lillrank, 1995).

**Creative Thinking Network**

A creative thinking network can quickly spread the culture of creativity and innovation throughout an enterprise. The OZ Creative Thinking Network, started in DuPont’s Industrial Fibers Division, US, is an interesting example (Tanner, 1994). Seven employees who were committed to understanding the tools of innovation and creativity in the workplace at a time of severe competitive pressure from foreign players organized it in 1986. The network grew to 600 members by 1993. The network sought to expand the company’s knowledge related to creativity and innovation and to promote internal entrepreneurship.

The network met once every six weeks and the participants generally numbering 100 to 150 shared experiences and knowledge. They ranged from plant-level operators to top managers. Experts such as inventors, innovators, professionals, people from R&D, and representatives of innovation teams were invited to speak. Trainers of creativity techniques were utilized in workshops. External experts were invited to speak on creative problem solving, the environment for creativity, applying creativity, managing innovation, laughter and creativity, fables for rousing imagination, etc.

The network launched such projects as an innovation fair, honouring of innovators, seed money for novel ideas, and the publication of a book of humorous cartoons-cum-essays titled ‘Are We Creative Yet?’ Over 20,000 copies of this book were distributed.

**‘Stretch’ Vision that Spurs Innovativeness**

A challenging but plausible future scenario can galvanize many innovative options to respond to it. The ‘Delphi’ technique can generate such a scenario (Helmar, 1964). For this, a group of experts is recruited but their identity is not revealed to one other. Each tries to visualize the situation in the somewhat distant future in the area of concern (such as the nature of a dynamic industry like IT) — as it would be or as it could be with appropriate effort. These scenarios are shared but without revealing the identity of the authors (so that the visualizer is not influenced by his/her sentiments towards the others) and each member is asked if, based on the fresh inputs provided, he/she would like to modify the scenario earlier visualized. After several such rounds, a consensus or two tends to emerge and the exercise is ended.

Delphi can generate innovative anticipatory actions. Shell’s experience is revealing (De Geus, 1988). In 1984, the ruling price of oil was $28 per barrel. However, the corporate strategic planning director asked managers to visualize what would happen if by 1986 the price of oil fell to $16 a barrel — an apparently unlikely event. They
visualized the response of the government, the competition, and the company scenario. A number of innovative responses was considered. Shell was ready with effective action when the price of oil fell from $27 a barrel in January 1986 to $10 in April 1986.

Vital Intelligence to Stimulate Innovations

Creative Surveys

Enterprises often survey their staff and customers for various purposes. Creative surveys are those that either solicit rarely gathered information and/or use that information innovatively. A good example is Italtel’s survey of its image held by various stakeholders in 1981 (Bellisario, 1985). Italtel, an SOE, got consultants to assess its public image and reasons for it. Feedback to management instigated many changes and innovations, such as in the company’s trademark, logo, product design, and the décor of the company’s facilities. Sears Roebuck, the US retailing major, surveyed its stakeholders and developed a mathematical model to link together the financial indicators, customer satisfaction, and employee morale (Rucci, Kirn, and Quinn, 1998). The model predicted what would happen, for instance, to financial results if employee attitudes changed or customer satisfaction changed. Sears University was set up to offer courses on how to use this model and the enterprise’s selection, promotion, and compensation of managers was aligned with how well they did on all the performance indicators.

Creative Organizational Experiments

Pilot studies or projects can be turned into creative experiments to yield reliable and novel intelligence. This can be done fairly simply by identifying a ‘control’ group that does not undergo change so as to be able to compare what happened in a project or a pilot study with what happened in a control group in the same period. Even if no ‘control’ group is possible, as when setting up a new plant, careful periodic measurement of key variables like efficiency can yield valuable, reliable information. Information turns into creative intelligence when the experiment is in an uncharted area such as the installation of a Balanced Scorecard system, JIT, TQM or EVA. At the least, such pilot experiments can reveal pitfalls to be avoided before full scale up. They can be creative also when the information gathered is used for widespread brainstorming for novel options.

A post office in Shimla in Northern India undertook an interesting experiment in the early 1980s (De, 1984). Each person in the post office was assigned only one task and the culture was of constant checking by superiors. The post office performed several functions: mail collection and delivery, money orders, mail registering, insurance of parcels, banking facilities, provision of postal stamps, dispatch of telegrams, etc. Each counter handled only one of these functions. A customer with several requirements had to go from one counter queue to another thus wasting a lot of time. A survey revealed much dissatisfaction among the 40-strong, unionized staff.

Initially, the mail delivery persons were organized into teams. In each team, instead of individuals specializing in only one function, the functions of overall supervision, mail collection, delivery, recording, etc., were rotated. The result was that the area covered per postman and the delivery load per postman got nearly doubled. This teamwork innovation spread to other local post offices.

Creative Benchmarking

Benchmarking is commonplace but creative benchmarking is not. Normally, enterprises compare themselves with industry-specific standards or the standards of industry leaders such as the number of employees needed to produce a unit. Benchmarking gets creative when standards are sought of the truly outstanding even if the pace-setter does not belong to the industry: for example, the staff motivation of a highly charged army unit or NGO whose members may well be willing to risk their lives to accomplish the mission given to them. Even ordinary benchmarking can be creative if the information it yields is used to brainstorm on novel ways to close the gaps revealed.

Ford Motor Company, US, had a serious quality and safety problem in the late 1970s. It lost $1.5 billion on sales of $37 billion in 1980. To restore its image, it developed a car named Taurus (Shook, 1990). The innovative part was that Taurus was benchmarked on 400 separate automotive features with the world’s best cars and it was decided to surpass these cars on each of these. Taurus turned out to be a great success. Also, on account
of other actions that the Ford management took, the company could raise its sales to $52 billion and earn $2.9 billion in 1984.

**Reverse Brainstorming**

The technique of brainstorming can be used not only to generate many novel ideas but also to find unnoticed problems with the selected option. All choices are based on assumptions and frequently many of these are not articulated in the discussion. In reverse brainstorming, the accepted option is attacked from the competitor’s point of view through a brainstorming process. Many weaknesses may come to light. The option is re-examined to eliminate the revealed weaknesses. GE is known to use reverse brainstorming extensively. ‘Devil’s advocacy’ is a variant of reverse brainstorming. An analytical mind plays the role of opposing any proposal that is made by an innovation team so that unnoticed issues are brought out into the open for discussion.

**Dumping of Obsolete Activities**

**Exnovation**

Conditions change and the policy or practice that was once a worthwhile change or innovation may currently be quite obsolete. This problem is acute in many bureaucracies. An American study indicated that for every dollar spent by the government on enforcing a new government regulation, the cost to business could be ten times more (Weidenbaum and Detina, 1978). In the UK, ministers for deregulation were appointed to identify damaging or unnecessary regulations and simplify or eliminate them (Commonwealth Secretariat, 1995). Nearly 900 such regulations were dealt with.

Old, large enterprises also suffer from needless regulations and policies. ‘Exnovation’ is a good way of identifying and deleting such junk (Drucker, 1985). It makes sense every few years to identify and delete the policies, practices, rules, and regulations that the organization presently has that have outlived their utility so that space is created for new and innovative policies. Continental Airlines, for example, offers a dramatic example of exnovation. Following losses in the early 1990s, a new management publicly burnt the 800-page book of rules and replaced it with an 80-page manual (Brenneman, 1998).

**Bringing about Widespread Change**

**Multiplication of Change Agents**

Given a long period of a sheltered economy in which change was at a discount, many enterprises in the Third World have been saddled with a large unfinished agenda of change and innovation. Many change agents are required to bring about the needed innovations. Several enterprises have shown ingenuity in identifying and empowering large numbers of change agents. At the ailing Steel Authority of India Ltd., the new CEO first met some 25,000 members of the staff singly or in groups to get acquainted with them. Later, he developed a turnaround strategy titled Priorities for Action. Next, he coached some 500 senior managers in two-day workshops on the turnaround strategy. These senior managers, in turn, conducted similar workshops for their subordinates. Thus, a very big army of change agents was created (Krishnamurthy, 1986).

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At Siemens Nixdorf, Germany, the new CEO met some 8,000 members of the staff even before joining. On joining, he initially identified three change agents who, in turn, identified 30 and so on so that eventually some 2,000 change agents were identified. They were sent on a 13-week tour of the US to visit the Silicon Valley enterprises and companies undergoing restructuring. They also got coaching from an expert. Some 400 managers were provided special entrepreneurial training and 250 of them were given charge of the newly created SBUs (Kennedy, 1998). GM, US, transferred some 7,000 data processing personnel to IDS, its dynamic subsidiary, to absorb the latter’s dynamic mindset (Kharbanda and Stallworthy, 1987).

Merely identifying a large number of change agents is not enough. They need to be empowered through training and exposure, and then, when they are ready, they need to be given autonomy in bringing about changes and innovations in their areas. They also need to be held accountable and, when they succeed, they need to be rewarded.

**Continuous Small Innovations**

**Kaizen**

The lower level staff is a huge reservoir of competence and ideas. But, it is seldom tapped for innovation in
traditional and authoritarian corporate cultures. The Japanese have developed systems for tapping this reservoir that they call kaizen. Kaizen facilitates little changes and innovations for continuous improvements in products and operations. The Japanese Association of Suggestion Systems as well as the Japan Human Relations Association has catalysed the use of effective kaizen systems.

Kaizen is a potent source of innovations. In the 1970s and 1980s, Japanese car companies continuously eroded the market share of US companies. One reason was the effective use of kaizen by the Japanese companies. According to one study, GM, US, received less than one suggestion per employee per year and adopted less than a quarter of the suggestions received while Toyota of Japan generated nearly 18 suggestions per employee and adopted nearly 90 per cent (McMillan, 1984)!

Kaizen works when it is managed well. The Government of Singapore initiated kaizen in the form of quality circles called Work Improvement Teams (WITs). Hundreds of WITs were started. Each WIT, consisting of the entire work team including the supervisor had a trained facilitator. Several thousand innovations and improvements were suggested and implemented. These contributed to the administrative excellence of the Singapore Government (Ng, 1990).

The Scanlon Plan is another proven source of numerous small innovations (Schuster, 1984; Thomas and Olson, 1988). It is a gains-sharing plan in which the team as a whole decides how the gains are to be shared even when the innovation has been proposed by a particular member. While the innovative idea is always welcome, ultimately, it is effective implementation that counts and, for this, the whole team needs to support the innovation. This support is forthcoming because the team as a whole decides who should get how much payment as incentive.

Creative Overload

Overload is commonplace in organizations but creative overload that stimulates innovations is not. Many a management creates an overload on the staff through overly ambitious targets but then does not apply creativity in achieving them. Often, these targets are not met and then there is much fault-finding, responsibility shirking, and a pervasive sense of failure. Lakhanpal National, an Indian producer of batteries, and a subsidiary of Matsushita Electric, Japan, used overload creatively (Khandwalla, 1992). It decided to double its productivity in just three years. To be able to do this, instead of focusing only on the output of batteries per employee, each department/section undertook to double its performance in three years. Over 70 different challenges were identified. Such diverse areas were targeted as reduction by half in the rejection rate of good battery cells, manpower employed in the parts section, rate of falling of the battery jacket on the floor, water consumption, level of inventories, etc. A cross-functional team was formed for each challenge and every staff member, including the CEO, was a member of one or more teams. Each team brainstormed on how to go about achieving its target. There were no financial incentives but there was appropriate financial and other support to the team and public recognition whenever a challenge was met. Most of the targets were met in three years.

Some enterprises such as 3M, US, create an overload by requiring that at least, say, 25 per cent, of the sales in any year should be from products developed by the company during, say, the previous five years (Fortune, 1988). This sends a powerful signal throughout the organization for speeding up new product innovation.

Thus, the way overload can be made creative is by breaking the overall ‘stretch’ into do-able small tasks, putting cross-functional teams in charge of each task, getting the team to brainstorm for options, and rewarding and recognizing success.

High Potential New Leads

Creative Data Mining

Enterprise data are mostly used for very limited accounting or MIS or marketing purposes. ‘Knowledge discovery’ is a method for creative data mining that seeks to uncover innovative new uses of information.

Knowledge discovery looks for links in the information available with the organization or accessible to
it. The idea is to identify previously unknown patterns (Siau, 2000). A merchandise store may have information on the sales of hundreds of products. Credit card sales can provide a lot of information on the buyers such as their income, occupation, age, gender, marital status, residence, buying habits, etc. Statistical analysis can help the store identify the most profitable goods, their buyers, and their buying habits. This can facilitate innovative and more sharply focused packaging, display, incentives, etc.

Knowledge discovery starts by specifying the areas where innovative action is a priority. Next, the data that can be mined for patterns are identified and prepared for analysis. Further, data mining is attempted through clustering, regression, cross-tabulation, correlation or other statistical techniques. Finally, there is brainstorming for interpreting the information and its application.

**Stakeholders’ Councils**

Every enterprise has multiple stakeholders: owners, managers, staff, unions, customers, vendors and so forth. Most of the time, the viewpoints of only a few of the stakeholders are taken into account while making decisions. Stakeholders’ councils bring in more voices in the process and, therefore, stimulate new ways of approaching problems (Freeman and Reed, 1983). The way forward is by setting up a council of the representatives of each major class of stakeholders. Each council meets the management a few times a year to exchange information about the enterprise’s prospects and the problems encountered by the class of stakeholders. The stakeholders are encouraged to make suggestions.

SnB Bank, Denmark, has developed a way of getting its various stakeholders to influence the way it operates with the help of Copenhagen School of Business (Pruzan and Zadek, 1997). The bank has identified the values it shares with various groups of stakeholders notably employees and customers. It has set up ‘dialogue circles,’ one for each class of stakeholders, in which the management and the representatives of the class of stakeholders discuss periodically the extent to which the values are lived up to and the concrete steps that have been taken or can be taken to improve this. Feedback from questionnaires given to stakeholders is also discussed at the meets and areas of improvement are identified. The bank budgets specific resources to implement improvements and innovations and the bank’s staff recruitment and appraisal processes reflect the values shared with the stakeholders. Concretization takes the form, for example, of specifying how jobs should be performed by the staff to reflect stakeholder values, how customers can get sound advice and service from the bank, how supervisors should listen to the viewpoints and suggestions of their subordinates, and how employees can experiment with new ideas.

**Securing ‘Breakthrough’ Innovations**

**Intrapreneurship**

In a turbulent, competitive, but opportunity-rich environment, the development of star potential products on a fairly constant basis is necessary for sustained competitive advantage and rapid, profitable growth. American studies suggest that only one in 50 new product ideas succeeds in the market (Booze, Allen and Hamilton, 1980; Quinn, 1985). Thus, to grab future opportunities, organizations must pursue many novel ideas at any point of time and try and decrease the mortality rate of novel products. Intrapreneurship can achieve both.

The way intrapreneurship works in some companies is by the management welcoming any novel product idea, even if it is a far-out one, from employees and outsiders (Pinchot III, 1985). If the idea is seen to have high future potential, the proposer of the idea is given a budget and modest facilities to work on the idea and hire a cross-functional team to develop the idea further. A senior corporate manager provides support and guidance to the team. The team is kept away from the R&D department because the R&D chief’s priorities may clash sharply with those of the team. Following product development and testing, a presentation is made to the corporate management. If the proposal passes muster, production is scaled up with the team head as the likely CEO of the new division. Intrapreneurship tries to cross small, entrepreneurial teams with the resources and systems.
of the large corporation without stifling creativity in a way that provides the enterprise with a stream of high potential growth products.

Over the years, researchers have thought of intrapreneurship as a mode of management. They have proposed four dimensions of intrapreneurship: new business ventures; innovativeness; organizational self-renewal; and proactiveness (managerial initiative and risk-taking). Indeed, scales have been developed to measure the extent to which the organization is intrapreneurial in terms of these four dimensions. In a comparative research of American and Slovenian firms, the extent of intrapreneurship was associated with the growth rate of the firm (Antoncic and Hisrich, 2001).

Parallel Groups
Parallel teams can be set up for designing highly innovative products, projects or activities (Bleicher, Bleicher and Paul, 1983). Both the teams may be given the same mandate but are encouraged to work independently and evolve distinctive approaches. Creative advertising agencies sometimes field two or more teams to develop a promotional strategy for a client (West, 1993). Before finalizing the strategy for a product launch, IBM reportedly sets up multiple teams to develop and test alternative products with customers. The idea is to find out which product morph the customers may be willing to pay for most profitably. After parallel groups make their presentations to management, there is some kind of a shoot-out for selecting one of the alternative designs. However, there is generally an attempt to incorporate the strengths of the losing design in the winning design.

**CONCLUDING COMMENTS**

The Third World economies need to grow fast to provide decent living standards to their impoverished people. If they are market economies, as most of them now are, they can grow fast if their enterprises become globally competitive and master the art of seizing the opportunities offered by globalization. Innovativeness offers a huge opportunity to these enterprises for rapid growth and sustainable competitive advantage. But, innovativeness is not easy for enterprises nurtured in hitherto protectionist economies and authoritarian and conservative cultures. Major organizational redesign is needed involving big mindset changes and major changes in strategies, structures, human resource management systems, and practices and style of management. If that could be successfully attempted, the stage would be set for innovativeness. If the 16 tools described in this paper are adopted after necessary context-governed modifications, the rate of successful innovation could be dramatically increased with attendant benefits to society and economy. Most of these tools are not part of the standard MBA curriculum. The latter, too, needs to be modified to bring the organizational design for innovativeness and the tools to stimulate innovation centre-stage in management schools so that a large number of young managers develop an innovationist orientation and play the roles of change agents.
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The principal mark of genius is not perfection but originality, the opening of new frontiers.

Arthur Koestler