The Innovative Potency of an Organization
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THE INNOVATIVE POTENCY OF AN ORGANIZATION

Thiruvenkatam Ravichandran*

The nineteenth and twentieth centuries witnessed an unprecedented economic growth which no one factor could explain. Nonetheless, the primary credit can be assigned to innovations, which include new technologies, products, processes, services, and new ways of conducting business and human resource practices. Increased internationalization, resource scarcity, rising expectations of the customers and the unrelenting moves of the competitors are forcing organizations to be highly innovative. Therefore, the real concern for CEO’s, managers, policy makers, researchers, consultants etc., is to create innovations and to design innovative organizations. Towards designing innovative organizations and creating innovations, I present a framework, quite facile to employ, to assess the “Innovative Potency of an organization”. The proposed framework albeit is an outcome of my doctoral thesis, it departs to be dominantly objective, in the sense, my doctoral work relied more on perceptual responses based on questionnaires and interview measures, supported by information from the organizational records. My doctoral work was based on an investigation conducted across 43 organizations operating in industries such as computers and electronics, machine building, automobiles and a few conglomerates.

Innovative Potency is the ability of an organization, to anticipate, and respond to the relevant changes in the environment. An innovative organization continuously develops creatively new business and market opportunities through effective utilization of the problem-solving skills of the people in the organization. Toyota Motor Corporation (TMC) not satisfied as one of the largest auto-maker initiated the development of Lexus to compete with Mercedes, and managed to gain a large market share from the Mercedes, in the luxury car segment. For Mercedes, the craftsmanship or the manual inspection (white glove treatment) for a defect free car was costing one-third of the production costs. Toyota instead automated the process and saved huge costs to pass the savings to the customer and added more attractive features which could be perceived by the customer very easily. As the quality guru Deming pointed out that the customer doesn’t see how you produce the product, but the product. Nevertheless, by implication, an innovative organization displays a high degree of willingness to encourage and foster experimentation notwithstanding the risks involved. Thus, an innovative organization is sensitive to the environment, engages in continuous learning, problem solving, and experimentation, demonstrating its risk-ready nature and the ability to absorb disruptions caused by creating and implementing new ideas. Thus, sensitivity, problem solving skills, trialability, risk-readiness, learning, and absorption are identified as some of the critical attributes of innovative organizations.

Sensitivity:

Sensitivity is the ability of an organization to search, predict, anticipate problems and opportunities, and formulate strategic responses to either adapt to the environmental changes or to create a new environment for its products/processes/services. Innovative ideas quite often spring from sensitivity to the environment. Whilst scanning the environment is primary, it will not suffice in a dynamic and complex environment. Organizations should foresee changes, and create new fundamentals in doing business. The successful U.S. based Raychem Corporation’s policy is self-obsolescence - to kill its
own products, every five years, and introduce the next version or generation of the product. Consequently, competitor’s reactions are minimal unless there are rapid followers. An organization to succeed could choose to be an innovator or a follower. Innovators being the first-movers enjoy resources and shelf space and maximize earnings until the followers generate competitive products with high differentiation. Nonetheless, rapid followers with better market information about buyer’s preferences and tastes have the advantage of introducing products, which match these better than the first-mover. For instance, although Thomson Consumer Electronics (TCE) introduced the first CTV in the world market as early as 1952, it is not the market leader. Organizations such as Sony, Akai, Panasonic, LG, Samsung, as second movers, had the advantages of differentiating their products through a right market-mix and achieved significant global market share. The most popular discussion in the literature on innovation management is that whilst the Americans invent, the Japanese innovate them by exploiting the commercial value of the products successfully, and remain dominant in many markets. The (South) Koreans emulated this strategy triumphantly. Hyundai Motor Corporation (HMC) in its attempt to export to the North American market, set up a technological center at Ann Arbor and a Styling studio at Los Angeles to be sensitive to the local needs. Similarly, it set up such centers at Frankfurt and Japan also. In Indian motorcycle market, TVS Suzuki, pioneered to introduce fuel efficient, easy handling, 100 CC bikes with sophisticated features. Thus, TVS Suzuki – an innovator in the Indian context, if not in the global context, enjoyed the monopolistic position for over three years. However, followers such as Hero Motors, Bajaj and Escorts with more information about customer’s tastes and preferences differentiated their products from TVS. Consequently, in a span of five years TVS was expelled from # 1 monopolistic position to # 3 position. To draw a comparison, Sony when it pioneered to introduce Walkman in 1979, imitators grabbed 80 percent of Sony’s market. Nevertheless, Sony fought back to capture 40 percent of market share through product proliferation i.e., by introducing over 250 models during the 1980’s. Thus, product proliferation is one of the successful strategies for a market leader to defend his position or for immediate followers to challenge the leader. HLL in the recent years utilizes product proliferation as the strategy to be the market leader across various product categories and market segments. In employing this strategy, firms, however, have to be cautious. Because, this will expose the company under severe market recession and the investment and development costs might prove detrimental to the company. Thus, under these conditions firms need to be extra-sensitive to predict the industry trends such as market recession.

Innovator or follower, organizations should be sensitive to the subtest changes in various environmental segments such as changing customer trends, preferences and tastes, technological advancements, competitor moves and government policies and regulations. Organizations should also be aggressive by making the right pre-emptive moves. MRF is one such aggressive player, with constant product innovations and market campaigns, which could challenge its erstwhile collaborator Michelin, the founder of radial tires. On the other hand, a case on insensitivity is, Opul Reddy’s Dyanora TV. Dyanora failing to capitalize on its initial success in a growing market (with the then famous ad campaign “What’s life without Dyanora?”), has been for the past few years adopting a survival strategy of assembling SKD kits of TCE. Had it anticipated correctly, and chosen a right strategy, Dyanora could have continued its success. Whilst the TV market was still in the early growth stage, Dyanora could have engaged in price wars, exploiting the price
conscious Indian consumers, and adopted aggressive campaigns or marketing innovations, if not radical product innovations, for its growth.

Majority of the products are market-pull as opposed to technology-push. Therefore, to innovate, organizations should consistently receive information about the market and the technological advancements. One way is, sending R&D engineers to the field to have a direct contact with the customers. Paul Cook (CEO of the Raychem Corporation) said in an interview (HBR, March-April, 1990), “You can’t understand the market unless you get your technologists to the customer in a deep and sustained way. Your sales force, the traditional link to the customer, only gets you part of the way. It can open doors and find opportunities, but it really can’t solve the customer’s problems. And you can’t pass the details of what the customer needs through the filter of the salesperson.” In contrast, in a PSU operating in the power equipment industry of India, it was found that the R&D professionals visit the field only when the customer encounters difficulties with the products. Further, an Indian scientist working for a large Indian pharmaceutical organization, with his past experiences of working in various countries, created new food products without understanding Indian consumers. The pharma organization albeit was proactive, insensitivity to the actual market needs resulted in product failures. On the contrast, Sony continues to rule the market for Walkman for two decades with a share of over 40 percent (in the U.S., Europe and Japan). In this, the average product life cycle or the longevity of each of Sony’s models (1.97 years) was higher than the industry average (1.2 years). This is because, Sony identified specific consumer lifestyle and introduced designs that were so well adapted to the needs of their target market segments that Sony felt little market pressure to redesign them.

A Belgian R&D director of the subsidiary of a German manufacturing company talked about “automatic marketing”. His R&D engineers are constantly running product tests with their prospective customers. For some Western organizations, operating in industrial chemicals and automotive coatings industry, the marketing personnel with a strong technical background assume R&D responsibilities by conducting technical product tests. More importantly, Japanese organizations employ highly flexible role schemes and practice continuous job rotation. This helps the functional areas of the organization to appreciate actual problems and opportunities, and predict future trends in the market and technologies.

Organizations can enhance their sensitivity by focusing on its three dimensions: the length, which is the number of channels utilized by an organization, the width, which is the number of application areas, and the depth, which is the range of an organization’s scanning.
**Table 1: Length - SCANNING CHANNELS/SOURCES**

<table>
<thead>
<tr>
<th>1. Sales personnel</th>
<th>8. Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. R&amp;D personnel</td>
<td>10. Suppliers/Vendors</td>
</tr>
<tr>
<td>4. MR Organizations</td>
<td>11. Distribution Channels</td>
</tr>
<tr>
<td>5. Professional meetings</td>
<td>12. Manufacturers’ representatives</td>
</tr>
<tr>
<td>15. Inventors</td>
<td></td>
</tr>
</tbody>
</table>

**Table 2: Scanning Width – Application areas**

<table>
<thead>
<tr>
<th>1. Products</th>
<th>7. Small group activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Production Process</td>
<td>8. Communication Patterns</td>
</tr>
<tr>
<td>4. Role definitions &amp; Responsibilities</td>
<td>10. Rewards &amp; Incentives</td>
</tr>
<tr>
<td>5. Recruiting Procedures</td>
<td>11. Managerial Styles</td>
</tr>
<tr>
<td>6. Developing &amp; Utilizing Personnel</td>
<td></td>
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</tbody>
</table>

**Table 3: Depth – Scanning Range**

<table>
<thead>
<tr>
<th>1. Regional/Local markets</th>
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<tr>
<td>2. National Markets</td>
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<tr>
<td>3. Global markets</td>
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An organization’s sensitivity therefore, could be augmented by

(a) Increasing the number of scanning channels utilized by the organization;
(b) Expanding the number of areas of application covered, and
(c) Broadening the range/base for collecting the information.
However, in measuring sensitivity, the scanning channels, application areas and range should be used only as a reference index and in this, the aspects relevant to the organization should only be considered to arrive at the total scores, for L, W and D. For example, for an educational institution, there are no formal sales personnel, which becomes irrelevant to include in the total score of L.

Thus, sensitivity could be assessed by

\[ S_Y = \frac{L/T_l + W/T_w + D/T_d}{3} \times 100 \]

Where \( S_Y = \text{Sensitivity}; L = \text{Length}; W = \text{Width}; D = \text{Depth} \) and the denominators indicate the total number for each dimension respectively.

**Problem solving Skills:**

Problem solving is the process by which a group is encouraged to utilize their creative skills for the generation, development and implementation of an idea/solution for an identified need. Problem solving skills is the capacity to produce adaptive responses which are apt but unusual, towards the furtherance of the organizational goals. Problem solving thus represents a capacity to create new knowledge. It manifests itself not only in creating new products and processes, but also in an organization’s day to day functions.

In problem solving, the criterion for an original response is that it should have a degree of uncommonness. Novelty is the degree of difference that an idea exhibits from comparable responses to a problem. Examples are all the new product innovations: Video Recorder from Ampex Corporation (USA), in 1956; Paper Copiers from Xerox, in 1959; Laser discs from Philips; Walkman Stereo from Sony, in 1978; Cameras, Televisions using digital technology and the continuing genetic engineering innovations. Thus, problem solving should result in products/processes, which are original, novel and feasible to produce. Feasibility should be assessed in terms of a solution’s fit with an organization’s goals and technical competence. The ideas brilliant in conception but out of keeping with the organizational philosophy will be infeasible. Marketability as a component of feasibility should be achieved through the commercial acceptability of the products and processes. Technocrats and scientists venturing into start-ups tend to focus more on the technical aspects because as creators they value the technology high, expecting that the customers would also value them as much as they valued. PCC Limited was started in the year 1992 by five scientists after an overwhelming technical success of a product called Polycarb in one of the national laboratories. This product is used in building missiles and for a few other purposes when mixed proportionately (1:8:3) with glass fabric and mica. Unfortunately, opportunities did not favor PCCL. Defence did not continue the orders since India was not building missiles. Other organizations are reluctant to buy Polycarb from PCCL due to the domestic availability of Dupont’s product. PCCL is yet to achieve break-even and recover from losses due to lack of marketability, notwithstanding the technical competence.
Globally, numerous organizations are moving towards knowledge creation. Increasingly, many of them are transforming themselves into knowledge organizations by expanding the base of knowledge workers. Mr. Lewis Platt, CEO of Hewlett-Packard quoted, “Success in the market place is increasingly linked to an organization’s ability to manage and leverage its intellectual capital... Successful companies of the 21st century will be those who do the best jobs of capturing, storing and leveraging what their employees know.” Thus, one dominant solution to meet the variegated environmental complexities is to generate knowledge for value creation. An organization can achieve this by assiduous utilization of the problem-solving skills of the members. The objective of problem-solving is to maximize the potential creative output of each employee by creating the right climate:

- allowing members to learn from the failures,
- appropriate reward systems,
- providing resources, autonomy and
- importantly, an intellectual climate which stimulates new ideas fostering free flow cutting across levels and functions.

However, the most common problem impeding problem solving and innovation creation is the interface issues arising between the functional departments of the marketing, R&D or engineering and manufacturing. Organizations to evolve into knowledge organizations should achieve a tight inter-functional coupling. This ought to be accomplished not merely through structural mechanisms and organizational processes, but by evolving a culture of togetherness and shared membership. SAIL, for instance, achieved a tight inter-functional coupling through the concept “ICS” - Internal Customer satisfaction. In this, based on the task movement from one unit to the other, the succeeding department becomes the customer for the preceding department. For example, for Coke Ovens, Sinter Plant etc., the customer is the Blast Furnace Department, for which Steel Melting shop and Foundry are the customers. Furthermore, members of the top management should champion promising ideas and justify the acceptance or rejection of an idea/solution. Champions should be especially careful during brainstorming sessions, which is a face-to-face interaction, by stimulating and not evaluating or being critical to the ideas generated by the employees.

In the organizational context, active problem-solving is represented in various forms such as quality circles, task forces, project teams, cross-functional teams, multi-disciplinary teams and so on. However, majority of the Indian corporate R&D units focus on production process modifications, quality and productivity improvements and reverse engineering (Japanese organizations, specialists in reverse engineering, spend $4 for every $1 of technology they buy from the market). Passively, problem solving is represented in the form of a suggestion system. Organizations such as MUL, Hero Motors, TVS Lucas, TELCO derive savings worth millions of Rupees due to task forces and suggestions system. MUL for instance, implements about 30 percent of the suggestions it receives in a year.

Problem-solving skills could be measured using the formula:

\[
Pss = \frac{\text{# of ideas implemented}}{\text{Total # of ideas generated}} \times 100
\]
TISCO, with the initiative of McKinsey & Co., implemented Total Operating Performance (TOP) during 1998, to leverage the intellectual capital of all employees across levels. Consequently, ideas were generated and implemented that significantly improved operations and resulted in cost savings to the extent of 15 percent on TISCO’s cost base. Thus, the effectiveness of problem solving can be evaluated, more objectively, by recording the savings earned due to the implementation of ideas/solutions. Savings could also be estimated per employee on roll. For example, the savings per employee is over Rupees. 2914 (p.a) in MUL. However, in Hero Honda, which is rated the best among 45 factories outside Japan, employees generate about 60 to 90 suggestions a month, of which 25 to 30 percent are implemented. The suggestions are rewarded anywhere between Rs. 100/ through Rs. 6,500/ depending on the value.

Organizations in India, which are operating in dynamic environments should seek employees whose skills and abilities not only meet the organizational demands, but go well beyond the needs of the job. In this, our organizations should be sensitive to the cues provided by the members concerning what satisfies them in the job.

Trialability:

Trialability refers to the extent to which new potential ideas are tested in the organization. Trialability, essentially refers to experimentation which springs from the predominantly research based character of modern manufacturing and management of technology. In experimentation, an organization tries out new solutions or attempts to modify existing products/processes. This process is an inevitable sequel to problem solving.

SmithKline Beecham’s Tagament was a run away success in 1980’s to the problems of peptic ulcer. Glaxo Plc considered to be a conservative firm had a market value of $4 billion during 1983 and was rated # 16 in the pharmaceutical industry. Identifying the market potential, Glaxo introduced Zantac, albeit a “me-too” product, for peptic ulcer. The critical part was ‘trialability’ – experimenting a new drug development process resulting in a process innovation. Glaxo conceived the first “parallel” development process in the Pharma industry by avoiding the traditional lengthy sequential process of testing first with rats, then with monkeys and so on. Instead, all tests were performed simultaneously. Thus, the development time was reduced by half, i.e., 5 Years. In a span of 9 years, i.e., by 1992, with the success of Zantac, Glaxo raised to # 2 position, with the market value mounting to $36 billion. Nonetheless, not conceding to smugness, Glaxo (now Glaxo Wellcome) continues to retain its market position of # 2. Trialability, thus spans the entire product development process and is not restricted to product per se. Recently, the scientists of Japan and Sweden collaboratively succeeded in developing virtual labs which could cut down the drug development cycle substantially and make the Blue Cross members happy, across the globe.

Trialability should be harnessed continually by an organization that places a high premium on producing innovations. The encouragement to conduct experimentation can take the form of continued investments in the products, processes and service operations. Ensuring individual liberty to experiment is as important as capital investment. For example, developing ‘intrapreneurs’ i.e., entrepreneurs within the organization. HCL the Madras based computer organization did succeed in the theory of intrapreneurship. In 1995, Shiv
Nadar, the CEO of HCL with a strategic intent of turning the Rupees. 1,000 Crore HCL into a Rupees. 10,000 Crore Global Company by the year 2000 (in 72 months) promoted the senior executives of HCL to CEO’s by divisionalizing the business (into hardware, consulting, training, telecom and networking). Shiv Nadar identified and nurtured the senior executives in HCL to become independent equity-owning entrepreneurs. These entrepreneurs/CEO’s are further encouraged to spin off new organizations by identifying and nurturing new talents in their organizations. HCL’s sale for the year 1997-98 is over Rupees. 4,000 Crores, indicating a growth trend.

Hyundai (HMC) after intense struggle developed a car namely Excel with 54 licenses from the advanced countries. The car emerged as the best selling import sub-compact car. However, HMC could not sustain its technological posture since it had neither the technological proficiency nor the support from the erstwhile licensors in sharing the technology, because of the threats posed by Excel’s worldwide success. Consequently, HMC’s Excel was listed bottom of consumer reports automobile ratings, tarnishing the image. This led to the development of R&D networks – three centers in Korea of which one with a University Collaboration, two in the U.S and one each in Frankfurt and Japan. The R&D constituted 10 percent of the total company personnel. The R&D intensity was also increased to 4.4%. To regain success in the market HMC created a crisis by setting up a task force to develop a car ingeniously in a stipulated time. The task force started the work by collecting the auto product literature of the U.S. and the Japan to raise their tacit knowledge. HMC also hired two Koreans, who after U.S. Ph.D’s were working respectively for GM and Chrysler, and an engineer from British Ricardo. Through trial and error process, the task force broke several engines and tested as many as 324 engines, 200 transmissions, 150 test vehicles to develop Alpha engine and subsequently Beta engine whose performance rose further against comparable Japanese cars. As a result, HMC developed two new models Accent and Avante and managed to regain its exports. The lesson is the crisis construction by the top management which facilitated technological transformation and served as an antidote to inertia. The crisis also sped up the development cycle which was well supported by the work culture and the persistent attitude of the employees. A case in point is that the Koreans during 1960’s had no clue about car engineering and design, and were tinkering with the trucks that they used during the World war II.

Today in this crisis environment success depends upon the firms willingness, and the ability to mobilize and deploy resources for new product development. This has to be combined with agile manufacturing and a proactive customer service. This has been realized by a conservative firm like the Coimbatore based textile machinery manufacturer, Lakshmi Machine Works (LMW), which was sitting complacent because of the global order backlog. Earlier, the customers would wait long for months after placing their orders for the machinery and go personally to LMW’s premises to collect them. Today, LMW’s promoter visits the customers sites and delivers the order and guarantees replacement parts free of cost. Importantly, LMW has invested big money and efforts in its R&D and has planned to unveil its newly developed machinery for the millenium in the forthcoming Paris industry exhibition.

Trialability could be measured typically through the traditional measure R&D Intensity, that is investments in new products, processes, without including land and building costs, costs incurred for furniture etc., as done by a typical Indian organization.
Capital investments in R&D

\[ T_L = \frac{\text{Total Sales revenue}}{100} \]

In the Indian context, the investment of Wockhardt Pharma in their R&D is Rupees 300 million approximately (1997 data) on the sales of Rupees 3.3 billion. That is to say, Wockhardt’s R&D intensity is 9.09%. Likewise, Ranbaxy’s R&D intensity is 4%.

Risk-Readiness:

“Nothing Venture Nothing gain”.

Risk-readiness is the willingness to invest in new products/processes/services, for pursuit of excellence and not because under conditions of compulsions of survival. If there is no choice between survival and investments on new product lines, the investment cannot be considered risky. High risks are associated usually with innovations, because of the potential cost of failure. However, not innovating is perilous. As discussed above, for Glaxo, the first ever “parallel” development process in the Pharma industry was fraught with risk. This process doubled the work and consequently the expenses of testing rose from $17 million in 1976 to $40 million in 1981. Albeit the research costs put considerable pressure on Glaxo’s profitability during drug development, Glaxo did not deter and created Zantac as the most successful product. This is despite the fact that nine of 10 new drugs fail testing.

In the US during 1990’s, the competition heated up for alkaline batteries. In 1996, Duracell, and Eveready the makers of energizer brand, both introduced alkaline batteries with built-in testers. Consequently, both the organizations faced fierce battle from each other, creating an Armageddon. Duracell and Eveready engaged in spending more on marketing and advertising without increasing the price of the alkaline battery. Eventually both the organizations faced the burden of producing an added feature without any financial gains. Duracell and Energizer instead of investing in the battery to advance/differentiate the product, fought the issue over “battery-on-line-testers” patent in the court. Much of the Indian industries do not engage in product differentiation activities and engage in price wars. In a path analytic model, constructed by the present author after studying 43 organizations, the results indicated that Indian organizations are risk-aversive. Pre-emptive moves, product differentiation and substitution whilst, are the usual responses of organizations in a competitive environment, the path analytic results suggested that increased competition would decline technological innovations and consequently make Indian organizations less innovative and adaptive.

Risk-readiness is the attitude of an organization in conducting its business. The paper copier market in India is dominated by Modi Xerox possessing a market share of 60%, followed by Canon with 18%. Modi Xerox, not to be complacent, is pursuing a proactive technology policy and aggressive marketing to introduce digital copiers in the Indian market. However, Indian industry is hardly risk-ready, which is evident through an unclear patent policy of the government, and the number of product patents filed by our industries. The Indian industry lingering in a collaborative culture should emulate their Japanese and South Korean counterparts to experience a new learning curve/industry life.
cycle. That is to say, the primary task for Indian organizations is to come off from the culture of “know-who” and nurse a culture of “know-how” and “know-why”.

Innovative companies need to continuously innovate to sustain their position and leadership. For instance, the successful innovator, 3M’s long-standing goal to derive 25 percent of each year’s sales from products introduced within the previous five years has been stretched recently to achieve 30 percent of each year’s sales from products that did not exist four years ago. In the bygone discussion on ‘Sensitivity’, whilst the risks of product proliferation strategy was discussed, the strategy of most of the World class companies across industries appears to be fast churning of new products or models of dominant designs. In the motorcycle market of Japan, during the early 80’s product racing occurred between Honda and Yamaha. Whilst Yamaha introduced 34 new models and 37 product alterations in a 18-month period during 1981-82, Honda outsmarted with 80 new models and 113 product alterations. Rubbermaid, one of the Fortune’s top ten admired companies of the U.S. has the goal to fill retail shelves up to 300 items every year for the next ten years. The current goal of Rubbermaid is to gain 33 percent of any year’s total sales from products introduced in the previous five years. Examples are abound with Toshiba’s laptop computers, P&G’s diapers, H-P’s calculators. Risk-readiness can thus possibly be assessed by

\[
R_R = \frac{\text{Profits generated by products which did not exist four years ago}}{\text{Total profits}} \times 100
\]

Learning:

Learning is the faculty of an organization to assimilate significant knowledge from its environment, experience and history to facilitate change. Learning is a primary agent promoting efficient innovation creation. Learning is a process through which members assimilate knowledge concerning products/processes/technologies/services, over a period, enabling the members to transfer the learning across similar or dissimilar innovations in the future. In dissimilar innovations, individuals generate a lot of new alternatives, attempting to generalize and discriminate ideas based on their past learning, and in the process, acquire more knowledge.

During 1980’s, the Ford Motor Company initiated a unique product development process, namely “simultaneous or concurrent engineering”, and Ford termed the process “concept to customer” which emphasized consumer needs and manufacturability through every aspect of the process. Cross-functional teamwork was central to the project. This resulted in a reduced product development time of 4 years, shorter by 2 years than average. Moreover, the design cost was reduced to $35 million from a standard cost of $150 million. This further increased the manufacturability of the product. Employee involvement resulted in a major reorganization such as higher levels of employee satisfaction and increased morale. Ford Motors also increased its earnings to $4.6 billion due to the success of Taurus. Later, the cross-functional team continued the success by transferring the learning experiences of Taurus to refurbish the Mustang model. The new Mustang was developed in three years, costing $300 million, demonstrating the fastest and
lowest cost development project in the history. Similarly, continual learning has helped large corporations such as Honda, Toyota and Nissan to lower their product development cycle (PDC) from 24 months to 11 months, from conception to production.

Learning always through one's own experiences is simply not possible and is expensive. Organizations should continue to learn from other industry experiences. Apollo Tires drawing parallels from airline industry introduced a promotional campaign in the LCV and truck segment, known as 'loyalty reward', similar to the 'frequent flyer' program. Customers who would continue to buy Apollo Tires over two years will gain points, and accordingly be rewarded with Cars, Foreign travels, TVs, quarterly lucky draws etc. Learning takes place when organizations interact with their environments and increase their understanding of reality by observing the results of their actions. Thus, an innovative organization is one, which adapts through continuous learning and improves its learning capabilities by unlearning the old routines and inventing or adopting new alternatives. Bajaj Auto albeit quickly learnt to react to TVS's 100cc motorcycles, and the fast growing markets, by introducing KB 100 model, the product failed owing to less fuel efficiency and style. However, Bajaj, learning the mistake introduced rapidly the next version, KB 100 RTZ, with Delta engine and marketed with a powerful ad campaign utilizing a metaphor - cheetah. Achieving success, Bajaj also attacked Hero Honda's segment with 4-stroke engines and attained # 2 position in the motorcycle market, ahead of TVS and Escorts. Nonetheless, not to be complacent, Bajaj Auto continues to introduce new designs and models in the two-wheeler segment. Thus, innovative organizations learn while innovating and learning causes further innovations. However, this is more so for organizations conducting their own R&D.

Learning occurs in a variety of ways such as "Learning by doing", "Learning from industry spillovers", and "Learning by interacting" with customers, vendors universities, labs, etc. From Mazda, Japan, the design engineer visited the vendor, who was supplying aluminum engines and brakes, to work closely together from the start-up of the project. This unconventional approach, usually the corporate- houses guard design as a secret, increased the manufacturability and the quality of the products. Further, the vendor did not face complications, which are customarily experienced by looking at the drawings. For Fuji Xerox, vendor involvement augmented supply flexibility and the speed of supply. This is how the Japanese organizations enhance their innovative potency by widening their learning base at each phase of product development.

Learning is crudely measured in many organizations by the number of man-days trained in a year across levels, over the total number of employees at the corresponding levels. The difficulty is in terms of evaluating ROI (return on the individual) in terms of work improvement, productivity, attitudinal changes etc. In addition, albeit the funds allocated for continued and higher learning for individual development are used as measures, the problems remain the same. Thus, ostensibly learning potency could be measured through the final outputs, i.e., extent to which the organization has generated new products, the level of differentiation in the products, processes and other managerial actions, in other words, product innovations, process innovations and managerial innovations.

Learning could be assessed by the CEO and his team by examining the content, i.e., the extent to which the product/process has departed from its earlier version. Furthermore, the degree to which the product/process are useful and successful should also be considered as the parameters. The success of the product could be assessed in terms of the market value
or the profits it has generated. However, in the case of non-availability of data, the perceived success appears to be a better device, and therefore, subjective responses could be sought from the concerned members. In the case of process innovations, while savings could be an indicator, availability of information due to estimation and problems of record keeping could cause difficulties. Alternatively, perceptual judgements appear to be the choice. Further, the usefulness of the product/process/managerial innovation could be evaluated by asking the actual user’s of the innovation. That is, the product innovations could be evaluated directly by the customers through a customer satisfaction index. Similarly, the members of the organization who are the “users” would be capable of evaluating the implemented benefits of the process and managerial innovations. Thus, the product/process managerial innovations could be evaluated by employing the following formulae:

\[
\text{Product Innovation} = \frac{C + Pp + U}{(I_1 + I_2 + I_3)} \times 100
\]

\[
\text{Process Innovation} = \frac{C + I b + U}{(I_1 + I_2 + I_3)} \times 100
\]

\[
\text{Managerial Innovation} = \frac{C + I b + U}{(I_1 + I_2 + I_3)} \times 100
\]

Where, \(C\), \(I b\), \(Pp\) and \(U\) respectively refer to the parameters – Content, Implemented benefits, Perceived profits and Usefulness; and \(I_1\), \(I_2\), \(I_3\) refer to the total number of items/questions used to measure each parameter. In measuring, all the three scales should entail a five-point scale – only 1 to 5 and not 0 to 4 or –2 to +2 and the like. However, if the CEO and his team identifies that the parameters \(C\), \(Pp/Ib\), \(U\) are relatively not equal in terms of importance to the organization’s objective, weights can be assigned. The weights can be distributed in per cent, such that the three weights sum up to 100%. The equation, for instance, to measure product innovation is:

\[
s\times W1 + Pp\times W2 + U\times W3
\]

Assuming, the average scores obtained on a five-point scale for the parameters \(S\), \(Pp\), \(U\) are respectively 3, 4, 4 and the weights assigned correspondingly are 3, 4, 3, the equation is written as:

\[
3\times 3 + 4\times 4 + 4\times 3 = 3.7.
\]

The output of the weighted equation is evaluated on a five-point scale, as used to measure the parameters. Thus, the score 3.7 indicates that the product is an innovation to a larger extent, on a scale ranging between to a very little extent though a very large extent. In other words, this product innovation can be interpreted as a major or a radical innovation. However, to convert the score into percent, the output should be multiplied twice, since, it is on a five-point scale and subsequently multiply by 100, i.e., \(3.7 \times 2 = 7.4 \times 100 = 74\%\). Thus, an organization’s learning could be assessed holistically either by arriving at an
Absorption:

Absorption is the ability of the organization to contain disruptions, caused out of experimentation, change and innovation. Innovations create disruptions in the system because they involve change and a redirection of organizational energies which may result in new strategies, product/market opportunities, working methods, processes and the structure. A new product line or manufacturing process introduced may necessitate departures from the existing practices. General motors launched a small car in 1990's in a competitive move against Japanese carmakers. Since, Saturn project was not liked by other GM divisions, production problems occurred. This caused significant Saturn recalls (one of the units involved recalled its entire output). This was followed by a recession in the market, and the Gulf war which furthered the crisis. However GM absorbed the disruptions, and converted the recalls into opportunities. For instance, one recall was used in an ad campaign demonstrating Saturn’s commitment to customer satisfaction. This increased GM’s sales significantly.

The decision to innovate should fit appropriately with the organization’s ongoing system, which includes technology policy, skills/abilities, resources and other management systems and values. Failing to arrive at a fit by being over ambitious can initiate organizational indigestion, ultimately causing an organization’s death. Western Group, Real Value Systems are some examples. NEPC is another classic example. Overwhelmed by the success of NEPC Micon, due to the demand for electricity and the support of Government regulations, NEPC chose conglomerate diversification strategy and ventured into Agro, airlines, textiles, sugar businesses. Unable to absorb the changes and disruptions caused by multiple businesses and the loss of support from the Government due to new regulations such as introduction of MAT, withdrawal of subsidy etc., NEPC lost its business in all the ventures.

Organizational disruptions are also due to the manifested conflicts of the employees. An organization failing to absorb or resolve the manifested conflicts will more likely result in lockouts, strikes, work stoppage, sabotage and other grievances. A poor organizational climate and health of an organization can lead to latent conflicts. Organizations unable to absorb the latent conflicts by altering the climate, structure and process elements will encounter absenteeism, turnover, tardiness and work withdrawal. Thus, the absorbing ability of an organization can be measured through its realized outputs:

\[
A_B = \frac{\text{# of products introduced}}{\text{Industry average}} \times 100
\]

In conclusion, a firm to be innovative needs to be sensitive, risk-ready, engage in problem-solving, and experimentation, absorb disruptions, and learn continuously. However, whilst not all-successful firms are innovative, innovative firms need not necessarily be successful. There are several explanations for this. One, innovations need to be created continuously. In the sense, in a growing market, firms need to churn out many new products or engage in continual product alterations to defend its market position. Examples of this kind were presented across the discussion. Two, innovating is risky.
Because of the irreversibility of the resources committed to it. History has shown that the failure rate of innovation is as much as 75 percent. Several factors, including, failure to understand the products at the customer level, failure to perform a careful performance-cost analysis, radically new technology-push products, interface issues, timing of the product, contribute to the failure of innovations. Three, product innovations need to be combined with adroit marketing techniques to achieve success. Earlier inventions and innovations such as steam engine, CT Scanner albeit belonged to Britain, it was not adept in commercially exploiting the major innovations. Similarly, other examples such as VCR were discussed earlier.

Firms, however, can be successful by not being innovative. Success without innovations is possible by being sensitive to the customer trends and intuitively serving with products that would meet their wants. In other words, firms by being sensitive, learning from others, that is, creative imitations, and by absorbing any disruptions caused out of this process can be successful without conducting R&D and problem-solving. The Hong Kong companies are known for imitating the designer brands. Their skill lies in imitating the designer labels quickly and supplying the products speedier to the shops than the designer brands supply them.

Risk-readiness is thus the attitude of the company. There are many firms in India which attempts to be innovative by not venturing into risky projects. For instance, Wockhardt Pharmaceuticals introduced about 72 products during two years of 1996 and 1997. The aim is to introduce as many products as possible such that the failures of some drugs can be leveled by the success of some other drugs. Wockhardt achieved success in creation of so many products by engaging in work on - molecules which are new to India but are under patent in the advanced countries, presentation of the existing drugs in alternate forms such as from tablets to dispersible ones to capsules, offering them in attractive shapes and varied size and demonstrating value in the packaging. By doing so, Wockhardt minimized the risk. Tata Indica has also managed to successfully minimize the risk by transplanting Nissan's assembly line from Australia and buying two of the three presses from Mercedes Benz. Further, was the technology choice to integrate the links of the value chain tightly, select established vendors, and make them benchmark against components of comparable cars. Risk-readiness is the most desirable attribute for an innovative firm. Firms lacking it may be successful in the short-run but not certainly in the long-term interests of the company. If firms increasingly emerge with strong contention of an unassailable leader such as Rubbermaid, 3M, Honda, Sony, Toshiba, H-P, P&G etc., creative imitations will prove quite difficult. In this context, customer acceptance would probably be low as well. Further are the patent regimes and trade blocs that can fortify an innovative firm's products. Thus, conducting own R&D creatively and exploiting the opportunities out of them adroitly is the answer probably for companies worldwide and importantly for Indian ones.

Finally, it was my desire to develop an aggregate measure for innovative potency. However, difficulties are there in integrating the various measures of innovative potency such as sensitivity, learning etc., because, the unit of measure is not the same across all the variables. Thus, further inquiries preferably by the practitioners are important to arrive at a facile measure, which could be used by managers off the shelf, to examine and assess the Innovative Potency of their firm.