MANAGEMENT OF INNOVATION : ROLE OF ENTREPRENEURSHIP

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SUMMARY

Individual entrepreneurship is essential for innovative activities
to flourish in organisations. More so, if the organisations have
to survive in competitive environment under conditions of rapidly
changing technology and market forces. Usually, when the orga-
nisations are small, they demonstrate a high degree of entrepreneur-
ship. But as years go by, and when the organisations become larger,
there will be a visible decline of this quality and the organisations
tend to acquire bureaucratic tendencies. Such situations are en-
countered, even in advanced countires where free mobility of people
exists and the organisational structures are not permanent. However,
in the context of developing countries like India, where the orga-
nisational structures tend to be permanent and the mobility of
people is severely limited, the problem becomes more acute. Even
under these conditions, organisations can retain their entrepreneurial
traits by devising organisational forms capable of transmitting know-
ledge and information across functional and divisional boundaries and
of responding rapidly to change.

Introduction

Management of Innovative Activities like Research and Development
is a difficult task. The task becomes more demanding in the case
of Industrial establishments characterised by dominant innovation
and which have to operate in a relentlessly competitive environ-
ment. Success to these establishments is assured only when they
constantly respond to changing situations. A classic example is
the field of electronics where change is rapid and innovation is
the key-word. Only those organisations, which were constantly
striving to adapt themselves to the changing scene and which were
equipping themselves to meet the new challenges survived and flou-
rished. Hundreds of books have been written on this subject and
most of them are from the western countries. Understandably so,
because extensive "Development Management" or "Management of In-
novation" has taken place there. Our discussing this issue now

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is very apt and pertinent because the country is in a strong
development phase and at this stage these developments have to be
"managed". Traditionally, in earlier days, management in our
country - it will be more apt to call it administration - has been
one of status-quo management. In other words, running the existing
things smoothly. During the British days, it was one of law and
order maintenance and revenue collection. Even after independence,
when we began creation of a large industrial base in the country,
most of the industrial establishments that came up in the country
were based on collaborations with one foreign country or the other.
In all these instances, products were known, manufacturing processes
have been proven and established. We have adopted these totally
including in some cases even the management systems. Our responsi-
bility in these circumstances was to keep the things going. How-
ever, of late, India, having created a fairly strong industrial
base and infrastructure, is striving more and more for self-
reliance. R&D activities and subsequent productionisation are
becoming increasingly important. In this context, management of
innovative activity and innovative people assumes crucial pro-
portions. The organisation has to be conscientiously structured
for sustaining the innovative element.

Innovation

The term 'Innovation' which we have been using here should be
understood as that process by which a new idea is successfully
translated into goods or services to create an economic impact.
It is much more than just Research and Development. When an in-
vention is carried all the way through development, production,
marketing etc. to make an economic impact on the society it is
innovation. Let us understand it that way.

One more point about which I want you to have a clear idea is
that we are not talking here of those epoch making and stunning

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inventions and discoveries made by almost super-human geniuses,
We are discussing here only about the management of the average
creative engineers and scientists, who are not extraordinary
but just bright people with a will to triumph and we are discus-
sing about those organisations where such people can flourish
and succeed.

Management Difficulties

Technological innovation raises some difficult problems for
management. The difficulties arise because of the degree of
uncertainty inherent in the process, the unique nature of the
task which is non-repetitive, the type of people to be dealt
with. Scientists and Engineers are "knowledge workers" and
managing them will be difficult. They differ from other employ-
ees in their expectations, attitudes, values and motivations.

Organisational Framework for Innovation to flourish

Several studies have been conducted by Management Scientists
in recent years to observe under what conditions innovation
flourishes. After a study of organisational structures in over
hundred electronic and other innovation based companies in
Scotland, Burns observed that innovation is more likely to
flourish in a framework which is "Entrepreneur centred" rather
than "Management Centred". The individual spirit of enterprise
or the entrepreneurial capability was behind the success of all
establishments engaged in innovative activities. A brief study
of the "Management Centred" organisations will help understand
the contrast better.

Management centred organisations are characterised by bureau-
cracy and "role culture". In these set-ups the role or job
description is often more important than the individual who fills
it. Individuals are selected for the satisfactory performance

of a role and the role is usually so described that a range
of individuals could fill it.   Position power is the major
power source in this culture and rules and procedures are the
major methods of influence.

The role organisation will succeed as long as it can operate
in a stable environment. When next year is like this year, so
that, this year's tested rules will work next year, then the
outcome will be good. Where the organisation can control its
environment by monopoly, where the market is stable, predictable
or controllable or where the product life is a long one, then
rules and procedures and programmed work will be successful.
Thus the civil services (monopoly in a sense), the automobile
and oil industries (long product life cycles), life insurance
companies and banking belong to role cultures and are success-
ful. Role cultures are slow to perceive the need for change and
slow to change even if the need is seen. This is the reason why
we hear of complaints against bureaucracy in times of need.
Even in the case of industrial establishments operating in the
role culture - if the market, the product needs or the competi-
tive environment change, these organisations will be found to be
sadly lagging behind and they will collapse. Many large orga-
nisations abroad found themselves in this position in the chang-
ing conditions of the 1960s.

But in the case of organisations, which innovate, which respond,
the framework will be different and will be entrepreneur-centred.
These entrepreneur-centred systems are adapted to unstable con-
ditions, when problems and requirements for action arise which
cannot be broken down and distributed among specialist roles
within a closely defined hierarchy. Individuals have to perform
their special tasks in the light of their knowledge of the tasks
of the firm as a whole. Tasks lose much of their formal defini-
tion in terms of methods, duties and powers which have to be

redefined continually by interaction with others participating
in the task. Interaction runs laterally as much as vertically.
Communication between people of different ranks tends to resemble
lateral consultation rather than vertical command. Omniscience
can no longer be imputed to the head of the concern. The influen-
cing methods will not be through position power but through indi-
vidual expertise or enterprise. "The entrepreneur adds vision to
his planning, flexibility to his organisation and daring to deci-
sion making" and will be prepared to take total responsibility for
any task that he takes up and will be determined to make a success
of it. The responsibility of the organisation will be only to
provide an environment for these people to function effectively.
No other major motivation need be offered by the organisation.
As aptly pointed out by Lewis M. Branscomb, Vice President and
Chief Scientist of IBM, there can be no higher motivation to an
individual from outside than his own self-motivation to achieve
and succeed. The managerial ability to foster, nurture, and sustain
this enterprising spirit in the individuals, at various levels,
will determine the success of the activity or the establishment.

High enterprising spirit when the organisation is small

In the initial stages, be it a Research and Development Laboratory
or an Industrial Establishment, one finds the enterprising spirit
at its highest. When the organisations are small, they will be
very innovative, responsive and also very enterprising. The indi-
vidual skills are manifested at their highest, the organisational
growth is faster and there will be a happy blending of the indi-
vidual and the organisation growing together. The reason behind
this success can always be traced to the high entrepreneurial capa-
bility of the person, who heads this small organisation in the
initial stages. This entrepreneurship is demanded of the leader
because he has to bring up an activity from scratch and should es-
tablish the organisation so that it can get going.

Growth poses problems

Coupling of development, production and marketing

As the organisation grows and expands one of the problems encoun-
tered is the transfer of technology from development to production
and from there on to marketing. This issue is very pertinent to
us because we are discussing establishments which are not only
characterised by high R&D content but in addition have to take their
goods or services to their ultimate end use. This problem was en-
visaged and expressed beautifully by Dr. Sarabhai. To quote him,
"The primary task of dundamental research is to discover; of Research
and Development is to optimise and of Industry to produce; and one
of the main problems faced in the organisation of innovative insti-
tutions or establishments is to link these three cultures and to
provide a basis by which transfer of knowledge of men and technology
can proceed from one step to another interacting freely and benefit-
ting one another." The success of an Industrial Establishment not
only depends on its R&D but it is also dependent on how the product
initially developed is subsequently productionised, marketed and
supported. If the institutions and establishments engaged in the
development activities are also burdened with commercial and competi-
tive constraints they find the going very tough. When the lead times
are short and when the product needs further perfection, things cannot
be done in an isolated manner in individual islands - islands of deve-
lopment, of production and of marketing. A successful pattern of
technology transfer often involves people moving with ideas from
research all the way through production and the organisation should
make this easy. It is very difficult to transplant new ideas from
one organisation to another. The development of new ideas has to
be left in the hands of originating group until sufficient probability
of success has been demonstrated. New ideas should not be transferred
prematurely just because they lie outside the assigned tasks of the
originating organisation.

Decline of entrepreneurial spirit with time

It is not just a case of "good old days" but many of us are aware of many organisations which have exhibited tremendous enterprising spirit, in the initial stages showing visible decline in this aspect as years go by and as the organisations become larger. The enterpreneurial capability so highly manifested in the early times appears to have gradually evaporated. Under such circumstances, leave alone the growth of the organisation even the survival of it is endangered in an environment full of competition. The problem merits rather detailed study. Let us try to understand the typical entrepreneur and how the growth of the organisation can affect him.

The entrepreneur wants individual and personal responsibility for managing and running a business situation. He wants neither the easy routine job nor the too-hard-to-solve problem. He operates in the area where he knows he can be effective without being underutilised. What's more, the entrepreneur is results-oriented rather than efforts oriented. He rarely needs or likes any control exercised from above. He would like to be recognised along with his task. The role of the management above becomes essentially one of promotion and guidance rather than regulation and control. The top management functions will at best be allocation of projects and resources. For mainly promotional purposes a number of managerial layers above the entrepreneur is not called for and in fact, multiple levels come in the way of his freedom and recognition. The increase in layers above the entrepreneur, as the organisation grows, gradually breeds a culture of bureaucracy in the organisation, which no doubt is good for steady state operations but suicidal for innovative activities and also in situations where fast response is required. Even in advanced countries where mobility of people is free and feasible, this type of problem is encountered. This is not withstanding the fact that there, organisational structures are temporary and this transitory nature of organisational/work structure is recognised and accepted by people.

But under conditions obtaining in developing countries where mobility of personnel is severely limited, there will be an accumulation of staff and layers get formed above the entrepreneur and the problem becomes more acute. Ultimately, the organisation, because of the situation it finds itself in, becomes management centred. The purpose for which the organisation was originally started, namely to be innovative and highly responsive, gets totally defeated. <u>The entrepreneurial personality does not fit as easily into the large company as it does the small one.</u> This is the reason why small new units which come up later, either as R&D units or Industrial establishments outbeat the large established concerns in their own game. This kind of situation can be easily perceived in the field of electronics where change is rapid and when large units become too inert to respond to changing circumstances. Experiences in western countries, narrated below, corrobrate the point better.

The difficulty of maintaining innovation in large organisations has been described by P.Haggerty, the President of Texas Instruments - a highly innovative firm. According to him, as the organisations grow larger the complexities increase and the financial constraints become more pronounced in a competitive environment. There will be need to cut costs and to increase operational efficiency. Managers who are very good in the job of administration come into picture. There will be a tendency to consolidate and stabilise on the existing products or adding the kind of products and services that flow naturally from the business one is already in, supplementing the markets in which one already engages, doing effective work in cutting costs and lowering prices - all essential, but unlikely to provide the step function in product and service necessary for dynamic growth. A time will come when the growth rate slows down or falls below that of the industries in which the organisation exists.

Also, management of technological innovation, will involve confronting with tasks which will be difficult, unfamiliar and entirely new. The tasks demand technical expertise which belongs more and more exclusively to the young, recently qualified - and junior - manager. This fact is often not recognised and the young entrepreneur is given a cold shoulder. An empirical study was conducted in the USA by Roberts of innovative ventures in a large company and his observation was that "The young men received less encouragement than the older men, they were given less latitude for independent action, had less say in formulating the judgemental criteria for the venture, experienced less co-operation between their venture and the company, experienced a good deal of trouble in securing capital support for their project and had a lower level of sponsorship for their project ......".

How to sustain entrepreneurship in large organisations

The prime requirement for the successful management of innovation, according to Dr. Sarabhai again, would appear to be entrepreneurship - not only in the individual but in organisational forms capable of transmitting knowledge and information across functional and divisional boundaries and of responding rapidly to change and in evaluation methods which take account of technological and market uncertainties and the nature of the various stages of the innovation process. The organisational forms should be such, as would demand entrepreneurial capabilities in people and should be able to maintain a high organisational enterprise. Task forces, task teams etc. are temporary work structures which fall into this category of organisational forms. Project teams, product teams etc. also belong to this category but for relatively longer task periods. Organisation of a division or section which has clear out goals and targets which are periodically reviewed and reset is another method available wherein one can trace and establish personal accountability. Similarly, extending the concept further, one can envisage a techno-economic unit such as a product division spanning development, production and marketing. This is a more lasting form of

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organisational structure which has to respond to market forces
and technological changes automatically. It is a self-respon-
ding unit in which response is inevitable and built-in. Even
if separate divisions and units cannot be formed within the com-
pany, hypothetical micro companies can be formed as profit cen-
tres to create "small-business environment and to create entre-
preneurial managers".

Large corporations must give potential entrepreneurs an opportu-
nity to manage and to achieve by granting them responsibility
and authority. The inevitable pre-occupation of large firms with
existing business together with the difficulties of getting across
functional and divisional boundaries have led some firms - such
as DuPont - to create a system of so-called "Venture management".
The essence of this system is that implementation of new ventures
leading to radical technological innovation is separated from the
existing business. One person is made fully responsible for the
project, in charge of a full time team thereby creating the advan-
tages of the "small firm" environment namely commitment, flexibi-
lity, rapidity and incisiveness in decision making. Such a system
is particularly appropriate when entering technologies or markets
radically different from the existing business. Members of such
venture teams must be at home in an environment of uncertainty
and rapid change.

William Copulsky and Herbert W. Mcnulty conducted wide surveys on
these lines and observe "New projects are assigned to men who are
given wide authority and responsibility ....At the 3M Company, this
philosophy is a way of life that permeates both new and established
ventures. The company is a prime testimonial that an entrepreneuri
approach can work for a large corporation. Besides a New Business
Ventures Division, 3M uses a venture approach to product developmen
at divisional levels. If the orginator of an idea (he can come fro
research, marketing, manufacturing, or some other function) can con
vince his supervisor or other appropriate unit leader that he has a
good idea, he may become a project manager and be allowed to run
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with the idea . . . . . "

Further, the authors add,"3M encourages the early formation of minicompanies or product teams made up of technical, marketing, production, and financial people recruited, rather than assigned, from other jobs at the company . . . . . If they flop, they may lose out on several years of organisational growth, but will have gained valuable off-setting experience. Also, while entrepreneurs who fail in their own businesses are likely to lose some of their own capital and have to look for a job or find the capital for a new venture, those at 3M move back into a new job that takes advantage of their entrepreneurial experiences, thus allowing them to learn from failure as well as from success".

Copulsky and Mcnulty studied other companies also and they assert that "Most companies are following in the footsteps of 3M; others, like Sony, Jim Walter Corporation, and Saga Administration Corporation, are taking another approach, one designed to grant increased personal responsibility to individuals at all levels. At these companies, relatively small, autonomous teams have been formed that are centres of responsibility, authority, and profit, and in which teamwork is the order of the day. Unlike the conventional organization with its highly vertical structure, these companies feature horizontally organized teams laced together into a network or matrix. The individuals in each team and the teams themselves are held together by common attributes and goals. At Sony's Atsugi plant, for instance, vertically and horizontally connected teams, each with two to 20 members, meet weekly to exchange information and decide how to act. The leader is a team member who guid the meeting; he is not a power centre. Top managers also are not power holders. They are colleagues who help the group in establish ing common goals and lead in encouragement and attainment of goals.

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Each of Jim Walter Corporation's eight profit centre units is managed by a vice-president whose role is only partly that of a supervisor, but primarily that of consultant, sounding board, and communication interface for the operating units. Middle managers have complete authority over their operations. Communication flows from and across all levels of management. Profit centre vice-presidents make sure their units grow, provide the tools for growth, help in budgeting and planning, and push a little.

Saga Administrative Corporation, too, is moving in the direction of an entrepreneurial organisation-that is, one designed to make entrepreneurs out of all its personnel. The company's goal, as stated by the organizational development staff, is to "encourage entrepreneurial spirit that will result in personal feelings of power, excitement, fun, and a sense of fulfilment throughout the organisation". As a result of a 1968 organizational development program, interlocking teams have been formed through which an individual can voice his opinion and be heard in company decisionmaking processes. Also, the role of top executives has changed; they act more as coordinators than as order givers or policy makers".

All the methods pointed out above, are only methods of decentralising the organisation so that each decentralised unit can function sufficiently autonomously and just as freely as a small organisation with all the attendant benefits. These measures will help the establishment of traceable performance accountability. Such measures will help ward off the creeping in of bureaucracy. <u>Thus the structure of the organisations which have dominant innovative characteristics and which have to demonstrate dynamic response to changing situation will be flat and horizontal at the top compared to the traditional vertical structures of the bureaucratic hierarchies.</u>

Training to be an Entrepreneur

The characteristics of an entrepreneur are not ones that we know how to instil by schooling. Today's business school is too far removed

from the practical problems of business and may not even know
what it is that the entrepreneurial business executive will have
to know. Corporate entrepreneurs have to be trained and tested
on the job, just as the small-business entrepreneur is tested in
the real business world. Still, there have been a number of
training programs stressing achievement motivation that have been
successful.

One training program was conducted in India under the direction
of David McClelland and David Winter.

Although the experimental course lasted only 10 days, within the
next two years those Indian businessmen who had taken the course
started four times the number of businesses, invested twice as
much money, and created twice as many new jobs as those who did
not take the course.

The need-for-achievement concepts of McClelland are also being
used in a training program at TRW's Systems Group at Redondo
Beach, Calif., by William Curra, organization development manager
for system Development Corporation, and Dr. R.Douglas Brynildsen,
organization development manager at the TRW Systems Group. Career
achievement workshops have been set up to identify occupational
profiles in people and help change those profiles where change
could be beneficial.

Aspects of concern in Entrepreneur-Centred Organisations

While the need for entrepreneurship in organisations is established
for innovative activities to flourish, certain crucial aspects that
crop up inevitably in running the organisations should be taken note
of. Individuals play the vital role in these set-ups. Appreciation,
understanding, trust and a spirit of sharing become absolute necessi-
ties among the entrepreneurs themselves and between the management
and entrepreneurs. This is very hard to achieve. In the absence of

these, an atmosphere of confusion, mistrust and frustration is
bound to develop. When the resources are unlimited the situation
will be relatively easy to manage. But when there are commercial
and competitive forces acting, and when the resource position be-
comes tight the objectivity and rationality of the management will
be very difficult to establish. In addition to these factors, new
entrants to the organisation, not exposed to this style of working
will find the environment mysterious to comprehend and difficult to
adapt. In this context, it will be a major responsibility for the
Management to be able to make the people comprehend the situation
and find their feet in the organisation. Further, if the organi-
sation is structured into will knit (and almost) self contained
groups taking into consideration the intensity of interaction and
interdependence requirements then the intra-group problems of trust,
understanding and confusion will be solved to a large extent. The
inter-group relationships can be maintained on a fairly well defined
basis approaching almost commercial relationships.

Organisation requires a cultural mix

In the overall context of an organisation, it should be borne in
mind that not all the tasks call for entrepreneurship nor all the
people are entrepreneurs. There will be tasks which demand
enterprise and entrepreneurship and there will be tasks where
conventional administration is required. Similarly some people
will be endowed with entrepreneural capabilities and some with
administrative and other capabilities. A correct delineation
of the tasks and the correct assignment of tasks will contribute
to the success of the organisation in a large measure. The sugges-
tion is that organisations should differentiate their cultures and
structures according to the dominant kind of activity in that de-
partment, division or section. R&D for instance should be organised

differently from accounting department. The innovative part of marketing can be expected to be more informal, more task oriented than the assembly line. The management of crisis should over-ride committees, rules and procedures. The management of steady state activities should properly be concerned with rules, procedures, regulations and formal controls. But if these are applied to the innovation areas of the organisation, they will suffocate.

Entrepreneurship - vital for innovation and response

When innovative things have to be attempted and succeeded at, entrepreneurship is vital and the success of the organisation in cultivating the entrepreneural culture will determine the ultimate success of the organisation. People who are basically enterprising will no doubt prove very successful in such situations. But organisational forms and the task forms can be skilfully devised to demand and develop the entrepreneural capability in epople even if they arenot naturally endowed with the quality. In the words of Copulsky and Mcnulty "A new wind is blowing, and it is a strong one. Corporate life is changing as companies realize that they need more than young managers who demand and get high starting salaries, work a standard day religiously, keep in line, and concern themselves about security. Business has come to recognize the need to foster and sustain entrepreneurship, realizing that failure to do so may result in a kind of in-house recession. And even large corporations - whose hierarchical structure inhibits adventuresome people - are discovering that it is possible to find and keep entrepreneurs."

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