

Table 1.3 Functions of entrepreneurs (Contd.)

<i>Major functional areas</i>	<i>Functions</i>
Managing production operation:	<ul style="list-style-type: none"> • prepare and review from time to time sections and master budgets, besides periodic funds-flow estimates; • maintain proper books of accounts, prepare annual profit and loss statements and balance sheets; and • analyse financial statements, compare actual performance with budgeted estimates, and enforce financial control.
Managing workforce:	<ul style="list-style-type: none"> • acquire details of basic technical knowledge and production operation; • formulate purchasing policy and inventory control system; • formulate framework for total quality control and guidelines for production schedule; and • ensure that every component/raw material procured is of right quality, from right source, at right price, in right quantity, and is delivered at right place and in right time.
Managing market:	<ul style="list-style-type: none"> • arrange systematic manpower planning; • prepare job descriptions for all positions at all levels; • decide pay and perquisites for each position; • select and recruit right person for right job; • assign responsibility and delegate authority to the key personnel concerned; • supervise, train and motivate employees; and • evaluate each employee's performance periodically.
	<ul style="list-style-type: none"> • collect and analyse regularly data on customer desires with special reference to product quality, function, pricing and after-sales service; • work out and adopt a comprehensive marketing mix approach involving usable marketing strategy and techniques; • put into effect and monitor the course of action on new product development, its basic designing, presentation, packaging and labelling; • determine and conduct periodic review of pricing policy bearing in mind (a) the actual cost and market image of the product or service, (b) the need to achieve marketing target, or (c) the compulsion to effectively meet challenges from competitors; • select and review marketing channel and ensure smooth flow of goods to marketplace; • review and, if necessary, take corrective steps in advertising, publicity, personal selling and other promotional schemes; and • motivate sales and servicing personnel and closely study their market assessment.

ROLE OF CREATIVITY AND INNOVATION IN ENTREPRENEURSHIP

Creativity

Creativity refers to the intellectual power to create something new. This intellectual power, in fact, symbolizes the quality of imaginative skills to create something original rather than to imitate something which already exists. Simply said, creativity usually refers to the intellectual ability to make or do something never seen or known before, be it a physical object, production process, device, artistic object or form, solution to a problem and so on.

Creative ability often gains recognition based on what and how something is created, namely: a creation which is entirely new; a creation achieved by synthesizing two or more unrelated things or factors; and, lastly a creation obtained in an entirely new shape by complete modification of something that existed earlier. Michael Michalko, author and specialist in creative thinking workshop for organizations, suggests that persons gifted with creative skills may be classified under two broad groups. For instance, one group comprising people of artistic talent such as painters, sculptors, musicians, directors, actors, lyricists, mime artists, comedians and authors and the other class which includes persons who make entrepreneurial use of creative ideas in business, profession or personal services in the fields of architecture, accounting, advertising, health care, information technology, consultancy and so on.

Cultivating Creativity

The power or quality of imaginative skills to produce something new is greatly influenced by the creativity process or flow of imaginative thinking, which ultimately contributes to the formation of unique creative ideas. There are several means of access to creative ideas and we will now discuss some of these processes.

While hunting for a good idea, one should go through countless number of ideas. This is because the thoughts coming down at the latter end are more refined or more mature than the earlier ones. The legendary inventor Thomas Alva Edison insisted that to pick up an idea worthy of being chosen, an individual must generate many. Edison, who did not have any formal education, reportedly left 3,500 notebooks that contained chronological records of his creative ideas. It is said that his employees were required to complete 'idea quota' as he prescribed for each of them. As for himself, he worked towards achieving one small invention every 10 days and a major invention every 6 months. Edison obtained 1,093 patents for his inventions that included lightbulb, phonograph, motion-picture camera, alkaline storage battery, electric pen, talking doll and a host of other objects.

According to British scholar Graham Wallas, a creativity process passes through the following phases: idea germination, preparation, incubation,

illumination and verification. Free play of imaginative thoughts, usually originate in germination of ideas once an individual takes interest in something or tries to find a clue to a certain difficult situation. It is this inquisitiveness that preparations begin so as to know more about the subject of interest or the problem to be resolved. In case this preparatory phase leads to the formation of a crude idea, next begins the search for ascertaining whether the idea thought about can indeed be translated into a reality. Consequently, at this preparatory stage, attempts are also made to collect more information and attain better awareness to be able to accomplish the objective. Incubation is a phase in which the subconscious mind of a creative person makes a critical appraisal of the subject matter from different angles, and he/she does this without any conscious planning. This act of seeing intuitively into the inner nature of a thing is not carried out consciously, rather it is practised without deliberate intention. And that being so, the subconscious state of the mind helps one to know and recognize mentally all that is not seen or understood ordinarily. It has the power to identify and choose what is true and appropriate. Such gains made through the workings of the subconscious mind do not usually come by in case one is consciously engaged in a formal analysis in search of a quick businesslike solution. Illumination is a phase when the workability of an idea is considered a distinct possibility. Illumination takes place as a favourable opportunity comes about increasing the chances of an idea turning into a reality. In the verification phase, steps are taken to verify whether in actuality the idea conceived can secure a commercial success. The success of a creative idea will be demonstrated only when it is translated into a profitable product. An idea conceived may seem to be feasible technically and otherwise, but eventually it may turn out to be useless and valueless if it fails to deliver a profitable product. A newly developed product may not sell in the market due to a variety of reasons. For example, among other things, lack of consumer interest, overpricing and/or inferior quality may render a new thing absolutely uncompetitive and/or unwanted in a market.

Another commonly used approach to creative thinking is "PMI" technique. The letters P-M-I stand for Plus, Minus and Interesting respectively. To explore the possibility of picking up the right idea in a particular instance, attention should be directed to the positive, negative and interesting aspects of each of the series of thoughts that one imagines in abstract form. In this approach to sharpen the intellectual skills, the positive aspects of an abstract thought should be listed under the 'Plus' column, similarly the interesting aspects, if any, under the 'Interesting' column and the rest, neither positive nor interesting, should be discarded under the 'Minus' column. The positive aspects, if any, will inspire the thinker to pursue the related thought further in search of a creative idea. As regards the interesting aspects, one has to decide if one wishes to hang on to the relevant idea for probable use in future for some other purpose.

Again, some authors suggest that the creative thinking strategies can be divided into four typical stages: unconscious scanning, intuition, insight

and logical formulation. Unconscious scanning implies an unprepared and unintentional mental process to know and recognize the problem that may not be quite plain and clear in case one thinks over the matter consciously. Intuition involves the search for a new combination as also the integration of diverse imaginative exercises. Intuition is more relevant in group discussions such as brainstorming and synectics, where several alternatives are considered. Insight refers to the act of seeing, through reasonings and experiments, the inner nature of multiple thoughts not quite related to the major problem in view. Logical formulation signifies the result of a systematized exercise undertaken to affirm the acceptability and accuracy of an idea conceived with a specific subject in mind.

Good ideas are conceptualized through intensive creativity exercised by creative persons either individually or in groups. Brainstorming is one such group exercise where talented persons discuss among themselves various aspects of their thoughts and thereby finally help derive creative ideas. Alex E. Osborn, who conceptualized the brainstorming theory, identified nine ways to manage the process of modifying and refining imaginative thoughts. To help memorise these ways, author and educationist Bob Eberle summed up the brainstorming technique in a single word: "SCAMPER". The alphabets S-C-A-M-P-E-R stand for (1) Substitute, (2) Combine, (3) Adapt, (4) Magnify, (5) Modify, (6) Put to other use, (7) Eliminate, (8) Rearrange and (9) Reverse. While series of immature ideas run in one's head, an individual may ask himself/herself whether it is possible to:

- Get a better substitute for any of those already thought of?
- Combine the subject of interest with any of those?
- Adapt any of those to suit the subject of interest?
- Magnify any of those?
- Modify any of those to suit the objective?
- Put any of those to some other use?
- Eliminate any of those?
- Rearrange any of those?
- Reverse any of those?

Every fresh concept, which keeps flowing in with a series of imaginative thoughts, consolidates, modifies, refines or replaces the earlier ones. The SCAMPER approach will help determine whether any of the newer ideas will serve a specific purpose. However, by following brainstorming or several variable analyses as mentioned above it is possible to draw a conclusion and choose the most desirable creative idea.

Synectics is another group exercise approach to creativity. This technique is the modified version of the earlier known "Gordon Technique", so named after its originator William J. J. Gordon. In synectics system, a team comprising few specialists is selected and assigned the task of working out solutions to the various challenges large business houses generally face. The head of the team, who is made aware of the specific problems,

is responsible for the conduct and acceleration of the creativity process. They should thoroughly understand the thoughts expressed by other team members and help evolve the most suitable actions for solving such problems. A group exercise of this nature involves hard thinking and careful consideration, by a number of persons, of the reasons for and against many imaginative thoughts and, finally, adaptation of an appropriate idea. Large corporate houses often avail of group exercises on a regular basis in order to solve diverse complex situations that they must always resist in a competitive market.

However, researchers claim that individual efforts are often more productive than group performances in fostering and encouraging creativity. This is because individuals may not speak out openly for fear of being humiliated or isolated by others. In a group exercise, therefore, an individual cannot be expected to put forward freely his or her best creative aptitude. Nevertheless, in corporate management where diverse organizational problems require quick and effective remedies, a decision by a group of experts should be prompt and advisable.

Innovation vis-à-vis Creativity

The dictionary meaning of innovation is "introduction of a new thing." If creativity is the ability of imaginative skills to create something new, innovation is the actual introduction of the end-product of creative imagination. So, in relation to creativity, innovation is a process through which a creative idea is given the shape of a real thing. The term innovation, in fact, refers to a creative change and this change may be in the form of a new product, new service, new found material, new market opportunity or a newly reorganized business enterprise.

Creativity is the response to human needs, whereas innovation is the recognition of creativity. Creativity is more active when good ideas are in increasing demand for innovation. It is only when an idea is adapted for conversion into commercial use that it receives economic significance, and utilization of creative ability for economic gain is what matters the most.

Innovation vis-à-vis Invention

Invention is something useful produced or obtained for the first time as a result of ingenious study and complex experiment. Said simply, it is a case of infusion of science into creative thinking. An invention may be a new object, new understanding or new awareness. *Innovation is an act of introducing an invention into market on a business basis for profit. Invention is a scientific fact, whereas innovation is an economic function*, said renowned economist Joseph Schumpeter.

An industrial invention may create a new technology, product, process, device or finding, but it is innovation that makes it possible to take advantage of the new invention economically. Unless and until an industrial invention is proved to be adaptable and gainful commercially, it

has no economic value. The true test of an industrial invention, therefore, lies in its commercial success.

Role of Creativity and Innovation

Ordinarily, in an open market competitive economy, a businessperson will have to look for a change that will bring opportunities for him/her to increase market share, strengthen financial position and thereby protect his/her business interests. Apart from profit opportunities, to meet the requirements of a pressing situation, the need to diversify production base, shift pattern of consumer demand, enhance productivity, improve quality, optimize resource utilization or reduce per unit production cost requires creative changes. To bring about the desired changes, innovation is important to not only new firms but also to old industries if they have to compete successfully and survive. Thus in a world of harsh competition and sustained technological progress, the combined role of creativity, invention and innovation is increasingly gaining prominence.

Creative ideas, inventions, technological changes, innovations, industrial development and economic growth are interlinked. Technological changes put into practice through innovations result in the introduction of new production methods, new merchandise, better utilization of resources, improved quality or increased productivity. These achievements accelerate industrial advancement, which, in turn contributes to economic growth.

Another important effect of industrial inventions has been in speeding up manufacturing activities and enlarging production base. Technological advances and innovations for large scale production in industries has made possible the transition from handicraft processing devices and water power to metal machinery and steam power. Manufacturing workplaces have been transformed from slow action handicraft units to fast-yielding mass-producing factories. Technological progress has always been a major force behind the creation of new industries and, as a result, disuse of outdated technology and closure, rather destruction, of old units. This is why the process of innovation is also termed as "creative destruction."

Thanks to the innumerable revolutionary inventions, in recent times, some of the most impressible technologies and products that have been introduced since World War II include atomic energy, missiles, computers, satellite communication, chemicals, printing machinery, medicines, medical equipment, jet engine and of course state-of-the-art electronic gadgets.

Innovations take place in direct adaptation, commercialization or dissemination of technological changes that originate in industrial inventions. Innovative changes cause improvements across a wide interrelated business activities, including product modification, investment and financing, marketing network, customer relations, organizational structure, staff motivation as also research and development. It is not the infusion of science into creativity alone, but also the new ways of organizing, financing, marketing and controlling a business that play dominating roles in industrial progress and competitiveness.

Many innovations are solutions to practical production or operation problems. For example, inadequate availability of a particular raw material may direct one's attention towards the invention of a suitable production technique without using the scarce raw material. Again, innovative marketing strategy may induce a change in consumer taste to an altogether new product, which will no longer require the scarce or high-priced raw material. Even if adequate resources are available, those are perhaps underutilized, misutilized or unutilized. Application of new processing technique and/or new equipment leading to optimum utilization of resources may help achieve same or higher output with lesser quantity of inputs. The resources thus saved may be utilized for increased yield of the same product, for making cost-efficient extra joint or by-product or even for some other additional products.

Efficient use of resources, expansion of capacity, enhancement of productivity, utmost capacity utilization or diversification of product range lead to increased supplies of various products and, consequently, reduction in their prices. In effect, innovations resulting in skilful utilization of given supply of resources add to the real income. Increased supplies and price reduction tend to benefit other industries as well who use these products as their inputs. In a way, innovatory activities indirectly contribute to the productivity and growth in other related sectors of an economy.

Innovatory activities grow in a cyclical order. More innovations generated by creative thinking and technological advances favourably influence the competitive business advantages and simultaneously help enlarge related environmental factors that promote and strengthen further growth of innovation network. The factors that generally help promote development of innovation network include labour skills, capital generation, supporting industries, product market, labour-management relationship, education system, science and technical infrastructure, social outlook and research and development. Facilities and advantages that grow in these areas as guided and aided by expanding innovation network are interlinked. The relevance of these facilities and advantages are as much important to individual entrepreneurs as to entrepreneurship in companies. As entrepreneurship facilitates, through creativity and innovations, the process of development, development in turn contributes to the growth and expansion of entrepreneurial activities in other sectors of an economy. In other words, the overall development process becomes cumulative thereby generating widespread interest in entrepreneurship and larger supply of entrepreneurs.

In essence, creativity leads to conceptualization of a new idea or creation of a new invention, but innovation facilitates commercialization of a new concept or invention. And this is made possible as the entrepreneur breaks away from traditional business practices, takes initiative, mobilizes resources and translates a new finding into a useful thing through innovation. The entrepreneur assumes risks, introduces a change and thereby plays a key role in technological progress, industrial advancement and economic

growth. And this explains Schumpeter's observation that the entrepreneur is the champion of technical and economic growth.

EVOLUTION OF ENTREPRENEURSHIP

The idea of entrepreneurship has undergone indicative changes from being associated with criminal activity to becoming essential to industrial development and economic growth. Fritz Redlich, a 20th Century German Scholar, drew comparison between the military adventures of mercenary captains in the 15th Century Europe and the risk-taking aspect of the entrepreneurial function. Richard Cantillon (1680–1734), a 17th Century Irish economist, observed that an entrepreneur makes careful use of factors of production with a view to ensuring optimum return on his/her investment. French writer Jean Baptiste Say suggested that an individual entrepreneur is a dynamic change agent who acts with exceptional forethoughts and makes significant contributions to economic progress through the process of taking risks. Scottish economist and moral philosopher Adam Smith (1723–1790) described entrepreneur as a person who organizes industrial activity.

In 1876, American economist Francis Walker compared entrepreneur with a capitalist and observed that while the capitalist finances the capital and gets profit as return on his investment, an entrepreneur earns profit as the compensation for his having managed a business. Joseph Alois Schumpeter (1883–1950), the renowned 20th Century economist, explained in his work "Capitalism, Socialism and Democracy" (1950) that the function of an entrepreneur is similar to that of a businessman benefiting from unexplored business opportunities. He broadened the concept by stressing the importance of the entrepreneur to technological progress.

Economic historians have been inclined to objectify entrepreneurship based on how entrepreneurs play their roles in economic growth. In some economic theories, much emphasis has been placed upon the entrepreneur, who as the individual innovator, breaks the tradition and introduces a new product, new service, new process or new device. An entrepreneur is often regarded as a fourth factor of production who brings in the other three factors — land, labour and capital — and puts them together for economic gain. The act upon which economic historians lay much emphasis is the process of entrepreneurial innovation as initiated by entrepreneurs.

Earlier, innovations were considered as the functions of either individual entrepreneurs who, if necessary, purchased rights to the inventor's new creation, or some inventors, in very rare cases. Already discussed earlier, economist Joseph Schumpeter glorified the role played by the singularly important owner-entrepreneur as innovator in economic growth. But there are some people who differ in opinions.

Innovation, in many industries, may create significant economies of large-scale production. Mass production, mass advertisement, mass marketing and consequent growth in business operation lead to the rise

of large companies and multinational corporations. In large corporations, the acts of invention and innovation are carried out as a routine matter by teams of specially trained managers employed for that purpose. There, innovations are regarded as a part of normal business activity and are undertaken collectively without the identification of a single individual. In effect, individual owner-entrepreneurs find that the important economic function, i.e. innovation, has been taken over by teams of salaried employees. Thus, many tend to suggest that there is no difference between the roles played by owner-entrepreneurs and managers employed in large business houses for innovations.

But in their work entitled *The Modern Corporation and Private Property* (1933), authors Adolf Berle and Gardiner Means suggest a different view. In their opinion, in joint-stock companies while the shareholders have no direct participation in management, the salaried managers own very little or no share at all in the companies they are employed in and evidently the theory of owner-innovator-entrepreneur role is not applicable to either the shareholders or the employed managers.

Entrepreneurial innovation, in effect, consists in changing existing pattern and bringing in for the first time something new for economic gain. This is how the early leaders of business and commerce made their great contributions to industrial development and economic advancement. Schumpeter's discussion of the innovational process moves around mainly on the truly impressive innovations that were introduced during the early 18th to the early 20th centuries. Those included steam turbine engine, railway system, electric motor, gasoline engine and many more. Almost all the major industries that we now see—including steel, automobile, aviation, ship building, electricity generation, telecommunications and so on — are the effects of some of the famous inventions that were put to use on a business basis by inspired innovator-entrepreneurs. In recent years there have been many quantitatively important innovations that have changed our life style. Many newly introduced services have created new service industries. For instance, home radio and television, mobile telephony, electronic mail, digital telecommunications, computerized information technology, photo-copying, health care facilities, ATMs and credit cards in commercial banking, insurance credit system, courier transmission and many more. Radio and television broadcasting of entertainment programmes interspersed with advertisements have not only added a new dimension to mass marketing, but also given rise to the mushrooming of broad-based advertisement business. The new service industries have created enormous job opportunities. Nevertheless, many claim that the economic impact as a result of the innovations introduced in recent times are relatively less severe than those associated with most of the major past inventions.

Entrepreneurship and Great Britain

The foregoing analysis of entrepreneurial innovations is highly useful in understanding better the historically significant Industrial Revolution.

which is commonly understood to have transformed Great Britain during the period 1760 to 1830. The Industrial Revolution in Britain was made possible by the pioneer entrepreneurs, who helped open up a new line of thought on industrial development. They demonstrated their sense of market opportunities and ability to tap and utilize such opportunities. During this period, successive major technological inventions and simultaneous entrepreneurial innovations accelerated the process of industrial development in Britain. The cotton textile manufacturing industry made a substantial progress and this was largely because of the innovative use of steam power and new machinery that replaced handlooms. The development of textile technology motivated inventions and growth in Britain's machinery industry and factory system as well. The expansion of machinery industry was feasible only after advancement of technologies in metal and metal-using, including iron and steel, industries. The introduction of cast-iron rails replacing wooden rails, subsequent improvement in railway system and simultaneous development of roadways and waterways expedited the extension of Britain's transport industry. The progress in Britain's machinery, manufacturing, coal mining, metal and transport industries contributed to a steep increase in its real national income and per capita real income. Increased per capita income and betterment of the standard of living led to a rapid growth in population, which in turn necessitated increase in agricultural productivity. Again, enhancement in agricultural productivity was made possible by intensive cultivation of land and introduction of agricultural innovations. However, the spectacular success of Britain's Industrial Revolution was not due to the series of technological advancements alone, but also due to new ways of organizing, financing and marketing that combined scientific inventions with entrepreneurial innovations.

The United States

The great Industrial Revolution in Britain and the changes that took place there set the path which several countries followed for their economic progress. Oliver Evans, who invented machines to speed up the milling of flour, was among the early entrepreneurs who helped develop the American factory system. The mechanized factory system introduced in the 1790s was the beginning of the transformation of the American economy. Samuel Slater (1768-1835), an English immigrant, who brought with him memorized plan of a textile plant, started a mechanized cotton thread production unit in Rhode Island. With the basic technology secretly imported from Britain and adapted by local entrepreneurs, mechanization of American textile industry began, somewhat moderately though, in Waltham, Massachusetts in 1813. The sewing machine patented in 1846 by an American inventor, Elias Howe (1819-1867), revolutionized the shoe and garment industries. By the 1850s, mass production of shoes, watches and clocks were well underway. Similarly, application of newly introduced harvester in 1836