

We Hear From

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Innovation Oh ! Innovation

(Innovation is a need based natural habit of a healthy and active individual. Innovation is important for any society and it has to be nurtured. In the scenario of globalization, a potential outcome has been to accomplish excellence in innovation-intensive activities, even inspiring talented grass-root innovators. The innovation subject is very much relevant in present state of India as our country has emerged as a knowledge based society)

The word innovation is derived from the Latin word **innovates**, which is the noun form of **innovare** “to renew or change”, stemming from in-“into”+novus-“new”. In fact it stands for something ‘new’ or ‘better’ which occurs in terms of product, process, service, business model and value market.

Innovation is defined as the development of new customer’s value through solutions that meet new needs, inarticulate needs or old customers, and market need in a new way. This is accomplished through different/more effective products, processes, services, technologies or ideas that are readily available to markets, governments, and society. It is also called as the process of translating an idea or invention into a goods or service that creates value or for which customers will pay (**BusinessDictionary.com**) and involves the steps that includes (a) first knowledge, (b) forming an attitude, (c) a decision to adopt or reject, (d) implementation and use, (e) confirmation of the decision. Therefore, according to Peter

F. Drucker, the Management Guru innovation is the specific instrument of entrepreneurship. Innovation is the act that endows resources with a new capacity to create wealth.

Innovation refers to the use of a better and, as a result, novel idea or method, whereas invention refers more directly to the creation of the idea or method itself.

Significance of innovation

1. Innovation is the profitable implementation of ideas.
2. Innovation aids in comfort, convenience and efficiency in everyday life.
3. Innovation reduces wastes and environmental damage.
4. Innovation creates growth, increases productivity and economical wealth (avoids stagnation)
5. Innovation provides better goods and services at a cheaper price.

Steps in innovational process

Innovational process involves

A) Understanding:

- Gathering information
- Clarifying the real problem
- Setting innovation goalposts

B) Imagination:

- Seeking stimuli
- Uncovering insights
- Identifying ideas

C) Action :

- Developing the innovation roadmap
- Gaining commitment
- Implementing the innovative roadmap

However, there are 8 steps¹ to Innovation. These are 1. Lay the foundation, 2. Create a challenge book, 3. Build participation, 4. Experiment with low cost at high speed, 5. Go fast from prototyping to incubation, 6. Iterate on the business model, 7. Build an innovation sandbox and 8. Create a margin of safety.

Principles of innovation

Jugaad is an Indian version of innovation. There are six principles of it.² Those are to -

1. Seek opportunity in adversity,
2. Do more with less,
3. Think and act flexible,
4. Keep it simple ,
5. Include the margin and
6. Follow your heart

Factors for innovation

The factors for innovation are

1. To sustain and push economic growth
2. To improve human well - being
3. To gain competitive advantage
4. To reduce cost of production
5. To explore opportunities
6. To improve past performance
7. To improve convenience
8. To ensure business survival

Components of innovation

Innovation is composed of four components: Creativity, strategy, implementation and profitability.

Types of innovation

Innovations are divided into two broad categories:

1. Evolutionary innovation(Continuous or dynamic innovation) that are brought about by many incremental advances in technology or processes.

2. Revolutionary innovation (Discontinuous innovation) which are often disruptive or new. **(BusinessDictionary.com)**

Seeds of innovation

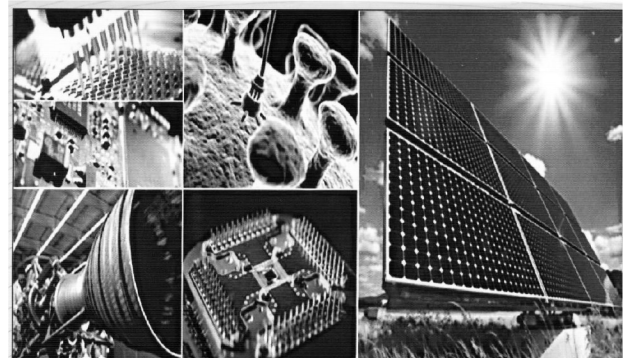
- > Creative thinking
- > Strategic thinking and
- > Transformational thinking

Sources of innovation

There are several sources of innovation like industry structure, market structure, local/global demographics, human perception/ mood and available scientific knowledge.

Characteristics of creative individuals / innovators³

- They can think differently and have confidence in themselves and the system.
- They are persistent.
- By nature, they are curious and love to experiment.
- They have the ability to connect with other people and other ideas.
- They are open to new ideas because they do not stick to fixed mindsets.
- They look forward to change.
- They have wide ranging interests.
- They can carry conflicting views without discomfort.



Growth of technologies and their human impacts

The following table shows the clear picture on growth of technologies and their human impacts:⁴

Approximate Period (Years preceding 1998)	Innovation / Breakthrough	Impact / Reason
100000	Making and using gear for hunting	Extending human capabilities

Approximate Period (Years preceding 1998)	Innovation / Breakthrough	Impact / Reason
40000	Making and using weapons	-
3500	Boats and sailboats	-
800	The clock, compass and other measurement instruments	Reducing and / or making manual work easier
360	Mechanical calculators	-
190	Railroads / using coal and oil for energy	Facilitating and / or making mental work easier
160	Electricity	-
140	Image and sound reproduction	Improving comfort and / or speed of transportation
100	Telecommunication / X-rays	-
95	Aircraft	Increased speed and / or availability of telecommunications
80	Automobiles and roads	-
70	Mass-produced chemical products	-
55	Nuclear weapons / energy	-
50	Computers	Improving the quality of arts and entertainment
45	Mass-produced home appliances	Improving material quality of life
40	Extensive use of fertilizers / oral contraceptives	-
35	Lasers	-
30	The moon landing / tissues and organ transplants	-
20	The CT (CAT or Body) scan	-
10	Genetically engineered plants / Internet	Increased knowledge base and applications

New age innovations

Some marvelous, brilliant, modern innovations of the last 50 years have also revolutionized our daily life. In fact, those have changed our world in many ways. A list is illustrated below: ^{5,6}

1	The Internet	44	World Wide Web (WWW)
2	Balloon catheter	45	Search engine
3	Smoke detector	46	Hubble telescope
4	Digital watch	47	Radio controlled watch
5	Cell phones	48	Webcam
6	Pocket calculator	49	Smart phones
7	Laser printer	50	GPS (Global Navigation System)
8	Floppy disk	51	Universal Serial Bus (USB)
9	Genetically Modified Organisms (GMO)	52	CD & DVD
10	Food processor	53	Cloning

11	Magnetic Resonance Imaging (MRI)	54	Hybrid electronic car
12	Space station	55	Human Genome Project
13	Computerized Tomography (CT) scan	56	Fuel cell bikes
14	E-mail	57	Artificial liver
15	Microprocessors (CPU)	58	Satellite radio
16	Touch screen	59	Scramjet
17	C programming	60	Blu-ray
18	Personal Computer (PC)	61	Skype
19	Polyethylene terephthalate (PET)	62	Graphene
20	Laser eye surgery (LASIK)	63	YouTube
21	Electronic paper	64	Night vision goggles
22	Digital camera	65	Surface computing
23	3D computer graphics	66	iphone
24	Super- computer	67	Bionic eye
25	Personal stereo	68	ATM
26	X-ray telescope	69	Large Hadron Collider
27	Air car	70	Thinnest glass
28	Maglev train	71	Oculus Rift
29	Post-it notes	72	Higgs Boson
30	Hepatitis B vaccine	73	Gravity-Light
31	Space shuttle	74	Mars Orbiter Mission (Mangalyaan)
32	Scanning tunneling microscope (STM)	75	3D printers
33	Artificial heart	76	SOCKET
34	Laptop	77	SolePower
35	Internet Protocol (IP) address	78	Morpher Helmet
36	Apple Macintosh	79	Ring
37	Robotic surgery	80	Hover Boards
38	DNA finger printing	81	Holo Lens
39	Self driving car	82	Safety Truck
40	Super conductors	83	Apple Pencil
41	Stent	84	Electronic car
42	Touchpad	85	Bladeless fan
43	MP3	85	Stealth technology

Some examples for experimenting on innovation

Experimenting on innovation leads the organization to be significantly ahead of others.

- For instance, earlier all the toothpastes were white in colour. Hindustan Lever Limited (HLL) changed the structure of the Indian toothpaste industry by launching Close-Up Gel. The first Close-Up Gel come in bright red colour, which broke the monotony of brushing the teeth with the white coloured toothpaste. Thus, HLL could not only improve its market share in the toothpaste industry tremendously, but made others also to follow on.
- Maruti Suzuki could also build up a great market share with its small, smart, technologically sound Maruti-800. Later they led the market share in the car industry due to its large service network all over India and by regularly introducing new variants and different types of cars. It changed the whole car industry of India in a way that now India has become a hub of small car segment all over the world.
- You Tube, Apple's ipod & iphones and

Microsoft's windows etc. are milestones in technological innovation achieved by highly successful companies.

Initiatives taken by India

- At the 2010 Indian Science Congress, the then Prime Minister of India declared the current decade 2010-2020 as Decade of Innovation by Govt. of India. India's Decade of Innovation has won the Hermes Award for the 'best Humanistic policy of innovation in 2012.'
- The national policy for Science and Technology has been restructured and formed as Science, Technology & Innovation (STI) Policy in 2013. A strong and visible 'Science, Research and Innovation System for High Technology- led path for India' – SRISHIT- is the main goal of India's new STI Policy, 2013.
- National Innovation Council has been formed with the purpose of fostering innovation in our country.
- The focal theme of 101th Indian Science Congress organized in the University of Jammu, J & K in February 3-7, 2014 was 'Innovation in Science & Technology for Inclusive Growth.'
- India is currently placed at 81st rank in the Global Innovation Index (GI) 2015. This annual ranking are jointly published by Cornell University, European institute of Business Administration and World Intellectual Property Organization.
- In recent time, Govt. of India has opened many avenues for protection of innovations like setting of Patent Facilitation Centre (funded by DST, GOI & co-ordinate by TIFAC), Intellectual Property Facilitation Centre (funded by GOI & Co-ordinate by MSME) and innovation Facilitation Centre (funded by National Research Development Corporation, under DSIK, New Delhi).
- The Central Government has introduced India Inclusive Innovation Fund (IIIF) through Public-Private-Partnership (PPP) Model, in which the aim is to utilize 2% of budget for this purpose.
- 'National Innovation Foundation – India' organizes events to showcase grass-root innovations from across the country.
- India unveiled a comprehensive Intellectual Property Right (IPR) policy in 2016 one of whose objective (out of seven objectives) is fostering innovation.

Awards for innovative ideas⁷

Sl. No.	Name of Award	Instituted by	Purpose
1	CSIR Award for S&T Innovation for Rural Development	CSIR, New Delhi	For implementation of S & T innovation to improvement quality of lives of rural community.
2	NRDC Meritorious Innovation Award	NRDC, New Delhi	3 categories (i) NRDC innovation Award (ii) NRDC Societal Innovation Award (iii) NRDC Budding Innovation Award for students
3	IGNITE	National Innovation Foundation, Ahmedabad.	To foster the spirit of thinking creatively and to culture the habit of innovating to find solutions for local problems. (For students upto 12 th standard)
4	India Innovation Initiative (I ³)	CII and DST	To help and support Innovators above 18 years of age.

Sl. No.	Name of Award	Instituted by	Purpose
5	Initiative for Research and Innovation in Science(IRIS)	CII and DST along with Intel Education	Awards for Research based Innovation Projects for students of class 5 to 12.
6	Grassroots Innovation and Outstanding Traditional Knowledge Award	National Innovation Foundation, Ahmedabad	For innovative ideas and traditional knowledge at grass-root level across wide subject areas.
7	MSME Awards	Ministry of MSME	To recognise and appreciate the innovation capacity of the micro, small and medium scale enterprises.
8	CSIR Innovation Award	CSIR, New Delhi	To enhance creativity amongst school children.
9	NABARD Award	NABARD in association with the Times of India	For rural innovations.
10	National Initiative for Developing & Harnessing Innovations(NIDHI)	Deptt. of Science & Technology	To cover the entire innovation chain right from scouting and mentoring to up-scaling the start up, to promote culture of innovation among students and rural communities.



How innovation will be a patentable subject matter

There are three main criteria on which an innovation is said to be patentable subject matter:⁸

1. It is a novelty
2. It is non-obvious
3. It has industrial applicability/utility.

What they have told about innovation

“Innovation opens up new vistas of knowledge and new dimensions to our imagination to make everyday life more meaningful & richer in depth and content.”

-Dr. A.P.J. Abdul Kalam

“If you have built castles in the air, your work need not be lost; that is where they should be. Now , put the foundations under them.”

-Henry David Thoreau

“The world is moving so fast these days that the man who says it cannot be done is generally interrupted by someone doing it.”

- Elbert Hubbard

“If you can imagine it, you can do it.”

- Walt Disney

“The nature of creativity has become a matter of life and death for any society.”

-Arnold Toynbee, an eminent historian

“- - - the act of innovation is to question the manner in which we are doing things, and ask ourselves is there another way to do it.”

-Mr. Ratan Tata

“An established company which in an age demanding innovation is not able to innovate, is doomed to decline and extinction.”

-Peter F. Drucker, Management Guru

“Let’s keep our plant clean and neat.
Let’s be cordial and friendly to everybody.
Let’s make our products with the utmost care.
Let’s learn something new every day.”

**-A Japanese factory (Hitachi) making
video recorder had this board
on its walls to inspire its workers.**

“I shall be telling this with a high,
Somewhere ages and ages hence,
Two roads diverged in a wood, and
I took the one less travelled by
And this made all the difference.”

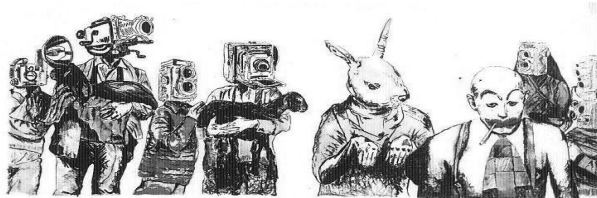
-Robert Frost

“We started from the premise that it is possible
to run an innovation program in much the same
way we run a factory.”

-A.G. Lafley

“We have to move to the top 10 (in Global
Innovation Index-GII) in order to able to move
forward, because innovation-led economic
growth and innovation-led competitiveness is
going to be the key in future.”

-Dr. R.A.Mashelkar



The Creative Minds | Lithography | 23"x44" | Edition:



The Creativity Dope | Serigraphy | 26"x3
Editions:

Innovation in An Artist's View⁹

Innovation is a need based natural habit of a healthy and active individual. Innovation is important for any society and it has to be nurtured. In the scenario of globalization, a potential outcome has been to accomplish

excellence in innovation-intensive activities, even inspiring talented grass-root innovators. Our academic institutions, research institutions, other organizations/companies and planners need to formulate pragmatic policies and mechanisms accordingly by cross pollinating ideas of diverse disciplines and cost effective innovations can be achieved only by a robust national innovation system.

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