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## ***Futurology: In Perspective***

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### **Definitions**

Futurology is the scientific method of predicting the future. To predict the future one needs to understand the present, all the forces that are relevant in shaping every aspect of the present and how these forces are expected to shape things and events in the future. It looks at the future in a medium to long-term horizon. It projects current trends into the future through extrapolation, through scenario building, through brainstorming, through forecasting and through a variety of other techniques that the subject of futurology has acquired, developed and learned to use. Futurology also involves taking a proactive stand of importing desirable future outcomes or scenarios and conducting normative research to explore better strategies. Prof Henry David defines futurology as ‘the intellectual form in which a society renders account to itself of its probable and possible futures.’<sup>1</sup>

Another, and perhaps more detailed definition is given by Eleonora Masini and Knut Samset: ‘Futures studies..... is a field of intellectual and political activity concerning all sectors of the psychological, social, economic, political and cultural life, aiming at discovering and mastering the extensions of the complex chains of causalities, by means of conceptualisations, systematic reflections, experimentations, anticipations and creative thinking. Future studies therefore constitute a natural basis for sub-national, national and international, and both interdisciplinary and trans-disciplinary activities tending to become a new forum for the basis of political decision making.’<sup>2</sup>

Futurology, also known as future studies or future research, envisages some basic elements: There is a concern for the future hence an attempt to predict it; it involves a set of tools, techniques and methodologies which are quite scientific; there are certain enabling assumptions and conditions which would have certain elements of subjectivity but which can be questioned and re-assessed; finally there is a set of objectives in the whole process of futurology which would be enabling strategy making and decision making towards a desirable future.

## **Genesis**

Dreaming and crystal-ball-gazing have been pastimes of men at all times. If we look back into history we see a lot of creative and inventive dreamers. Bible and Torah have their own set of prophecies<sup>3,4</sup>. Michel de Nostradamus<sup>5</sup>, in the 16<sup>th</sup> century, prophesied a host of things; most of them, couched in poetic language, continues to be shrouded in mystery till this day. Mankind still spends a lot of time, trying to decipher them. Leonardo da Vinci visualised many inventive gadgets and contraptions that belonged to the future<sup>6</sup>.

Jules Verne, in the 19<sup>th</sup> century, talked about a journey to the moon, with a level of precision that is too baffling to be coincidence. In 1865, he wrote of an aluminium spacecraft rising from Florida, at a speed of 24,400 miles per hour, going round the moon and returning to the earth in the Pacific Ocean. In 1968, 103 years later, Apollo-8 rose from Florida, at a speed of 24,200 miles per hour, went round the moon and splashed down in the Pacific<sup>7</sup>.

Study of the future received a lot more rigour towards the close of the 19<sup>th</sup> century with HG Wells<sup>8</sup>' publication of '*Anticipations of the Reactions of Mechanical and Scientific Progress upon Human Life and Thought.*' He has been a prolific writer of fiction, which can be termed as scenario building, and non-fiction about the future. Given the versatility of his writings on the future, he is very often called the father of Future Studies.

Second World War gave a boost to futurology too. US Military needed to know things that never existed nor were known before: about new technologies, their impacts, about nuclear exchanges and a host of other things. The concept of technological forecasting emerged; Defense Department created the RAND Corporation<sup>9</sup> as a think tank; techniques like Delphi Method<sup>10</sup> came into existence.

In the post world war period, man started looking at future more scientifically. Alvin Toffler<sup>11</sup> and John Naisbitt<sup>12</sup> are examples of this trend. 1960s saw further interest in the study of the future. The first courses in futurology<sup>13</sup> were offered in Yale University and in Virginia Polytechnic University. In the 60s the *Club of Rome* was created to deliberate on the survival of the planet earth; it came up with a document called *The Limits to Growth*<sup>14</sup>. Think tanks of all hues emerged across the globe looking at the future in various dimensions. Some were sponsored by governments, some by special interest groups and some by concerned corporate entities; with the result that the body of knowledge known as futurology developed fairly well. World Future Society<sup>15</sup> was formed in the late 60s; the World Future Studies Federation<sup>16</sup> was founded in the early 70s.

## **Futurology and Science Fiction**

Some similarities exist between futurologists and science-fiction writers; and a lot of differences<sup>17</sup>. Both are looking at the future. For this reason they are often termed as future historians. Both need to have a fair understanding of the scientific principles. The futurists try to predict or forecast the future by studying the forces of change scientifically; the science-fiction writers visualise situations based on scientific projections of the emerging factors and variables. Many of the science-fiction writers are well trained and well-versed in science – Aldous Huxley, HG Wells, Jules Verne, Arthur C Clarke, Isaac Asimov<sup>18</sup> etc. It is interesting to note that some of the well known science-fiction writers are accomplished futurists too. HG Wells, very often regarded as the father of futurology, is known more for his science-fictions. So is the case with Arthur C Clarke.

The science-fiction writers visualise the future, they create situations and scenarios that are plausible; their objective is to entertain the readers by stimulating the readers' brains with creative, inventive, imaginative but scientifically feasible scenarios. This may trigger new vistas of thoughts and ideas; but that is not the primary purpose of the science-fiction writers.

Futurologists try to predict and invent the future. They look at the possible scenarios; find out which is the most desirable from the point of view of larger segments of people; prescribe and plead to take proactive steps to make that particular scenario happen. Alvin Toffler in his trilogy of books does precisely that: he has predicted the vast changes and paradigm shifts; he has prescribed the basis of survival and growth in that era of change.

Precision or accuracy is not something that is expected in the predictions of the futurologists. In the first place one can make any assessment about accuracy only after the future has happened. Secondly the variables and linkages that shape the events are so manifold and unpredictable that one is not even sure whether all the variables have been looked into despite the veracity and exhaustiveness of the methodologies adopted in the predictions and forecasts. The catastrophe that Malthus<sup>19</sup> predicted never happened primarily due to the technological advancements. Club of Rome in its seminal work called the *Limits to Growth* predicted the depletion of the natural resources one by one. Though the time limits stipulated for that situation is yet to arrive, the rates of consumption of many of the resources are not in pace with what was envisaged in the forecast of the Club of Rome. Scientific and technological advancements have been able to ensure better productivity and substitution in almost all the fields. Science-fiction, per se, does not make any claim to accuracy and precision; they are fiction any way. All the same, they delve on the realms of plausibility. So curiosity about their precision cannot be ridiculed. Jules Verne's imagination about space travel turned out to be fairly accurate. George Orwell's 1984<sup>20</sup> nor Huxley's Brave New World<sup>21</sup>, nor Arthur C Clarke's Space Odyssey<sup>22</sup> turned out to be true. Precision is not a strong characteristic of science-fiction; nor can it be expected in any great measure in the futurological forecasts.

The methodology adopted by the science-fiction writers is creative, inventive and imaginative. Futurologists employ scientific and logical methods to the extent possible.

But given the uncertain nature of the world in which we exist, the methods cannot be totally logical or scientific; they can at best be heuristic. Take the example of the Delphi method: it relies on the gut feelings of a large number of people who we think are experts. The process is to compile the assessments of a number of “experts” and through an iterative process we only hope to move towards some better assessment of the future that is anyway fuzzy.

Science-fiction, by and large, tends to be the result of individual efforts; they are the result of individual geniuses. Futurology is generally driven by collective effort of think-tanks. Both involve high order cerebral efforts. Do they supplement each other? Perhaps yes. Way back in the middle of the twentieth century, Orwell explored the limits of egalitarianism in *The Animal Farm*<sup>23</sup>; this perhaps helped mankind understand the concept better and perhaps influenced the thinking process of the following decades. George Orwell wrote *1984*, possibly perturbed by the possibilities of regimentation through the emerging technological advancements. In all possibility the scenario scared mankind to thinking of better alternatives and possibly helped achieve better sociological options.

Were the NASA scientists influenced by Jules Verne’s writings? It appears that NASA scientists were influenced by Jules Verne. The super cannon that Jules Verne described in *From the Earth to the Moon*<sup>24</sup> to transport the three men to moon’s orbit is called the Columbiad; The command module of NASA’s lunar mission was called Columbia. Jules Verne described his aluminium vehicle rising from Florida; NASA too chose Florida as the launch-pad for its space-vehicles. Jules Verne predicted the speed of the space-craft rising from Florida at 24,400 miles per hour; in reality Apollo-8 rose from Florida at 24,200 miles per hour. Were these mere coincidences or did the NASA scientists see some sense in the thought processes of Jules Verne? Surely, Jules Verne’s writings were able to trigger some new direction of thoughts; science-fiction need not be devoid of any relevance to mankind.

In *On the Beach*<sup>25</sup>, Nevil Shute has explored the scenario of nuclear holocaust and how ordinary people are compelled to cope with it. It gives a wealth of insights into the sociological aspects of the scenario which are hardly available anywhere else. Morris West, in a work of fiction titled *The Shoes of the Fisherman*<sup>26</sup>, explored beyond the constraints of the cold war era towards a détente between archrivals Christianity, represented by the Pope and Communism represented by a Chinese Commissar.

### **What futurology is not.**

Futurology is not an exact science even though the intentions of the futurologists are to make it as scientific as possible. The methods employed by the futurologists are being evolved over the years; they have achieved fair degree of scientific rigour. But they do not ensure any predictive power to the conclusions. The basic fact is that we are dealing with high degree of uncertainty and with large number of variables whose variability is also unpredictable. Further the horizons handled by the futurologists are medium to large

– 20 years, 40 years and more. Futurology cannot offer a definite picture nor a definite scenario of things in the future. They can at best offer a direction of things to happen.

### **Current Concerns of Futurology.**

What themes and issues generally become the concerns of futurologists? What are the subjects that are taken up by futurologists for study? Many of the concerns are global in nature; many others are country specific though there is a fair amount of overlap among them. Yet another set of concerns are firm specific and are taken up by corporate planners of the firm. Salient among these concerns are listed below<sup>27</sup>:

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#### **Global concerns**

- Global Population growth and demographic trends
- Sustainable Development
  - Water security, Food Security, Energy Security
- Environment
  - Pollution, Climatic Change, Global Warming, Greenhouse Effect. etc.
- Global Peace, Conflicts, War and Terrorism
- Global Governance
  - The UN System, North South Dialogue, Emergence of Regional Blocks
  - Economic and Political Trends
- Socio-Cultural Issues with the emergence of new Technologies

#### **National Concerns**

- Managing the Population Growth and Demography
- Sustainable Development
- Environment
- National Security
- Governance
  - Growth and Development of Institutions, Managing Diversity, Integrating with the world, Empowering the People etc.
- Equity and Justice
  - Poverty, Digital Divide, Human Development, Urbanisation, Urban Planning, Rule of Law, Equal Opportunity, Gender Equality etc.

#### **Concerns that are firm-specific**

- Emerging Competitive Environment
- Technological Changes
- Changing patterns of Customer preferences and taste

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Edward Cornish<sup>28</sup> has identified six mega-trends that need to be studied to in understanding the emerging transformation. These are

1. Technological Progress
2. Economic Growth
3. Improving Health
4. Increasing Mobility

5. Environmental Decline
6. Increasing Deculturation

In the current context, technology is the main driving force for almost all the transformations. Internet technology has had great impact on many aspects of human existence: it has altered the way businesses are done in many sectors whether it is banking or aviation or retailing; it has brought in more transparency; it has reduced the role of the intermediaries; it has brought producers and consumers much closer; it has reduced diseconomies and ushered in more competition. So in understanding the emerging transformation it makes sense to predict the technological changes.

Economic development is the impact area of such transformation. The results of the changes are reflected in terms of economic development; they can be measured in terms of economic development. Improvements in health also are reflections of the changes, human progress, brought in by basic factors driving the change. When infrastructure improves, when communication and transportation improve, barriers tend to reduce and social interaction and mobility tend to increase. Increasing mobility is a measure of the improvements in infrastructure, speed of communication, and also the ease and confidence of social interaction. When you are looking into the future and trying to predict the emerging transformations it makes sense to forecast economic development, health improvements and mobility as indicators and benchmarks of the changes that are expected to unfold.

Environmental degradation is the undesirable by-product of the transformations ushered in by the basic triggers like technology. Nuclear technology has ushered in devastating damages to the society; urbanisation has led to deprivation; use of synthetic fertilisers and chemicals has led to irreparable damages to the eco-system. By measuring the degradation we are able to measure the damages being done to the eco-system, the costs the next generations have to pay for the changes. In forecasting the emerging future, it is essential to assess these negative impacts as precisely as possible so that pro-active steps can be initiated to minimise their impacts.

Each society evolves its social norms and culture over a long period of time. These are based on the resource base of the society, economic activities and the social processes of the society. In the face of emerging transformation, resource base may change, the modes of economic activities may change; as a result, changes may be forced upon the social processes too. This may bring in cultural shocks and conflicts. With increasing mobility different societies come into contact with each other; this also is a source of cultural shocks and conflicts. Cultural aspects are critical to the sustenance and growth of any society. So it is important to manage the cultural issues delicately to ensure sustainable development. In any future study it is important that the cultural issues are also assessed carefully and delicately.

### **Relevance of Futurology**

Is futurology relevant in the context of the technologically advanced 21<sup>st</sup> century? In an era of fast changes it makes sense to know what and how things are likely to shape up in

the future so that one can plan to take proactive steps to minimise the negative impacts and to take advantage of the new emerging scenarios.

The current scenario is characterised by large number of players in every field leading to increased competition; rapid technological changes lead to faster technological obsolescence. These two factors – competition and technology – are pushing each other: Competition spurs intense search for new technological options and technological innovations ushers in new dimensions in competition<sup>29</sup>. The spiralling effect of technology and competition makes the future more uncertain and more unpredictable. Hence the need to explore the future.

Over the years the pace of technological change has increased resulting in shorter lifecycles of products and processes<sup>30</sup>. Firms need to reap the benefits of a product or a process in a much shorter time today; they need to innovate new products and processes faster or they face the threat of being obsolete and out of market much faster than ever<sup>31</sup>. The impact of the events and happenings are much greater today than ever. The war in the small geographical area of Vietnam<sup>32</sup> saw more destruction than what the world saw in Europe and Asia together during the Second World War. The war in Kuwait<sup>33</sup> for a much shorter period unleashed far more destruction than what the Vietnamese suffered in 15 years. The internet technology has enabled far-reaching changes in business-processes and has caused irreversible changes in the manner of doing business; organisations needed to restructure to adjust to these changes. The stakes and risks of firms and nations of not scanning the horizon for the emerging future have gone tremendously high.

A firm in the business of manufacturing and marketing of fertilizers would gain to know the emerging trends in the technology of manufacturing fertilizers to remain competitive; The firm needs to know the emerging trends of consumer preferences for bio-fertilizers and the societal concerns of ecology, environmental pollution etc. Firms in the pharmaceuticals and information technology business are more knowledge intensive and hence need to scan the technological trends and their competitive impacts much more significantly. An automobile manufacturing firm need to keep pace with the emerging technological solutions in supply chain management to ensure the firm's competitiveness in terms of cost, speed of response, delivery schedules etc. a firm that does not keep pace with the changing technologies is bound to lose the competitive war. With fast changes happening in every field, the firms need to re-invent themselves to remain in the forefront of competition. For this reason, the firms need to scan the future scenario continuously and take pro-active steps of repositioning themselves. This is the relevance of futurology at the firm level. Royal Dutch/Shell survived the oil crisis<sup>34</sup> of the 70s primarily because they used scenario-planning as a tool to scan the future and on this basis repositioned itself continuously.

Nations and economies are concerned with the macro-picture and they need to scan the future for the emerging trends in various fields. Demography, Sustainable Development, Human Development, National Security etc are some of the major concerns at national level. *India in 2020*<sup>35</sup> is a work of futurology looking at the technological trends and their impact on the nation. Arun Shourie<sup>36</sup>, in a seminal work has explored the various factors

affecting the security of India and their impact areas. Institute of Defence and Strategic Analysis [IDSA]<sup>37</sup> is a think tank created by Government of India to study the various aspects relating to national security. At global level there are a number of think tanks dedicated to futurology; Hudson Institute<sup>38</sup> established by Herman Kahn and the Club of Rome<sup>39</sup> are among the prominent ones.

## **Epilogue**

In a world of fast technological changes, shrinking distances and increasing competition, having an active concern for the future is a basic prerequisite for survival and growth at firm level and national level. Developed world seems to have realised this aspect fairly well, judging by the investments that they have made in terms of people, in-company groups, think tanks, university departments, research outputs, specialised courses, specialised journals and the like. In countries like India, the awareness is still to emerge. There is urgent and increasing need to spread the awareness of the relevance of futurology; there is urgent need to create a new perspective of thinking among the policy makers, managers, educationists and thinkers alike. To nurture this culture there is a great need to create institutions dedicated to futurology.

## **End Notes:**

1. David, Henry: *Challenges for the Future*. Proceedings of the International Future Research conference Vol 4 Kodansha Ltd., Kyoto 1970 pp102
2. Masini, Eleonora & Samset, Knut: *Recommendations of the WFSF General Assembly*. WFSF Newsletter June 1975, pp15
3. Ryan, Donald D: *Complete Idiot's Guide to Biblical Mysteries*. Penguin 2000.
4. Zucker, David J: *The Tora: An Introduction for Christians and Jews*; Paulist Press NJ 2005.
5. Leoni, Edgar: *Nostradamus and his Prophecies*; Dover Publications, New York, 2000. Nostradamus [1503-66] is best-known for his clairvoyant prophecies. Also see [www.nostradamusonline.com](http://www.nostradamusonline.com)
6. O'Conner, Barbara: *Leonardo da Vinci, The Renaissance Man*; Twenty-First Century Books [a division of Lerner Publishing Group], 2003. Leonardo do vinci [1452-1519], synonymous with renaissance, is well-known for his inventive thoughts on scientific gadgets, which included flying machines, as also for his paintings.
7. Dasgupta, Swati: *Nemo's Ark – The Prophetic Vision of Jules Verne*; Times of India, Ahmedabad; 24 th March 2005; the 100<sup>th</sup> death anniversary of Jules Verne.

Jules Verne [1828 – 1905]; French writer and pioneer of science fiction whose best-known works today are *Twenty Thousand Leagues Under the Sea* [1870], and *Around the World in Eighty Days* [1873]. Other works include *Five Weeks in a Balloon* [1863], *From the Earth to the Moon* [1865] and the *Invasion of the Sea* [1905].

8. Wager, W Warren: *HG Wells, Traversing Time*; Welseyan University Press UK 2004. Herbert George Wells [1866-1946], the foremost among science-fiction writers is also well-known for his non-fiction writings about future. He is considered the originator or father of futurology.
9. RAND Corporation is a think tank created by US Military primarily to do technological forecasting. Over the years it has emerged as a major think tank of the US Government.



10. Delphi Method: This is the name given to a technique employed in technological forecasting. The method involves asking a set of questions to a set of experts; then refining the questionnaire based on the responses and administering the questionnaire to the same set of experts and other experts recommended by the experts. This process is repeated a number of times to achieve better clarity. The name Delphi has its origin in the Delphi's Oracle, which was the most well-known Oracle in ancient Greece.
11. Alvin Toffler: The major works are *Future Shock* [New York, Bantam Books, 1971], *The Third Wave* [ New York, Bantam Books, 1981] and *Power Shift* [ New York, Bantam Books, 1991]
12. Naisbitt, John: *Mega Trends – Ten New Directions Transforming Our Lives*; Warner Books, 1988.
13. Education in the field of future studies started in the US in the 1960s; it has since developed in many countries. For a detailed documentation of this aspect see Slaughter, Richard A: *Futures Beyond Dystopia: Creating Social Foresight*. Routledge Falmer, London. 2004.
14. Club of Rome: *Limits to Growth*; 1972. Limits to Growth is a report given to the Club of Rome; this was prepared by a group of authors consisting of Donella H Meadows, Dennis I Meadows, Jorgen Randers and William W Berhrens III.
15. World Future Society is an association of people concerned about future. Founded in 1966 at Washington DC, USA. The society strives to serve as a neutral clearing house for ideas about future. It touches 25,000 members in more than 80 countries.
16. World Future Studies Federation is an organisation of 300 individuals and 20 institutions around the world whose mission is to promote education and research on future studies.
17. Pohl, Frederick: *Thinking about the Future: The Futurist*, Sept-Oct 1996.
18. Isaac Asimov [1920 – 1992]; Russian born American Jewish author and bio-chemist; has written a large number of novels and short-stories under the category of science-fiction.
19. Malthus, Thomas Robert: *Essay on the Principle of Population*; 1798.
20. Orwell, George: *1984*. Signet Classic [a division of Penguin]. Originally printed in 1950 and reprinted from 1961 onwards.
21. Huxley, Aldous: *The Brave New World*; Penguin 1932.
22. Clarke, Arthur C: *2001, A Space Odyssey*, 1958. This has been developed into a film which is considered a landmark science fiction classic, by director Stanley Kubrick.
23. Orwell, George: *The Animal Farm*; Signet Classic; 1956.
24. Dasgupta, Swati: *Op.cit*.
25. Shute, Nevil: *On The Beach*; Ballantine Books [Random House] New York, 1957.
26. West, Morris: *The Shoes of the Fisherman*, 1963. Published as a novel in 1963. Later filmed under the same title in 1968; directed by Michael Anderson from a screenplay by James Kennaway and Pohn Patrick II. It featured Anthony Quinn, Lawrence Oliver, David Janssen, Leo McKern and John Geilgud.
27. The concerns listed in this paragraph are based on those listed by Dr Linda Groff and Dr Paul Smoker: *Introduction to Future Studies*; 1997.
28. Cornish, Edward: *Futuring: The Exploration of the Future*. Bethesda,MD: world Future Society; 2004.
29. Bala Bhaskaran P: *Managing for Value-creation – Role of Strategic Leadership*; Global CEO; Sep 2005; pp11-20.
30. Foster, Richard and Kaplan, Sarah: *Creative Destruction*; Doubleday [Random House]; New York 2001.
31. Very often scientific progress is explained in terms of speed of travel achieved by man. In the middle ages the maximum speed achieved by man was the speed of Stage Coaches;

- then came the steam locomotives, then motor car, much later the airplanes. Much later man achieved super sonic speed and still later achieved capability to travel in outer space.
32. Levande Framtid: *Vietnam Holocaust: 140 Years of Pillage, Slaughter and Persecution*. <http://www.nnn.se/levande/holocaust.htm> Americans entered South Vietnam officially in 1954 and continued till 1975. The American entry was preceded by French colonisation of the of the Indo-China region, including Vietnam for over 140 years. The article says, “The total amount of munitions exploded by the US and its allies was twice that used all over the planet by all sides during the World War II, on an area less than four percent the size of the US. Some 23 million bomb craters were gouged into the landscape.”
  33. William Head: *Air Power in the Persian Gulf: An Initial Search for Right Lessons*. Air Force Journal of Logistics, Winter1992, p.11. The article says “ US expended more bombs in six weeks in the Persian Gulf War than during any single year in Vietnam”
  34. The concept of Scenario Planning emerged during the World War II as a method of military planning. In the 1960s Herman Kahn refined it as a tool for business prognostication. In the early 70s Pierre Wack of Royal Dutch/Shell started extensive use of this planning tool to scan the future during the period leading to the OPEC crisis and beyond. The experience of Royal Dutch/Shell in tiding over the OPEC crisis established the credentials of scenario planning as a powerful planning tool. For a detailed discussion on the topic see Daum, Juergen H: *How scenario planning can significantly reduce strategic risks and boost value in the innovation chain*. The new New Economy Analyst Report – Sep08, 2001. [http://www.juergendaum.com/news/09\\_08\\_2001.htm](http://www.juergendaum.com/news/09_08_2001.htm)
  35. AbdulKalam, Dr APJ and Rajan YS: *India in 2020 – A Vision for the New Millennium*; Viking [Penguin], 1998.
  36. Shourie, Arun: *Will the iron fence save a tree hollowed by termites? Defence imperatives beyond military*. ASA Publications, New Delhi. 2005.
  37. Institute of Defence and Strategic Analysis [IDSA], New Delhi, is a think tank created by Govt. of India to research on various aspects relating to national Security of India.
  38. Hudson Institute: Founded by Herman Kahn and Max Singer in 1961, as a non-partisan policy research organisation; it is dedicated to research promoting global security, prosperity and freedom.
  39. Club of Rome: *Op. cit.*