Science Museum - Science Centre - Science City - What Next ?

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Some people are fond of making doomsday prediction not as much as for pressing a panic button, but for bringing an issue to the centre of the stage. Back in 1998, James Bradburne presented a thesis 'that science centres as they are presently constituted are dinosaurs threatened with extinction in the not too distant future, and that science centres as major capital projects are white elephants which can only saddle governments with unrecoverable debts'[1]. Although Per-Edvin Persson[2] quickly joined the debate in the same journal predicting a rosy picture for science centres of tomorrow, several science centre enthusiasts started ringing bells and blowing whistles until ten years later, the issue was brought to the centre stage of AAM annual conference as well as the ECSITE 2008 conference, with a question: 'What is the Science Centre of 2020?' The session description for the ECSITE conference[3] stressed on the 'relationships between the public presentation of science and the academic and industrial research centers', because it was felt that 'typically characterized as attractions for children, many science centers are struggling to be relevant to an older, adult audience, while revising the economic model to remain sustainable and viable.' Field & Powell talked about 'public understanding of science versus public understanding of research'[4] while Larry Bell talked about 'engaging the public in technology policy'[5]. Some others underscored the need for *public engagement in science* through lectures, debates, one-to-one interaction with renowned scientists – all as a part of the activities of science centres. This line of thinking tends to suggest a paradigm shift from fostering creativity amongst the children to encouraging critical analysis by the adults.

Museum, Centre, City

None of these suggestions, however, necessitate any change in the character of a science centre as far as its exhibit contents are concerned. Everybody agrees that concept and philosophy of exhibits in a science centre differ considerably from those in a science museum, but do the exhibits in a science city differ in any way from those in a science centre? Unfortunately, this is still a fuzzy area, where a science city is often considered just a *magnum opus* science centre without any difference in the concept of exhibits. In that case the title of this article becomes a misnomer. On the other hand, if the exhibits in a science city could be developed with a different philosophy, more advanced than in a science centre, title would imply a transition from science museum to science centre to science city. If so, one would venture to think what could be the next to science city.

Science Museums are primarily exhibit-based institutions concentrating on collection, conservation, documentation and exhibition of historical artefacts. 'A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment'[6]. Initially science museums were set up with touch-me-not artefacts, encased in glass cabinets, projecting the scientific and technological heritage of a country or of the human civilisation. Slowly came up some science museums with additional push button operated active exhibits to demonstrate the basic principles of science and the functioning of a contrivance. Danilov has given an elaborate account of the development of science museums while dealing with the history of science centres[7].

Science Centres, inspired by the Exploratorium in San Francisco and Ontario Science Centre in Toronto, evolved as activity-oriented institutions with hands-on interactive exhibits, and organised activities, involving visitors in experimentation so that they discover science by themselves. On the one hand, exhibits could be developed to supplement formal education in schools, as well as for non-formal education of the public. On the other hand, exhibits could have broad-based social relevance for creating scientific temper in the community. Parallel to the exhibits, science centres organise extensive activities, both in-house and outreach, for schools and communities.

Most science centres in the world are restricted within the four walls with indoor exhibits, sometimes supplemented by outreach activities. India introduced the concept of science park with interactive outdoor exhibits, developed for the first time in Nehru Science Centre, Mumbai in 1979, and then in all science centers in India. Some science centers, notably in New York, St Louis and Israel followed the suit with remarkably attractive playground exhibits. In a science city, the indoor didactic exhibits of a science centre and outdoor playground exhibits of a science park could be integrated into a theme.

Science City, for the first time developed at Kolkata in 1997, is a step ahead of science centres in the following aspects:

1. In addition to hands-on exhibits of science centres, a science city introduces minds-on experience through immersive visualization and simulated situation, which are created to cross the barriers of space and time and to emotionally involve the visitors.

2. In doing so, a Science City combines the fantasy and excitement of an outdoor theme park with non-formal learning process of an indoor science centre. The whole science city is a single unified exhibit area with imaginative integration of indoor and outdoor exhibits.

3. A Science City is developed as a self-contained closed biome reflecting exemplary symbiosis between man and other life forms with a carefully designed nature park, its own water management, sewage treatment plant, solar power station, and entertainment areas. That is why it is called a City, complete by itself.

4. The new concept of integration of indoor and outdoor exhibits in a science city is more relevant in countries like India, where a low capital-intensive outdoor exhibit area provides maximum *edutainment* to the people during most part of the year.

Science City in India is therefore not just a giant science centre like the *Cite des Sciences et de l'Industrie* in Parc de la Villette in Paris. It is conceptually different, and more advanced than a science centre where mental function plays a dominant role.

Hands-on Exhibits, Minds-on Experience

In a science city we are differentiating 'minds-on' experience from 'hands-on' interactivity, although these two terms are uttered in the same breath. Similarly the words 'hands-on' and 'interactive' are freely, and wrongly, treated as synonymous. The conceptual difference between passive, active and interactive exhibits, as well as the difference between hands-on and minds-on have been discussed elaborately elsewhere[8]. In brief, it may be stated the passive exhibits are those which have a visual, and sometimes tactile, appeal but are non-working in nature like in a traditional museum. Active exhibits are those which are animated or made to work by a push button, to act in the same manner every time they are operated. Interactive exhibits are of two kinds – hands-on and minds-on. Hands-on exhibits are those which build up a dialogue between the visitors and inanimate exhibits, by operating in different manners and by throwing questions to visitors through such operations. Thus, hands-on exhibits have two criteria – multiplicity of option and two-way communication. Minds-on exhibits are those which *may or may not be* hands-on, which go through a discovery process by themselves or where they cross the barriers of space and time in a simulated situation or in immersive visualisation. The differences may be summed up in the following chart:

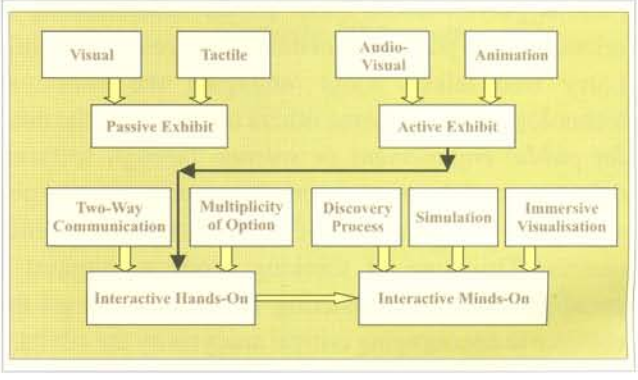

Fig 1: Passive, Active and Interactive exhibits

Let us take up an exhibit for example. This is an age-old exhibit on loop-the-loop demonstrating how a steel ball rolling down a channel negotiates a circular track without falling down. The weight of the ball is counteracted by the centrifugal force pushing it out. In order to save the ball from pilferage, the exhibit is encased in a glass cabinet and operated by a push button from outside. The exhibit is made more fascinating by passing the ball through nine loops in succession as developed by NCSM in 1987 (*fig 2*).

Fig 2: Demonstration of centrifugal force with two 9-loop exhibits placed back-to-back – an active exhibit behaving in the same manner every time it is operated (NCSM, 1987)

Operation by pressing a push button merely makes it active, and not interactive, because the exhibit behaves in the same manner whenever it is operated. It does not have multiplicity of option nor does it communicate with the visitors as they have no option to operate it in some other way. If we take out the exhibit for releasing the ball by hand, it instantly becomes interactive hands-on (*fig 3*). Visitors attempt to release the ball from

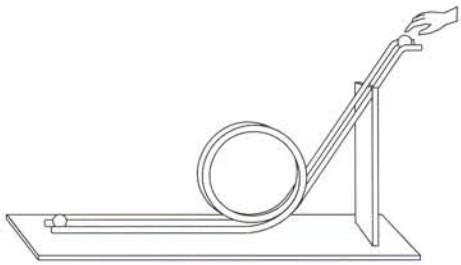

Fig 3. Interactive hands-on exhibit on centrifugal force, giving multiple options to visitors

different heights and discover the optimum height below which the ball will fail to negotiate the track. Then instead of releasing the ball from the top of the channel, somebody tries to push the ball from the lower end to see whether it negotiates the loop upwards (*fig 4*). He fails, doesn't matter how hard he pushes the

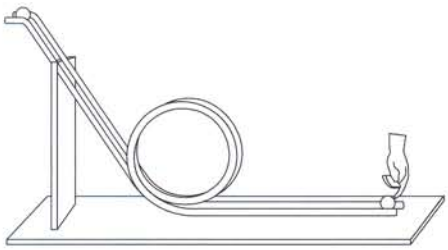

Fig 4. Visitors try to push the ball up the loop – an example of multiple options

ball up, but the moment he spins the ball while pushing up, the ball negotiates the loop. Thus, the exhibit now offers many options to the visitor.

Now we can make the exhibit interactive minds-on by using several table tennis balls, filled with a liquid, or partially filled with sand in different quantities, or with molten wax. We can use a straight channel for rolling down these balls to make it look simple but much more intriguing (*fig 5*). One ball rolls

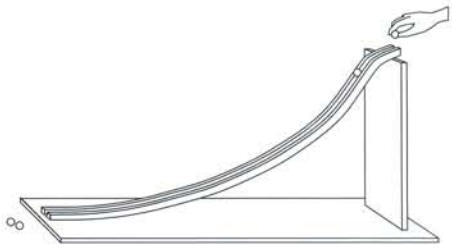

Fig 5: Interactive minds-on exhibit on rolling balls – simple but intriguing – giving rise to speculations and critical study

down with accelerated motion, the other with constant velocity, another does not roll but slides down, one ball leapfrogs down the channel, and the other simply refuses to move and stays tight in a spot. The exhibit looks totally confusing and its understanding demands application of mind in full extent.

The exhibit 'Mission to Mars' in Gujarat Science City (GCSC) is another minds-on exhibit combining a motion simulator with event simulators. Visitors ride a motion simulator for a space flight (*fig 6*) through the entire solar system and landing on the Mars on the

Fig 6. Motion simulator in Mission to Mars exhibit for simulating travel through the solar system (GCSC, 2008)

return journey with all associated thrills. After landing on Mars, they enter into a space laboratory set up on

Martian surface and perform experiments that astronauts are supposed to do for studying the geo-morphology and atmosphere of Mars, and searching for oxygen, water, and microbial life forms, if any (*fig 7*). This creates an emotive involvement through

Fig 7: Event simulation in Mission to Mars exhibit conducting experiments as if on the planet Mars (GCSC, 2008)

hands-on and minds-on experience, much more than the immersive visualization in a dome theatre.

Success Criteria for Future Development

The success of a science centre or science city depends on how effectively it can involve visitors, irrespective of their age, in activities for discovering science by themselves through their personal experience, sometimes in simulated situations, sometimes with immersive visualisation and most of the times in real-life real-time experimentation in open-

Fig 8. Children performing experiments in open-laboratory situation (GCSC, 2008)

laboratory environment (*fig 8*). Science centres do not believe in *Top Down* system of teaching-learning process which demands blind acceptance of authoritative explanation and information. Science Centres believe in *Bottom Up* system where the people have to build up their understanding of science through hands-on minds-on process. Science centres believe in the dictum of 'do it', then 'observe it', and finally 'discover it', rather than 'observe it' and 'accept it' without raising any question. Blind acceptance is a 'no-no' in interactive science centres. Bradburne summed up in his conclusion that 'the new learning platforms must stress the acquisition of new skills, not just information.... of course information is still indispensable, but it must be linked to the skills of finding, using and appropriating that information'[9]. This is precisely what the science centres are doing now and are meant to do.

Interactive science centres emphasize through its hands-on exhibits and activities, that science is not just some theories or mathematical equations or even some test tube experiments. Science is a logical thought process through which we can understand the laws of nature. The concept of science develops in a child's mind through observation of nature – the sunrise and sunset; the moon and stars in the night sky; the flowing river and turbulent ocean; the foliage, flowers, fruits and seeds; the life of birds, butterflies, bees and bugs; shapes and colours; and so on. In this observation a child uses all five senses to fathom the mysteries of nature. At a more matured age the young mind gets intrigued with laws of nature relating to sound, light, heat, and kinematics; electricity and magnetism, chemistry and chemical structures; mathematical logic; and the mysteries of the microworld of atoms and macroworld of outer space. With further maturity in thinking, visitors try to correlate the scientific phenomena with their understanding of life relating to environment, ecology, biotechnology, genetic engineering, information technology, and so on[10]. 'Topics such as global climate change, genetically modified organisms, information technology, and research into learning are not only of interest to the researcher, but affect everything from commonplace decisions such as whether or not to purchase genetically modified foods to policy debates on global warming to how we teach our children'[11].

What next ? Perish or Flourish?

Passive to active exhibits in science museums, active to interactive hands-on exhibits in science centres, and then hands-on to minds-on exhibits in science cities gradually brought us where we stand today. Now the question comes up – where do we go from here? What next? Are we going to follow the footsteps of white elephants and dinosaurs on way to extinction? Or do we have opportunities to transgress to a new domain? With further modified exhibits and activities ? Let us examine the activities first.

Concerns of future as expressed by various experts can be summed up in the questions raised by Robert Mac West : 'The museum industry is engaged in a series of very serious discussions and reflections on its future. What will the museum of the 21st Century be (we ask this question almost a decade into that century – a strong indication of collective uncertainty)? What will be the impact of Web 2.0 initiatives? How do museums respond to the enormous societal changes, ranging from considerations of authority figures to the rapidly-increasing personalization of desirable experiences? What economic and operational model(s) will museums have to adopt in order to be sustainable in the new environment?[12] Undoubtedly these questions are heavily loaded for museums but also of generalised nature to include science centres as well. Science centre and science city are now acknowledged as a good platform for captivating the children, but what is lacking is adult participation. Science centres have to catch this large contingent through their activities.

Public Engagement in Science - get adults involved

In a lecture on 'Recent Trends in Science Centres' delivered in Science City, Kolkata, Per-Edvin Persson (Pele) pointed out that activities relating to *public understanding of science* are now yielding to *public engagement in science* with inclusive dialogue. Lectures, debates, interactive seminars, and face-the-scientist programs are organized by science centres to attract adult visitors (*fig 9*). Pele said that NGOs and special interest groups are urging science centres to *take a stand* on subjects like global warming, nuclear power, genetically modified food etc. During

Fig 9. One-to-one meeting with scientists on subjects of topical interest – an example of people's engagement in science (GCSC, 2009)

discussions, Pele clarified that it was not his personal opinion but a report on the current trends in science centres. Coming from a person who has enormous exposure to science centre activities all around the world, this observation deserves serious attention. Taking a stand on an issue means exerting authority on the Public, which is essentially a *Top Down* approach, in contravention with the accepted objectives of science centres. Also before taking a stand, science centres should first ascertain whether they have known the final words relating to such issues, after resolving all controversies emanating from social, economic and political vested interests. Opinions are split, with every camp claiming scientific evidence in their support. How much unambiguous are the scientific interpretations?

Field & Powell quotes a source stating that 'in 1997, 63 percent of the public thought that the same scientific evidence can be interpreted to fit opposing views, 72 percent thought that scientific research is almost always affected by the values held by the researcher, and 40 percent thought that technology has become dangerous and unmanageable'[13]. And how much dependable is the media reporting on such acrimonious issues? Field & Powell quote *Science and Engineering Indicators 2000*, stating that 52 percent of journalists polled agreed with the statement that "the news media do not cover science because they are interested in instant answers and short-term results."

Science centres and science cities may not have disagreement that public understanding of science requires activities for public education and engagement. Instead of taking a stand, they should disseminate all necessary information and engage the public in interactive dialogues and hands-on experience with a *Bottom Up* approach so as to enable the public to take their own decision based on their exposure and experience derived in the science centre. Over the years science centres, around the world, have focused on hands-on learning experiences specially for the children, that are centered on exploratory learning and discovery. In the realm of technology, the focus has been on how things work. But public technology education is also about the impact of technology on the society, on which science centres need to organise sustained activities. In this regard, Larry Bell reports on his experience[14] : 'The Museum of Science in Boston has been experimenting with a variety of public engagement approaches designed to help visitors think and talk about the societal implications of nanotechnology. These approaches are generally interactive and two-way, allowing for the collection of data about what people think in addition to simply disseminating information about technology to them. This aspect raises ethical issues in itself. What, if anything, should museums do with information about the opinions expressed?'

White Elephant or Adorable Pet?

The future science centres and science cities have to take care of Bradburne's first caution that today's science centres are gobbling up enormous amount of public and private funds like white elephants, and are doomed to death. In support of his opinion, he cited high capital costs, high operating costs, and high maintenance and renewal costs. He looked convinced that 'given the exponential increase of the availability of new electronic media, such as home computers, CD-ROMs, and, soon, interactive television, coupled with their massive interconnection via the Internet, the informal learning which once was the preserve of the science centre can now be enjoyed at home or in other sites, thus rendering the science centre increasingly unwieldy, expensive, irrelevant and obsolete'[15].

Now in ten years after Bradburne's prediction, science centres have doubled in number from 1200 (in 1998) to 2400 (in 2008) in spite of occasional shut down of some science centres, here and there, for inefficient management. However, his second point regarding the availability of new computer technology at home deserves careful consideration. Subsequent to the success of the new breed of hands-on exhibits, developed and displayed in the Exploratorium, the USA was flooded with similar exhibits in 1980s, thanks to the Cooke Books brought out by the Exploratorium. By 1990 these exhibits became stereotype due to repetition and over usage. With the advent of handy communication technology with desktop computers, CD-ROM, and a large library of educational software and games, many science centres filled their halls with computer-aided exhibits which could converse and interact with visitors. In this context, Bradburne's caution of 1998 was very appropriate. But unlike dinosaurs, science centres again changed their approach with theme-based exhibits. By 1998 India's National Council of Science Museums had developed 25 science centres in addition to 2 industrial & technological museums and no two centres looked similar. Science centres, do not evolve around home-computer-technology any more.

It is true that science centres, and more so science cities, are instantly expensive to build but they are not ultimately expensive when one considers that the high running cost is completely off-set by large revenue. Museums and science centres, particularly at national and state levels in India, have been perennially dependent on government funding both for capital expenditure and operation & maintenance cost. A handful of private museums function with a low-key budget and low visitors attendance. In 1997 the Science City at Kolkata was developed with one-time government grant for capital expenditure with a plan that from day one after inauguration the government budget would be zero. This is the first self-reliant museum or science centre in the country, where the annual income-expenditure is fully balanced. Other science cities, which have come up during the last one decade, followed the suit where the operation and maintenance cost is met from the revenue, and government fund is used for the new development. In order to achieve self-reliance in O&M, several points had to be kept in mind:

1. ***Optimum Size:*** A small science centre which can be visited in two hours time is seldom self-sustained. A science city has to be developed to a size that a family is tempted to spend the whole day and have a satisfaction of getting the money's worth. A large science city, spread over a campus of 50 acres or more of outdoor exhibits in addition to the indoor exhibits, is also capable of holding a much larger size of visitors for longer period.
2. ***Fun, Fantasy, Excitement:*** *Edutainment* and not 'education' or 'entertainment' alone shall be the guiding principle for the exhibits and activities. Children are averse to education in parks, and adults feel 'science is not for me – but fun, yes'.
3. ***Blockbuster Exhibitions:*** People visit a cinema hall many a times, not for the building but for changing films. Science cities must have changing exhibits, preferably blockbuster, to attract repeat visits.
4. ***Sponsorship & Franchise:*** Private funding is plentifully available only if the client size is large. One million visitors or more is prerogative for attracting sponsorship and franchise for sustenance.

In free economy the guiding principle is *survival of the fittest* which sometimes turns out to be *survival of the fattest*. Whether it is the state or the private sponsor, nobody will dole away money just for nothing. No sensible person pays for white elephants. Funding will come for Science City only when agencies will be convinced of a good return, not always in terms of hard cash but in terms of achievements, which may be short term or ultimate. The ultimate achievement is *social transformation* for bettering the way of life.

Social Transformation

One definition of *Social Transformation* is the process by which an individual *alters* the socially ascribed social status of their parents into a socially achieved status for themselves. However another definition refers to large scale social change as in cultural reforms or transformations. The first occurs with the individual, the second with the social system. Social transformation can be achieved only by a *Bottom Up* process.

Science museums, science centres and science cities write their mission statements in different manners at different points of time, eg.:

- To collect, conserve, and exhibit artefacts with a view to instil national pride in country's rich scientific heritage
- To assimilate information relating to mutual interaction of science, technology and society with a view to develop self-confidence in nation building and disseminate the information through exhibits and activities
- To develop spirit of inquiry by encouraging curiosity and questioning processes, and to promote and support innovative ideas and activities
- To foster creative talent especially amongst the younger generation
- To promote scientific temper and eradicate superstition and obscurantism
- To supplement curriculum education in schools and colleges and to impart non-formal education on the community as a whole
- To encourage critical analysis of social, cultural, technological and natural environment and to inculcate an ability to identify the problems and work towards appropriate solution with scientific attitude for the welfare of mankind.

With all these statements, the ultimate mission needs to be 'social transformation' for bettering the life and values of the individuals and the social system. One has to remember Pele's oft-quoted statement: 'We are not in education business, nor in information business. We are in motivation business'. Can science cities of next generation motivate the people for social transformation? That would be the greatest success.

Dinosaurs or Adaptation?

Future science cities have to take note of Bradburne's second caution that 'Dinosaurs became

extinct for three fundamental reasons - rapid change in the climate, insufficient food to sustain their bulk, and increased competition from smaller, more flexible forms of life. In the same way, the life and death of the science centre as an institution is a question of ecology, and its demise just a matter of time"[16].

The change in climate comes from rapid changes in the societal structure, economic strategies, political institutions, and environmental scenario that every country (and the world as a whole) is going through. For their survival, science centres and science cities have to reschedule their priorities and realign their activities with the national priorities in the country they would be functioning.

For sufficient food to sustain, science cities shall have to explore the government sources, seek for corporate funding, and plan for visitor-focussed marketing[17]:

Exploring the Government Sources

- Reorienting the activities in line with national priorities
- Programs for the promotion of Cultural Heritage tourism
- Preparation of attractive packages for project proposals clearly identifying the objective, scope, target audience, expected outcome, finance and time schedule
- Approaching concerned government departments, central and state, instead of asking funds only from the nodal ministry
- Regular follow-up

Corporate Fund Raising

- Identifying the corporate bodies having business interest and/or ready market in a particular zone
- Preparation of attractive packages for project proposals preferably linking the activities with commercial interest of prospective sponsors, and highlighting the mileage that will be accrued to the sponsors
- Creating a one-to-one give-and-take sponsorship/partnership situation rather than asking for grants or donations
- Facility rental marketing

Visitor-focused Marketing

- Working out a reasonable entrance fee. structure and facilities like lucky draw during festivals
- Involvement of the local community in museum's programs
- Organisation of special events for different ethnic groups or for different celebrations.
- Celebration of birthday parties
- Creating a good environment for a profitable restaurant/snack bar, souvenir shop etc.

The most serious challenge comes from competition with other forms of entertainment. For science cities, the competition primarily comes from theme parks, packed with adventure, thrill and excitement. In a typical park atmosphere, theme parks offer opportunities for uncontrolled jumping and thumping all around for children, joy rides of all kinds for children and adults, and even quiet places on waterside with good food for elderly accompanying persons. Theme Park is a place of enjoyment for one and all. It seems a bit difficult for science centres with limited indoor facilities and education-loaded exhibits to compete with the adventures of theme parks, but science cities stand a much better chance to compete with their comparable outdoor facilities, immersive visualization, motion simulators and similar other exciting exhibits. What next? An even greater excitement with a strong foundation of science? That would be forthcoming.

Another challenge is the adaption to rapid changes in communication technology. Science museums and science centres passed through Computers 186 to 486, then P1 to P4 and onwards, a few hundred KB of memory to several hundred GBs, from DOS to Windows of various forms, from CD-ROM to DVD and interactive computer multi-media, sound-light-video synchronization, robotics (*fig 10*), animatronics, virtual reality (*fig 11*), more and more advanced types of immersive visualization, 4-D or 6-D theatre and what not. Additional capital investment brings in additional revenues to off-set the O&M cost.

Fig 10. Robotic dinosaurs in the Science City at Kolkata (1995)

Fig 11. Going back to 1947 to witness Jawaharlal Nehru delivering his Tryst with Destiny speech (Parliament Museum, Delhi, 2006) – animatronics with virtual reality

Bradburne evidently underestimated the capability of science centres to adapt. The question now comes: if science museums, science centres and science cities constitute three generations of activities, what shall be the next in fourth generation? What is our dream?

Dream Science

Jules Verne had a dream of 20,000 Leagues Under the Sea. The dream materialized in submarines.

Martin Luther King (Jr) had a dream of social equality. The dream materialized with the election of a black President for the USA.

APJ Abdul Kalam have a belief that "Great dreams of great dreamers are always transcended."

One has to have a dream of ***Dream Science*** after the present form of Science city.

Dream Science shall be a step ahead of Science City with stress on *Imagination* in all minds-on presentation. In addition to development of advanced generation of minds-on exhibits in open-laboratory situation, the fourth generation institution of Dream Science shall be futuristic to kindle imagination for things-to-come with exhibits and activities similar to the list below, which is just indicative and not exhaustive:

- Minds-on exhibit with motion simulation for undertaking inter-galactic travel in the so-called hyperspace suggesting multi-dimensional universe
- Animated 4-D/6-D theatre taking the visitors to the time of Big Bang and the *first three minutes* of the expanding universe
- Space tunnel with animated Large Hadron Collider
- Creating a situation for experiencing zero-gravity life in outer space and Moon Walk
- Virtual Reality projection on evolution of life
- Immersive visualization and event simulation on life and civilization in outer space
- Interactive activity for creating life in a laboratory, starting from inorganic matters
- Interactive laboratory for gene manipulation, gene therapy and genetic engineering
- Animatronics presentation of landmark inventions in human civilisation
- Creation of a robotic ideal village with *appropriate technology*
- Living inside huge bio-domes, experiencing a Mars colony by *terraforming* of Mars
- Live shows of performing arts on themes of science, technology and environment
- Walk through faithfully recreated eco zones with animatronics of biodiversity
- Conversion of typical theme park rides to science-based edutainment
- Live audio-video channels with BARC, ISRO, DRDO, CSIR labs, medical centres
- Live audio-video interaction with inspiring scientists of the country
- Regular interactive programs for public engagement in science
- Advanced activities for fostering creativity in the young minds
- And so on

The real strength of Dream Science shall be something which dinosaurs did not have. Dream Science shall transcend from education, information, adventure and knowledge to *imagination*. In the words of Einstein: 'Imagination is more important than knowledge. Knowledge is limited. Imagination encircles the world.'

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Dr. Saroj Ghose, Padma Bhushan, the first Director General of the National Council of Science Museums in India, former President of the International Council of Museums in Paris, and Fellow Member of the Association of Science-Technology Centres in USA, spent more than 50 years of his life in developing more than 30 new science museums, science centres, science cities and high-tech story-telling museums in India and abroad.