Center for Science

Re-designing The National Museum of Science and Technology

Agargaon, Dhaka

BY

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SEMINAR II

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Abstract

Science is a fundamental base and a vital component of the life in today's world. Being surrounded with the countries that are constantly improving and developing their skills in science and technology, Bangladesh needs to enhance theirs too. The first step of the country like Bangladesh to be aware of the science and technology possibilities is to create curiosity in the minds of the blooming ones.
This project will be a source for such curiosity and to attract children and adults to the world of science and technology. This museum would portray the possibilities and the expression of science and technology generation and development. This museum would be a one stop roof to house all the science and technology fundaments and divisions so that a person can enrich his knowledge in whatever way he feels; let it be interactive exhibits or just some mute installations.

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1. Chapter 1

Background of the project:

1.1 Project Brief:

Name of the project: Centre for Science [Redesigning The National Museum of Science & technology]
Project type: Educational & Cultural
Client: The Ministry of Science and Technology
Location: Agargoan, Dhaka
Site Area: 217800sqft, 5acres (approx)

1.2 **Introduction**:

Rabindranath Tagore, once wrote “In our country childhood education system contains no delight for children”. [Merry Monwar, 2000]. Latest theories and technology emphasizes on fun way to educate children, thus they are encouraged to learn.

In recent times, science and technology has taken over the power of human and has the whole world in their hands. As being a developing country, it is vital for us to be able to go hand in hand with the super paced world, for technological enrichment, the roots of the future generation should be enriched. Lately, within the last decade, Bangladesh has developed widely in the technical field, launching our mobile manufacturing company, remote controlled motorbikes and so on. Even though, there is still a margin between being technically challenged and technical enrichment.

We, the people of Bangladesh, still need to go through a polish to be technically enriched, we all must involve ourselves more into the technical world ahead.

The ministry of science and technology realized this requirement and made an attempt for technical enlightenment in 1966 through “the national museum of science and technology”. It was a huge success; though for a certain period. Like many other institutions, it stopped its progress and development. All the hype about the technology museum cam to a stop and it remained as a “Dinosaur-ed building” in Agargaon.

1.3 **Aims and Objectives**:

With the proper help of our creative way of teaching, we can provide a new world for the young minds of the generation to broaden their imaginative world. The aim of the project is to design to create a world of technology, so that the visitors are able to learn more about science and technology through exhibits, games and installations. The proposal of the project is to redesign the national museum of science and technology into an education centre; this could be a single place where people of all age group can learn about science and technology. Redesigning it in such a way that not only it can be of the same or almost the same level of equipped with the foreign science centers. This could be a one stop experience for any children who have and eye for science. In short, this could be a complete recreation and education package for a growing and curious mind.

1.4 **Given programmes**:

The targeted number of visitors at peak hour s around 1000 – 1500. The proposal can be divided into the following main, according to the types of activity.

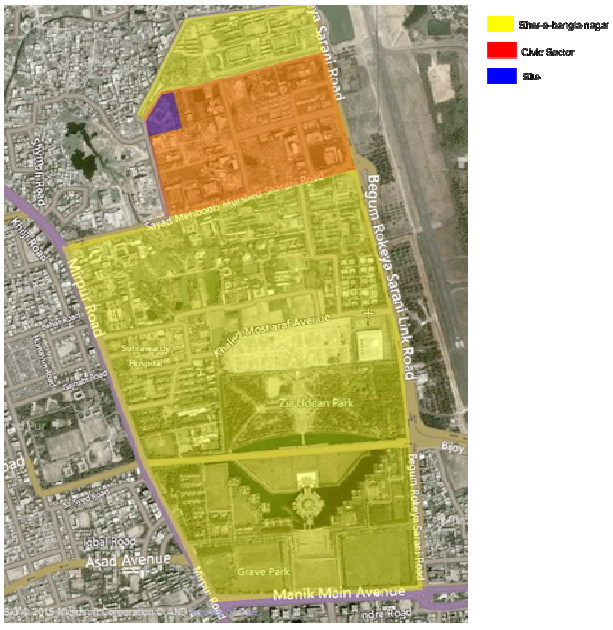
a. Administration Unit
b. Technology Unit
c. Gallery (separated for different groups of science and technology)
d. Movie theatre
e. Library
f. Drama theatre
g. Restaurant
h. Souvenir Shop
i. Parking

Chapter 2: Site Appraisal:

2.1. Location of the site:

Location: Agargaon, Sher-e-Bangla Nagar, Dhaka, Bangladesh
Site area: 217800 sq.ft. 5 acres (approx)
Currently: The National Museum of Science and Technology
Altitude: 9m from sea level
Latitude: 23"46' N
Longitude: 90"22' E

The site is in Agargaon, which is a part of the master plan of Sher-E-Bangla nagar. Shere-e-Bangla Nagar is the heart of Dhaka. All government office and Parliamentary office situated in this area. It is divided into six sectors. The location of the chosen site is at the civic sector. The site is currently holds The National Museum of Science and Technology.



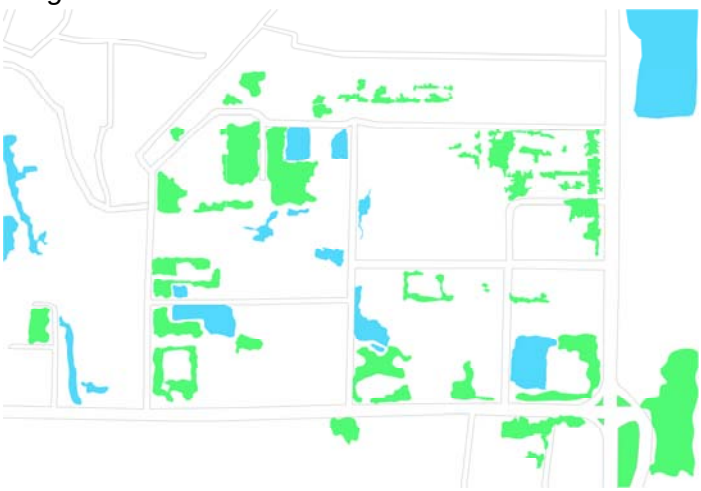
2.2 Site and surrounding:

Road network

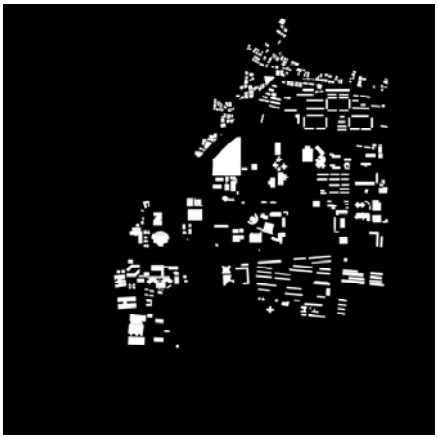
Road types

Zoning

Height distribution within the site



Ecological map



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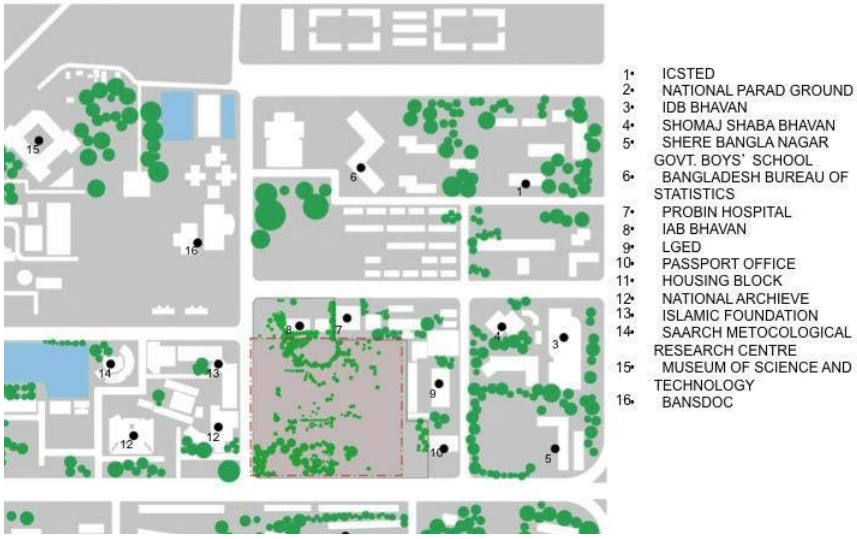
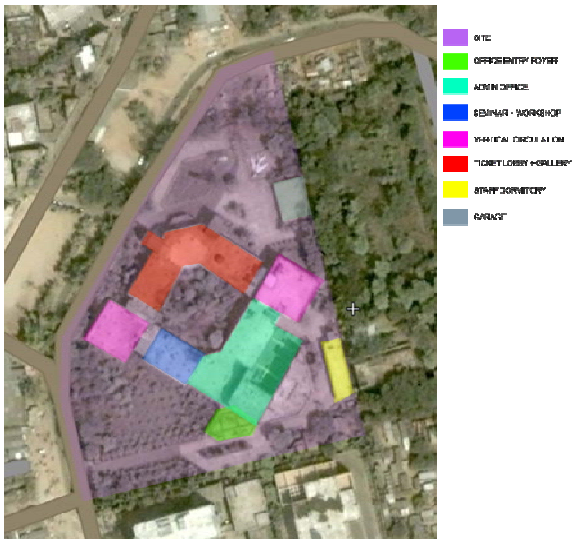


Green and important places (source: Mahmudul Islam Chowdhury)



Existing museum and its zoning

2.3 **The National Museum of Science & Technology**:

National Museum of Science & Technology (NMST) is A Attached Department of the Ministry of Science and Technology, the Government of the People's Republic of Bangladesh. !t was formed under an executive order of the then Pakistan Government on April 26, 1965. This museum is functioning as a unitary body.

The museum has several galleries like: Physical science gallery, Fun science gallery, Biological science gallery, Technological gallery, IT gallery and so on. Except those, there is a science park, a sky observatory, a science library and so on.

The museum arranges different types of educational program like: Popular science lecture, scientific film show, Children science festival and so on. The museum also

arranges National Science and Technology each year both district level national on behalf of the respective ministry. The museum also helps the young scientists in developing their works.

Vision Statement to build a science minded nation. Mission Statement their mission is to popularize science and technology through display of scientific exhibits & to encourage the young and non-professional scientists for their innovative activities. Administration National Museum of Science & Technology is an Attached Department of the Ministry of Science and Technology of the Government of the People's Republic of Bangladesh. !t is unitary body. The executive officer of the museum is Director. He is appointed by the government. Other officers and employees are permanent personnel of the museum. Next after director, curator coordinates overall museum activities.

Aim & Objectives

a) To create awareness of science & Technology among the common mass.
b) To popularize Science & Technology among the students and for this purpose:
To set up permanent exhibition in the museum. To arrange Science & Technology fair, Science exhibition and to organize various Competitions on Science & Technology.
To arrange Mobile Science Exhibitions.
To publish journal on different subjects of Science & Technology. To arrange series of lecture on scientific topics, seminars and workshops.
To organize research activities on the exhibits for the development of the museum.
To arrange studies on space science by establishing a planetarium.
c) To supplement the formal Science education in the schools and colleges through formal educational program.
d) To undertake updating program on Science education.
e) To encourage and co-operate the young and non-professional scientist in their innovative works.
f) To depict the chronological development of science & technology through various exhibits.
g) To help create awareness about the benefits of Science & Technology discovered by the scientists for welfare of the human civilization. Present Activities The present activities of the museum can mainly be classified into following categories, namely)

a) Exhibitory activities: The following galleries at present are: Physical science gallery, Fun science gallery, Biological gallery, IT gallery, Technology gallery except these, some outdoor exhibits including Science Park also existed.

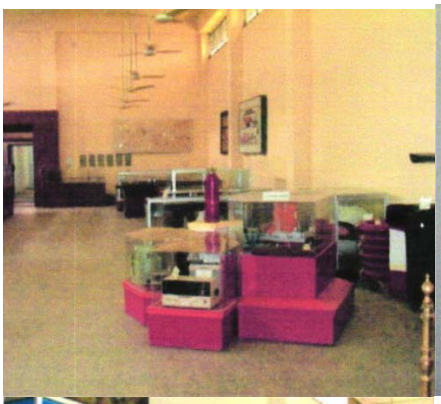
Students from schools/colleges/universities can apply in-group wise for above exhibitions through their respective authority. In that case, they can also apply for the free museum bus for their transport if the institution in the Dhaka city. Sky observation

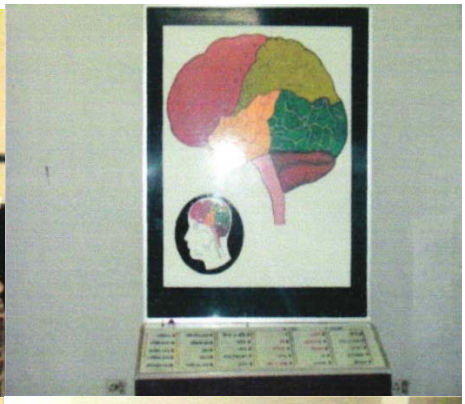
through powerful telescope is held on every Saturday and Sunday evening by a ten take ticket for each visitor. The sky observation is only possible if the sky is cloudless. The mini planetarium show is only held on every Saturday and Sunday normal exhibition time. Visitor can enjoy this show through a ticket of five taka each.
b) Educational Activities: Popular science lecture, scientific film show, Children science festival, Quiz contest, Seminar and Symposium, Library service, internet browsing service and so on. Generally popular science lecture is held for a term of three-month duration on one lecture per week. The renowned scientists of the soil deliver the science lectures. Subject matters may be Astronomical, Astrophysical, Cosmological, Medical, and Biotechnological, Environmental or Contemporary scientific crisis and so on. Children science festival is held once per year. Only students of class III to class VII can participate on the festival through registration with a fixed amount of money. This is a day long program enhances the scientific creativity of the children.

Quiz contest is held randomly among the group-wise student visitors from educational institutes without any notice. Seminars and Symposiums are arranged on special occasion. Library service is open for all only in the office time from Sunday to Thursday on 9.15 A.M. to 4.45 P.M. This library has more than 5000 Scientific & Technological books. The outside readers can read only but cannot borrow books from the library.
c) Publications
d) Science Week & activities NMST arranges National Science & Technology Week every year in both district level and national level. Only two participants (One from junior level and other from senior level or college level) from each district can participate in National level. The viable projects from the science weeks are encouraged to be developed further by Young scientist's activities.
e) Young Scientist activities NMST always encourage the young generation and help them in development of their potential projects. NMST helps them both financially and technologically. NMST has an enriched workshop for their development of the Young Scientist's projects and museum exhibits.

As it was established in its permanent home in 1981, the museum is quiet old. lt is not well maintained since then. Even though it holds many activities all year round for the kids due to lack of publicity, poor appearance and maintenance of the building and lack of new and modem exhibits it is not known to most of the people of the city and the ones that knows about the place are not willing to visit next time.


NATIONAL MUSEUM OF SCIENCE & TECHNOLOGY





2.4 Environmental considerations:

Topography

The topography of the site is a flat land. There has no great variation in the elevation.

Habitation

To the north and the west it is still undeveloped. To the east is the BANSDOC. There is height variations from twenty storied to two storied.

Climatic consideration

The site receives constant southern breeze as the building height of the southern site is not
more than five storied. Though the west side is still underdeveloped and the east is loaded with green trees. It also receives plentiful amount of north light.

Temperature

Season	Month	Maximum (Degree C)	Minimum (Degree C)
Dry-Summer	March- June	40	35
Monsoon	July- October	30	32
Winter	Nov- Feb	26	28

Temparature chart of Agargaon
(source: http://weather.mirbig.net/en/BD/81/1349452_Agargaon])

Temparature chart of Agargaon
(source: http://weather.mirbig.net/en/BD/81/1349452_Agargaon])

Rainfall

Rainfall chart of Agargaon
(source: http://weather.mirbig.net/en/BD/81/1349452_Agargaon])

2.5 S.W.O.T. analysis:

Strength:

• Agargaon hasn't fully developed yet, so the site has a potential of becoming a good urban public place and will speed up the process of development.

• The site already has The National Museum of Science and Technology, ever since 1966.

• In this centre visitors from inside and outside the country can learn more about science and technology, therefore it will leave a mark globally.

• The site demands an updated science and technology center, for all age group

• It is located almost centrally in the city and easily accessible

• The west side is mostly filled with build structures, so it will provide sufficient shade

• The present access road is very narrow

• The site is larger in the east-west side

Weakness:

• At night the area becomes insecure

• The site and surrounding is not properly taken care by authority

• The existing museum used to be vibrant, but due to low maintenance and ignorance made the place to be less lively.

Opportunity:

• As the area does not have a proper public place, this site will give a chance to flourish the idea of public place in the city

• The other public building around the site would act as positive forces for the centre.

• It will initiate a fresh development in this area

• The site being near to the Parliament Building could help to generate for visitors, local and foreign to visit

Threat:

• If the site is not handled appropriately, it might make a bad effect in society as this being the only science center

• The environment would be affected if the ratio of build area and green is not properly balanced

Chapter 3: Literature Review:

Defining science, technology and society:

Science, technology and society (STS), also referred to as science and technology studies is a branch or offspring of science studies. It considers how social, political, and cultural values affect scientific research and technological innovation, and how these, in turn, affect society, politics and culture.

STS is a new and expanding subject. Like most interdisciplinary programs, it emerged from the confluence of a variety of disciplines and disciplinary subfields, all of which had developed an interest—typically, during the 1960s or 1970s—in viewing science and technology as socially embedded enterprises.

Science, technology, and society In the mid- to late-1960s, student and faculty social movements in the U.S., UK, and European universities helped to launch a range of new interdisciplinary fields (such as women's studies) that were seen to address relevant topics that the traditional curriculum ignored. One such development was the rise of "science, technology, and society" programs, which are also—confusingly—known by the STS acronym. Drawn from a variety of disciplines, including anthropology, history, political science, and sociology, scholars in these programs created undergraduate curricula devoted to exploring the issues raised by science and technology. Unlike scholars in science studies, history of technology, or the history and philosophy of science, they were and are more likely to see themselves as activists working for change rather than dispassionate, "ivory tower" researchers. As an example of the activist impulse, feminist scholars in this and other emerging STS areas addressed themselves to the exclusion of women from science and engineering.

Science, engineering, and public policy studies emerged in the 1970s from the same concerns that motivated the founders of the science, technology, and society movement: A sense that science and technology were developing in ways that were increasingly at odds with the public's best interests. The science, technology, and society movement tried to humanize those who would make tomorrow's science and technology, but this discipline took a different approach: It would train students with the professional skills needed to become players in science and technology policy. Some programs came to emphasize quantitative methodologies, and most of these were eventually absorbed into systems engineering. Others emphasized sociological and qualitative approaches, and found that their closest kin could be found among scholars in science, technology, and society departments.

Science and technology in Bangladesh:

In Bangladesh, the cultivation of modern science started during the British rule when the first modern educational institutions, focused on scientific fields, were established in the country. The University of Dhaka, established in 1921, acted as the driving force in producing many renowned scientists in Bangladesh.

Since its independence in 1971, Bangladesh has been plagued with many social issues like poverty, illiteracy etc. Hence, science and technology have lagged behind in the priority list of the successive governments. However, induced by the recent economic progress, science and technology has been witnessing intense growth in the country

after a period of stagnation, most notably in the information technology and biotechnology sectors. The national policies for science and technology is planned and developed by the National Council for Science and Technology which is controlled by the ministry of science and technology.

Branches of science and technology:

The branches of science (also referred to as "sciences", "scientific fields", or "scientific disciplines") are commonly divided into three major groups: physical science, earth science and life science.

The natural sciences and social sciences are empirical sciences, meaning that the knowledge must be based on observable phenomena and must be capable of being verified by other researchers working under the same conditions.

These three categories make up the fundamental sciences, which form the basis of interdisciplinary and applied sciences such as engineering and medicine. Specialized scientific disciplines that exist in multiples categories may include parts of other scientific disciplines but often possess their own terminologies and expertises. The fields of the specialized scientific disciplines are as follows:

The Physical Sciences

- Physics: The study of matter and energy and the interactions between them. Physicists study such subjects as gravity, light, and time. Albert Einstein, a famous physicist, developed the Theory of Relativity.
- Chemistry: The science that deals with the composition, properties, reactions, and the structure of matter. The chemist Louis Pasteur, for example, discovered pasteurization, which is the process of heating liquids such as milk and orange juice to kill harmful germs.
- Astronomy: The study of the universe beyond the Earth's atmosphere.

The Earth Sciences

- Geology: The science of the origin, history, and structure of the Earth, and the physical, chemical, and biological changes that it has experienced or is experiencing.
- Oceanography: The exploration and study of the ocean.
- Paleontology: The science of the forms of life that existed in prehistoric or geologic periods.
- Meteorology: The science that deals with the atmosphere and its phenomena, such as weather and climate.

The Life Sciences (Biology)

- Botany: The study of plants.
- Zoology: The science that covers animals and animal life.

- Genetics: The study of heredity.
- Medicine: The science of diagnosing, treating, and preventing illness, disease, and injury.

Background of The National Museum of Science and Technology:

The National Museum of Science and Technology was an initiative to acknowledge the country with the rich science and technology of the world. The National Museum of Science and Technology was established in 1966 by the East Pakistan government. After the liberation war in 1971, this vibrant museum was closed and it reopened in about 1982. After it reopened it organized annual exhibitions and programmes so that they can still run smooth. It used to very crowded and vibrant place to be, as the museum had a wide range of galleries and exhibits. It ran successfully since then, but for some reasons it stopped upgrading the exhibits and it resulted in failure of the project. Failure in a sense that; it used to have 200 to 2000 visitors per day but in recent times it has about 100 visitors on average. The up gradation might not be the only problem, it might also be that the technology is so easy to reach and the people nowadays are so lazy to visit a museum or they have a wrong perception about museum being boring that they are no longer interested.

The museum has 7 different galleries all integrated. All the galleries are dedicated to different sections and branches of science and technology.

Educational psychology:

Educational psychology is the branch of psychology concerned with the scientific study of human learning. The study of learning processes, from both cognitive and behavioral perspectives, allows researchers to understand individual differences in intelligence, cognitive development, affect, motivation, self-regulation, and self-concept, as well as their role in learning. The field of educational psychology relies heavily on quantitative methods, including testing and measurement, to enhance educational activities related to instructional design, classroom management, and assessment, which serve to facilitate learning processes in various educational settings across the lifespan.

Educational psychology can in part be understood through its relationship with other disciplines. It is informed primarily by psychology, bearing a relationship to that discipline analogous to the relationship between medicine and biology. It is also informed by neuroscience. Educational psychology in turn informs a wide range of specialties within educational studies, including instructional design, educational technology, curriculum development, organizational learning, special education and classroom management. Educational psychology both draws from and contributes to cognitive science and the learning sciences. In universities, departments of educational psychology are usually housed within faculties of education, possibly accounting for the lack of representation of educational psychology content in introductory psychology textbooks.

The field of educational psychology involves the study of memory, conceptual processes, and individual differences (via cognitive psychology) in conceptualizing new strategies for learning processes in humans. Educational psychology has been built upon theories of Operant conditioning, functionalism, structuralism, constructivism,

humanistic psychology, Gestalt psychology, and information processing.
To understand the characteristics of learners in childhood, adolescence, adulthood, and old age, educational psychology develops and applies theories of human development. Often represented as stages through which people pass as they mature, developmental theories describe changes in mental abilities (cognition), social roles, moral reasoning, and beliefs about the nature of knowledge.
For example, educational psychologists have conducted research on the instructional applicability of Jean Piaget's theory of development, according to which children mature through four stages of cognitive capability. Piaget hypothesized that children are not capable of abstract logical thought until they are older than about 11 years, and therefore younger children need to be taught using concrete objects and examples. Researchers have found that transitions, such as from concrete to abstract logical thought, do not occur at the same time in all domains. A child may be able to think abstractly about mathematics, but remain limited to concrete thought when reasoning about human relationships. Perhaps Piaget's most enduring contribution is his insight that people actively construct their understanding through a self-regulatory process.[16]
Piaget proposed a developmental theory of moral reasoning in which children progress from a naïve understanding of morality based on behavior and outcomes to a more advanced understanding based on intentions. Piaget's views of moral development were elaborated by Kohlberg into a stage theory of moral development. There is evidence that the moral reasoning described in stage theories is not sufficient to account for moral behavior

Educational technology:
Educational technology is the effective use of technological tools in learning. As a concept, it concerns an array of tools, such as media, machines and networking hardware, as well as considering theoretical perspectives for their effective application. Educational technology is not restricted to high technology. Nonetheless, electronic educational technology has become an important part of society today. Modern educational technology includes (and is broadly synonymous with) e-learning, instructional technology, information and communication technology (ICT) in education, EdTech, learning technology, multimedia learning, technology-enhanced learning (TEL), computer-based instruction (CBI), computer managed instruction, computer-based training (CBT), computer-assisted instruction or computer-aided instruction (CAI), internet-based training (IBT), flexible learning, web-based training (WBT), online education, virtual education, personal learning environments, networked learning, virtual learning environments (VLE) (which are also called learning platforms), m-learning, and digital education. These labels have been variously used and understood, and conflate to the broad domain of educational technology and e-learning. These alternative descriptive terms are all more restrictive than "educational technology" in that they individually emphasize a particular digitization approach, component or delivery method.
Theoretical perspectives and scientific testing may influence instructional design. The application of theories of human behavior to educational technology derives input from instructional theory, learning theory, educational psychology, media psychology and

human performance technology.
Educational technology includes numerous types of media that deliver text, audio, images, animation, and streaming video, and includes technology applications and processes such as audio or video tape, satellite TV, CD-ROM, and computer-based learning, as well as local intranet/extranet and web-based learning. Information and communication systems, whether free-standing or based on either local networks or the Internet in networked learning, underlie many e-learning processes.
Educational technology and e-learning can occur in or out of the classroom. It can be self-paced, asynchronous learning or may be instructor-led, synchronous learning. It is suited to distance learning and in conjunction with face-to-face teaching, which is termed blended learning. Educational technology is used by learners and educators in homes, schools, businesses, and other settings.

Educational media and tools can be used for:

- task structuring support: help with how to do a task (procedures and processes),
- access to knowledge bases (help user find information needed)
- alternate forms of knowledge representation (multiple representations of knowledge, e.g. video, audio, text, image, data)

Numerous types of physical technology are currently used: digital cameras, video cameras, interactive whiteboard tools, document cameras, electronic media, and LCD projectors. Combinations of these techniques include blogs, collaborative software, ePortfolios, and virtual classrooms.

Audio and video
Radio offers a synchronous educational vehicle, while streaming audio over the internet with webcasts and podcasts can be asynchronous. Classroom microphones, often wireless, can enable learners and educators to interact more clearly.
Video technology has included VHS tapes and DVDs, as well as on-demand and synchronous methods with digital video via server or web-based options such as streamed video from YouTube, Teacher Tube, Skype, Adobe Connect, and webcams. Telecommuting can connect with speakers and other experts.
Podcasting allows anybody to publish files to the Internet where individuals can subscribe and receive new files from people by a subscription.

Computers, tablets and mobile devices.Teaching and learning online.
Computers and tablets enable learners and educators to access websites as well as programs such as Microsoft Word, PowerPoint, PDF files, and images. Many mobile devices support m-learning.
Mobile devices such as clickers and smart phones can be used for interactive feedback. Mobile learning can provide performance support for checking the time, setting reminders, retrieving worksheets, and instruction manuals.

Social networks

Group web pages, blogs, and wikis allow learners and educators to post thoughts, ideas, and comments on a website in an interactive learning environment. Social networking sites are virtual communities for people interested in a particular subject or just to "hang out" together. Members communicate by voice, chat, instant message, video conference, and blogs, and the service typically provides a way for members to contact friends of other members. The National School Boards Association found that 96% of students with online access have used social networking technologies, and more than 50% talk online specifically about schoolwork. These statistics support the likelihood of being able to bring these technologies into our classrooms and find successful teaching methods to employ their use in an educational setting. Social networking inherently encourages collaboration and engagement. Social networking can be used as a motivational tool to promote self-efficacy amongst students. In a study by Bowers-Campbell (2008) Facebook was used as an academic motivation tool for students in a developmental reading course. Group members may respond and interact with other members. Student interaction is at the core of constructivist learning environments and Social Net-working Sites provide a platform for building collaborative learning communities. By their very nature they are relationship-centered and promote shared experiences. With the emphasis on user-generated-content, some experts are concerned about the traditional roles of scholarly expertise and the reliability of digital content. Students still have to be educated and assessed within a framework that adheres to guidelines for quality. Every student has his or her own learning requirements, and a Web 2.0 educational framework provides enough resources, learning styles, communication tools and flexibility to accommodate this diversity.

Social networking is important for educators themselves. On the social media website Twitter, educators have the ability to review lectures, remind students of upcoming lectures, and provide supplementary materials/resources. In turn, students can tweet questions and observations back to the educator. Postings take place throughout the day and educators are linked internationally through the Internet. This learning network is shared globally.

Webcams

Webcams and webcasting have enabled creation of virtual classrooms and virtual learning environment.

Whiteboards

Interactive whiteboards and smart boards allow learners and instructors to write on the touch screen. The screen markup can be on either a blank whiteboard or any computer screen content. Depending on permission settings, this visual learning can be interactive and participatory, including writing and manipulating images on the interactive whiteboard. Schools started to use whiteboards as an education tool for a long time before tablets or other technological tools. These kinds of technological tools improve student motivation, interest and care when they used during the lesson. Students who

have kinesthetic multiple intelligence can be more active and engaged with these kind of lessons. Also visual students will be more careful and active during the lesson. Not only for all students during the lesson, some students can work on the whiteboard and others can work on a different work. Teacher can use whiteboards as a part of a differentiated lesson plan.

Screen casting

Screen casting allows users to share their screens directly from their browser and make the video available online so that other viewers can stream the video directly. The presenter thus has the ability to show their ideas and flow of thoughts rather than simply explain them as simple text content. In combination with audio and video, the educator can mimic the one-on-one experience of the classroom and deliver clear, complete instructions. Learners have an ability to pause and rewind, to review at their own pace, something a classroom cannot always offer.

Virtual classroom

A Virtual Learning Environment (VLE), also known as a learning platform, simulates a virtual classroom or meetings by simultaneously mixing several communication technologies. For example, web conferencing software such as Go To Training, WebEx Training or Adobe Connect enables students and instructors to communicate with each other via webcam, microphone, and real-time chatting in a group setting. Participants can raise hands, answer polls or take tests. Students are able to whiteboard and screen cast when given rights by the instructor, who sets permission levels for text notes, microphone rights and mouse control.

A virtual classroom provides the opportunity for students to receive direct instruction from a qualified teacher in an interactive environment. Learners can have direct and immediate access to their instructor for instant feedback and direction. The virtual classroom provides a structured schedule of classes, which can be helpful for students who may find the freedom of asynchronous learning to be overwhelming. In addition, the virtual classroom provides a social learning environment that replicates the traditional "brick and mortar" classroom. Most virtual classroom applications provide a recording feature. Each class is recorded and stored on a server, which allows for instant playback of any class over the course of the school year. This can be extremely useful for students to review material and concepts for an upcoming exam. This provides students with the opportunity to watch any class that they may have missed, so that they do not fall behind. Parents and auditors have the conceptual ability to monitor any classroom to ensure that they are satisfied with the education the learner is receiving.

In higher education especially, the increasing tendency is to create a virtual learning environment (VLE) (which is sometimes combined with a Management Information System (MIS) to create a Managed Learning Environment) in which all aspects of a course are handled through a consistent user interface throughout the institution. A growing number of physical universities, as well as newer online-only colleges, have

begun to offer a select set of academic degree and certificate programs via the Internet at a wide range of levels and in a wide range of disciplines. While some programs require students to attend some campus classes or orientations, many are delivered completely online. In addition, several universities offer online student support services, such as online advising and registration, e-counseling, online textbook purchases, student governments and student newspapers.

Augmented reality (AR) provides students and teachers the opportunity to create layers of digital information that includes both virtual world and real world elements, to interact with in real time. There are already a variety of apps which offer a lot of variations and possibilities.

Learning management system
Main article: Learning management system
A learning management system (LMS) is software used for delivering, tracking and managing training and education. For example, an LMS tracks attendance, time on task, and student progress. Educators can post announcements, grade assignments, check on course activity, and participate in class discussions. Students can submit their work, read and respond to discussion questions, and take quizzes. An LMS may allow teachers, administrators, students, and permitted additional parties (such as parents if appropriate) to track various metrics. LMSs range from systems for managing training/educational records to software for distributing courses over the Internet and offering features for online collaboration. The creation and maintenance of comprehensive learning content requires substantial initial and ongoing investments of human labor. Effective translation into other languages and cultural contexts requires even more investment by knowledgeable personnel.

Internet-based learning management systems include Canvas, Blackboard Inc. and Moodle. These types of LMS allow educators to run a learning system partially or fully online, asynchronously or synchronously. Blackboard can be used for K-12 education, Higher Education, Business, and Government collaboration. Moodle is a free-to-download Open Source Course Management System that provides blended learning opportunities as well as platforms for distance learning courses. Eliademy is a free cloud based Course Management System that provides blended learning opportunities as well as platforms for distance learning courses.

Learning content management system

A learning content management system (LCMS) is software for author content (courses, reusable content objects). An LCMS may be solely dedicated to producing and publishing content that is hosted on an LMS, or it can host the content itself. The Aviation Industry Computer-Based Training Committee (AICC) specification provides support for content that is hosted separately from the LMS.

A recent trend in LCMSs is to address this issue through crowd sourcing.

Computer-aided assessment

Computer-aided assessment (e-assessment) ranges from automated multiple-choice tests to more sophisticated systems. With some systems, feedback can be geared towards a student's specific mistakes or the computer can navigate the student through a series of questions adapting to what the student appears to have learned or not learned.

The best examples follow a formative assessment structure and are called "Online Formative Assessment". This involves making an initial formative assessment by sifting out the incorrect answers. The author of the assessment/teacher will then explain what the pupil should have done with each question. It will then give the pupil at least one practice at each slight variation of sifted out questions. This is the formative learning stage. The next stage is to make a summative assessment by a new set of questions only covering the topics previously taught.

Learning design is the type of activity enabled by software that supports sequences of activities that can be both adaptive and collaborative. The IMS Learning Design specification is intended as a standard format for learning designs, and IMS LD Level A is supported in LAMS V2.elearning and has been replacing the traditional settings due to its cost effectiveness.

Electronic performance support system
An electronic performance support system (EPSS) is, according to Barry Raybould, "a computer-based system that improves worker productivity by providing on-the-job access to integrated information, advice, and learning experiences". Gloria Gery defines it as "an integrated electronic environment that is available to and easily accessible by each employee and is structured to provide immediate, individualized on-line access to the full range of information, software, guidance, advice and assistance, data, images, tools, and assessment and monitoring systems to permit job performance with minimal support and intervention by others."

Student data systems have a significant impact on education and students. Over-the-counter data (OTCD) refers to a design approach which involves embedding labels, supplemental documentation, and a help system and making key package/display and content decisions.

Child psychology is one of the many branches of psychology and one of the most frequently studied specialty areas. This particular branch focuses on the mind and behavior of children from prenatal development through adolescence. Child psychology deals not only with how children grow physically, but with their mental, emotional and social development as well.

Understanding what makes kids tick is an enormous task, so the study of child psychology is both wide and deep. The ultimate goal of this field is to study the many influences that combine and interact to help make kids who they are and to use that information to improve parenting, education, child care and psychotherapy other areas focused on benefiting children. By having a solid understanding how children grow, think and behave, we could be able to design their knowledge according to their abilities and intellectualities.

Importance of science and technology:

The importance of science and technology in contemporary society is demonstrated by the use of it in our daily lives. And we often have no idea how science and technology really affect us. We live and work in structures given to us by science and technology. We are transported around on the ground, across the water and in the air by vehicles that are the direct result of science and technology. Modern societies are literally built on science and technology. When we turn on the tap, flush the toilet, or flip a light switch, we are accessing science and technology.

Medicine is wall-to-wall science and technology, and anyone who is more than mildly ill or has been injured in more than a minor way will benefit from science and technology. Without technology, we would not have a TV, computer, phones and other things. Without science, we would hardly know anything about our planet, country or even our local area. Therefore, acknowledging the young generations of the variety of science and technology, our country could be developed in an extent we might have never considered. Also knowledge about science and technology could shape Bangladesh in an extent that it could be able to compete with the developed countries.

Museum design:

Most mid-size and large museums employ exhibit design staff for graphic and environmental design projects, including exhibitions. In addition to traditional 2D and 3D designers and architects, these staff departments may include audio-visual specialists, software designers, audience research and evaluation specialists, writers, editors, and preparatory or art handlers. These staff specialists may also be charged with supervising contract design or production services. The exhibit design process builds on the interpretive plan for an exhibit, determining the most effective, engaging and appropriate methods of communicating a message or telling a story. The process will often mirror the architectural process or schedule, moving from conceptual plan, through schematic design, design development, contract document, fabrication and installation. Museums of all sizes may also contract the outside services of exhibit fabrication businesses.

Exhibition design has as multitude of strategies, theories, and methods but two that embody much of the theory and dialogue surrounding exhibition design are the metonymy technique and the use of authentic artifacts to provide the historical narrative. Metonymy, or "the substitution of the name of an attribute or adjunct for that of the thing meant," is a technique used by many museums but few as heavily and as influentially as Holocaust museums.

The United States Holocaust Memorial Museum in Washington D.C., for example, employs this technique in its shoe exhibition. The basic idea behind exhibiting authentic artifacts is to provide not only legitimacy to the exhibit's historical narrative but, at times, to help create the narrative as well. The museum attempts, in other words, to archive the unachievable. A well designed exhibition should employ objects and artifacts as a foundation to the narrative but not as a crutch; a lesson any conscientious curator would be well to keep in mind.

Types of museums vary, from large institutions, covering many of the categories below, to very small institutions focusing on a specific subject, location, or a notable person. Categories include:
Fine arts, applied arts, craft, archaeology, anthropology and ethnology, history, cultural history, science, technology, children's museums, natural history, botanical and zoological gardens.
Within these categories many museums specialize further, e.g. museums of modern art, folk art, local history, military history, aviation history, philately, agriculture or geology.
Another type of museum is an encyclopedic museum. ln the early twenty-first century, technological development and globalization have brought profound changes to society that require from individuals critical and creative thinking skills to adapt to change. Swart and Park underline that good thinking became essential to face the challenge of living in a technologically oriented, multicultural world (Swartz, Parks, 1994,Cit.IDES,2004, p. 9). Knowledgeable thinkers have more opportunities to achieve success, solve problems and take correct decisions in their jobs and lives. Also museums must adapt to change and rethink its role and relevance. This essay aims to:
Justify the importance of critical and creative thinking skills in the XXI century;

Analyze the challenges museums face and suggest possible ways to to the development of critical and creative thinking skills;
Show evidences of the need for museums to be spaces of knowledge, learning, reflection, development of thinking skills, to prove their relevance for the XXI century.
Museums are appropriate spaces for reflection and critical and creative relations with objects and ideas. The research by ln6s Ferreira on 'Museums in the Twenty-First Century
The importance of Critical Thinking and Creative Thinking', arises from the assumption that thinking tools are important today and might be developed in museums, what might constitute an opportunity for museums to become more relevant and creative in the XXI century. Creativity is composed by creative thinking, motivation and expertise (Amabile,1998). Although we find differences in the definitions, all suggest that creativity is related to new and applied ideas, products, processes, analogies or tools. We consider in this that creativity is the capacity to create new and applied ideas, capacity deeply dependent on the attitude and decision of the intervenient(s), which always operates some change, detected in the person, in a process, in the involvement or in a product. Together with motivation and expertise, creative thinking, can generate creativity. If the subject is not motivated or has not enough expertise, creative thinking

may do not generate creativity. Many researchers, however, use the term creativity to refer both creativity and creative thinking. Although this research is focused in thethinking skills itself, as the distinction in literature is not always demarcated, we sometimes will refer creativity in both meanings. Distinctive capacities, critical and creative thinking skills act together. Because of that we will consider them here, as a whole, interrelated. Creative thinking skills need critical thinking to choose between the results of a creative process and take decisions on its results - evaluate, select, develop new ideas. On the other hand, critical thinking skills require creative thinking skills to find adequate answers to problems or to propose arguments and alternative explanations (Tenreiro-Vieira And Vieira, 2000, p.28), think out of the box. Occidental societies live new changes that affect everyone and every organization, including museums (Falk et al., 2011). Knowledge became the most transacted product in actual economy, and museums are producers of knowledge. Free Choice learning is getting more important and museums are free choice learning spaces. Time people have to free choice learning is growing and will grow more. (Falket 2011,p.324). Citizens are called to assume a more interventional, critical role and museum visitors are called to participate in museum decisions. It is in this context that museums, today, attempt to redefine themselves. (Center for the Future Of Museums, 2008, 9.2-3). As knowledge and learning spaces, museums may be spaces for development of a critical and creative way of thinking. This challenge is an opportunity for museums to answer and adapt to changes, attempting to get relevance. Museums are free choice learning spaces. There is, however, a dissonance between what museums may be and what museums are. Thus the idea of building a creativity museum for the children is justified. A Children's museum is defined as an institution committed to serving the needs and interests of children by providing exhibits and programs that stimulate curiosity and motivate learning. Children's museums vary greatly in style, size and content. Because of this creativity and diversity, the field is on a continuum of exciting change. To more fully understand the definition and use of children's museums, ACM offers some useful publications. The book Collective Vision: Starting and Sustaining a Children's Museum ' addresses all the considerations in starting a museum for children including finding space, hiring staff, developing programming, beginning an endowment, writing a business plan and much more. Moreover, the book has collection of noted research, quotes from early learning experts and statistics from the children's museum field that frames the argument for why children's museum are an important and worthy community investment. According to the article 'Children's Museums and the Role of Play' by Fred Rogers, A children's museum stimulates curiosity and creativity by providing children with opportunities for hand-on-learning, key to their cognitive, social and emotional well-being. These museums are committed to serving the unique needs and interests of children by providing exhibits and programs that create a spark for discovery and lifelong learning. "These types of museums afford unique opportunities for children, parents, and teachers to explore concepts in math, science, art, music, history, and social studies. In these museums, individuals of all ages are encouraged to play because of the richness of experience that play affords" (Henderson, 2007).Thus when the term 'creative' is added to a children's museum it gives a new dimension to the museum. These museums have art studios

where young children can draw or create from a wide variety of materials. They don't need to try to make something that looks exactly like something they see in the world. Drawing gives them away to express their own feelings and thoughts. It’s not important that they "get it right." it’s important that they do it their own way. Children can try on costumes and different roles," which give them safe ways of exploring and acting out their concerns and deeper inner needs. According to Kronkosky, a charitable foundation, Children's museums play a vital role in the learning experiences of children of all ages, but especially for toddlers. Studies have shown that learning begins at a very early age; both parents and curators of children's museums are listening to those studies. Nearly half of the children that visit children's museums every year around the world are under the age of six and today's children's museums have the latest technologies to help these very young children develop cognitive and physical skills through interactive learning and play (Caplan, 2004).!n today's world museums participate in developing more creative communities by working with government, supporting local community initiatives and ensuring that the role of museums is fundamental to community culture. Sometimes, museums and galleries are seen as an end in themselves, being described as the stewards of community collections, venues for creative programming and support infrastructure for local artists. They also play an important role in informing, educating and entertaining communities and their visitors. Museums are also community symbols. Along with a courthouse, the possession of a museum enhances the status of a city or town. The research on 'Creative cities, creative museums' by Museums and galleries NSW has indicated that museums have a valuable role to play in engaging fully in the cultural planning process and that these organizations can strengthen the cultural capacity of their communities. Indeed they are essential to the community's development of a vibrant creative environment to both sustain and nurture the future of that community and ensure a viable future for museums in these communities.

Chapter 4:

Case Study 1: Bangabandhu sheikh Mujibur Rahman Novo theatre:

The Bangabandhu Sheikh Mujibur Rahman Novo theatre, a planetarium, was established by the Ministry of Science and ICT of Dhaka. One of the major function of the ministry is to support the socio-economic development of the country through research, development, extension and successful utilization of Science and Technology, and the Bangabandhu Sheikh Mujibur Rahman Novo Theatre is one of its major projects, and any matter related to it are handled by them. According to the DG from the Ministry of Science & Technology under the Government of the People's Republic of Bangladesh, the novo theatre was established to educate and inform citizens through entertainment to learn about space science. The vision behind the construction was to educate the citizens and create opportunities for research of space and astronomical science. The mission was to develop positive attitudes in the minds of people and to get rid of superstitions about outer space from the society. They wanted it to act like an informal science and educational institute. This is the first planetarium of the country and was opened to public on 25 September 2004. The total cost of the project was Taka 1,231.27 million, covered by the Government of Bangladesh on 5.46 acres of land.

The purpose and objectives of the Novo theatre were:
To spread actual knowledge and provide information about space science to the residents of Bangladesh notably students.
To create interest in younger generation to learn about science and space through entertainment.
To help develop a positive scientific attitude in people to remove superstitions and irrational thinking from the society.
To exhibit modern scientific discoveries and creation to the general people and encourage them to study science as a subject.
To provide a platform of research on astronomy and celestial bodies.
To launch science library for preservation and exhibition of films, books, journals, periodicals, research papers on astronomical features.
To obtain latest pictures, documentaries, papers on astronomy for collection and preservation.
To conduct seminar, conference regularly to share the knowledge and to keep updated with the world particularly for students.
To keep people aware about the activities in Novo Theatre through newspapers, radio, television and other means.
To create a network with schools and educational institutes through publication of leaflets, advertising, and brochures.
To organize scientific edutainment with the use of modern and advanced technologies and mechanisms like 5D edutainment simulator, Space Ride Simulator, Virtual Planetarium etc.

The Novo Theatre is not limited to an educational center but also provide scientific knowledge among the student community of the city through other means. It is equipped

with advanced technological equipment and gadgets inclusive of mind-keeping projector systems such as, Astrotec perforated aluminum curtain, GSS-Helios Space Simulator produced by GOTO Optical Manufacturing Company, Astrovision-7O and many other special effects projectors. The program of the Novo theatre includes a planet show 'Journey to infinity' directed by Dr. Bill Gutsch, will give the audience a dream like experience. The highly specialized projector and sky-scan videos produce excellent quality images, taking the audiences to a journey to the Solar System. It will explain the creation of the universe and Milky Way Galaxy. The film ends by the death of a star and the well-known concept of Black Hole. Like all the other planetariums around the world, it is just not limited to astronomy but provides information and has illustrations on various topics like Biology, History, industry, Geography and Anthropology. 'Africa: the Serengeti' will be displayed through the projection of Astrovision-70. Along with that different types of award-wining and heart throbbing IMAX films will also offer the natural beauty of Africa, showing the migration of animals and life in the forest.

Novo theatre has been designed by Architect Ali lmam and construction was carried out by PWD. The eye catching factor of the building is the light blue metallic dome, bounded by green, a well taken care of lawn. lt can be easily identified by its distinctive architectural style, where the key elements are the pillars, use of glass, and the definite geometric shapes. 14 pillars, seven on each side, can be seen at the entrance of the building. The images of these columns are reflected on 3 fountains located before the dome shaped theatre. The staircase is beside it which is in the shape of a telescope like an observatory. lt is a 27O seated theatre which has multiple functions including a three dimensional screen, and also used as a space for scientific exhibition. There is an art gallery called the Hall of Fame where photographs of famous scientists like Galileo, Copemicus, Ptolemy, Newton, Einstein, Dr Qudrat-e-Khuda, Satyen Bose, Stephen Hawkins and Dr Qazi Motahar Hossen are displayed. The pictures are life size about 50 feet and were painted by the architect himself. lt is a five storied planetarium and the level distribution is as follows: Level 1: Three-dimensional shows and simulator shows Level 2: Car parking for 100 cars Level 3: Hall of Fame and Food Court Level4: Exhibition Hall and Theatre Hall Level 5: Models of various planets and solar systems There are three exhibition halls at the planetarium, where the evolution process of the animal world is displayed. A 250-seat lecture hall is also available for holding seminars and symposiums on science-related matters. The 215,000 square feet planetarium will have water fountains, food shops, a lobby, a library and arrangements for audio-video units. A four-story administrative building is located at the back of the planetarium, which also has a car-parking facility for over 100 cars. With the help of a powerful projector inside the planetarium, special shows are displayed on the large curved screen on the ceiling. This curved ceiling represents the sky and shows moving images of planets and stars on a large screen dome at an angle of 120 degrees. The background audio score of the starry shows s available both in Bengali and English. Findings Bangabandhu Sheikh Mujibur Rahman Novo Theatre, it has been found that the planetarium has a group of targeted customers. The main target segment is all the schools and colleges to bring their students for study tour. Both English and Bengali Medium school students of

classes 3-9 go for a study tour particularly with their geography teacher. The secondary target customers are the middle, upper middle and higher class urban families who seek place of amusement for their children. The planetarium raised a huge curiosity in the general public and one of the major reasons for it was the structure of the building. However, besides few artworks and models of planets kept at one small corner at the building, the rest of the large areas have nothing to offer the visitors, unfortunately. There are hardly any decorations, and no sculptures or exhibitions of anything related to astronomy. The Novo Theatre hasn't changed since its opening in2004. The same models and artwork still remain and no additional features have been added to the building since 2004. The number of customers coming in per day into the theatre is very few, according to the ticket sellers there. Most of the visitors, usually on weekdays come to visit the place for the purpose of dating and not to enjoy the show or for edutainment. There are, however, a few times when students are brought here from different schools on their field trips but such visits are very few. It is rare to have something as extraordinary as this modern infrastructure in the center of Dhaka city. lt aims to engage the public in astronomy but unfortunately, it lacks in a lot of things which inhibit people to take an active interest in the planetarium. There is, however, a great potential for this theatre to be developed into a delightful, informative and an enjoyable place to visit for both tourists and the city dwellers. The government took steps in improving the Novo Theatre after a lot of years of its establishment. Novo Theatre officials said in the past eight years they had heard about many development projects but till now no such project was implemented. The planetarium has only two entertainment sections - a 3O-seat capsule ride simulator, which takes Tk 20 per person for a ride and a modern tilted domed planetarium combined with a large format motion picture system and the ticket price for this is Tk 50 each person. Ever since the time of construction only two entertainment projects have been running and people and visitors started losing interest. The government hence should modernize the Novo Theatre to increase the scope of edutainment.

Case study 2: Bangladesh Shishu Academv

Half of the populations of Bangladesh are children. Bangladesh Shishu Academy was established in 1976 with the view to the development of physical, mental, cultural and latent talent of children and thus builds up the future nation builders as efficient citizens. Even 13 years before the Child Right Convention regarding child security and welfare by the United Nations was adopted in 1989, the founding of Bangladesh Shishu Academy played an important role in the development and national interest of the children of Bangladesh.

Out of the necessity of Shishu Academy in different districts of Bangladesh, in FY-1980-81 in the then 20 large districts the branch offices of Shisu Academy were established. Later on, in 1993-95 in the rest of the 4 districts and in FY 1996-97 in the 6 upazilas of 6 districts the branch offices of Shishu Academy were established.

At present Bangladesh Shishu Academy is an autonomous institution under the Ministry of Women and Children Affairs. Its activities are run by a 13 member board of management. It is the only national institution working for children's cultural and mental development. The main activities of Shishu Academy are operated by the central office. The same activity is followed by the central office as well as in all districts. For the smooth operation of the branch offices there is an operational committee headed by the District Commissioner. There is a local committee headed by the UNO to operate the children activities in every upaztla. Thus it has been made possible to start an effective process to bring all the children of the country under the activities of the academy.

It is a unique organization for cultural and mental development of Bangladeshi children has started from 1976. From 1992 their activities have spread out all over the country through district offices. Every year, more than 30 events have implemented all over the country with three regular activities like cultural training, National children award competition and SBK and Pre-school program.
The purpose and objectives of Bangladesh Shishu Academy were:
To develop the physical, mental creativity and latent talent of the children of Bangladesh.
To publish different books, monthly magazines, dictionary suitable for children.
To organize different educational programs like quiz, debate and recitation competitions to facilitate children are reading habit.
To organize national children award competition, occasional competition and different fairs for children every year.
To create opportunity for the children of Bangladesh to participate in the international painting competitions.
To make children films.
To send children cultural teams to different countries.
To operate informative children museum based on the history and tradition of Bangladesh and different countries' geography.
To celebrate traditional cultural programs.

To operate cultural training on different subjects for children.
To operate informative children museum based on the history and tradition of Bangladesh and different countries' geography.

Bangladesh Shihsu Academy is working in different areas for overall development of the children. The areas are Music, Dance, Painting, Acting, Musical lnstrument playing, Recitation, sports, Information technology, Children film, Children publication, Children library, Children Museum, Debate etc. Recently Early childhood development becomes as an important area of activities of Bangladesh Shishu Academy. The basic programs of the Shishu Academy are conducted from the central unit.The same program is followed by all District Branches including the Central office.

Fine arts program
Children's painting is playing an important role in the development of Bangladeshi culture. The fine arts department of Bangladesh Shishu Academy is working to encourage children in painting and creating opportunity for children to participate in national and international competitions. The fine arts department collects children's paintings from the grass root level through the district branch offices of Bangladesh Shishu Academy, sends those to international competitions and ensures that the winners receive the awards and certificates properly. The children of Bangladesh have already proved their talent by participating in various competitions.

Children Art Gallery
Bangladesh Shishu Academy has a Children Art Gallery to preserve and exhibit the beautiful paintings of the children.

Jobeda Khanam Shishu (Children) Granthagar (Library) from the beginning of Bangladesh Shisu Academy, the library, situated on the first floor in the central office, is serving library facilities to the children. The library has a tranquil environment where 200 children can read at a time. At present the collection of books is 27000 in the sole children library of Bangladesh. Children library does not only facilitate children. Students of Dhaka University, members of various government and non-govemment, researchers on child issues use this library regularly. In 1990, in the memory of the founder Director of Bangladesh Shishu Academy, Jobeda Khanom, this library has been named as 'Jobeda Khanom Children Library".
Special Information of this Library:
200 people can read at a time
Members can issue books from the library.
There is facility to participate in library based programs.
There is opportunity to be elected the best reader among regular members. Overview of district children libraries:
Average number of books is 2500 in each library.
On an average 30-35 children can read.
An average number of 200 children come to the library every month.

Through the implementation of various library based educational programs, activities to enhance children's reading habit are going on. Museum Out of the necessity of an individual children museum to make the children aware of history and tradition, in 1980 a plan was taken to establish children museum in Bangladesh Shishu Academy. In 1984 artist Amanullah Siddque and Tapan Kumar Das started to build and establish the designed objects for the museum. At last in 1991, the children museum was founded in the independent building of Bangladesh Shishu Academy. The three storied children museum of Bangladesh Shishu Academy, with the children friendly illustrations placed on the spacious ground and the first floors is playing a great role in making the children aware of history, tradition and science. Exhibits are arranged in three dimensional forms. Exhibits of the Museum: o Memories of children freedom fighter A sequence of description, suited to the children on the social, political, economic and cultural history of Bangladesh from the prehistoric period to the birth of Bangladesh has been put in 72 three-dimensional showcases o Science project. Stamp corner. 23 showcase of 23 different countries with their Historical elements and information o Data, information, Chart poster etc Auditorium Bangladesh Shishu Academy has a fully Air conditioned modern Auditorium comprises 650 seats. The Auditorium is used for different cultural activities for children by Academy and different children group and organization.

Regular activities of Bangladesh Shishu Academy The central office of Bangladesh Shishu Academy runs different cultural activities through 64 district and 6 upazilla branch offices. So the programs are mostly guided. District offices have implements those programs with the support from schools, children organizations, and local administration.
To take initiatives to fulfill the demands related to shelter, education, health and nutrition for the disadvantaged, helpless, street children and make them independent.
To implement the project titted Advocacy Awareness Program on Girl Child Right to create awareness among allabout the girl child rights.
To start computer training program for the children all over the country.
To offer scholarship for poor and street children.
To adopt programs on early learning for child development.
To build own building of Bangladesh Shishu Academy in every district.
To establish branches of Shishu Academy in all the upzillas of the country gradually.

Findings
the nature and working pattern of the Academy is unique and uncommon. So the initiative was appreciated nationally and internationally. But due to the lack of publicity, it was really difficult for others to know about BSA and its activities.

Case Study 3: Gujarat Science City

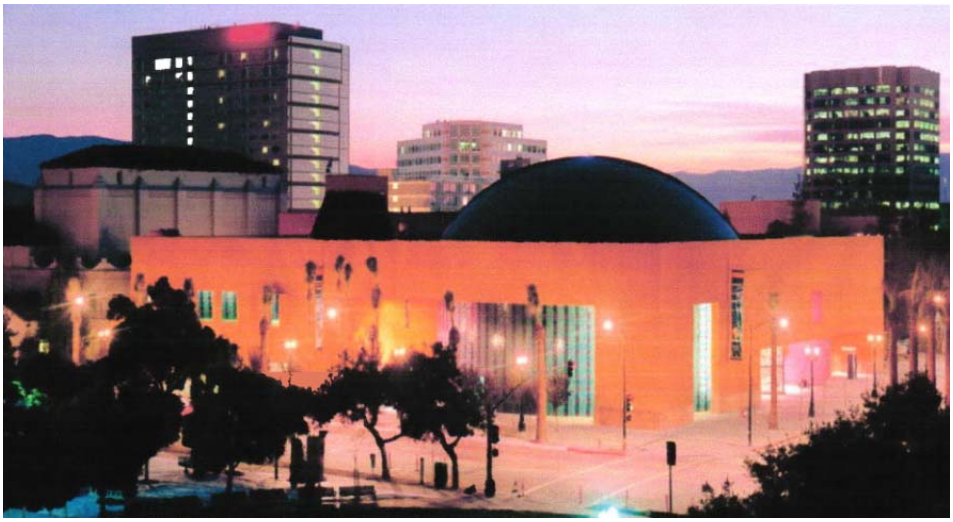
It is located in Hebatpur, Ahmedabad, is part of a government initiative to draw more students towards education in science. The center hosts an IMAX 3D theatre, an energy park, a hall of science, Planet Earth, an amphitheatre, Life Science Park and dancing musical fountains among others. The center also provides housing for students

preparing for science exams. Since 5 years, a program called "Vacation Training Program on Bio-resources for school children" is even organized by Science city with the help of government funds to encourage students regarding Bio-resources. It is a month-long program for students who gave their SSC exams, each from every district of the state.

As of 2012, Science City is awaiting the opening of a long-anticipated Earth Pavilion - an earth-shaped dome created in 2009 whose goal is to showcase live experiences with natural disasters. The Pavilion will detail each continent and allow visitors to participate in hands-on activities.

Case study 4: Technological Museum of innovation

Location: San Jose, U.S.A.
Area: 1 1,000 sqm/ 3 acres approx
Client: Technological Museum of innovation Executive
Architect: The Steinberg Group
Interior Design: SMWM and Legoneta Arquitectos
Year: 1998.



The structure was conceived as a horizontal block "shaped" by the diversity of events taking place inside. There is a cylindrical massive IMAX tower over the whole, culminating in a metal dome, which becomes the focal point on the corner. The museum is composed of three floors, each with its own significance. The ground floor has the main entrance, a gift shop and cafe, the lmax Theater, and a recreational area that is reserved for special events. The Tech Store contains various gifts, shirts and souvenirs. The ground level is a location where Segway and other robotic demos are displayed and given. The Tech Museum's architecture is the work of Mexican architect Ricardo Legoneta. Four major theme galleries fill the upper level and lower level of the museum: Communication, Exploration, innovation and Life Tech. These galleries are constantly being revamped and changed to fit the theme movies and exhibits. On the lower level there is also a public piece of artwork titled "Origin", which is inside a 4S-foot-tall (1a m) cylinder. The facades were designed in codependence with the urban context. One is supported by the massive joist framing the groove that functions as the main entrance. By contrast, the rest of this facade is a long wall with a series of apertures allowing access to the cafeteria, gift shop, and a terrace leading to the park. The other facade is more abstract, functioning as the secondary access for groups coming by bus, and therefore less visible. lt also provides access to temporary exhibits and to the 300-seat IMAX auditorium. A spectacular atrium, of great high, presides as the focal point of each side of the hall. The curved wall of the cinema identifies the north side with its richness in texture and color. The south side is very dynamic with two stairs.

The 132,000 sq/ 1.4 acres museum is divided among themed galleries that focus on innovation, the internet, the human body and exploration. A 299 seat domed Omni Max Screen Theatre is the architectural and programmatic centre of the facility, and is served by an adjacent caf6, a gift shop and a large public lobby/ atrium that features several exhibits, both stationary and suspended from the ceiling. The museum also contains a variety of public meeting rooms and staff offices. Findings The museum is a well designed, high maintained building with well technologically and developed interactive exhibits, labs and studios. It attracts many visitors and school going students although the year.

Chapter 5

Program and Development

5.1 Proposed program:

Managerial:

Director general + toilet = 400sft
General curator + toilet = 300sft
Academic curator = 100sft
Conference room = 450sft
Lounge = 200sft
Toilet = 150sft
Engineers' room = 200sft
Laboratory = 200sft
Sub total = 2000 sqft
30% circulation = 600
Total = 2600sqft

Workforce:

Workshop = 2000sft
Store = 2500sft
Sub total = 4500sft
30% circulation = 1350sft
Total = 58510sft

Literacy:

Theatre = 2000sft
30% circulation = 600sft
Total = 2600sft

Exhibition:

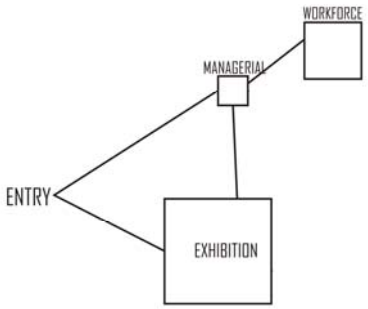
Mathematics gallery = 5000sft
Industrial Gallery = 3000sft
Chemistry Gallery + lab = 8000sft
Biology gallery = 12200sft
Physics Gallery = 22000sft
Natural History = 2000sft
Sub total = 52200sft
30% circulation = 15660sft
Total = 67860sft

Miscellaneous:

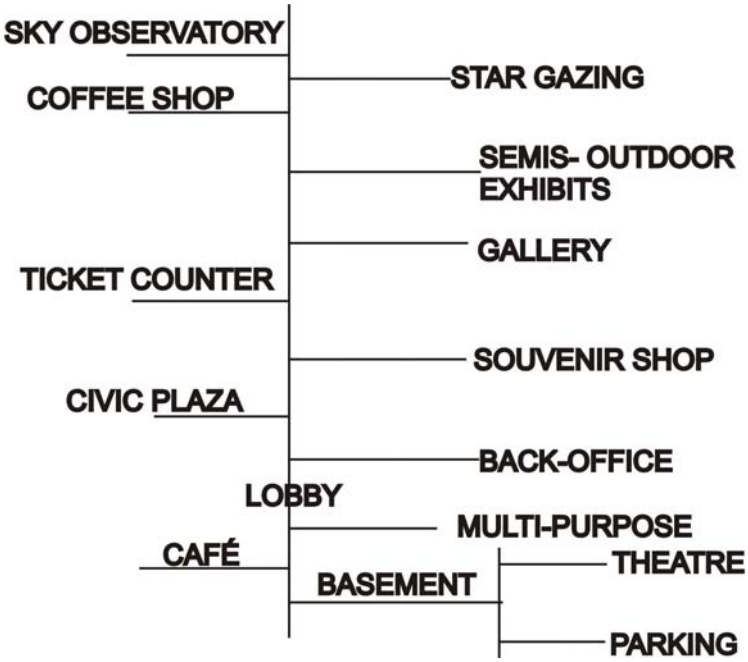
Café = 800sft
Multi-purpose hall = 3000sft
Shop = 300sft

Coffee Shop = 1500sft
Sky Observatory = 1000sft
Star gazing = 1000sft
Sub total = 7600sft
30% circulation = 2280sft
Total = 9880sft
Grand total = 141450sft

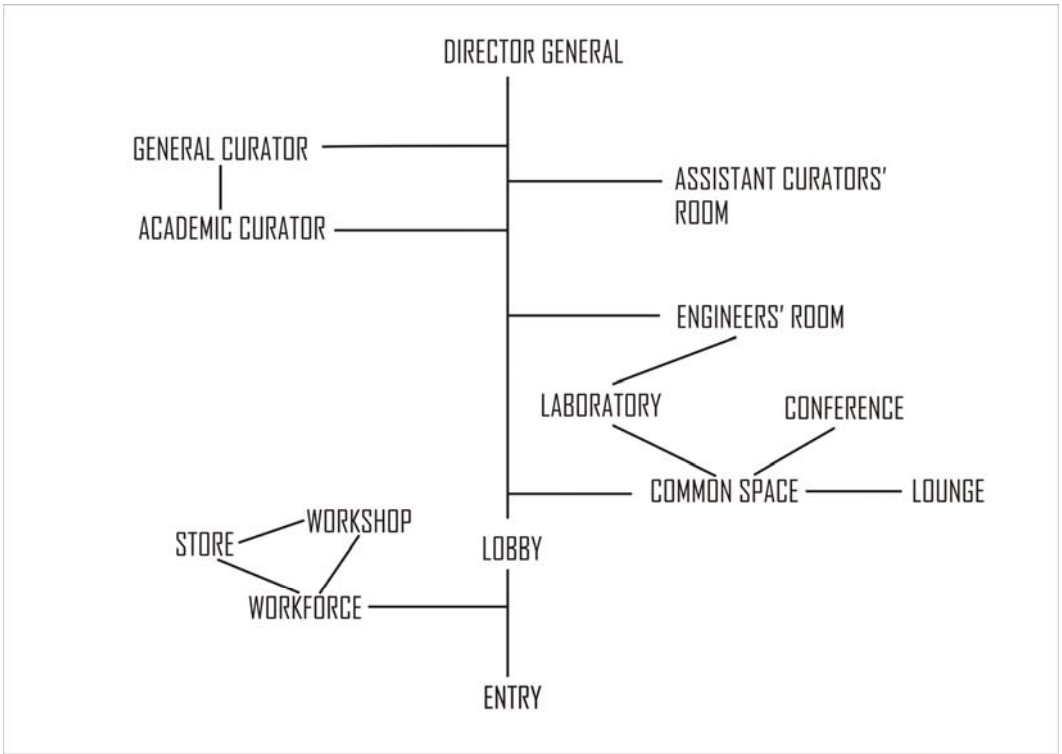
5.2 Conceptual layout
Schematic flowchart:



Visitors' flow throughout the museum:



Admin Flow:


DIRECTOR GENERAL
GENERAL CURATOR
ACADEMIC CURATOR
ASSISTANT CURATORS' ROOM
ENGINEERS' ROOM
LABORATORY
CONFERENCE
COMMON SPACE
LOUNGE
STORE
WORKSHOP
WORKFORCE
LOBBY
ENTRY

Chapter 6

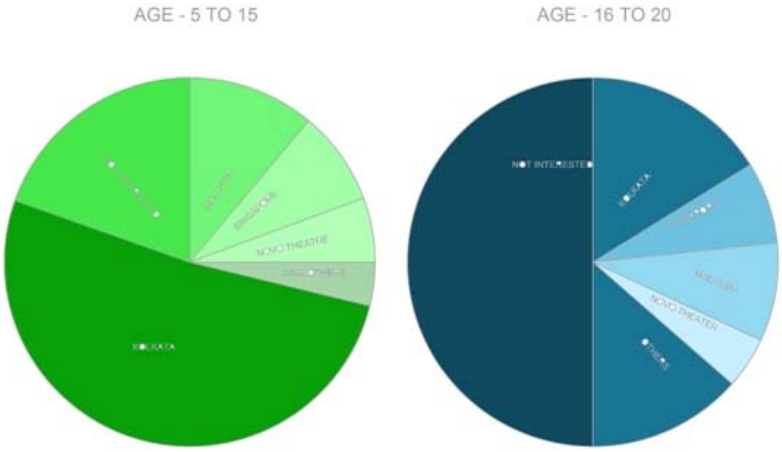
Conceptual stage and design development

6.1 Study and aspiration:

Design of a museum requires a very imaginative and fun progression. In this, design function is not more important than the experience, logic, justifications. When I begin to study about how science museums functions, I was looking for their notions, philosophies dreams about giving people of the country something new and exciting. It will be a new kind of experience to share with all. I wanted to give such a look to the museum so that the museum itself could be an exhibit and the people would be that much curious to visit and find out what it holds. So, I wanted to visualize this museum as a place where people could spend few hours and enjoy themselves with their family all through the year, and eventually end up learning a bit more about science and technology fundaments, both consciously and unconsciously. It will give a new direction to the existence and significance of science and technology of the country.

6.2 2 Concept development and development phase:

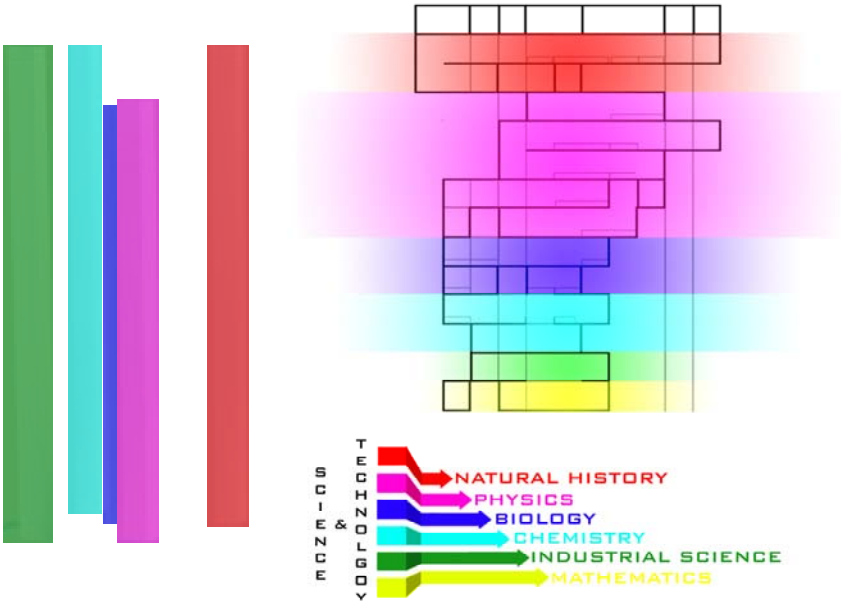
First of all, I wanted to know how far the blooming minds of our country are aware of science and technology. Then I carried out a survey to determine the percentage of the students in different age groups who have visited or at least know about the science and technology museums throughout the world.



The evaluated results were so shocking that the students, the young minds of our country is aware of so many museums on science and technology around the world, but very knew our own ones. Though I could point out a couple of children who visited or knows about Bangabandhu Sheikh Mujibur Rahman Novo Theatre, but I was shocked to fail to point out a single child who could recognize our national museum of science and technology. None of the children is aware of the face that there is museum dedicated solely to science and technology, but yes some could at least recognize the dinosaur-ed building in Agargaon.

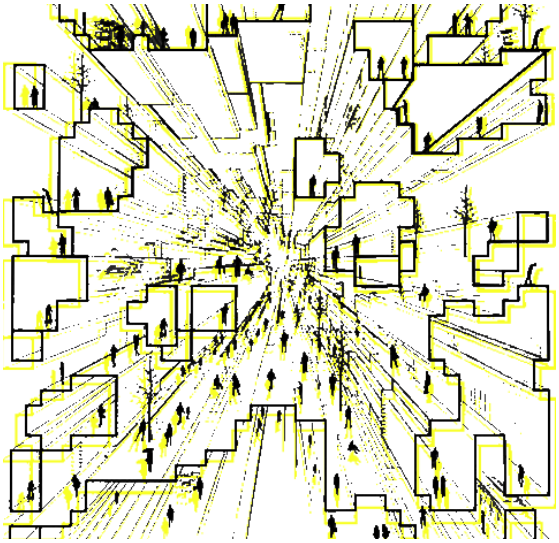
Through this survey, I can evaluate that a structural entity and diversity can help catch an eye or two of the young minds. Therefore, I decided to start with the basic of science and technology and to create a structure that could be so unique and eye-catching.
to start with the basic, I broke the structure of science and technology fundaments.

As it is clear, that there are 5 fundaments of science and technology, I later used these 5 fundaments and abstracted it as the “five pillars of science and technology”.
Furthermore, I managed to incorporate these five pillars as the basic mode of vertical circulation.



This was not all; I also distributed these 5 pillars within the gallery and exhibition spaces. As the basic idea of the design of the project was the basic of science, I then pointed the unitary method of generation and development of science and technology inventions and discoveries. As the building units of science and technology I used cubes or I would

rather say the pixels to building the museum. As every inventions, discoveries and innovations in the world of science is not independent, rather integrated within each other, I tried to join and form complex interior spaces, using multiples of pixels.



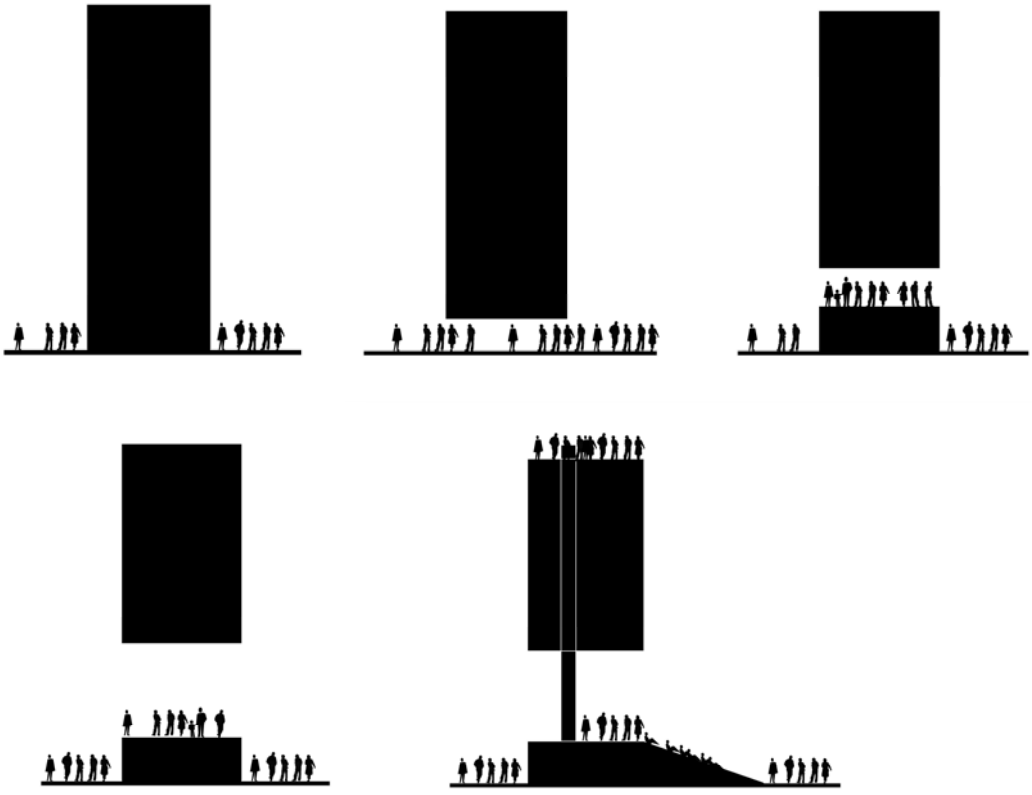
Again, as the science is infinity, there is no end to scientific inventions or discoveries, thus, I wanted to give a “complete-incomplete” look to the entire museum. Therefore, I not only kept the structure of the museum as simple as the column-beam structure, I also kept them exposed, and placed some of the pixels or cubes or the exhibition galleries exposing and some hidden behind the structural forest. This could help to create curiosity
within the minds of the people and encourage them to come and pay a visit.

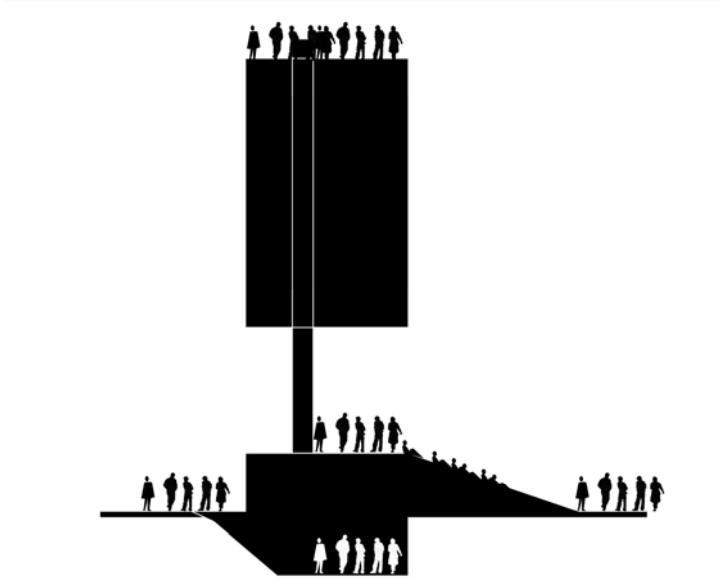
After I tried to make the galleries as attracting and experiential, I also tried to play with the public and civic flow within the building. I zoned the building into two different zones, a) civic and b) visitors. I wanted to portray our capability to reach towards science has

developed, and therefore, the civic and the visitors could be able to reach the entire building and all the interesting space it had to offer.

Existing section

Conceptual proposed section

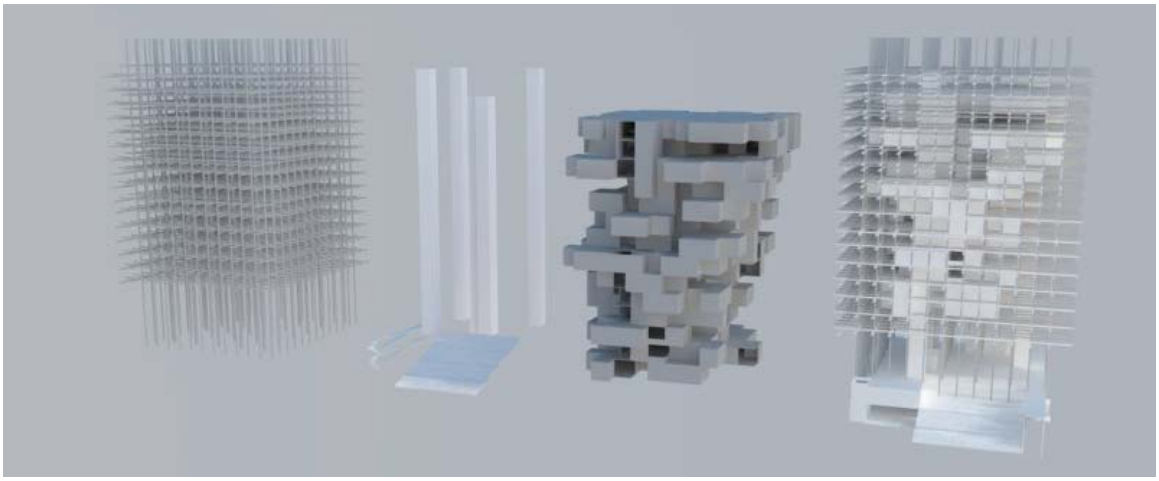




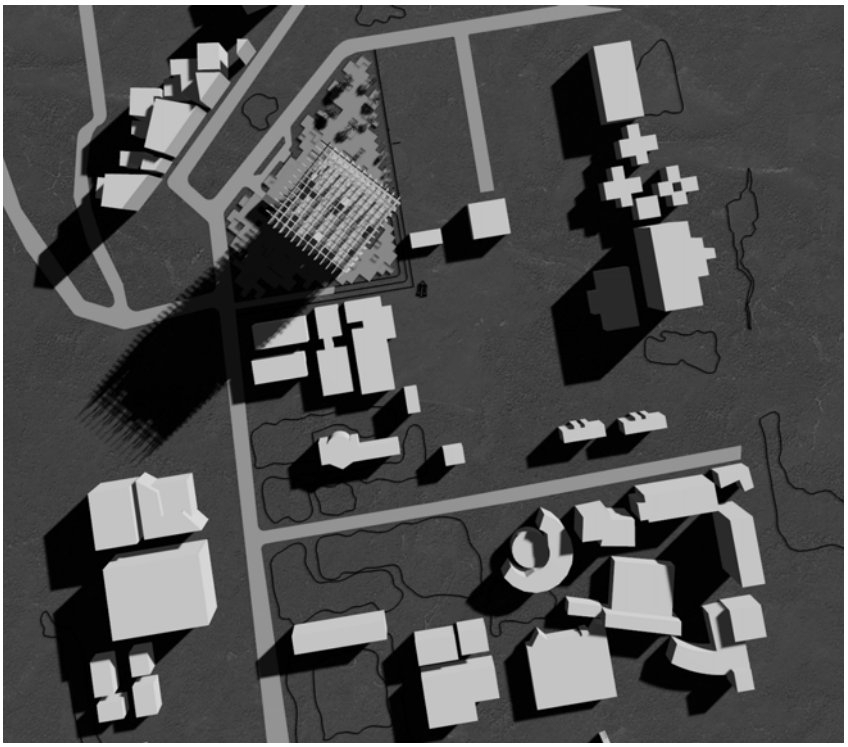
The above diagrams show the form derivations which was the abstract of the connectivity of science and the people.

6.3 Final Design:

From all the calculations and concepts I stated above, I could formulate the museum into these:

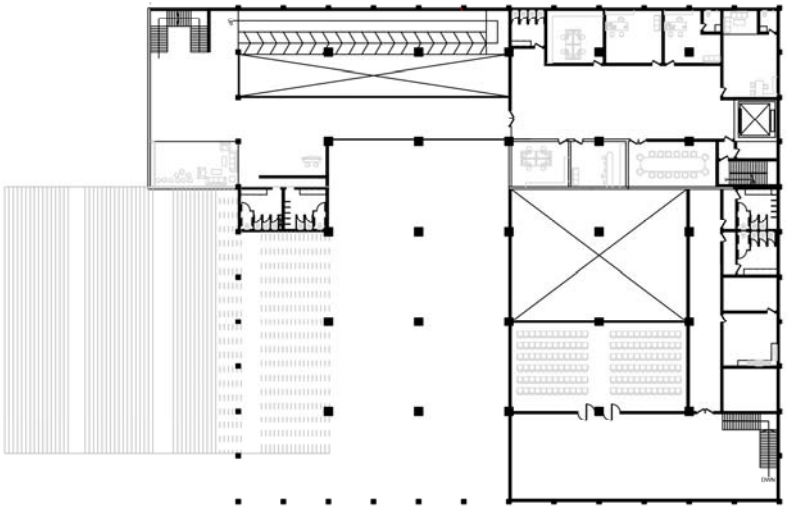


Roof View:

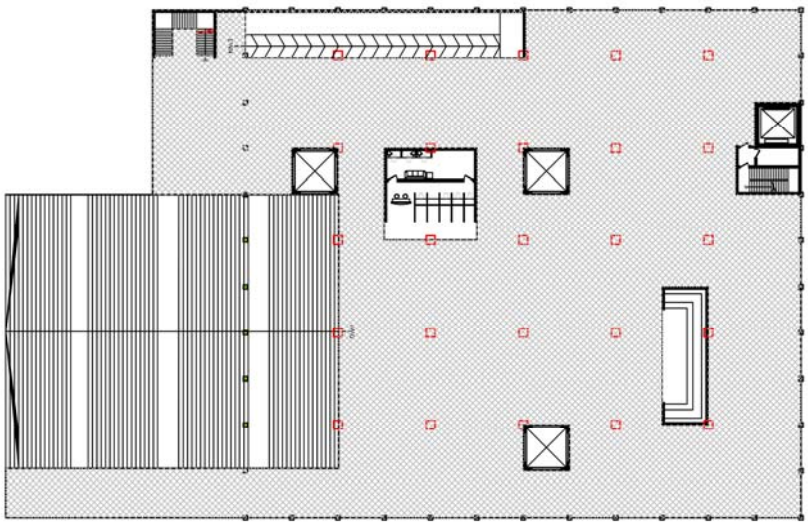


Masterplan:

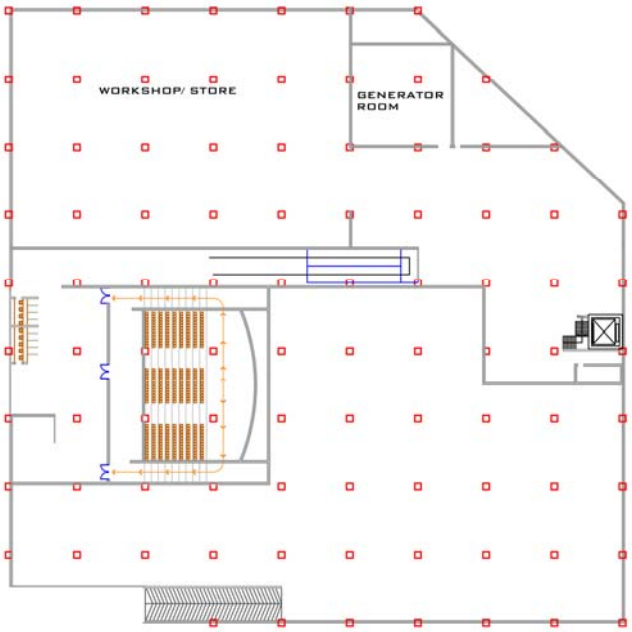
1st floor:



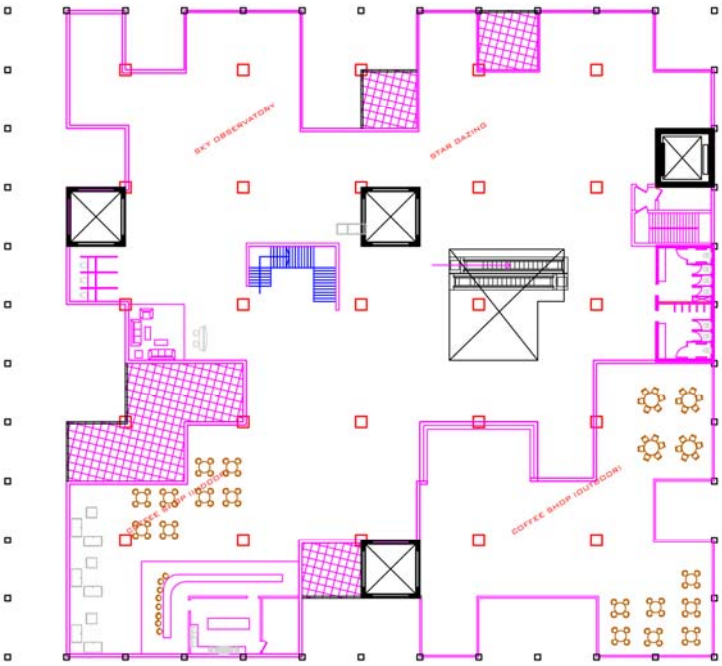
2nd floor (civic plaza):



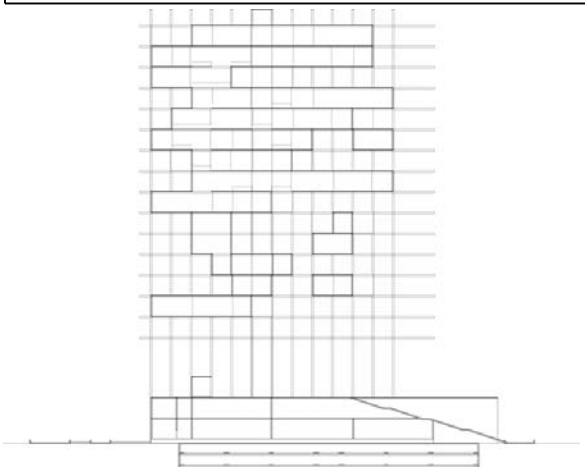
Basement:

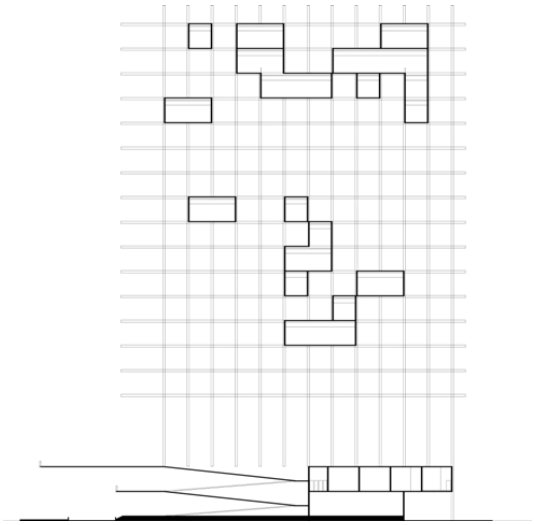


Top Floor plan:

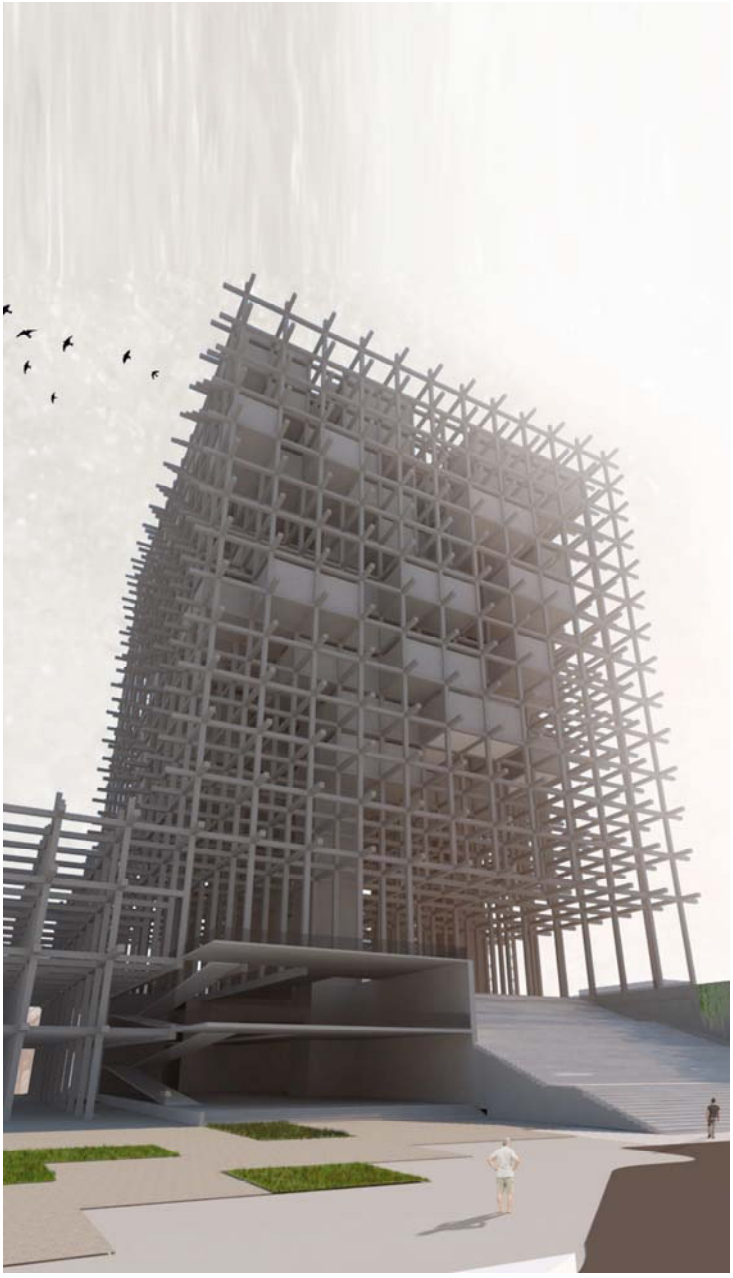


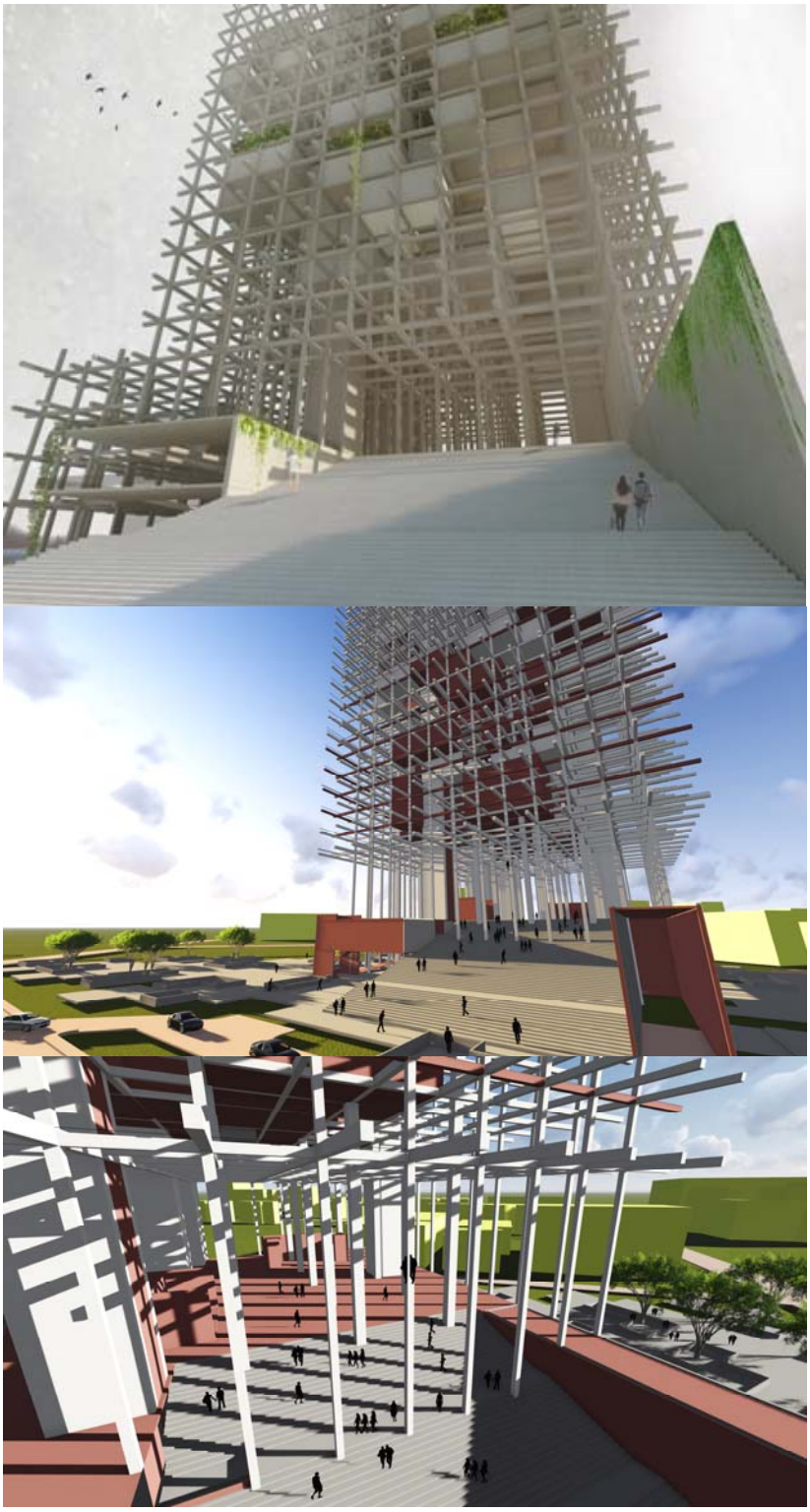
Sections:





Rendered perspectives:





Chapter 7

Conclusion:

The stated above chapters include the process & journey of completion of the redesign of the national museum of Science and technology. It can have a huge impact on the life of the people of Bangladesh to enhance their knowledge on science and technology, as we all need a place to groom ourselves to face the paced digital world.

The museum will be self-sustaining as it will not only benefit the people and the young minds of our country but will also bring economic yield by attracting tourists.

Like any redesigning project, the development and the acceptance of the whole new look of the national Museum of science and technology, will likely experience challenges but it will also add a unique element to the city, enriching the quality of life for all of our citizens.

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