

MUSEUM OF KNOWLEDGE

- a Feasibility Study based upon Le Corbusier's conception

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Report on the Feasibility Study

Conducted for the Chandigarh Administration, and
Based upon the Notes and Concepts of Le Corbusier

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October 1976

Full Report (PP 97), Rs. 200.00 (India); US\$ 10.00 (Overseas)

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FOREWORD AND BACKGROUND OF THE STUDY

Foreword

Means of communication of information have always played a key role in the progress of civilisation. One milestone was the printing press which made it possible to disseminate information to a large cross-section of society. This was further enhanced by electronic means of mass communication in this century. From the middle of this century onwards there is an increasing impact of electronic methods of data storage, retrieval and computation. Combined with means of audio-visual presentation they are bringing about another revolution in the handling of information and in human communications. Like its predecessors, this development is also likely to have a far reaching impact on society.

Apart from the hardware made available by electronic technology, new approaches and techniques have been evolved such as management information systems, social systems engineering, operational research, and decision analysis. These techniques used with computers can help the policy makers, executives, and managers with complex problems of decision making in a modern society. They help in collating vast amounts of data, showing the patterns in it, simulating situations arising out of different alternative plans of action, and presenting the resultant data in easily assimilable form.

The concept of a **Museum of Knowledge for Chandigarh**, which will make use of such developments in the field of electronics, was put forward by many years ago. Apart from rendering help to legislators and administrators, such an institution could bring immense benefits to students and the general public. Its use to the youth and the lay citizen would lie in obtaining information and getting educated regarding topics of prime interest to them. By all these outlets the institution would assist in the economic development of the region. The proposed facility will act as a pace setter within the country as well as for trainees from abroad.

This report is an attempt to present a comprehensive and integrated design for such an institution which can provide a basis for future action. An audio-visual presentation of this report is being prepared by CEERI and SRI. This will make use of a synchronised slide projection system developed at CEERI, Pilani.

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Chapter 1 which lays the foundation for the whole report by presenting the basic model of the envisaged institution, also describes what the rest of the report contains.

For convenience, we refer throughout this report to the proposed institution as 'MOK' (Museum of Knowledge); however the choice of the name is open as we note in **Chapter 7**.

2. Historical Background

2.1 Le Corbusier's concept of an ideal township - its relationship to the Capitol Complex

Chandigarh is one of the few State Capitals in the world which have been planned right from the start. Its many features have been commented upon in the professional literature. The plans have taken an integrated view of the needs of various arms of Government, and the citizens.

At the apex of the city are the Secretariat, the Legislature, and the High Court collectively called the **Capitol Complex**. Besides, there are other public institutions such as the University, a Postgraduate Medical Institute, various museums and Art galleries, and the Central Scientific Instruments Organisation. The city is divided into sectors with self-contained facilities for residence, shopping, recreation, etc. and an ingeniously devised network of roads. Presently it is acting as the capital of the States of Punjab and Haryana.

In the original plan of the city the Capital Complex had included a mansion for the Governor at a site located between the Legislature and the High Court. Subsequently, it was decided that in the context of a socialistic pattern of society, one need not go in for a palatial building for the Governor (at that time Punjab and Haryana constituted one State). In its place it was suggested that a Museum of Knowledge and Laboratory for Scientific Decision Making may be constructed.

It is a tribute to the far-sightedness of Le Corbusier that he visualised the important role that new developments in electronics could play, both for audio-visual presentation, as well as for marshalling of data as an aid to decision making.

In the notes sent by Le Corbusier, he has indicated the use of electronic techniques for the purpose of helping the policy makers to arrive at decisions on a scientific basis. Apart from acting as a Laboratory for Scientific Decision Making, this facility would also be used for disseminating knowledge to the citizen in various fields which are of interest to him.

A detailed visualisation given by him in his note dated the 29th December, 1960, is given in Annexure 1. The facility thus has two aspects, namely as a **Museum of Knowledge** and as a **Laboratory for Scientific Decision Making**.

2.2 Formation of the Working Group

The question of setting up a Museum of Knowledge and Laboratory for Scientific Decision Making as part of the Capital Project of Chandigarh, came up for discussion at a meeting held on 19th December 1972 under the Chairmanship of the Prime Minister. The Prime Minister was of the view that we should first be quite clear in our minds what purpose the proposed Museum of Knowledge would serve before embarking on its construction.

The question was further discussed on 27th August 1974 in a meeting convened by the Ministry of Education and Social Welfare. It was decided to constitute a Working Group, which may prepare a feasibility report after technical details of the project had been spelt

out.

In this connection a meeting of the Working Group was held on February 11, 1975 in the room of the Chief Architect and Secretary, Department of Architecture, Chandigarh Administration. It discussed the various aspects and came to the following conclusions:

"The Working Group felt that, at this stage, it would be desirable to undertake the preparation of a feasibility report which would bring out the inputs and outputs for the Centre as well as enumerate various areas in which such a tool can be utilised for decision-making, together with cost benefit studies, wherever possible.

The Working Group felt that the preparation of such a feasibility Report would require a fairly large effort and expertise in the area of audio-visual technology, electronic data-processing systems and analysis, etc."

A copy of the summary record of the meeting held on February 11, 1975 is given at Annexure 1.

The mode of utilisation, the technical data and other details emerged in further meetings and discussions. A meeting held at CEERI, Pilani, on March 10, 1975 was attended by Dr. Amarjit Singh, Director, CEERI, Mr. B P Sinha, Senior Town Planner, Chandigarh Administration; and Prof. J. G. Krishnappa, Director, Systems Research Institute, Poona. In this a plan of action for preparation of the feasibility report was worked out. The resources for this were sanctioned by the Chandigarh Administration and made available by December, 1975.

2.3 Survey of User Requirements

One of the considerations in preparation of the feasibility report was to arrive at an optimised system considering current developments, and user requirements.

Accordingly one had to have a clear idea, of the usage to which the facilities will be put.

Several discussions were also held with representatives of Chandigarh Administration (Chief Architect; Secretary, Finance, Education, Public Health Departments) and the Governments of Haryana (Chief Secretary and his other senior colleagues in the Secretariat) and Punjab (Chief Secretary).

Additional data were collected from:

1. Shri A. Bose, Director of Museums, CSIR
2. Shri S.P. Bagla, Secretary, Finance Dept., Govt. of Punjab
5. Shri N.N. Vobra, Commissioner, Housing and Local Government, Government of Punjab, Chandigarh
4. Shri N.G. Kuttu, Special Secretary, Dept. of Finance, Government of West Bengal, Calcutta
5. Shri B.V. Chitnis, Tata Consulting Engineers, Bombay

6. Dr P.R. Sondhi, Director of Health Services, Haryana.

Among the high officials interviewed, the Chief Secretary of Haryana, Shri Bhambri, was particularly enthusiastic about the use of computers in regional planning and decision making. In a previous assignment he had already seen the effectiveness of the use of computers for optimised distribution of petroleum products.

The type of applications which came to the fore in various discussions are given below. The broad categorization has been given for convenience in planning. In actual fact the interests of the two major groups would overlap in many areas.

(a) Subjects of Prime Interest to Citizens

- i) Employment - Career planning, training, etc.
- ii) Family Planning
- iii) Housing
- iv) Increasing productivity and removal of poverty
- v) Agricultural development and priorities.

(b) Subjects of Prime Interest to Planners and Policy Makers

- i) Water resources
- ii) Development of land. resources
- iii) Allocation of resources
- iv) Distribution of goods and, services
- v) Urban and Rural development and planning
- vi) Technological assessment and. choice of appropriate technology and areas of research
- vii) Environmental development and control of pollution of water and atmosphere.

It was the view of many users that as a few applications are developed and become widely known, the usage will increase.

2.4 Preparation of the Feasibility Report

Apart from evaluation of user needs, information was collected regarding other "museums" in the country and abroad. In this survey particular attention was paid to the innovative approaches used in various places. So also, examples of use of computers and electronic data processing in system planning, were collected with special reference to relevance in the context of needs of this region.

An opportunity was taken by Dr Amarjit Singh who was visiting the United States in connection with another project to discuss the matter with the group using computers in urban and system planning, at the University of California at Berkeley. Computers are also being used there for processing of data before presentation on television screen.

Prof. J. G. Krishnaya of Systems Research Institute has drawn insights for this report from his personal visits to the following institutions abroad, and experience in India:

- Maison Le Corbusier, Zurich
- Museum of Science, Boston
- Museum of Science & Industry, South Kensington, London

- Smithsonian Institute, Washington DC
- Natural History Museum & Hayden Planetarium, New York
- Museum of Science and Industry, Chicago
- Time Sharing Computer Centre, Indian Institute of Management, Ahmedabad
- Project M.A.C., MIT, Cambridge, Mass., U.S.A.
- Project INTREX, MIT, Cambridge, Mass. U.S.A.

The “**Museum of Discovery**” and the “**Museum of Man**” in Paris had been mentioned in the correspondence from Le Corbusier. These were seen in the same visit. Also, at Berkeley, the **Lawrence Hall of Science** was visited. This has certain items in common with the original concept. For instance computer terminals are available to the visitors. The necessary software has been developed in which the visitors can interact with the computer in a conversational mode. The queries and the answers from either side appear either on a teleprinter or on the face of a cathode ray tube.

While this can be used purely for an educational Or entertainment mode, the same technique is applicable for retrieval of information from the computer memory by decision makers.

Information was collected from **WED Enterprises** regarding their use of electronics for purposes of animation. This has been called by the name Audio Animatronics by them and has been used in Disneyland and Disney World

Information and literature was collected from the **Exploratorium** which is located in the Palace of Fine Arts in San Francisco, California. This organisation has acquired a reputation as an innovative educational institution in which the visitors are encouraged to touch the exhibits and interact with them. The impressions that were acquired facilitated the process of learning.

Discussions were held among the representatives of Central Electronics Engineering Research Institute (Dr Amarjit Singh, Director), Systems Research Institute (Prof. J. G. Krishnayya, Executive Director), Tata Institute of Fundamental Research (Dr P.V.S. Rao), regarding various aspects of the projects. The drafts of this report were reviewed at these discussions.

The report was finalised at a meeting held between the representatives of CEERI and SRI held at Pilani on September 20-21, 1976 and at Pune on September 27-28, 1976. The institutions have interacted thus and pooled their resources in the preparation of the report.

Summary of Feasibility Report

Le Corbusier, the principal designer the new capital city of Indian Punjab, visualised an institution which would provide facilities to “... **Chiefs of State, Legislators, Administrators and the mass of citizens permitting the grasp of the immense complexity, diversity, succession or simultaneity of events ... the conduct of which ... can bring about the happiness or unhappiness of the peoples**”. He envisaged the use of the new technologies of electronic data recording, storage and. presentation for attaining

these objectives. Le Corbusier placed this institution in the heart of the Chandigarh Capitol Complex and called it the “**Museum of Knowledge and Laboratory for Scientific Decision Making**”.

In order to give physical shape to the MOK, the Ministry of Education, in collaboration with the Chandigarh Administration, instituted a Working Group which recommended a feasibility study as the first step. Central Electronics Engineering Research Institute, Pilani, and Systems Research Institute, Pune, were asked to conduct this study.

Basic Framework

The aims of Le Corbusier’s Institution were not only to tackle the issues of relevance to developmental statesmanship and decision-making, and, to do so in a dynamic multi-disciplinary way, but also to enable the ordinary person to see for himself, to grasp, the complexities of these issues. Clearly electronic audio-visual display technology was involved, and computer Use, and research on scientific decision making, but how were they to be effectively articulated? How was creativity and originality as well as utility to be ensured on a continuing basis? These were the basic issues facing the designers. (Chapter 1, p 10-15).

These issues have been squarely met in the basic framework of the MOK which incorporates a five-sector model of its activities (Sec 1.1, pp 11, 18-21).

<u>Sector</u>	<u>Activity in the Sector</u>	<u>Target Group</u>
I	Audio-visual Public Display	People and Students
II	Public Policy Analyses: Research based Public Displays	People and Students + Policy Makers, Scholars
III	Research Data Archive - Private Display	Scholars, Analysts, Administrators
IV	Conventions, Conferences Colloquia	Relevant National and International Groups
V	‘Live’ Display	People and Students

These five activity sectors rest upon the skills and, equipment of the Service Centres which are:

1.	Computer Service Center	Information Processing, Analysis and Display
2.	Audio-visual Service Centre	Design and Production of Audio-visual material
3.	Archives Service Centre	Collection of audio-visual and Documentary reference material
4.	Workshop Service Centre	Fabrication of Models, Prototypes and special-purpose equipment. Maintenance of equipment.
5.	Administrative Service Centre	Administration, Accounts, upkeep of building and facilities.

The creative integration of the resources of the MOK takes place in two ways: (a) in public Displays organised and manned by the Curators (Sec 1.8.1, p 49), and (b) in research projects related to developmental and social issues conducted by 'Fellows' who are issue specialists, holding short-term MOK Fellowships (Sec 3.2, p 29). The (topical) research projects of the Fellows are expected to be transmuted into expository audio-visual displays and interactive computer packages for the general public and for officials.

Organisation

The Director, as head of the Institution, would be guided on policy issues by his Board, or Council, representing the public interest and sponsoring governments. He would be able to call upon the expert advice of Visiting Committees for evaluating the technical or scientific quality of the work of Fellows and other staff (Sec 7.4, p 47). For the day-to-day management of the Institution's service centres, the Chief Curator would function as internal '**Works Manager**' (Sec 7.8, p 49), thus enabling the Director to concentrate on planning, growth and boundary management with the MOK's constituencies.

The Curators would form the bridge between the world of policy research and the general public, and they would be responsible for translating research data into displays. The Heads of each of the technical service centres would be responsible for their own capital and recurring budgets and for the supporting services needed for projects and displays.

Technology

Real-time interactive computer equipment (Annexure V, p 70) and audio-visual recording and display facilities (Annexure III, p 62) provide the basic technical infrastructure. Conventional dioramas and working models will also be used. Such equipment as the synchronous-sound cum slide-projection system developed by CEERI are recommended. Permanent display areas such as 'Discovery Lane' and 'Hall of Progress' would be microcomputer-instrumented to enable the viewer to interact with the displays. Audio-visual Booths would provide groups with the opportunity for exploring subjects with the resources of the audio visual archive. Computer terminals and TV monitors in the public areas would serve visitors, and elsewhere the research workers. 'Live' displays including drama and dance as well as lectures and demonstrations will add warmth and obviate an overly sterile atmosphere. The archives would contain both documentary and audio-visual materials in many media for reference and analysis as well as display purposes (Sec III. 7, p 64), while the production of film, video-tape and sound recordings requires suitable equipment and studio facilities.

Example

To demonstrate the effectiveness of electronic. Audio-visual display, a synchronised-sound slide-presentation is being prepared at CEERI in conjunction with the feasibility report. To illustrate the use of interactive computer use in clarifying public policy issues, a prototype analysis using simulation and computer graphics is being conducted by SRI at the computer facility of the NCS DCT (Annexure VI, p 75). The **problem** taken for study is **alternatives for disposal/utilisation of Bombay city sewage**.

Phasing

The development of the MOK has been visualised as taking place in three phases over a period of 5 years. The 'phasing has been set out to enable stable growth without stagnation (Chapter 6, p. 38).

Financial projections have been made based upon the time-wise manpower and equipment requirements (Table I, p 41). The total recurring and nonrecurring expenditure for the initial 5 years period totals up to approximately Rs 3 crores (of which Re 1 crore is the estimate for the building). Suggestions have been made regarding the likely sources of funding.

Conclusion

The authors of the feasibility report firmly believe that Le Corbusier's conception is an exciting and practical idea which, if materialised, could play a significant role in the development of our country by providing unique services to government and public alike, and by serving as a model for similar institutions in other regions of the country and the world.

October 1976

CEERI, Pilani
SRI, Pune

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