

# **DECISION SUPPORT SYSTEM FOR REAL ESTATE**

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## **INTRODUCTION**

From the day human being started living, they started living in some form of shelter starting from trees to modern concrete houses. Shelter is one of the basic requirements of the human beings. Human beings are constantly in search of houses whether rental or ownership. As his economic status improves, he keeps on looking for better accommodation. Provision of shelter is also one of the prime concerns of Government also.

Cities keeps on expanding and in this process it is blessed with formal and informal shelters. As the city expands with the better employment opportunities the population increases and the matching housing needs have to be taken care of. Real Estate development both by the private and public sector agencies provides for variety of choices to the buyers. Finding a good shelter according to an individual's preference is very difficult in absence of good information on this. Urban Information System is the only answer to this; study has attempted to develop an urban information system on Real Estate. This study focuses on the need for information system and development of a quarry based information system on Real Estate.

### **Need for the study**

Development is a continuous process. Our Urban cities are growing and expanding. Many new neighbourhoods/buildings are built and infrastructure facilities are also created to facilitate these new developments. Chennai is no exception to this. Permission has to be obtained for all developments within a site/building from CMDA, which involves a set of procedures. Common Public does not have much knowledge about these procedures for obtaining Planning Permission and how to design their site/buildings as per Development Control Rules (DCR). Many individuals buy a site,

which does not even qualify for a site approval. In such cases no building could be constructed in the site under reference and the investment becomes waste. If the individual develops the site unauthorisedly, it results in haphazard development. Such unorderly developments become a liability to the Government. One of the main reasons for such unauthorised haphazard development is lack of knowledge on rules and regulation i.e. DCR, governing the development of a site/building. DCR is a highly technical document, which is very difficult to understand, but knowledge on DCR is very much essential to take a decision on type of developments to be taken up on a site. Hence there is a need to develop a Decision Supporting System (DSS) for Real Estate, which will incorporate the criteria involved in development of site including the physical and legal aspects. Decision Supporting System is to be developed in the form of GIS, which will give spatial information so as to enable the general public to have a better understanding of the procedure in buying a site as well to purchase a site/building to their choice.

## **GIS AND DECISION MAKING**

Most of the decisions require the use of spatial data. Decision-maker face difficulties as data obtained are from different sources. The spatial data must be linked with other spatial data and non-spatial data sets to maximize the use of data in decision making. The applications of GIS are numerous and varied. People and groups involved in decision making come from all walks of life and include citizens as well as from government officials and other organization representatives. Most decisions involve one or more aspects, which has to be weighed against one another for which GIS is used. The volume of data available is also enormous which make the user to make use of a tool which will help them to relate itself to a spatial unit and GIS is only tool available. Capacity of GIS in visualising the data is very high and visualization of data helps to a great extent in decision making.

## **REAL ESTATE AND DECISION MAKING:**

In both Real Estate marketing as well as in getting a site/building approval lot of factors require consideration. These factors involve site location, facilities available both on site and off site, social and communal facilities. rules and regulation of Government etc. Many issues require consideration, which are as follows:

- Government Policies
- Rules and Regulations in force
- Land values and pricing
- Individual preferences
- Demand and supply

All these issues are interlinked and influence a great in decision making in selection of site either to promote or sell or buy. For example Government policy on restricting the developments in the coastal zones will impede the Real Estate development in that area. Individual's decisions and preferences have greater impact in marketing the site. Like wise potential of a site in terms of accessibility to work place, social and other infrastructure facilities have greater impact on marketing.

As already discussed earlier in this chapter, these factors have to be weighed against each other to promote Real Estate. To make effective decisions, the decision making have to support the values attached to it. GIS takes care of these values efficiently and this ability to help in different ways by varied disciplines to analyze and integrate information. It permits the structuring and layering of different types of information to varied degrees and thereby providing the capability of integrating information for answering both simple and complex queries.

A perspective buyer and seller can put forth several options and GIS permits the decision-maker to view an analyze the spatial information at speeds and in ways that were never possible in the past. GIS helps the analyst to look at all spatial and non-spatial information that has been collected about a particular area merely clicking to the area. GIS has the ability to locate a site according to an individual choice weighing the merits and demerits. Developing GIS for Real Estate will provide quick results. Since

the GIS has the capacity to visualize the problems it could be used to model the merits and demerits of a proposal.

In Real Estate GIS is used to map the voluminous spatial data such as land parcels, on site facilities available in the individual parcels, location of infrastructure facilities such as water supply mains, sewer mains, transformers, telephone exchanges, telephone junction boxes, street lights etc. Linking of spatial and non-spatial data will enhance the capacity of a system, which makes the decision making process simple.

## **OBJECTIVES**

The major objectives of the study is as follows:

- i) To build a Decision Support System (DSS) for the Real Estate developer for development of a site/building following the rules and regulation.
- ii) To build a DSS for the prospective buyer, to choose a site/building according to his choice (after analysing lot of facts)
- iii) To build an information system on sites suitable for construction
- iv) To build an information on eligible location of house sites or building which will include.
  - a) Location and type of construction
  - b) Facilities available on site and off site.
- v) To build an information system on the aspect to be looked into while buying a site.
- vi) To build a Land use Information System for Adayar area.

## **Study Area**

The study is being carried out for Chennai city, the capital of Tamil Nadu a State in India, which covers an area of 172 Sq.kms. The population of Chennai city as per 2001 provisional census is 4.2 million. The city of Chennai is basically a commercial center and is a gateway of south India. Many large scale industries and service industries are located in Chennai. In Chennai City for urban planning the Government have setup a statutory Authority named Chennai Metropolitan Development Authority. The main function of this Authority is Planning, Co-ordination and Implementation. This Authority plays a key role in real estate by way of issuance of planning permission.

## **Thematic Maps prepared.**

The study is supported with a series of thematic maps, which is the basis for analysis. The key factors in the real estate development are mapped in a separate thematic layer. The thematic maps prepared for Chennai City is as follows.

1. Transport Network (Road & Rail)
2. Parcel Details (Only for Adayar Area)
3. Utility Services
  - a. Railway Stations
  - b. Bus Terminals
4. Social & Recreational facilities
  - a. Hospitals
  - b. Educational Institutions
  - c. Parks
5. Approved details of Buildings
6. On site and Off Site facilities for the approved Buildings
7. Area covered under Coastal Zone Regulation.

## **Methodology**

To carry out analysis, the base map for Chennai city was prepared by individual layers for transport and social facilities, land use, approved flats etc. These layers were supported with the respective attribute table in which all the required data such as on site

facilities, offsite facilities, building cost, type of building, use of the building etc. were entered. This attribute table was used for analysis purpose as well as querying. Thematic layers were built for Road Network, Social Facilities, Location of Approved building for a particular time period etc. A query table was also built to enable the user to get information about Land use, type of building and the rules and regulations of the permissible developments.

### **Decision Support System**

Basically the main aim of the project is to provide with the necessary information to take decisions in buying as well as locating buildings and plots. To provide such information, the Decision Support System was built in such a way to give the details of the facilities such as Railway stations, Bus Terminals, Educational Institutions, Hospitals, Parks and other facilities within a particular distance from the location of the building/flats available for sale. One can choose a building/flat by giving their preference at one stroke. Likewise a Real Estate Developer can also know the type of building that is allowed in a particular parcel of land. For example if a person gives the revenue details of a particular site (such as Block No., Survey No.) the Decision Support System will give the details on permissibility of type of building (Ordinary/Special/Multi-storey), restrictions on developments (such as Government Ban on Development, Development of future and ongoing projects etc.) and infrastructure facilities available (such as Transport, Water Supply, Sewer etc).

To make this system user friendly, the queries were customized by using the avenue scripts. The scripts can be executed by clicking the tool bar buttons created which will exhibit the necessary criteria required for querying.

The query could be fired on the following

1. Flats nearer to
  - Railway stations
  - Bus Terminals
  - Educational Institutions
  - Hospitals

- Parks
- 2. Cost
- 3. On site/Off site facilities available and

The results will be displayed both in the form of Table and Map, which will enable the user to take quick decision, matching their criteria.

### **Analysis**

To carry out analysis, the individual layers were built for the following as point features

1. Railway stations
2. Bus Terminals
3. Educational Institutions
4. Hospitals
5. Parks.
6. Approved Flats
7. Land use (Adayar area)

These layers were supported with the respective attribute table in which the necessary updations were carried out (Annexure).

Basically the main aim of the project is to provide with the necessary information to take decisions in buying as well as locating the building/plots. To provide such information, the analysis has to be carried out. For this purpose buffering was created for the following.

1. Railway stations (1.0 km)
2. Bus Terminals (0.5 km)
3. Educational Institutions (1.0 km)
4. Hospitals (0.5 km)
5. Parks (0.5 km)
6. Coastal Boundary (200 m, 500 m)

## 7. River margin (100 m)

These buffer distances for the point features (1 to 5) were chosen taking into consideration the general walking/traveling standards for accessing facilities. The buffers on Coast and River were based on the Coastal Zone Regulations imposed by Government of India.

The site eligible for various developments such as Ordinary Buildings, Special Buildings, Group Developments and Multi-storied Buildings were identified based on the DCR norms especially Site Extent, Road width and Land use.

### **Querying**

To make this system as user friendly, the queries were customized by using the avenue scripts. The scripts can be executed by clicking the tool bar buttons created which will exhibit the necessary criteria required for querying.

The query could be fired on the following

4. Flats nearer to
  - Railway stations
  - Bus Terminals
  - Educational Institutions
  - Hospitals
  - Parks
5. Cost
6. On site/Off site facilities available and

The results will be displayed both in the form of Table and Map. Which will enable the user to take quick decision matching their criteria.

Land use information system for Adayar area will give the information such as Land use, Ownership, Eligibility of Site for a particular type of building, restrictions on

the developments prescribed by the government etc. by clicking the parcel or through query tool.

### **Conclusion**

The Decision Support System evolved for Real Estate will be highly useful to the public, Real Estate promoters and also to the concern Government departments. Such a system will make the public aware of the rules and regulations prevalent and also helps one to judge whether the investment made/to be made is worth. This system will also allow one to choose the dwelling units/plots according to their choice. From the Real Estate developer's angle, this system will help the promoters to buy properties, which will satisfy the rules and regulations.