



Cost Management of Urban Street Lighting Using GIS and VB.NET (Case Study: City Sultanabad)

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ABSTRACT

Understanding and management of urban street space capable of lighting it creates a huge role in city communications. Urban lighting design is not only a matter purely decorative, but also a way for us to search for advanced security and convenience of a better environment. The lighting, the definition of the identity and image of the city at night there is no light and darkness complications such as increased incidents, accidents, loss of social security cause. Due to the fact that today there is a system of automated, accurate, timely, a key element of management is to develop management plans. The study on the management of urban street lighting system in the form of a set of tools for storage management, safety and service has created the lowest cost. Special features of the system can report the current status of the lighting effects in the streets, technical and economic analysis in order to receive funding for maintenance, repair lighting effects in the streets, as well as proper positioning analysis the lighting effects noted in the streets. To create a special place in the field of Management Information Systems Urban led lighting effects. The study sample was selected region of Khorasan Razavi functions. All relevant information, were collected over a period of four months, then using Arc GIS 9.3 software system to record, process, and analyze location data reference was incorporated. The system was developed using Visual Basic programming language to be specific capabilities. Finally, the efficiency of the system given its role in managing the effects of lighting in urban streets investigated. And the study of how to use technology to manage the lighting system in Sultanabad finally came to the conclusion that the correct lighting in addition to the beautification of the city, we can take effective steps to secure the city.

Keywords GIS; Visual Basic Programming Language; Urban Lighting Effects.

1- INTRODUCTION

Lighting function is capable of practical special place in the city. As urban planners and designers to build a replica of the subject and multiple color schemes, many large-scale urban spaces to display and analyze, but not a special method for simultaneous display time and current and future status of the proposed project could use [7]. Therefore, the model can not be visually integrated with other parts of the city to be. Without a doubt one of the major causes of underdevelopment and energy waste in developing countries is the lack of a coherent management system. Today there is a system of automated, accurate, timely, one of the main pillars for the development of project management in the management of urban spaces, which together with the urban environment can be very powerful simulation system for urban management function. In this study, the management of street lighting is considered

urban, urban streets role in the discovery of physical and social environment perception and symbol of civilization, identity and civilization of the city. [6] Expression of civic life time and place of the occurrence of events and social activities of citizens in urban life. The right design and development of the social and cultural life will be richer. So in the management of urban street lighting is usually automated systems to store descriptive information and location maps in AutoCAD format such as Excel spreadsheet or database program such as Access to relevant agencies to have come. Weaknesses in the systems of mechanized different and separate, diversity and decentralization, among them [1] and the lack of correlation between the spatial effects are descriptive data. Therefore, in this case, the study takes a site-specific management [8], Looking from the side is also curious in using new techniques in the management of urban streets is a step. And new techniques aimed at removing existing management Srdrdgmy city streets, particularly in urban lighting in the streets is to create a platform for the engineering, has been carried out. Given the sensitivity of these sites to facilitate urban life and provide comfort and safety of citizens on the other. Limited

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resources and increasing demands, the importance of research in this field is essential. It is worth noting that research has been appropriate and valuable urban space with lighting studies have been conducted. Can be found in this connection, check Maurer, Jean-Pierre and his colleagues, who study urban space in the design, implementation, and management, has been investigated. [4]. And comprehensive studies sidewalks in Tehran organized by the Consulting Engineers were birthplace [5]. Given the fact that the growth of urban population is growing rapidly [3]. The research to create a special place in the field of management information system of urban street lighting led. The study sample was selected region of Khorasan Razavi functions. All relevant information, were collected over a period of four months, then using Arc GIS 9.3 software system to record, process, and analyze location data reference

was incorporated. The system was developed using Visual Basic programming language to be specific capabilities. Finally, the efficiency of the system given its role in the management of urban street lighting investigated. And indicators such as safety, security, comfort, continuity, network convenient, attractive, topography, climatic conditions, social inclusion and cultural ... [11]. It is hoped that a comprehensive study be studied in the future management of the city streets.

2. STUDY AREA

Sitanabad area in this study in a city in Khorasan Razavi province, the city of Sabzevar city is located in the juice. With a population of 4,987 people in 1385, is. At a distance of 42 km and 70 km from Nishapur and in the course of the past three way Sabzevar Sabzevar, turquoise and Quchan is located.

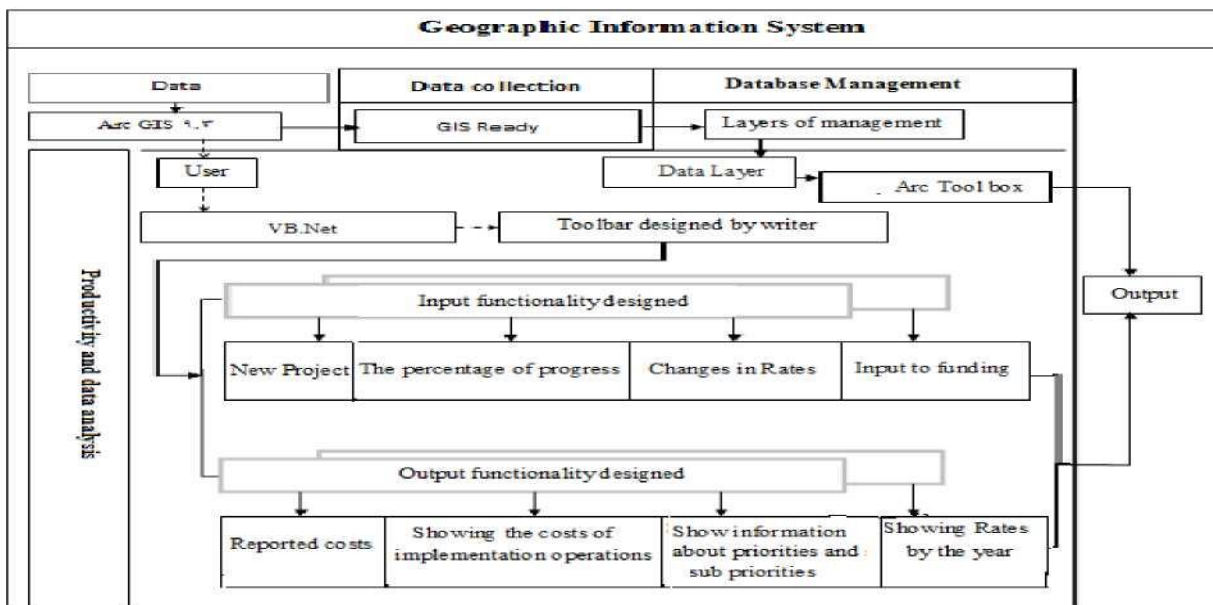


Figure 1 - System Design

2-1-Outline research

Geographic Information System (GIS) 1 tool powerful and cost-effective over time for many analyzes is the place. This study also aims to manage the cost of construction of city streets using Geographic Information System is based on the following conceptual model. Which includes the following steps. 1. collect data, organize and manage data 2-, 3- prepare a conceptual model that uses analytic functions Arc GIS,, the three parts are in contact with each other. (Figure 1).

2-3-1- Data and requirements gathering

Data Fusion and compatibility with file formats, has more processing power of GIS for specific purposes. [10] The aim of this step is to complete the first spatial information and spatial information systems software is to use. For this purpose, a detailed examination of available data, information, system requirements specified. This data includes the list of basic data and tech-

nical information on the project, including the road map, lane width, the width of sidewalks, parks border crossing, across the middle, and light utility asphalt path and steep approach procedures, etc. is. To implement the plan design is done in the following steps.

1. collect, produce and prepare basic location
2. The collection, production and preparation of basic descriptive information
- 3-implementation of basic map

After preparing the data entry system to display information on a computer screen with standard system location. Prepare 2 data formats Shape - File has been done.

2-3-2-Database management

Like any other enterprise management of urban and navigate complex utilities and macro planning requires a comprehensive information base is. And such activi-

ties are now location-based information database Namnd.dr this article the structure of a database based on GIS spatial data is examined. And according to the model of functional requirements, we can design and create a logical model should be taken. The translation of the information contained in the logical modeling phase conceptual modeling language comprehensible to software [9]. Spatial database model used in this study, the model is Zhyvdytabys 3 Arc GIS software it supports. This model can hold all the information in a database, and the structure of the Zhyvdytabys Feature Dataset organized for relevant information to use. The Representation in Arc GIS capabilities to store profile information, along with other graphical effects used.

2-3-3-Preparation of the conceptual model

After the preparation and establishment of database management, data flow path to the productivity and analysis with a conceptual model of the pass. and analysis in order to manage the cost of construction of urban thoroughfares.

4-SPECIAL FEATURES SYSTEM

Special Features Vyzhal system using BASIC programming language is designed as a toolbar. The following briefly describes the application (Figure 2).



Figure 2 - specific system functionality toolbar

4-1-Defining new project

In addition to "define" project, to enter new projects in film projects, the project drawing. And information about the new project under the name and other information can be entered through the table. By select-

ing the "project definition" will open a form that displays the list of selected projects that can be set from the list using the option "Add operation" or "Delete operations" in the form of new operations added to the project and low (Figure 3).

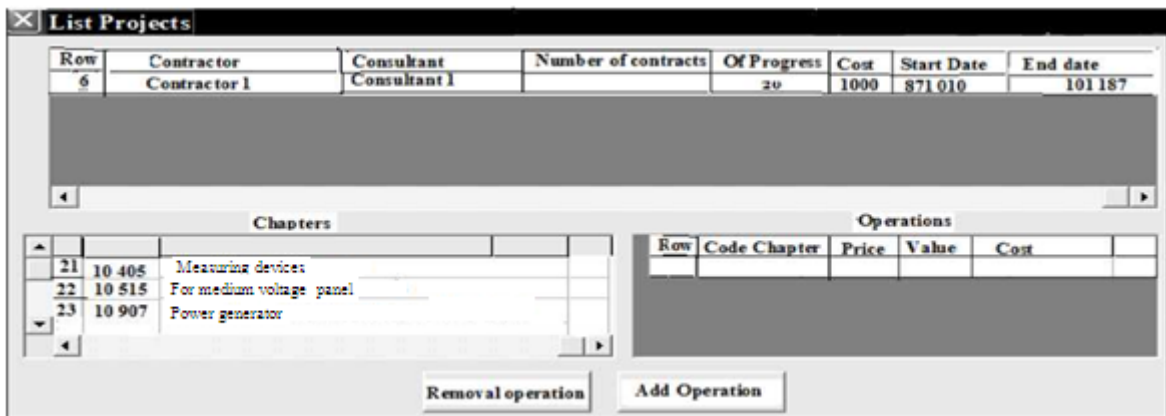


Figure 3 - Adding or Removing a New Project

4-2- Based on the estimated funding

Knowing that the existing budget of how things can be done, will be very useful. This system is currently antic-

ipated that the cost of each operation can be work to calculate the amount of the budget is low (Figure 4).

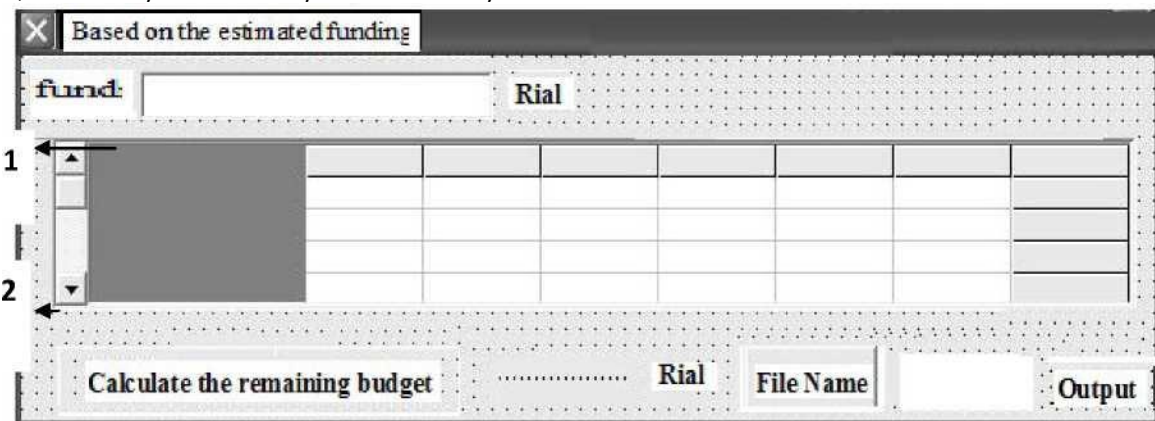


Figure4 - Based on the estimated funding

In the figure above, Part 1 is devoted to input the amount of money. Doubleclick on any of the two phases of work following window opens. Includes the under priorities of each work phase and the phase of the work of the unit. This window has been completed and approved, then click the option to calculate the budget

in Figure 3. The remaining budget in the following window is displayed. Thus, users can know the amount of money, a list of desired work processes so that the appropriate budget is allocated. Use the form below with the option "Text output" generated list as a text file is also stored (Figure 5).



Figure 5 - Run the command window and set the budget priorities and actions

4-3-reporting costs

Downloadable report costs in the system before they can be examined. Projects relevant to note that the total funds allocated in one phase does not. Consultants design studies, several high priority projects in order to estimate the incremental costs are classified. This classification and pay any part of the template is

created in the system. Click on Options on the toolbar to report expenses. Relevant information to each priority and each of them and the cost of each subset are shown. Over time from year to year cost of implementing the priorities will change. This allows the system to update the information provided. The case will be discussed (Figure 6).

Priority 1		Priority 1 Cost rial	
Street Eghbal	330736515		2266164606
Saber Street	456031394	Priority 2 Cost rial	2250965426
Boulevard Railway (Road Quchan)	1009093145	Priority 3 Cost rial	65602376
Niloofar Street and Hakim	331534746	Land dredged, or other unexpected	
Street Jame Mosque	138768806	Kanyvha to rial	4417321417
Priority 2			
Abolfazli and Azadegan Street	519777475		
Janet Street	167083107		
Janet lane	45119002		
Street Khordad 15	276152675		
Keshavarz Street	341302608		
7 tir Street	562882911		
Priority 3			
	65602376		

Figure 6 - Display the option of reporting costs

4-4 Show separately the costs of operations performed

Related projects have been prioritized due to restrictions of transfer credits. These priorities have been classified as main priorities. and in every major priority under the priority of priorities and a breakdown of each also conducted a series of operational performance. It is noteworthy that each of the operations with the code name of code, quantity, cost per chapter

and code...Formed. For documentation of the cases mentioned, the ability to "show costs separately operations", is designed. Given what was said in the documentation process. if you consider the time factor. May change operations arise. This system could easily change with the operating time required for the operation, the cost of each operation and the operation rate ... Is possible. another our capabilities of this system can display the progress of each operation. (Figure 7)

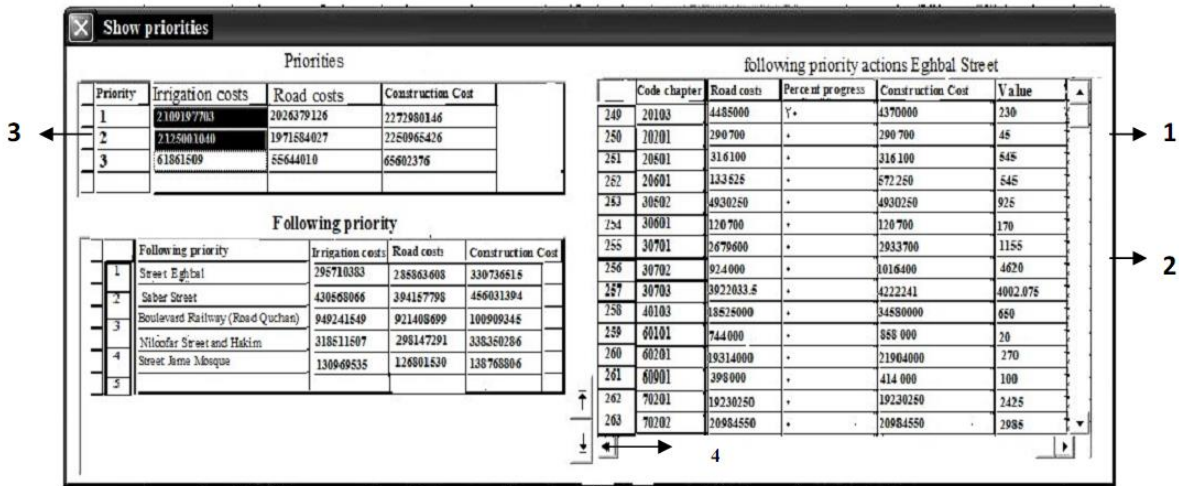


Figure 7-Show separately the costs of operations performed

In the above, in Part 1, the list of priorities and the cost of each of the three types of rates: "buildings", "The airport and railway infrastructure" and "Irrigation and Drainage" exists. Select the priority of this section, the following list of priorities and costs related to each of the three types based on the rates mentioned above, is shown in Part 2. The following priorities are selected

from Part 2. All operations in the priority list in Part 3 are shown below. Part 3 of the cost of operations based on three types of fees and expenses as the cost of doing the work progress will be displayed. Selecting the option in Part 4, according to the rates application is shown (Figure 8).

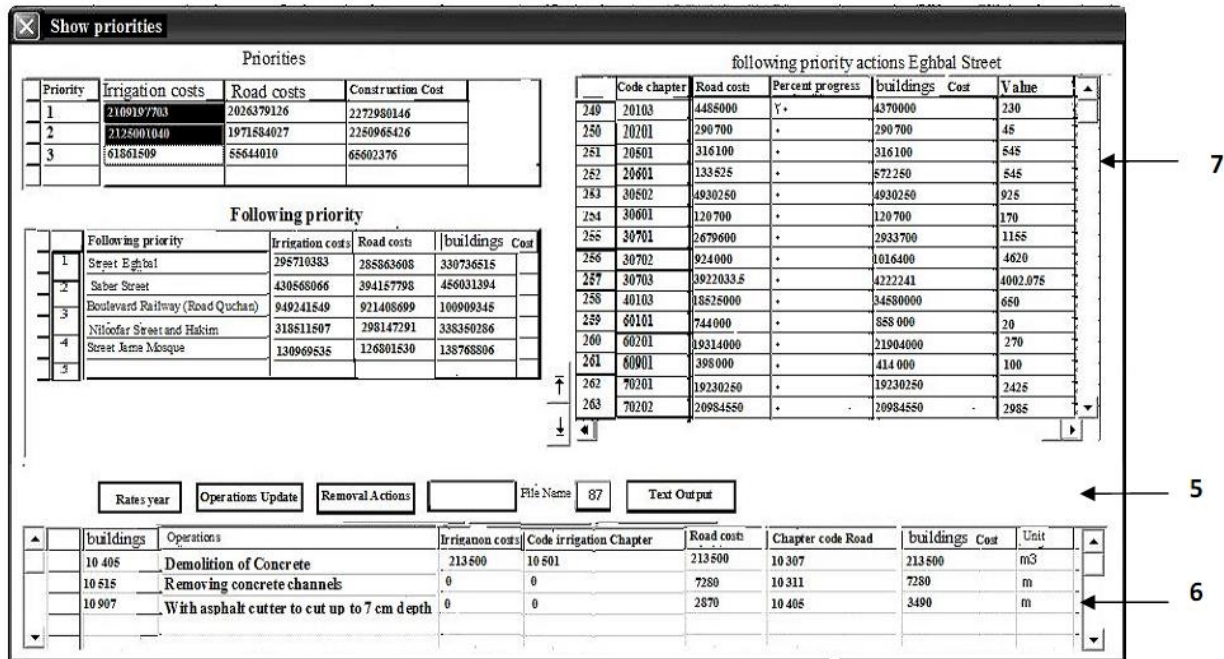


Figure 8 - Application Rates associated with the desired

In this Figure, Part 5 consists of four costs options: "Delete Operations", "updated information", "rates year" and "output text" is. The option to "remove the" cause of action in Part 3 of the already selected, will be removed. Select "Update Details" to enter the changes in operations on the following priorities are priorities and fit it on. Option "rates year" for rates based costs used in the request, because of year to year, some of the rates will change. Therefore, costs are calculated based on the new rates. To do so, should the Excel file to the

existing rates in the project, a new year is called Datasheet. The new rates information required to be entered in a sheet. After this step, in section 5 form, and enter the corresponding rates option is selected. Perform these operations with the new rates levels have been attributed to the operation. And costs were calculated based on the new rates is shown in Part 7. Select "Text output" of the five is the last option. The priority will be selected from a text file. And double opt Part 7 below will be displayed (Figure 9).

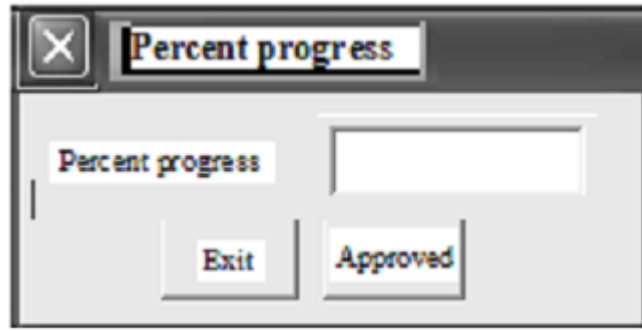


Figure 9 - Form of the progress of each operation

Enter the percentage of operations in progress. Approved expenditures made by selecting the relevant operations are shown in Part 7. The user will be able to operate on the basis of the amount of money spent on development and related charges (which shall be

communicated in different years), shall see. Also, double clicking a window will open with section 6 in Figure 8. In this window, enter the amount and confirm the option we choose. This action adds to our existing sub-priorities (Figure 10).



Figure 10 - Adding forms to a subset of operational priorities

4-5- Show Rates

Option "Show Rates" rates years of operation will be displayed. This option has all the information on rates (Figure 11).

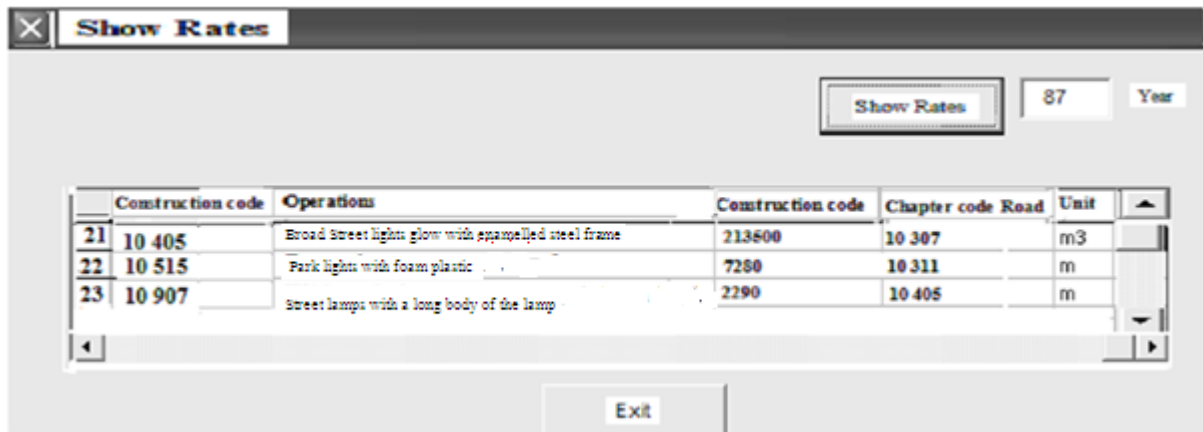


Figure 11 - Form Show Rates

4-6-Show information about the priorities selected on the map

To use this feature, the range selected on the map. Select "is selected report" from the toolbar, the following list of priorities along with their related costs in the selected range is displayed (Figure 12).

5-CONCLUSIONS AND RECOMMENDATIONS

System In addition to the functions of public functions in the field of cost management of urban street lighting that was mentioned in the context of research, has been able, with the use of specially designed features, reporting costs, representing costs returns the results of this research.

6-CONCLUSION

1. The rapid updating and harmonizing spatial data and descriptive
2. to achieve an appropriate level of quality in terms of a data follow a single standard

3. facilitate the transfer and exchange of information and thus save costs.
4. increase the accuracy of the statistics and the elimination of multiple data
5. The management costs of reduced taste
6. reduce the costs of action to reduce trial and error and risk management decisions

7- FOOTNOTES

- 1-VB.Net
- 2- Full Structure Data
- 3- GIS Ready
- 4- Geo database
- 5- Arc Tool box
- 6- GIS Tools
- 7- Thiessen polygon
- 8- Datasheet

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