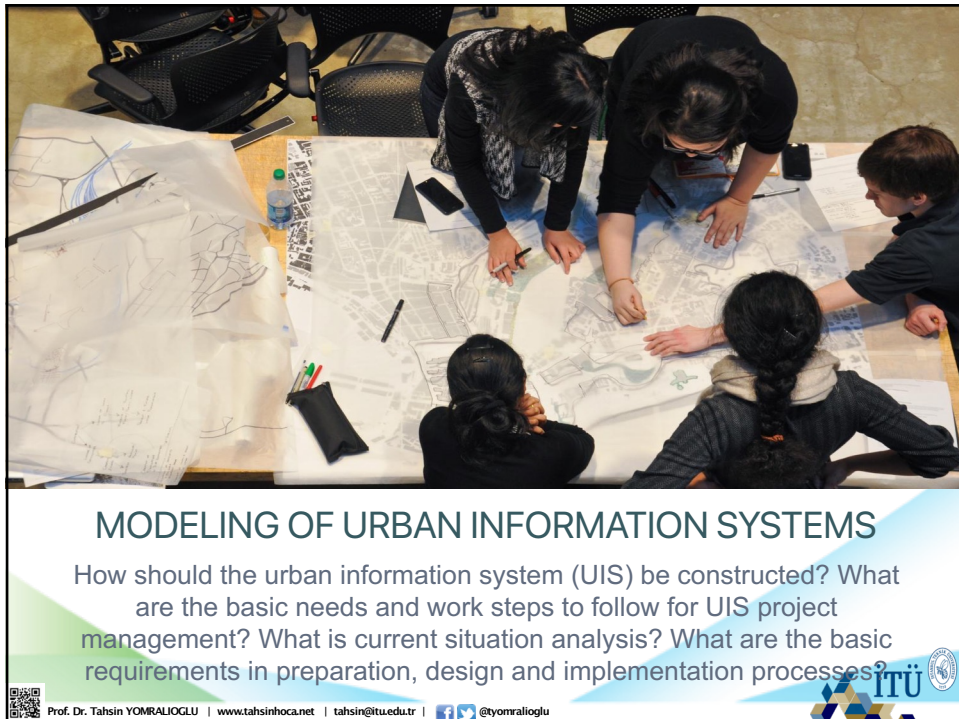




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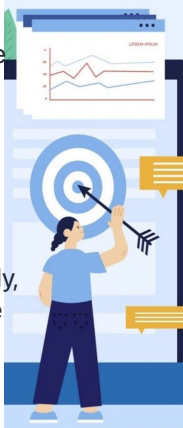


MODELING OF URBAN INFORMATION SYSTEMS

(A) Evaluation of needs for spatial information...
In the realization of a long-term UIS project, determining the institutional goals separately and clearly in the development process and making final decisions on what data are necessary for the realization of these goals.

(B) Gaining institutional supports...
Cost /benefit estimations determined by a pilot project study, by determining the economic value of the system to be established with cost / benefit analysis.

(C) Management of the UIS project...
In addition to the necessary personnel organization, updating the map information, transferring it to the computer environment, storing the information in this environment and producing the necessary information for the future.



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MODELING OF URBAN INFORMATION SYSTEMS

(A) Evaluation of needs for spatial information...
By the institution that will create the city information system, first of all, the way of obtaining the spatial information used, its functions and the needs for this information should be well analyzed and understood and defined.
In particular, the advantages and disadvantages of the information to be used in the short and long term should be revealed very well. Such an approach is important in the long run as it enables the expansion of the project volume and possible information sharing between institutions. Therefore, possible future planning is put forward at the initial stage.
In summary, the work steps to be followed for this purpose are;

- (a) Gaining advanced institutional support,**
- (b) Identification of potential applications,**
- (c) Determining the order of priority in implementation activities,**
- (d) Ensuring maximum use at the institution level,**
- (e) Identification of resource requirement,**



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MODELING OF URBAN INFORMATION SYSTEMS

(A) Evaluation of needs for spatial information... (1)

- a) **Gaining advanced institutional support** - The support of high-level institutions that have authority in decision-making should be obtained by demonstrating that using spatial information will be support works and that there will be developments, and that the success will be increased in the studies carried out by the institutional units by providing the contribution of technology.
- b) **Identification of potential applications** - A broad-based and long-term UIS project should include all institutions dealing with spatial data. Therefore, it is necessary to define the institutions that can benefit from the project and the advantages that these institutions will provide from the project. In particular, the administrations should be informed that how GIS can be used by locally.
- c) **Determining the order of priority in implementation activities** - If the necessary institutional support has been received and potential applications have been identified for the success of the plan in the long run, an inter-institutional priority should be made in line with the services to be provided to the organizations and work schedules for the necessary detailed implementations should be determined. Such an approach will contribute to the future development of the priority the necessary databases should be.



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MODELING OF URBAN INFORMATION SYSTEMS

(A) Evaluation of needs for spatial information... (2)

- d) **Ensuring maximum use at the institution level** - Although the integration of different data sources is the basic principle of GIS, information sharing and the resulting opportunities should be taken into account in a long-term UIS project. Since the sharing of information that has not been shared before will provide an institutional comfort, the importance of information will be understood and the information will be benefited more. Thus, it will be aimed to use information at the maximum level in transactions based on spatial information on the basis of city and region.
- e) **Defining the resource requirement** - In a system to be established, the worst approach is to set the targets randomly at the beginning and not be able to realistically allocate the necessary resources. Such a bad approach can disappoint post-project practitioners. For this reason, cost and investment analyzes must be estimated very well. Especially in a long-term urban GIS project, the necessary investments should be made on time without risking the project expenditures.



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MODELING OF URBAN INFORMATION SYSTEMS

(A) Evaluation of needs for spatial information... (3)

(A)-1: Documentation of management objectives

- Some local administrations prepare long-term planning studies in advance and document the planning functions that are aimed to be realized in the future. Such plans are prepared in a general structure, taking into account the current development trends and problems.
- Some of the issues that are mainly stated in the plans are as follows; Increasing the number of jobs, improving the economy, increasing the number of residences, reducing the crime rate, increasing health services, improving the environment, increasing administrative efficiency, improving education, maintenance and repair of the urban infrastructure, controlling the developments, etc. to facilitate and increase the tax collection with other local services.
- If these targets have been documented in a development plan with all the details, these targets should definitely be taken into account in the long-term UIS program to be created.



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MODELING OF URBAN INFORMATION SYSTEMS

(A) Evaluation of needs for spatial information... (4)

(A)-2: Definition of administrative functions

- All administrative functions that will support the objectives determined by the local administration units should be examined and how they will help the developments and how they will be used in the UIS should be stated.
- Such administrative functions and duties are generally defined within the functions of various public institutions and organizations. Each function is associated with a purpose.
- E.g; While the function of "maintenance of road stones" is fulfilled by municipal units, this function is directly related to the purpose of "maintenance and repair of urban infrastructure".
- It is possible to multiply such examples. Almost all of these functions are among the other administrative duties to be considered within the scope of UIS.



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MODELING OF URBAN INFORMATION SYSTEMS

(A) Evaluation of needs for spatial information... (5)

(A)-3: Identification of institutional possibilities and object definition

- After defining the objectives determined by the local administration and the functions that support these objectives, the UIS planner must define the existing possibilities and difficulties in order for these functions to work.
- Especially if there are physical and legal obligations, these should be taken into account. For example, in a road arrangement work to be done, it should be known in advance how the situation of a building blocking the work will be resolved legally or what kind of symbols related to the roads should be used in a map to be produced.
- In addition to these, alternative functions that will be encountered in the fulfillment of the defined functions should also be revealed in detail. For example, in the subgroups of the function defined as "street repair", sidewalk repair, tree maintenance, street lamp repair, traffic sign maintenance, etc. objects can be.



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MODELING OF URBAN INFORMATION SYSTEMS

(A) Evaluation of needs for spatial information... (6)

(A)-4: Detection of attribute information

- After the necessary detection and definition of spatial objects, it is time to design and create the database. At this stage, there is a need for attribute information to fulfill the object function of each function in order to fulfill the defined administrative functions.
- Attribute information (location, size, condition, construction year, material type, etc.) of an object defined as a street is required for UIS. Thus, the function (repair of the street) will be supported and an aim of the local administration (maintenance-repair of the urban infrastructure) will be fulfilled.
- This function is a planning start for the UIS and is essentially modeling the data.
- The objectives determined by the institution, the functions that support these objectives, the objects that will fulfill these functions, and the attribute information that defines these objects are the method process to be followed in a long-term UIS project.



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CURRENT STATUS ANALYSIS: DATA/FUNCTION (D/F) MATRIX

Data needs should be determined to support the working functions carried out within the organization. In simple terms, it is decided that the function **Produces (U)** or **Uses (K)** of data. At this point, it is noted whether the functions contain any positional data. Depending on the function dimensions, how and by whom the data is produced, stored, the transitions between the data and the directions of data flow should be determined and if there is repeated generated data, they should be determined at this stage.

A Data/Function (D/F) matrix can be created to adapt data. One dimension of the matrix indicates functions, and the other dimension shows the data.

The cell at the intersection of D/F is encoded with a character that will state that the data is generated (U) or used by the function (K). The aim here is to express the relationship between data and function at a high level.

Completing the D/F matrix is a time-consuming process. Bilateral meetings within the institution will require several sessions, as well as the discussions to be written down and documented and discussed again.

VERİLER	FONKSİYONLAR						
	Arazi kullanım planı	Arazi gelişme yönetimi	Ruhsat verme denetimi	Adres yönetimi	Değerlendirme	Yol ağı yönetimi	Taşımacılık planlaması
Master plan	Ü	K					K
Arazi kullanım zonları	Ü	K					
Arazi gelişimi		Ü					
Parselasyon	K	Ü					
Yapı izni-ruhsat	K		Ü				
Adres			Ü*	Ü*	Ü*		
Değerlendirme parseli	K	K	K		Ü		K
Parsel malikleri	K	K	K		Ü		
Sokak	K	K		K		Ü	K
Trafik						K	Ü
Taşımacılık planı	K	K				K	Ü

Veri/fonksiyon (V/F) matrisinin gösterimi
(Ü=üret, K=kullan; *veri kolonu altındaki her bir kayıt bir fonksiyon için üretilir)

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MODELING OF URBAN INFORMATION SYSTEMS

(B) Gaining institutional supports...

- ✓ The easiest and most effective method for the support and approval of a UIS project, which is designed to be established, by local governments is to make a demonstration (presentation) of the project, in case such a system is used, the economic profit will be much higher than the application costs made with classical methods and the advantages of the system will become more and more over time and development should be emphasized.
- ✓ Such an approach can be achieved with classical cost/benefit analysis. Therefore, estimations regarding the costs required for the establishment and activation of the system and the economic profit that the system will provide for the future should be made. If the estimations to be obtained as a result of these analyses are positive, it will be much easier for the project to be approved by the decision-making bodies.
- ✓ There are also cases where the estimations for the cost/benefit calculation are not kept and the planned project is not realized on time. For this reason, it is necessary to benefit from previous similar projects and experience gained in order to reduce the risk in project costs. However, it is possible to make cost/benefit analyses with a **pilot project study** to be realized in a certain dimension.

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MODELING OF URBAN INFORMATION SYSTEMS

Pilot project implementation requirement...

- For the creation of an urban information system, as with other project processes, a **pilot-zone** work needs to be done.
- In the study to be carried out for this purpose, a region with the desired characteristics and the quality of providing the necessary data should be determined and project steps should be applied for this region.
- The pilot-regional study will help to present the system to be created to the relevant parties, as well as to encounter the problems that may arise during the installation and operation of the system and to carry out the necessary studies to eliminate them in advance.
- In order to realize the pilot project, the necessary actions to be carried out within a certain time period in line with the targets to be determined at the beginning should be determined and these processes should be implemented within the framework of the plan to be prepared.
- As a result of the pilot study, the advantages and disadvantages of the system are revealed by making a general evaluation and these are taken into account in the decisions regarding possible spatial activities in the future.



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MODELING OF URBAN INFORMATION SYSTEMS

Pilot project implementation requirement...

Some of the work steps to follow in realizing a pilot project

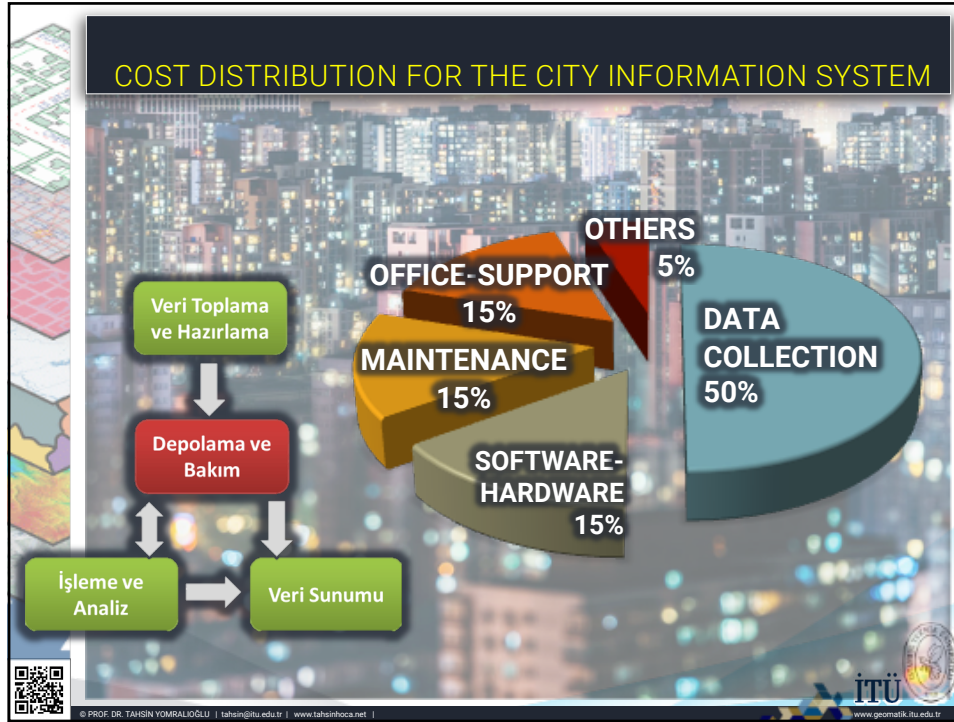
- a) Receiving, placing, installing and testing software-hardware systems.
- b) Receiving the necessary training for programming and digitization. At this stage, it is necessary to obtain technical information about the features of the software and hardware, the use of the menu, and how the digitization is done.
- c) Creating an index map of the city within the same coordinate system.
- d) Creation of basic bases by digitizing index maps. At this stage, after the digitization process is completed, the accuracy of the process should be checked by comparing it with the original. Considering the completion time of the work on the layout, the time estimates for the completion of the other layouts are made, and the digitization process is re-evaluated.
- e) Necessary water, canal, sewerage, electricity, pavement, etc. for infrastructure works. digitization of other information from base maps
- f) Ownership information should be obtained from the institutions, and such written and graphic information should be associated with the coding method to be determined.
- g) Necessary menus created for special viewing, querying, information and presentation.
- h) Channel, sewer, water, telephone, etc. information should be defined linearly, infrastructure topology should be established, and symbols should be determined
- i) Zoning implementation plans should be digitized based on the base maps created. Information on the zoning plan should be displayed in different layers as area.



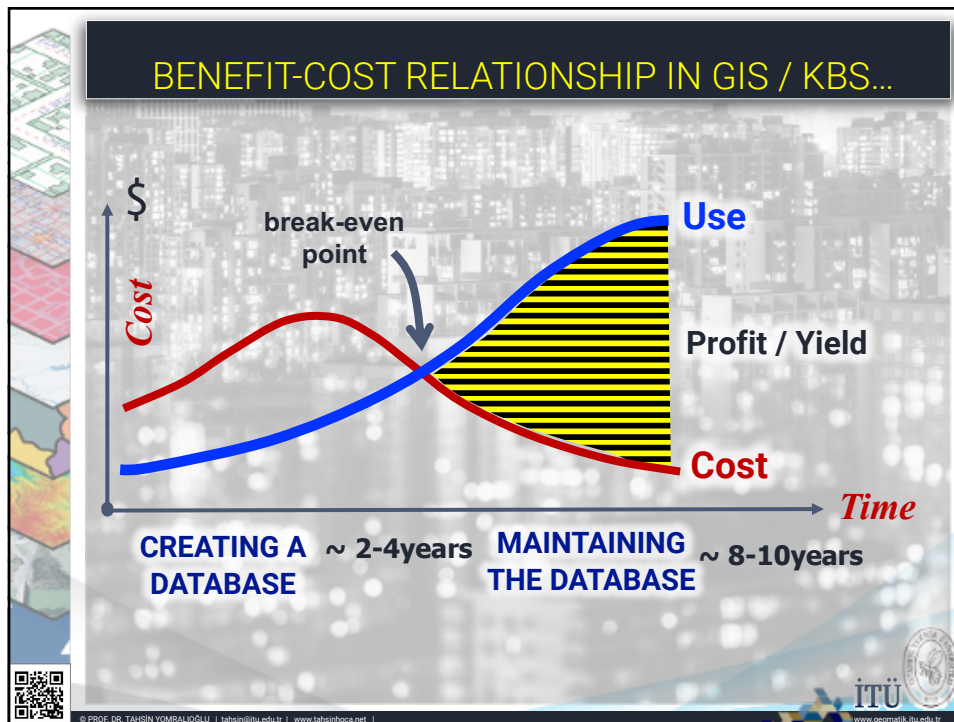
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COST & BENEFIT (C/B) ANALYSIS...

Cost Benefit (C/B) Analysis is basically an analysis that shows the sum of benefits such as financial gain to be obtained against the costs of a project/product/service to be made by businesses. It is often used when trying to make a decision for an investment action. When calculating the activity of the investment, the intangible benefits as well as the opportunity cost are usually included in the calculations.

The benefits and costs of a particular investment project throughout its life are determined in money-making terms. After the benefits and costs are expressed in money-making terms, they are discounted with an appropriate discount rate and compared with the present values of the benefits and costs, and a decision is made about the viable status of the investment project.

Investing is considered appropriate if the present value of the benefit (B) is greater than the present value of the cost (C).

- That is, if $B > C$ or $(B > C) > 1$, the investment project is profitable.
- If the present value of the benefit is less than the present value of the cost, then $B < C$ or if $(B < C) < 1$, the investment project cannot be implemented.



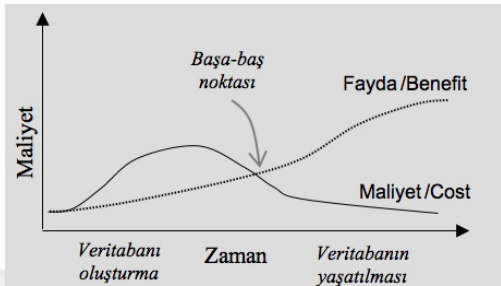
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COST & BENEFIT (C/B) ANALYSIS...

Cost and benefit graphs change over time, with two lines intersecting at a certain point. This point is the “**break-even point**”, and from this point on, the project becomes beneficial. **The result of the C/B analysis is taken into account as the recycling time.** This period is the ratio of the total investment cost to the estimated annual earnings.

GIS is that the investment items to be made cannot be defined very clearly in advance and the fees for these items cannot be determined sufficiently.



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COST & BENEFIT (C/B) ANALYSIS...

In terms of cost/benefit to the GIS/UIS project, the effects can be **direct** and **indirect** in two ways.

Doğrudan maliyet		Doğrudan fayda	
1 Yazılım-Donanım	- Donanım - Yazılım - Yazılım geliştirme - Ara-yüz geliştirme - Çıktı üretim araçları - Yazılım güncelleme - İlave bakım anlaşmaları - İletişim ağı	1 Tasarruflar	- Personel tasarrufu - Mekan tasarrufu - İş zamanında tasarruf
2 Veri	- Veri tabanı oluşturma - Veri aktarımı - Veri tabanı koruma - Veri güncelleme	2 İş verimi	- Daha hızlı bilgi edinme - Bilgi sunma hizmetlerinde gelişme - Bilgi daha hazır halde - Güncel bilgi hazır
3 Yönetim	- Sigorta - İdari yönetim - Eğitim - Kira	3 Yeni ürünler	- Çok çeşitli çıktı ürünleri - Daha kaliteli çıktı sunumu
4 Sistem için metod seçimi	- Pilot proje - Benchmarking - Maliyet/fayda analizi - Danışmanlık		
Dolaylı maliyet		Dolaylı fayda	
	- Bilgisayarlara olan güven artar - Düşük kaliteli çalışma çevresi; gürültü, ısı, personel için sıkıcı işler - Yüksek yetenekli iş desteği gerekir		- Bilgi akışı ve paylaşımı artar - Daha etkin karar-verme olanağı olur - İş motivasyonu artar - Daha adil kararlar verilir - Veri görüntüsünde gelişim sağlanır - Sorunlar daha iyi anlaşılır ve analiz edilir

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MODELING OF URBAN INFORMATION SYSTEMS

(C) Management of the UIS project...

- ✓ For the implementation of the planned UIS project, the project transforms into a different structure after the necessary approvals are received for the investments related to the project.
- ✓ What will be done after that is technical procedures, potential applications and how the project will be implemented by successfully fulfilling it are considered. This means that after the necessary personnel is provided and the organizational structure is established accordingly, the hardware structure is created and data collection, in other words, the digitization of the necessary bases containing location information, is started as soon as possible.
- ✓ The use and protection of an UIS system, which will be created as a result of large investments, by experienced and responsible personnel is also of great importance in terms of keeping the system alive.
- ✓ When technical problems such as software, hardware and database management arise, they must be resolved in a healthy way. For this reason, personnel recruitment, training and organization have an important place in the information system project.





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MODELING OF URBAN INFORMATION SYSTEMS

Preparation of base maps

In order to digitize the map layers needed at the beginning of the project or to obtain new ones from the existing ones, the base maps must first be transferred to the computer environment. Generally, three different map bases will be used for this transfer process. These;

Available maps- Existing maps are used instead of costly recovery of maps. However, the extent to which these maps are healthy and reliable should definitely be determined by a preliminary study. Then, the map information is transferred to the computer environment by digitization.

New maps- The required measurement values are used to reproduce the maps that are needed but not currently available, or the necessary location data is transferred with a direct connection to the computer. In particular, coordinate information or measurement values and aerial photographs are used.

Digital maps- Many geographic data are now available in electronic form. Some institutions can process information in computer environment. Therefore, it is possible to transfer such location-based information to the system to be installed. Generally, ready-made databases are capable of enabling this.



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MODELING OF URBAN INFORMATION SYSTEMS

Preparation of base maps...

The production of base map bases is one of the core elements of UIS. Maps perceived as graphical data form the basis for many spatial analyzes and applications. In our country, various maps are produced by different institutions and organizations for various purposes and requirements. The main organizations producing maps in Turkey are as follows;

- Harita Genel Müdürlüğü
- Coğrafi Bilgi Sistemleri Genel Md
- Tapu Kadastro Genel Müdürlüğü
- İller Bankası Genel Müdürlüğü
- Karayolları Genel Müdürlüğü
- Devlet Su İşleri Genel Müdürlüğü
- Orman Genel Müdürlüğü
- Tarım Reformu Genel Müdürlüğü
- TEDAŞ Genel Müdürlüğü
- Doğalgaz altyapı İdaresi Genel Md
- Su ve Kanalizasyon İdaresi Genel Md
- BOTAŞ Genel Müdürlüğü
- KÖYDES- MAKS vd..
- Belediyeler
- Özel sektör
- Diğerleri



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MODELING OF URBAN INFORMATION SYSTEMS

Preparation of base maps...

- Maps have different information according to their production purpose and the subject they contain. All of this information should be evaluated in information technology and used to achieve the determined goals.
- It is not an economical approach to transfer the maps to the computer environment for short-term or high-quality printing only with the latest technology. Within the scope of the philosophy of GIS, it is not only to transfer the map information to digital media for visual output, but also to make various analyzes by integrating this information with non-graphical data, which is one of the other elements of an information system.
- For this reason, instead of all map information, necessary map data should be transferred to the city information system for the purpose of the information system. It is possible to consider the base maps that are likely to be used initially in an urban information system to be created for this purpose as follows.

• Topographical maps	• Electrical network
• Zoning maps	• Phone networks
• Cadastral maps	• Natural gas network
• Infrastructure maps	• Cable TV network
• Water and sewerage network	• Other pipelines...



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MODELING OF URBAN INFORMATION SYSTEMS

Problems in creating digital cadastral bases...

In our country, when it comes to the creation of UIS, which has been started and still continues in many cities, especially in metropolitan municipalities, the transfer of property data to the system comes at the beginning of the problems in general. In accordance with the Regulation on the Production of Maps Subject to Registration, it is essential to create digital cadastral bases in the country coordinate system. However, important problems are encountered in the creation of digital bases in the country system. Some of those;

- To produce map-based information at different scales, in different coordinate systems, with different methods and in different time periods,
- Inadequacy and non up-to-date of the geodetic network at the point of applicability of the bottoms created as a result of the first cadastre ,
- Which of the trio of layout-original measurement value-ground can be preferred technically and legally in the creation of digital cadastral bases,
- The inadequacy of cadastral map sheets and the fact that the bases are not up-to-date from the first detection to the present day,
- The disorganisation inadequacy and complexity of archival data



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MODELING OF URBAN INFORMATION SYSTEMS

Personnel organization

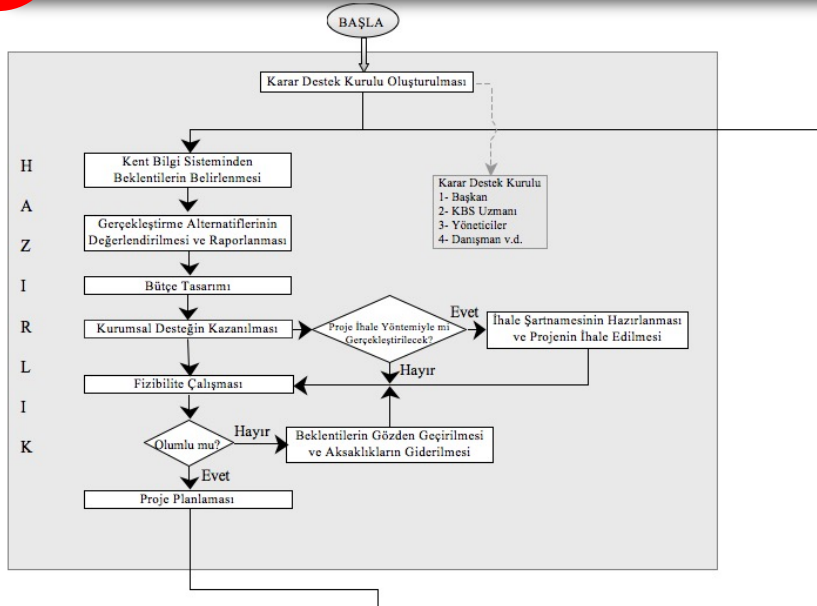
The use and protection of a UIS system, which will be created as a result of large investments, by experienced and responsible personnel is also of great importance in terms of keeping the system alive. When technical problems such as software, hardware and database management arise, they must be resolved in a good way. For this reason, personnel supply, training and organization have an important place in the information system project.

1. **Manager** : Responsible for the management of the personnel and system working in the project.
2. **Analyst**: A person with technical knowledge and experience in geographic information systems. In addition to taking on the task of eliminating special technical problems during the development of the system, it negotiates with potential users, determines the expectations from the system and carries out the necessary design processes.
3. **System operator**:. Person responsible for the regular operation of software and hardware.
4. **Programmer**: A person who transforms applications designed by the analyst into software.
5. **Processor**: The one who prepares the products produced by the system in the form desired by the users and presents them to them.
6. **Database operator**: It is the data processor that implements the necessary software for storing data in accordance with the physical capacity of the system.
7. **Digitizer** : The operator needed to digitize the required maps is a skilled person.
8. **Users**: who form the last link of the system, are those who present the information produced to the needy, that is, to the customers.

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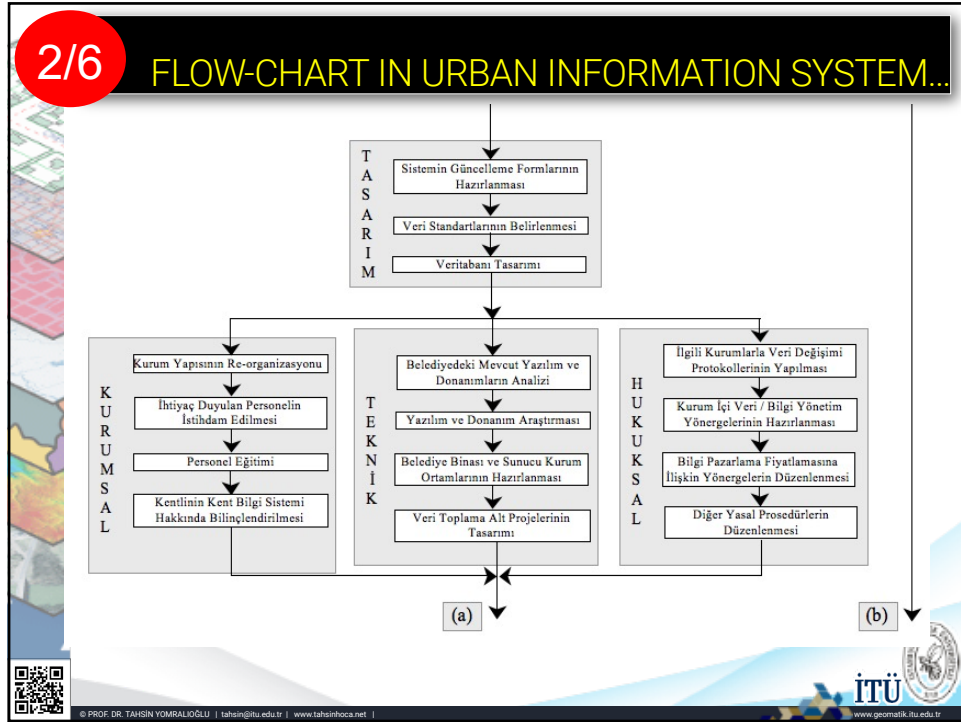
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FLOW-CHART IN URBAN INFORMATION SYSTEM...

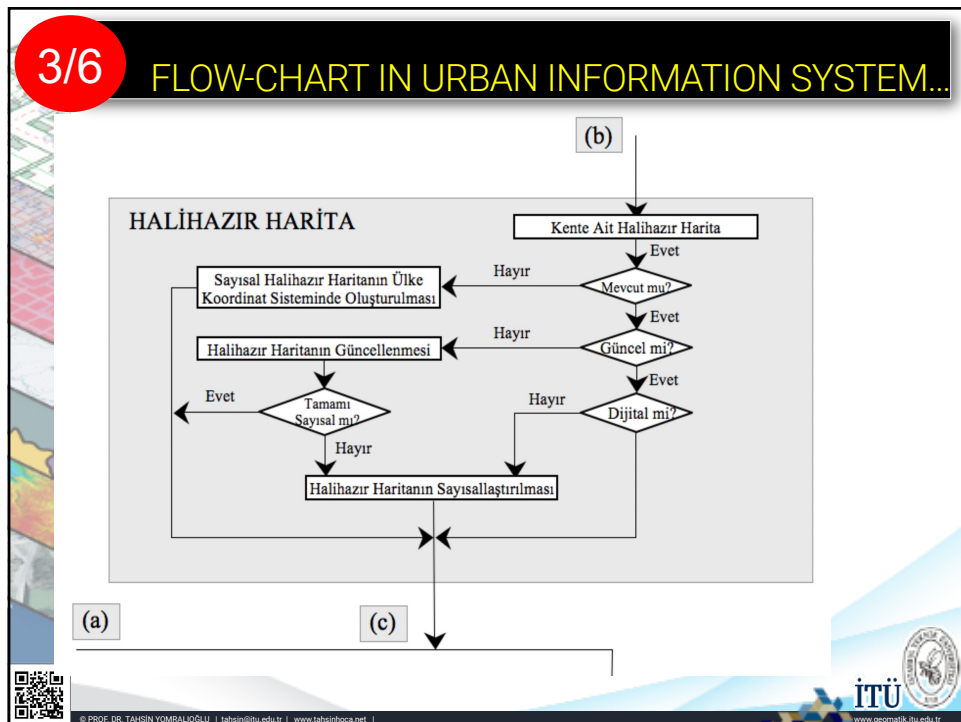


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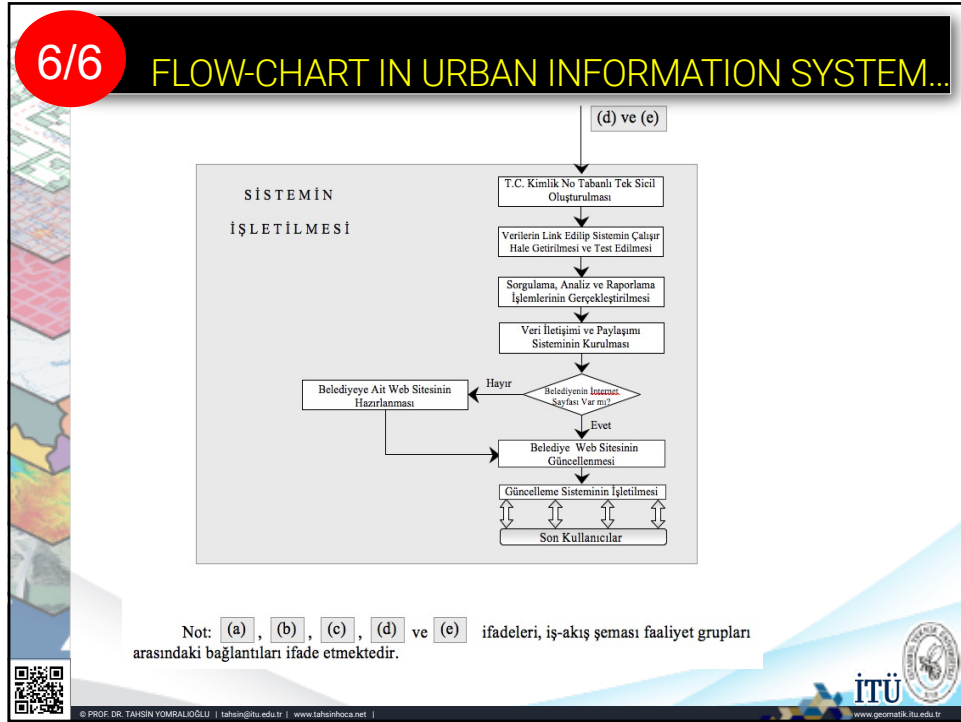


FLOW-CHART IN URBAN INFORMATION SYSTEM...

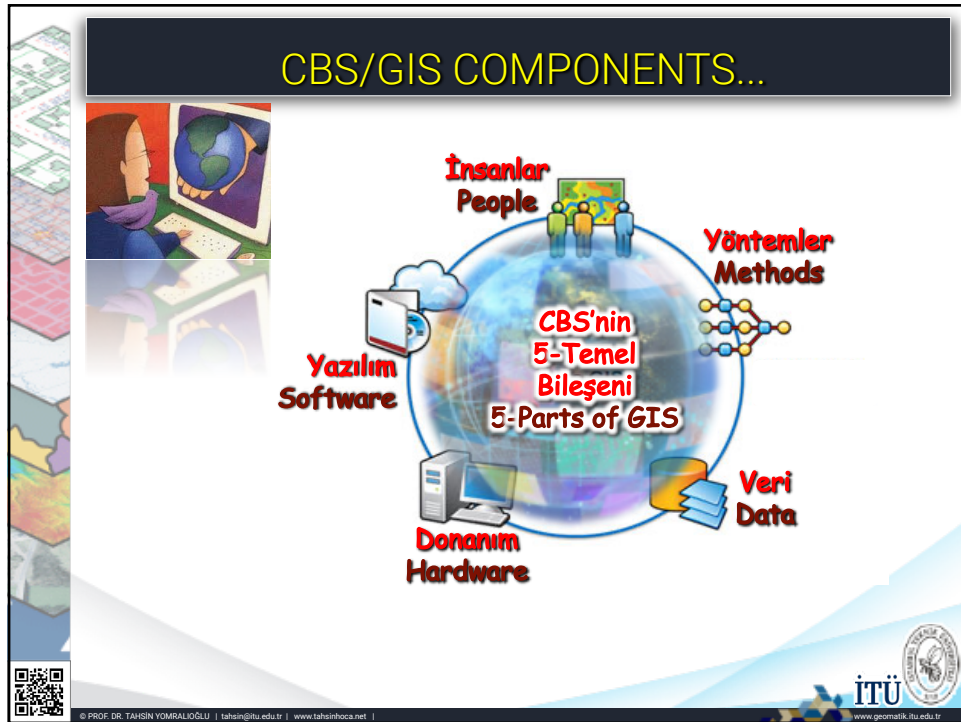


FLOW-CHART IN URBAN INFORMATION SYSTEM...





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LEGISLATION ...

e-government

information sharing?

identification number?

personal property?

digital-signature

price of knowledge?

Is the information publicly available?

tax number?

Who is responsible?

➤ LAW

➤ REGULATION

➤ CHARTER

➤ CIRCULAR

➤

ITU

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LEGISLATION ...

- 5216 sayılı Büyükşehir Belediyesi Kanunu'nun 7. maddesi,
- 5393 Sayılı Belediye Kanunu'nun 14. maddesi,

644 Sayılı KHK Çevre ve Şehircilik Bakanlığının Teşkilat ve Görevleri Hakkında Kanun'un 13. maddesindeki Coğrafi Bilgi Sistemleri Genel Müdürlüğü'nün teşkilat ve görevleri kapsamında belediyelerin kurmak zorunda oldukları kent bilgi sistemleri ve coğrafi bilgi sistemlerinin kent bilgi sistemlerine ilişkin standart belirleme ve yaygınlaştırma görevinin etkin şekilde yerine getirilmesi amacıyla;

20.03.2015 tarih ve 29301 sayılı Resmi Gazetede yayımlanarak yürürlüğe giren **Ulusal Coğrafi Bilgi Sisteminin Kurulması ve Yönetilmesi** Hakkında Yönetmelik kabul edilerek Türkiye'de TUCBS kurulması ve işletilmesi sürecinde uygulanacak mevzuat kapsamı belirlenmiştir.

Yönetmeliğin birinci maddesinde "Ulusal Coğrafi Bilgi Sistemi'nin kurulması ve yönetilmesine; coğrafi veri temaları kapsamındaki coğrafi verilerin tanımlamasının yapılmasına ve sorumlu kurumlarca bu tanımlara uygun olarak üretilmesine; coğrafi verilerin, coğrafi veri setlerinin, coğrafi veri servislerinin ve bunlara ait meta verilerin paylaşılmasına; coğrafi verilerle ilgili iş ve işlemler için kurumlar arası koordinasyonun gerçekleştirilmesine ve diğer hususlara ilişkin usul ve esasları kapsar" denilmektedir. Bu Yönetmelik ile birlikte coğrafi verilerle ilgili iş ve işlemler için kurumlar arası koordinasyonun gerçekleştirilmesini, kurulların ve komisyonların teşkil edilmesi ve diğer uygulamalara ilişkin usul ve esasların belirlenmesi amacıyla;

(a) Koordinasyon Kurulu, (b) Teknik Komite, (c) Çalışma Grupları oluşturulmuştur.

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TÜRKİYE CUMHURİYETİ
ÇEVRE VE ŞEHİRCİLİK
BAKANLIĞI

GENEL MÜDÜRLÜĞÜMÜZ - GÖREVLER MİSYON-VİZYON BİRİMLER

Coğrafi Bilgi Sistemleri
Genel Müdürlüğü

Cumhurbaşkanlığı Kararnamesi

TUCBS
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Kanun
Cumhurbaşkanlığı Kararnamesi
Bakanlar Kurulu Kararı
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Kalite Çeşitmeleri
Hizmet Yönetim Sistemi Politikamız
Sosyal Medya Hesaplarımız

Coğrafi Bilgi Sistemleri Hakkında Cumhurbaşkanlığı Kararnamesi

7 Kasım 2019 Tarihli ve 30941 Sayılı Resmi Gazetede Coğrafi Bilgi Sistemleri Hakkında 49 Sayılı Cumhurbaşkanlığı Kararnamesi yayımlanmıştır.

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RESMİ GAZETE

YASAMA BÖLÜMÜ
KANUN
Türk Devleti Kanunu ve Baş Kanunlarda Doğrudan Yapılan Kararı

YÜRÜTME VE İDARE BÖLÜMÜ
CUMHURBAŞKANLIĞI KARARNAMESİ
Coğrafi Bilgi Sistemleri Hakkında Cumhurbaşkanlığı Kararnamesi (Kararnama Numarası: 49)
CUMHURBAŞKANLIĞI KARARLARI

Türkiye Coğrafi Bilgi Sistemi ve ağırsısına ilişkin kamu kurum ve kuruluşları arasında koordinasyon sağlanması, hedef ve stratejilerin oluşturulması, coğrafi veri temaları içinde yer alan coğrafi veri ve bilgilerin üretimi ve güncelliğinin sağlanması, yönetilmesi, kullanılması, emniyeti, güvenliğinin sağlanması, paylaşılması ve dağıtımına yönelik usul, esas ve standartlar ile bu Cumhurbaşkanlığı Kararnamesi kapsamında oluşturulan kurumların, kamu kurum ve kuruluşlarının, gerçek ve tüzel kişilerin görev, yetki ve sorumluluklarının belirlenmesi amacıyla 07/11/2019 tarih 30941 sayılı Resmi Gazetede 49 sayılı Cumhurbaşkanlığı Kararnamesi yayımlanarak yürürlüğe girmiştir.

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