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SENIOR PROJECT

MOBILE HOSPITAL MANAGEMENT SYSTEM

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İstanbul, 2008

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PREFACE

First of all I would like to thank my project supervisor Prof.Dr. Ahmet Coşkun Sönmez for all his help. It was absolutely invaluable. He gave his support, help and advice to my project. He was particularly helpful and answered all technical details about the project**.**

I also thanks to my all teachers from the begining of my scholar life especially Yrd.Doç.Dr Ahmet Tevfik İnan who gives always best answer to my long questions.

And thanks for a special teacher of mine Yrd.Doç.Dr Eyyüp Gülbandılar to give me big ideas for having a good future.

I would like to thank Research Assistant Erkan Uslu for his all support for my project.

To my parents, I gratefully dedicate this thesis. Thank you for always supporting me. I think it was worth it.

And All my friends who always support me to not to stop only a moment; thanks for all.

ABSTRACT

In our fastly improving world being mobile is always become a real need to every working person. Because of this reason all the computer applications that we are using on our normal life started to become mobile. Nearly all the technology progres goes on to make humanity more mobile and mobile. The newest hardware are designed to having a mobile capability. The 3G and HSPA tecnologies can enable mobile devices to connect the internet like our personel computer. For our next 10 years this mobile technology grove up not less than 60% according to the master of Philippe Camus who is the CEO of Alcatel[1].

So that we have to know this market and start to develop our applications mobilable. Maybe you can't see this term mobilable on any dictionary, it will became a very famous word to say application which one can stabil on any mobile device.

Consequently from all sayings I developed Mobile Hospital Management System to become the hospital management more simple and less false informations. The system get the primitive visiting technich down and it will use the latest technology to get people more health.

ÖZET

Hızlı gelişen Dünyamızda mobil olmak, çalışan her insan için önemli bir ihtiyaç olmuştur. Bu yüzden normal hayatımızda kullandığımız bilgisayar programları da giderek mobil olmaya başladılar. Gününüzün neredeyse bütün teknoloji gelişmeleri insanı daha fazla mobil hale getirebilmek için çalışmaktadır. En yeni donanım çözümleri hep daha fazla mobil yeteneklere sahip özelliklerde ortaya çıkmaktadır. 3G ve HSPA gibi teknolojiler mobile araçları kişisel bilgisayarların internet yeteneklerine erişebilmesine imkan sağlamıştır. Alcatel CEO su Philippe Camus a göre gelecek 10 yıl içerisinde mobil teknolojiler %60'dan fazla gelişecektir.[1]

Bu yüzden bizler de bu piyasadan haberdar olmalı ve biz de programlarımızı mobil özelliklere sahip bir biçimde geliştirmeliyiz.

Bu söylemlere dayanarak Hastane yönetim işini daha kolay ve daha yanlışsız gerçekleyen bir Mobil Hastane Yönetim Sistemini geliştirilmiştir. Geliştirilen sistem ilkel hasta ziyaret sistemini alt edecek hasta bakımında son teknolojiyi hastanelere getirecektir.

INTRODUCTION

In our high speed improving world, everything goes on mobile. Mobile computing can improve the service you offer your customer. For example, you could use your laptop computer to give a presentation. You could then transfer PDFs of your product literature to your client's computer. Or you could connect remotely to your diary to arrange a follow-up appointment. Alternatively, you can enable doctors to pay for services or goods without having to go to the till. For example, by using a wireless payment terminal diners can pay for their meal without leaving their table.

More powerful solutions can link you directly into the office network while working off site, for instance to access your company's database or accounting systems.

This leads to great flexibility in working - for example, enabling home working, or working while travelling. Increasingly, networking "hot spots" are being provided in public areas that allow connection back to the office network or the Internet.

1.1. Information About The System

In Mobile Hospital Management System we will have 4 roles these are

Sekreter(Secretary): Sekreter can give to the system all the necessary information about a patient

Also sekreter can find an old patient’s information on the system.

Hemşire(Nurse): Hemşire role able to query the patient database with an api. Hemşire can find all the necessary information about patient an olso she can see the patient’s revisal that doktor wanted to do patinet. Hemşire can make the tetkik işlemleri that we have done or to do next time.

Doktor(Doctor): Doktor is the leader role of our management system the mobile web development made for this role all the doktor api will be mobil web. To reach all time anywhere. Doktor can find all the patient with patients’ any information. The most important part of our Project starts from here Doktor can make their own visiting job with our mobile platform. They use any kind of pocket device to reach the internet and they can insert any information on the patient’s next health information or personel information to do, or a Doktor friend call. Doktor can want Tetkik from our system for a

patient and Hemşire will see it on theirs on screen and will make the necessary tetkik to the patient.

Admin: The Administration role of our system is this but also this role has a unlimited authorization. An admin can insert any information about a patient. Admin can not make visiting and want tetkik from a patient to Hemşire.

The role Admin can only add Doktor, Hemşire, Sekreter on System and insert alotof information about them. It will enable the system authority and we can reach our all hospital employee simply.

And the others are another Personel Types. They are Bakıcı, Teknisyen, Hademe, Çamaşırcı, etc.Hospital's other required staff members.

Our System can reachable from all the Personel Digital Assistant. The relevant PDA can have all the operating system like Symbian or Windows Mobile editions. But I while I demonstrating the system I will use Windows Mobile 6.0 emulator.

Figure 1.1 The figure of the mobile operating system

1.2. Current System Structure

There isn't any information system used in this wholesale shop . For routine works, one computer is being used. And it is serve for doctor by phone calling .There is no web face for doctors, the doctors knows the patient and their information by a paper based not very useful sheets.

1.3. Current System Problems

In the traditional business flow, there exist several defects and inconveniences.

- Lots of paper used

  In the old way, the hospital must be print patient catalog and delivery them to doctors It has high cost for print and delivery

- Difficult to follow whom takes the patient information for a particular doctor

Due to the restriction of the old system, the secretary have difficulties to trace which doctor wants to control which patient. It was written on paper and it could be very complicated to classified them for doctors .

- Ease of losing papers or late, wrong delivery of patient information

As the paper ordering is not very reliable, it may happens sometimes that info is lost or late delivery.

- In hospital everything must be more and more true information

Only a small mistake can cause a real life so the system must work so assurance.
In old system there may be a lot of mistake and cause big problems. For example we always heard about wrongly made surgery operations. The information System must be the highest important currency for any of hospital.

The Health Sector Growing with the pover of Technology and the Computerized Software is the main part of the all medical treatment.
Our system get the latest technology software to hospitals. It is easy to use. Because it is web based application. Anybody who can reach the internet can manage our system correctly.

2. INSPECTION OF SYSTEM FEASIBILITY

The system feasibility can be explained in two distinct sections;

- Technical Feasibility,
- Economical Feasibility

2.1. Technical Feasibility

Mobile Hospital Management System' is a system that depends on both mobile and data base technologies, so we need at least one mobile devices and also a PC(Personel Computer), which will act as a central database server .

We can examine technical feasibility under the five different subsections:

- Software used in PC and PDA,
- Minimum Hardware Requirements for PC and PDA,
- The Communication Technologies,
- Comparing the methods to communicate server and PDA,
- Human Resource And Time Management

2.1.1. Software Used In PC And PDA

Choosing a programming language depends to the scope of the application. While small applications are often created using only one language, it is not uncommon to develop large applications using multiple languages. We must first inspect available development tools then decide the appropriate one to develop our application. The following sections will help us choose the right programming language for our application

2.1.1.1. Microsoft Visual Studio .Net

Visual Studio .NET is a superb, next-generation development tool. At its heart is the .NET Framework, a runtime engine and class library that enables rapid application building for both Windows and Web applications. The runtime engine handles housekeeping tasks, like memory management, while also providing fine-grained

security and version awareness. The class library reduces the code needed to build rich applications. [2]

Visual Studio .NET has two distinct form designers. Windows Forms are for traditional Windows applications, but managed by the common runtime. Web Forms are ASP (Active Server Pages). NET pages, which means they run on Web servers and work over the Internet. Microsoft has made designing and coding Windows Forms and Web Forms as similar as possible so that both types of applications can share components and much of the complexity of coding Web applications is kept hidden. Another key feature is Web services, which lets developers create an XML-Extensible Markup Language interface for an application so that it can be called across the Web or from any platform or language. XML support generally is strong, with a range of classes for parsing and transforming XML data. There is also a visual designer for XML Schema.

There are a few points against Visual Studio .NET. One is that, like earlier versions, it only creates applications that run on Windows. Web applications are a partial exception, in that they support cross-platform clients, but deployment requires a Windows Web server. Another factor is that, with its multiple compilers and mountains of documentation, Visual Studio .NET eats up gigabytes of disk space, and the IDE tends to be slow with less than around 384 MB RAM. Serious developers will take this in stride, but casual users could have difficulty. Fortunately, the applications created have more modest system requirements, although Windows 95 is not supported. Finally, developers coming from earlier editions face a lot of learning due to radical changes in both Visual Basic and ASP.

Features of Microsoft Visual Studio .Net:

Rapidly build next generation Internet applications,

Single, unified, fully customizable environment,

Intuitive tools for working with XML and XSD (XML Schema Definition) files,

Remote debugging,

Statement completion and syntax notification for HTML (Hyper Text Markup Language) and XML tags

2.1.1.2. Java Technologies

The Java platform is the ideal platform for network computing. Running across all platforms from servers to cell phones to smart cards Java technology unifies business infrastructure to create a seamless, secure, networked platform for your business. [3]

The Java platform benefits from a massive community of developers and supporters that actively work on delivering Java technology-based patient and services as well as evolving the platform through an open, community-based, standards organization known as the Java Community Process program. You can find Java technology in cell phones, on laptop computers, on the Web, and even trackside at Formula One Grand Prix races

Business Benefits:

- **A richer user experience:** Whether you're using a Java technology-enabled mobile phone to play a game or to access your company's network, the Java platform provides the foundation for true mobility. The unique blend of mobility and security in Java technology makes it the ideal development and deployment vehicle for mobile and wireless solutions.
- **The ideal execution environment for Web services:** The Java and XML languages are the two most extensible and widely accepted computing languages on the planet, providing maximum reach to everyone, everywhere, every time, to every device and platform.
- **Enabling business from end to end:** Java offers a single, unifying programming model that can connect all elements of a business infrastructure.

2.1.1.3. The Comparison of Java and .NET

.NET emulators are much better than Java emulators. They are more harmonious with Pocket PCs [4]

NET interfaces are closer to user,

.NET works much better with Microsoft patient

In general Java helps to develop applications on PALMs for embedded programmers,

.NET helps to develop applications on PDAs for embedded programmers

Java is platform independent.

Because of PALMs have insufficient memory i decide to develop my application on .NET.

2.1.1.4. The Comparison of .Net Languages

The .NET Platform programming languages including Visual Basic .NET, Visual C#, Managed Extensions for C++, and many other programming languages from various vendors use .NET Framework services and features through a common set of unified classes. In most situations, we can effectively use all of the Microsoft programming languages. Nevertheless, each programming language has its relative strengths the following sections will show the features of each programming language. [5]

Visual Basic .NET

Visual Basic .NET is the next generation of the Visual Basic language from Microsoft. With Visual Basic .NET applications can be built, including Web services and ASP.NET Web applications, quickly and easily. Applications made with Visual Basic are built on the services of the common language runtime and take advantage of the .NET Framework.

Visual Basic has many new and improved features such as inheritance, interfaces, and overloading that make it a powerful object-oriented programming language. Other new language features include free threading and structured exception handling. Visual Basic fully integrates the .NET Framework and the common language runtime, which together provide language interoperability, garbage collection, enhanced security, and improved versioning support.

Visual C# .NET

Visual C# is designed to be a fast and easy way to create .NET applications, including Web services and ASP.NET Web applications. Applications written in Visual C# are built on the services of the common language runtime and take full advantage of the .NET Framework.

C# is a simple, elegant, type-safe, object-oriented language recently developed by Microsoft for building a wide range of applications. Anyone familiar with C and similar languages will find few problems in adapting to C#. C# is designed to bring rapid development to the C++ programmer without sacrificing the power and control that are a hallmark of C and C++. Because of this heritage, C# has a high degree of fidelity with C and C++, and developers familiar with these languages can quickly become productive in C#. C# provides intrinsic code trust mechanisms for a high level of security, garbage collection, and type safety. C# supports single inheritance and creates Microsoft intermediate language (MSIL) as input to native code compilers.

C# is fully integrated with the .NET Framework and the common language runtime, which together provide language interoperability, garbage collection, enhanced security, and improved versioning support. C# simplifies and modernizes some of the more complex aspects of C and C++, notably namespaces, classes, enumerations, overloading, and structured exception handling. C# also eliminates C and C++ features such as macros, multiple inheritance, and virtual base classes. For current C++ developers, C# provides a powerful, high-productivity language alternative.

So we will use C# programming language while developing our project.

2.1.1.5. Pocket PC and Windows CE

Windows CE is the name of operating system of Pocket PC and developed by Microsoft Corporation. The newest version is called Pocket Windows 2003. In additional,

Windows CE is an open, scalable, 32-bit operating system that is designed to meet the needs of intelligent devices

2.1.1.6. The Comparison of Pocket PC 2002 And Pocket PC 2003 Operating Systems

Microsoft recently announced Windows Mobile™, a new global brand for Microsoft software for mobile devices such as Pocket PCs and Smartphones. The launch of

Windows Mobile software extends the Windows brand to the Pocket PC and Smartphone mobile device categories. The new Windows Mobile brand also helps doctors more readily understand the consistent user experience they can expect from the software inside Pocket PCs and Smartphones.
The new branding also reflects Microsoft's commitment to the mobile space in bringing its mobile device software into the Windows brand family.

Pocket PC 2002 was introduced in 2001. It's fairly similar to the original Pocket PC operating system, but the user interface and networking capabilities were significantly improved.
Generally, Pocket PC 2002 units physically differ from their Pocket PC for bearers in 2 ways: they have more built-in memory for storage, and faster processors.

The effort being made to manage the memory in the Pocket PC 2002 is improved so you really don't have to pay much attention to the applications that are running in the background. Also, Microsoft added the ability to update the Pocket PC 2002's flash ROM selectively so you can get fixes and features added without having to wait for Service Pack 1. This feature is cool since it allows users to select whether or not to update their applications and it does not take up more RAM to hold the patches like the original Pocket PC Service Pack 1 did. Overall the systems that run Pocket PC 2002 appear to operate at about the same speed as the original Pocket PCs did so the users won't notice a difference in performance.
Pocket PC 2003 (Windows Mobile 2003) was introduced June 2003 and it's the newest version. It's fairly similar to the original Pocket PC 2002 operating system, but it has numerous bug fixes, a more capable version of Pocket Internet Explorer that supports many current browser standards, improved networking capabilities and support has been added for XScale optimized 3rd party applications. It's built in the Windows CE 4.2 core, while older versions are built on Windows CE 3.0.

Windows Mobile 2003 software for Pocket PC enables industry leading innovative mobile computing devices by optimizing the user interface, applications and corresponding feature sets around mobile personal information management and

connectivity scenarios. By standardizing core hardware requirements and providing a consistent set of programming APIs, Windows Mobile 2003 provides a consistent application development environment across devices. This consistency allows the external development community to build applications that effectively target a single doctor base. The Software Development Kit (SDK) for Windows Mobile 2003-based Pocket PCs and emulation environment further empower the broad-based Windows developer community to create third-party applications for the Windows Mobile Pocket PC, further increasing its attractiveness as a platform to the developer community.

2.1.1.7. MS SQL And SQL CE

Microsoft® SQL Server™ 2000 Windows® CE Edition (SQL Server CE) extends a subset of the database programming functionality of Microsoft SQL Server to Microsoft Windows CE-based devices. You can create, access, and modify SQL Server databases programmatically in these devices using the SQL Server CE database engine. [6]

The Microsoft® SQL Server™ 2000 Windows® CE Edition (SQL Server CE) database engine provides the following features for accessing SQL Server CE databases:

Parameterized queries: Create queries with parameters and use these queries many times. The parameters are placeholders for values supplied run time.

Intrinsic functions: Use mathematical, string, and system functions in your queries to perform operations and return scalar values.

UNION operator: Obtain a single result set from a combination of two or more SELECT statements.

SQL Server CE Query Analyzer: Use the SQL syntax in the SQL Server CE Query Analyzer to access and modify databases.

As a result, we could give the development time software requirements in Table 2.2.

Table 2.1 Minimum Software Requirements

PC Side	PDA Side
MS Visual Studio .NET 2003 Final Version	Pocket PC 2002
MS SQL Server 2002	MS SQL Server CE 2.0
MS Windows XP Professional	Windows CE Pocket PC 2002 or above

2.1.2. Hardware Requirements In PC Side And PDA Side

Pocket PC The Pocket PCs are the palm-sized computers embedded with Microsoft Windows CE Operating System. They use microprocessor with similar performance as Pentium II. Also, they always use ROM (Read Only Memory) and RAM (Random Access Memory) as their major storage. Some of them may also support external flash memory, like Compact Flash card. [7]

ROM in Pocket PCs is used for storing the operating system and RAM is used to store user program and data. Due to the volatility of RAM, Pocket PCs can't be powered off. The Central Processing Unit (CPU) and RAM of Pocket PCs are continuously consuming energy. If the Pocket PCs run out of battery, all the program and data in RAM will disappear.

Pocket PC versus Notebook/Handheld PC Many differences exits between Pocket PCs and notebook computers. They use different operating systems and storage devices. Windows CE is the default operating system uses in Pocket PC. However, Notebooks computer can install many different operating systems, like Microsoft Windows and Linux, except Windows CE. Moreover, RAM in Pocket PCs is mainly used for storing user programs and data. However, user programs and data in Notebooks are stored in magnetic storage devices, like hard disk.

Furthermore, Pocket PCs always use handwriting on graffiti and touch screen as input device. Notebooks use keyboard and tablet to input. The other difference is like vertical /horizontal display, CPU architecture, performance, size, weight etc.

Pocket PC versus Palm Unlike Pocket PCs and Notebook, Pocket PCs and Palms are quite similar. They are also small and light. They also use horizontal display. They use the similar input and storage device. However, there are still some differences between them. First of all, they use different operating system. Pocket PC use Windows CE but Palms use PalmOS. Also, the prices of Pocket PCs are higher then Palms. This is because their CPU architecture is different. The speed of CPU of Pocket PC (average 200 MHz) is much higher than Palms (average 66-100 MHz). Beside, Pocket PCs have a higher degree of integration with Desktop Windows.

PC For Server Application The minimum hardware requirements for Microsoft Visual Studio .NET Professional is given below.
Pentium II 450 MHz or faster processor
Microsoft Windows NT 4.0, 2000, or XP
64 MB RAM for NT 4.0; 96 MB for 2000; 192 MB for 2005 Server; 160 MB for XP Professional
2,500 MB hard disk space (minimum of 500 MB on the system drive)
CD-ROM drive
SVGA, 256-color display
Mouse
As a result, we could give the hardware requirements for PC and PDA in Table 2.3

Table 2.2 Minimum Hardware Requirements

PC Site	PDA Site
Pentium III-800 Mhz CPU	206 Mhz Intel 32 Bit
160 MB RAM (.NET Framework Requires	64 MB RAM
Graphic Card 8 MB AGP	16 MB ROM
20 GB HDD	Desktop Synchronization Kit for PDA

2.1.3. The Communication Technologies Methods

3G

3G is the third generation of mobile phone standards and technology, superseding 2.5G. It is based on the International Telecommunication Union (ITU) family of standards under the IMT-2000[9].

3G networks enable network operators to offer users a wider range of more advanced services while achieving greater network capacity through improved spectral efficiency. Services include wide-area wireless voice telephony, video calls, and broadband wireless data, all in a mobile environment. Additional features also include HSPA data transmission capabilities able to deliver speeds up to 14.4Mbit/s on the downlink and 5.8Mbit/s on the uplink.

Unlike IEEE 802.11 (common names Wi-Fi or WLAN) networks, 3G networks are wide area cellular telephone networks which evolved to incorporate high-speed internet access and video telephony. IEEE 802.11 networks are short range, high-bandwidth networks primarily developed for data.

3G technologies enable network operators to offer users a wider range of more advanced services while achieving greater network capacity through improved spectral efficiency.

High-Speed Downlink Packet Access (HSDPA)

is a 3G (third generation) mobile telephony communications protocol in the High-Speed Packet Access (HSPA) family, which allows networks based on Universal Mobile Telecommunications System (UMTS) to have higher data transfer speeds and capacity. Current HSDPA deployments support down-link speeds of 1.8, 3.6, 7.2 and 14.4 Mbit/s. Further speed increases are available with HSPA+, which provides speeds of up to 42 Mbit/s downlink.[9]

The High-Speed Downlink Shared Channel (HS-DSCH) lacks two basic features of other W-CDMA channels — variable spreading factor and fast power control. Instead, it delivers the improved downlink performance using adaptive modulation and coding (AMC), fast packet scheduling at the base station, and fast retransmissions from the base station, known as hybrid automatic repeat-request (HARQ).

Wi-Fi

is the trade name for the popular wireless technology used in home networks, mobile phones, video games and other electronic devices that require some form of wireless networking capability. In particular, it covers the various IEEE 802.11 technologies (including 802.11n, 802.11b, 802.11g, and 802.11a).

Wi-Fi technologies are supported by nearly every modern personal computer operating system, most advanced game consoles and laptops, and many printers and other peripherals.

The purpose of Wi-Fi is to provide wireless access to digital content. This content may include applications, audio and visual media, Internet connectivity, or other data. Wi-Fi generally makes access to information easier, as it can eliminate some of the physical restraints of wiring; this can be especially true for mobile devices.

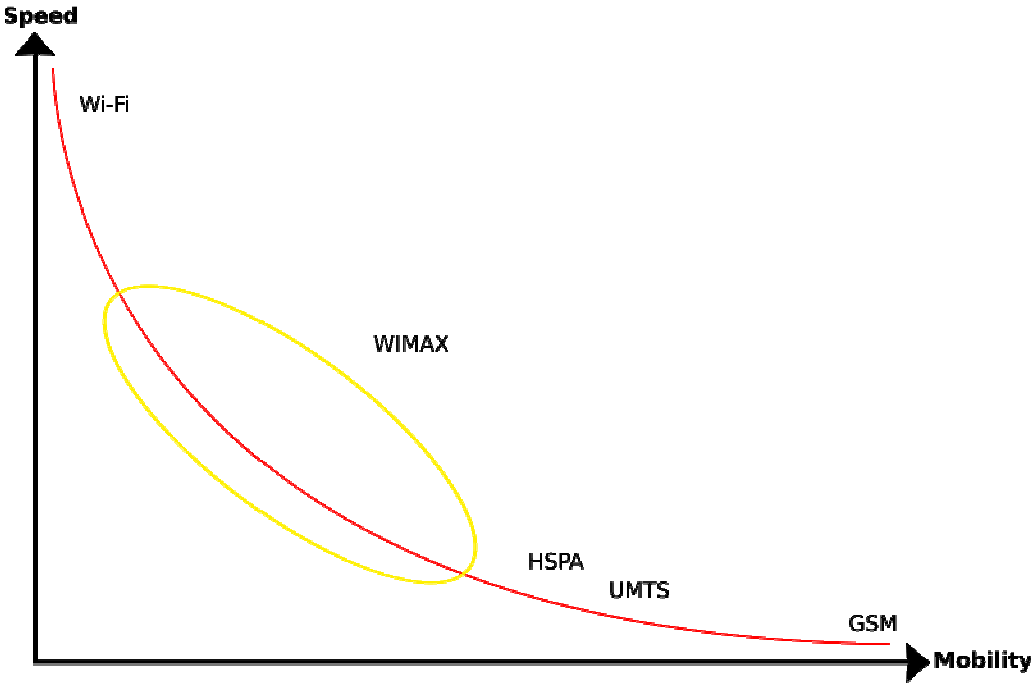


Figure2.1: The Speed &Mobility specialty of mobile networks

Table2.3: 3G vs Wifi

	3G	**Wi-Fi**
Generic Performance	Low data rate, wide coverage	High data rate, point coverage
Standards	Internationally sanctioned by service providers and standards organizations: 3GPP and 3GPP2	Evolution with Internet industry standards organization: IEEE 802 LAN/MAN Standards Committee
Spectrum (GHz)	Generic coverage includes 1.885–2.025 GHz and 2.110–2.2 GHz Europe's Universal Mobile Telecommunications System: 900–2025 MHz and 2110–2200 MHz 1710–1755 and 2110–2170 to be made available in the United States in 2006	*802.11a* 5.15–5.25 (USA UNII lower band) 5.25–5.35 (USA UNII middle band) 5.470–5.725* (USA/Europe) 5.725–5.825 (USA UNII upper band) *802.11b* 2.401–2.473 1000 mW/MHz (North America) 2.401–2.473 100 mW/MHz (Europe) 2.483 10 mW/MHz (Japan)
Access	DSSS/CDMA multiple channel configurations available	802.11b DSSS 4 channels @ 80 Mhz in the United States 802.11g OFDM 802.11a OFDM 12 channels @ 300 Mhz in the United States
Spectrum Model	Exclusive spectrum rights model gives the licensee the rights to the spectrum within a defined geographic area and then that licensee manages that spectrum for its optimal use, transferring the right to use it if that is appropriate	Common spectrum model allows unlimited numbers of unlicensed users to share the spectrum where usage is governed by technical standards or protocols; wireless applications demonstrate this concept: wireless LANs, Bluetooth devices, etc
	Licensed 120 MHz (US), cost: millions of US dollars	Unlicensed 383.5 MHz (US), cost: free
	Centralized allocation and control of resources permits allocation of scarce resources to mange congestion and maintain quality	Sharing spectrum may challenge quality and prevent delay sensitive services, limited mobility management/roaming capability
Interference	Protected from interference	There is no right to protection from interference; cordless phones and microwave ovens all share the same frequencies.
Applications	Technologies geared toward consumer voice and data	Technologies geared toward data in the enterprise

* Subject to use of dynamic frequency selection (DFS) and transmit power control (TPC). Not yet approved for use in the United States.

Web Services

Web Service is a way for objects or components on a server to accept incoming requests from clients using standard Internet protocols, such as HTTP or SMTP. Creating a Web service is very easy with Microsoft® Visual Studio® .NET. You create a Web page, add a few functions, and mark those functions that you want to expose with special attributes to make them available for a Web client. [8]

A Web service uses Extensible Markup Language (XML) as its data or message format. An XML schema is used to define the data types in the XML document. A Web service uses SOAP, which is a lightweight communication protocol to transport messages. It uses HTTP or SMTP for the transport and XML for its message format. SOAP stands for the Simple Object Access Protocol. A Web service uses WSDL, which is for Web Service Description Language, to define and describe the format of its message.

When you develop Web Services in Visual Studio® .NET, the tool encourages you to use the ASP.NET plumbing a certain way. Specifically, it prompts you to implement a service as a class that exposes a set of methods marked with the [WebMethod] attribute, auto-generate a corresponding Web Services Description Language (WSDL) description and client proxy code, and then implement a client.

2.1.4. The Comparison Of Methods To Communicate Server And PDA

Today's business environment now requires flexibility. An increasing number of employees are using high-end laptops as their core workstation. This allows them the flexibility and mobility to work across geographic and physical boundaries.

A large amount of productivity now occurs away from their desks. In this type of environment, a Wireless Local Area Network (WLAN) would be particularly useful by allowing the worker to access the LANs resources without the physical constraints of finding an available network drop.

2.1.5. Human Resource And Time Management

Employees work on four different sections in development time. Employees and development times of these sections can be examine in Table 2.4.

Table 2.4 Gantt Diagram

Number	Task	Start	End	Duration	Q4 - 2008		
					October	November	December
1	Subject Investigation	10/1/2008	10/8/2008	5			
2	Getting more information on Sublect	10/6/2008	10/18/2008	10			
3	Project Suggestion& Acceptance Duration	10/8/2008	10/10/2008	2			
4	Feasibility Working	10/10/2008	11/15/2008	26			
5	Prerequsest Preparation	11/12/2008	11/18/2008	4			
6	PreProjection	11/18/2008	11/21/2008	3			
7	Detailed Projection	11/21/2008	12/25/2008	24			
8	Coding the System	11/21/2008	12/28/2008	26			
9	Testing	12/25/2008	12/29/2008	2			
10	Reporting	12/24/2008	1/1/2009	5			

2.2. Economical Feasibility

Economical feasibility can be inspected in three distinct sections,

Software Cost,

Hardware Cost,

Cost of all salaries of programmers

2.2.1. Software Cost

Table 2.5. The Price examples of MS Sql Server

Processor Licence			Server plus Client Licence(CAL)	
	Retail Price	Example Price	Retail Price	Example Price
Express Editon	Free	Free	Free	Free
WorkGroupEdition	3.899$	3700$	739$(5CAL)	730$(5CAL+146 $)
Standart Edition	5.939$	5.737$	1.849$(5CAL)	Server Price 885$ 162$ CAL
Enterprice Edition	24.939$	23.911$	13.969$(25CAL)	ServerPrice 8437$ +162$

For this application i choosed the Workgroup Edition with 2 CAL so the database mnagement system cost is 2200$

Table 2.6 The Software Cost Of PDA And Desktop PC

Software Cost	
Microsoft Windows XP Professional	$60
MS SQL Server 2005 [10]	Free
Microsoft Visual Studio .NET [11]	Free
Total Software Cost	$60

2.2.2. Hardware Cost

Table 2.7 The Hardware Cost Of PDA

PDA	
Memory	64 MB RAM, 32 MB ROM
Screen Type	3.5" colored TFT LCD display
Color	65536
Resolution	240*320
Processor	206 Mhz Intel Strong Arm 32 Bit
Operating System	Microsoft Pocket PC 2005
Keyboard	Screen Keyboard
Web Browser	Yes
USB Port, Infrared	Yes
PC Cable	Yes
Total Cost Of PDA	300 $

Table 2.8 The Hardware Cost Of Desktop PC

Desktop PC		
Processor	P4 3.00 Ghz Box	250$
Memory	1GB DDR-400	50$
Disk Space	Seagate 120 GB 7200 Rpm Barracuda	116$
Mouse	Microsoft Value Pack Optical PS/2	25$
Graphic Card	128 MB GeForfe	120$
Fax-Modem	56K Apache PCI BOX-Quake	45$
Monitor	17" LG 700S	150$
Total Cost Of PC		798 $
Total Hardware Cost		1096$

2.2.3. Cost Of All Salaries Of Employees

Table 2.9 The Cost Of All Salaries Of Employees

Salaries	
System Analyzer	$1000
PDA Based Programmer	$2500
Tester	$300
Web Based Programmer	$3000
Total Cost	$6800

The overall cost of the system is shown in Table 2.10

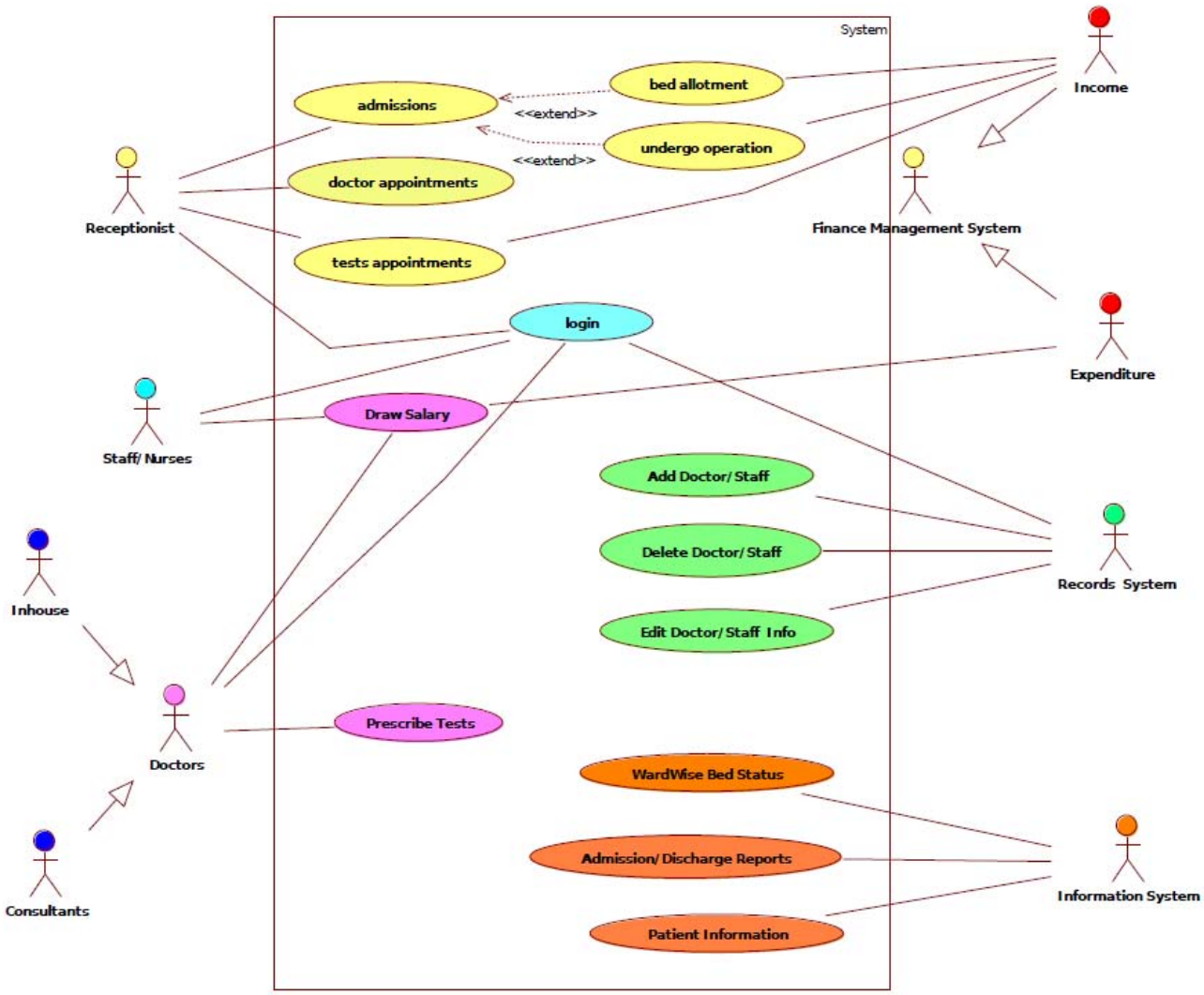
Table 2.10 The Overall Cost Of The System

Costs		
Hardware Cost	PDA	$300
	Desktop PC	$798
Software Cost	PDA	$3339
	Desktop PC	
Employees Cost		$6800
The Overall Cost		$14576

3. CREATING THE SOLUTION

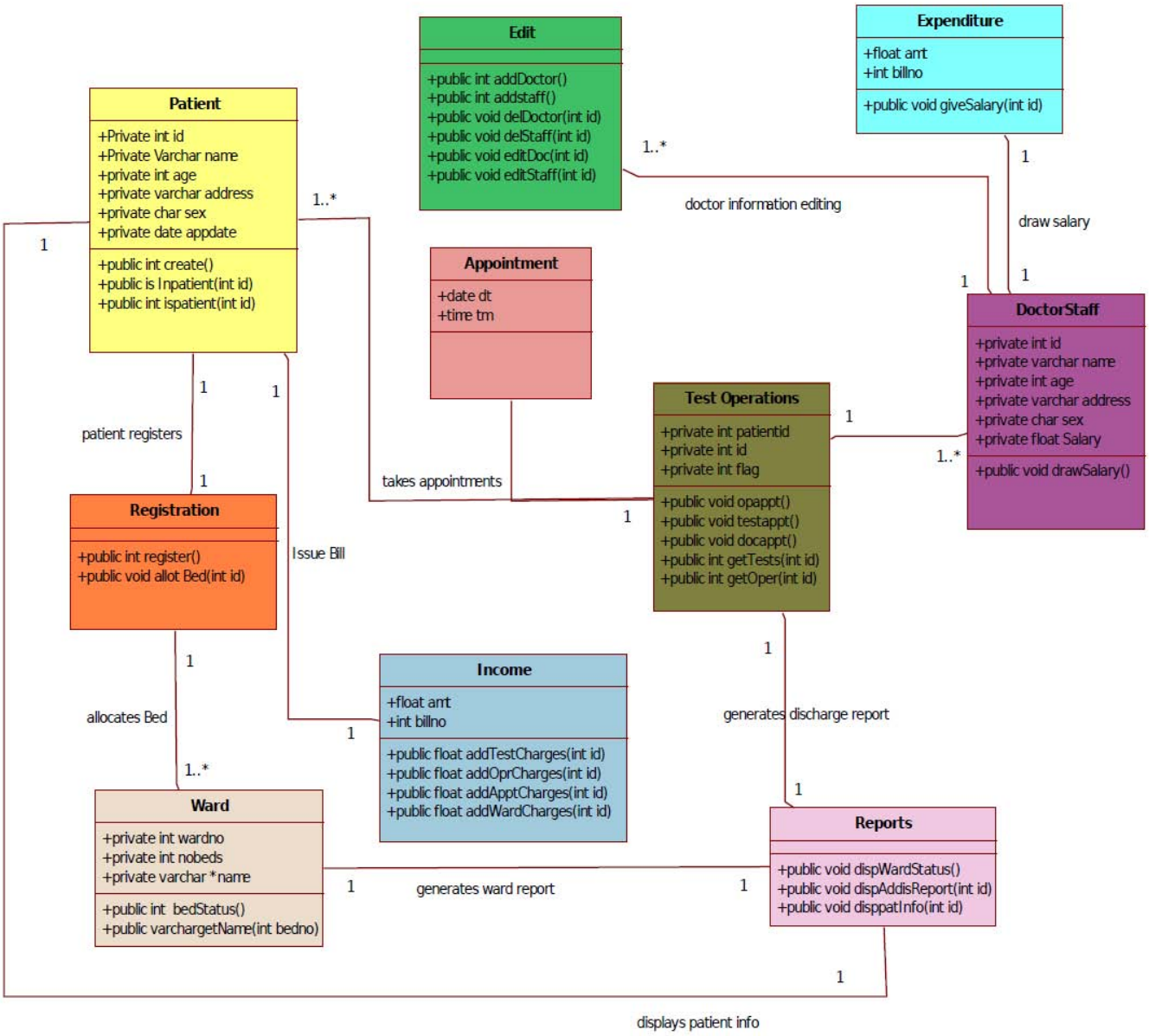
UML Diagrams

- USECASE DIAGRAM:



This diagram shows us the roles of our system and also it gives us what is the authority of each of them. In our Management System if it will continue to develop it will has all of this capabilities in this diagram you can see the finance management sytem but in this final projecting there is not a finacial management system it requires to contact a real word hospital financial analyst. But the first goal of our Project is taking the patient more fluent and required information to our system.

- CLASS DIAGRAM:

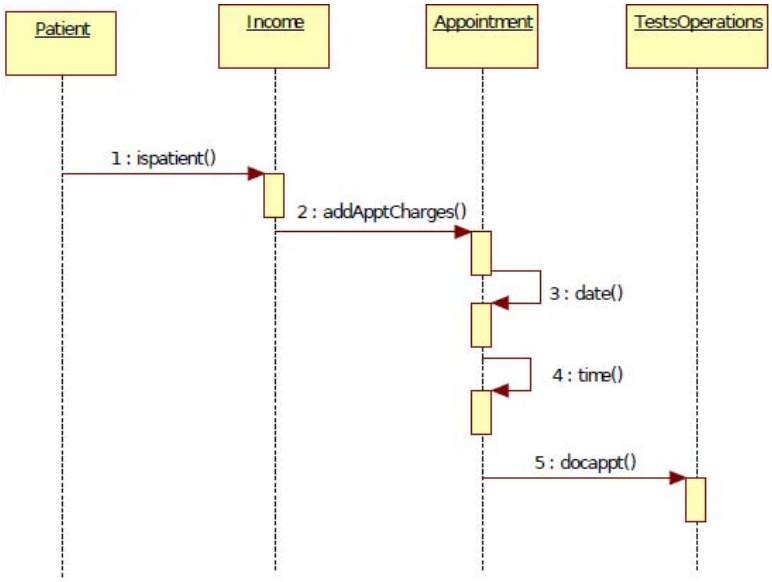


All the prosedure about our mobile management system is shown in this class diagram. Project based on this class diagram but not all the classes have created.

- SEQUENCE DIAGRAMS

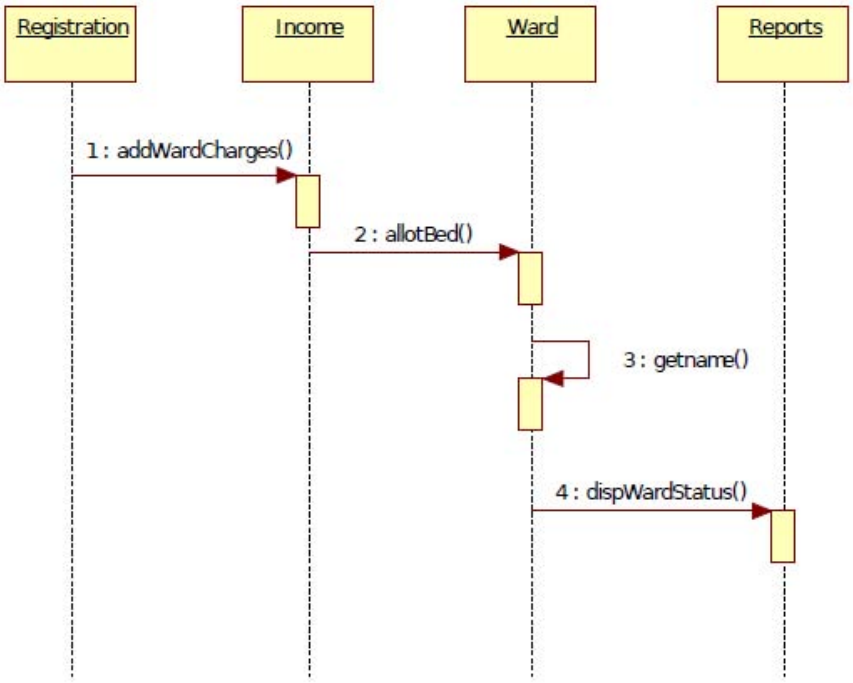
  The Sequence Diagrams shows us how the system is working on net. All the roles how to contact and how to make its mission.

1. DOCTOR APPOINTMENTS:



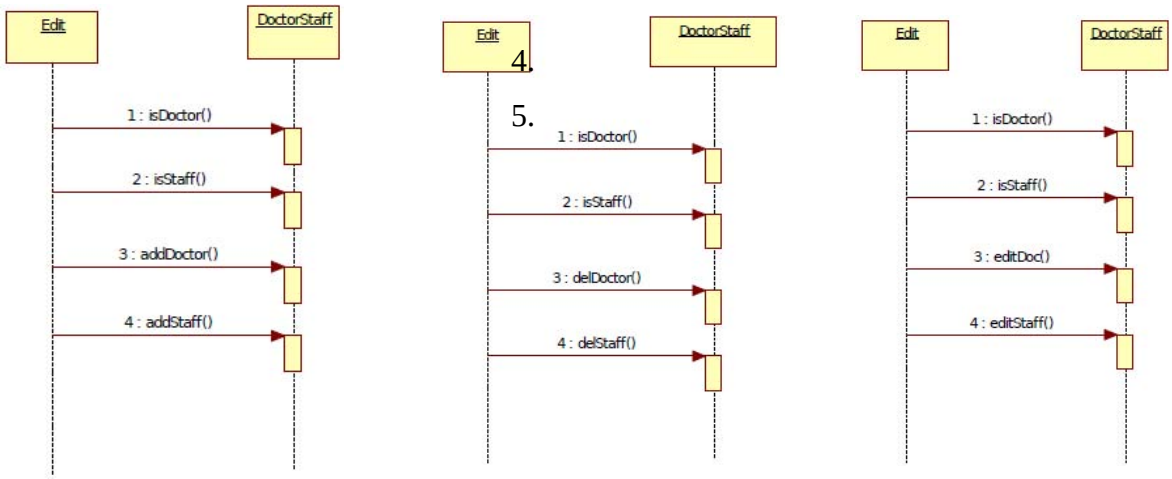
In this diagram you can see how the role of us Doktor appoint the patient income and make its possible operations.

2. BED ALLOTMENT:



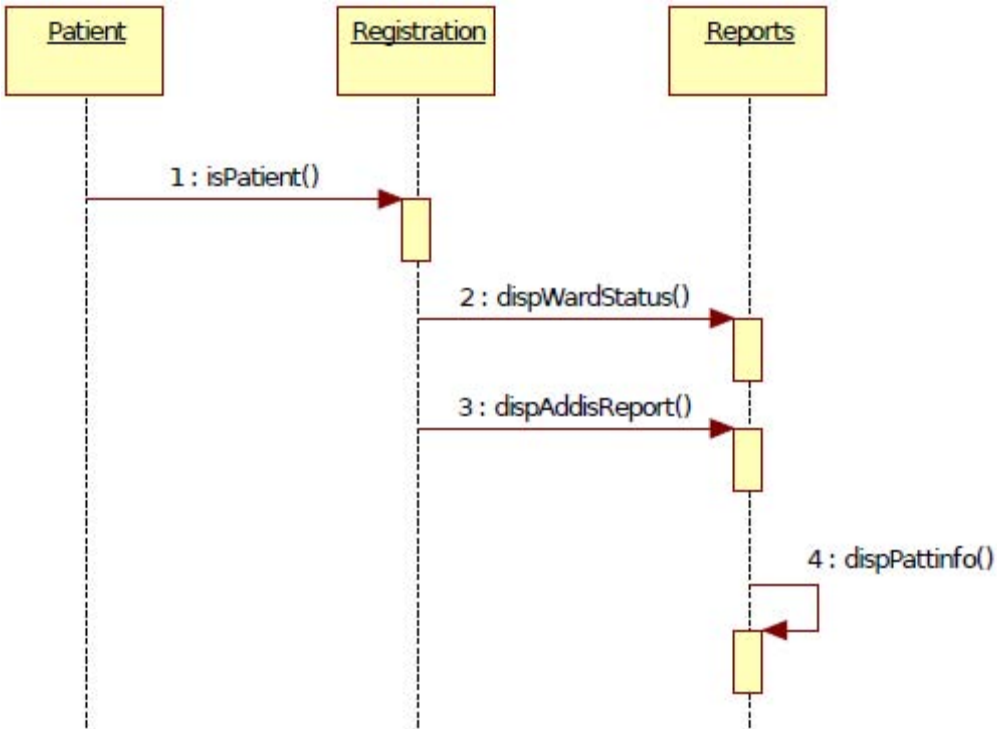
In this diagram you can see the allotment of bed registration how and how to make our Yataklı hasta changes.

3. ADD DELETE EDIT DOCTOR/STAFF:



This diagrams shows us deleting inserting and updating all the staff I don't give all the types of management system

4. PATIENT INFORMATION:



This diagram shows how to registration patient information to the system.
In this protection we can manage the system durability. In system the control mechanism of the protection of repetition is to controlling the recorded data in database with the unique key TCKimlik.

4. SYSTEM DESIGN

The Structure of our System will explain in this section.

4.1. The Structure Of Database

In this section we will examine the database system. In Mobile Hospital Management System I used a big database which is required to save all the information about patient. Our data tables has the most optimum data fields. They made for not to repeat unnecessary data field on database. For example the Adres table made for this. All the staff and the every kind of patient (yataklı and yataksız type). It got with an unique adres_id and find it after that you can do all updates, inserts, deleting whatever you want to do.

The database has special properties. It can be manage by a simple mobile device or a compact PC we develop it to have ability of this. Having this ability maden by using SQL server CE edition with Linq technology. Linq is a very up to date Query language which is simplfy the developers Works. Language Integrated Query uses DataContext to do this. My mobiledatacontext is always used for this reason.

It gives power to our database that can be reachable from all the spesific device.

The Anamnez Table is our biggest table which save the most important query information to the system. Anamnez Table can be optimized but the most optimized version used to build the project.

In Figure 4.1 you can see the database and all the field.

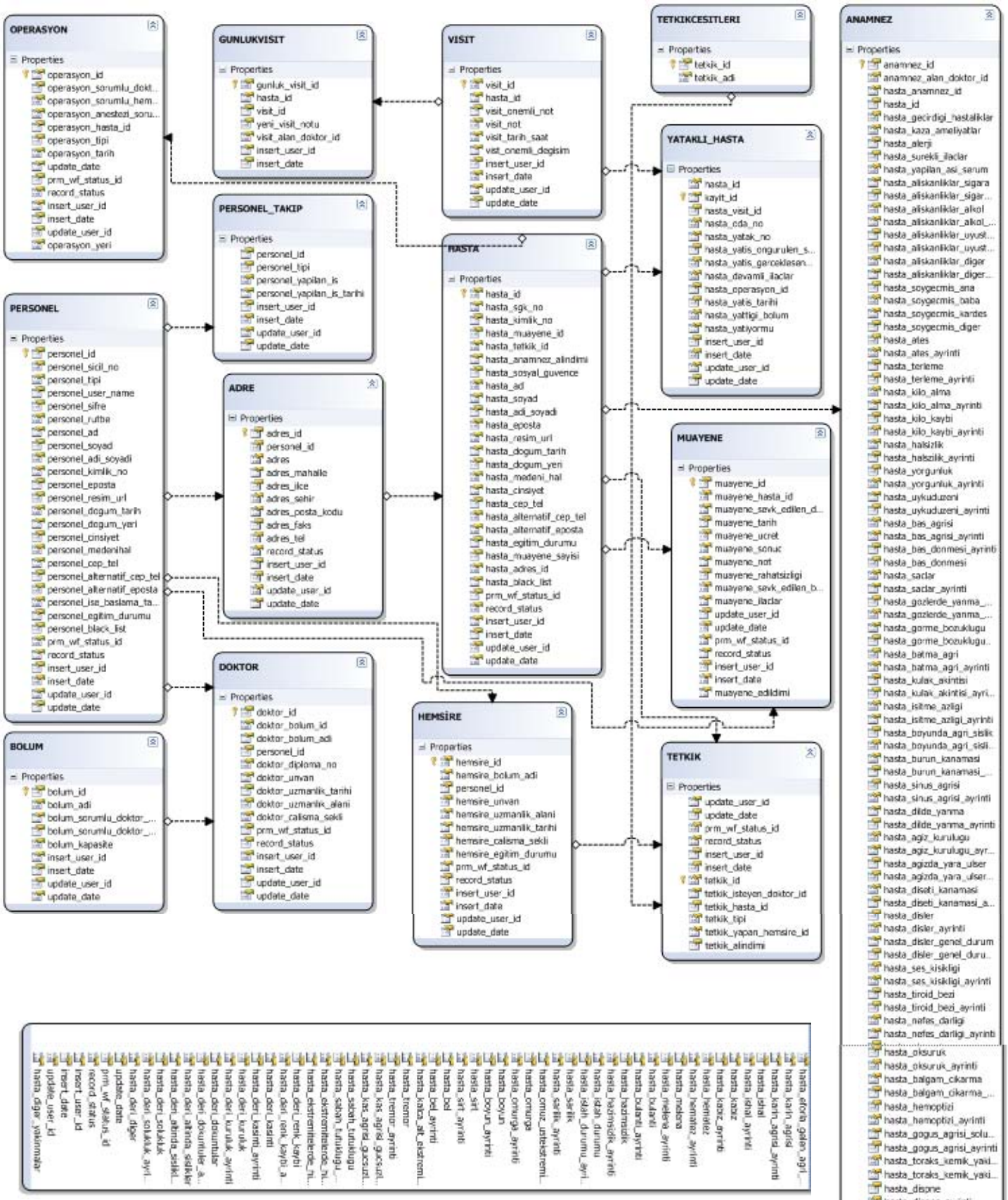


Figure 4.1 Database E-R Diagram

5 . RUN TIME VIEWS

5.1. WebSite Views

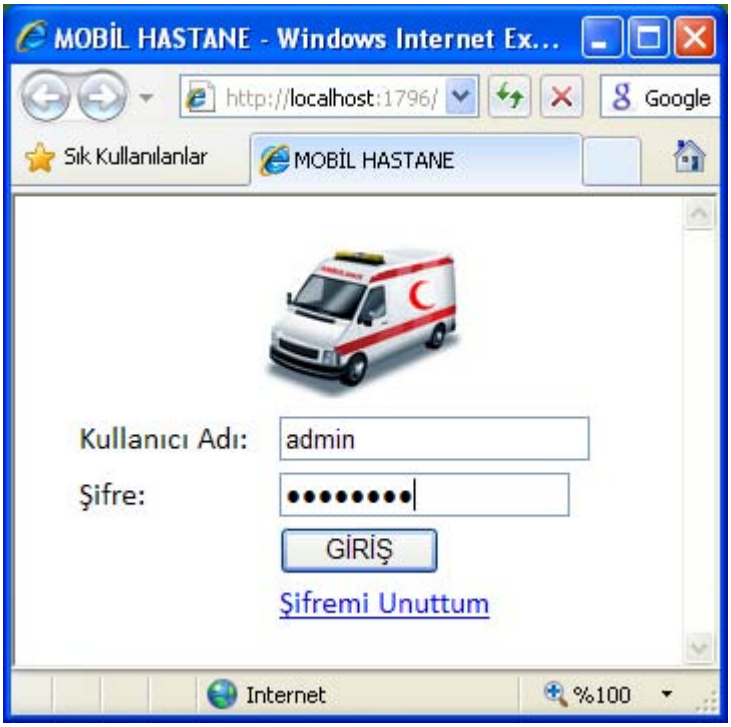


Figure 5.1 giris.aspx

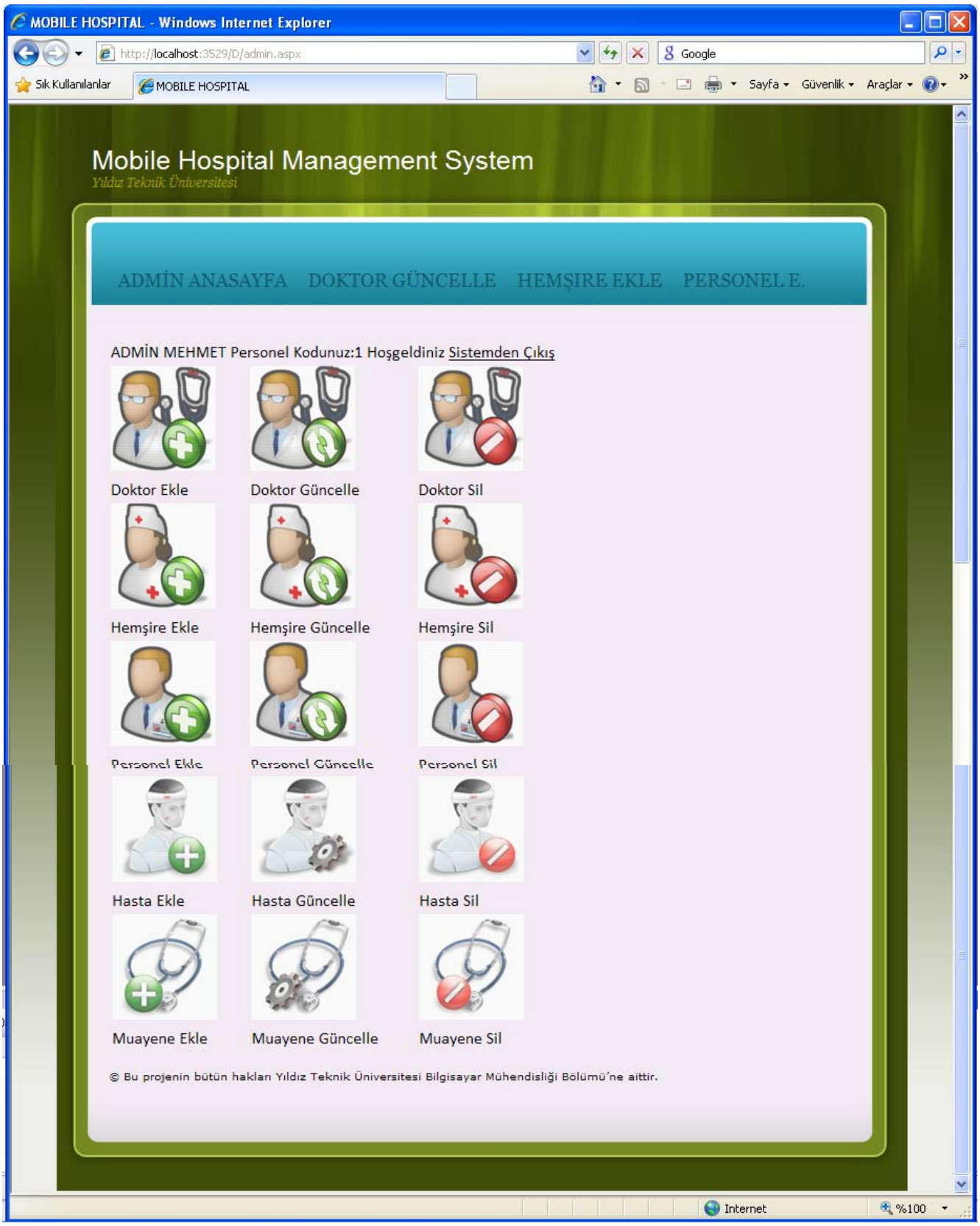


Figure 5.2 admin.aspx

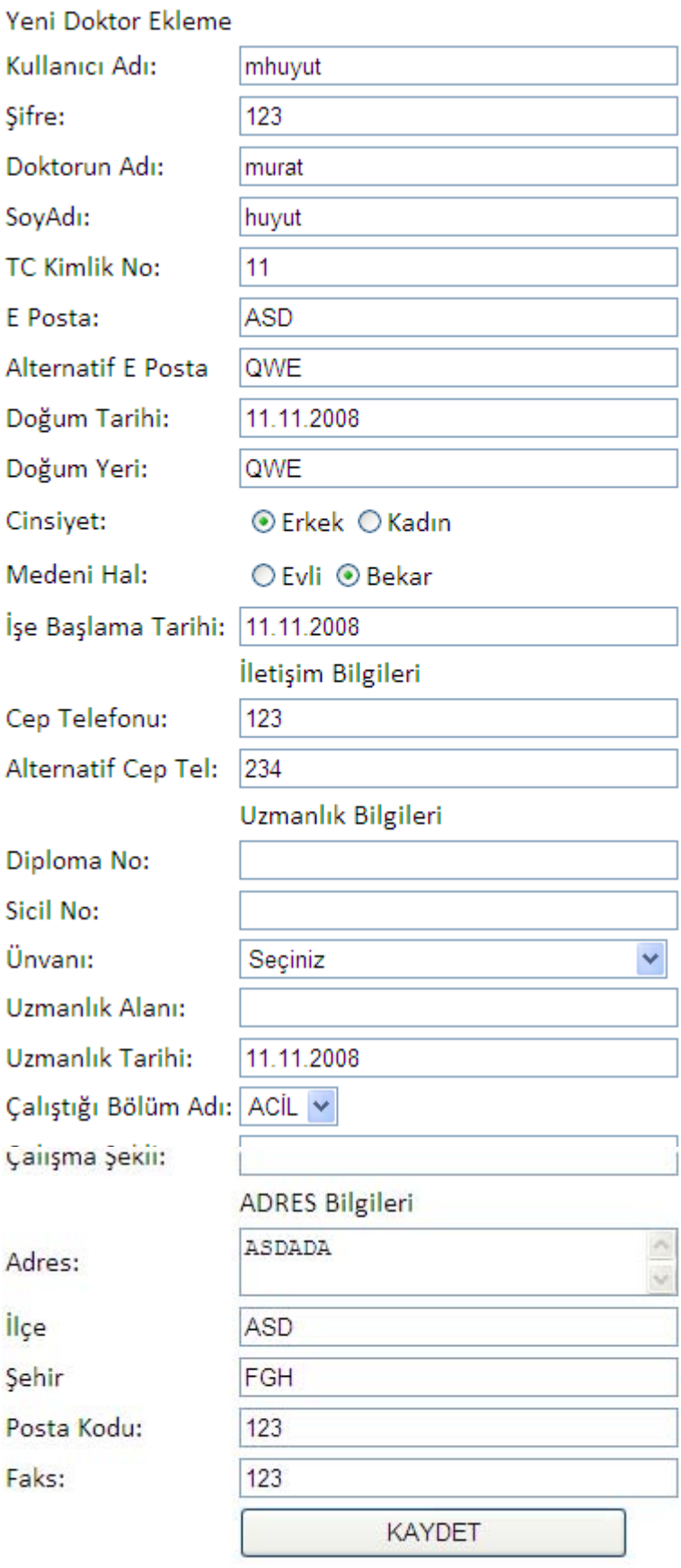


Figure 5.3 admin.aspx

New Doctor Adding Panel

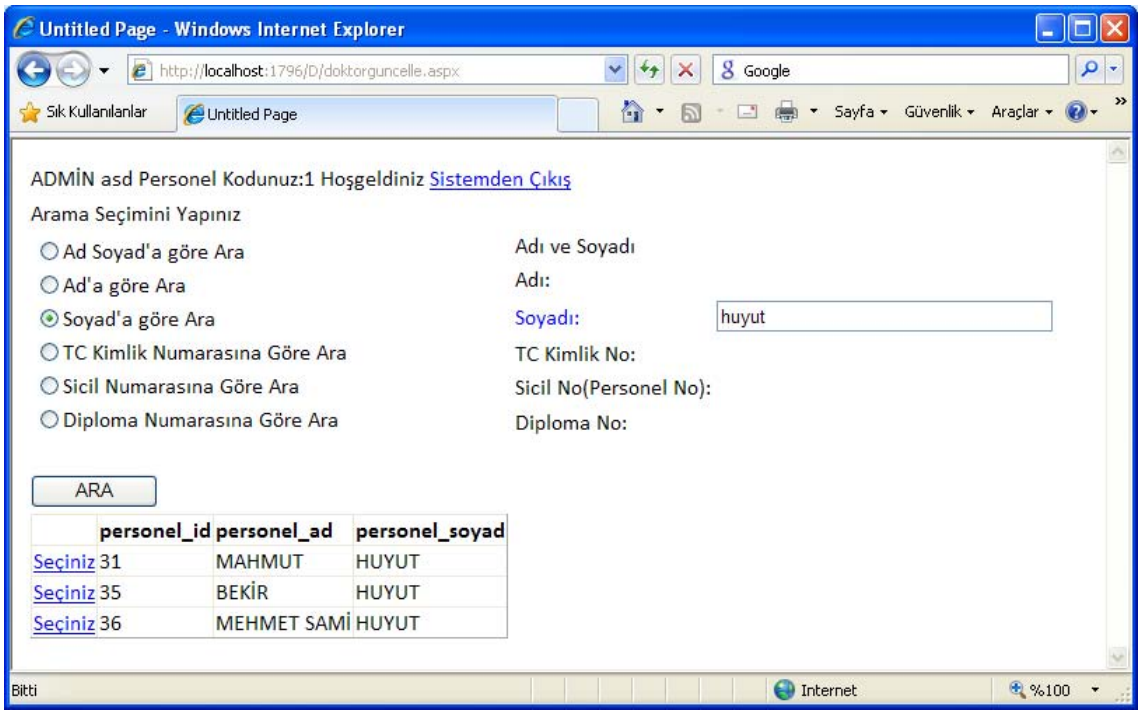


Figure 5.4 doktorguncelle.aspx

Refreshing the Selected Doctors Information

Figure 5.5 sekreter.aspx

Sekreter Can Add Patient and New Medical Exam

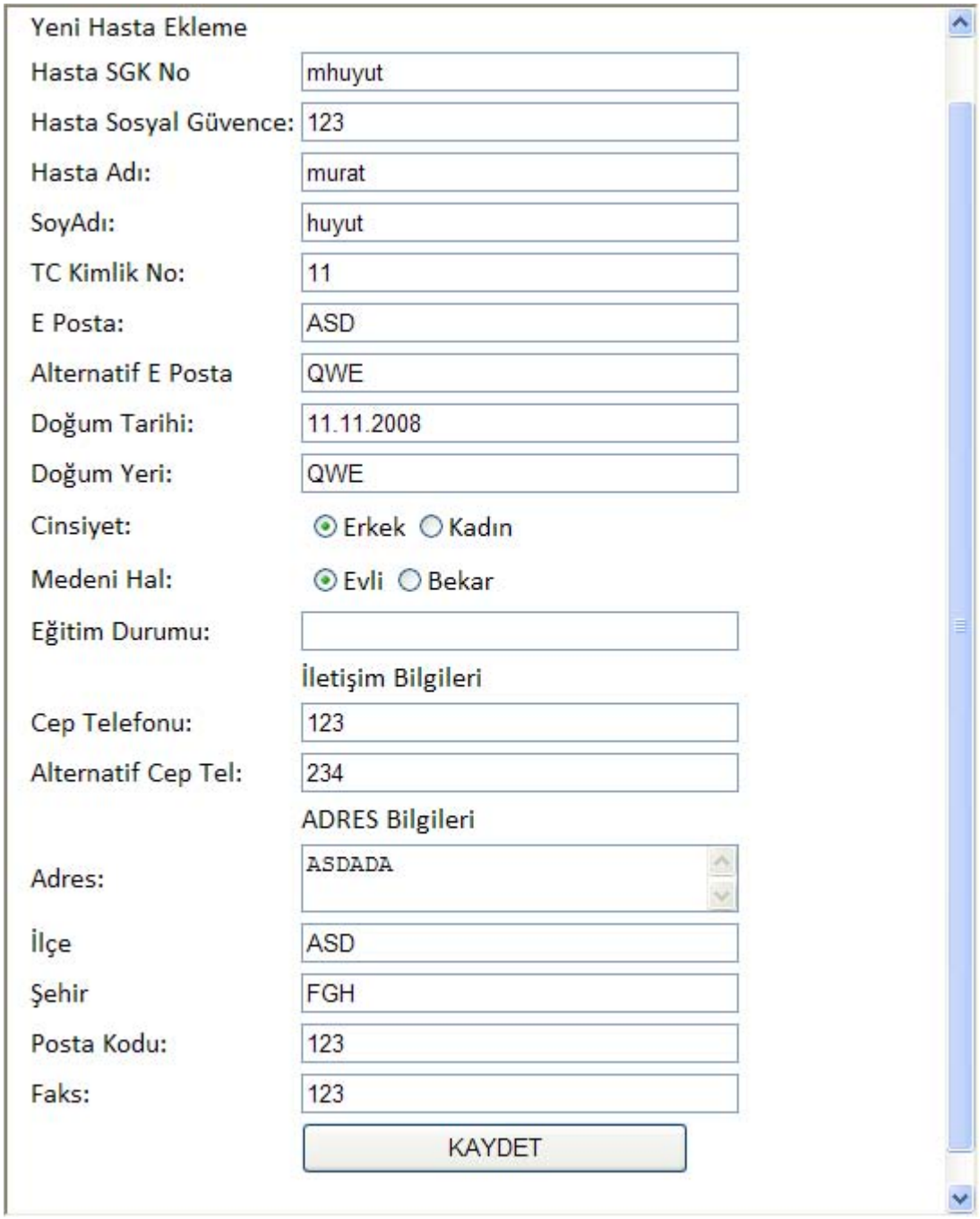


Figure 5.6 hastaekle.aspx

Adding a New Patient to the System

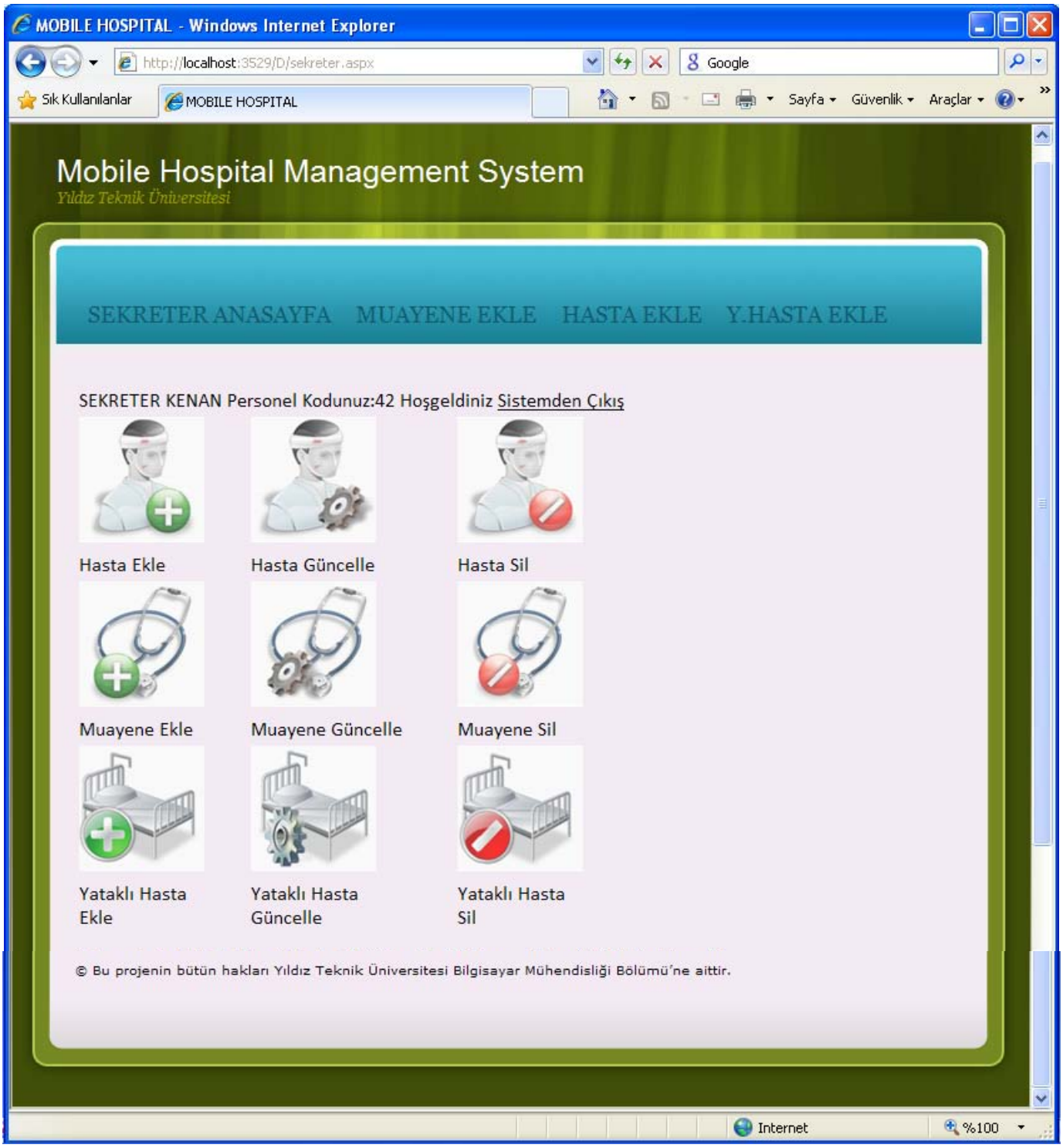


Figure 5.7 muayeneekle.aspx

Adding New Medical Exam

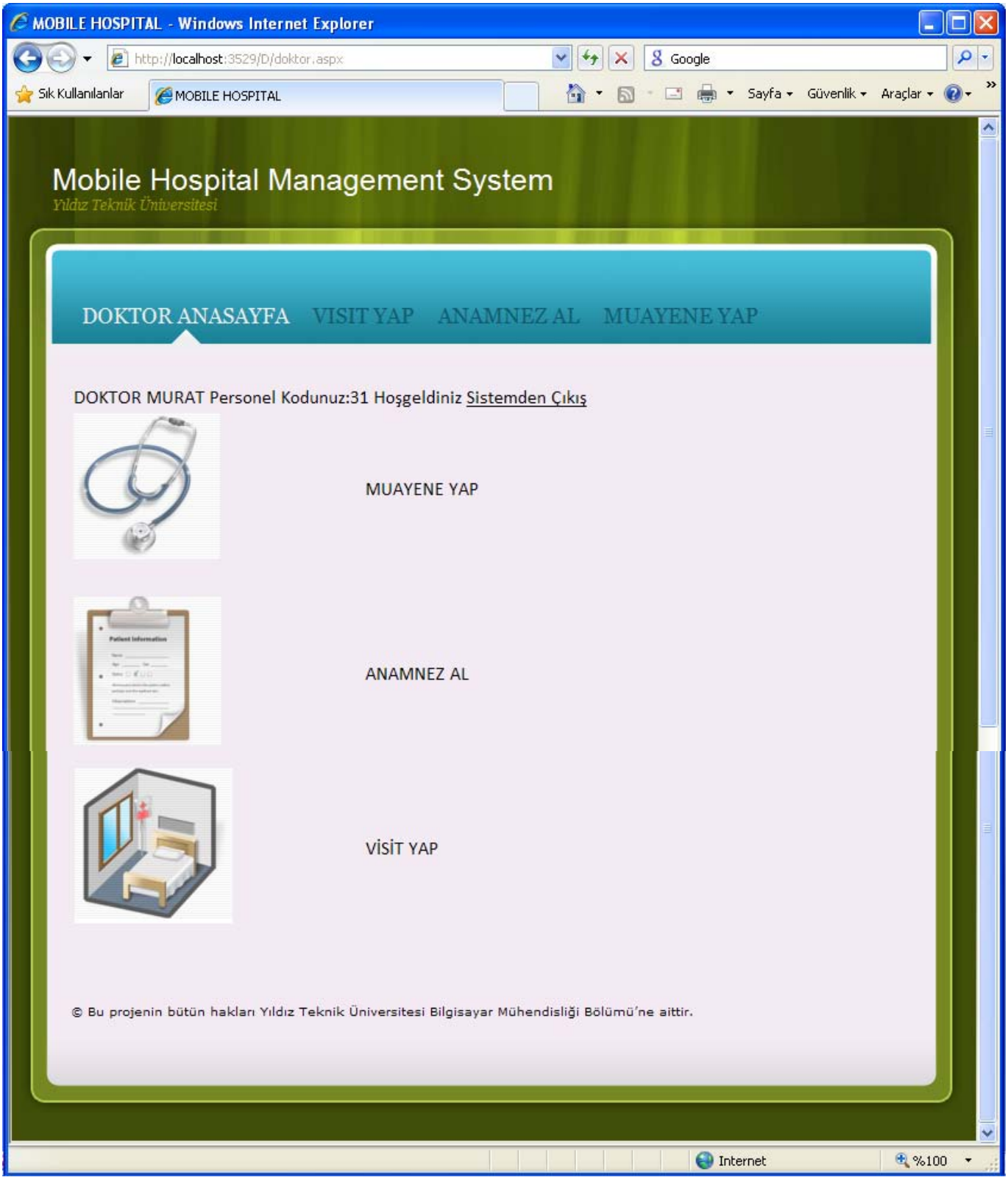


Figure 5.8 doktor.aspx

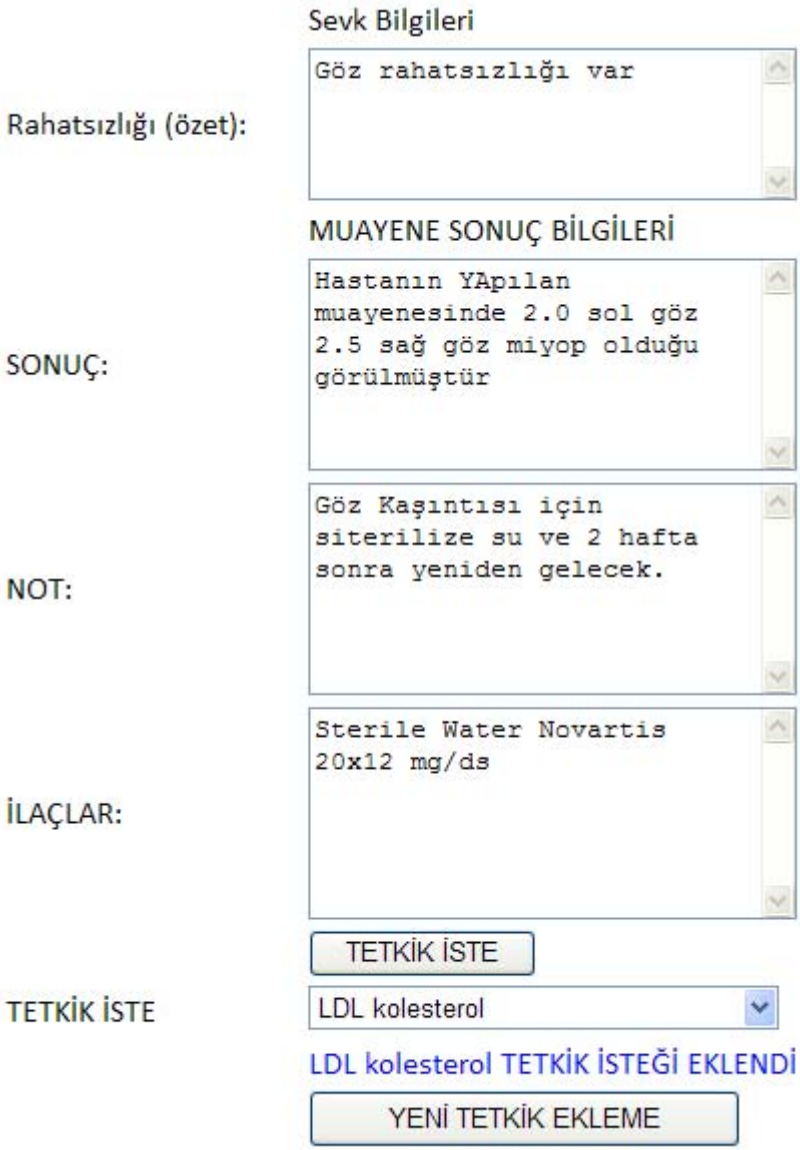


Figure 5.9 doktormuayene.aspx

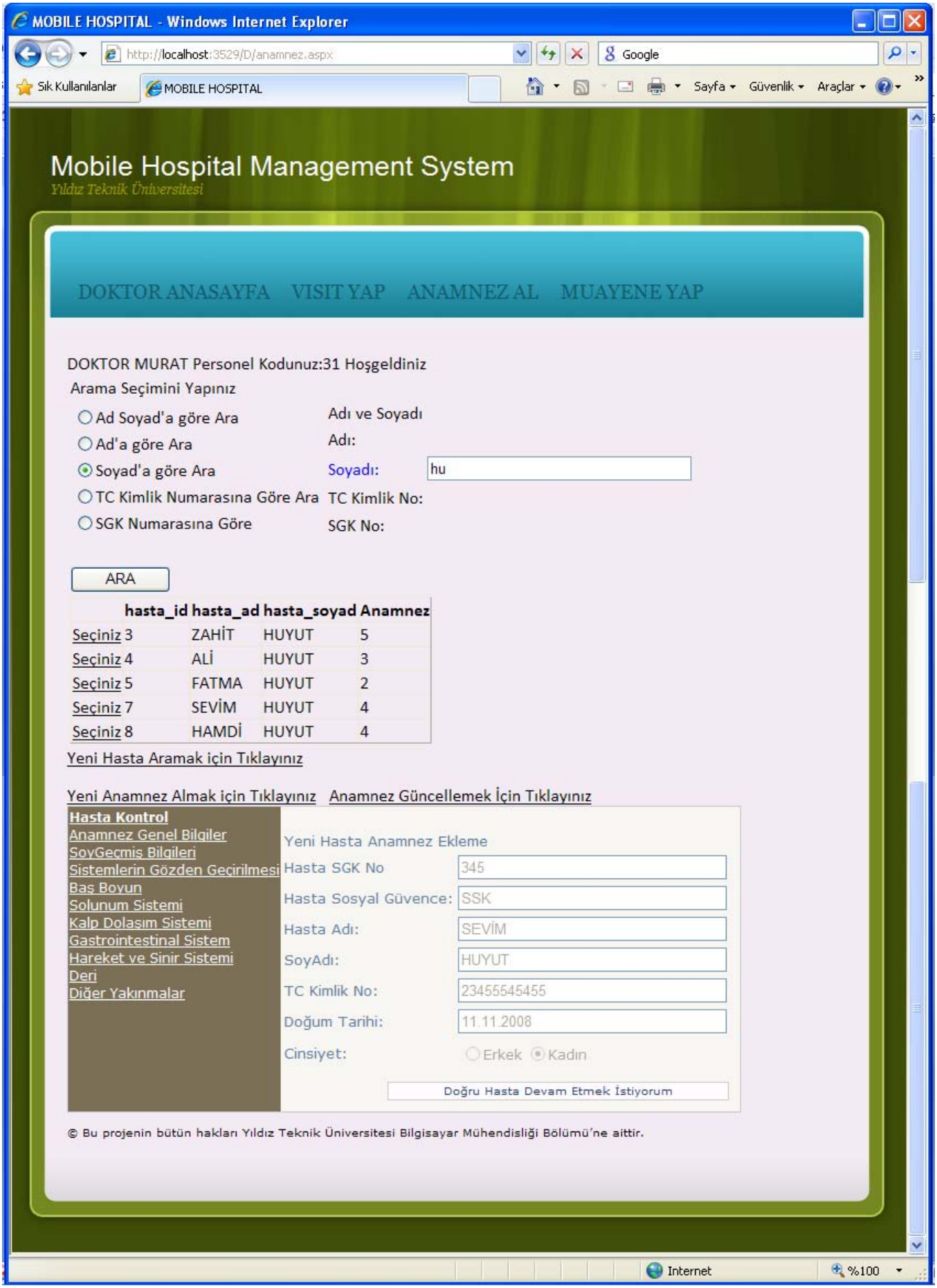


Figure 5.10 anamnez.aspx

Figure 5.11 anamnez.aspx

The detailed view of Wizard Each Step Has Next and Forvard Button

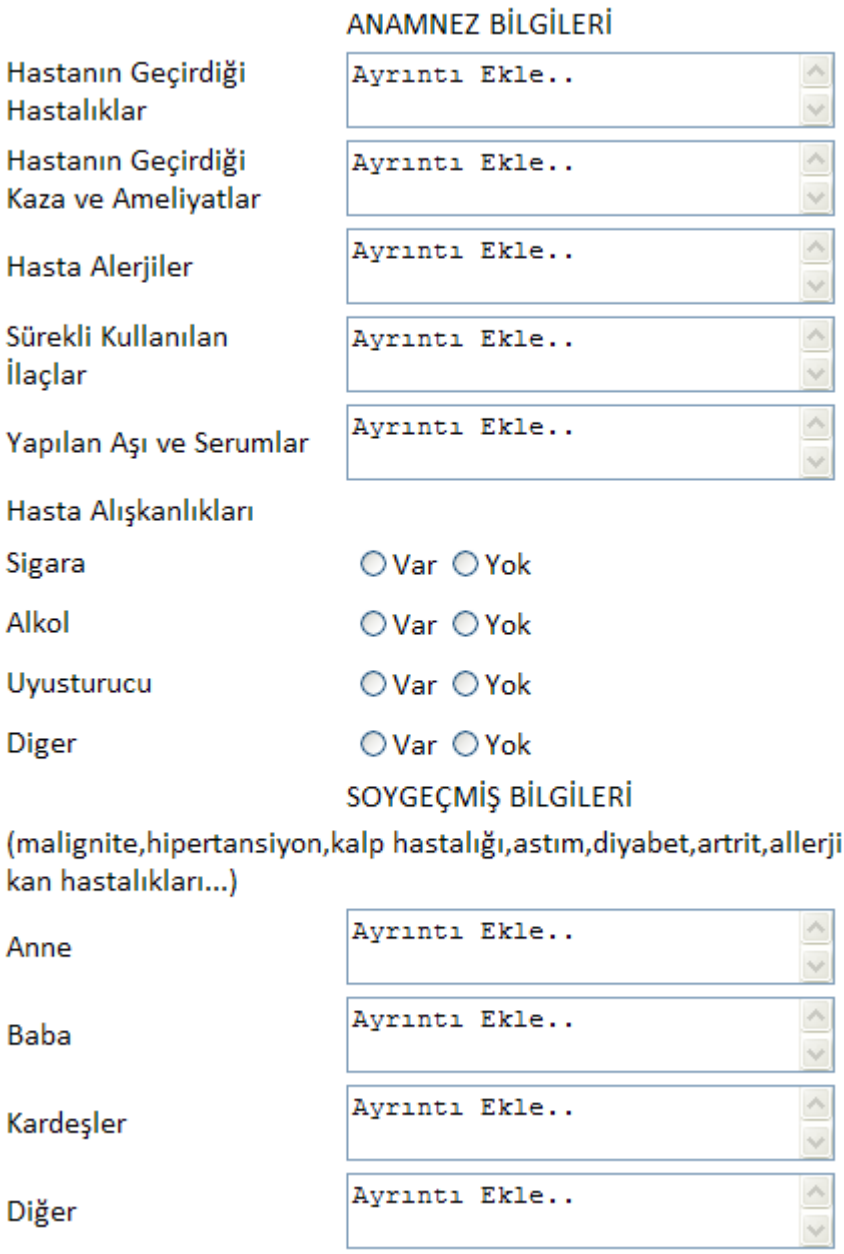


Figure 5.12 anamnezguncelle.aspx

Page Has All Wizard Step on Only One Page to Show Simply What to Change

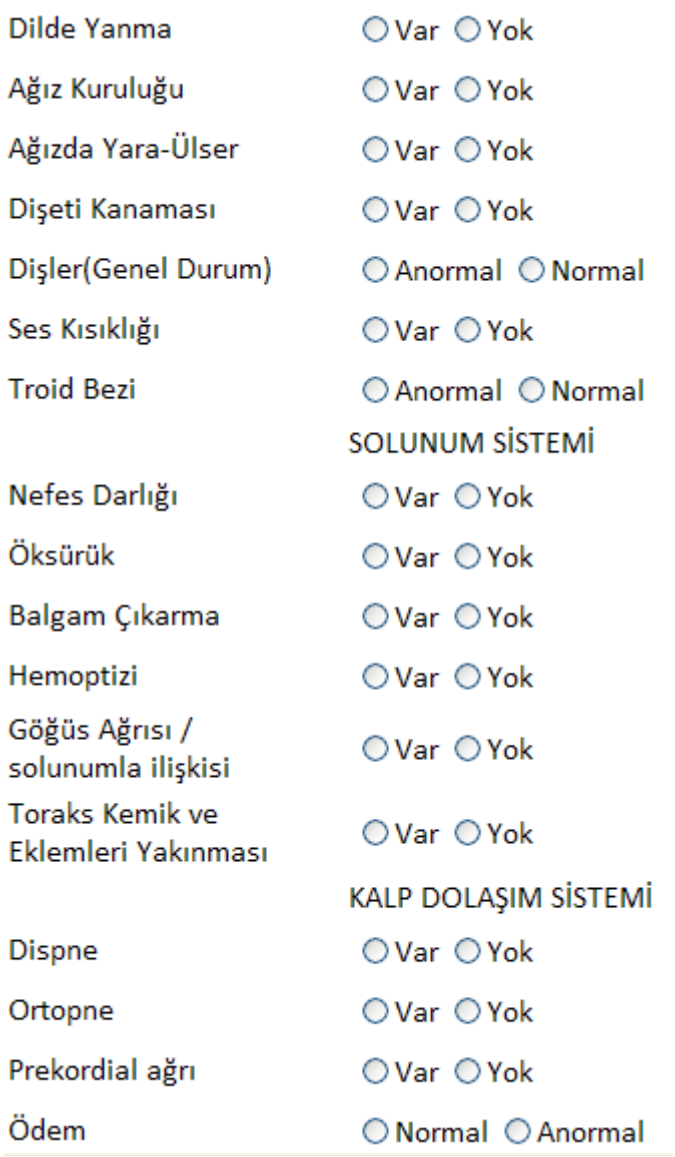


Figure 5.12 anamnezguncelle.aspx

Continual of Previous Figure

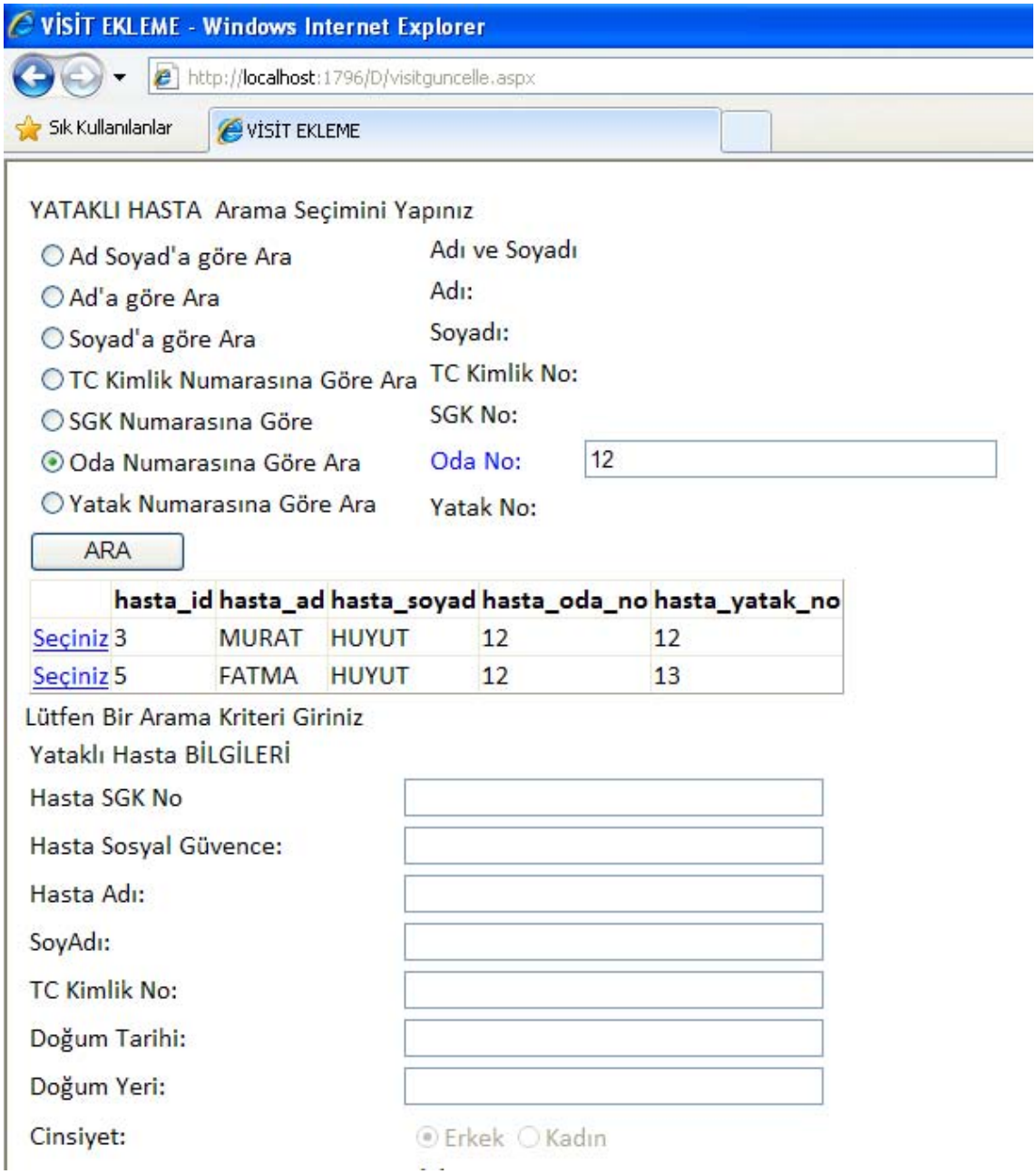


Figure 5.13 visitguncelle.aspx

Adding a new Visiting or Refreshing any Visit can make in this form

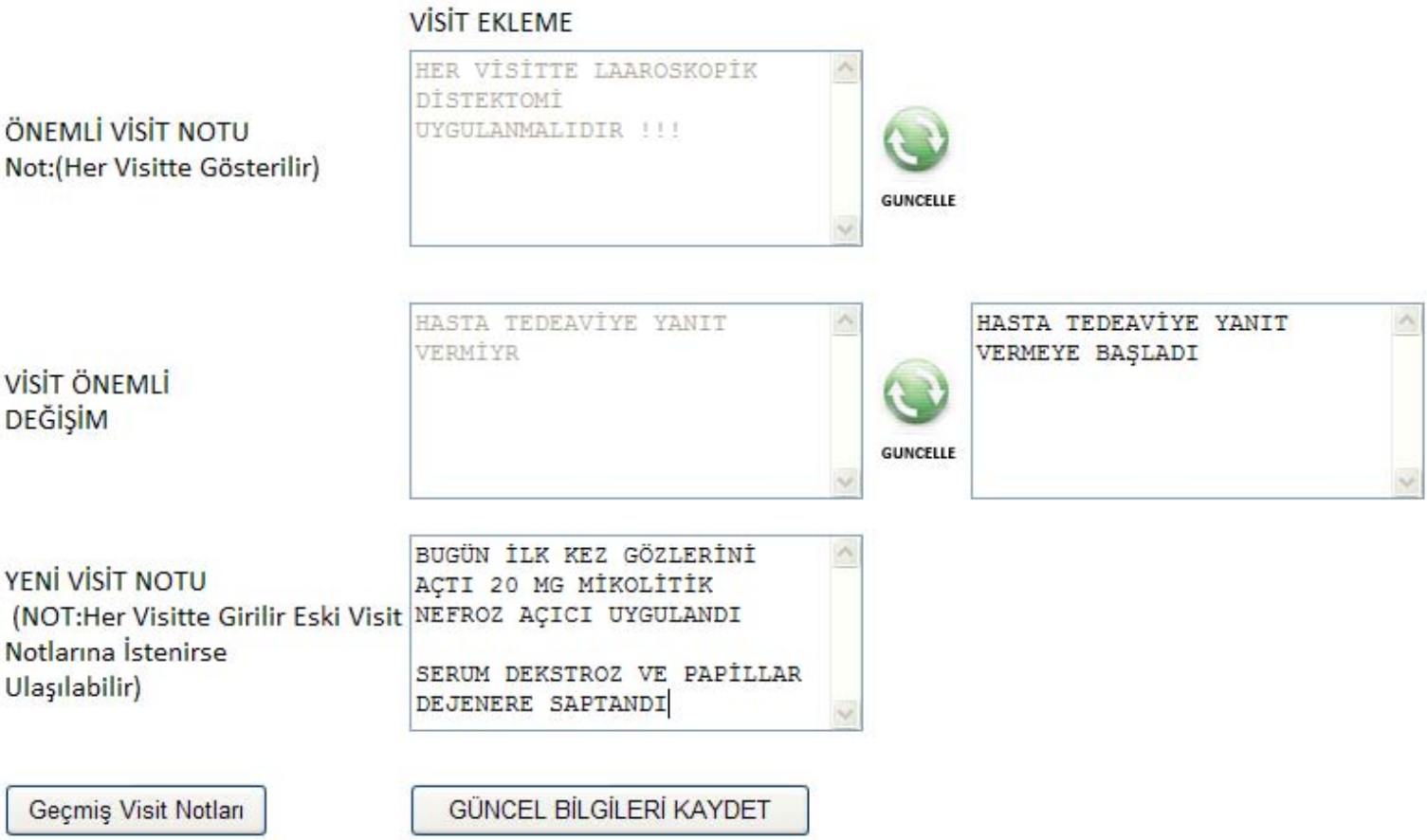


Figure 5.13 visitguncelle.aspx

Continual of Previous Figure

5.2 Mobile Device Views

Figure 5.14 mobil.aspx

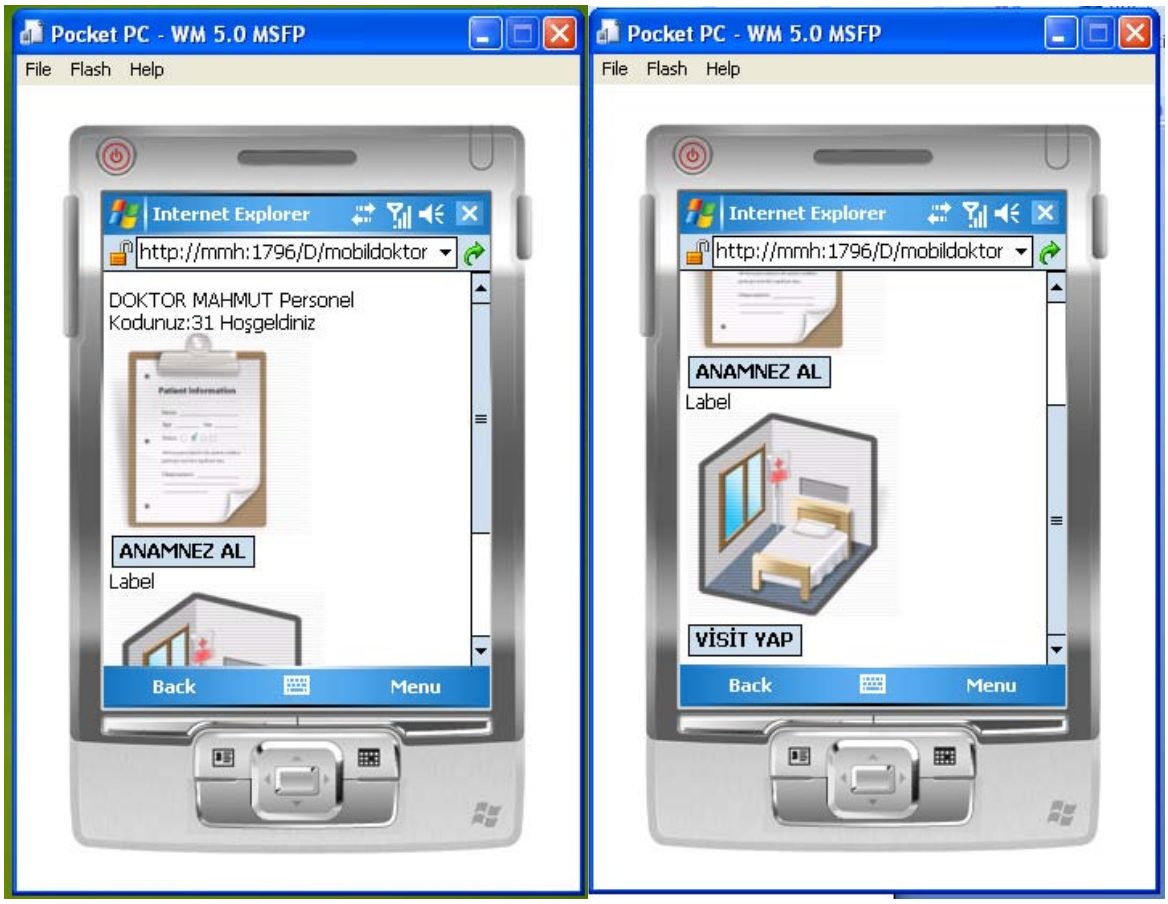


Figure 5.15 mobildoktor.aspx

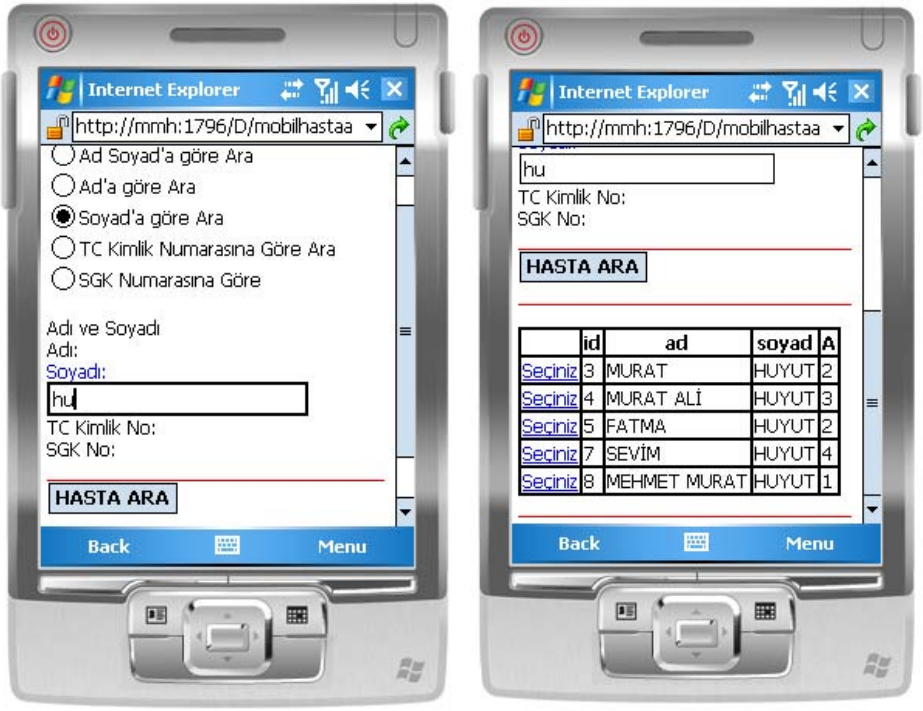


Figure 5.16 mobilhastaara.aspx

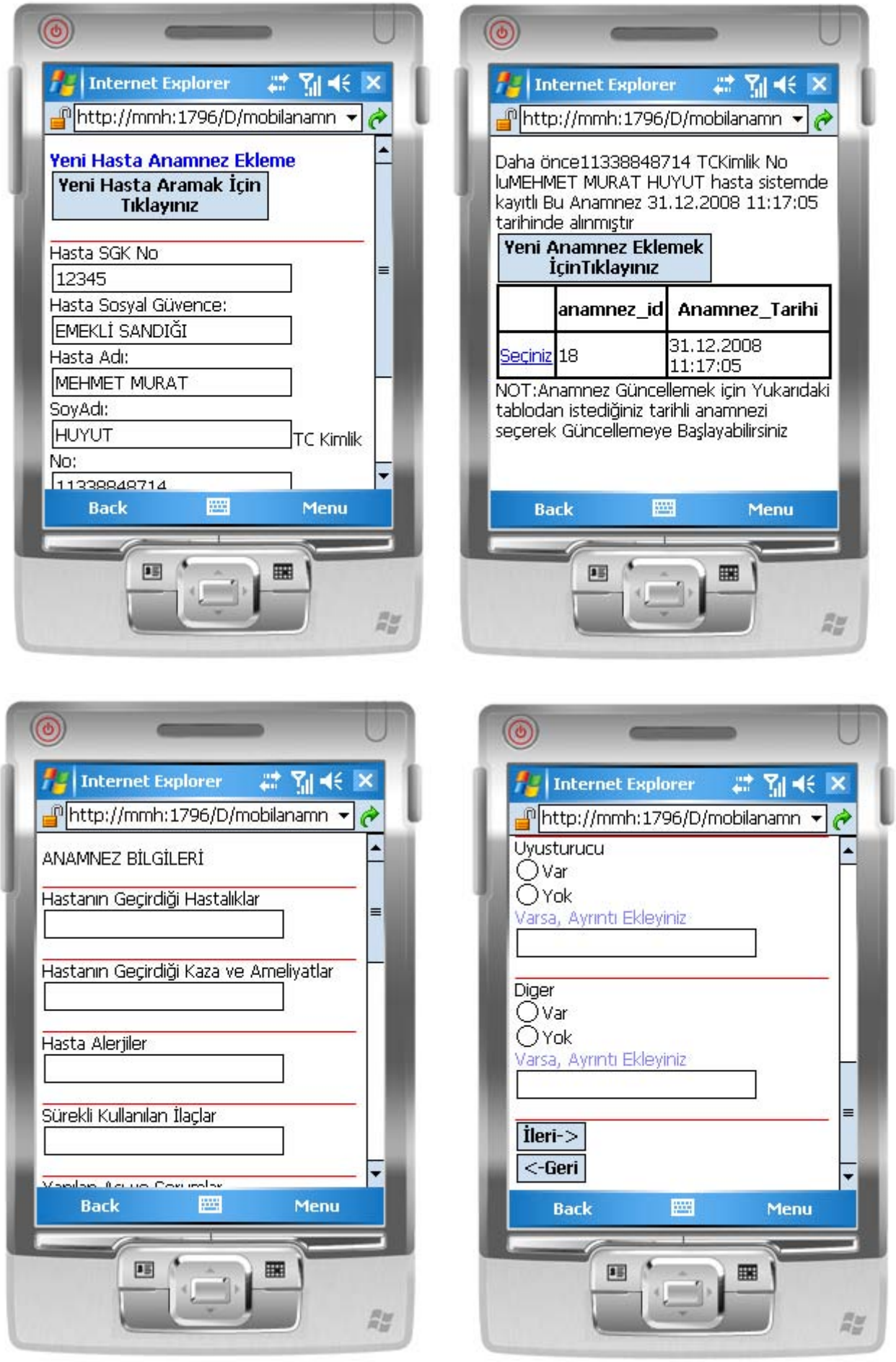


Figure 5.17 mobilanamnez.aspx

Figure 5.18 mobilvisit.aspx

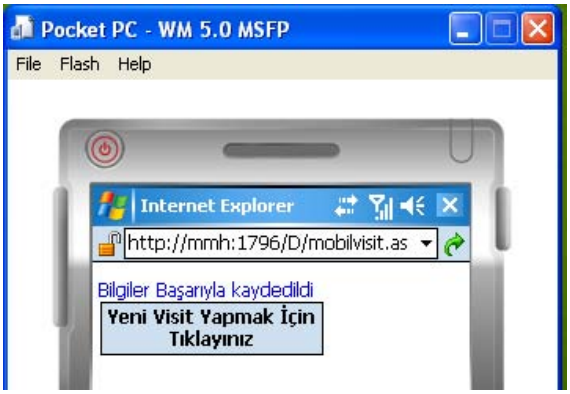


Figure 5.19 mobilvisit.aspx Final Step
Succesfully adding to the database

Figure 5.20 Showing Different Mobile Browser Capability

6. CONCLUSION

In this project, the main aim is to make a new realization on all hospital treatment forms using mobil computer facilities.

The Mobile Hospital Management System enables a new regulation to manage hospital better. Also it may have alot of headway to do but, for the present it supply our requirements. It gives a big capability to control all the changes about the patient’s health information.

While the mobile technology is the modern trend, this project is targeted to be a start point to make mobilable all hospital management.

In conclusion, my system is not perfect but i have tried our best to satisfy the project requirements. I have tried to make our system to cover most of the hospital operations.

7. FUTURE DEVELOPMENTS

Many improvements can be possible in this system. First of all, this type of system is supposed to have more mobile pages in order to simplfy hospital managemet.

The anamnez forms content relies on the department features and changes department ro department. So the anmnez forms content is generated according to the related department. Thus, the more information about its own reletad department is shown on the form.

The hospital databases is a big information sources to use and can be used for research aim. For examle, this database can be used for datamining and from this, results based on artifical intelligence techniques bring us useful information that anyone on the system can use.

In Future, a role for a patient can be added to the system, so patient can also reach to the system. Patient can connect to his/her personel doctor and get relevant informations from internet. I also developed this concept on my junior project with Yrd.Doç.Dr Yunus Emre Selçuk. This project may be used together to enhance the project.

This work needs alot of hardware tools to increase its feaures. The main aim must be to use high tehnologic devices. Such as, patinents may have an RFID bracelets to inform doctor who that petient is. And display his or her own information about health situation or whatever they want to on their mobile device which is equipped with RFID reader.

As a conclusion, for the future developments, there is no an end point to stop in heatlh sector and it always run together with the developments on Information Technologies. So, we have to use them to give best service to the Human Beings.

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