

Tele-health - Telemedicine Holistic Approach



Motivation



- Global challenges of non-communicable diseases (NCDs)
- NCDs represent 50-80 % of the foreseeable disease burden and are an increasing economic concern as treatment options multiply
- Tackling NCDs is not simply a health care challenge but rather a challenge of prevention in which multiple sectors are involved

What needs does it address ?



Worldwide Today:

- ~ 1 billion adults overweight
- ~ 860 million chronic disease patients
- ~ 600 million elders, age 60 or older
- increasing number of chronic and long term patients
- steadily increasing elderly population

Sources: World Health Organization and McKinsey

Chronic Diseases



- ▶ CHF (Congestive Heart Failure)
- ▶ Cardiac arrhythmias
- ▶ Diabetes (Blood Glucose)
- ▶ Arterial hypertension
- ▶ COPD (Chronic Obstructive Pulmonary Disease)
- ▶ Asthma (Severe Respiratory Diseases)
- ▶ Obesity
- ▶ Etc...



[DISEASE MANAGEMENT]



Definitions

► Telemedicine / mHealth:

- Healthcare at a distance
- Healthcare over mobile devices

► E-health:

- healthcare services delivered electronically

„Telemedicine is the use of telecommunication and information technologies in order to provide clinical health care at a distance. It helps eliminate distance barriers and can improve access to medical services that would often not be consistently available in distant rural communities“

- Health & Wellness
- Aging Independently
- Disease Management

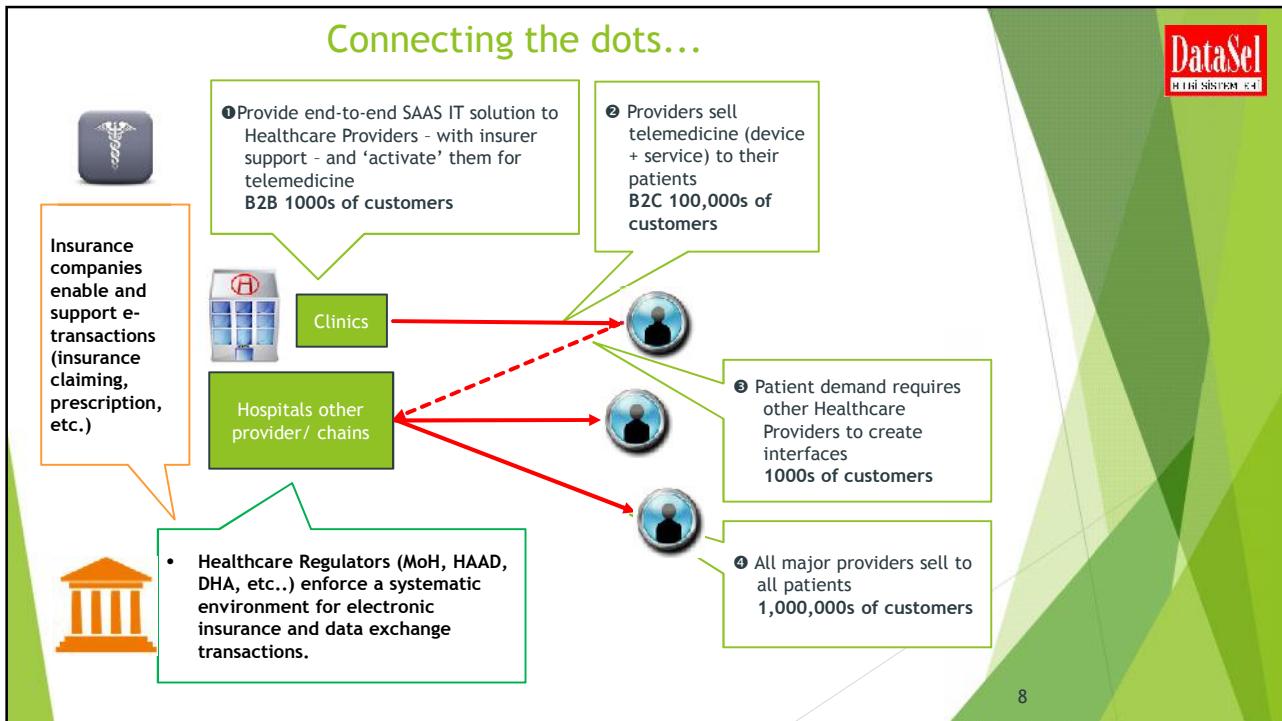
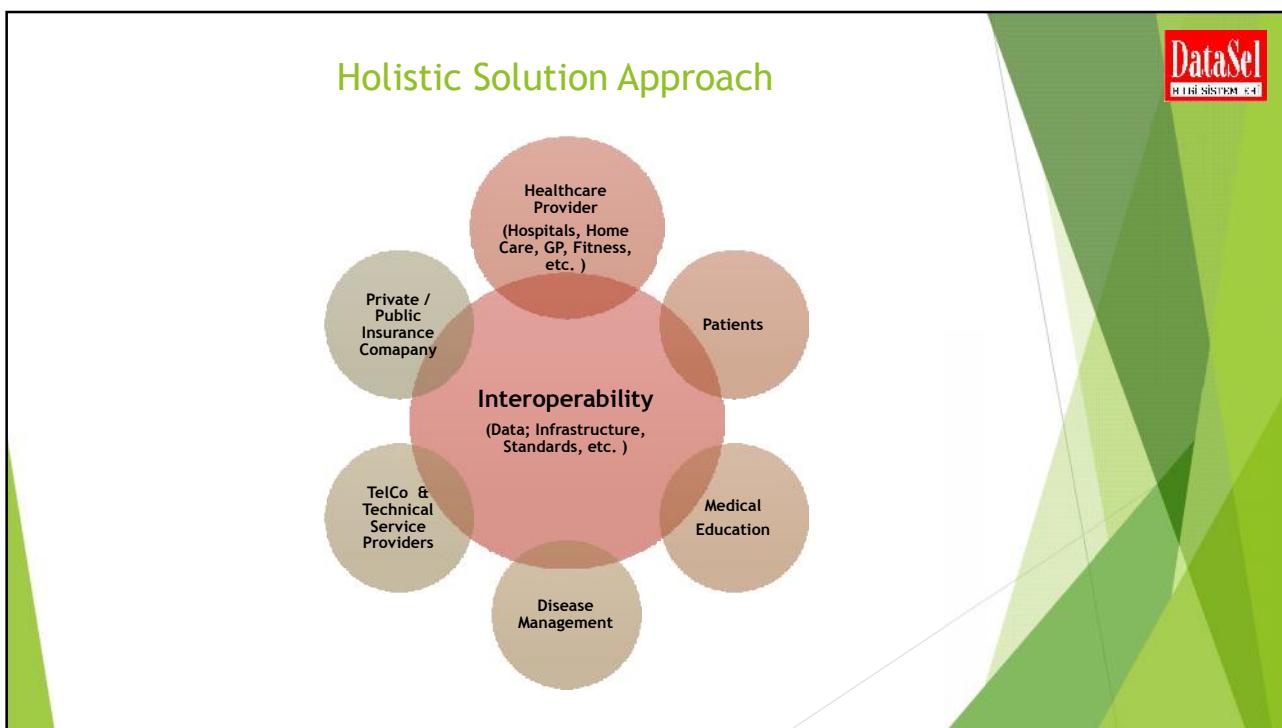


Source: Juniper Research Report, Google+

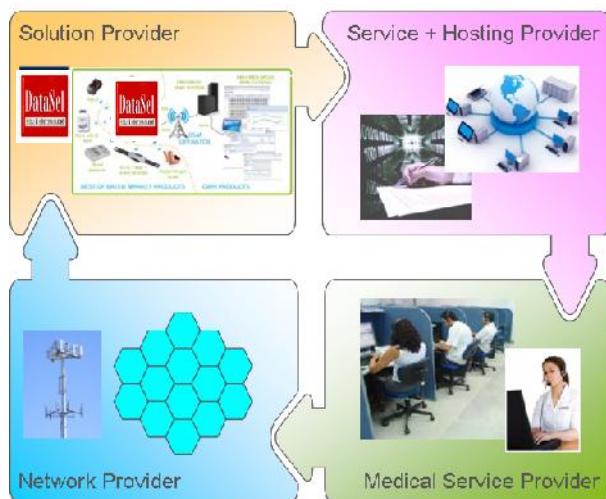
- **2018 there will be 96 million users of mHealth and mobile-fitness apps**
- **mFitness sector will experience strongest growth in the short and medium term (15 million now)**
- **growth driven by**
 - a **motivated target market**
 - **increasing demand for healthier lifestyle**



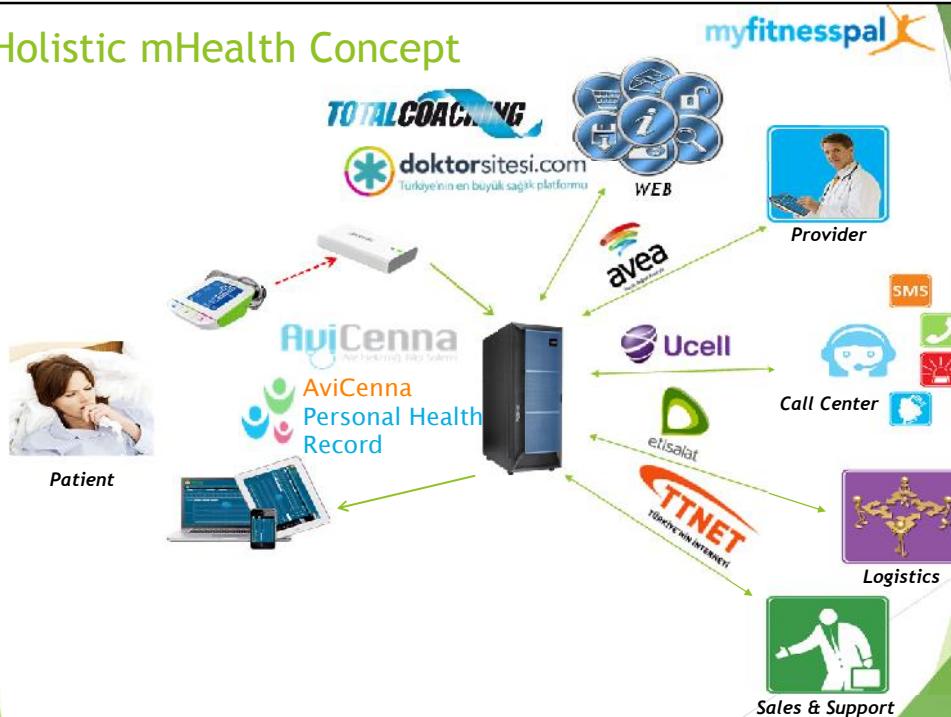
- As mobile fitness devices become more widespread, they will pave the way for more critical mHealth services delivered through the smartphone”
- “While **mHealth and mobile fitness** are two discrete markets - with **divergent audiences** - increased usage of the **former** will stimulate wider awareness of the **latter**”

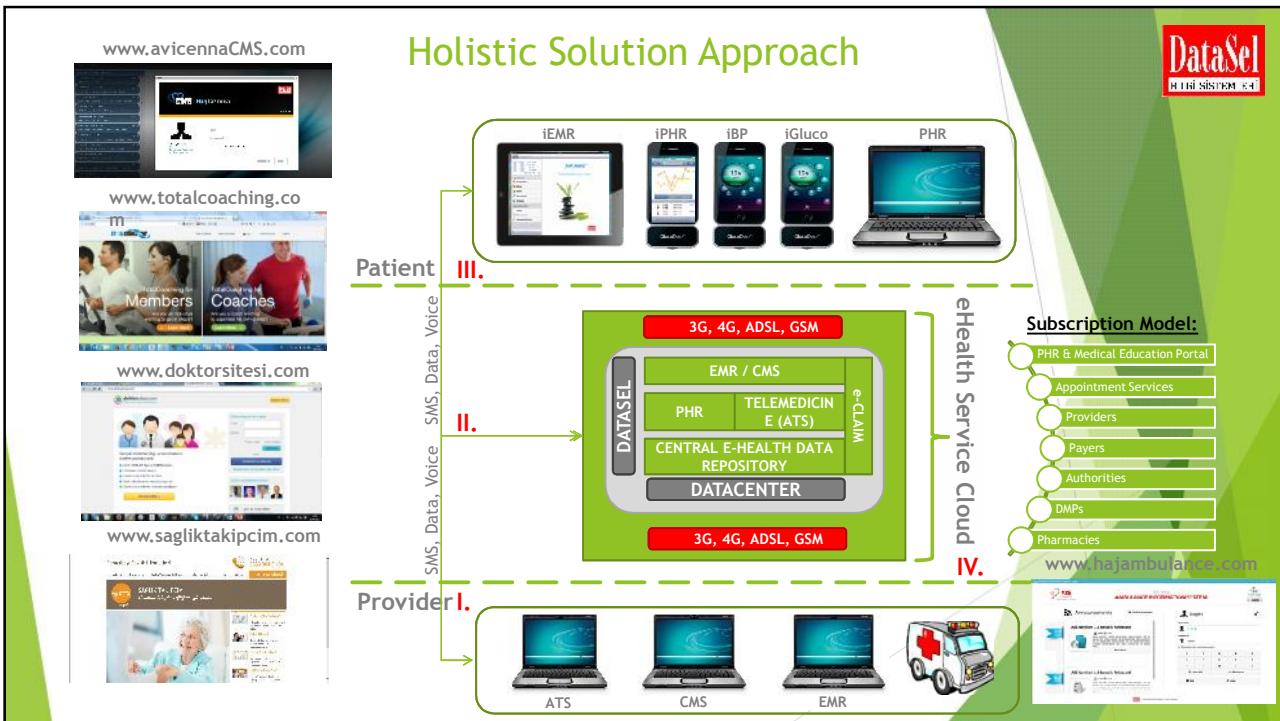


Avicenna Telemedicine Concept



Holistic mHealth Concept





Holistic view on Mobile Diabetes Monitoring



- ▶ Diabetes monitoring
 - ▶ TelCo, Healthcare Provider, IT Solution Provider, Regulator, Insurance
- ▶ Supply chain for measurement strips and other day-by-day consumable material needs to get guaranteed
 - ▶ Medical Supplier, Pharmaceutical Companies, Pharmacies, B2B, B2C
- ▶ Integration of diabetes monitoring sensor (glucometer) in existing Healthcare IT Infrastructure (EMR, CRM, eClaims, etc.)
 - ▶ Provider, IT Solution Provider, TelCo

*Agreement on use case must go along with **regional medical policies** and **strategies of authorities** and should be mandatory and should be based on **medical best practices standards***

Benefits to patients



- ▶ Peace of mind and better quality of life
 - ▶ Guidance provided
- ▶ Relevant therapy and care through mobile monitoring
 - ▶ Personalized support and education
- ▶ Mobility enables normal life and usual activities
 - ▶ Customized interventions to meet individual needs
- ▶ Direct communication with Caregivers & Healthcare Providers
 - ▶ Coordination of services
 - ▶ Adherence to clinical treatment guidelines and patient safety protocols

“BETTER QUALITY OF LIFE”

Benefits to patients



- ▶ Provide "second opinion" service worldwide
 - ▶ patient management consultation
- ▶ Access to care for remotely located consumers
- ▶ Peer2peer consultation and access to diagnostic and therapeutic information for
 - ▶ healthcare providers and patients
- ▶ Continuity of care via
 - ▶ virtual community networks, integrated health systems, interconnected, real-time, virtual healthcare teams, and virtual unified electronic health records

Benefits to healthcare providers



- ▶ Effective patient management, monitoring and therapy
 - ▶ Innovative technology to effectively track utilization, data and compliance with care plan
 - ▶ *"Increased health care provider and patient satisfaction"*
- ▶ Quality of care without pressures on healthcare staff
 - ▶ Improved quality of care through participant education and coordination of care
- ▶ Increased efficiency through remote diagnosing and treatment
 - ▶ Demonstrated cost reductions while improving clinical, quality and financial outcomes
 - ▶ Reductions in treatment and management costs
 - ▶ Provision of multiple, integrated services through a single-source provider at a reasonable cost

Benefits to healthcare providers



- ▶ Monitoring treatment side-effects
 - ▶ Modification of treatments according to Tele-monitoring signal transmissions
- ▶ Reduce administrative Primary Care Physician visits and avoid unnecessary hospital admissions through
 - ▶ *use of goal-setting and evidence-based methodologies*
- ▶ Decrease mortality rates.
 - ▶ “OVERALL EFFICIENCY INCREASE BY ALL MEANS THROUGH USE OF TELEMEDICINE”

Benefits to healthcare providers



- ▶ Overload on specialists - long waiting lists
- ▶ Telemedicine enables the provision of healthcare services through
 - ▶ specially trained nurses that take digital photos
 - ▶ specialist software routes to consultant dermatologists (anywhere) for diagnosis
 - ▶ Healthcare consultant/Provider can work from home
- ▶ Telemedicine replaces local consultant but not totally



Benefits to operators

- ▶ New customers
 - ▶ Healthcare businesses
 - ▶ Users
- ▶ New vertically integrated solution in new industry
- ▶ Service innovation
- ▶ Participation in socioeconomic development

"New services, new customers"



Benefits to health insurers

- ▶ Cost savings through minimized treatment in the hospital
 - ▶ Better management of patients disease and healthcare resources
 - ▶ Premium service through personalized and interactive treatment
- ▶ Minimizes patient security issues and post-treatment care issues
- ▶ Accurate data enables right diagnosis that saves resources
- ▶ Integrated computer reporting that allows effective tracking of utilization, data, and cost trends

"Cost savings, preventive care"



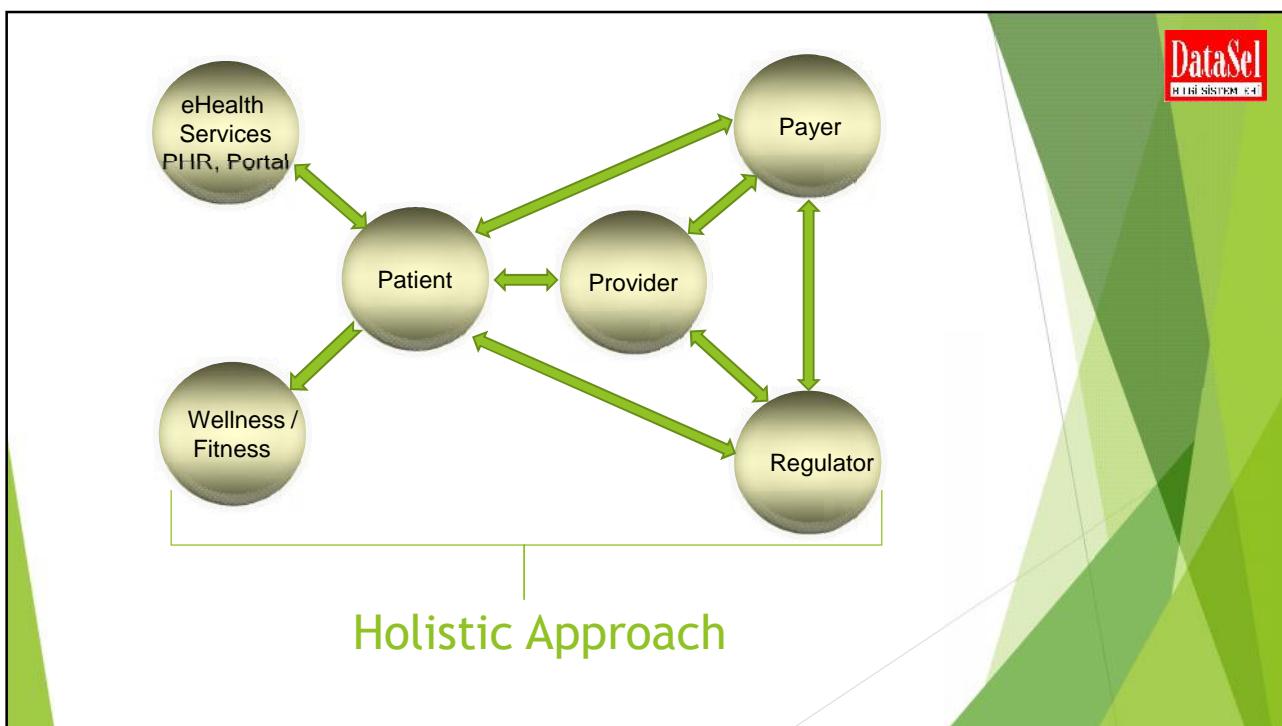
Benefits to health insurers

- ▶ Comprehensive care management
- ▶ Established instruments such as DMP or integrated care programs are optimally supported
- ▶ New care processes such as case management and Tele-monitoring are also comprehensively represented and controlled
- ▶ Active health management
- ▶ The care process can be automatically and continuously tracked and interventions can be initiated. E.g., participants in a health program receive automatic appointment reminders



Benefits to health insurers

- ▶ all policy relevant health information of patient can be clearly aggregated and assessed
- ▶ control functions signal health insurance company if a patient has not attended training measures or has not met his/her personal target values
- ▶ Caregiver can directly contact the patient and his/her physician to discuss potential problems
- ▶ Prevention of service expenses from exceeding the allocations without having to increase the number of administrative staff
- ▶ Etc...



Telemonitoring and self-management in the control of hypertension (TASHMINH2): a randomised controlled trial

Richard J McManus, Jonathan Mant, Emma P Bray, Roger Holder, Miren I Jones, Sheila Greenfield, Billingsley Kaambwa, Miriam Banting, Stirling Bryan, Paul Little, Bryan Williams, F D Richard Hobbs

Summary
Background Control of blood pressure is a key component of cardiovascular disease prevention, but is difficult to achieve and until recently has been the sole preserve of health professionals. This study assessed whether self-management by people with poorly controlled hypertension resulted in better blood pressure control compared with usual care.

Interpretation Self-management of hypertension in combination with telemonitoring of blood pressure measurements represents an important new addition to control of hypertension in primary care.

Funding Department of Health Policy Research Programme, National Coordinating Centre for Research Capacity Development, and Midlands Research Practices Consortium.

Source: *Telemonitoring and self-management in the control of hypertension (TASHMINH2): a randomised controlled trial*.

Richard J McManus, Jonathan Mant, Emma P Bray, Roger Holder, Miren I Jones, Sheila Greenfield, Billingsley Kaambwa, Miriam Banting, Stirling Bryan, Paul Little, Bryan Williams, F D Richard Hobbs

Randomised Controlled Trial of Telemonitoring and Self Management in the Control of Hypertension: Telemonitoring and Self Management in Hypertension (Tasmin2)

Source: Economic Analysis: Pp.16.106

Kaambwa, B1; Bryan, S2; Mant, J3; Bray, EP1; Holder, R1; Jones, M1; Greenfield, S1; Little, P4; Williams, B5; Hobbs, R1; Mcmanus, RJ1

URL:

http://journals.lww.com/jhypertension/Fulltext/2010/06001/Randomised_Controlled_Trial_of_Telemonitoring_and_791.aspx#

Online EMR for family doctors



Online EMR for family doctors

Managed Medical Monitoring Service

Personal Health Record

The screenshot displays the Personal Health Record (ATHP) application. At the top, there's a header with the logo and the text "Your health & its unique with ATHP". Below the header, the user profile shows "JENIFER WOOD" and "Activity History" for April 2013. The main area features a graph titled "Blood Pressure" with three data series: Blood Pressure, Blood Glucose, and Weight. A callout box highlights a specific data point: "Blood Pressure 128", "Systolic 128", "Diastolic 78", and "Calculated BMI 19.77". To the right, a sidebar titled "Medical Information" contains icons for search, incoming call, call, next page, help video, settings, and exit. The overall theme is dark blue with light blue highlights.

Medical Call Center

The screenshot shows the Medical Call Center application. At the top, there's a header with the logo and the text "Sağlık Takipimi". Below the header, the user profile shows "JENIFER WOOD" and "08:08". The main area is titled "Ana Menü" and contains a 2x5 grid of icons. The icons represent various medical functions: Ön Sipariş, Sıcak Satış, Bildiri Değerlendirme, Cihaz Eşleştirme, Test Pages, Genel Tanımlar, Sipariş Arama, Bildiri Girişи, Bildiri Çözme, Üye Gözlem, and Kullanıcı Oluştur. On the right side, there's a sidebar with icons for search, home, help, settings, and privacy. The overall theme is dark blue with light blue highlights.

Medical Call Center

The screenshot shows a medical call center application. At the top right is the DataSel logo. The main area features a map of Istanbul with various districts labeled. To the left of the map is a graph showing blood pressure levels over time, with a blue line representing systolic pressure and a yellow line representing diastolic pressure. On the right side of the map is a 'Patient Search' panel with fields for name, gender, and age, along with a search button. Below the search panel are buttons for 'Incoming Call', 'Call', 'Main Page', 'Help Videos', 'Settings', and 'Exit'. The bottom of the screen shows a navigation bar with icons for Home, Contact, Doctor, and Logout.

Health Portal - Patient Education

The screenshot shows a health portal website for patient education. At the top right is the DataSel logo. The main content area includes a banner with three cartoon doctors and a family, followed by text: "Gerçek doktorlar bilgi ve tecrübelerini sizlerle paylaşıyorlar." Below this are several bullet points: "★ Kayıtlı 1.656.417 Üye vs 14.689 uzman", "★ Uzmanlara ücretsız danışın", "★ Doktor ve diğer hekimlere tanыın", "★ Sağlık videolarına ve makalelere göz atın", and "★ Sizinle aynı problemleri olanlarıla mesajlaşın". A yellow button labeled "Hemen Katılım >" is at the bottom. To the right is a login form with fields for 'Email' and 'Şifremi Z'ye', and a 'GİRİŞ YAP' button. Below this is a 'FACEBOOK İLE BAĞLAN' button and a link to "Doktorsitesi'ne Ücretsiz Kayıt Olun". Further down is a section titled "Online uzmanlarından bazıları" featuring small profile pictures of doctors. The bottom of the screen shows a taskbar with various application icons.

Fitness Portal - Personal Wellness

The screenshot shows a split-screen landing page for 'TotalCoaching'. The left side is titled 'TotalCoaching for Members' and features an image of three people working out on treadmills. The right side is titled 'TotalCoaching for Coaches' and features an image of a coach in a red shirt assisting a client. Both sections have a 'Learn More' button.

Hospital Emergency Department

The screenshot shows the homepage of the EDIS system. At the top, there's a banner with the text 'EDIS EMERGENCY DEPARTMENT INFORMATION SYSTEM' and the logo of the 'Royal College of Surgeons in Ireland'. Below the banner, there's a navigation menu with links to 'Announcements', 'Campaigns', 'Main Page Tools', 'Inquiries', and 'Ministry of Health Announcements'. On the right side, there's a 'User Login' form with fields for 'Email' and 'Password', and buttons for 'Login' and 'Forgot my password?'. At the bottom left, there's a note for 'Demo Users' and a link to 'EDAS Demo Ready'.

Hospital Emergency Department

EDIS 14:50 Friday 10 May 2013 MURALE ÜNAL

Main Menu

Quick Registration	Patient List Board	Rota and Schedule	Clinical Pathway	Admin Panel	Test
Work List	Bed Allocation	Disposition	Reports	Settings	Debug

Hospital Emergency Department

EDIS 14:52 Friday 10 May 2013 MURALE ÜNAL

Bed Allocation

Waiting Patients

MRN/ID	Patient Name	CTAS	Arrival Date	TRIAGE DATE	Gender	Age
2762	ALİCAN DEMİR	09.05.22.13			1	
	MİMAR İLKAY	21.04.22.13			1	
	KÜLLÜK TÜRK	09.05.22.13	09.05.22.13		2	
	MİMARŞE SİNAN	20.04.22.13			1	
	UNAL HÜSEYİN	20.04.22.13			1	
	ALİDOĞUZ FİYAH	21.04.22.13			1	
	MİMARŞE DEMİR	09.05.22.13			17	
	BİROL Y.	25.04.22.13	30.04.22.13		1	
	UNAL HÜSEYİN	21.04.22.13			1	
	ALİDOĞUZ FİYAH	21.04.22.13			1	
	PHARMACIST İLKE	09.05.22.13	09.05.22.13		13	
4953	ABİDAS SAĞLAM	18.04.22.13			14	
	MİMARŞE DEMİR	23.04.22.13			1	
	ALİDOĞUZ FİYAH	24.04.22.13	30.04.22.13		1	

Ambulance Information System

AIS Ambulance Information Systems

AviCenna AMBULANCE INFORMATION SYSTEM

وزارة الصحة Ministry of Health

DataSel RİEL SİSTEMLER

URGENT PATIENT !!!

ALPER ÇETINKAYA
MRN:155454847878
Turkey Male 30 years Adult

1-125

CASE SUMMARY

1 Call Time 05:01:00 PM	2 Response Time 05:09:00 PM	3 Arrive to Scene 05:09:00 PM	4 Patient-In 05:10:27 PM	5 Leave Scene 05:19:28 PM
6 Arrive in Hospital 05:15:00 PM	7 Patient Discharge 05:29:00 PM	8 Leave Hospital 05:29:00 PM	9 Arrive to Station 05:31:00 PM	

CASE STATUS: Case Closed

Pre-HospitalCare Report

Report No. **Date:** 04/09/2013 **Time:** 10:48 AM **Unit:**

Medical Patient: **Trauma Patient:** **Team Codes:** 1-125

Pre-Hospital Care

TIME UNIT NOTIFIED BY	TIME UNIT RESPONDED	TIME ARRIVED ON SCENE	ENROUTE	ARRIVED	IN SERVICE
5:01 AM	5:06 AM	5:09 AM	5:10 AM	5:16 AM	5:25 PM

PATIENT INFORMATION

Name: ALPER ÇETINKAYA	<input checked="" type="checkbox"/> M <input type="checkbox"/> Female	<input type="checkbox"/> Child <input checked="" type="checkbox"/> Adult	Age: 30 <input type="checkbox"/> > <input type="checkbox"/> =	Wt: 70.00 <input type="checkbox"/> kg	Other: <input type="checkbox"/> Emergency <input checked="" type="checkbox"/> Non-Emergency
Med. Insurance No.: <input type="text"/> Com.: <input type="text"/>	<input type="checkbox"/> F <input type="checkbox"/> Infant	<input type="checkbox"/> Adult <input checked="" type="checkbox"/> Senior	<input type="checkbox"/> Head Injury <input type="checkbox"/> Chest Injury <input type="checkbox"/> Abdominal Injury <input type="checkbox"/> Spine Injury <input type="checkbox"/> Limb Injury <input type="checkbox"/> Other Injury	<input type="checkbox"/> Head Injury <input type="checkbox"/> Chest Injury <input type="checkbox"/> Abdominal Injury <input type="checkbox"/> Spine Injury <input type="checkbox"/> Limb Injury <input type="checkbox"/> Other Injury	Severity: <input type="checkbox"/> Critical <input checked="" type="checkbox"/> Urgent <input type="checkbox"/> Non-Urgent
Location: <input type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Street/Hwy <input checked="" type="checkbox"/> Homeless <input type="checkbox"/> Public Building <input type="checkbox"/> Other	<input type="checkbox"/> Other: <input type="checkbox"/> Non-Urgent				
Address: seyhansehir					

PRESENTING PROBLEM

<input type="checkbox"/> Acute Confusion	<input type="checkbox"/> Allergic Reaction	<input type="checkbox"/> Diabetic Related (Hypoglycemia)	<input type="checkbox"/> Drowning/Accident	<input type="checkbox"/> Trauma/Blunt	<input type="checkbox"/> Environmental	<input type="checkbox"/> Pain	<input type="checkbox"/> Other
<input type="checkbox"/> Respiratory Arrest	<input type="checkbox"/> Syncope	<input type="checkbox"/> Unconsciousness/Unresp	<input type="checkbox"/> Head Injury	<input type="checkbox"/> Trauma/Penetrating	<input type="checkbox"/> Ext	<input type="checkbox"/> Shock	<input type="checkbox"/> Other
<input type="checkbox"/> Respiratory Distress	<input type="checkbox"/> Seizure	<input type="checkbox"/> Seizure	<input type="checkbox"/> Head Injury	<input type="checkbox"/> Bone/Tissue Injury	<input type="checkbox"/> Acid	<input checked="" type="checkbox"/> Burns	<input type="checkbox"/> Other
<input type="checkbox"/> Hypotension	<input type="checkbox"/> General Illness/Malaise	<input type="checkbox"/> General Illness/Malaise	<input type="checkbox"/> Traumatic/Chemical	<input type="checkbox"/> Bleeding/Hemorrhage	<input type="checkbox"/> Acid/Alk	<input checked="" type="checkbox"/> COA	<input type="checkbox"/> Other
<input type="checkbox"/> Hypoxia	<input checked="" type="checkbox"/> Severe Ingestion/Overdose	<input type="checkbox"/> Severe Ingestion/Overdose	<input type="checkbox"/> Hypoxia	<input type="checkbox"/> Hypoxia	<input type="checkbox"/> Hypoxia	<input type="checkbox"/> Hypoxia	<input type="checkbox"/> Hypoxia

PAST MEDICAL HISTORY

<input type="checkbox"/> None	<input type="checkbox"/> Hypertension	<input type="checkbox"/> Diabetes	<input type="checkbox"/> Hypertension	<input type="checkbox"/> Hypertension	<input type="checkbox"/> Hypertension	<input type="checkbox"/> Hypertension	<input type="checkbox"/> Hypertension
<input checked="" type="checkbox"/> Hypertension	<input type="checkbox"/> Hypo	<input type="checkbox"/> Hypo	<input type="checkbox"/> Hypo	<input type="checkbox"/> Hypo	<input type="checkbox"/> Hypo	<input type="checkbox"/> Hypo	<input type="checkbox"/> Hypo
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<input checked="" type="checkbox"/> Asthma	<input type="checkbox"/> Hypo	<input type="checkbox"/> Hypo	<input type="checkbox"/> Hypo	<input type="checkbox"/> Hypo	<input type="checkbox"/> Hypo	<input type="checkbox"/> Hypo	<input type="checkbox"/> Hypo

VITALS

TIME	PULSE	B.P.	SP02	H	PUPILS	L	GLASGOW COMA SCALE
05:09:00	Regular	120/80	98	95	<input checked="" type="checkbox"/> Equal	Normal	Spontaneous/ 15.00mm
05:10:27	Regular	120/80	98	92	<input type="checkbox"/> Dilated	Constricted	14.00mm
05:19:28	Regular	120/80	98	90	<input type="checkbox"/> Constricted	Normal	13.00mm
05:29:00	Regular	120/80	98	90	<input type="checkbox"/> Normal	Normal	13.00mm

SKIN

Normal	Urticaria	Wheals
Normal	Normal	Normal
Normal	Normal	Normal

ABDOMEN

Normal	Normal	Normal
Normal	Normal	Normal
Normal	Normal	Normal

NECK

Normal	Normal	Normal
Normal	Normal	Normal
Normal	Normal	Normal

DATASEL RİEL SİSTEMLER

Patient Vital Signs

The interface displays a large digital readout of "130" above "96". To the left, there's a "PATIENT INFO" section with "Quick Registration" and "Vital Signs" tabs. Under "Vital Signs", there are two ECG-like waveforms: one for "systolic" and one for "diastolic". A small icon of a person with a plus sign is at the top right, and a "PRINT" button is at the bottom right.

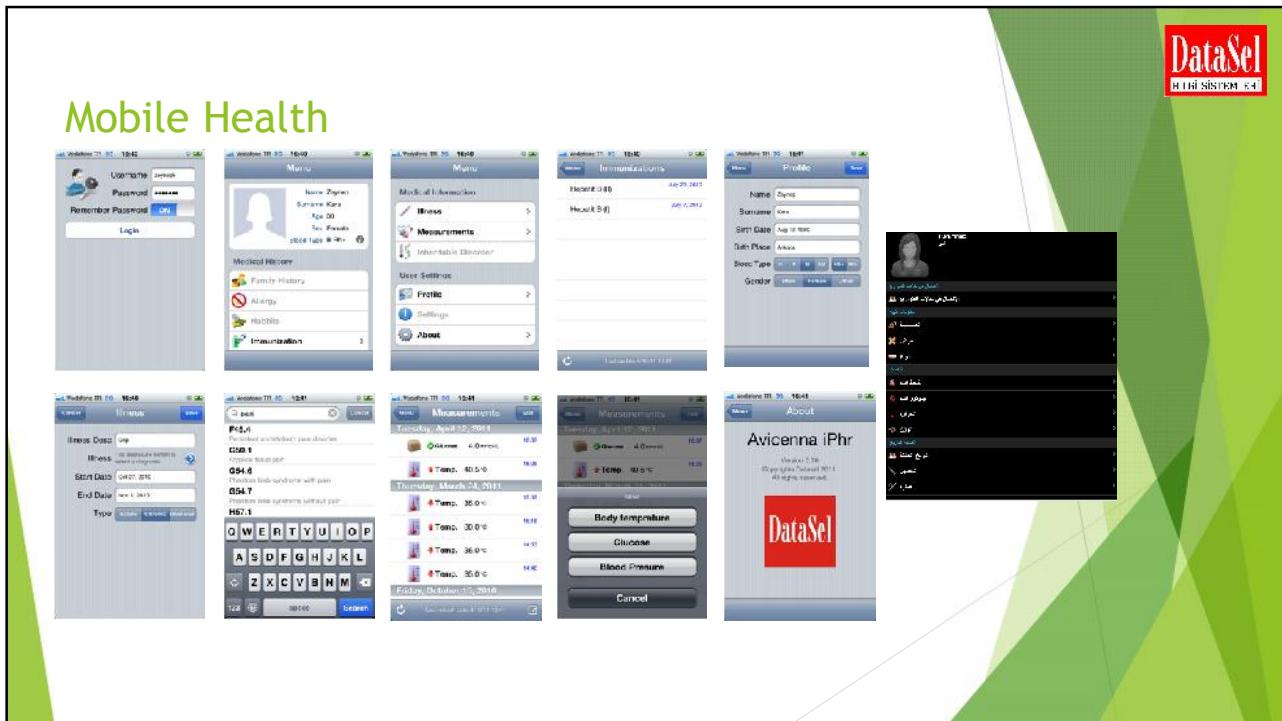
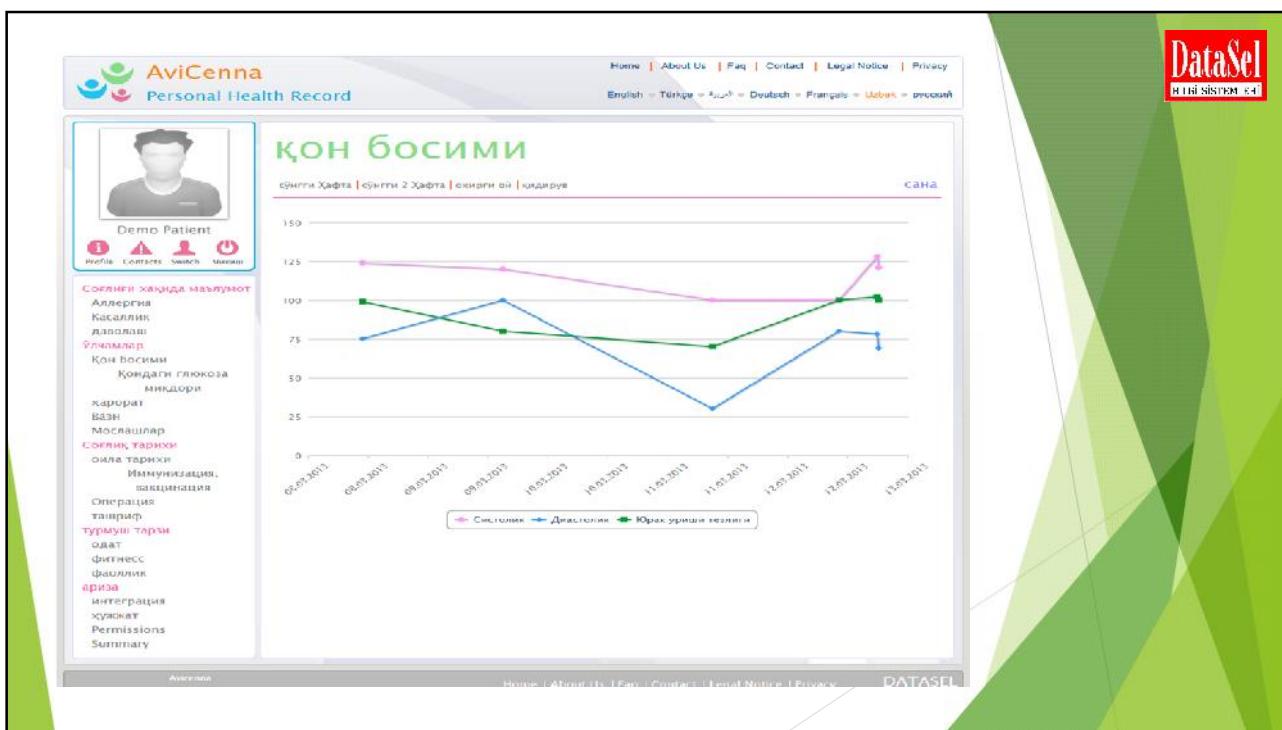
MEASUREMENTS

The interface shows a table of measurements and a line graph. The table has columns for Measurement Time, Systolic, Diastolic, Pulse, and Pulse Regularity. The graph plots Systolic (orange), Diastolic (green), and Pulse (yellow) over time from 1:15 PM to 1:40 PM. A callout box highlights a peak in the diastolic reading of 120 mmHg at 1:25 PM.

Measurement Time	Systolic mmHg	Diastolic mmHg	Pulse bpm	Pulse Regularity
1:15 PM	110	80	70	Regular
1:20 PM	80	90	100	Regular
1:25 PM	75	120	95	Regular
1:35 PM	130	80	150	Irregular
1:41 PM	120	70	95	Regular

The screenshot shows the AviCenna Personal Health Record website. At the top, there are logos for AviCenna (with a green and blue stylized figure), Ucell (with a purple globe icon), and DataSel (with a red and white logo). The top navigation bar includes links for Home, About Us, Faq, Contact, Legal Notice, Privacy, English, Türkçe, العربية, Deutsch, Français, Uzbek, and русский. Below the navigation, the main title "Ибн Сино Personal Health Record" is displayed. A large image of a woman in an orange sweater sitting at a desk looking at a computer screen is the central visual. To the right of the image is a login form with fields for "Фото/документ/личные данные" (Photo/Document/Personal Data) and "Пароль" (Password), followed by a "Карта" (Card) button. Below the form is a link "Can't access my account?". At the bottom of the page, there is a footer with "Personal Health Record" and links for Home, About Us, Faq, Contact, Legal Notice, Privacy, and "DATASEL © Copyright 2010".

The screenshot shows a detailed patient profile page. At the top, it displays the AviCenna Personal Health Record logo and the DataSel logo. The main title "шахсий" (Patient) is centered above the profile information. On the left, there is a sidebar with a user photo placeholder, a "Demo Patient" label, and icons for Profile, Contact, Search, and Logout. The main content area is divided into several sections: "Хисоб" (Account) with "Name: Demo", "Email: demo@dataSel.com.tr", and "Last login: 2013-09-24 10:22:28"; "демографик" (Demographic) with "Физиология: мальчик", "Отношение к полу: женщина", "Отношение к полу: мужчина", "Фамилия: Иванов", "Имя: Иван", "Отчество: Сергеевич", "Город рождения: Москва", "Контакты: +79555555555", "Место рождения: Москва", and "Адрес: Москва, улица Красная, дом 10"; "мулодот қилиш" (Delivery) with "Женская половая система: матка", "Установка матки: матка", and "Матка"; "Security" with a key icon and a "Change Password" button; and a "To change your password please click on the change password button." message. The bottom right corner of the page features a QR code.





Thank you!

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