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sense and simplicity

Innovations to improve people's lives
a care cycle ICT approach in Healthcare

Rick Harwig, CTO



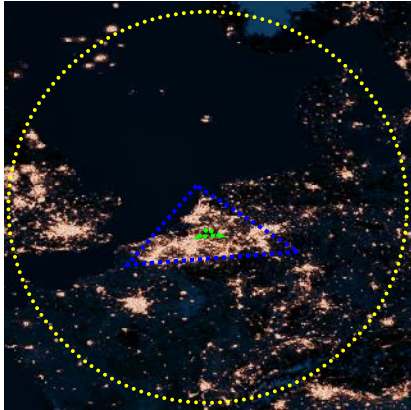
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Innovations to improve people's lives
a care cycle ICT approach in Healthcare

- Global competitiveness
 - Europe's regionally connected towns versus Mega cities
- Cardiac care, treatment and compliance
- Interactivity at the hospital bedside
- Activity monitoring and feedback in Directlife venture

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Our Rhein Meuse Schelde Delta is Europe's mainland gateway



- ~ 44 million people
- Diverse economy of ~ 1 trillion € regional GDP
- Networks of Main ports and Brain ports including Brussels
- Strong in business, services, science, technology, industry, agro, food, and transport
- Important centres within convenient travel distance
- Global Gateway to mainland & world
- 45% of logistics market share to Europe including major international activities

Living Earth Inc 15 Jan 2002

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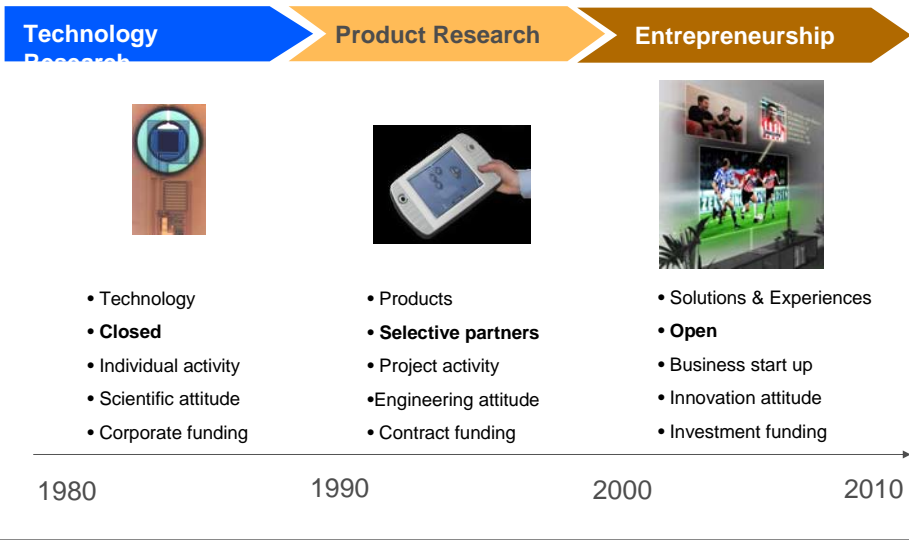
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50% of the global villagers live in (mega) cities



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The scope of innovation continues to change



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Open Innovation at High Tech Campus Eindhoven

80 companies, institutes,
agencies, VCs
> 7500 people
> 50 nationalities



A collection of logos for various partners and organizations at High Tech Campus Eindhoven, including:

- IBM, ASML, NP, ZEISS, océ, PHILIPS, Agilent Technologies, Holist Centre, TCO, imec, ctmm, Embedded Systems INSTITUTE, FOM, FEI COMPANY, Corporate innovators, Research institutes, DALSA, corus, CASCADE, MiPlaza, Point-One, NewVenture Partners, High Tech Campus Eindhoven, DELTAPATENTS, YACHT, brainport eindhoven, Consultancy & services, Start Up companies, amBX, HANDSHAKE SOLUTIONS, iRex, accenture, EUROPARTNERS, VDL, VDL Enabling Technologies Group, DSP VALLEY, fluXXion, Silicon Hive, Polymer Vision, and Liquavista.

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Philips Research: application focus as of 1914,
today we focus on people first, not on “things”

HomeLab

ShopLab

CareLab



Gilles Holst *, *“never look at the thing itself, but always at the things surrounding it, because it is from there that the answer must come”*

* Research Director 1914 - 1946

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Communication and information exchange in
global life



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and emerging markets....

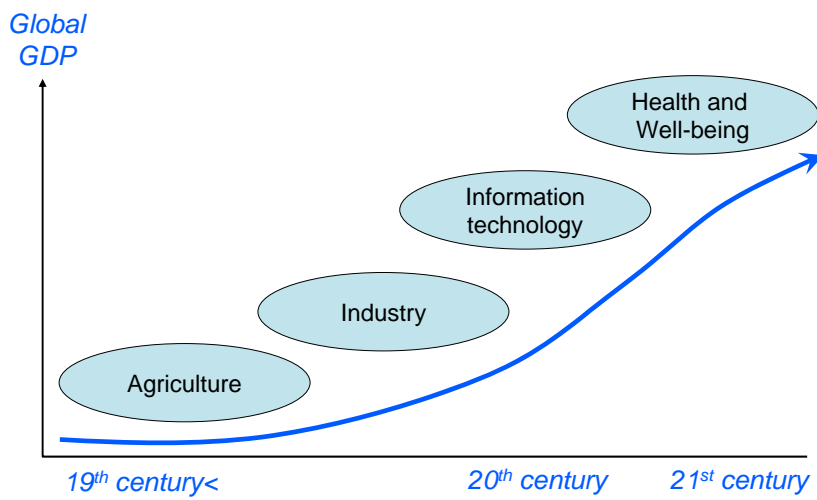


by IDSA
BusinessWeek

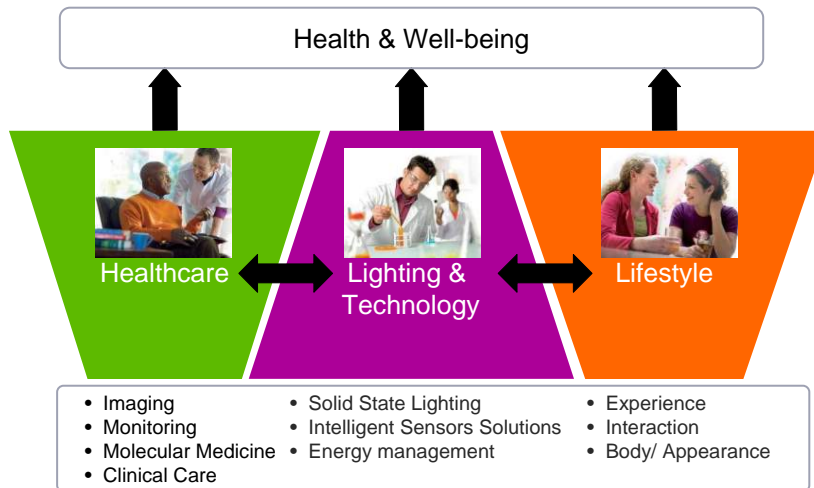


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Health and Well-being: the next economic wave



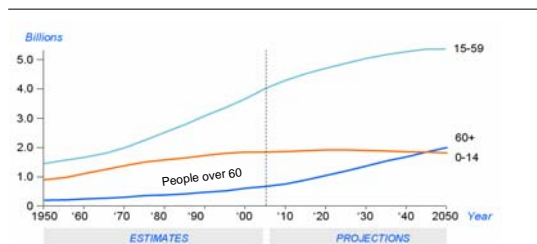
Philips Research focus on a broad set of innovations to improve people's lives



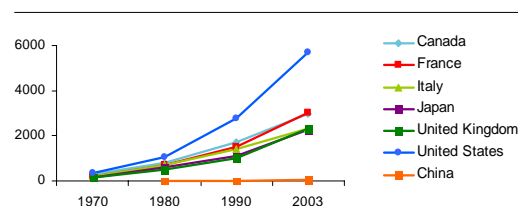
Healthcare trends – aging population, cost pressures, health-at-home, emerging markets growth

- Global population is increasing and aging
- People are living longer with chronic diseases
- Healthcare costs are becoming unsustainable
- Healthcare at home is an increasingly viable and cost effective
- People are becoming increasingly aware of the impact of lifestyle on health

*World population by age group, 1950-2050 **

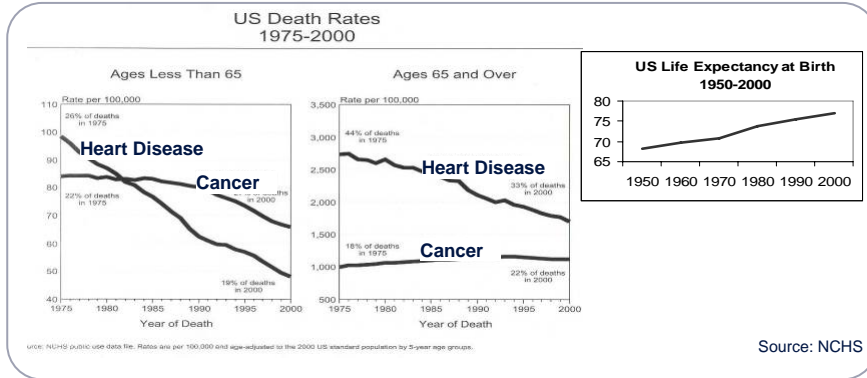


Healthcare expenditure per capita, US \$



Source: UN, 2006 Revision of World Population Prospects, http://www.un.org/esa/population/publications/wpp2006/FS_ageing.pdf

Medical technologies have improved Healthcare



Around 70% of the survival improvement in heart attack mortality is a result of changes in technology

Significant new *Healthcare* product introductions

Neurology



World's first combined MR, X-Ray and CT machine installed in Japan

Cardiology



Integrated cath lab



EP Navigator

Women's Health



Avalon FM 20 & FM 30 fetal monitors



Healthcare Informatics

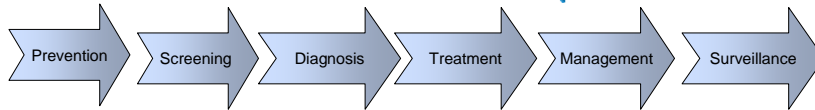
Xcelera R2.1 cardiovascular workstation

A Care Cycle approach to Healthcare

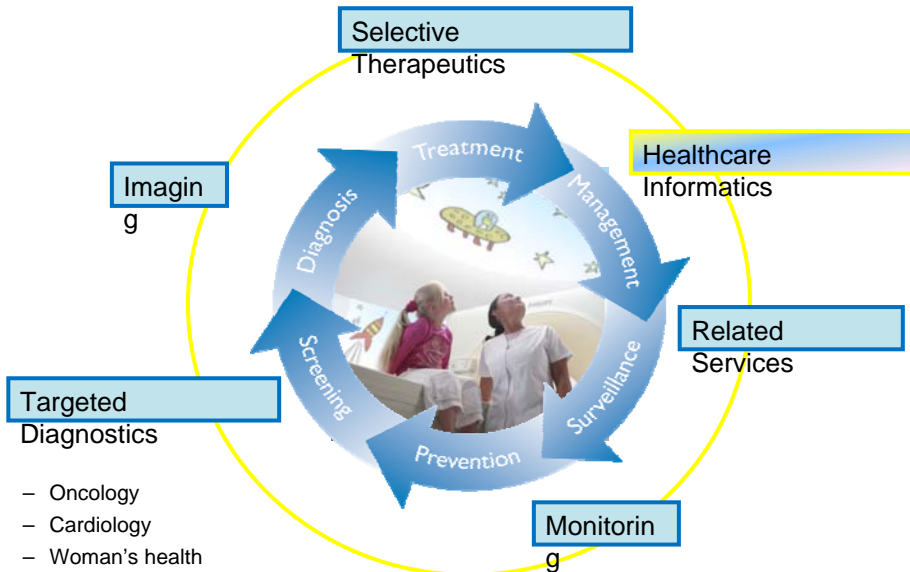
Increasing the quality of care while simultaneously increasing the efficiency per euro spent, will require a holistic approach to healthcare delivery

Philips focuses on Care Cycles for

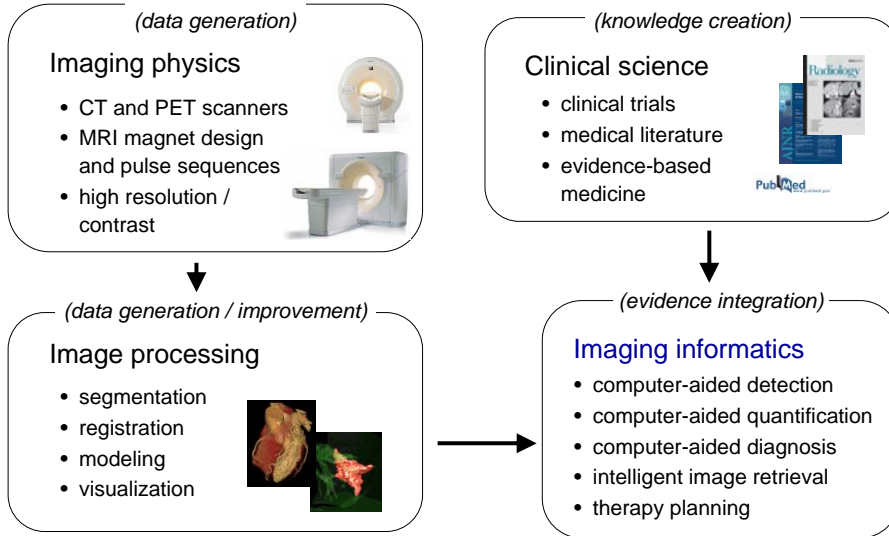
- Oncology
- Cardiology
- Woman's health



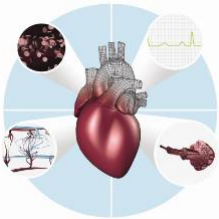



Informatics to integrate Healthcare across cycle



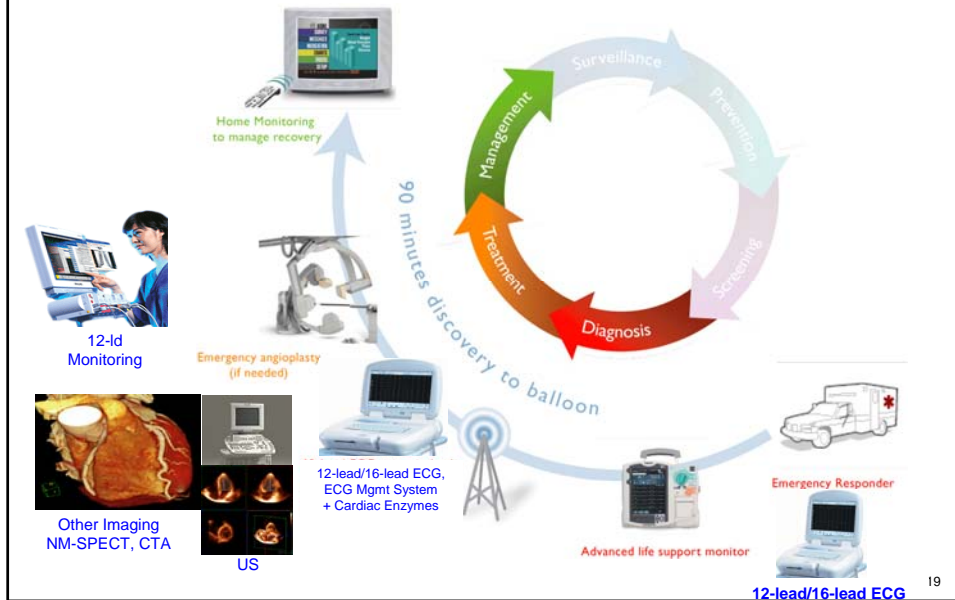
Imaging based Clinical Decision Support



ICT for Healthcare

 <p>euHeart <i>Heart models for cardiac care</i></p>	 <p>HeartCycle <i>Home monitoring of cardiac patients</i></p>
 <p>Directlife <i>Activity monitoring</i></p>	 <p>CareServant <i>Interactive multimedia for patients</i></p>

Innovation for Acute Coronary Syndrome – Door to Balloon Time

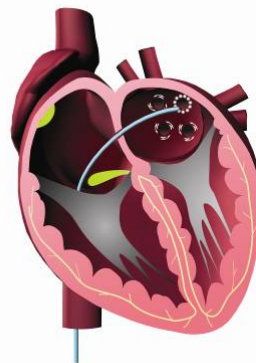


euHeart project (EU 7th Framework Program)

Target Applications

Improving the diagnosis, therapy planning and treatment of cardiovascular disease:

- Heart failure
 - cardiac resynchronization therapy
 - congenital cardiac surgery
 - left ventricular assist devices (auxillary pumps)
- Heart rhythm disorder
 - radiofrequency ablation
- Coronary artery disease
 - revascularization using coronary stents
- Valvular and aortic diseases
 - diagnosis and treatment



Clinical need

- Cardiovascular diseases (CVD) represent a significant contributor to loss of quality and quantity of life within Europe
 - each year CVD causes over 1.9 million deaths
 - total estimated cost of €105 billion
- Several examinations are usually performed for the diagnosis and therapy selection of CVD.
 - to exploit the full value of these complementary examinations, there is a need for consistent data integration and interpretation

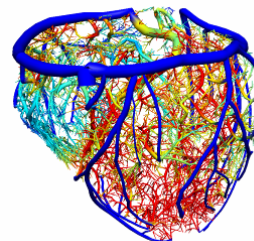
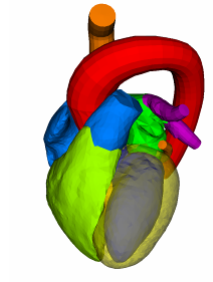


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Proposed solution

Heart models

- Models include the interaction **across temporal and spatial scales** from molecules to cells, tissues, and organs
- Combine models of the human **physiology** together with **imaging** data for early diagnostics and therapy selection

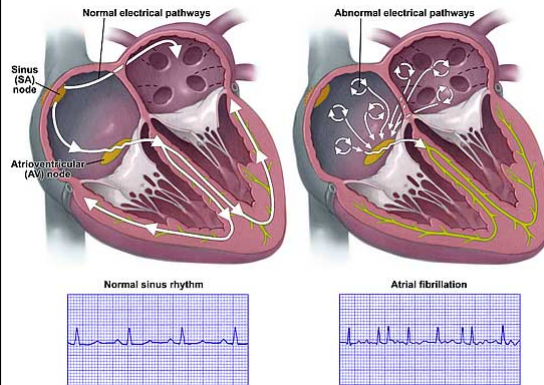


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Atrial Fibrillation (AF)

Incomplete ejection of the blood from the heart chamber

About 15 percent of strokes occur in people with atrial fibrillation (American Heart Association).



AF treatments:

- Controlling heart rate
 - Anti-arrhythmic drugs
- Preventing thrombus formation
 - Anti-coagulation drugs
- Correcting the rhythm disturbance
 - Cardioversion
 - **Catheter ablation**

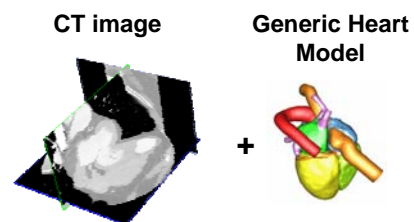
Cardiac electrophysiology (EP)

Correcting the rhythm disturbance by catheter ablation under X-ray guidance

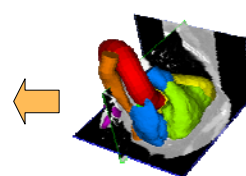
Clinical need: Accurate visualization and navigation of the catheter.

Challenge: X-ray images the catheter, but not the anatomical details of the heart.

Solution: Fusion of pre-acquired CT information with real time X-ray images using sophisticated heart models.



Personalized heart model



HeartCycle project (IST-e-health 7th framework)

Target Applications

- *Chronic Disease Management: Heart Failure*
 - 10 million patients in the EU are treated for Heart Failure
 - Over €3bln hospitalization cost in the EU
- *Secondary Prevention: Coronary Heart Disease*
 - Most common cause of death in Europe (~22%)
 - 18% of men and 35% of women have 2nd heart attack



Clinical need

Problem of non-adherence to treatment

- Non-adherence to treatment regime is major problem
- Primary reason for suboptimal clinical benefit
- 11 percent of hospitalisations result from poor adherence with prescribed medication

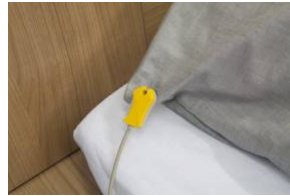
Increasing the level of patient compliance may have a far greater impact than improvements in specific medical treatments



Proposed solution

HeartCycle concept

- Closed-loop management of medication and lifestyle compliance
- Monitoring of vital signs and other parameters
- Motivating patients to adhere to treatment regime by providing feedback on the short- and long-term effects of non-compliance
- Decision support and care plans for optimal treatment
 - Patient-loop
 - Professional loop



CareServant

Target application

To provide:

- A communication and information service platform that enhances the quality of life of hospital patients
- Solutions that allows hospitals to improve their quality of care and increase efficiency

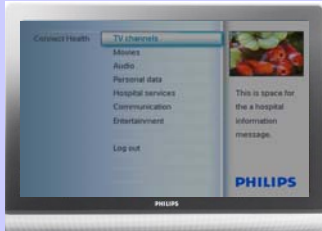


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Solution

Philips Careservant

Interactive network-TV



Touchscreen



Media Work table



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DirectLife

Target Applications:



The development of unique new approaches to boosting people's health and well-being

- *Employees:* productivity and sustainability
 - Less than 50% of employees reach the activity targets of WHO
 - Active employees are healthier
 - A healthy employee is more productive
 - A health employee produces lower health care cost and is less often absent
- *Consumers:* friends and family of employees
 - Home circumstances influence behaviour of employees
 - Joint participation increases success

directlife

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Need

Limited activity levels of employees

- Not reaching recommended levels is the standard
- Inactivity relates to prevalence of chronic diseases like chronic heart disease, stroke, diabetes, cancer and others



Increasing their activity levels may lead to healthier employees, resulting in higher productivity and lower health related cost



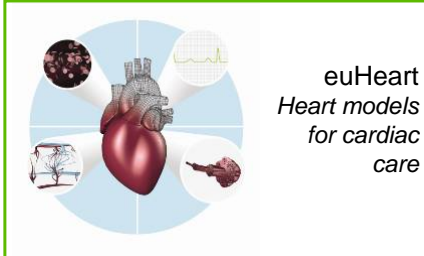
Solution

Directlife service

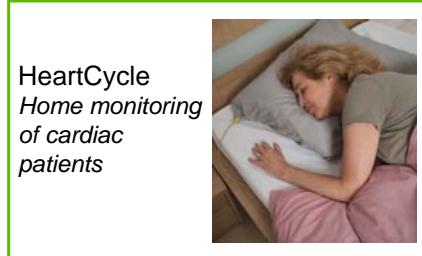
- A complete service concept that creates awareness on users activity and helps to change towards a more healthy lifestyle
 - A very small activity monitor (that you can even swim with !)
 - A web based, step by step program
 - Personal emails and messages
 - A real personal coach
- Users tell us that they find the service Fun and Easy
- We see significant behavior change for inactive users



ICT for Healthcare



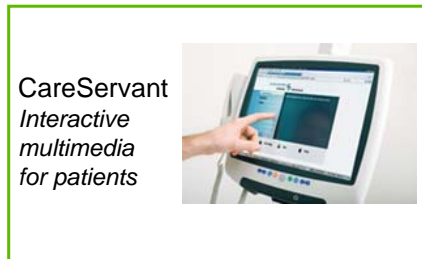
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