Innovative solutions for an improved Workflow
Opportunities from global Megatrends drive the long term strategy at Siemens

- Energy & Environmental Care
- Automation & Control, Industrial & Public Infrastructures
- Healthcare
Siemens recent acquisitions reflect this well

Major acquisitions
- VA Tech
- Wheelabrator
- Sustec
- Bonus
- US Filter
- Flender
- Robicon
- Berwanger
- VA Tech
- Electrium
- UGS

More than 40 deals since 2000
Transaction volume > 10" EUR (12"7 USD)
Through recent acquisitions, we aim to serve the full continuum of care.

- **2000:**
  - Shared Medical
  - Workflow-oriented IT
  - Prevention & Early Detection

- **2005:**
  - CTI

- **2006:**
  - DPC
  - Bayer Diagnostics

- **2007:**
  - GSD

**Workflow-oriented IT**

- Diagnosis
  - In-vitro Diagnostics (IVD)
  - In-vivo Diagnostics (Imaging)

- Therapy

- Care

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First integrated diagnostics company

In-vivo diagnostics (major medical imaging systems)
- X-Ray
- Computed Tomography
- Magnetic Resonance
- Molecular Imaging
- Ultrasound

Healthcare IT

In-vitro diagnostics (major medical laboratory systems)
- Immuno-diagnostics
- Nucleid Acid Testing
- Clinical Chemistry
- Hematology
- Urinalysis
- Lab Automation
- Near Patient Testing
First integrated diagnostics company …
… it makes sense: e.g. Breast Cancer

Workflow Oriented IT

Prevention and Early Detection

Accurate Diagnosis

In Vitro Diagnostics (IVD)

- Genetic marker panel
- Assay sensitive to protein expression
- Mammography

In Vivo Diagnostics (Imaging)

- Mammography;
- Sonography;
- Breast MRI
- Molecular imaging

Personalized Therapy

- Molecular diagnostics for therapy selection
- Image-guided radiation therapy

Ongoing Care

- Proteomic test

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How to best improve healthcare efficiency

Quality of Healthcare delivery

Cost

through

- Innovation
- Process-optimization

Proven Outcomes

Two words: Improve Workflow

Prevention / Early detection

Diagnosis

Therapy

Care
Mandatory for every employee.
E-learning initiative for 41,000 Med employees

Founded on three pillars:
- Experience Customers’ World
- Understand Customers’ Business
- Learn to improve Customers’ Competitiveness
Workflow improvement – Top priority in our customers minds

“... radiology’s Holy Grail: improving departmental workflow.”

Top 10 Trends by facility type:

<table>
<thead>
<tr>
<th>Hospitals in the United States</th>
<th>US Imaging Centers:</th>
</tr>
</thead>
<tbody>
<tr>
<td>over 500 beds:</td>
<td></td>
</tr>
<tr>
<td>1. Improving Workflow</td>
<td>1. Increasing Procedure Volume</td>
</tr>
<tr>
<td>2. Adding CT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Improving Workflow</td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td>200-500 beds:</td>
<td></td>
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<tr>
<td>2. Increasing Procedure Volume</td>
<td></td>
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<tr>
<td>&lt; 200 beds:</td>
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<td>1. Improving Workflow</td>
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</tbody>
</table>

Source: Health Imaging & IT, October 2006 (US market survey)
Soarian – First and only winner of WARIA Workflow award for Healthcare

- Soarian Customer wins honorous reward
- Chester County Hospital: “2006 North American Global Excellence Business Process Management (BPM) and Workflow Award from WARIA”

⇒ More than 50 documented Soarian Workflows in active use across 15 sites.
Med IT Strategy –
In the future, extracted knowledge will become more important

- Highest degree of integration with Soarian/SAP, Syngo and Remind
- Open architecture, meaning components of different vendors can be interfaced. However, higher degree of integration yields higher performance.
- Knowledge management / data mining will become more important:
  Extract objective measurements, Support reading/analyzing huge (image) datasets, Determine what are significant differences, Combine all data available per patient (longitudinal) and across cohorts (horizontal) to support decision making for the physician.
Example: Computer Aided Detection (CAD) – syngo Lung CAD

Steps:
1. Identification of nodes
2. Quantification
3. Comparison with prior exams
Cardiac MR – One-stop-shop

Prevention  Diagnosis  Therapy  Care

Atherosclerosis  CAD / Heart attack  Integration to cardiac procedure planning  Heart function follow-up after infarct

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Example: 4D Display of Cardiac Function – Argus 4DVF for magnetic resonance imaging

E.g.: Ejection fraction (EF), as a key parameter for therapy decision, can be determined with high accuracy in cases where ultrasound fails.

Image Courtesy: SCR Princeton
Workflow improvement through innovation – e.g. the World’s First Dual Source CT

... First results
DSCT saves 68 min vs. oral β-blocker application (10 min vs. IV β-blocker application)
DSCT Clinical results –
Dual Energy stone characterization supports therapy decision

- Stone type differentiation*, allows to select adequate therapy. E.g. drug therapy in case of uric acid type stones instead of intervention.

* Stone type differentiation by conventional diagnostics requires contrast agent and results show only limited accuracy.
Workflow improvement through innovation – e.g. *syngo* DynaCT

<table>
<thead>
<tr>
<th>Without DynaCT</th>
<th>Intervention</th>
<th>Transport to CT</th>
<th>CT</th>
<th>Transport from CT</th>
<th>Continued Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incident (e.g. bleeding)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>With DynaCT</th>
<th>Intervention</th>
<th>DynaCT</th>
<th>Continued Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Time is brain&quot;</td>
<td></td>
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</tbody>
</table>
**syngo DynaCT Cardiac –**
Workflow improvement in Cardiology

Real-time 3D images in the EP lab

- 3D/4D cardiac reconstruction – acquired during procedures like AFib* ablation
- Patient needs no workflow delaying intra-operative visit for CT/MRI

* Atrial fibrillation (AFib) is an abnormal heart rhythm originating in the atria (top chambers of the heart). Instead of the impulse traveling in an orderly fashion through the heart, many impulses begin simultaneously and spread through the atria, causing a rapid and disorganized heartbeat.

Courtesy of Amin Alahmad, MD, Stanford University, USA

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Digital Breast Tomosynthesis
Earlier detection and 3-D information

3D Tomosynthesis dataset
71 slices of 1 mm thickness
(slice 25 displayed)

Conventional (2D) digital mammography image

2.8 cm ductal carcinoma grade 3

Goal: Increase both, sensitivity and specificity.

*Works in Progress. The information about this product is preliminary. The product is under development and is not commercially available in the U.S. Future availability cannot be ensured.
Workflow improvement in MR – syngo Tim CT: Continuous table movement powered by Tim

MR as simple as CT more advanced than ever
**syngo TimCT** – Paradigm Change in MR
From Local to Total

**Conventional Local MR**

**Total MR with TimCT**

Metastasis Evaluation in Oncology

12 min in 4 steps

4 min in 1 move

ImageCourtesy: J. Hennig, Ute Ludwig, Matthias Honal, Oliver Schäfer, Gregor Pache, Tobias Baumann; University of Freiburg

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Workflow improvement in MR – *syngo* DTI Tractography…

Image courtesy: SCR Princeton
Workflow improvement in MR – syngo DTI Tractography… for presurgical planning

MAGNETOM Trio A Tim system

Courtesy of Morton Grove, Chicago, USA

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MAGNETOM 7T* -
“On it’s way to replacing the Microscope”

Non-invasive visualization of microscopic anatomy in-vivo

Histological Section

Corticospinal Tracts

7T MRI In-Vivo

Corticospinal Tracts

*Works in Progress. The information about this product is preliminary. The product is under development and is not commercially available in the U.S. and its future availability cannot be ensured.

Courtesy of Prof. Cho et al., Seoul, S. Korea

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MAGNETOM 7T* Community – 17 of worldwide ~30 high-field sites

- Massachusetts General Hospital, Boston, USA
- Institute for Neuro-Biology, Magdeburg, Germany
- New York University, NYC, USA
- Center for MR Research, Minneapolis, USA
- Oregon Health Center, Portland, USA
- Gachon University, Seoul, Korea
- University of Essen, Essen, Germany
- Center for Imaging in Biomedicine, Lausanne, Switzerland
- University of Pittsburgh, Pittsburgh, USA
- Max Plank Institute Tuebingen, Tuebingen, Germany (9.4T)
- Atomic Energy Commission (CEA), Paris, France
- Max Plank Institute Leipzig, Leipzig, Germany
- Medical University of Vienna, Vienna, Austria
- University of Juelich, Juelich, Germany (9.4T)
- German Anticancer Research Center (DKFZ), Heidelberg, Germany
- Hospital University of Philadelphia, Philadelphia, PA, USA
- Max-Delbrueck Centrum, Berlin, Germany

*Works in Progress. The information about this product is preliminary. The product is under development and is not commercially available in the U.S. and its future availability cannot be ensured.
Impact of Molecular Medicine and IT

Molecular Medicine advancements
converted into new
In-vitro diagnostics and molecular imaging

Earlier Prevention
More specific Diagnosis
More efficient Therapy
Highest quality Care

IT integration & mining of medical data
translated into knowledge-driven healthcare

Two words: Improve Workflow

Disease orientation
Visualisation of biologic processes in vivo requires a sufficient measurement signal.

**Morphology**  
**Physiology**  
**Metabolism**  
**Molecules**

- **CT**  
  Dynamic, Perfusion

- **US**  
  Dynamic, Flow-through, Perfusion

- **MRI, MRS**  
  Dynamic, Flow-through, Perfusion, Diffusion, Molecules

- **NM**  
  Perfusion, Molecules

- **Fluorescence (optical)**  
  Molecules

1 Molecule/Cell

$10^6 - 10^8$ Molecules/Cell

Multiple Molecules/Cell

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BrainPET for MAGNETOM Trio -
First results

Siemens first in-vivo images simultaneously acquired by MR and PET (17.11.06)

Courtesy of University of Tennessee, USA and University of Tuebingen, Germany
Lymphnode Evaluation in Oncology with MR –
New Iron Oxid Contrast Media and Innovative Image Processing

Typical lymph node size: > 1 mm

Image courtesy of Prof. Barentzs, Nijmegen

Automatic Lymphnode Identification

> 90% Specificity

Precise Decision Surgery vs RT

* Works in Progress. The information about this product is preliminary. The product is under development and not commercially available in the U.S., and its future availability cannot be ensured.
Introducing HD•PET
World’s first High-Definition PET scanner

HD•PET is world’s first and only PET technology to offer 2mm uniform resolution across entire field of view.

HD•PET allows visualization of small lesions with highest available resolution and contrast.

Source: Data Courtesy of University of Erlangen

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Superior specificity of FDDNP over FDG may improve diagnosis/monitoring of Alzheimer’s disease

IND*- filing by FDA accepted as of July 31st 2006

[18F] FDDNP
- FDDNP marks amyloid plaques in the brain.
- Amyloid plaques are a specific sign for Alzheimer’s Disease

[18F] FDG
- FDG only shows a decrease in metabolic activity
- An unspecific sign of many neurological disorders


* Investigational New Drug application
** Mild Cognitative Impairment
Superior specificity of FLT over FDG improves diagnosis/monitoring of Brain Tumors

\[^{18}\text{F}\] FLT

- FLT marks cell proliferation
- Proliferation distinguishes growing tumors from healthy brain tissue.

*Phase 1/2 studies ongoing.

\[^{18}\text{F}\] FDG

- FDG only shows a weak increase in metabolic activity
- Disturbed by strong background signal from normal metabolic brain activity.

Proven Outcomes
Trendsetting, workflow improving innovations have driven growth

Market share gains

- **+5%**
  - SOMATOM Definition First Dual Source CT

- **+6%**
  - Biograph 64 TruePoint PET-CT

- **+14%**
  - MAGNETOM Espree First Open Bore 1.5 T

2002 CT  MI  MR  2006
Since 1997, we achieved substantial growth in profit and sales.

**Key results** in EUR billions

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales (in billions)</th>
<th>Profit (in billions)</th>
<th>Margin (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>3.4</td>
<td>-0.084</td>
<td>-2.4%</td>
</tr>
<tr>
<td>2006</td>
<td>1.061</td>
<td>8.2**</td>
<td>12.9%</td>
</tr>
<tr>
<td>2006 pro forma*</td>
<td>11.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Sales adjusted by USD-currency effects compared to 2001 and including full IVD business (Bayer Dx and DPC) as of 2005.
... a fascinating challenge for a partnership approach