MEDIATE
Patient friendly medical intervention

Co-summit 2015, March 10-11, 2015
Berlin, Germany
Herman Stegehuis (Philips Healthcare)
Agenda

- Trends in healthcare
- Role of MEDIATE
- Clinical use case scenarios
- Results
- Key success factors
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Trends in healthcare

From open surgery
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Trends in healthcare

From open surgery

To minimally invasive surgery
Expanding field of applications
Benefits of minimal invasive surgery:

- Improves quality of life
- May enable treatment when open surgery is no option
- Reduces costs significantly
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Trends in healthcare

- 10% of GDP in Europe is spent on healthcare

- Increasing number of patients, complexity, costs:
  - Ageing population
  - More chronic and degenerative diseases
  - More combinations of diseases
  - Healthcare professional staffing shortages
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Role of MEDIATE

Solutions for:

- Image guidance

X-ray
US
MRI
CT
OCT
Role of MEDIATE

Solutions for:

- Image guidance

X-ray
US
MRI
CT
OCT
Role of MEDIATE

Solutions for:

- Catheter/needle manipulation
Role of MEDIATE

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- Catheter/needle manipulation
State of the art: From many independent screens and solutions
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Role of MEDIATE

State of the art:
From many independent screens and solutions

To one integrated workspot with an optimized UI

an architecture for an integrated intervention room
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Role of MEDIATE

State of the art:
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an architecture for an integrated intervention room

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Role of MEDIATE

- 5 industries
- 12 SMEs
- 10 universities/research institutes, linked to 6 hospitals
<table>
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<tr>
<th>Use cases</th>
<th>Demonstrators</th>
<th>MEDIATE</th>
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<tbody>
<tr>
<td>Cardiac RF ablations</td>
<td>Registration of pre-operative MR data with EP recordings</td>
<td>Real-time MR tracking of morphological structures and devices</td>
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<tr>
<td>Transcatheter Aortic Valve Implantation (TAVI)</td>
<td>Pre-/intra-interventional registration and overlay of some pre-operative data onto interventional images</td>
<td>Augmented reality interface with simple and clinician oriented decision making aid data</td>
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<tr>
<td>Percutaneous Coronary Interventions</td>
<td>Fusion of pre-operative CTA and intra-operative OCT</td>
<td>Multi-modal Coronary Lesion Evaluation and Qualitative Comparison: X-ray based 2D+time &amp; 3D+time</td>
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<td>Minimally-invasive treatment: needle ablation</td>
<td>Needle planning &amp; needle tracking Real time MR/X-ray imaging of surgical devices</td>
<td>Xper guide based needle placement (without robot) incl remote visualization and representation of 3D data</td>
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<td>Single Incision Laparoscopic surgery (SILS)</td>
<td>SILS, guided by robotics with state of the art devices</td>
<td>SILS, guided by robotics with new robotic devices</td>
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<td>Bone tumor navigation</td>
<td>Ultrasound /MRI for navigation purposes: tracker calibration, US/MRI segmentation, tracking, registration</td>
<td>Simulation/planning of RF ablation (IT) and web visualization (pre-operative simulation and post-operative control, SQI)</td>
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<td>Corrective osteotomy</td>
<td>Optimal virtual planning of a corrective distal radius osteotomy, based on the relation with the contralateral radius and ulnae.</td>
<td>Metal Artifact Reduction in 3DRX images</td>
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<td>Innovative user interfaces in minimally invasive treatment</td>
<td>Remote visualization of procedural data &amp; interoperability: Peer to peer streaming of medical video data</td>
<td>Integrated solution for the visualization of medical image, video and data sources combined with workflow solution</td>
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Clinical use case scenarios
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Clinical use case scenarios

LTSI, Therenva

Medisys, Philips
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Clinical use case scenarios

Retrieval process along the operative workflow

LTSI, Therenva

Medisys, Philips

University Girona
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Clinical use case scenarios

Published Clinical Data
    Run locally
    MRI data
    Segmented image
    Initial + Boundary conditions
    Anatomical data
    Input for physiological reconstruction

IC (GIMIAS platform)
    Unicore Command Line Client
    Pre-Interventional reconstruction
    Physiological reconstruction
    Grid: HPC: parallel run on several clusters
    Directly visualized
    Unicore Storage
    Transferred / Stored

Atos, IAC3

Case 2
Task 1
Attribute 1
Attribute 2

Task 2
No info
Attribute 1

Case Base

Task n

Progressive workflow
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Clinical use case scenarios

Barco, iMinds, Vicomtech, SQI
More than 80 presentations and scientific papers
- 10 patents filed, at least 10 more in preparation
- Quantified system improvements by technical innovations
- Contributions to international standardization committees
- Participation in new projects
  - Project FLUOROMIS on endoscopy in France in 2013
  - ITEA project BENEFIT in Q4 2014
- Fast exploitation results and exploitation perspectives for all commercial partners
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Results

- Web based tool for collaborative treatment planning integrated into a
  - clinical application for a World TOP 10 company in orthopedics
  - workflow management software for radiotherapy

- Localization technology delivered to another World TOP 10 company in orthopedics

- Presentation in running ITEA project MEDUSA
Karl Storz endoscopy GmbH, number 1 in OR integration in Europe and number 2 on a worldwide scale, has released their new OR1 Fusion with Nexxis as their visualization backbone.

Kortrijk, November 18 2013, Merivaara has selected Barco’s Nexxis to form a critical part of its highly acclaimed OpenOR™ digital integrated operating room (OR) solution.

Kortrijk, November 21 2013, In today’s increasingly complex operating rooms, BuzzTM - Digital O.R. by Brainlab together with Nexxis, an IP-centric solution for image and audio management by Barco, will provide seamless integration with improved workflow efficiency for better patient care.

RASTATT, GERMANY, Feb 2015 — Maquet GmbH today announced a partnership with Barco to incorporate the company’s Video over IP technology as a powerful option within the TEGRIS OR integration system.
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Results

PHILIPS

- New features in Philips MR systems:
  - Motion compensation strategies during MR imaging
  - Metal artifact correction and UI for metal implants
  - Larger bore for improved patient access

- Entering the image guided intervention and therapy solutions market based on imaging improvements and integrating architecture

infraredx

March 7, 2013 -- …integration of Infraredx’s true vessel characterization (TVC) imaging system with Philips’ Allura Xper systems

VOLCANO

Dec 17, 2014 -- Major acquisition to boost Philips’ Image Guided Therapy business

- Significant additional annual sales volume due to this strategy and improvements.

The topic: solutions for a large market, a societal need and clear technical opportunities
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The consortium: balanced with research institutes, small and large industry and large participation and input from end users (including clinical advisory board)
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The focus: concrete clinical use cases and collaboration between many partners
Thank you for your attention