Open Source Imaging Initiative (OSI²)
Bringing affordable magnetic resonance imaging (MRI) to the world

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Problem

Why is MRI important?
Most powerful clinical imaging modality today
Key to the early diagnosis and successful treatment of infectious diseases (tuberculosis), musculoskeletal injuries and diseases (osteitis), trauma (brain/spinal cord injuries), cancer (breast cancer), lung diseases (pneumonia), etc.

Global MRI scarcity¹
(density per million population)

Complex & Costly
1-2.5 mio € for a scanner
Plus annual costs of
120,000€ maintenance
300,000€ operations
Total cost:
5.2 – 6.7 mio € over 10 years (!)

Developing countries: Very limited or no access to MRI
Industrialized countries: Long waiting times for an exam (>30 days in France)²

Solution

A Roadmap for Open Source research and development

Open Sourcing Research & Development
• Guidelines for open source hardware licenses
• Legal frameworks for open source hardware in research institutions
• Documentation and publication strategies

Building Open Source MR Hardware
• B₀=0.2T MRI (<10.000€)
• „mobile“ <100kg
• No liquid helium/nitrogen needed
• No power needed for the magnet
• Simple push-button scans
• Safer operation at low field
• Quiet scanning
• Open source documentation
• Open source development of lab equipment for building and testing the device

Business Opportunities
• Customized and local production
• Maintenance and service
• Training and workshops
• Certification

Lower costs of acquisition, maintenance and operation

Knowledge sharing and collaboration

Community Building
• Connecting the research, industry and maker communities for open source value creation
• Connecting medical doctors and developers (collaboration with OneWorldDoctors.org)

Ensuring patient safety

Quality, Reliability, Safety
• Guidelines for hardware development for a smooth transition from research prototype to medical device
• Collaborations with experts in the certification of medical devices and OpenQRS

Education
• Clear documentation and manuals
• Training developers and staff
• Interdisciplinary collaborations

Learning to develop, implement, maintain and understand

Creating regional markets with stable low prices: global access to MR Hardware

References:
1 World Health Organization, "Global Health Observatory (GHO) data: Medical equipment (density per million population)", 2014