Karlsruhe Institute of Technology

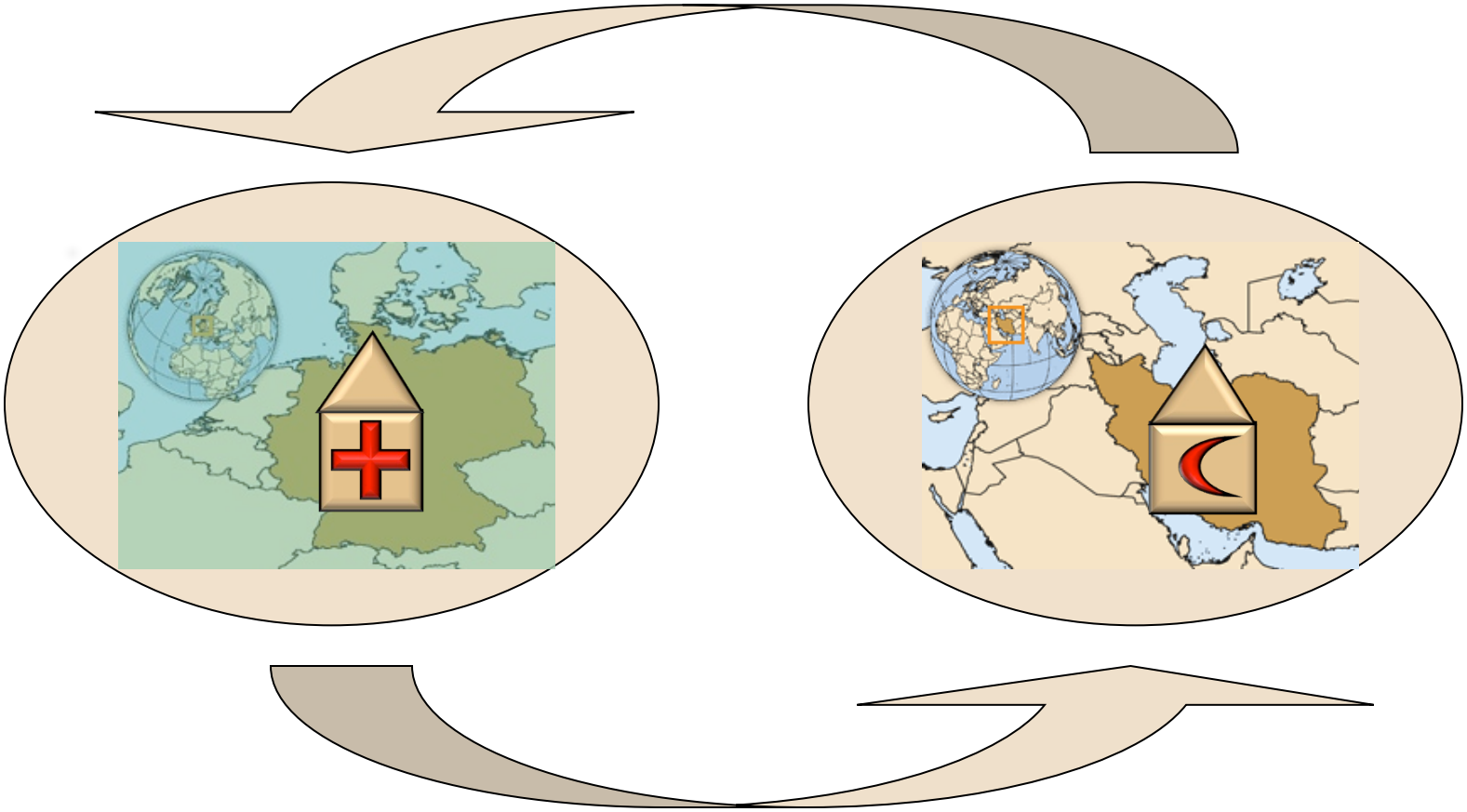
# System transferability of Facility Management in hospitals

Faculty of Civil Engineering, Geo- and Environmental Science,
Insitute of Technology and Management in Constuction (TMB), Department of Facility Management

4th European Conference on Healthcare engineering -
51e Journées d'études et de formation IHF

Purpose:

# System transferability of Facility Management?





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Research project:




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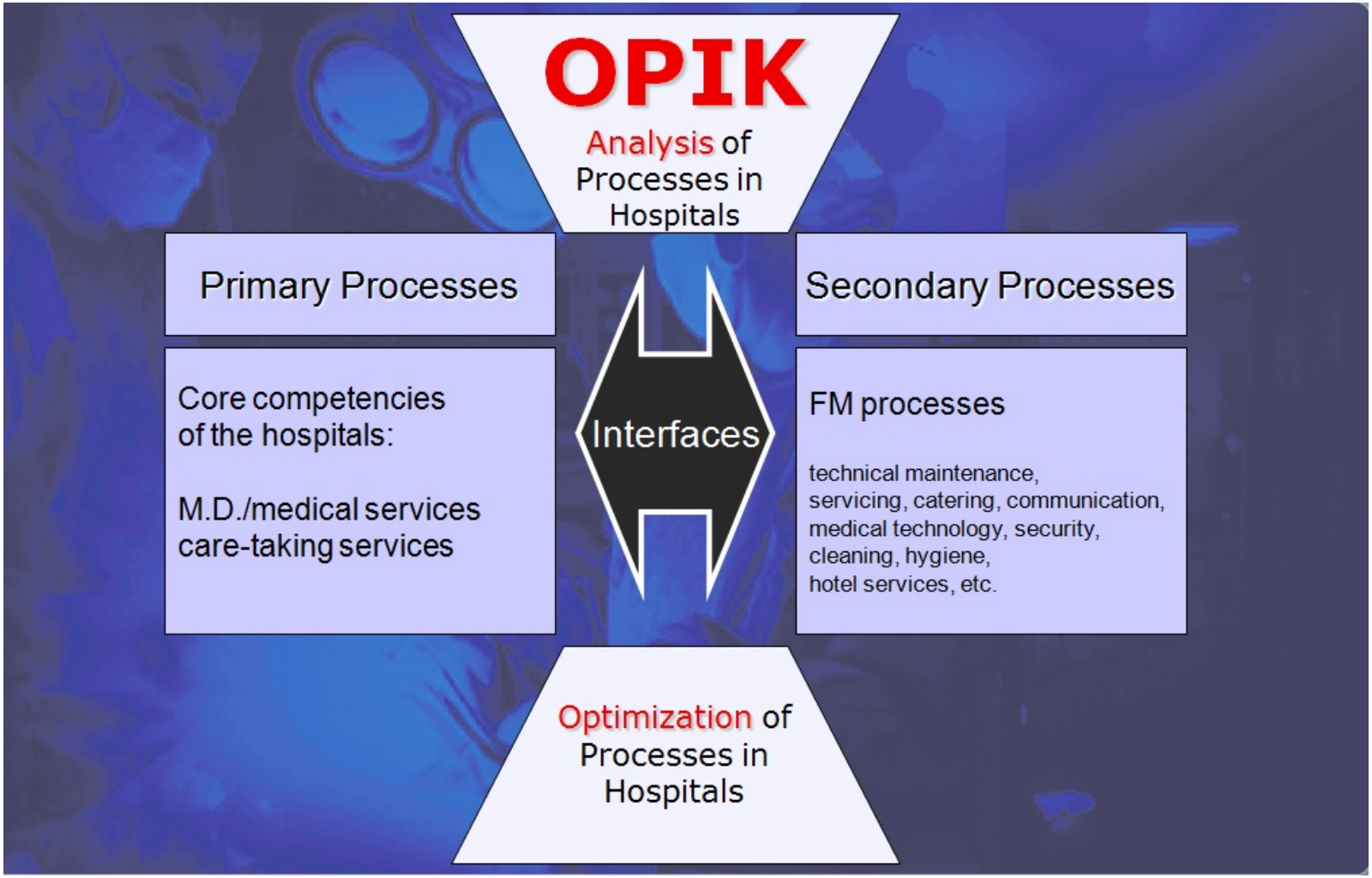
# Research project:




*Source [Lenenerts2003]*



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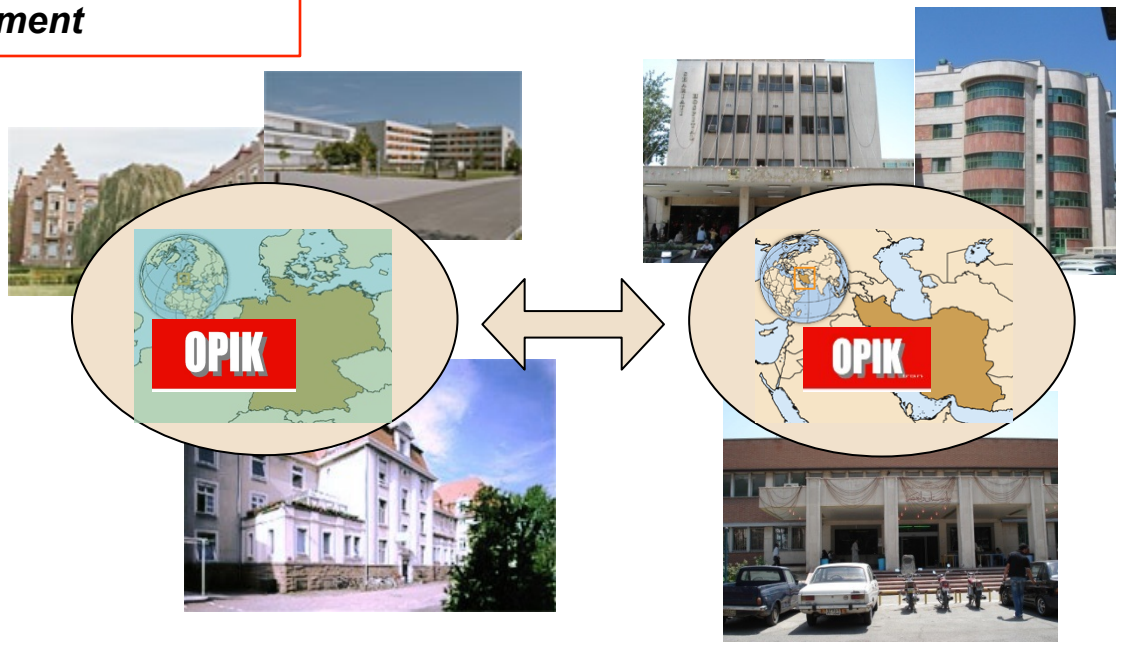
Realized processes:

- ***Maintenance and repair of technical facilities***
- ***Maintenance of medical equipment***
- *Logistic of pharmaceuticals*
- *Logistic of medical products*
- *Cleaning Management*
- *Sterilisation*
- *Waste Management*
- *Waste Water Management*
- *Organization*
- *Service Management*
- *Energy Management*
- *Repair Management*
- *Catering*
- ***Laundry Management***
- *Telecommunication Management*
- *IT-Management-*




Tehran University of Medical Science

- Vali Asr Hospital
- Shariati Hospital
- Tebie Kudakan Hospital



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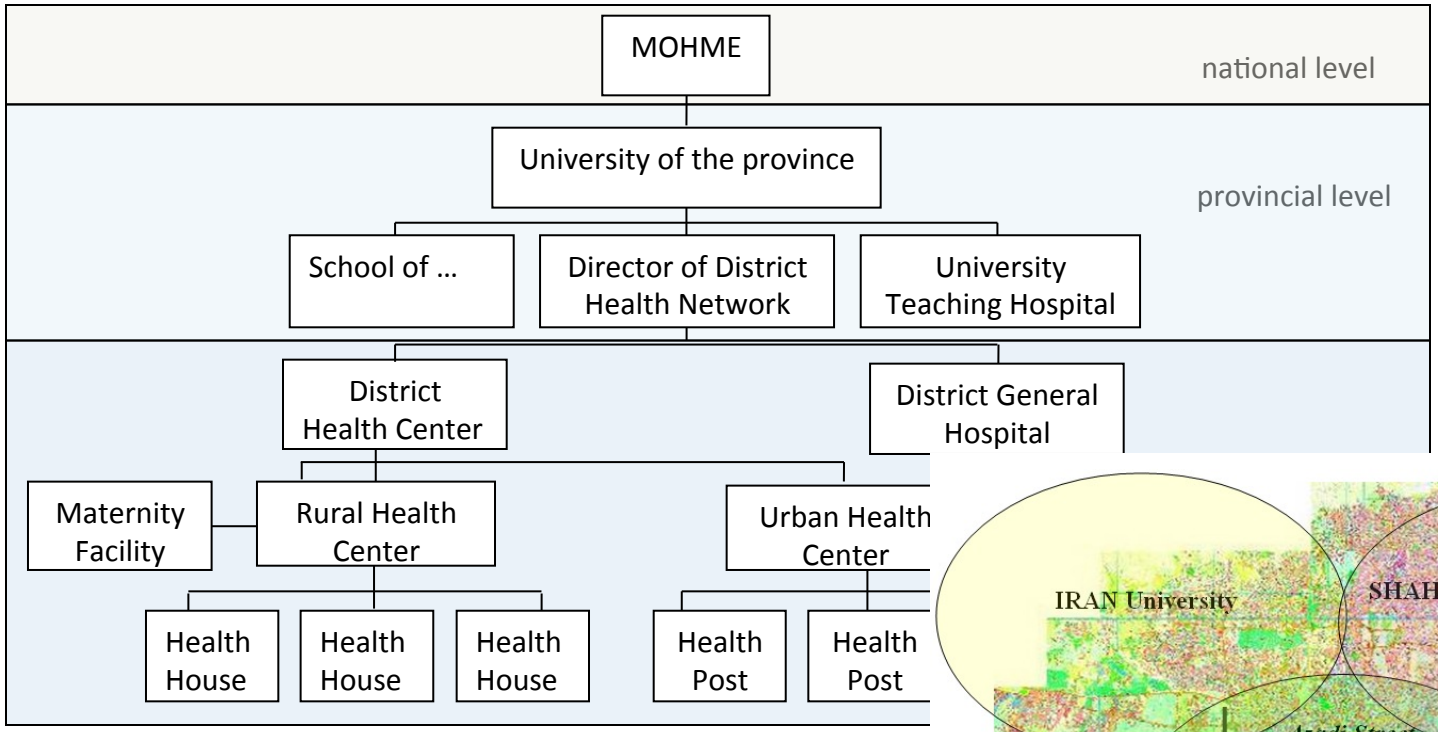
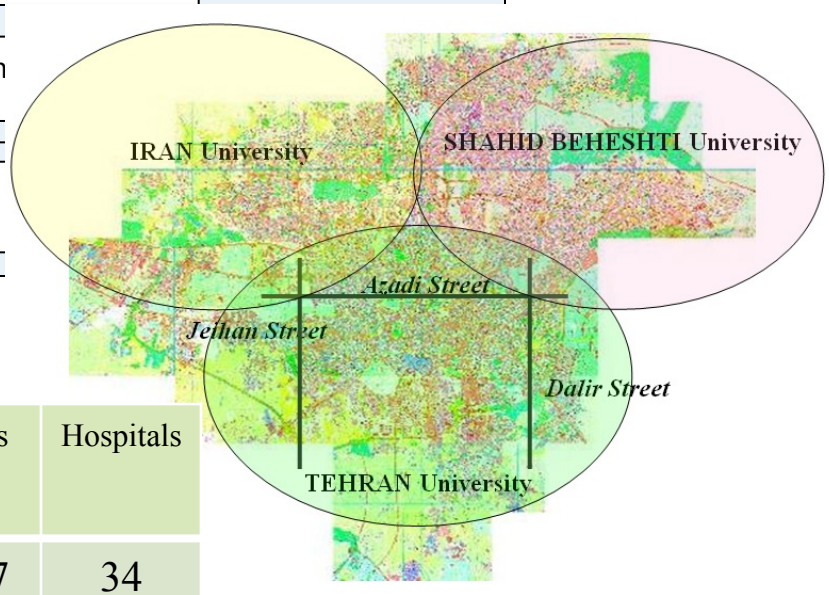
# The Iranian Health Care System:




| Urban Health Centers | Rural Health Centers | Health posts | Health houses | Pharmacies | Labs | Hospitals |
|---|---|---|---|---|---|---|
| 54 | 13 | 50 | 47 | 200 | 147 | 34 |



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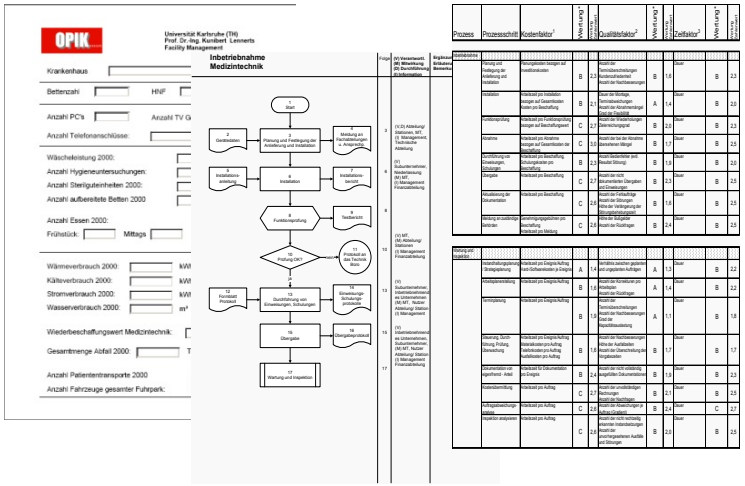
# Approach

| ***Project Hospital*** [1] | ***Tebie Kudakan*** | ***Vali-Asr*** | ***Shariati*** |
|---|---|---|---|
| Founding year | 1968 | 1975 | 1974 |
| Number of hospital beds | 245 | 365 | 830 |
| Number of inpatients 1384 (2004-2005) | 62.000 | 12.011 | 136.000 |
| Number of employees | 600 | 566 | 1.070 |
| Area of the site [m²] | 3.600 | 28.000 | 72.000 |
| Area of the hospital [m²] | n.s. | 20.000 | 33.247 |
| Annual budget [Milliarden Tooman] [2] | 1.2 | 4,4 | n.s. [3] |

[1] source MOHME
[2] 1Euro is equivalent to around 1200 Tooman (2006)
[3] Not specified




1. Questionaires
   - General questionaires
   - Process related questionaires
2. Analyse of the processes
   - Application area processes
   - Definition of the customers
   - Aims of the process
   - Description of the process
   - Responsibilities
   - Characteristic variables (cost and quality factors)
   - Interfaces
3. Data collection in the hospitals (20days)



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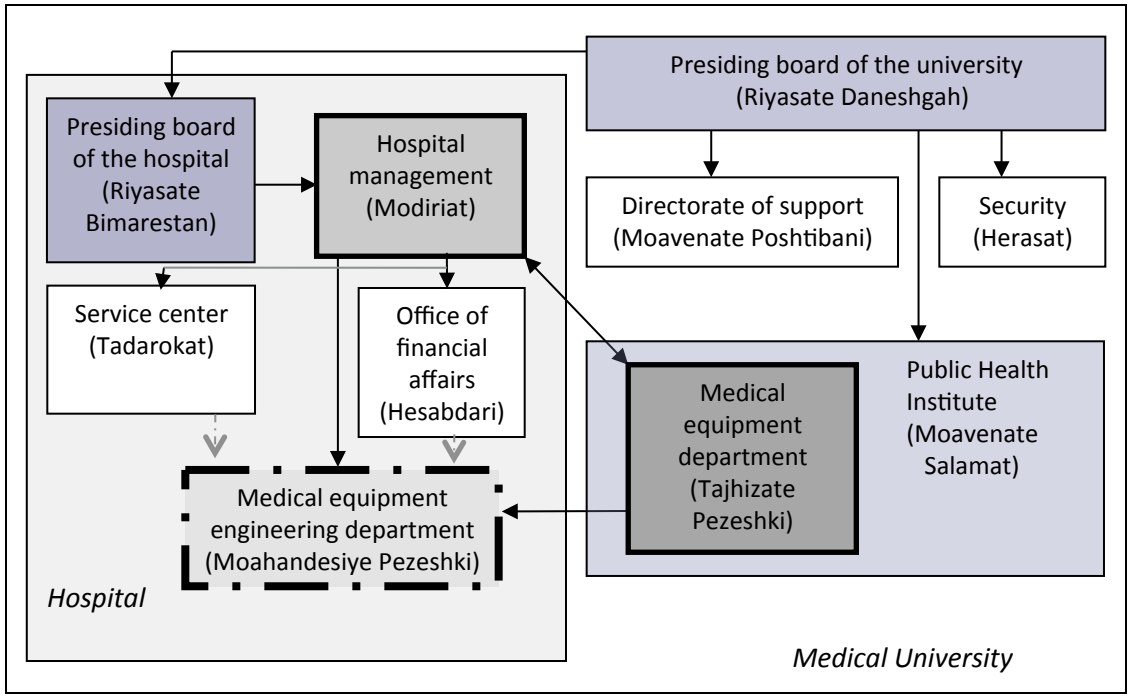
# Evaluation of the processes using the example of medical equipments

- Only 2 hospitals had a department for medical equipment
- 10 of 15 hospitals belonging to TUMS exhibit such a department
- 10% [1] of hospitals in Iran have a medical department
- First department founded in 1992 in the Imam Khomeini Hospital
- Since 2005 MOHME instituted a committee for medical equipments




[1] source MOHME



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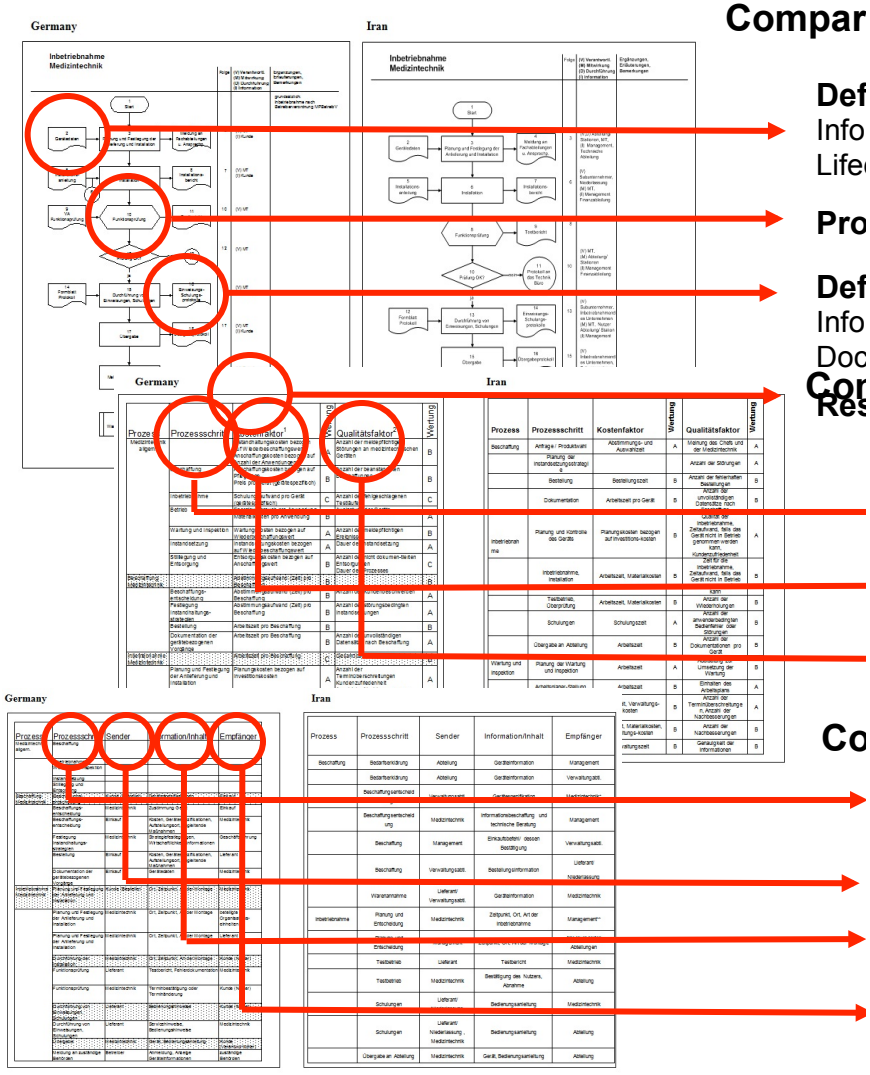
# Evaluation of the processes using the example of medical equipments




Compar

Def
Info
Life

Pro

Def
Info
Doc

Cor
Res

Co

| Process step | Germany | Iran |
|---|---|---|
| ***Procurement*** | • device-specific maintenance strategy is determined in agreement with the financing unit<br>• costs of maintenance are calculated | • no strategy or annual plan<br>• short term demand<br>• particularly by request of the doctors |
| ***Installation*** | • according to the rules of medical product operation (MPBetreibV) | • follows the operating instructions of the manufacturer |
| ***Operation*** | • law on medical products (Medizinproduktegesetz (MPG)) | • operation follows experiences and training<br>• a law is in development |
| ***Maintenance and inspection*** | • training, check according the radiation control regulation (Röntgenverordnung (RöV))<br>• inspection analysis<br>• analysis of the maintenance | • only takes place for few, expensive types of equipment |
| ***Corrective*** | • economic efficiency<br>• cause analysis | • no cause analysis |
| ***Shut-down*** | • repurchase by the producer<br>• regulations for shut-down | • spare part camp<br>• biomedical and scrap metal bazaars<br>• transmission, sales to hospitals that can use it |



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# Outcome of the processes

| | Germany | Iran |
|---|---|---|
| ***Laws / regulations*** | Very extensive, worked out in detail, available for all processes | Do not exist in every field. If existing not or partly implemented (control organs too weak) |
| ***Public and private institutions*** | Well represented (affects to the terms of employment and working standards) | Very weak |
| ***Organisation, management, policy*** | − depending to the management method<br>− less personal<br>− strong planning | − Strongly hierarchic structure , very bureaucratic, more personal<br>− Weak planning (strategy-, work-, budget plans and resource management)<br>− Weak documentation |
| ***Historical and cultural background*** | − Christianization<br>− Age of Enlightement 17th / 18th century<br>− Industrialization and inventions<br>− Bismarck (insurance system)  | − 4800 old skeleton with artificial eye<br>− Middle Ages (important physicians [Razi, Avicenna])<br>− PHC system since 1985  |
| ***Education, training, research*** | − education posibilities for all levels (university but also for technicians)<br>− permanent trainings for all areas | − good education for the academic level; less for practical workers<br>− weak trainings (especially for technical areas) |
| ***Economic and monetary possibilities*** | − DRG<br>− budgets for maintenance and repair | − small budgets<br>− low payment for technicians and service worker |



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# FM-System transferability method

| Country | D[1] | IR[2] |
|---|---|---|
| Total population | 82.424.700 (2006) | 70.049.826 (2005/06) |
| Area km² | 610.357 (2006) | 1.648.195 (2005/06) |
| Population density inhabitants per km² | 231 (2006) | 42 (2005/06) |
| Population growth rate (%) | 0, 02 (2006) | 1,07 (2005/06) |
| Urban population (%) | 87,27 (2006) | 64,54 (2005/06) |
| Average age | 41,70 (2006) | 23,5 (2005/06) |
| **Health system** | **D[1]** | **IR [2]** |
| Life expectancy (w) | 82 (2004) | 73,17 (2003) |
| Infant mortality rate (per 1000 Life birth) | 4,0 (2004) | 26,0 (2004) |
| Percentage of Population aged 14 - years | 14,7 (2006 ) | 28 (2005/06) |
| Percentage of Population aged 65+ years | 18,3 (2006) | 4,8 (2005/06) |
| **Hospital** | **D[3]** | **IR[4]** |
| Beds in hospital (per 10 000 population) | 64,4 (2004) | 30 (2005/06) |
| Number of admissions per year | 16.801.649 (2004) | 10 324 734 (2005) [5] |
| Average period spent in the hospital (days) | 9,8 (2001) | 3,6 (2005) |

[1] According to the Statistisches Bundesamt
[2] According to the Statistical Centre of Iran (SCI)
[3] According to the WHO
[4] According to MOHME
[5] Estimate based on mean length of stay and occupancy rate of hospital beds



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# FM-System transferability method

## Conclusion finding

| Ranking | Parameters of Influence Model | Indicator Analysis with help of the Share Model | Expert Opinion |
|---|---|---|---|
| 1 | Management | Economy | Management |
| 2 | Politics | Management | Politics |
| 3 | Culture | Politics | Culture |
| 4 | Judicative | Culture | Judicative |
| 5 | Economy | Judicative | Economy |
| 6 | Infrastructure | Education | Infrastructure |
| 7 | Education | Public and private institutions | Education |
| 8 | Public and private institutions | Infrastructure | Public and private institutions |
| 9 | Geography | Geography | Geography |

| Rank | Transferability parameters | | |
|---|---|---|---|
| high | Management | Economy | Politics |
| middle | Culture | Judicative | Education |
| low | Infrastructure | Public and Private institutions | Geography |



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Name of the project:

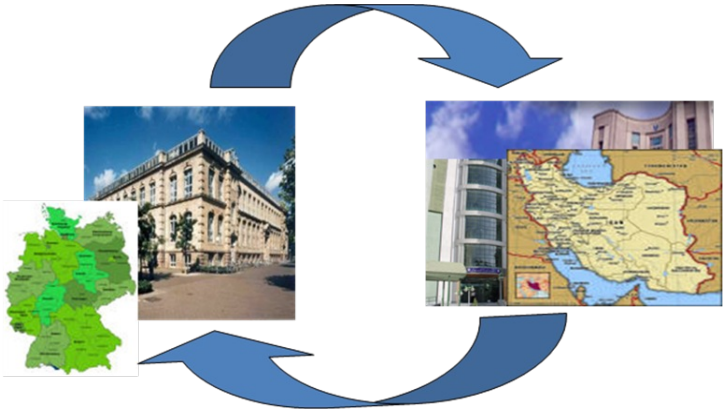
DAAD Deutscher Akademischer Austausch Dienst
German Academic Exchange Service

***Facility Management for Health Facilities- Introduction of a new management system in Iran*** مدیریت امکانات وتجهیزات برای تشکیلات پزشکی تشکیل سیستم مدیریتی جدید در ایران

Supported by:

Deutsch-Arabisch/Iranischer Hochschuldialog

***DAAD [Deutscher Akademischer Austausch Dienst] (German Academic Exchange Service) -German/ Iranian Higher Education Dialogue*** تبادل علمی دانشگاهی آلمان – ایران

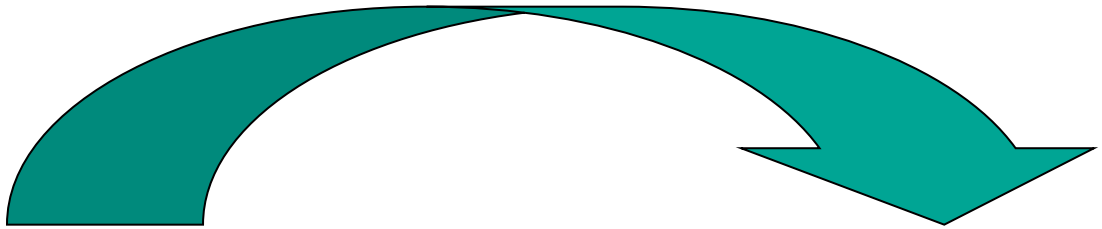


## Coorperation Partners:

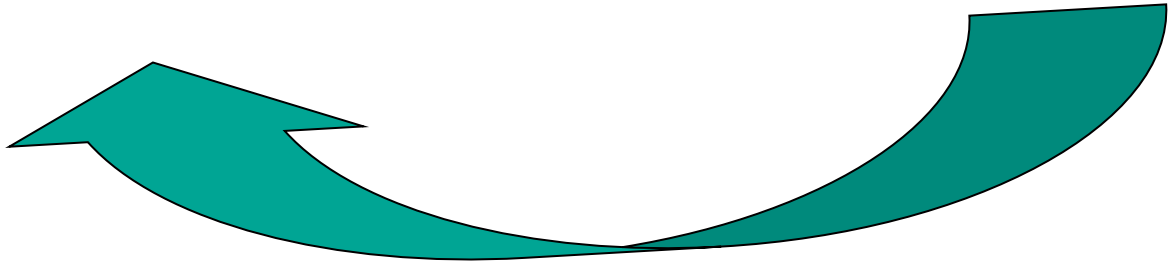
- Karlsruhe Institute of Technology (KIT) – Department of Facility Management
- University of Tehran (UT), School of Engineering
- Tehran University of Medical Science (TUMS) – Institute of Public Health
  - MOHME- Ministry of Health and Medical Education
  - Hospitals
    - Heart Hospital Tehran
    - Vali Asr Hospital

# **Aims:** *Intoduction and development of facility management in Iran*

- Master Course Facility Management
- Starting with the spezialisation on hospitals
- Exchange of academical staff
- Facility Management Competence Center
- Anual Facility Management Conference in Tehran
- Iranian
  Facility Management Association



# Thank you for your attention





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