

# **Operational Excellence in Healthcare**

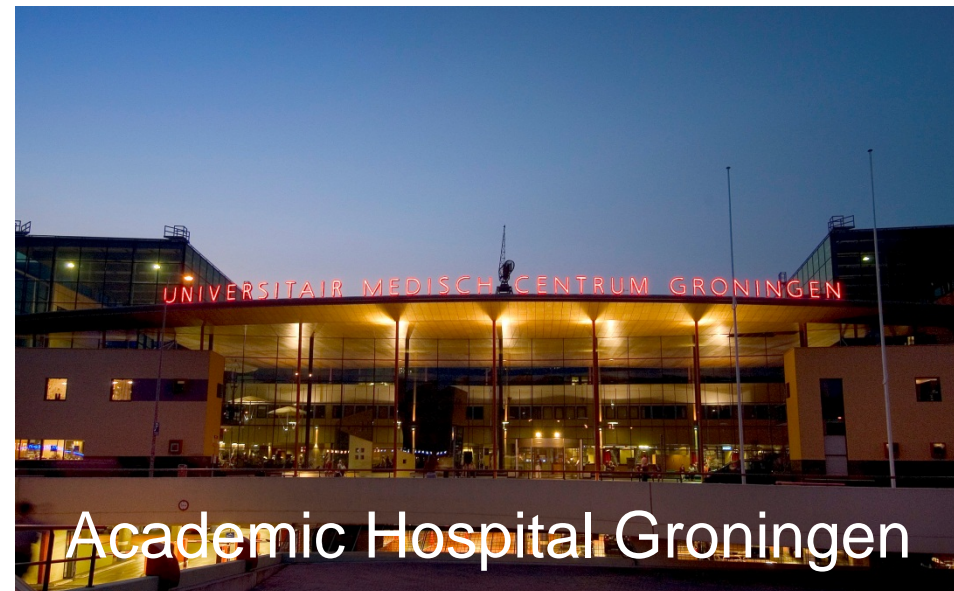
October 27, 2015

**Ronald J.M.M. Does**

Institute for Business and  
Industrial Statistics,  
Amsterdam Business School,  
University of Amsterdam

Email: [r.j.m.m.does@uva.nl](mailto:r.j.m.m.does@uva.nl)

# IBIS UvA: many hospitals are clients



# Healthcare Quality

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## Observations

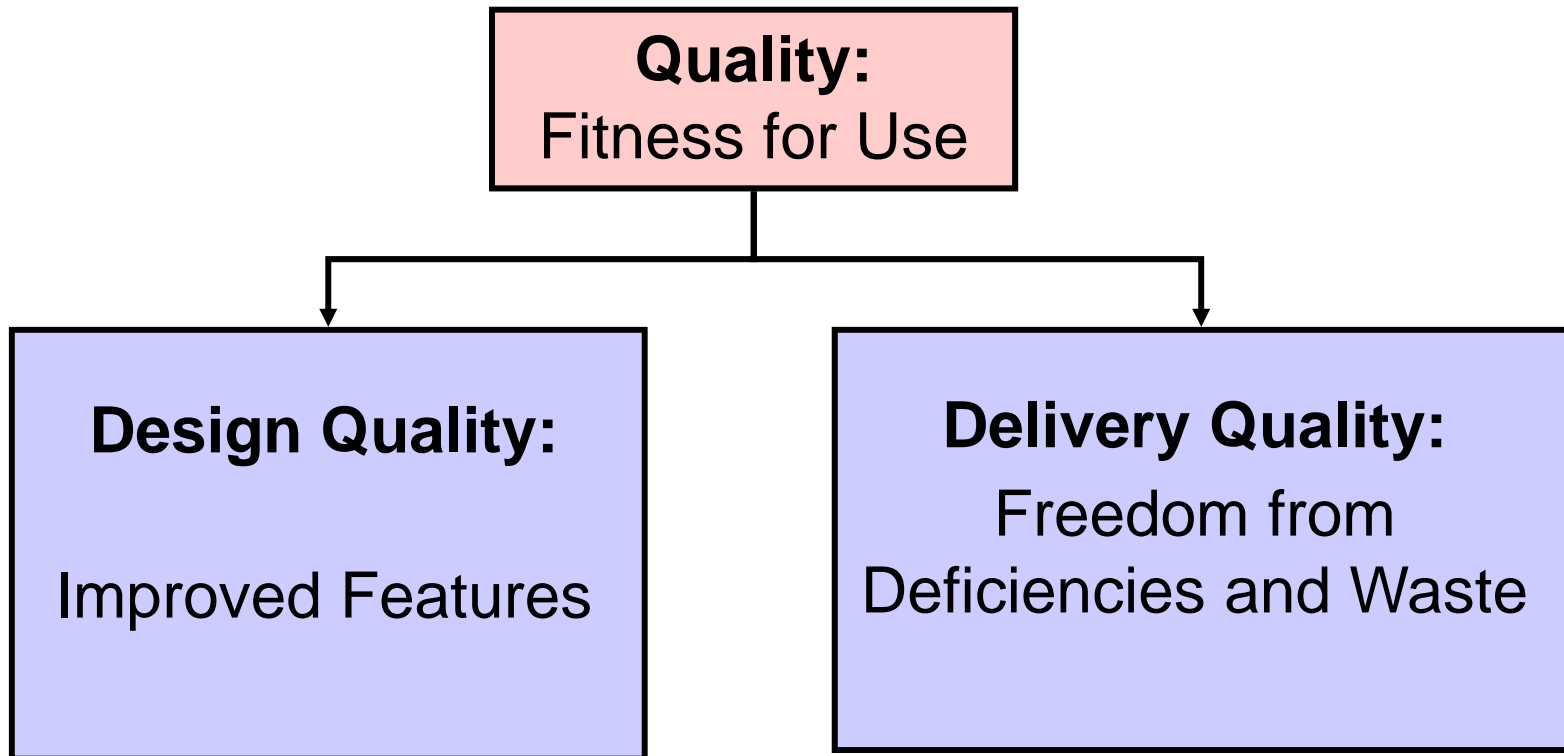
- Worldwide the cost of medical care is increasing at an alarming and unsustainable rate
- A significant part of the increase in healthcare cost can be characterized as operational inefficiency.
- Outdated (pre-industrial) organizational structures
- New expensive treatments and procedures
- An aging population
- Competition and Globalization (e.g. medical tourism, services that can be performed remotely, low-cost competitors, retail healthcare)

# Top Level Definition of Quality: *Fitness of Use*

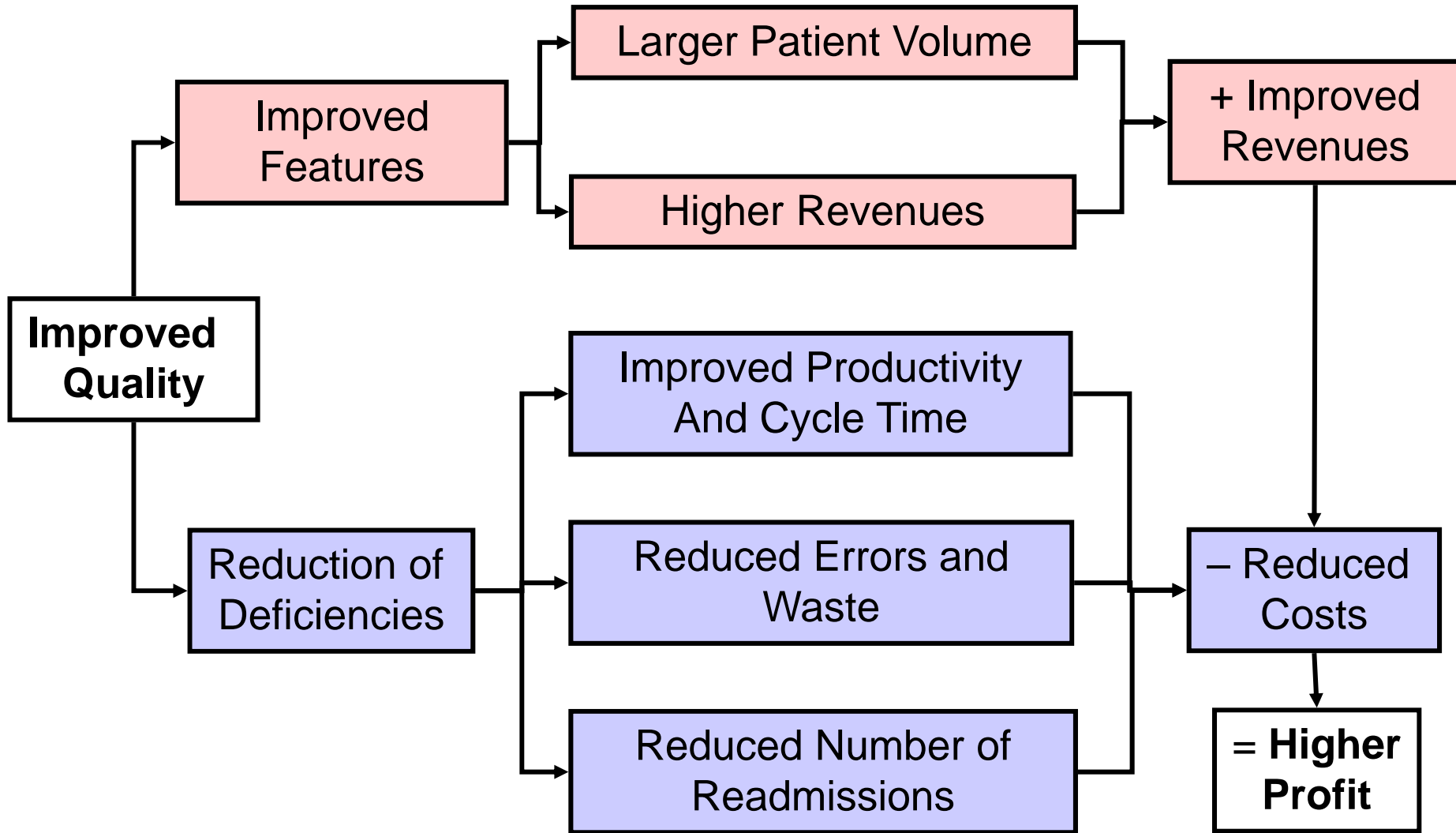
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## *Subsidiary Definitions of Quality:*

- Features: Typically cost more
- Freedom from Deficiencies: Typically cost less

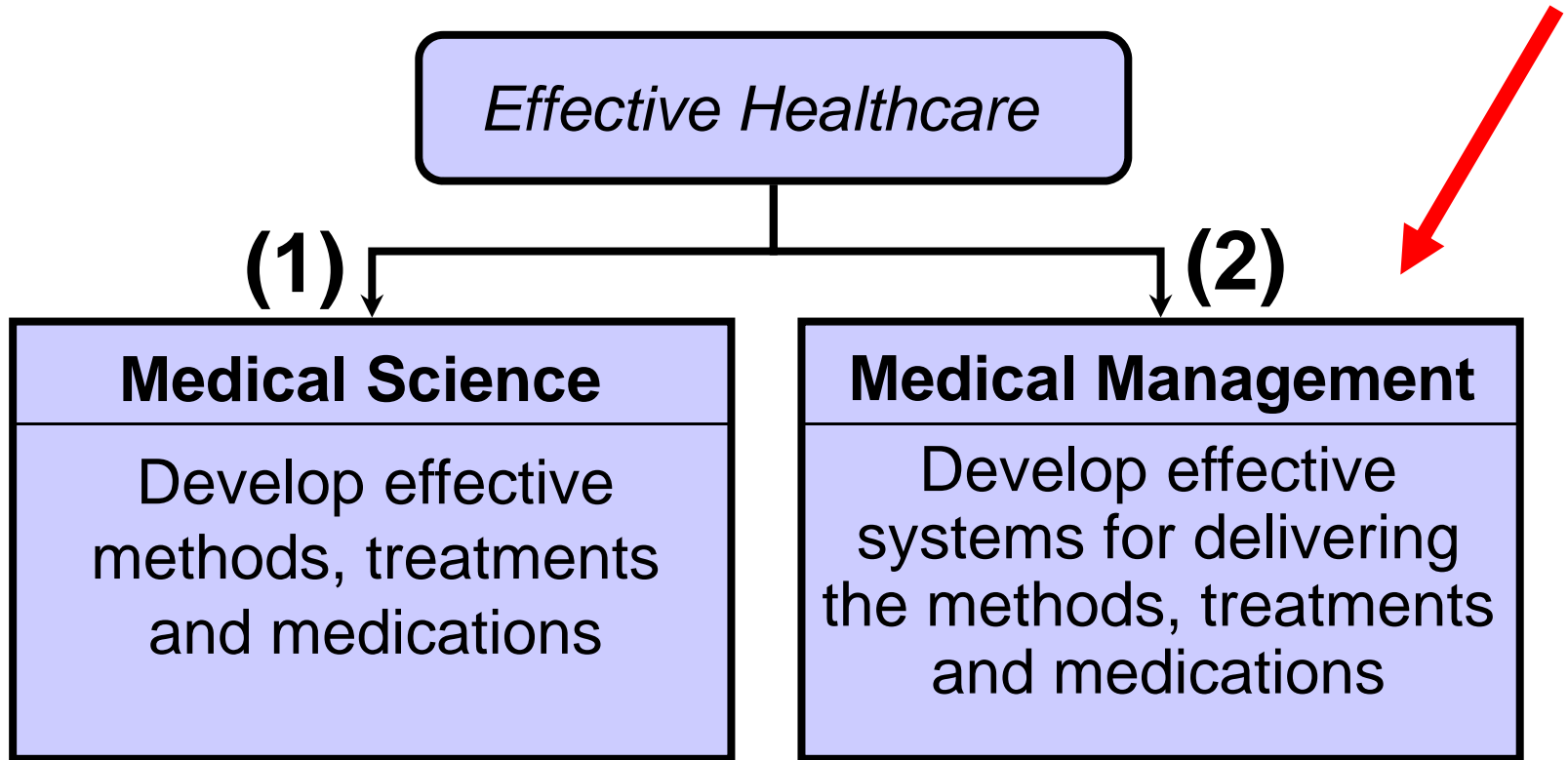


# Improving Quality and Reducing Costs



# Effective Healthcare: *Two Parts*

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The medical profession has done extremely well on issue #1. We have done less well on issue #2.

# Effective Healthcare Delivery

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## Remedies

- Improving the quality and safety of care
- Reducing the direct cost of care
- Improving the efficiency of healthcare administration, logistics and the operational side of the healthcare delivery system
- Make affordable medical services available to a larger segment of the population

***Healthcare can learn from how other industries and sectors of the economy have dealt with competition, market pressures and change***

# Five Approaches of Quality

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1. Transcendent approach of philosophy
2. Product-based approach of economics
3. User (client)-based approach of economics, marketing, and operations management
4. Manufacturing-based approach
5. Value-based approach of operations management

An organization should cultivate all five approaches



# The Special Position of the Patient



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# **Process Improvement in Healthcare**

# Process management

*Gantt*

*Design for Six Sigma (2000–)  
Design for Lean Six Sigma (2008–)*

*Lean, Six Sigma, BPM,  
Workflow management (1990– )*

*TQM, BPR (1980–2000)*

*Quality and process control  
(1920–1950)*

*Scientific management (1880–1920)*

*Process management*

*Taylor*

*Shewhart*

*Ishikawa*

*Ohno*

*Juran*

*Deming*

# Process Improvement in Healthcare

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## *Lean Six Sigma*

Projects run by people with understanding of the process and problem at hand

Problems are defined in a crystal clear, operational form

Emphasis on quantification

Data-based diagnosis and testing of ideas and improvement actions

# How to organize process improvement?

## Bottom-up: kaizen, short-cyclic improvement, PDCA, 8D, etc

- Small initiatives driven by the work floor.
- Advantages: creates awareness, involvement of employees, and a change of attitude on the work floor.
- Challenge: difficult to address the big fish; initiative derails in a multitude of trivialities. Difficult to address sensitive problems and carry through unpopular measures (change within the comfort-zone).

## Top-down: business process reengineering

- Driven by experts, staff departments, or external consultants.
- Advantages: design optimal process without the weight of history; decisiveness and focus on the big fish.
- Challenges: Acceptance (employees may feel alienated or not recognized). Experts may have a sterile perception, and miss the devilish details and stubborn complications of daily reality.

# How to organize process improvement?

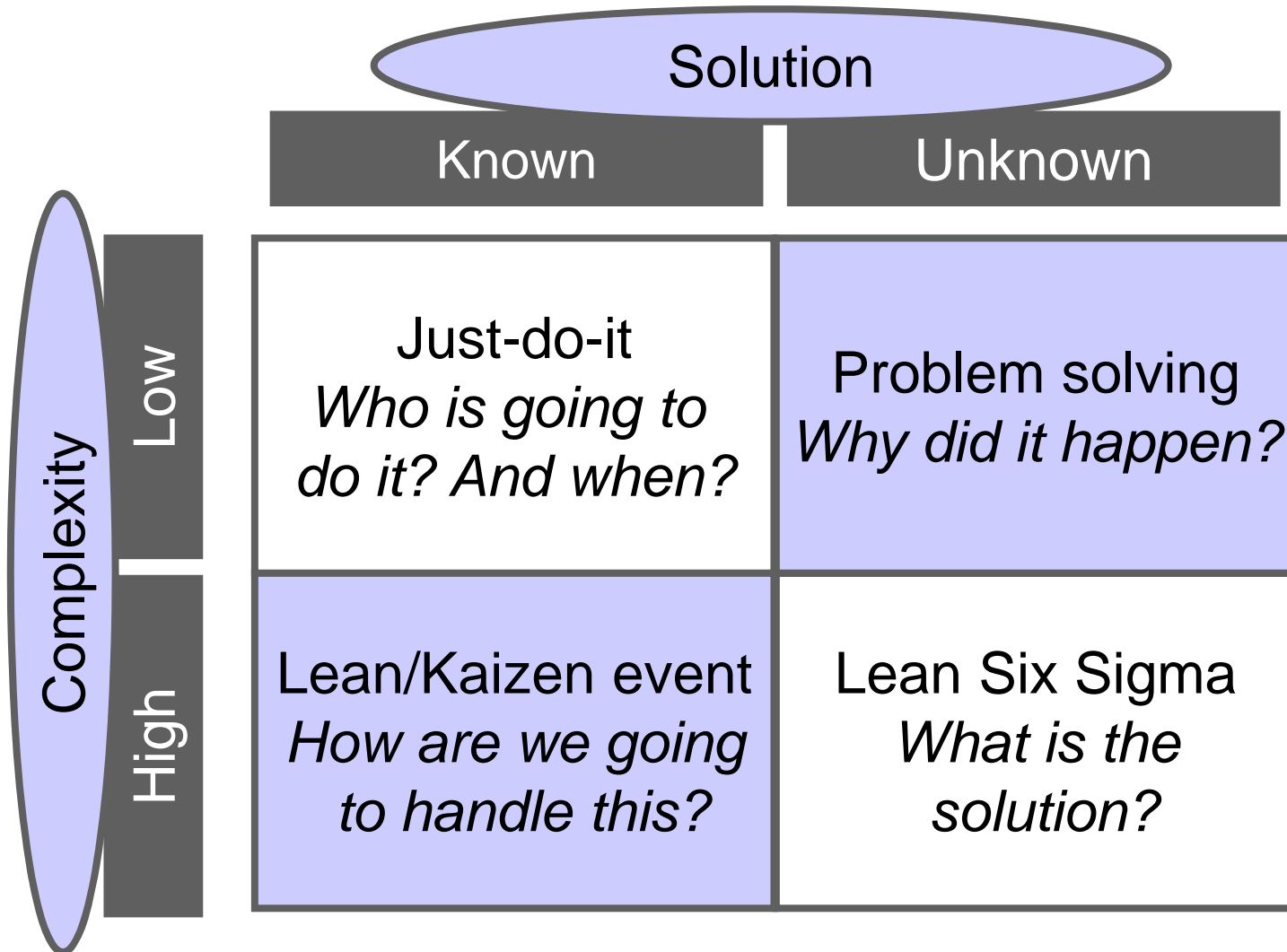
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## Bottom-up: execution with top-down control: DMAIC

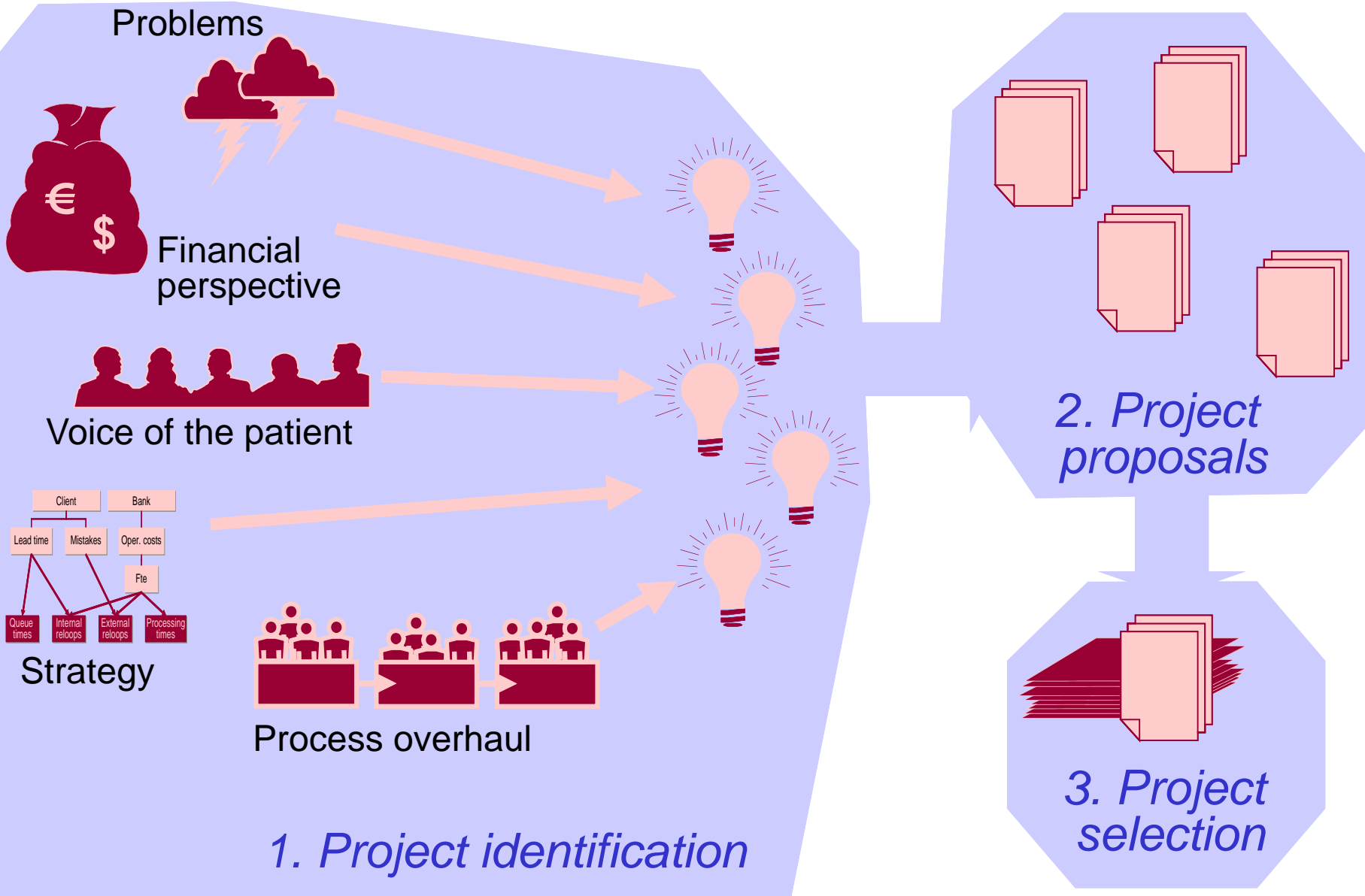
- Projects proposed and executed by GB/BBs from the work floor, but ratified and reviewed by champions and program managers steering at the big fish.
- DMAIC projects analyze and improve the process, ensuring that its basic structure and configuration are good. (YB)
- The Control stage lays down structures for continuous improvement. (OB)

# Projects and execution

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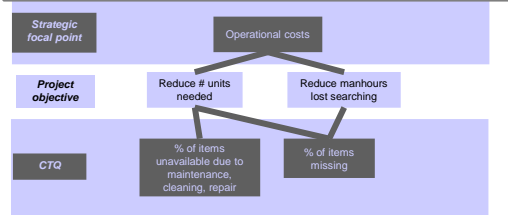
# Project definition



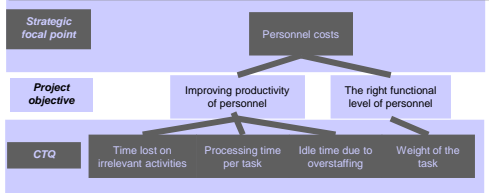


# Project execution: 9 templates for the first steps.

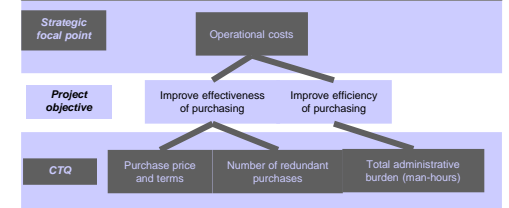
Type 1: Reduce costs by improving utilization of equipment/facilities



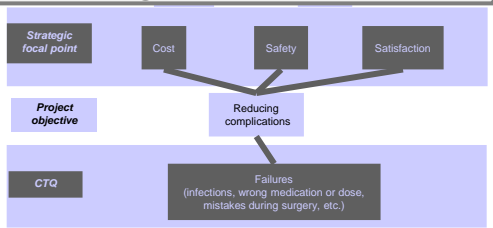
Type 2: Reduce costs by improving productivity of personnel



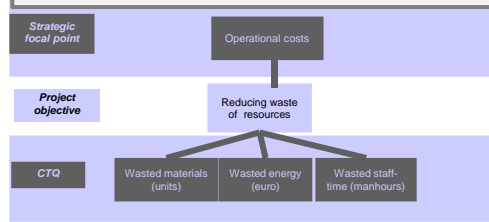
Type 3: Reduce costs by improving purchasing processes



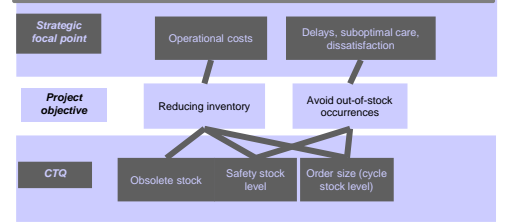
Type 4: Improve safety by reducing complications



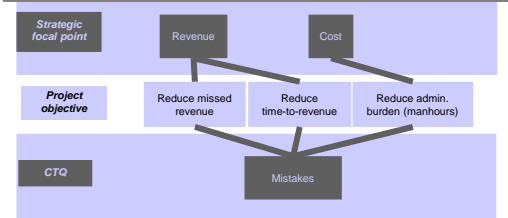
Type 5: Reduce costs by reducing unnecessary use of resources



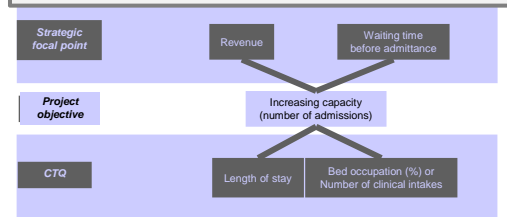
Type 6: Reduce costs by reducing inventory



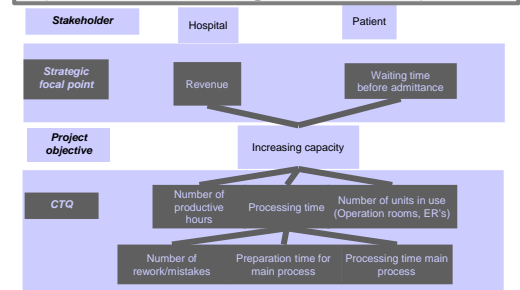
Type 7: Increase revenue by improving registration



Type 8: Increase revenue by increasing number of admissions



Type 9: Increase revenue by increasing capacity



# Examples: projects with impact

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## Projects w.r.t. Fte reduction:

- Salaries hospital 2009: 287 million dollars; 6430 Fte's
- Mobility in personnel 2009: about 550 Fte's.
- Recording of processing times reveals insight in the activities (e.g. in one of the units 38,5% of the available time was not spent on the patients).
- Almost 50% of the projects within services has to deal with Fte reduction.
- Reference: Wijma et al. (2009), *Quality Engineering* **21**, 222-228.

## Projects w.r.t. Length of Stay:

- About 30% of the Length of Stay in a hospital is due to an inappropriate discharge procedure.
- Reducing the inappropriate stay by 50% means 15% extra admissions or closing beds.
- Reference: Niemeijer et al. (2010), *Journal of Trauma* **69**(3), 614-619.

# Examples: projects with a big impact

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## Projects w.r.t. use of materials:

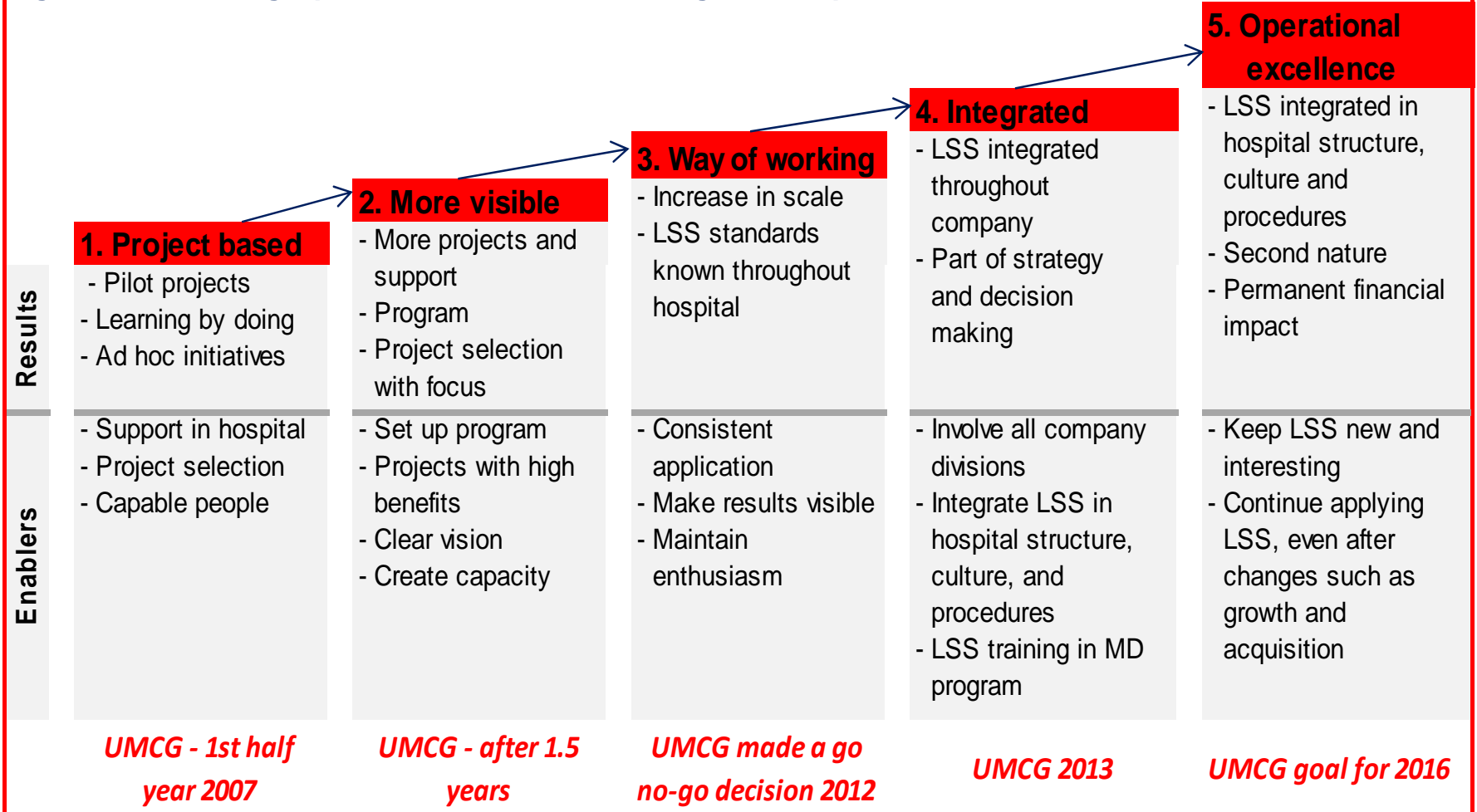
- Costs of medicines in an academic hospital in 2009: 18 million euros.
- Reduction with 5% is almost 1 million euros.
- Example: the difference in price of the use of antibiotics with or without infusion is substantial.
- Reference: Van den Heuvel et al. (2004), *Quality and Reliability Engineering International* **20**, 419-426.

## Projects w.r.t. optimal use of facilities:

- A CT scan takes about 6 minutes. This means that one may run 10 CT scans per hour.
- In most hospital the average number of CT scans per hour is about 3 to 4.
- Hence doubling is possible!
- Reference: De Mast et al. (2011), *Quality and Reliability Engineering International* **27**, 1095-1106..

# Maturity grid of Lean Six Sigma

Figure 6 - Achieving Operational Excellence through LSS Implementation - UMCG Position





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