

# Session 1 - Introduction

**Ulan Bator, 24<sup>th</sup> October 2015**

*Dipl. Wirt.-Ing. Lisa Graßler*

Chair of Production Metrology and Quality Management





# RWTH Aachen, Fraunhofer Society and PRS Technology GmbH



## Fraunhofer

### Fraunhofer Society

- Largest organization for applied science in Europe
- More than 80 Institutes and facilities in Germany and the world
- 24,000 employees
- Research budget over 2B €, thereof >1.7B € contract research
- 3 Institutes in Aachen

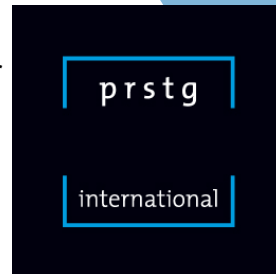


**RWTHAACHEN**  
UNIVERSITY

public &  
private sector  
collaborations

### PRS Technology GmbH

- Private sector partner of RWTH and Fraunhofer for commercial activities
- Focuses on technology and education export of German companies and research institutes into the world
- Comprehensive network and expertise abroad



### RWTH Aachen University

- Formed in 1870
- Largest technical university in Germany
- Repeatedly rewarded as „University of Excellence“
- More than 42,000 students and 115 study programs
- More than 530 Professors and 9,100 Employees
- Budget > 840M €, thereof > 330M € 3<sup>rd</sup> party funding



# Laboratory for Machine Tools and Production Engineering (WZL)



## Laboratory for Machine Tools and Production Engineering (WZL)

- Formed in 1906
- Institute of RWTH Aachen University
- Four chairs and six fields of research
- More than 800 staff members
- More than 10,600 m<sup>2</sup> laboratory and office space



basic research  
& applied  
development



## Institutes and Professors (from left to right)

- Production Metrology and Quality Management (Prof. Dr.-Ing. Robert Schmitt)
- Manufacturing Technology (Prof. Dr.-Ing. Dr.-Ing. E.h. Dr. h.c. Dr. h.c. Fritz Klocke)
- Production Engineering (Prof. Dr.-Ing. Dipl.-Wirt. Ing. Günther Schuh)
- Machine Tools (Prof. Dr.-Ing. Christian Brecher)

# Technology and Education Partnerships

Demands

- **TE1: Business Development**
  - Development and realization of business ideas German companies in foreign countries
  - Assessment of feasibility and profitability
  - Forming consortiums with experts/ investors
  - Realization support and accompaniment
- **TE2: Quality Management & Production Engineering**
  - Transfer & adaption of solutions for the local market in terms of consultancy activities
  - Involvement of local actors for capability building

**Technology Export**

**Education Export**

- **EE1: Education & Governance**
  - Establishment of Higher Education institutions abroad
  - Implementation of “Good Governance” and Quality Management for educational institutions
  - Transfer and adaption of study programs and appropriate Learning & Teaching concepts
- **EE2: Capacity Building**
  - (Certified) training activities for local actors
  - Coaching activities and support on request to enhance knowledge transfer

Potentials

# Our Partners – Cooperation and Projects

## RWTH Aachen University



### Projects

- Development of Quality Management System for studies and teaching
- Preparation for System Accreditation
- Consultancy in the area of the Internationalization Strategy with focus MENA Region



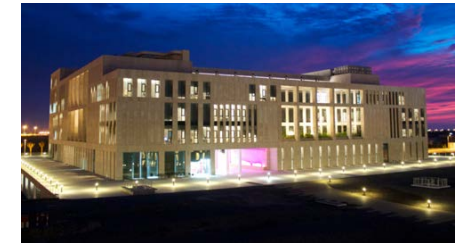
	RWTH	GUtech
Founded	1870	2007
Faculties	9	4
Courses	115	8
Students	40.000	1.200
Professors	496	8
Staff	7550	150
Area	2.500.000 m <sup>2</sup>	500.000 m <sup>2</sup>
Buildings	291	1
Budget	894 bil.	
Matriculations per Semester	8440	550

## GUtech in Oman



### Projects

- Development of Management System
- Conduction of Market Research Studies
- Development of Study Programs
- International Workshops



- Branch campus opens an experimental ground
- Matched use of expertise
- Broad extensive industrial network

Source: RWTH Aachen University, German University of Technology (GUtech) in Oman

# RWTH Aachen University – Quality Management & Accreditation

## RWTH AACHEN UNIVERSITY

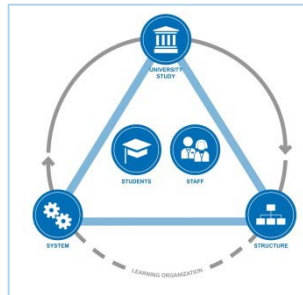


### Projects

- ▶ Development of Quality Management System for Teaching and Learning
- ▶ Preparation for System Accreditation

## QUALITY OBJECTIVES

Set of University wide quality objectives for teaching and learning



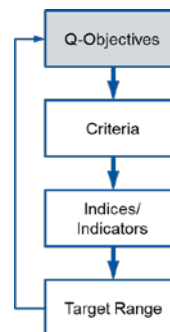
Implementation of database and development of custom oriented reports for management reviews



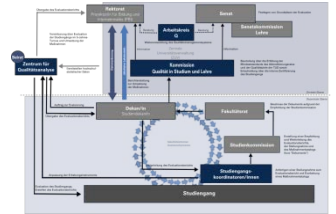
## DATABASES AND REPORTS

## KPIS AND INDICATORS

Key performance indicators to gather status quo



Adjusted control loops at study program, faculty and university level incl. external reviewers



## CONTROL LOOPS

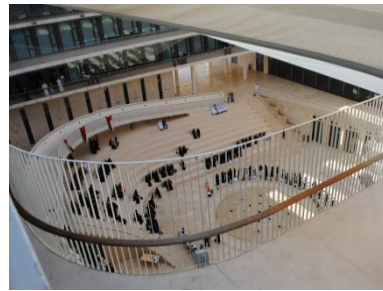
## ACCREDITATION

Preparation and accompaniment for accreditation process





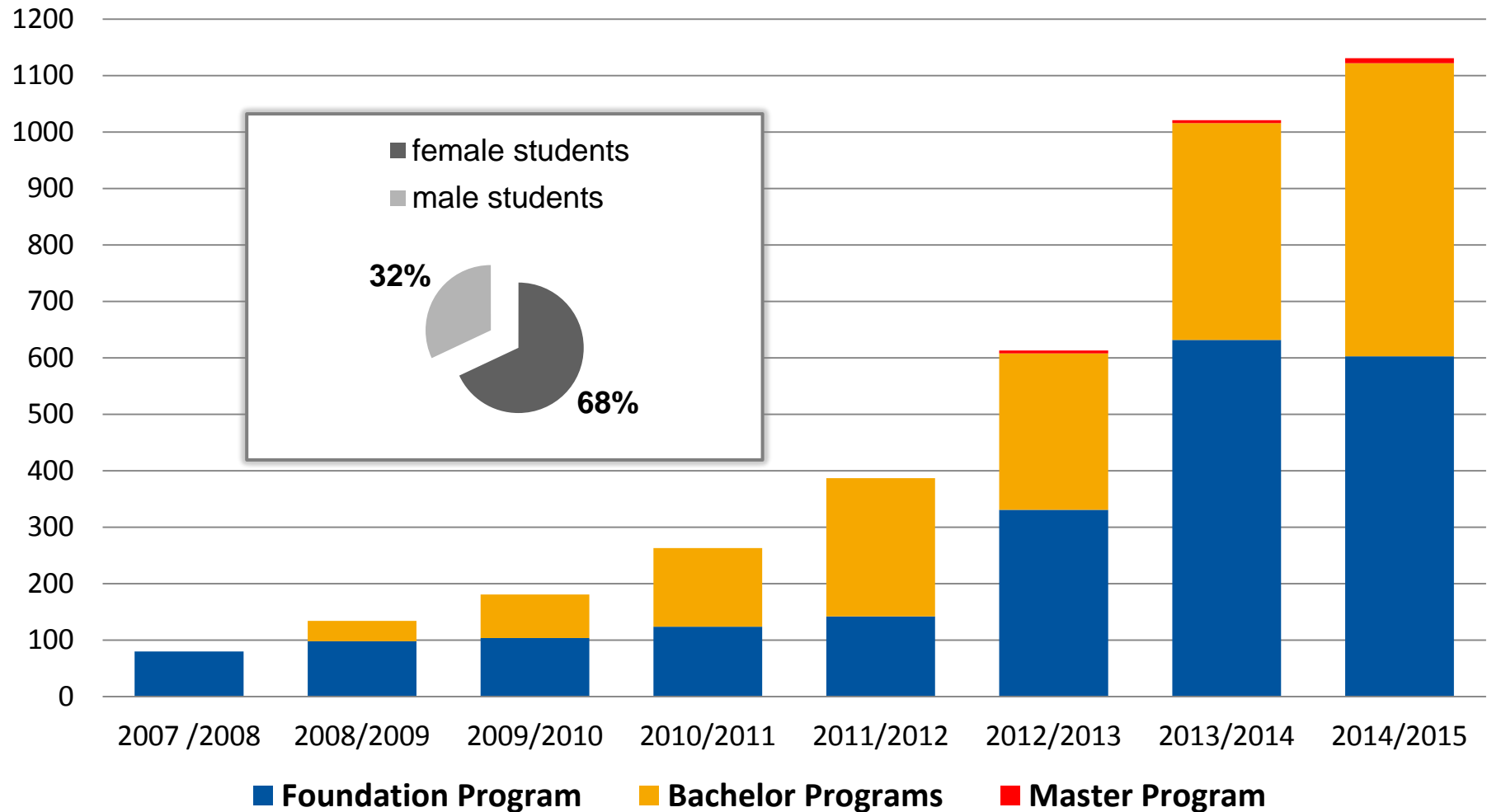
# The first footprint in the Gulf or key figures of a success story?



- 1.200 students
- 15% international students
- 150 employees
- 70% European teachers
- Four faculties: Business and Economics, Engineering and Computer Science, Science und Urban Planning and Architecture
- Foundation Program
- Seven Bachelor and one Master Program

The development of innovative structures in teaching is a strategic objective of the young university

# Rapid Growth – Student Numbers and Gender Distribution



# GUtech – Overview of Activities

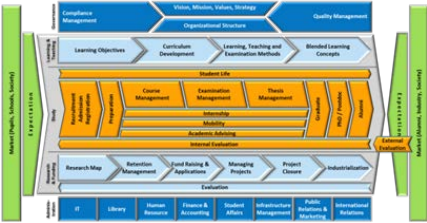
**GUTECH IN OMAN**


**Projects**

- ▶ Development of Management System
- ▶ Conduction of Market Research Studies
- ▶ Development of Study Programs
- ▶ International Workshops

**MANAGEMENT SYSTEM**

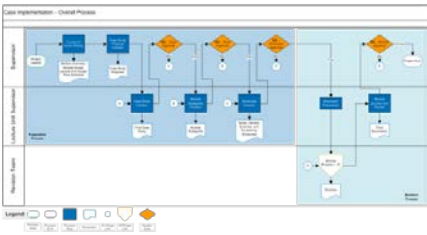
Development and implementation of management system and process landscape on Q.Wiki basis



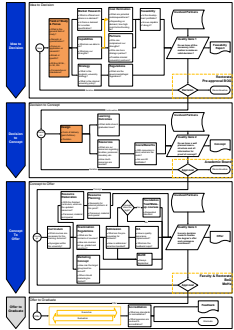
**MARKET RESEARCH**

Market research for new master programs, to develop portfolio and reach market demands






Standardized guideline for Case Study based learning



Guideline for development of study programs

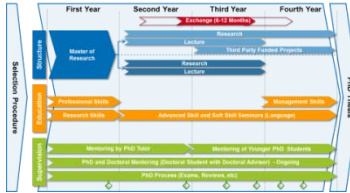
**TEACHING AND LEARNING METHODS**



Project sponsored by **DAAD**

**PHD PROGRAM**

Development of PhD Model



**STUDY PROGRAMS**

# Session 1 – Quality Management

**Ulan Bator, 24<sup>th</sup> October 2015**



# Understanding of Quality Management

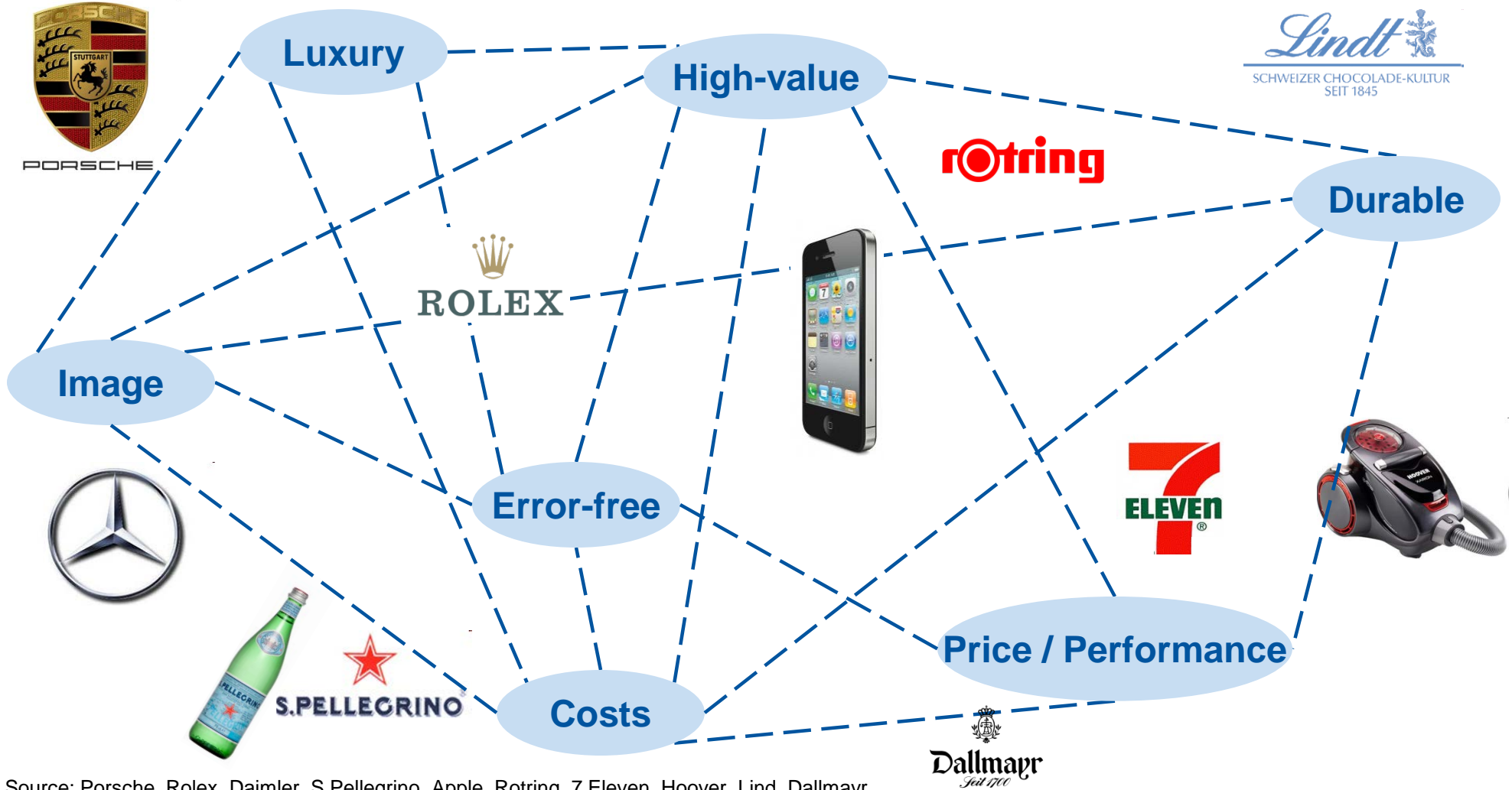
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## Target

What is this “Quality” all about and what is Quality Controlling good for?

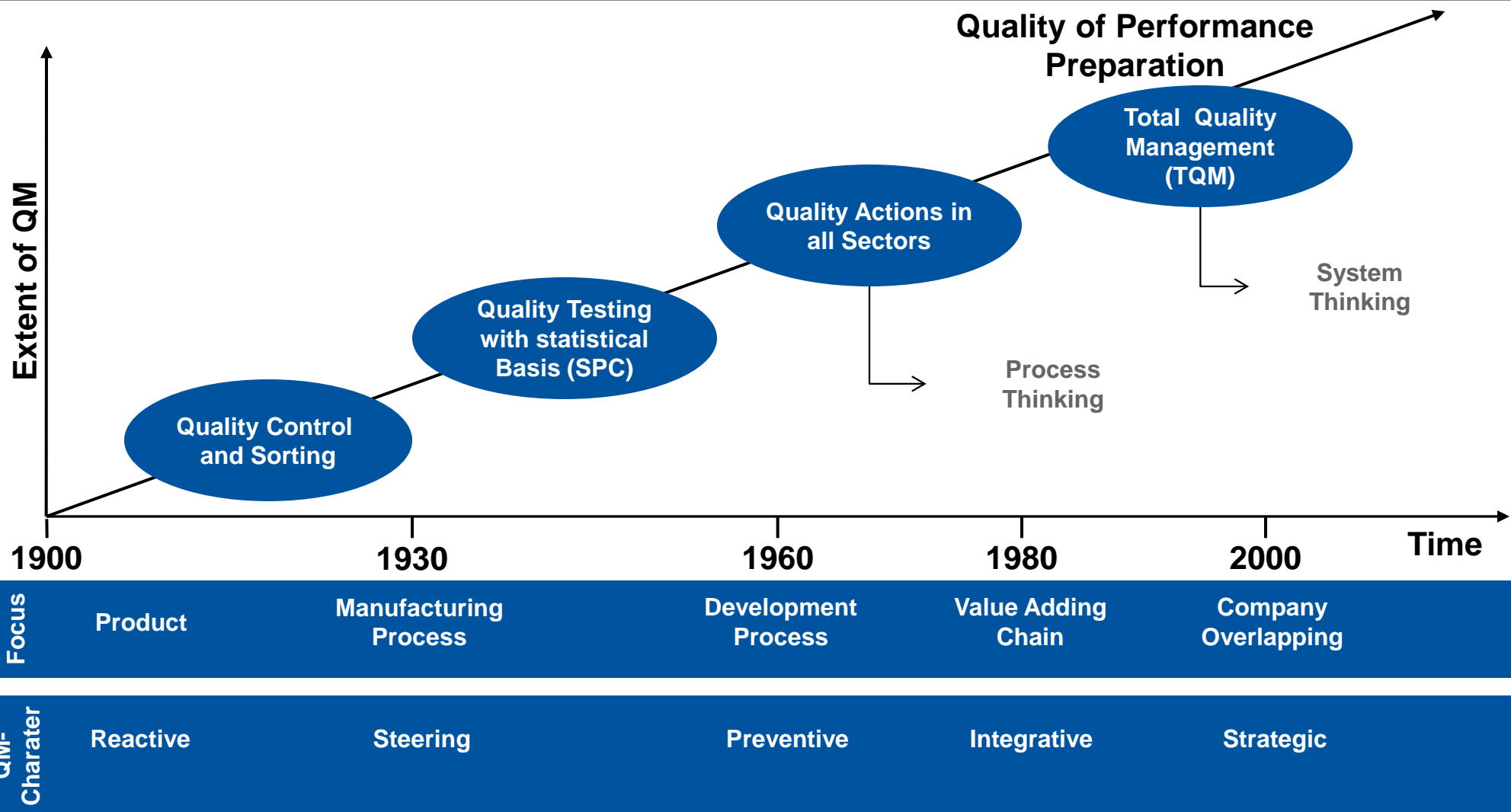


# Quality, Expressed Every Day, is Understood in Various Manners

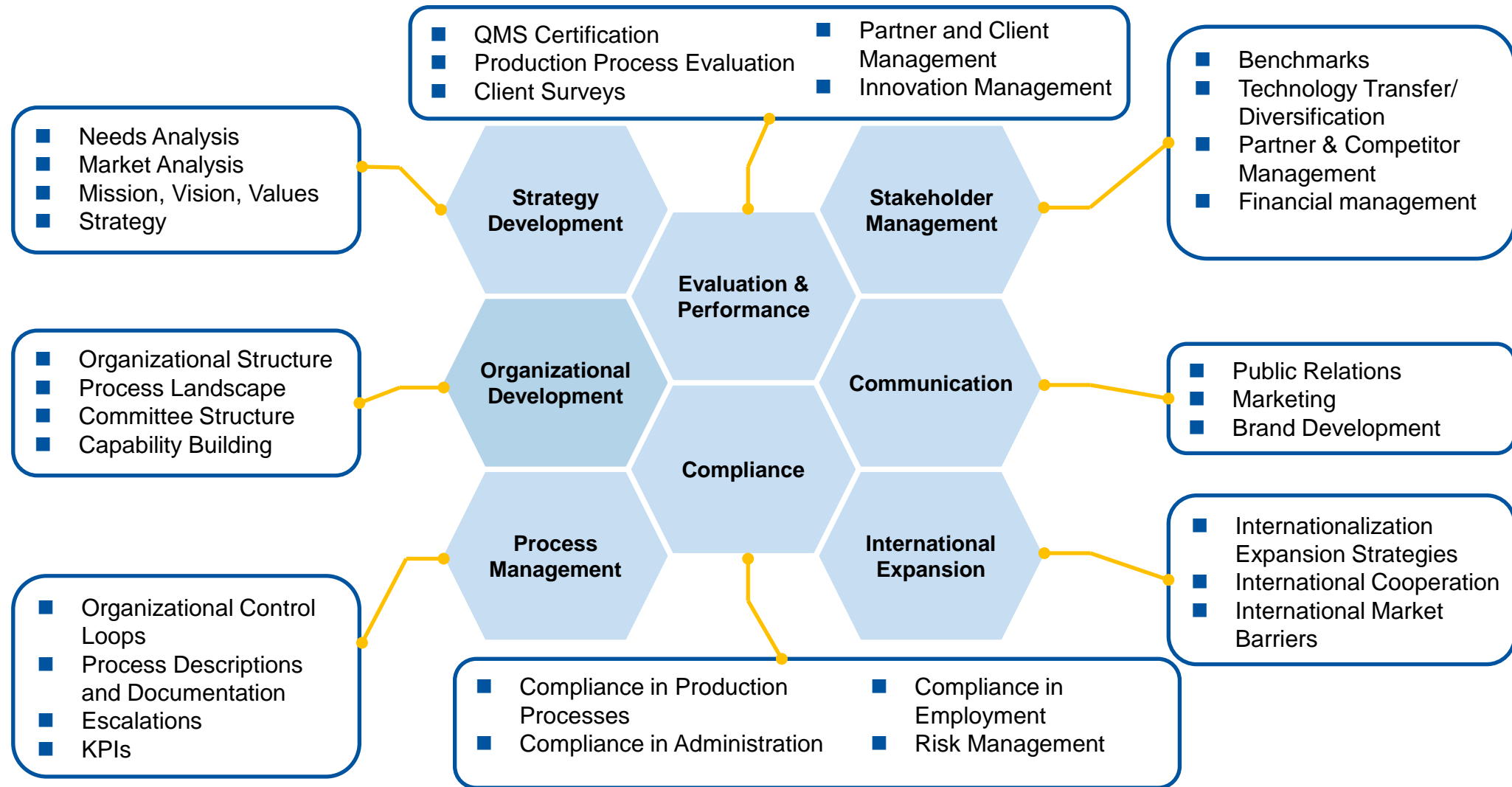


Source: Porsche, Rolex, Daimler, S. Pellegrino, Apple, Rotring, 7 Eleven, Hoover, Lind, Dallmayr

# Change in the Understanding of Quality



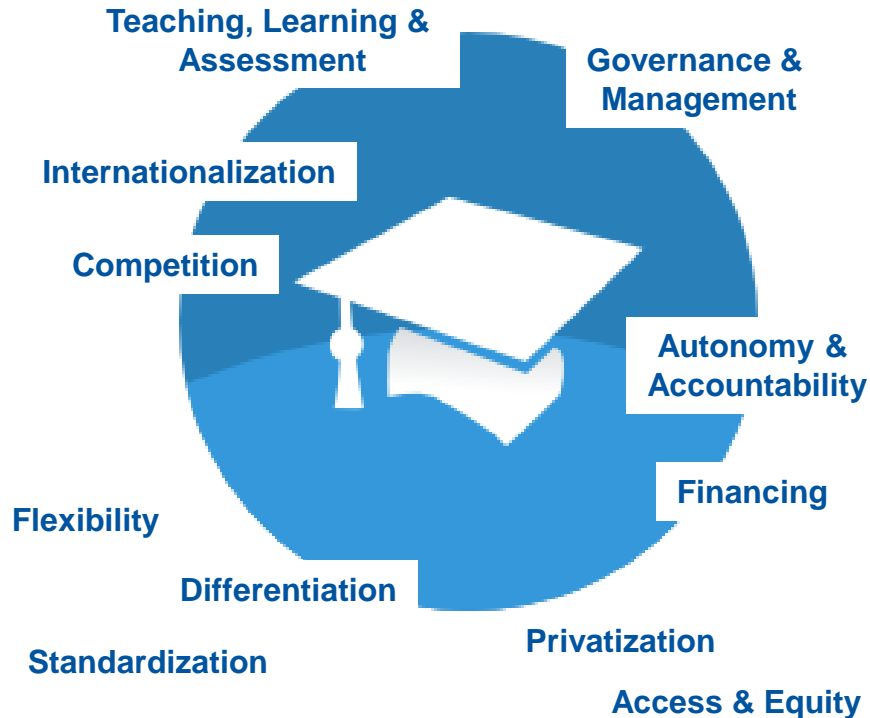
# What are the Tasks of Quality Management in Companies?






# Why Quality Management in Higher Education matters?!

## Internal Factors



## External Factors



 *Global trends affect organizations and are drivers for change. Universities are not decoupled from these trends and Quality Management is a major approach to face the challenges.* 

Compare: Update on Megatrends (2014), UNESCO (2007), CHE (2014), Pasternack/Kreckel (2011), Borgwardt/John-Ohnesorg (2011), Kehm (2007), HRK (2010), Lange (2006), Mitterauer (2013)

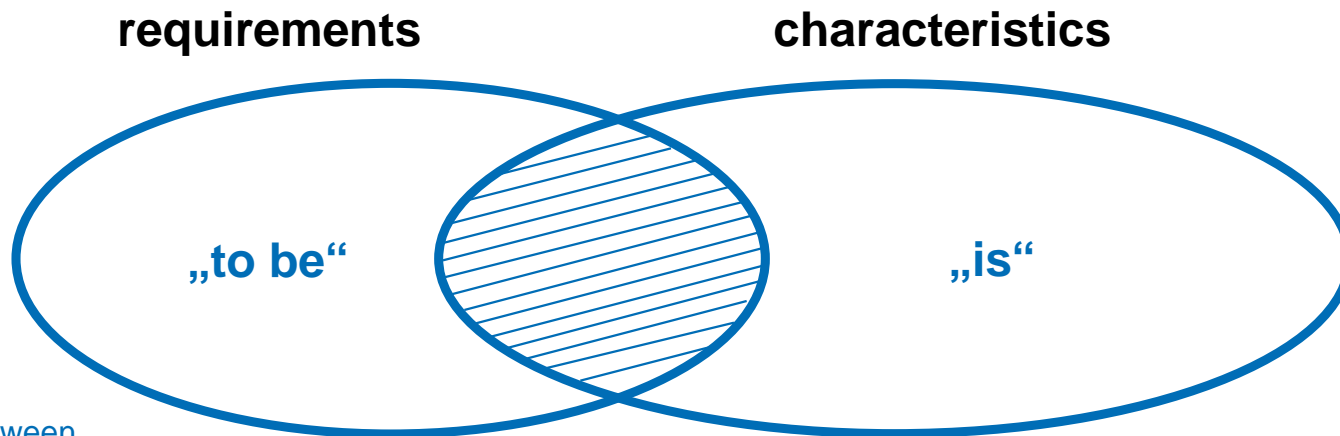
# Quality according to ISO 9000

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„quality“...

...is the degree to which a set of inherent characteristics fulfils requirements.

*Source: ISO 9000*



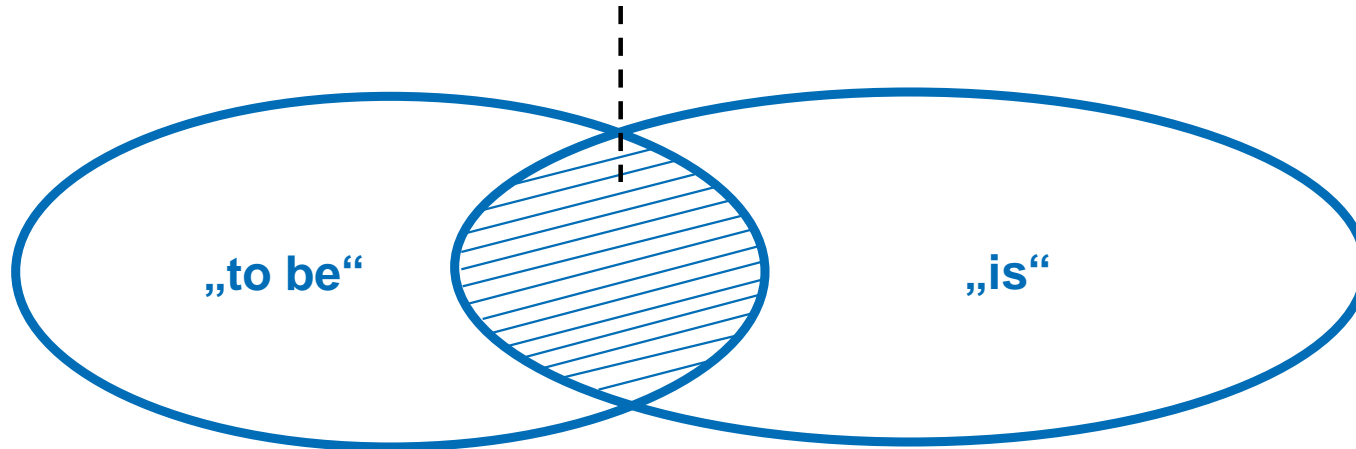
/// Overlap rate between  
requirements and characteristics

# Quality according to ISO 9000

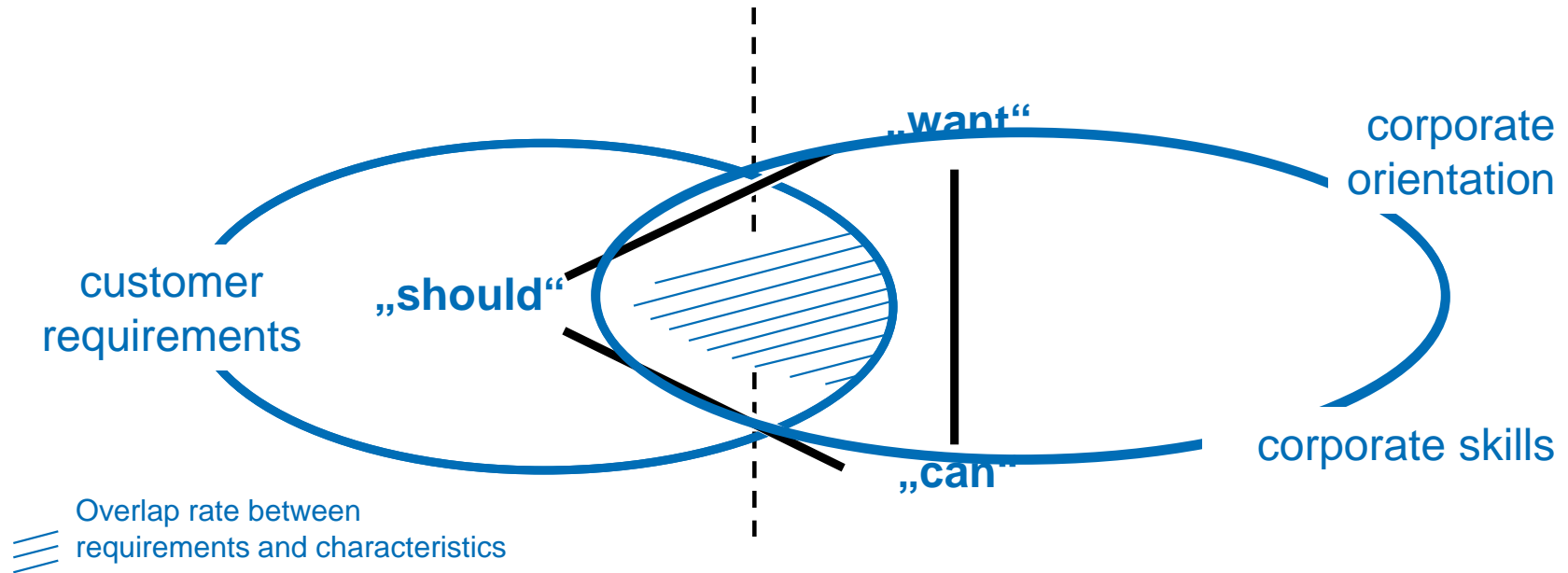
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requirements

characteristics

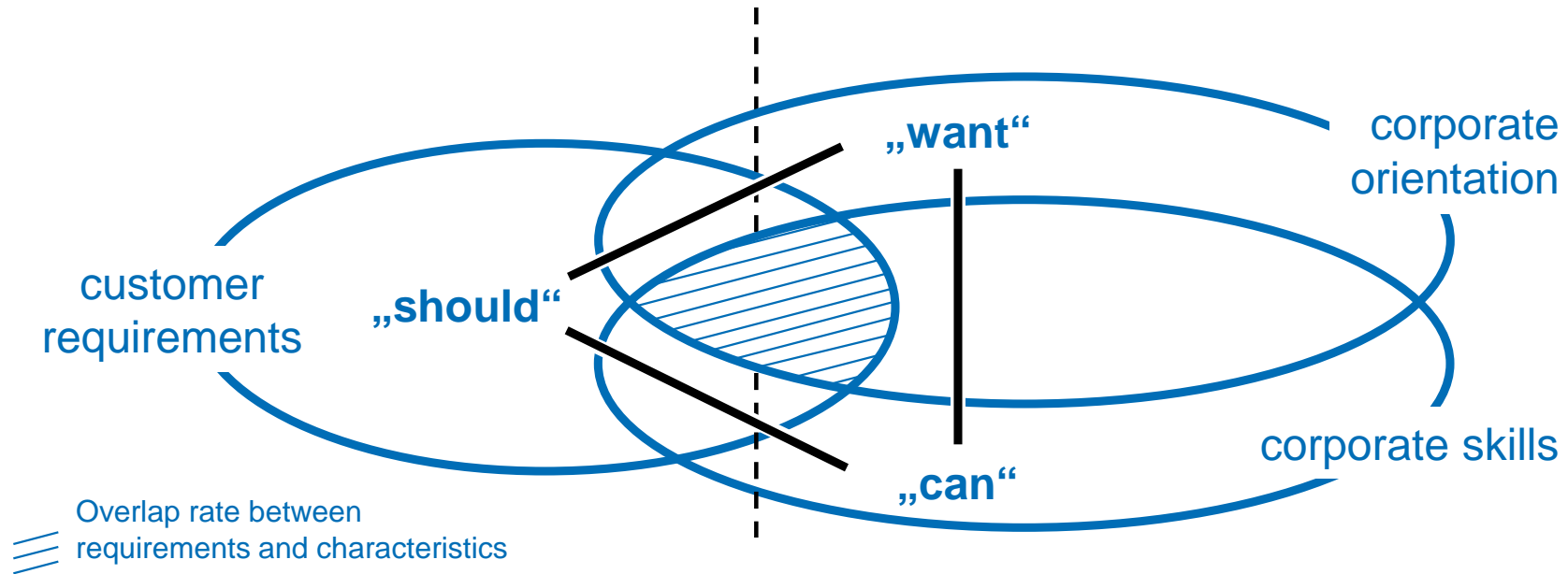


# The corporate understanding of quality



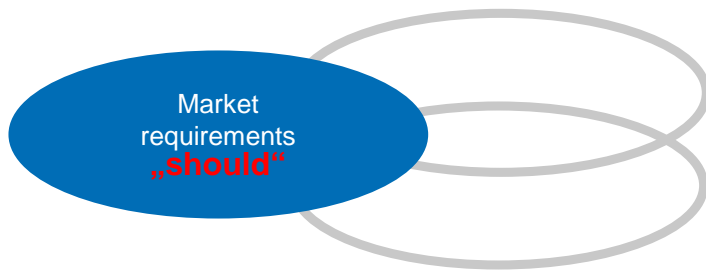


# The corporate understanding of quality



- Leading perspective: Positioning of the **want** across from the **should** and **can**
- Customer perspective: Adjustment of the divergence between requests (**should**) und and characteristics (**want** and **can**)
- Operational perspective: A comparison between **can** and **want** inside the company

# The Entrepreneurial Understanding of Quality leads to the design of the Aachen Quality Management Model in its basic elements

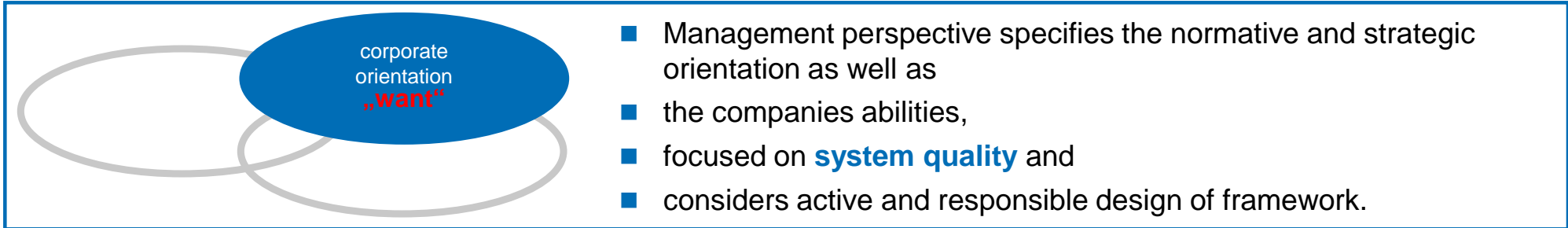


- Customer perspective supports the transportation of customer requirements into inspiring products by:
- A continuous monitoring of transformation, so
- The customer voice is transformed with focus on **product quality**



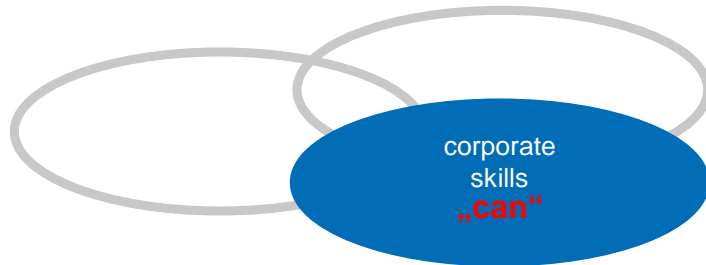
**Point of view: Customer perspective on the Quality Stream**

# The Entrepreneurial Understanding of Quality leads to the design of the Aachen Quality Management Model in its basic elements



**Point of view:** Management perspective on the Quality Stream

# The Entrepreneurial Understanding of Quality leads to the design of the Aachen Quality Management Model in its basic elements



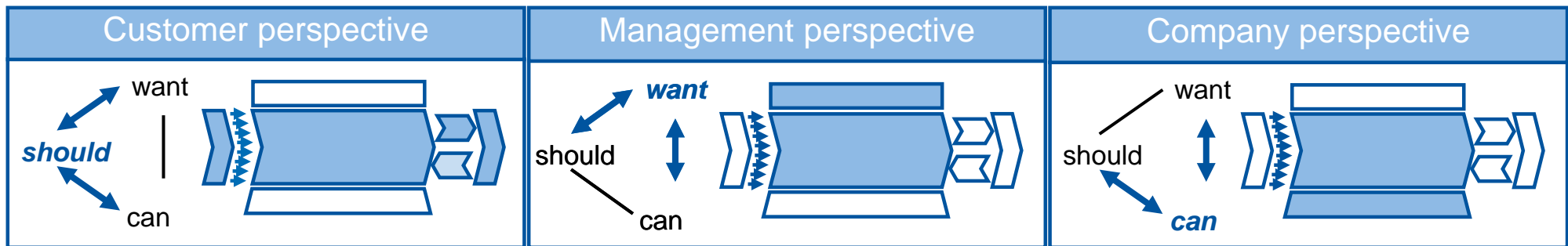
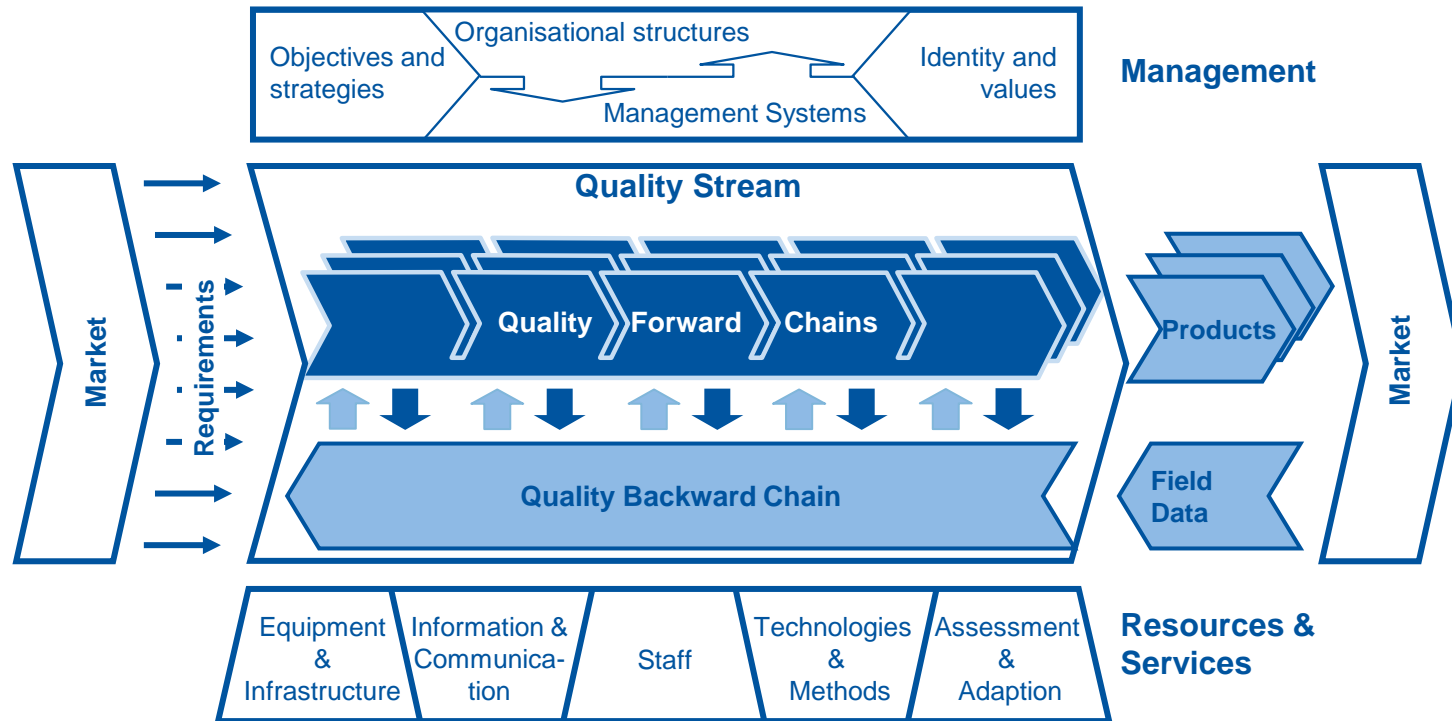
- Company perspective contains operative design and implementation of the other two perspectives
- with focus on **process quality**,
- whereby optimal coverage of resources and services is guaranteed.



**Point of view: Operational perspective on the Quality Stream**

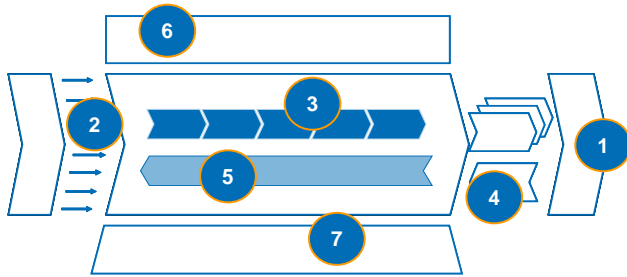


# The Aachen Quality Management Model



# What are elements of a university?

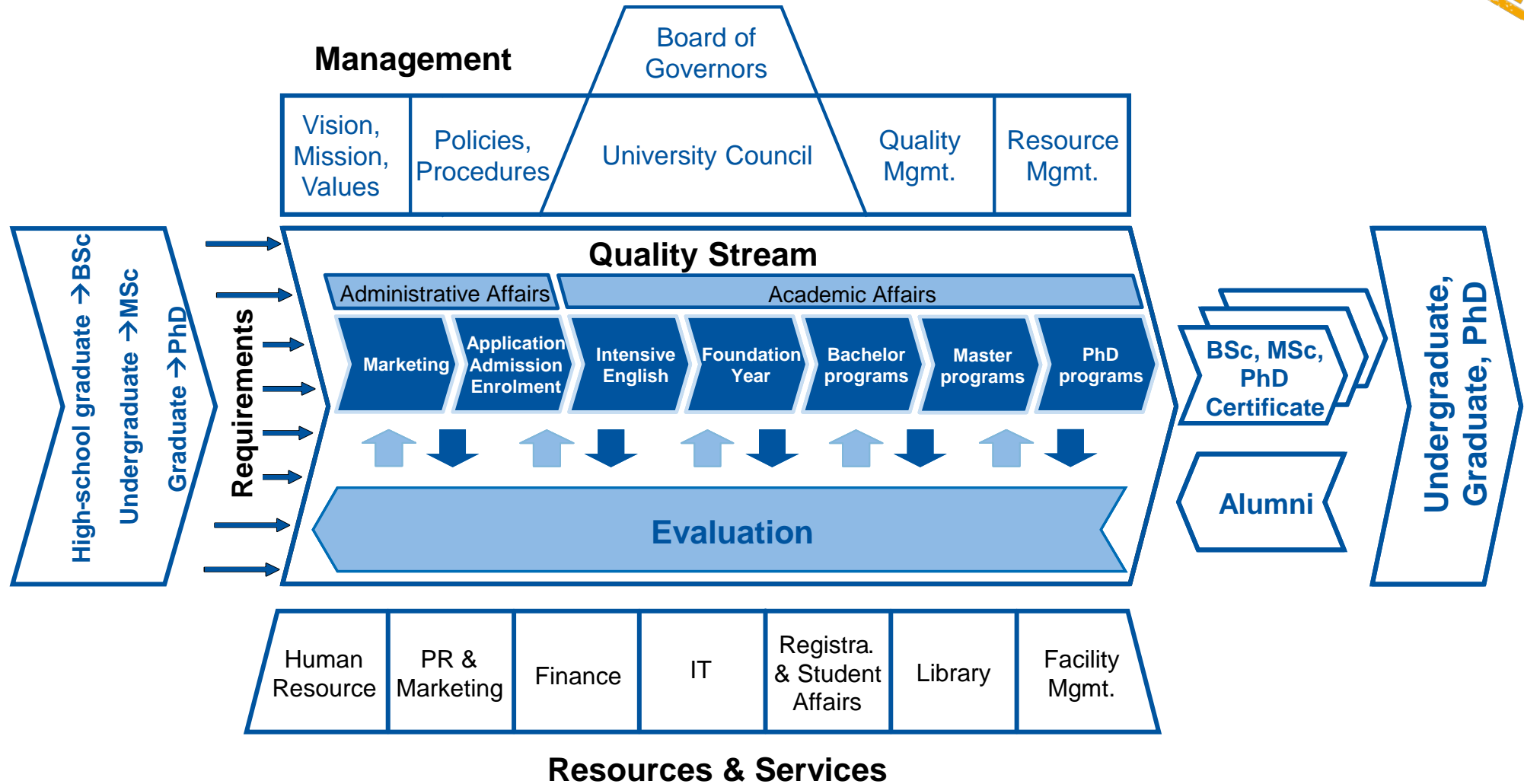
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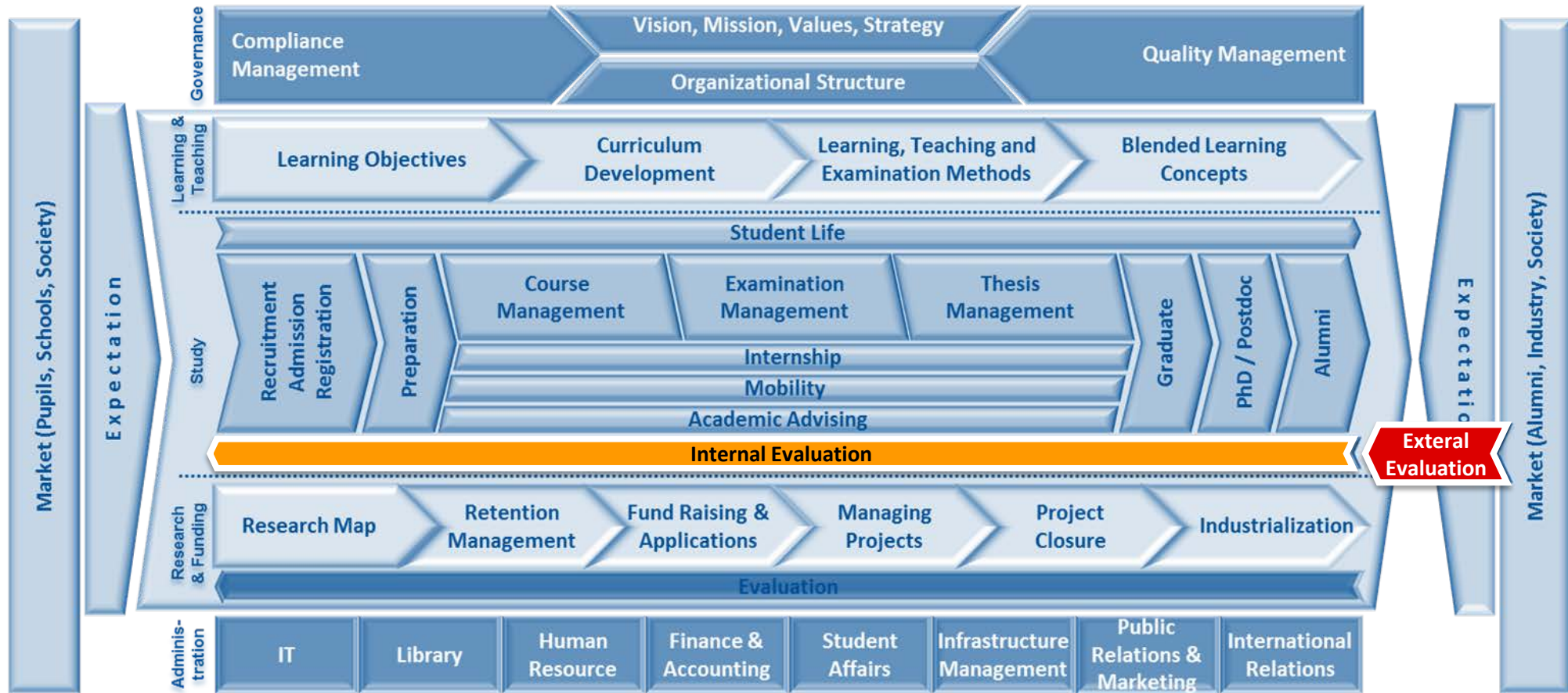
- 1 Who is the **customer**, how does the situation evolve?
- 2 What are the customer **demands**?
- 3 How are the **core processes** designed?
- 4 Which system is used to **collect field data**?
- 5 How is the **feedback process** handled?
- 6 How is the organizational complexity controlled by the **management**?
- 7 Are the **formal processes** optimally adjusted for “can”?  
How are the relations between the resources and the core processes designed?

# We designed the basis for a Quality Management System!

EXAMPLE



# Evaluation Tools are needed throughout the whole Organization



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Break

20 Minutes

