



**University of St.Gallen**

Institute of Accounting, Control and Auditing  
*Chair of Controlling / Performance Management*

Prof. Dr. Klaus Möller

29.04.2015, 18.00 – 19.30 UK Time

**Dr. Franziska Hasselmann**

## **Managing Strategic Mega Infrastructure Assets:**

**a review of European institutional  
and capacity-building challenges**

**OMEGA Series Seminar 2015**

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## **1** Sharing worldview, position & perspective

## **2** Experiencing complexity

Asset Management is not 'rocket sciences' ...

Beyond the 'iron triangle' ...

The innovation potential of London Heathrow ...

## **3** Resolving conflict

... but rocket sciences makes asset management more sustainable

... is potential for dynamic capability in technology

... can be facilitated by future infrastructure asset managers

## **4** Positioning and learn

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# Sharing worldview, position & perspective

## Worldview

### Institutional sustainability & collective action

advance state of the art in mega transportation project (MTP) management (Dimitriou et al., 2013)

MTP are part of infrastructure networks

overcome narratives that provide core rigidities


**For institution building in MIA are no challenges that are exclusively ,European‘**

value chains are global

high-tech is global

soil disservices are local

## Position



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|---------------------------------------|
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| Faculty                               |
| Application                           |
| Login area                            |

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### Managing Infrastructure Assets

Based on ongoing strategic dialogue - about the future of the construction industry and asset management - with leading public and private institutions as steering committee we are reaching out to our future graduates by means of a unique executive education program for asset management and related knowledge domains, including strategy, technology strategy, and asset management strategy formation, control, planning, and asset health management. Successful participation enables graduates to perform future oriented practices as asset management and to live ISO 55 000/1/2. The program is dedicated to leaders and innovators in public and private infrastructure management organizations, international development institutions, and financial market institutions.

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»The new CAS MIA at the University of St. Gallen will become the cornerstone of a very-much needed continuing education program in the infrastructure and asset management sector. This new program brings you the best expertise available in the private sector, academia and civil society. Its modular format will enable you to learn about the concepts and best-practices currently used in modern infrastructure asset management and will ultimately prepare you for


**Further information**



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energieschweiz  
Unser Engagement: unsere Zukunft.

Figure 1: Pilot phase executive education program CAS MIA in managing infrastructure assets at HSG

## Position

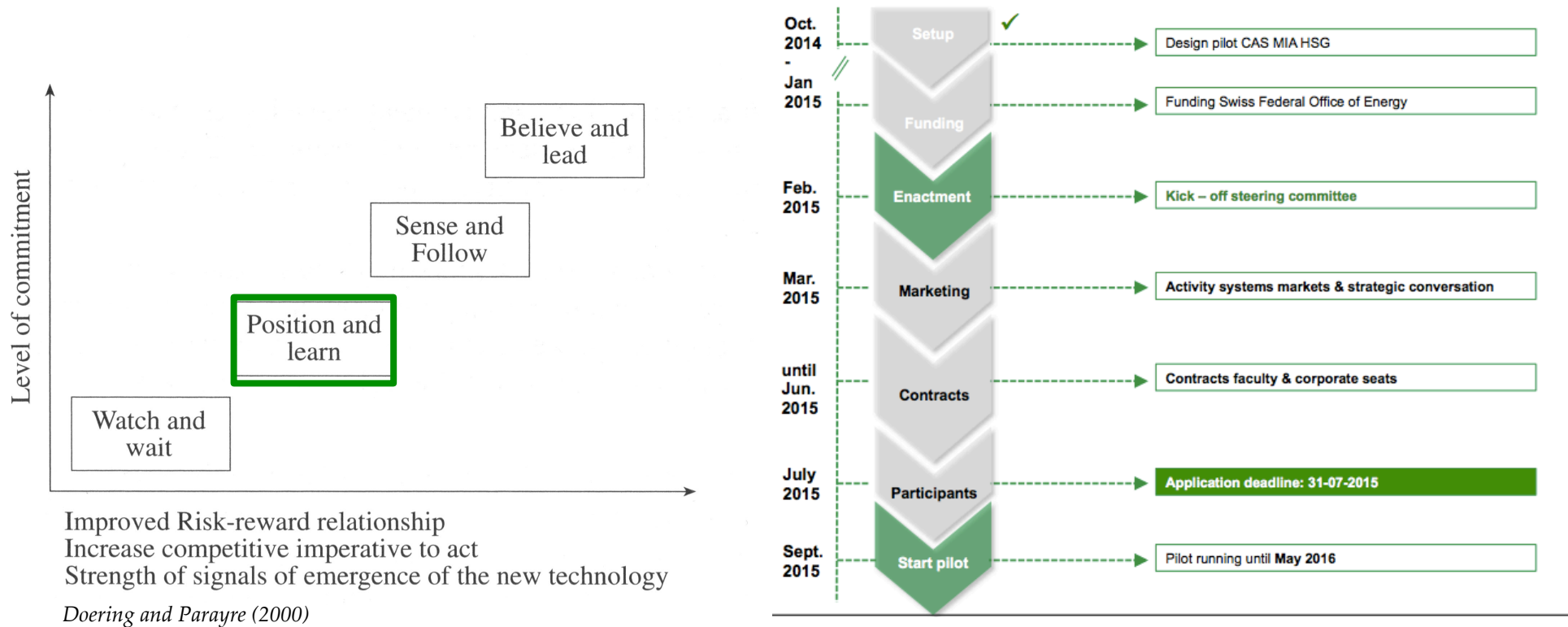
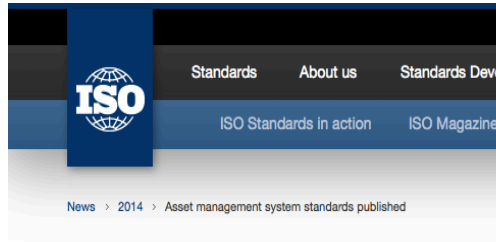


Figure 2: Pilot phase executive education program CAS MIA in managing infrastructure assets at HSG

## Perspective as capacity institution builder in MIA



### Asset management system standards published

23 January 2014



ISO 55 000/1/2 (2014)

Decoupling ‚means and ends‘ (Wijen, 2014) in MIA

Lack of framing infrastructure assets as  
‚high or appropriate technology‘

## Perspective as capacity institution builder in MIA

ISO 55 000/1/2

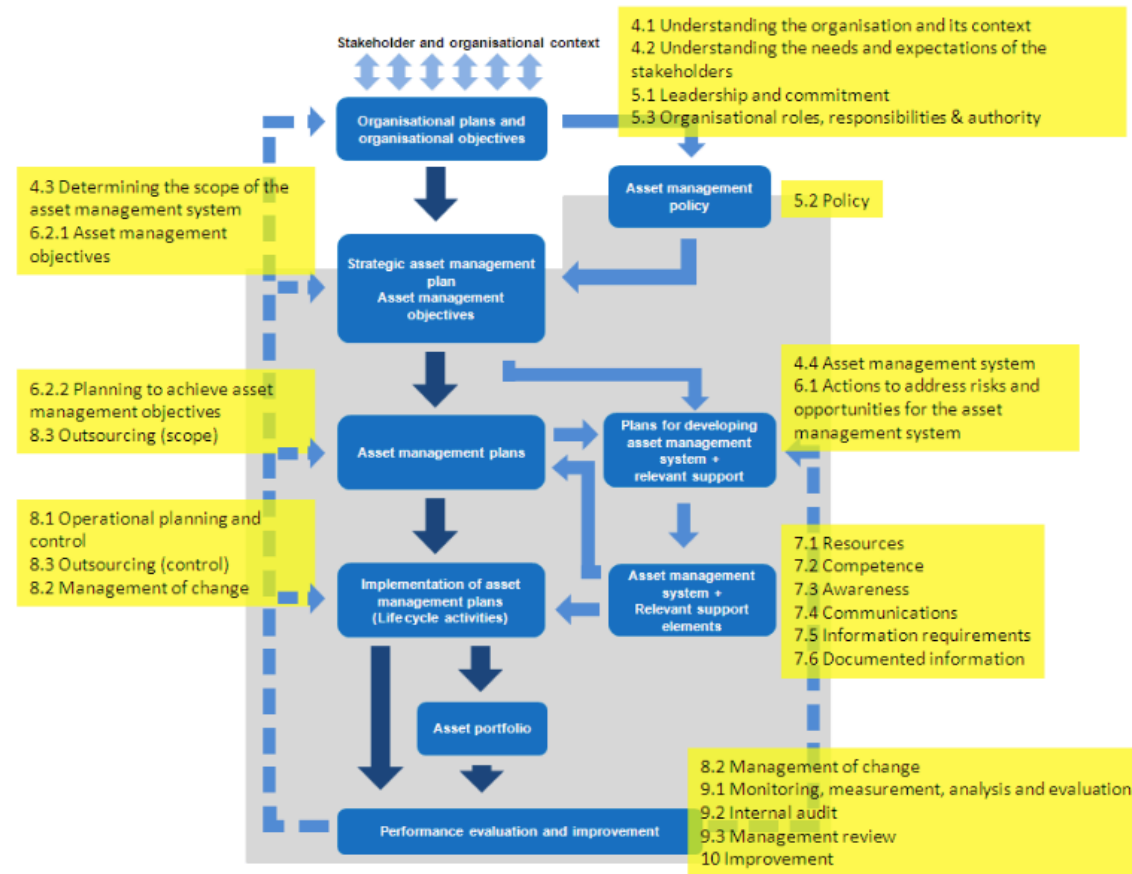


Figure 3: ISO 55001 elements of an asset management system (Woodhouse Ltd., 2013)



## Perspective as capacity institution builder in MIA

ISO 55 000/1/2

Decentral, private institutions, co-exist with conventional policy measures (King et al., 2004)

MIA organizations are looking for specific roadmaps to ISO 55 00X compliance

Fundamental research – **‘organizational perspective’** - is missing to do so (Terlaak and King, 2006; Too, 2011; Jimenez and Pagano, 2012; Minnaar et al., 2013; El-Akruti et al., 2013)

## Perspective as capacity institution builder

Decoupling  
,means and ends'  
(Wijen, 2014) in MIA

MIA is a ,highly opaque field': complex causal relationships, multiplicity of behaviour, invisibility of practices

Compliance - oriented institution (,best practice transfer') deliver concrete, uniform rules to provide clarity and monitoring

,Means' (,best practice transfer') provide substantial compliance, but misse ,ends' (policy goal internalization within organizational context)

**Niche institutions** – between policy and best practice – can mitigate trade-offs

*Institution according to (Fear and Azambuja, 2014)*

## Perspective as institution builder

Lack of framing  
infrastructure assets  
as ‚high technology‘

MIA includes  
high-tech

Relationship between  
asset strategy,  
corporate strategy,  
technology strategy  
needs management  
attention

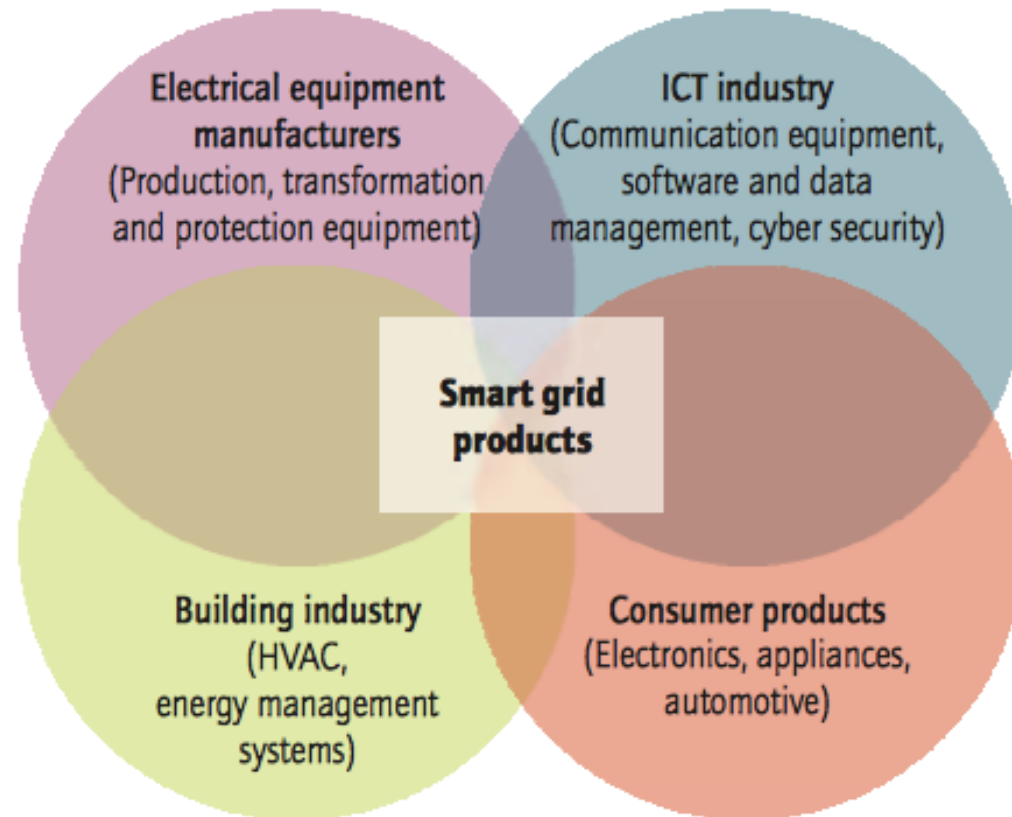


Figure 4: Smart grid product providers that need to collaborate in the future (OECD/IEA, 2011)

## Perspective as institution builder in MIA

Niche institution  
MIA profession

integrated and innovative portfolio of capacities –  
combining new and existing ones (application knowledge) –  
will trade-off ‚best practice‘ and complex policy.

adding technology management and (urban) planning  
(NOT planning approach to corporate strategy)  
emergent strategies and organizational learning become  
institutions that provide clarity

# Experiencing complexity

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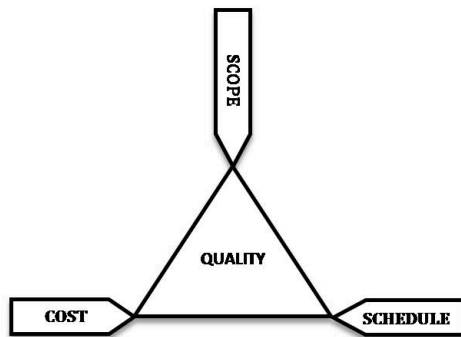
## Asset management is not ,rocket sciences‘

Absence of ,rocket sciences‘ is a quality indicator of asset management conferences and training courses

Strong narrative serving as core rigidity for integrated MIA

## Beyond the 'iron triangle' (Dimitriou et al., 2013)

Managing MTPs exclusively as 'projects' is a result of emphasis on compliance seeking



Research in PM has limited potential to further improve large infrastructure situations (e.g. cost overruns, behavioural deviance) (Giezen, 2012; Eriksson, 2013; Mir and Pinnington, 2014; Liu et al., 2013; Pinto, 2014; Irimia-Dieguez et al., 2014)

Figure 5: The project management 'iron triangle' ([http://en.wikipedia.org/wiki/Project\\_management\\_triangle](http://en.wikipedia.org/wiki/Project_management_triangle))

Nevertheless, project management is the main approach to MIA, due to lack of alternatives

## The innovation potential of London Heathrow (Gil et al., 2012)

Technology adoption in MTP rises when core rigidities (e.g. project culture framings) are balanced by alternative framings

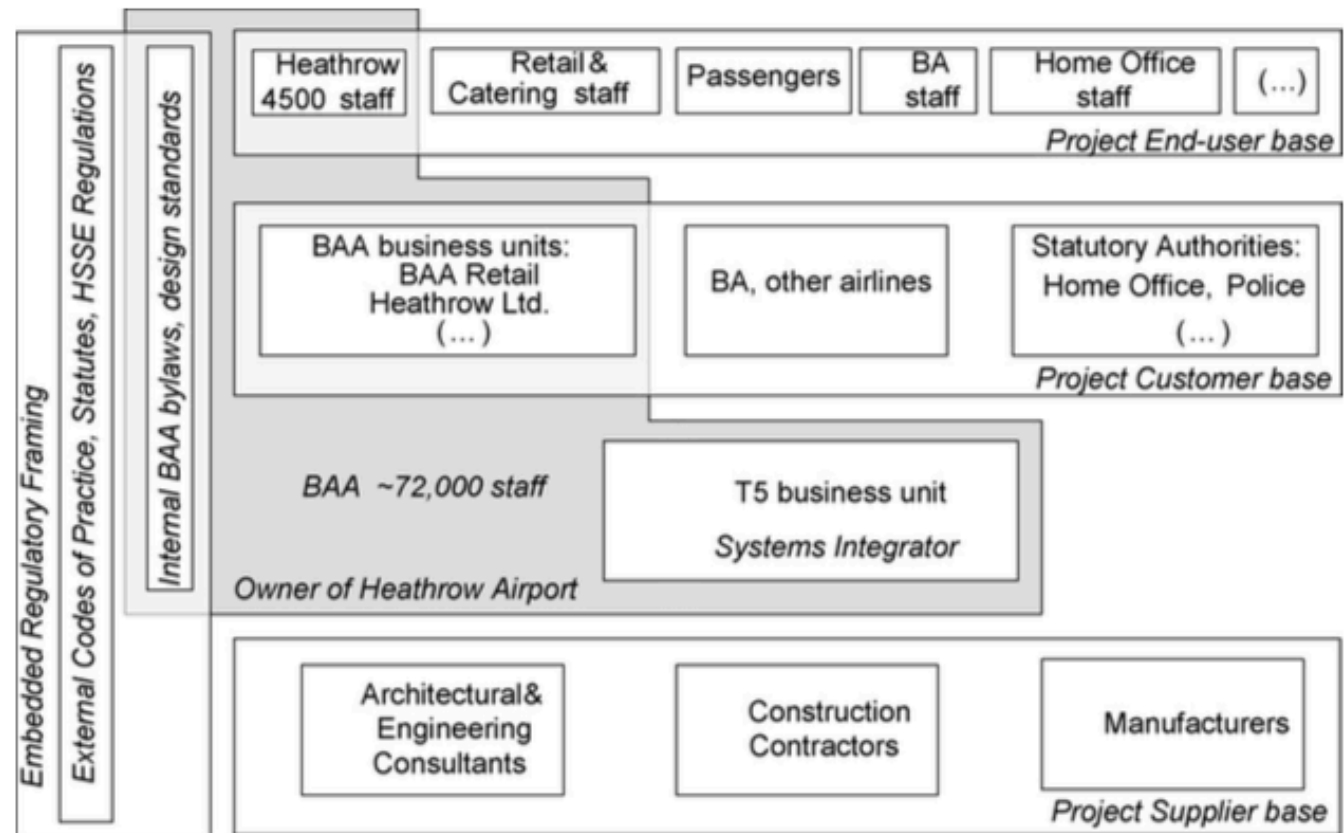


Figure 5: T5 stakeholder and embedded framing relevant to technological decisions (Gil et al., 2012)



# Resolving conflict

How can a future MIA address the challenges

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## **‚Rocket sciences‘ can make MIA more sustainable**

Impact assessment of new infrastructure (material sciences)

Guidelines for sustainable urban planning and underground space use

Disentangle soil services, disservices (costs), and grid assets  
(Total sciences of environment, ecosystem approach)

## ‘Rocket sciences’ can make MIA more sustainable

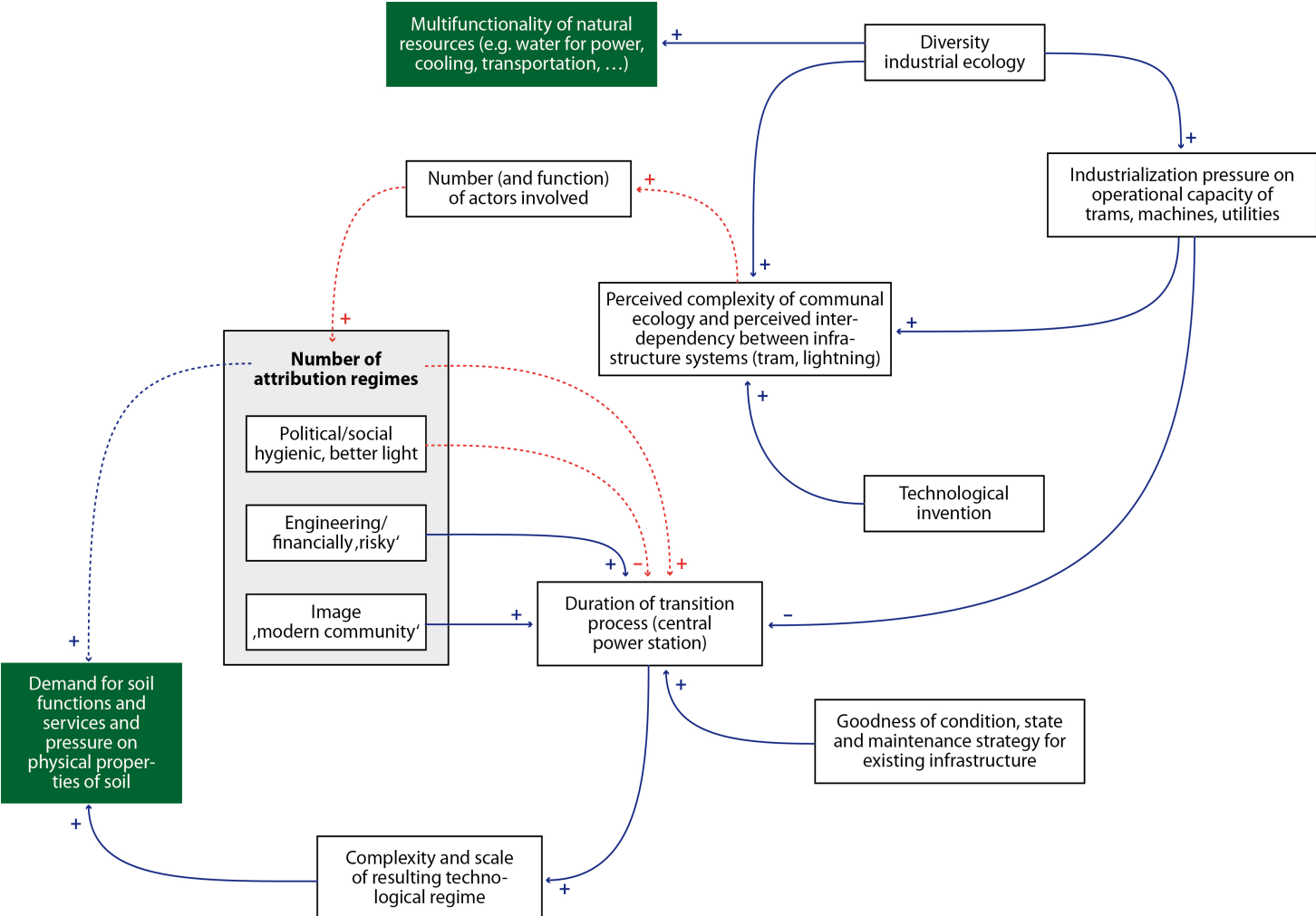


Figure 6: causal loop diagram of transition from decentral to central power supply in six municipalities in Germany 1880-1914. The orange-dotted arrows denote implicit processes, such as perceptions. Green variables belong to the environmental system and white ones to the social system. Dashed blue arrows indicate slow processes (Hasselmann, F. with R. Seidl, reproduced from Hasselmann, 2015).

## ‘Rocket sciences’ can make MIA more sustainable

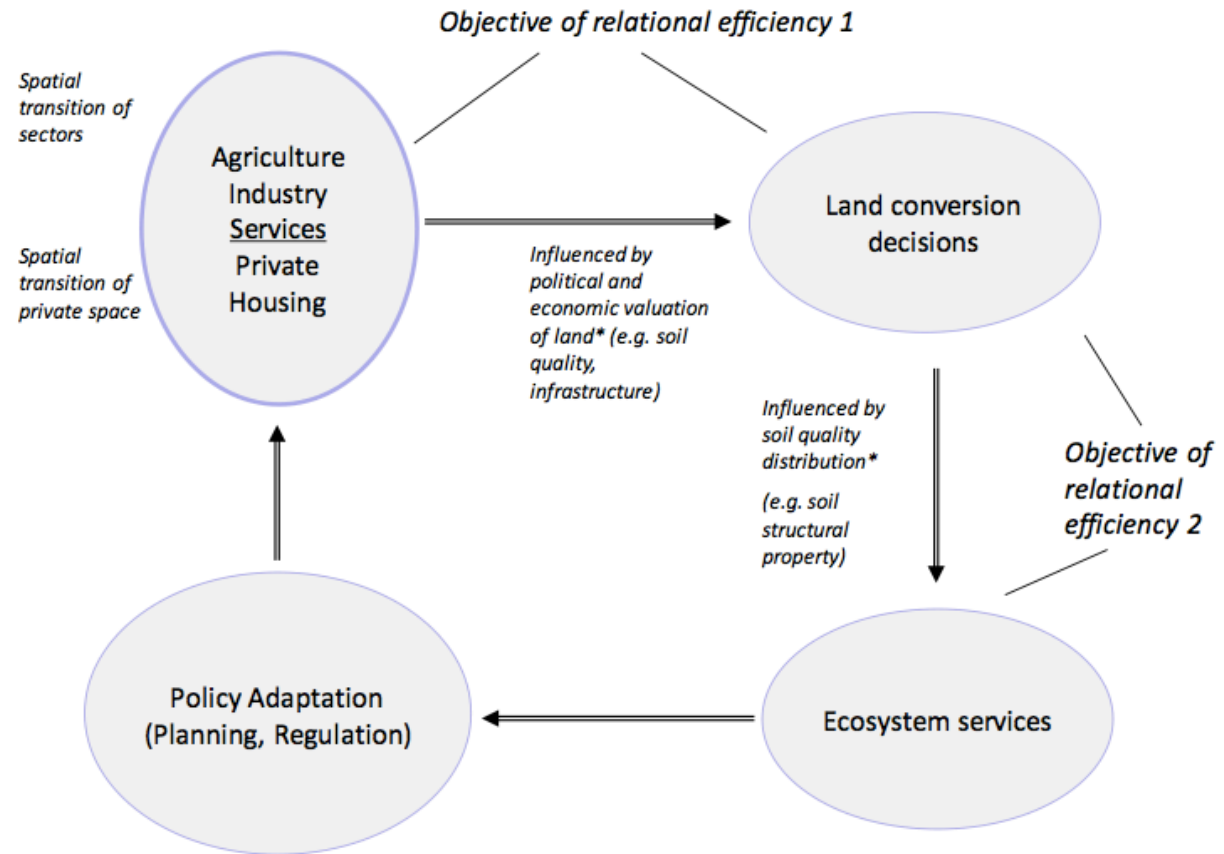


Figure 7: conceptual model integrating underground space use by public and private construction with regional and sector economics (Mann, S. with F. Hasselmann, reproduced from Hasselmann, 2015).

## Beyond the 'iron triangle' is dynamic capability in technology

Projects are innovation projects when they include innovation activities

Innovation activities can strengthen core competences (cc) and establish dynamic capability in technology by linking cc (Leonard, 1992, 1995)

**Shared problem solving**  
**Prototyping and testing**  
**Implementing and integrating**  
**Absorbing knowledge from 'outside'**

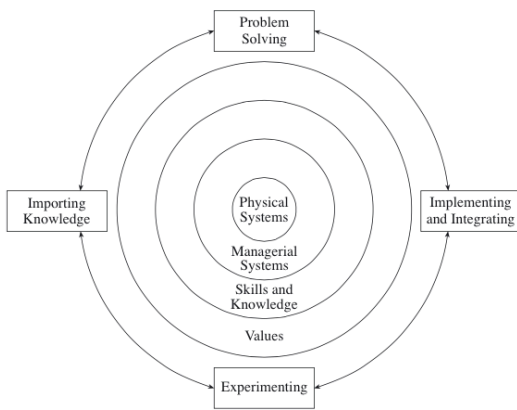


Figure 8: activities that create and renew technological capability (Leonard, 1995).

## Beyond the 'iron triangle' is dynamic capability in technology

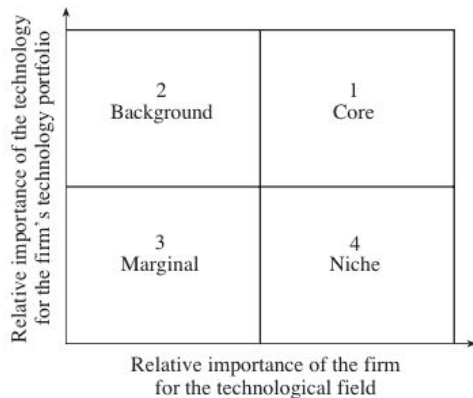


Figure 9: classification of competences (Patel and Pavitt, 2000).

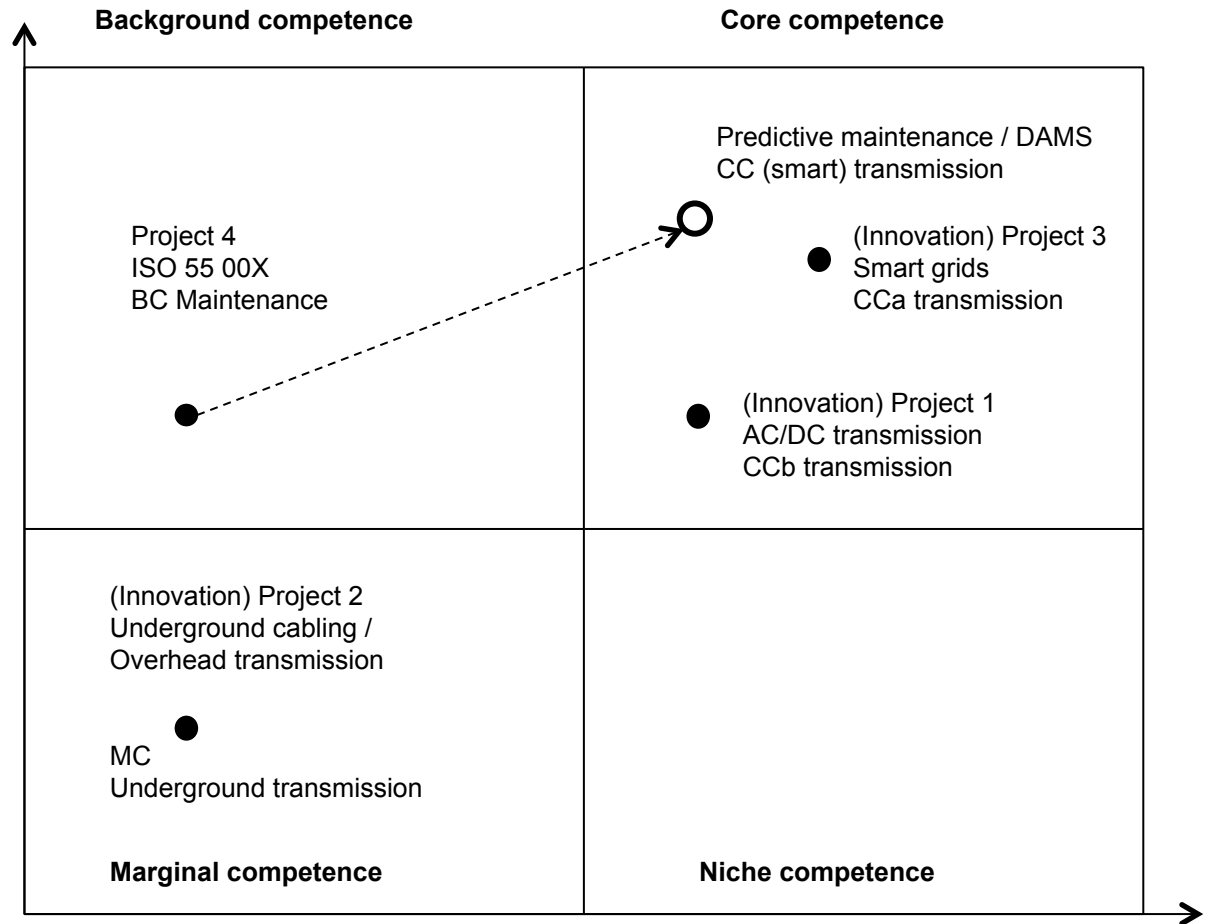


Figure 10: classification of competences for transmission system operator (Hasselmann, 2015a, adapted from Leonard, 1995).

## Beyond the 'iron triangle' is dynamic capability in technology

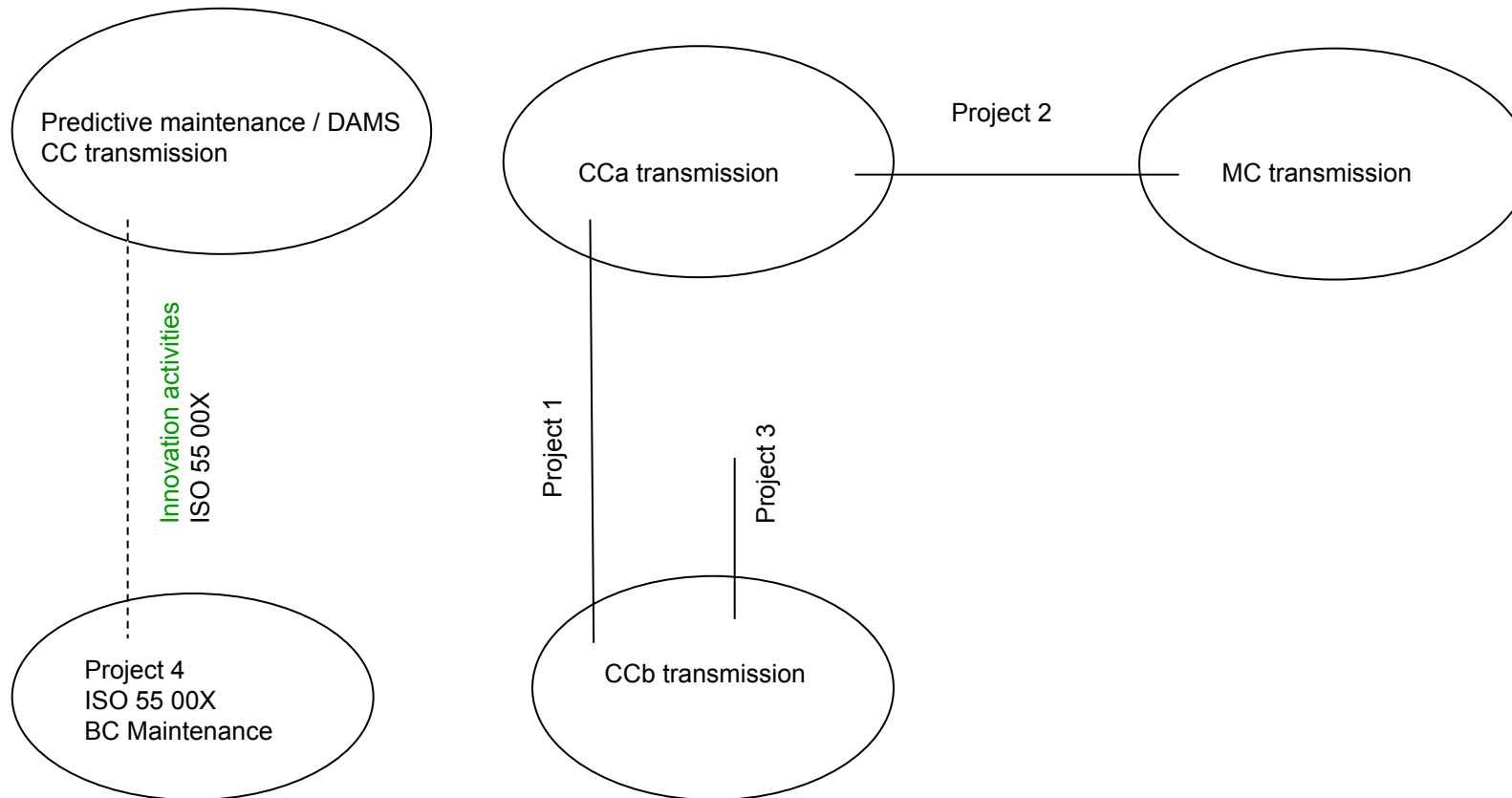


Figure 11: linkages between projects and classification of competences for transmission system operator (Hasselmann, 2015a, adapted from Leonard, 1992).

## Innovation potential can be facilitated by future HSG MIA managers

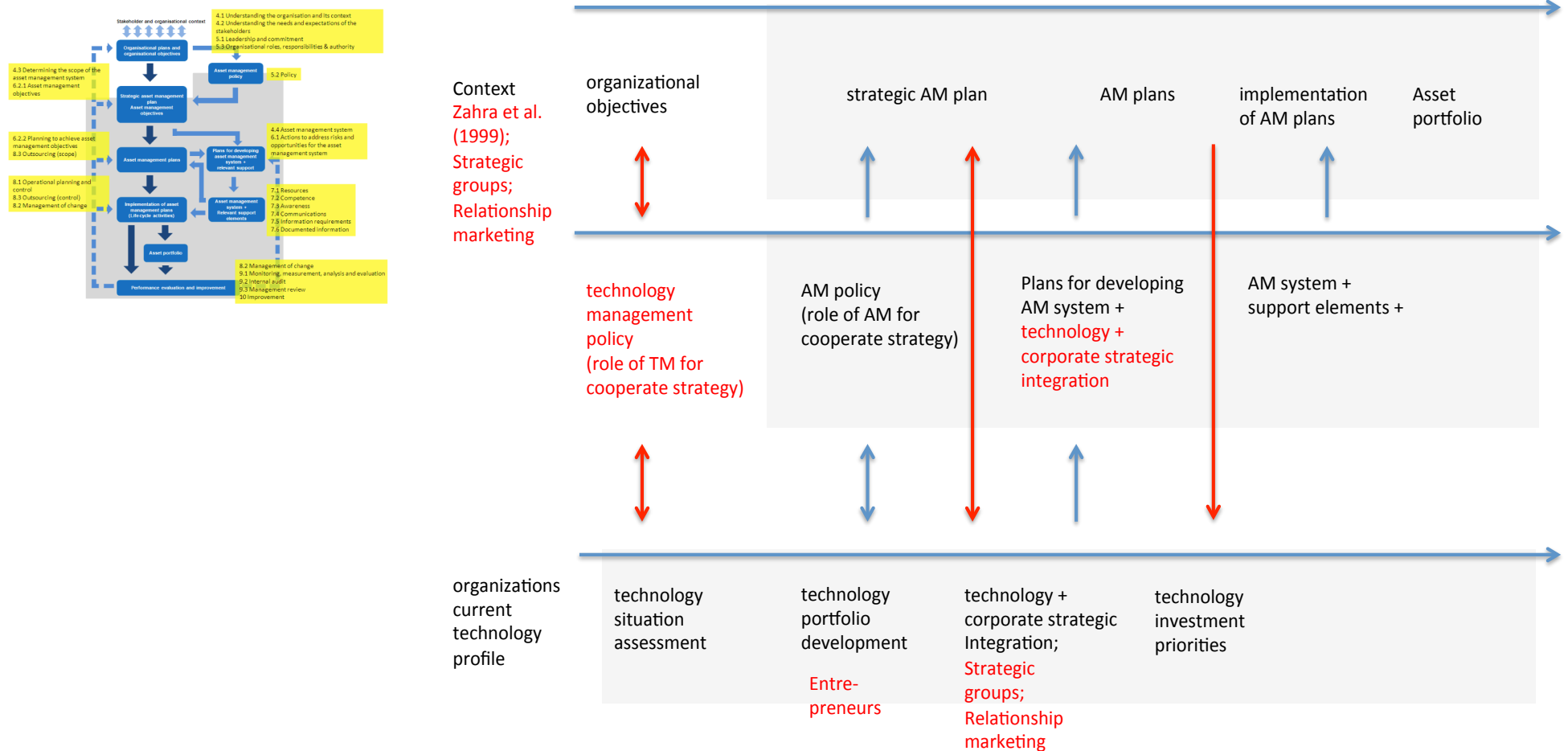


Figure 12: linkages between AM strategy and technology strategy formation (Hasselmann, 2015b).



## **Positioning and learn**

HSG MIA strategy and modules are positioned



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### **Dr. Kurt Rüegg**

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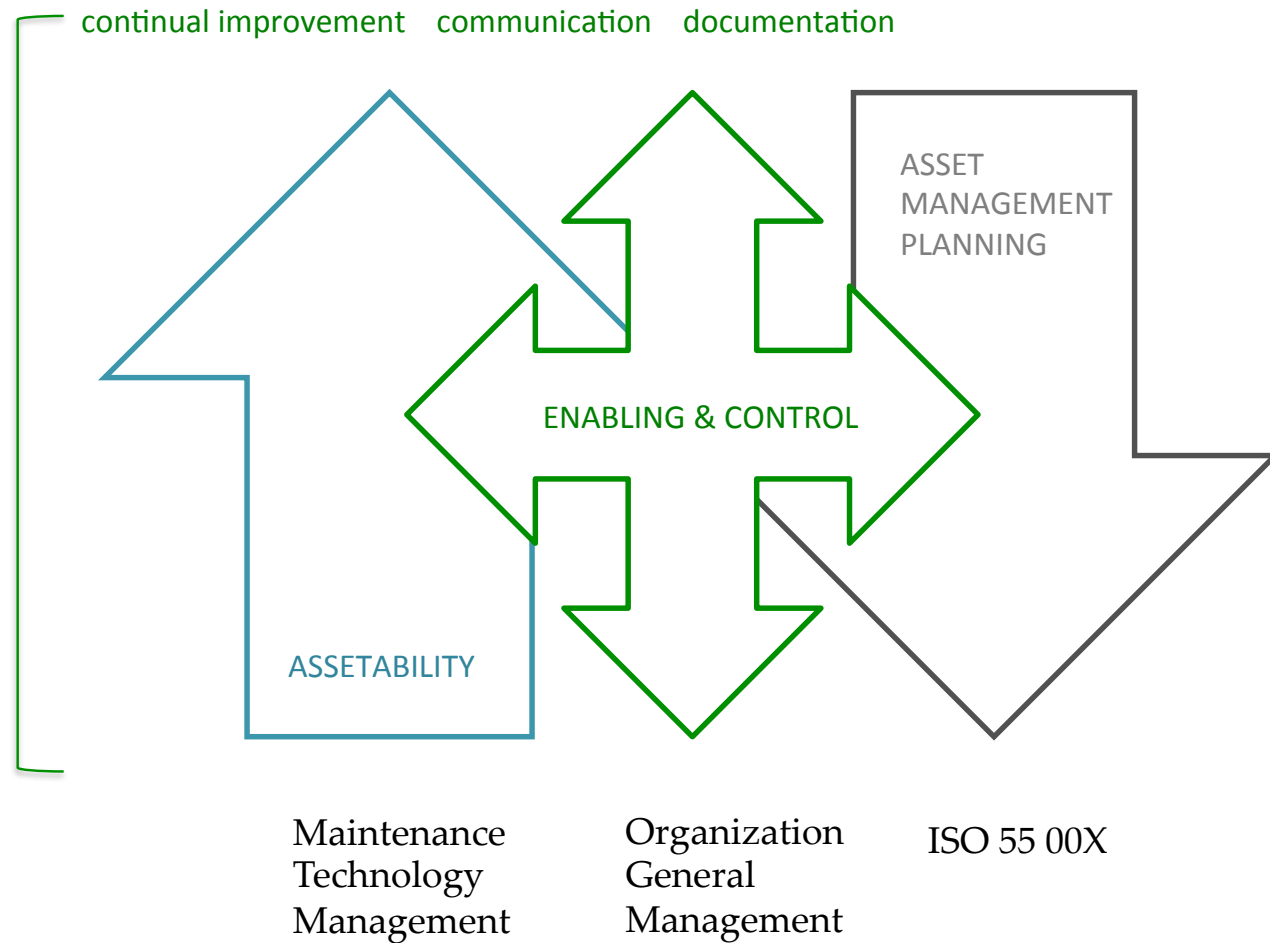


Figure 13: three core competences of MIA at CAS MIA HSG ([www.casmiahsg.ch](http://www.casmiahsg.ch)).



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Figure 14: prototyping and testing at CAS MIA HSG ([www.casmiahsg.ch](http://www.casmiahsg.ch)).



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