

Software Excellence and Outsourcing Experiences at PSE

October 2006, Budapest

- PSE as a global software service supplier
- Software Excellence at PSE
- Outsourcing Experiences

PSE as a Global Software Service Provider

PSE History

- Division of Siemens Austria
- Founded around 1960 in Vienna
- 2200 engineers by 1990
- One of the biggest Software development centers in Europe

why PSE went global

- Limited growth possibilities in Austria
- Increase of development cost
- Sales opportunities for software products in CEE

Decision in 1990 to build up development centers (companies) in the neighbouring CEE countries

PSE a Global Software Service Supplier



- 7000 employees
- 22 locations
- Sales FY 06 appx. € 566 million

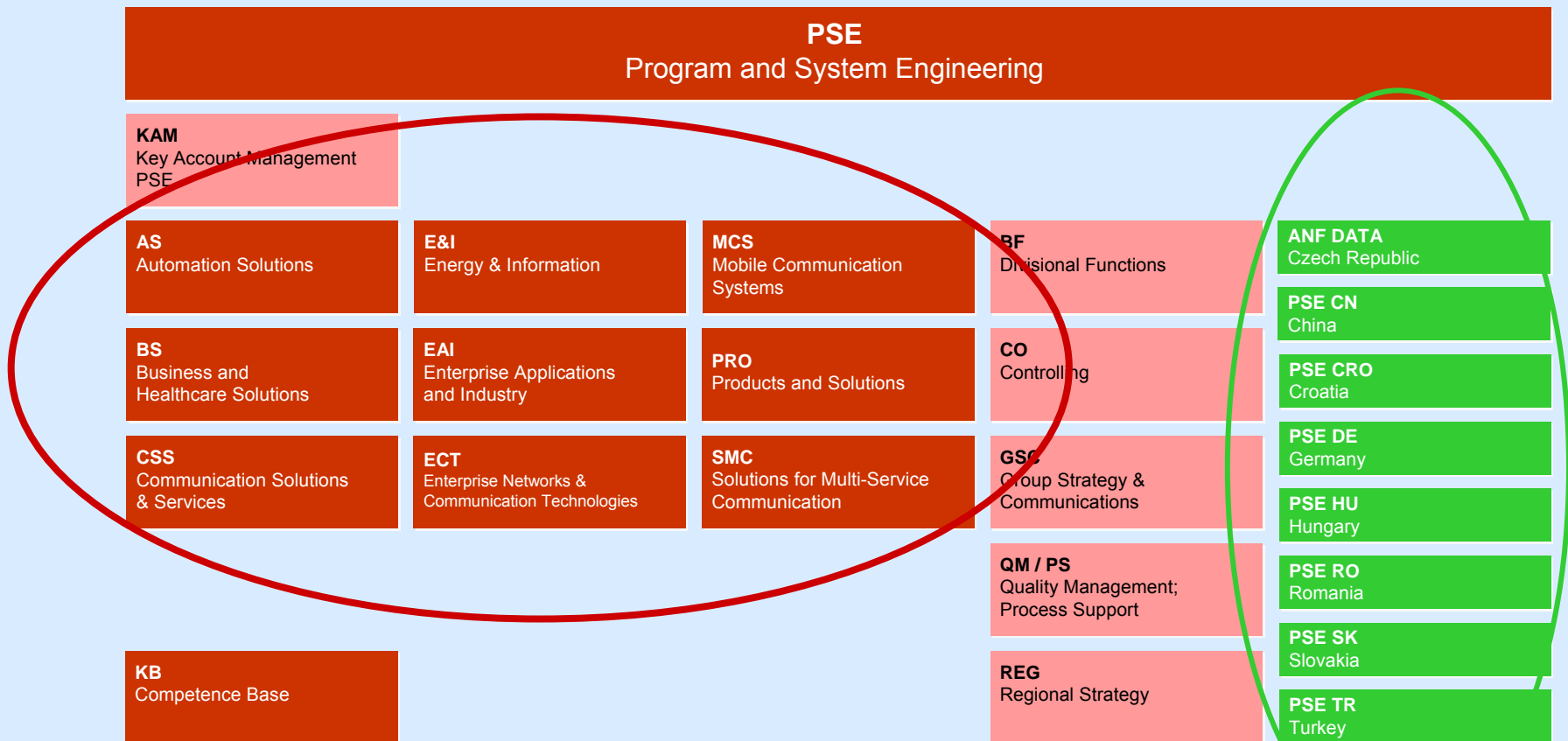
Represented in USA by
Siemens Shared Services LLC



Present situation of PSE

- more than 7000 engineers
- 9 countries
- software development in 22 locations
- more than 55% in low cost countries

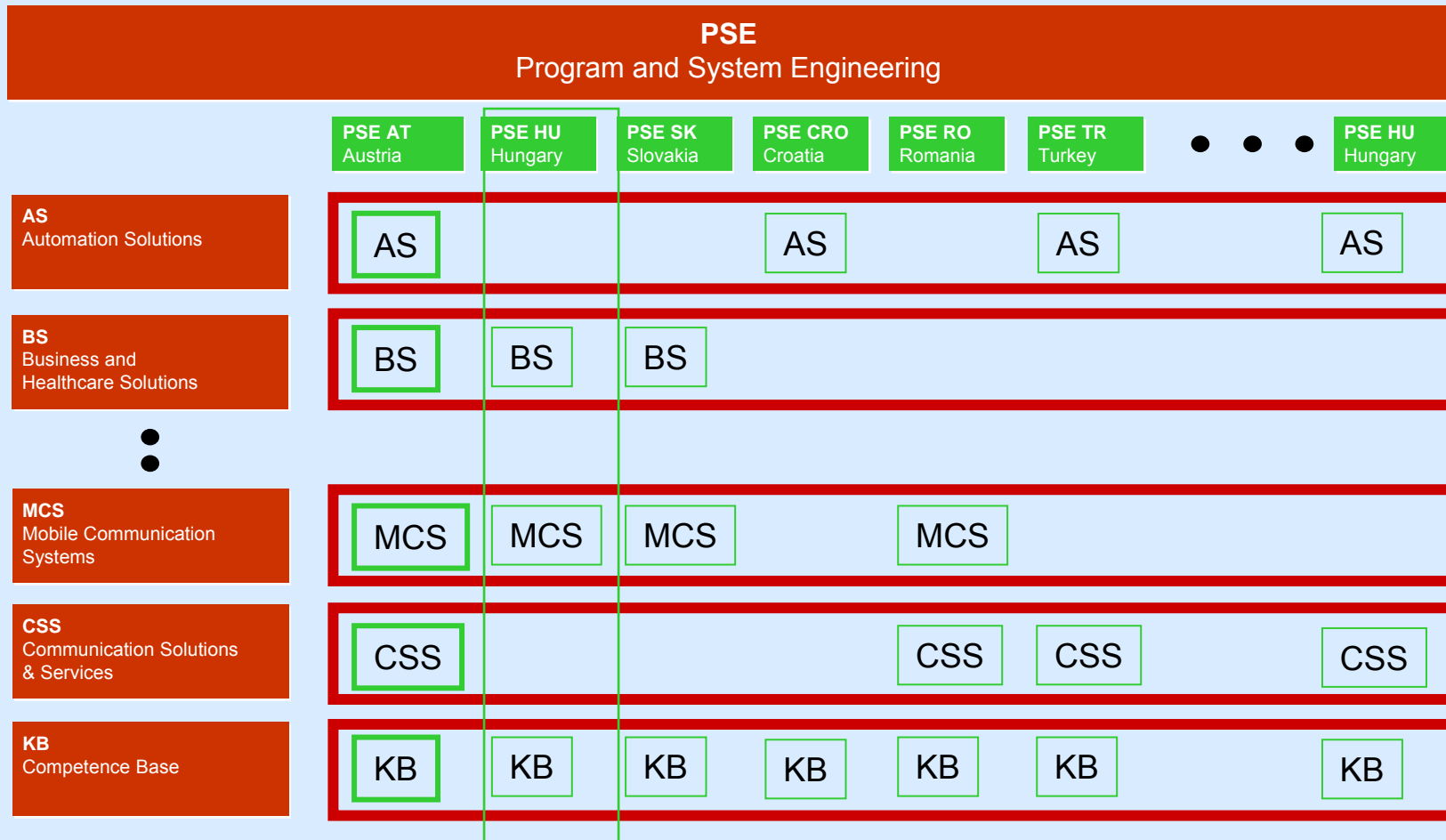
PSE organization: business units and regions



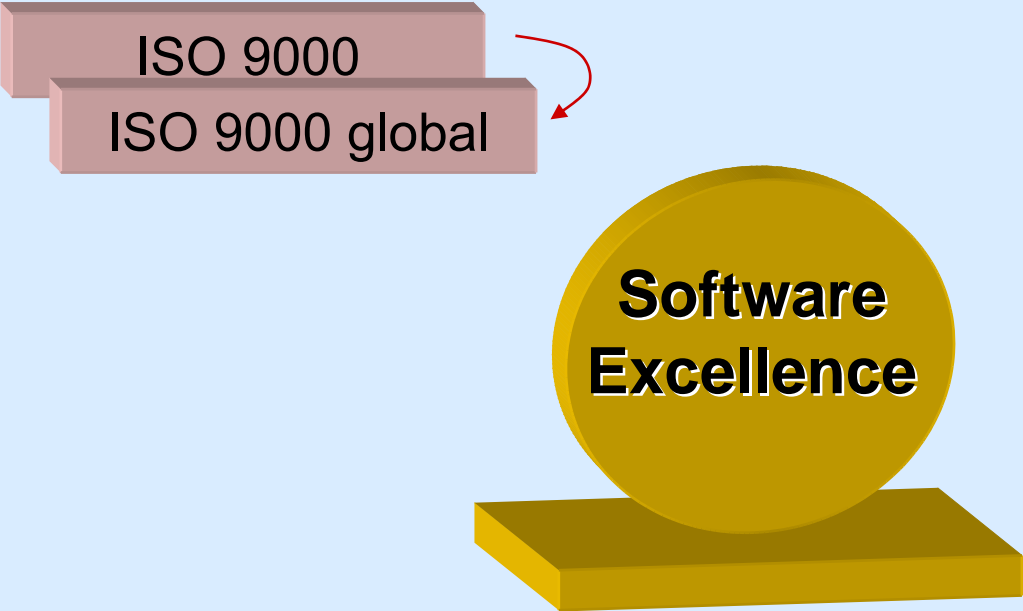
PSE a Global Software Service Supplier

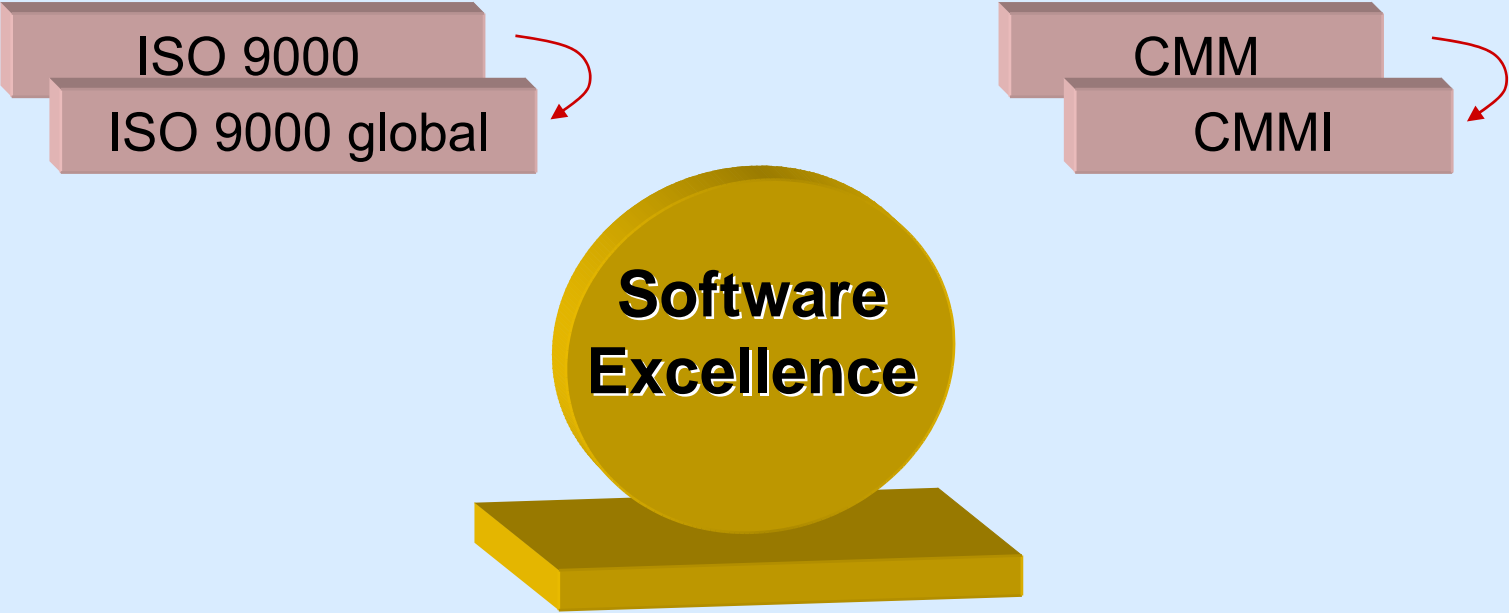


global PSE business units in a matrix organization with PSE countries



Software Excellence at PSE

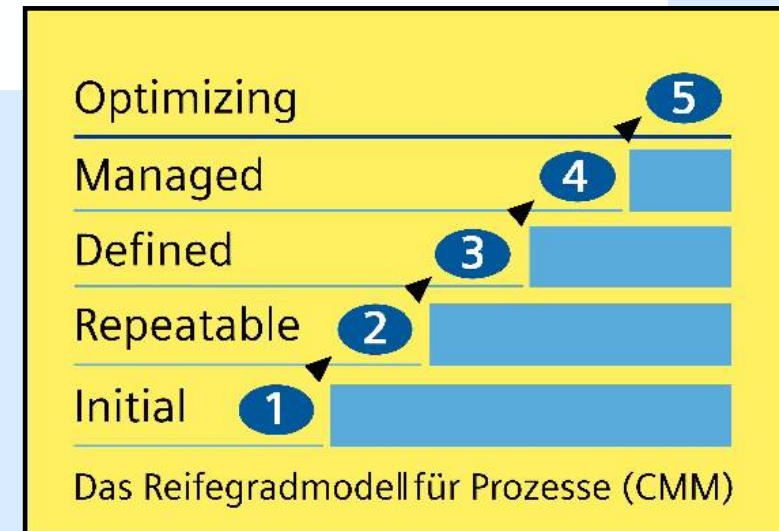




Software Excellence at PSE

SIEMENS

Why CMMI at PSE ?



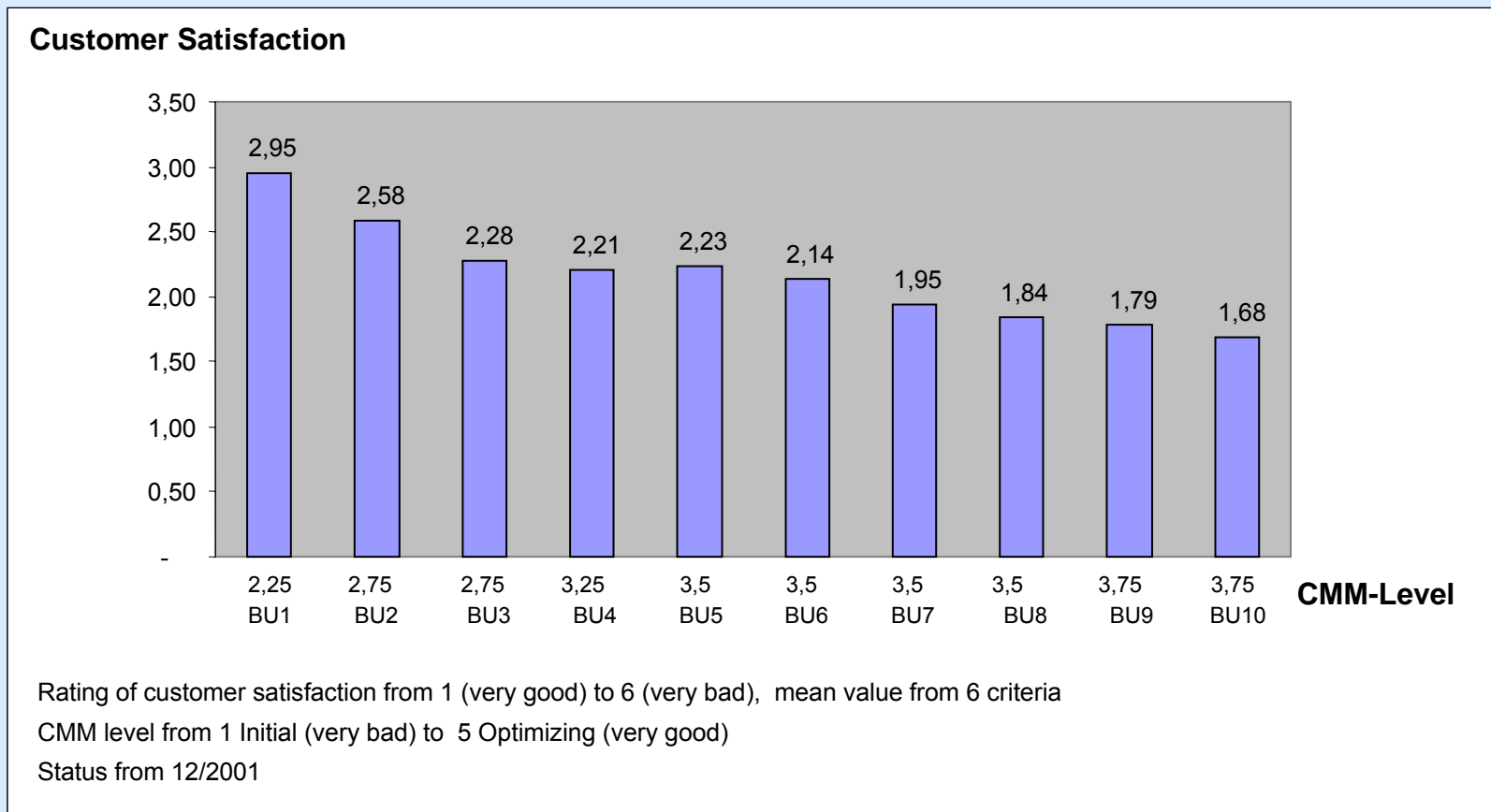
- **CMMI exactly addresses all the key process areas of Software Development**
- Siemens Process Assessment (SPA) is a derived methodology based on SEI and Bootstrap method, which was introduced by Siemens Corporate Technology to focus especially on **process improvement**

- **First steps with CMM in 1993 – 1994**
 - according to 1984 defined PSE software development method (SEM) -> Level 2,75
 - initiated some very important improvement activities
 - Web based SEM
 - „Support Centers“ (internal consulting groups) -> Start PSE specific technology management
 - PROWEB: Tool for project controlling and metrics
- **1997 – 2001 CMM Assessments in all business units**
 - Level 2,25 to 3,75 reached
 - again new improvement projects where initiated
 - PSE Metric Catalog
 - Risk Management Toolbox
 - TechnoWeb / Interest Nets / Expert Nets (Technology Management)

Software Excellence at PSE



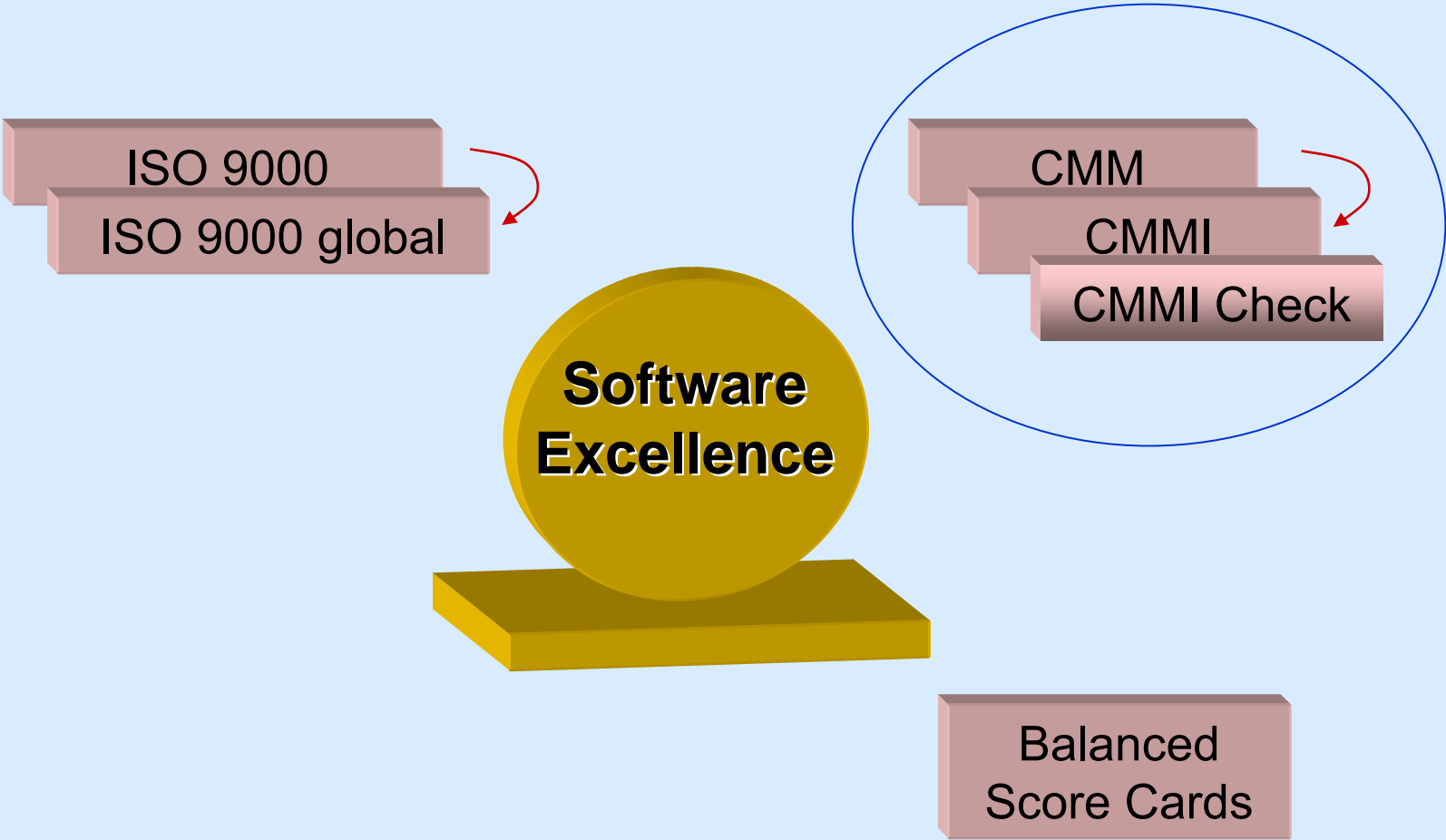
Analysis of all PSE's Business Units showed a very high correlation between CMM-Level and Customer Satisfaction !

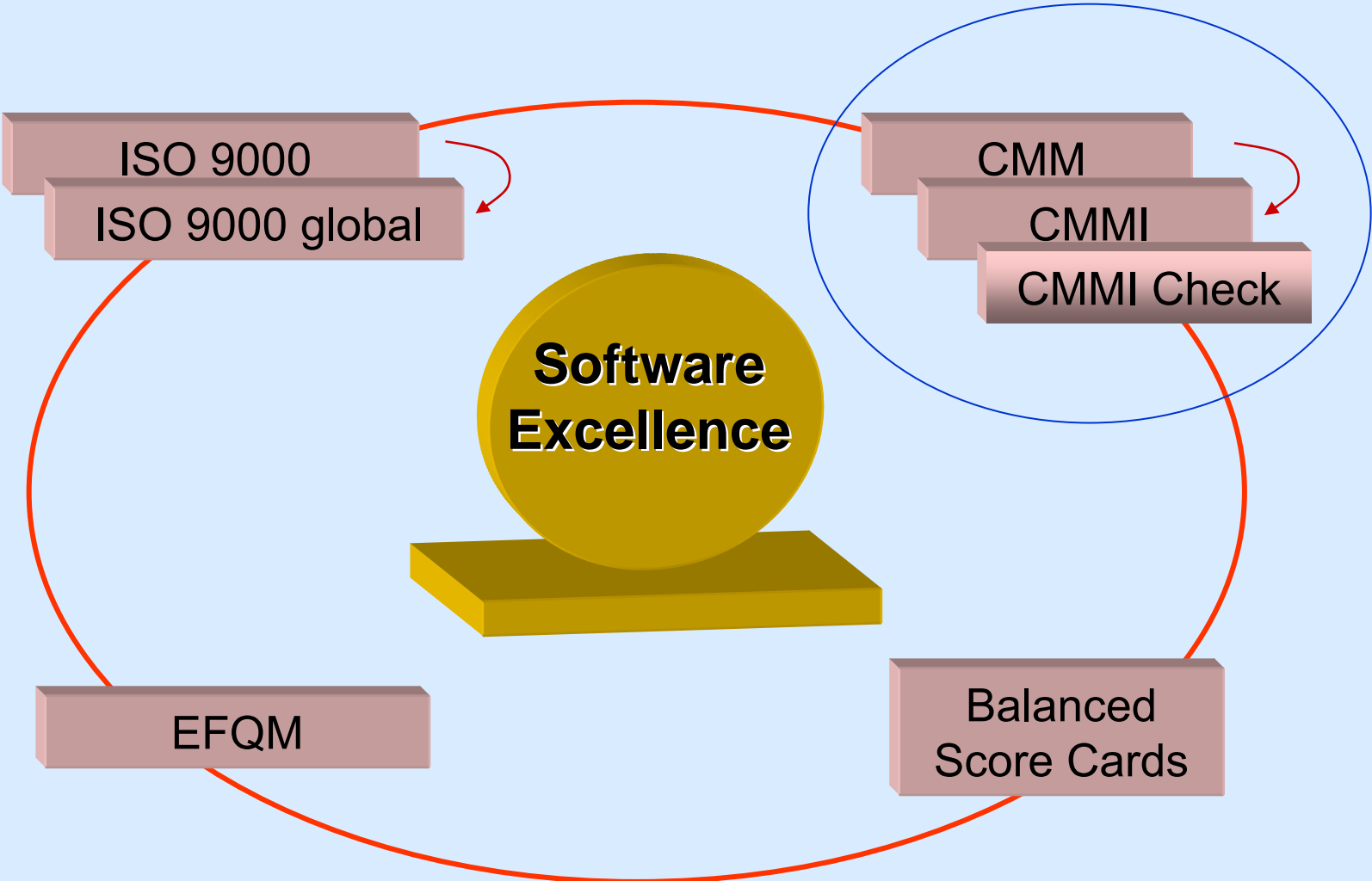


- **2004 Transition CMM to CMMI**
 - Level 4 reached for development process
 - Assessment for all business units started
 - regions of PSE included in business unit assessments

- **CMMI Checks : a continuous improvement method**
 - **self assessment** done by PSE assessors on project level
 - helps to keep high quality standard
 - defined process based on **CMMI questionnaire**
 - **cost efficient** (2-3 days per project)
 - **mandatory** in all PSE business units and regions
 - Quality Goal : at least **one CMMI Check per year** in each organizational unit

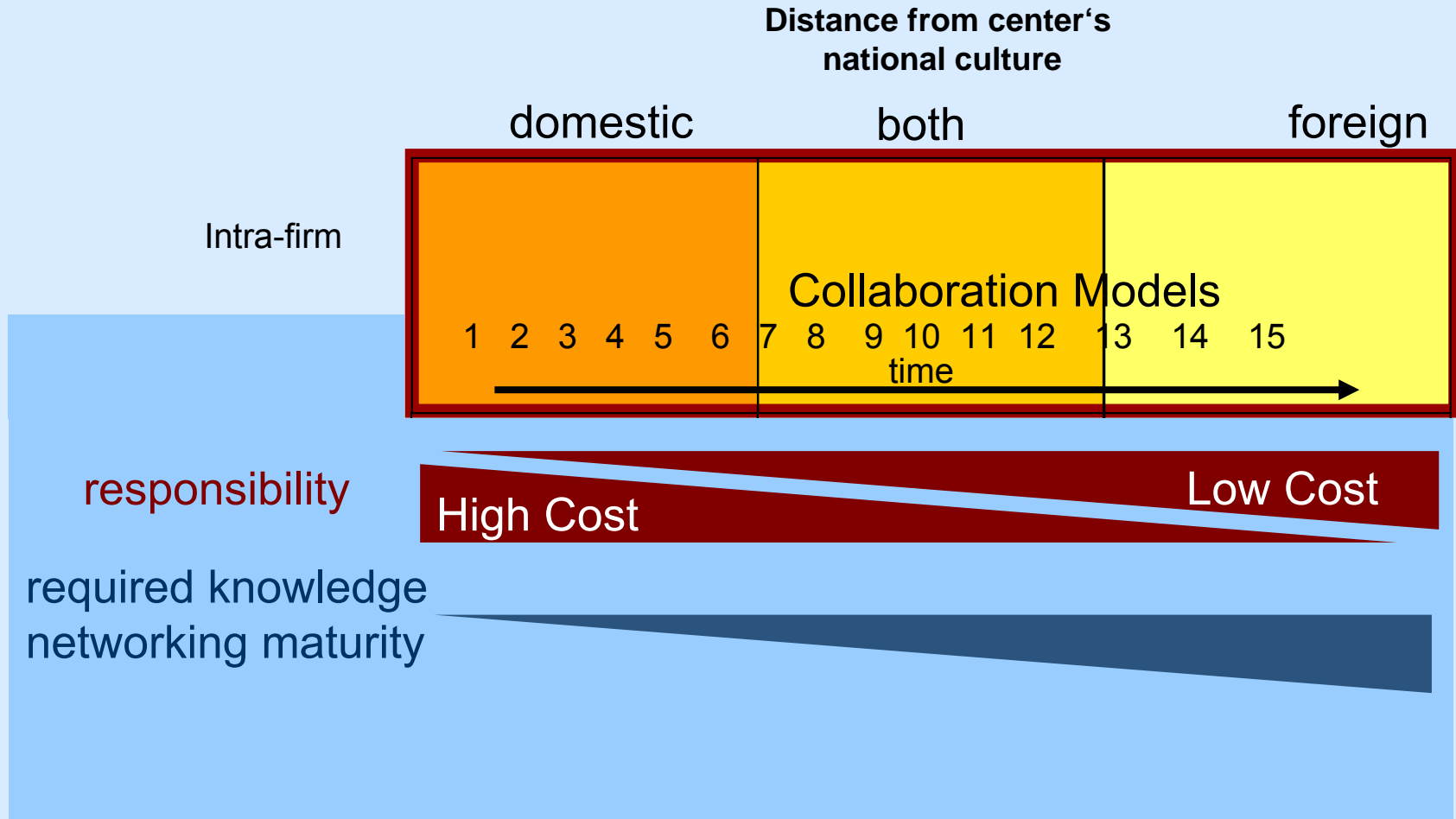
Software Excellence at PSE



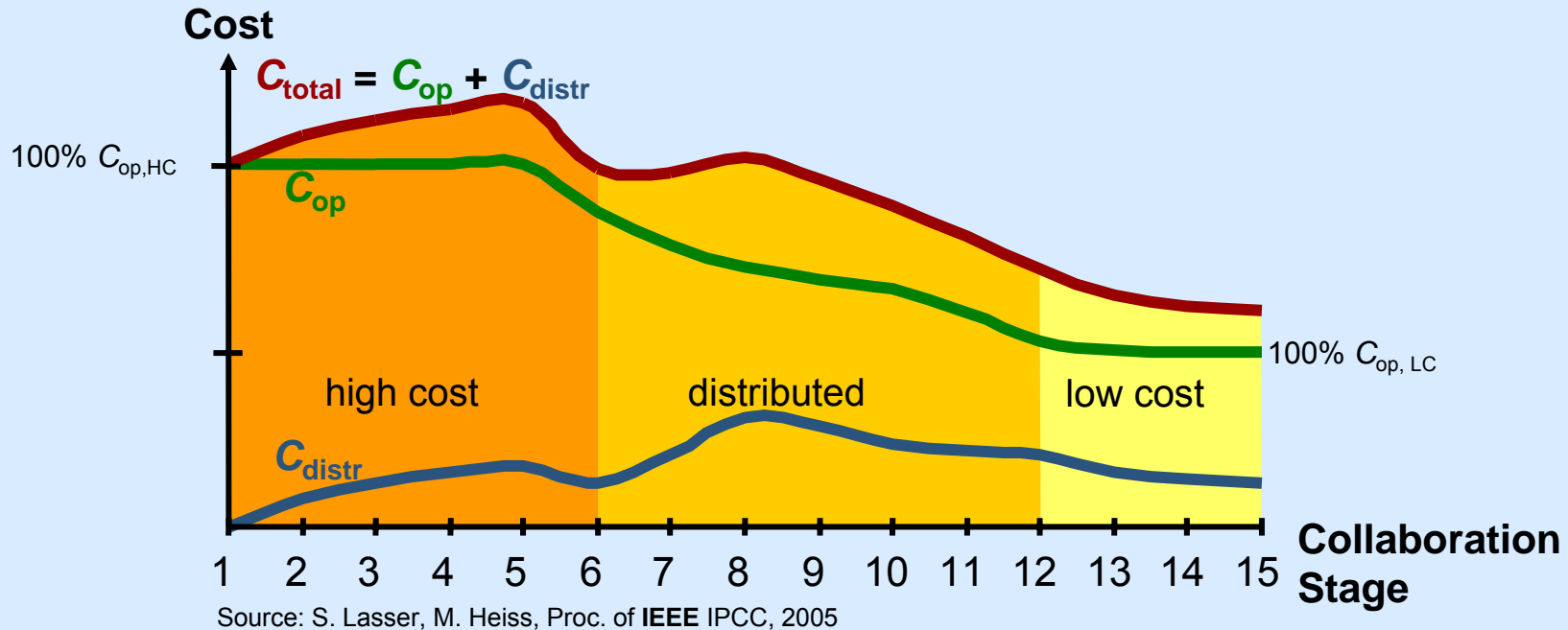


Outsourcing Experiences at PSE

15 different In-house Offshoring Collaboration Models



Cost Trends for Different Collaboration Stages (with high collaboration maturity)



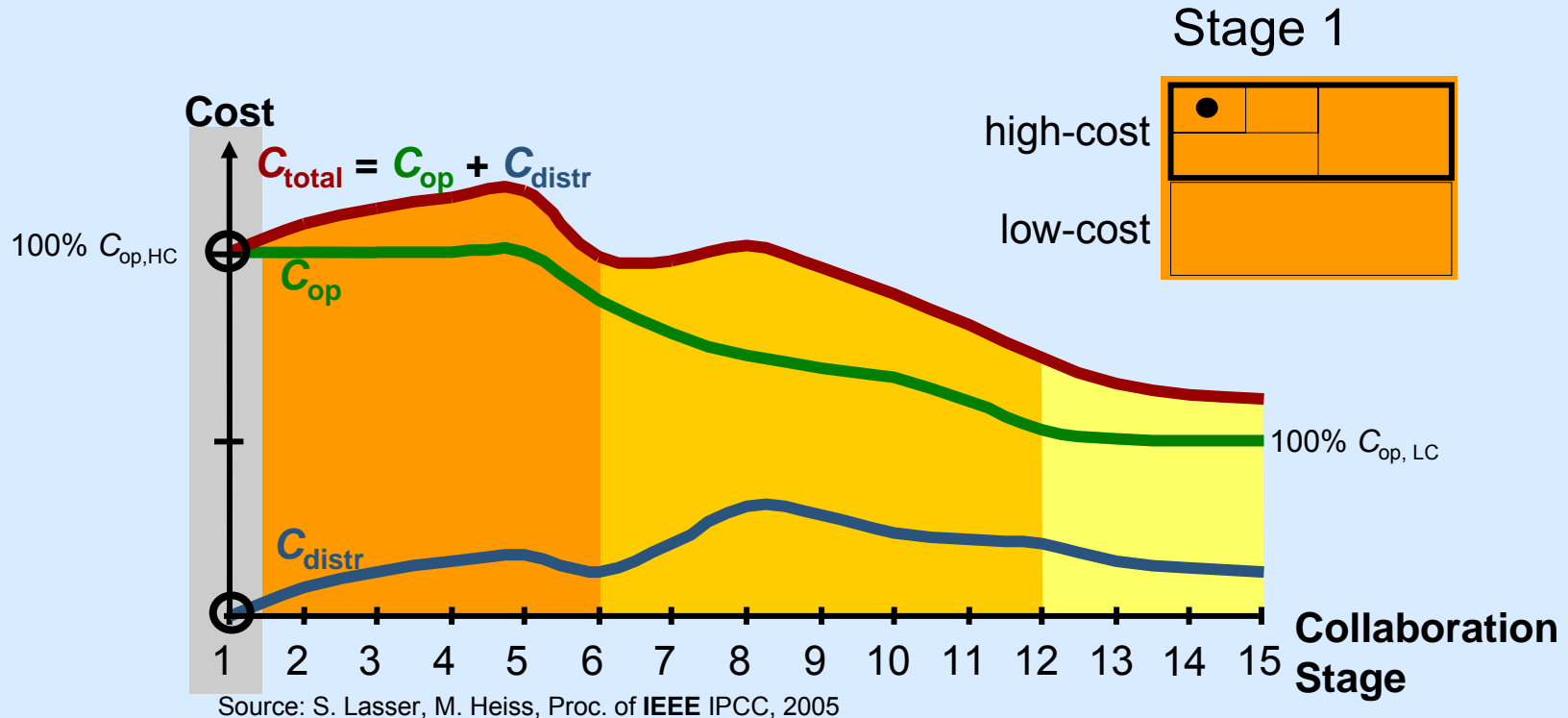
C_{op} ... Operative Costs:

all costs that would also be applicable for a one-person project
mainly **labor costs**

C_{distr} ... Distribution Costs:

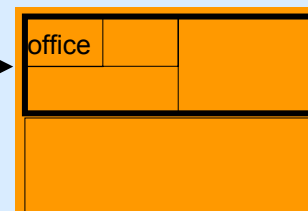
costs that occur because work is not performed by a single person
coordination, communication, travel, rework due to misunderstandings...

Cost Trends for Different Collaboration Stages (with high collaboration maturity)



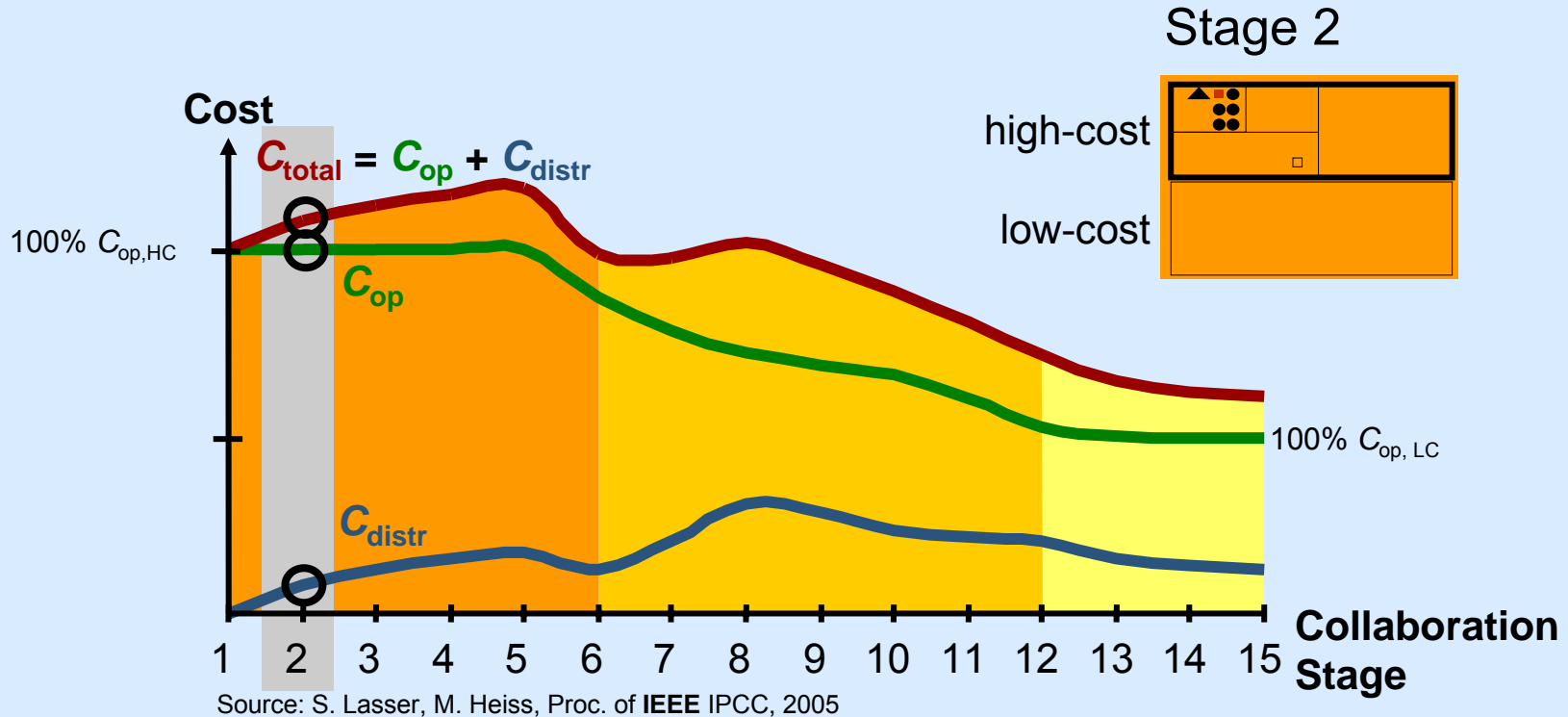
One-person project at a high-cost site

business responsibility →

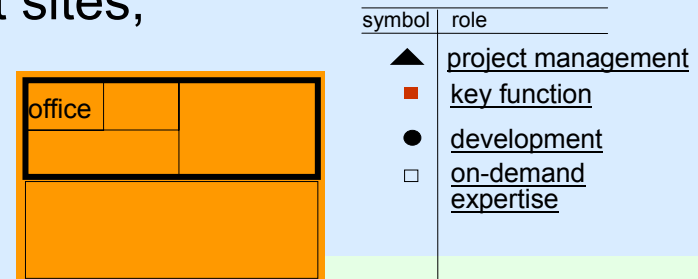


symbol	role
●	„single point of responsibility“

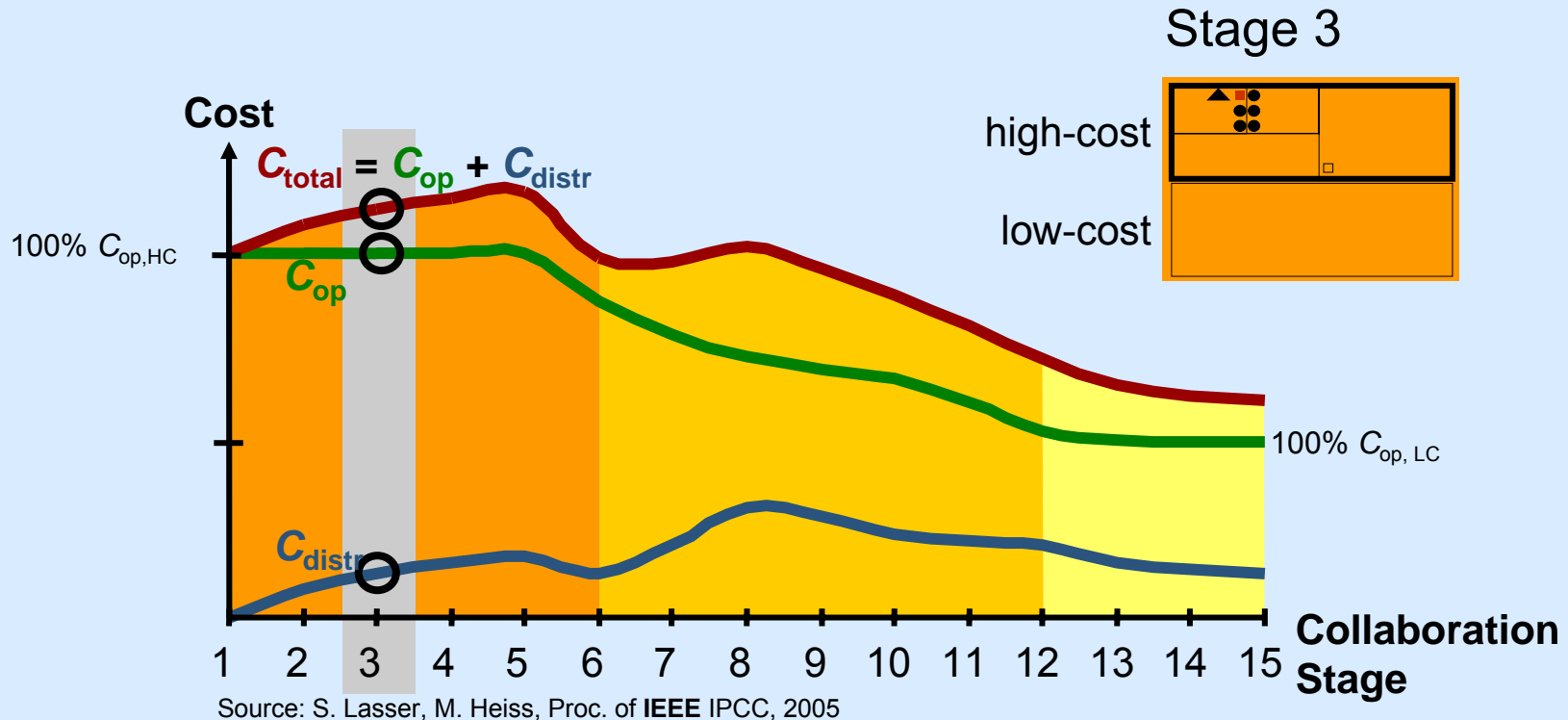
Cost Trends for Different Collaboration Stages (with high collaboration maturity)



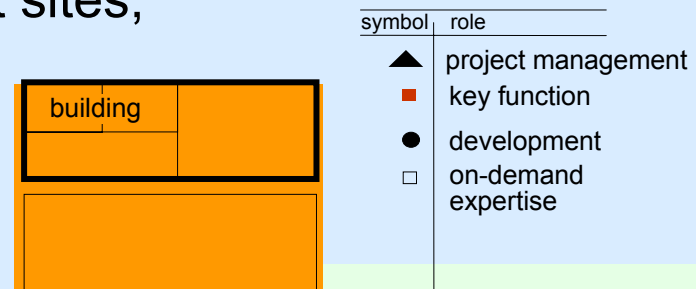
Only project members from high-cost sites,
working within one office



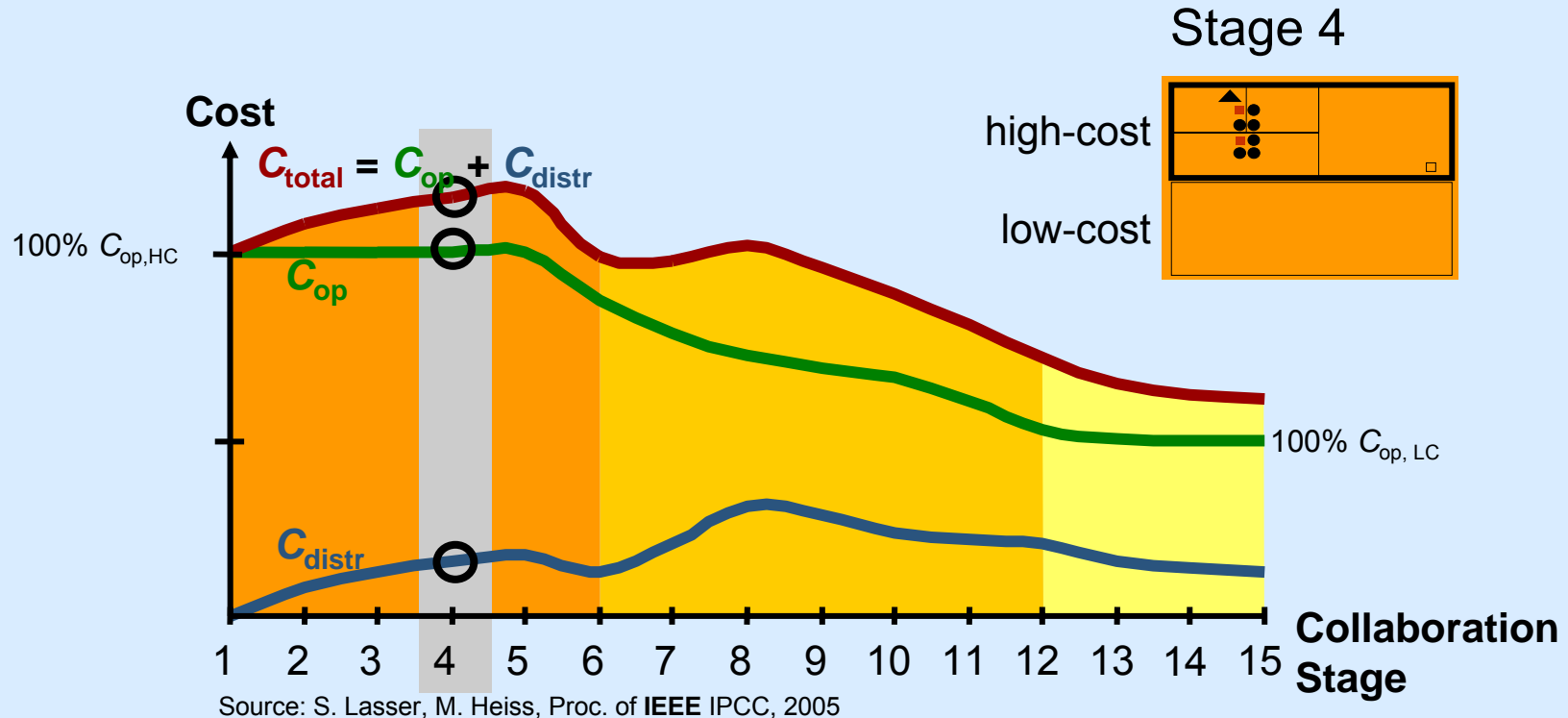
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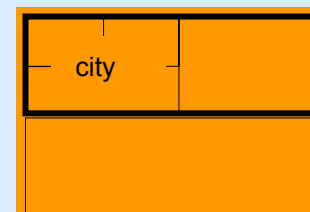
Only project members from high-cost sites,
distributed within one building



Cost Trends for Different Collaboration Stages (with high collaboration maturity)

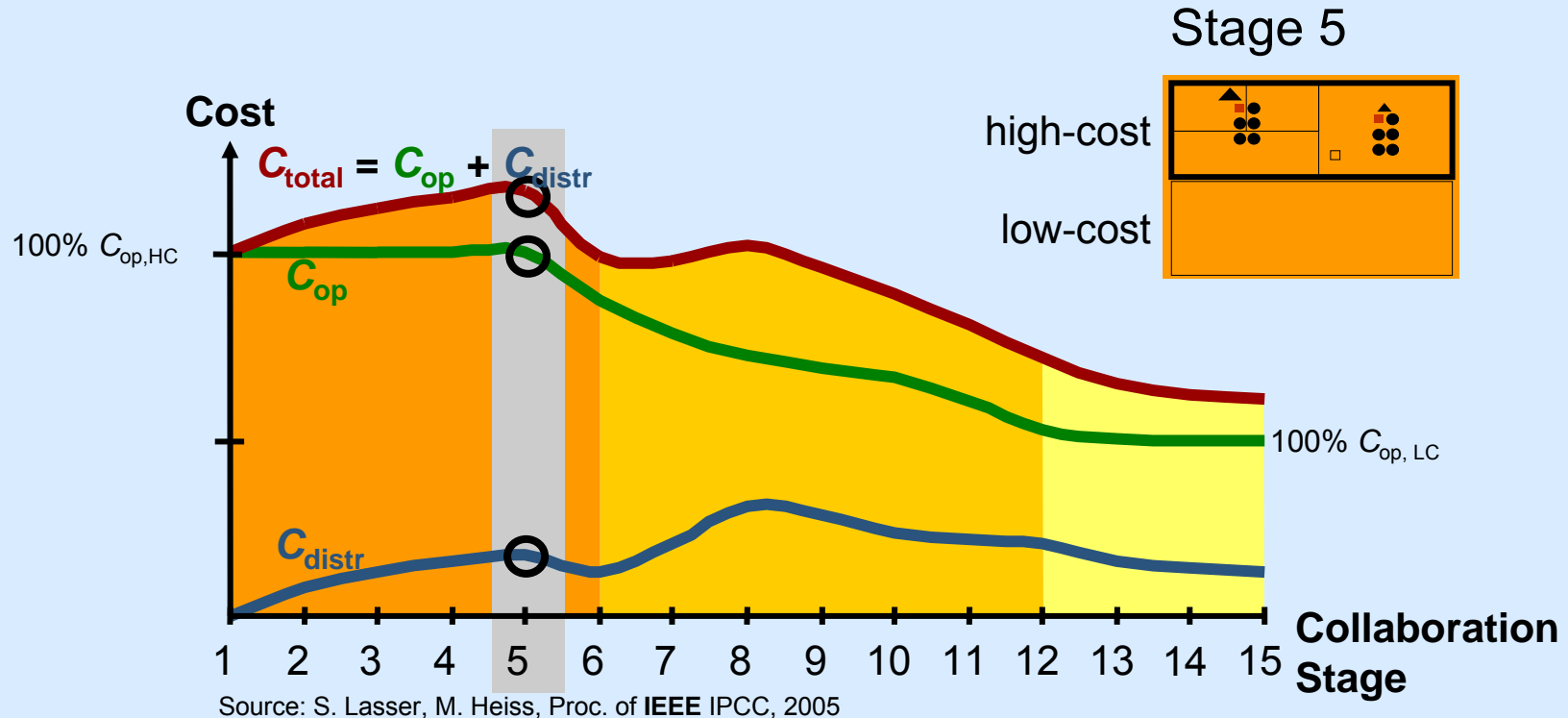


Only project members from high-cost sites,
distributed within one city

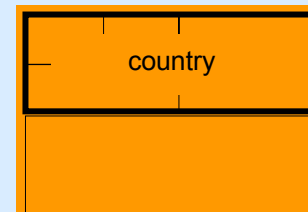


symbol	role
▲	project management
■	key function
●	development
□	on-demand expertise

Cost Trends for Different Collaboration Stages (with high collaboration maturity)

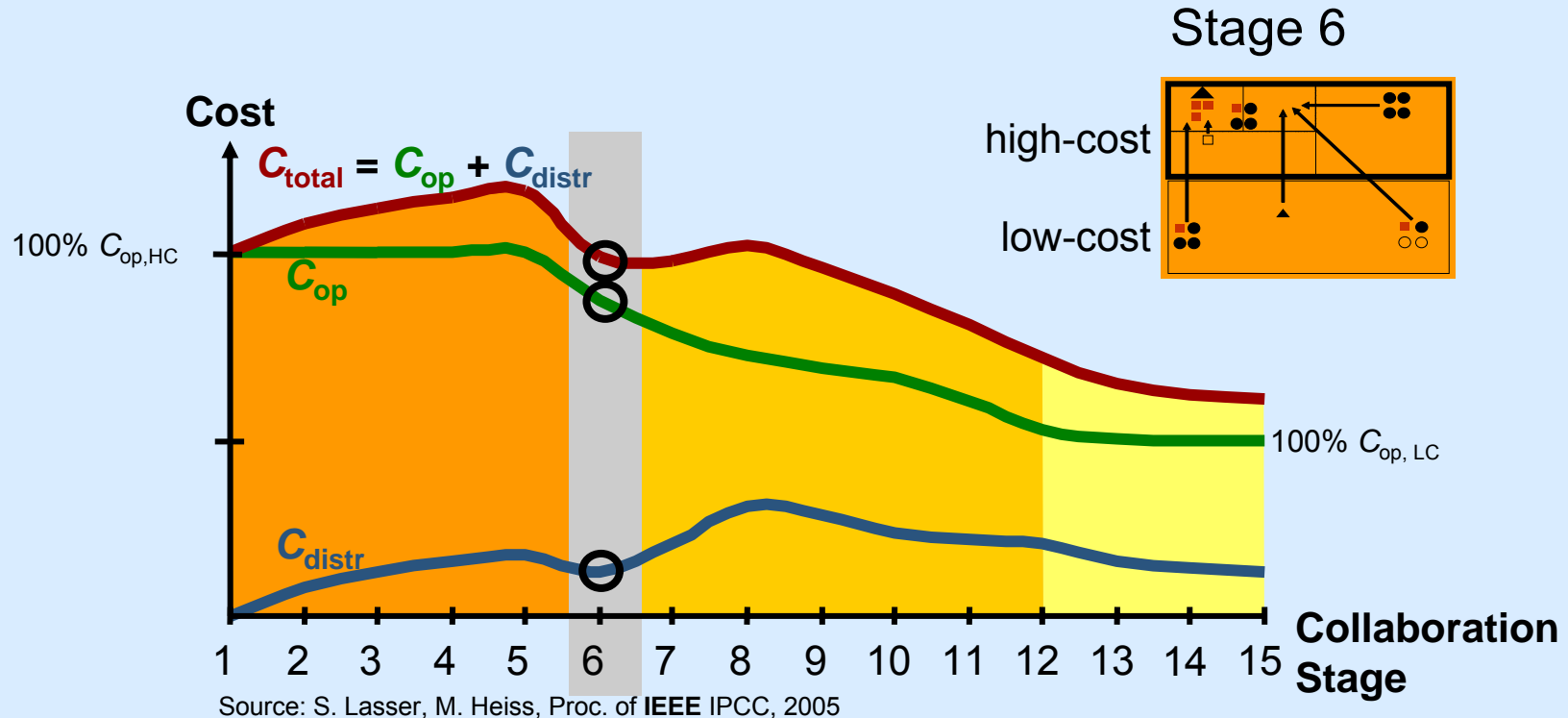


Only project members from high-cost sites,
distributed within one country



symbol	role
▲	overall project management
▲	sub-project management
■	key function
●	development
□	on-demand expertise

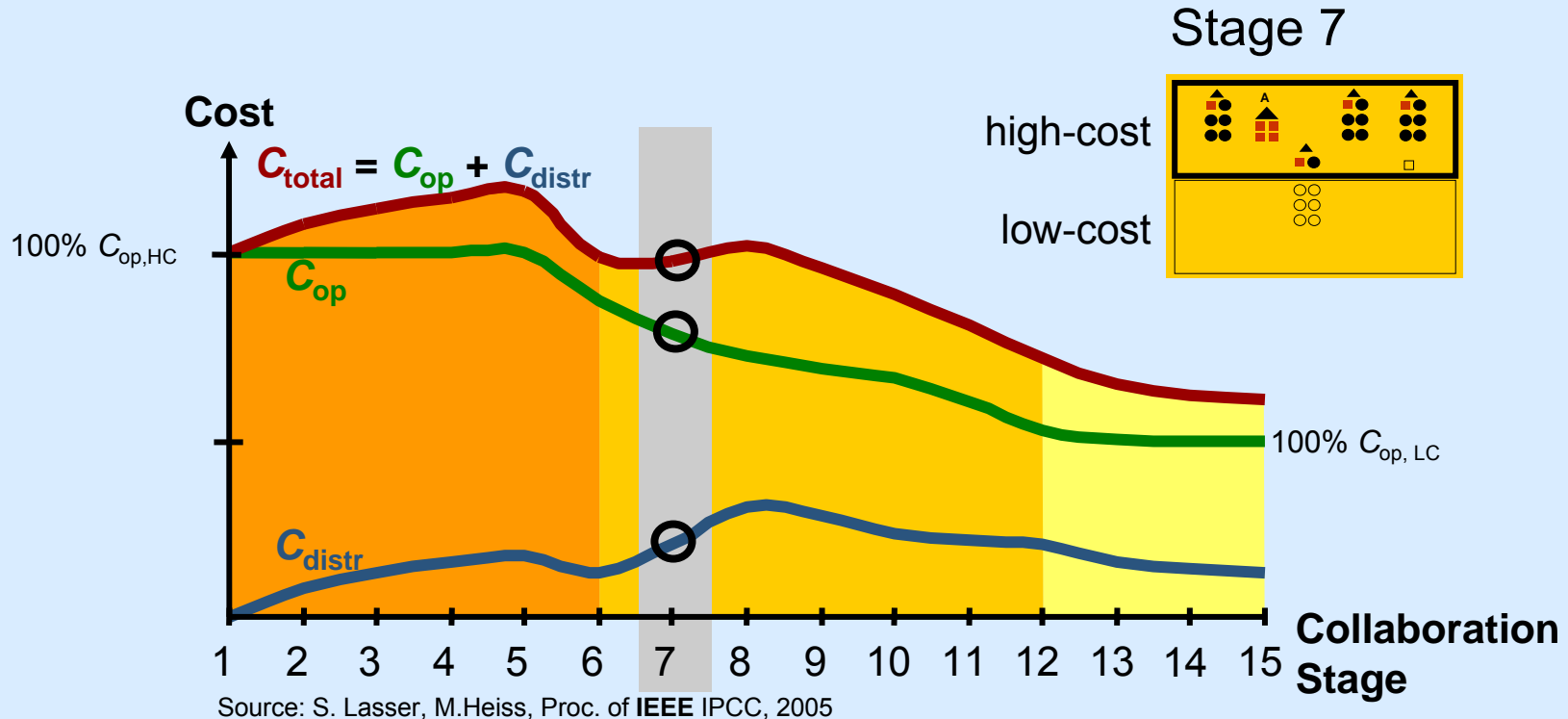
Cost Trends for Different Collaboration Stages (with high collaboration maturity)



A globally recruited team working on one site

symbol	role
▲	overall project management
▲	sub-project management
■	key function
○	<u>non-critical tasks</u>
●	development
□	on-demand expertise

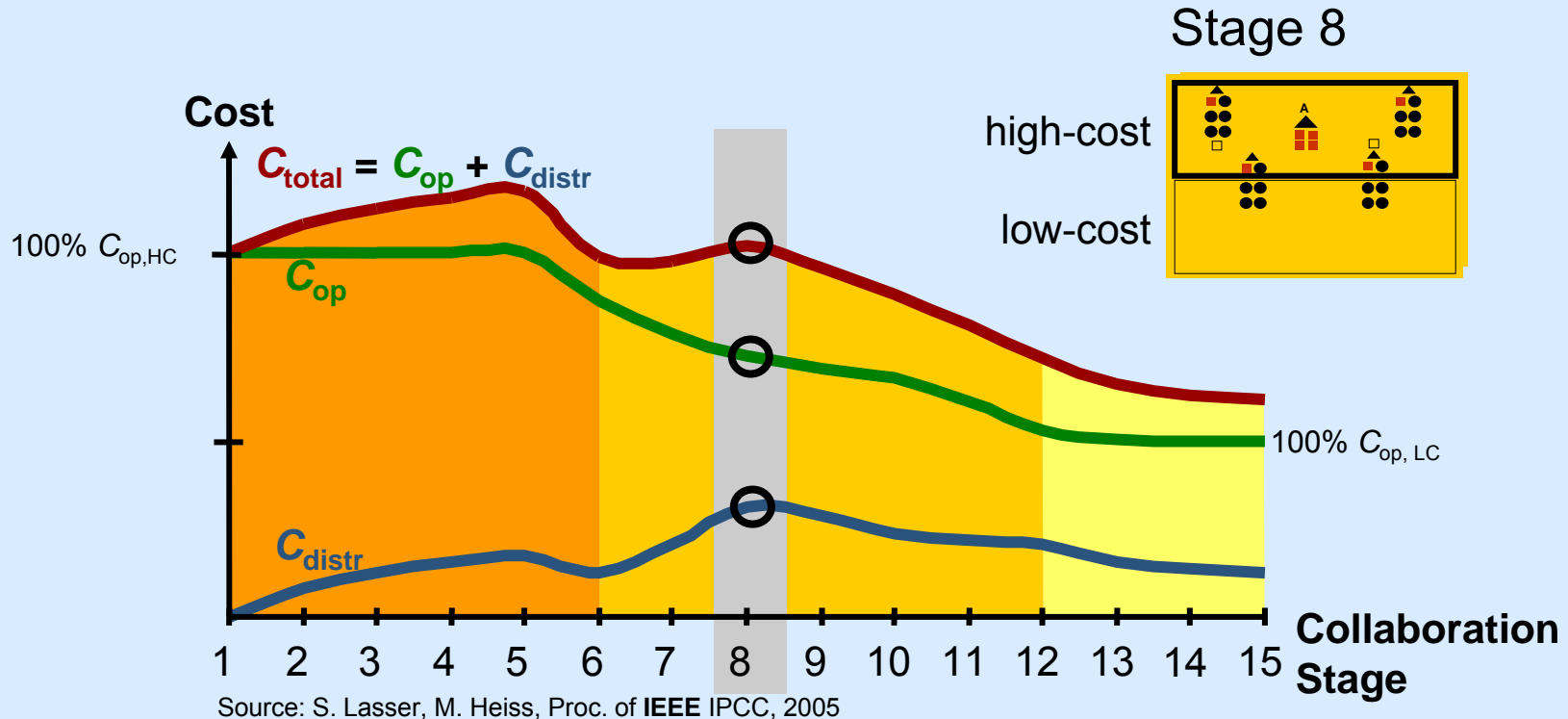
Cost Trends for Different Collaboration Stages (with high collaboration maturity)



Offshoring non-critical work to low-cost sites

symbol	role
A	acquisition
▲	overall project management
▲	sub-project management
■	key function
○	non-critical tasks
●	development
□	on-demand expertise

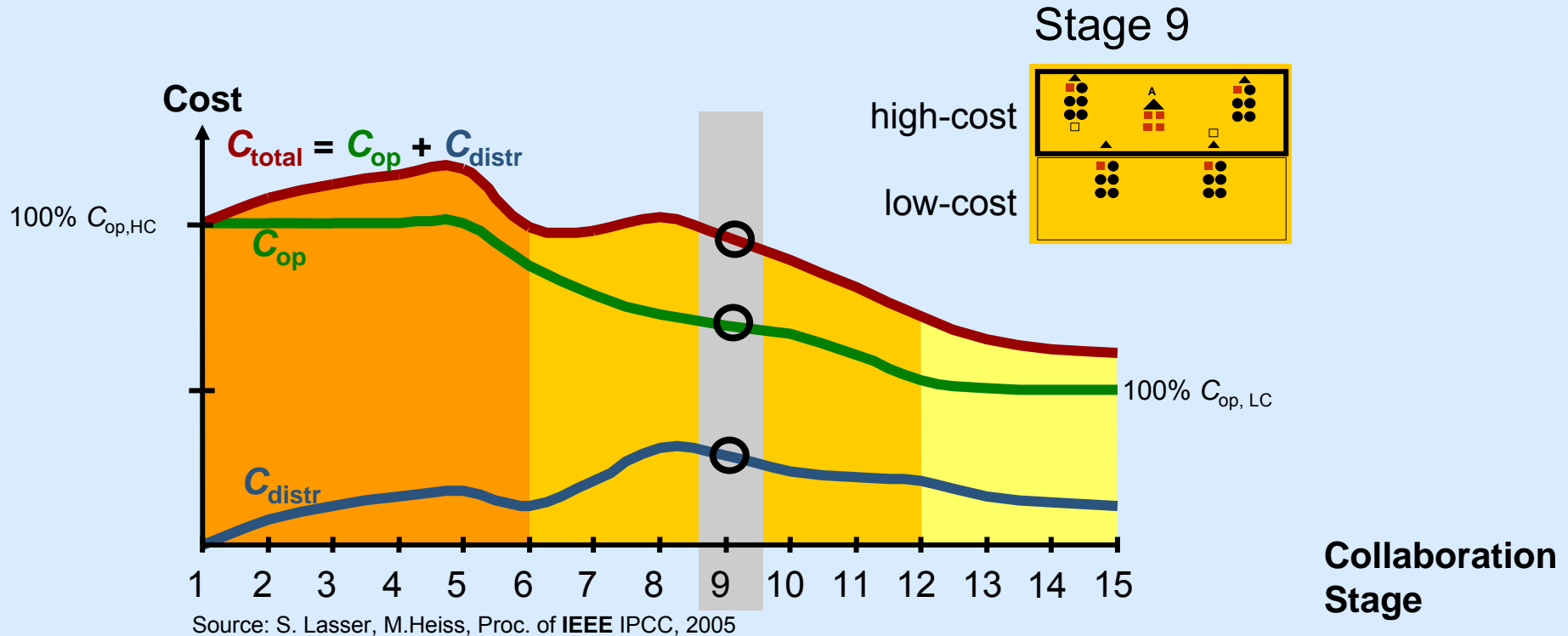
Cost Trends for Different Collaboration Stages (with high collaboration maturity)



Development tasks at low-cost sites without key functions

symbol	role
A	acquisition
▲	overall project management
▲	sub-project management
■	key function
○	non-critical tasks
●	development
□	on-demand expertise

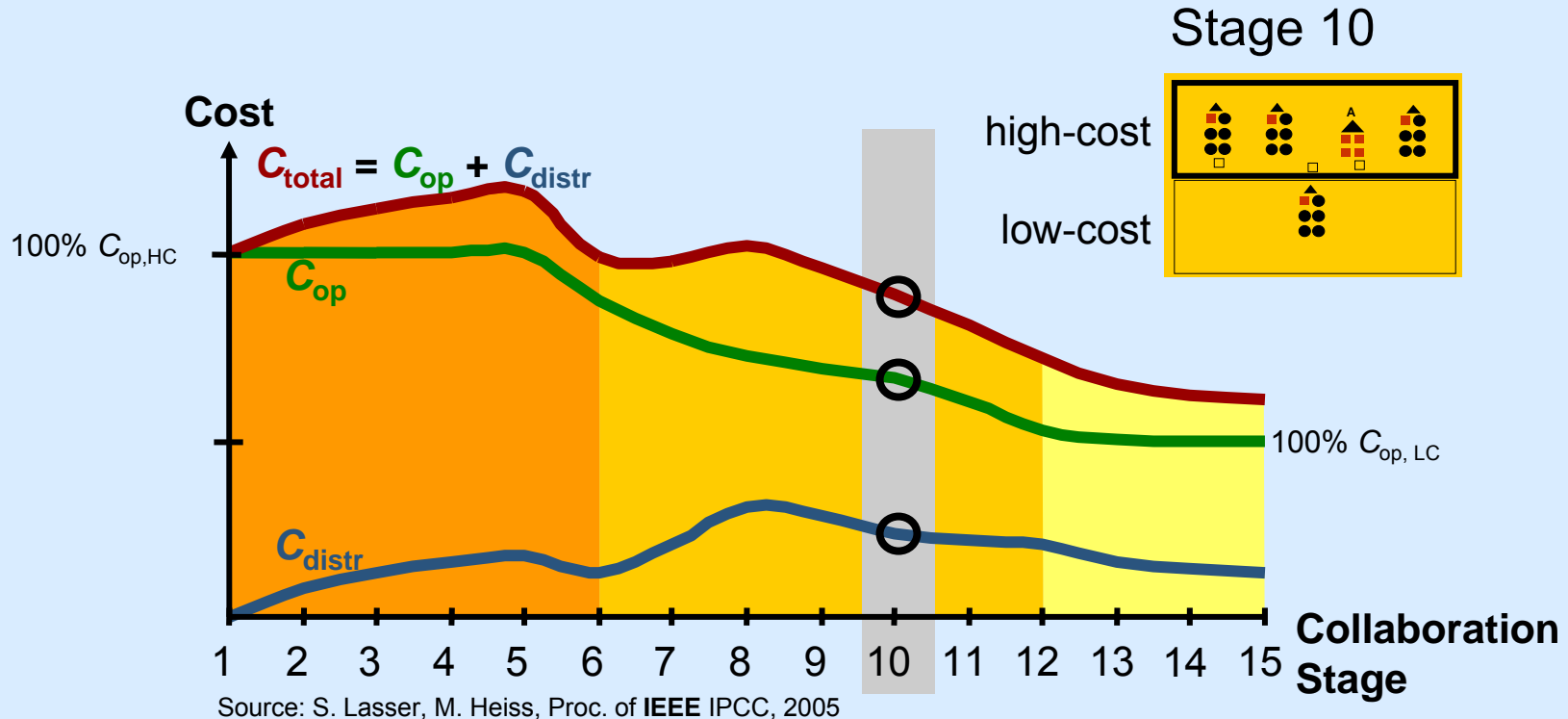
Cost Trends for Different Collaboration Stages (with high collaboration maturity)



Some key functions are assigned
to the low-cost site

symbol	role
A	acquisition
▲	overall project management
▲	sub-project management
■	key function
○	non-critical tasks
●	development
□	on-demand expertise

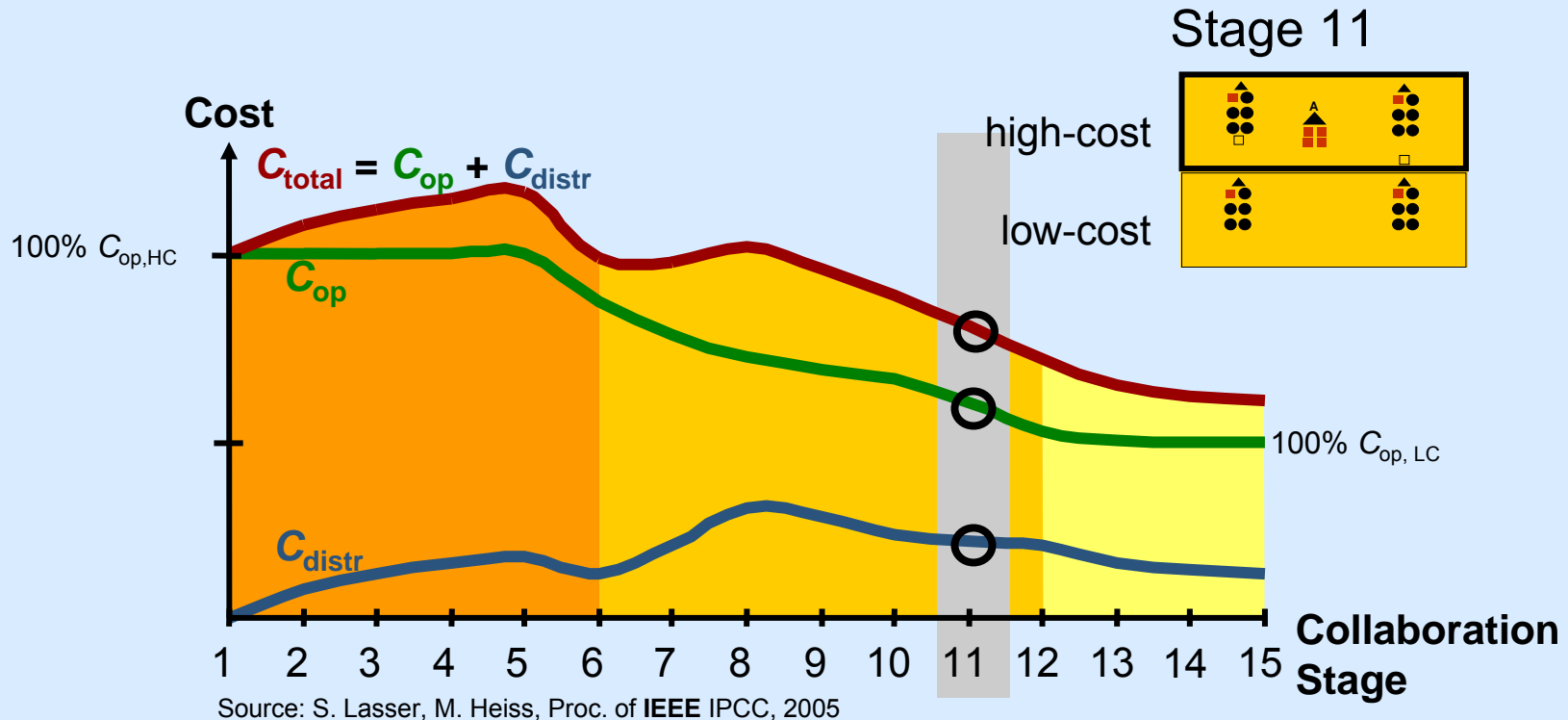
Cost Trends for Different Collaboration Stages (with high collaboration maturity)



A local sub-project manager
at the low-cost site

symbol	role
A	acquisition
▲	overall project management
▲	sub-project management
■	key function
○	non-critical tasks
●	development
□	on-demand expertise

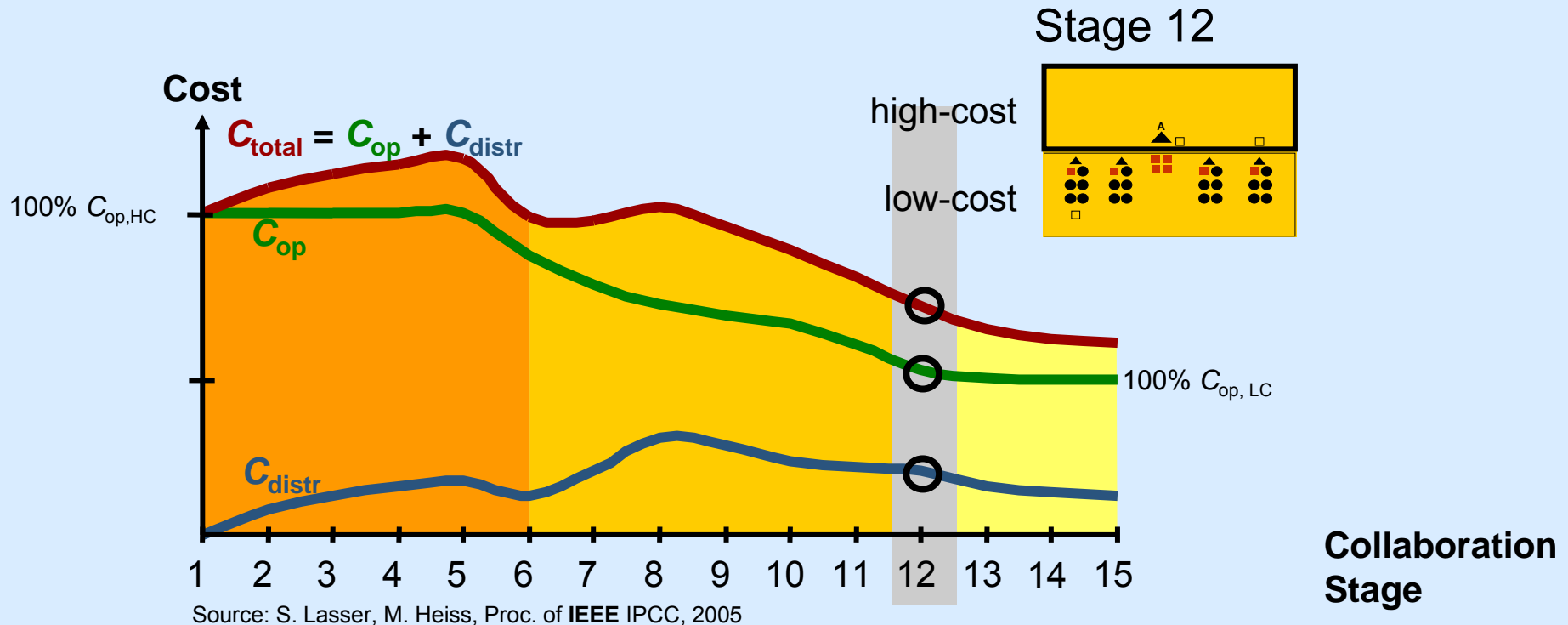
Cost Trends for Different Collaboration Stages (with high collaboration maturity)



More than one complete sub-project
at low-cost sites

symbol	role
A	acquisition
▲	overall project management
▲	sub-project management
■	key function
○	non-critical tasks
●	development
□	on-demand expertise

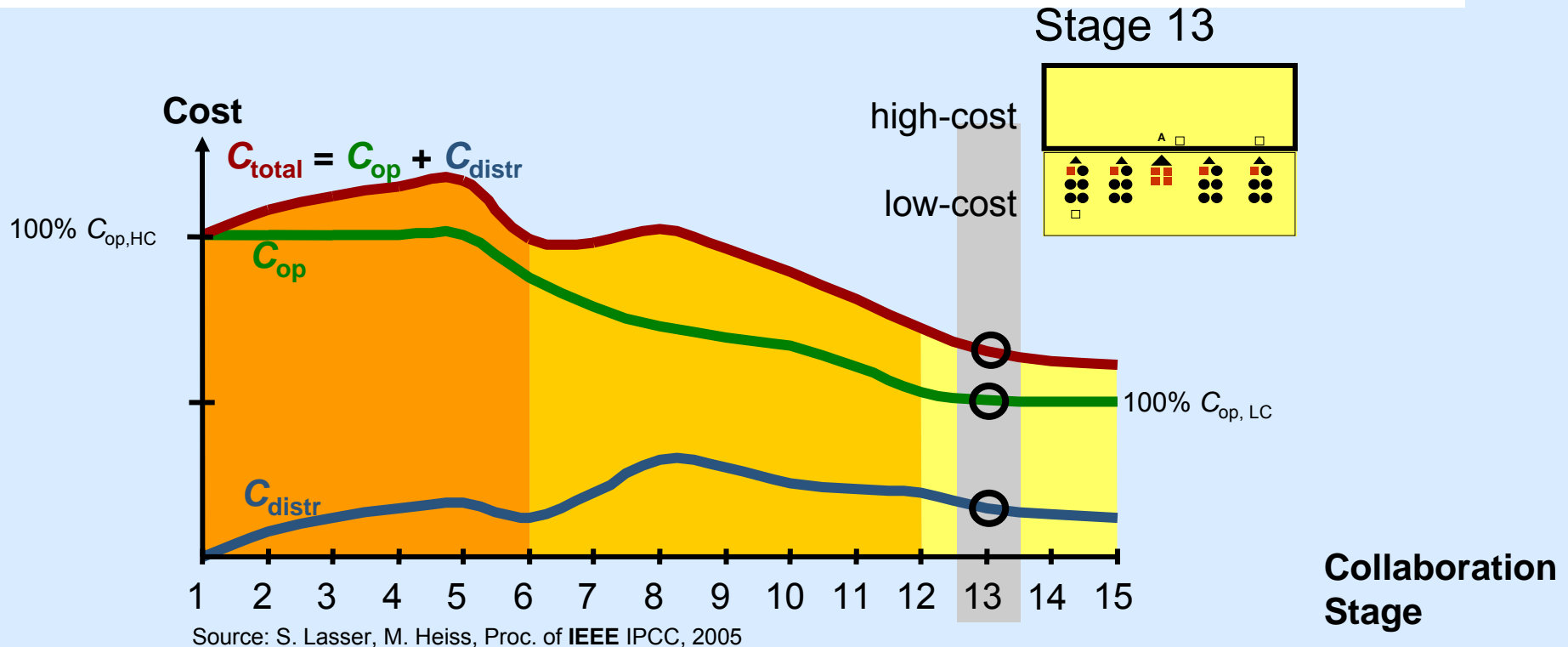
Cost Trends for Different Collaboration Stages (with high collaboration maturity)



Only the overall project manager
comes from the high-cost site

symbol	role
A	acquisition
▲	overall project management
▲	sub-project management
■	key function
○	non-critical tasks
●	development
□	on-demand expertise

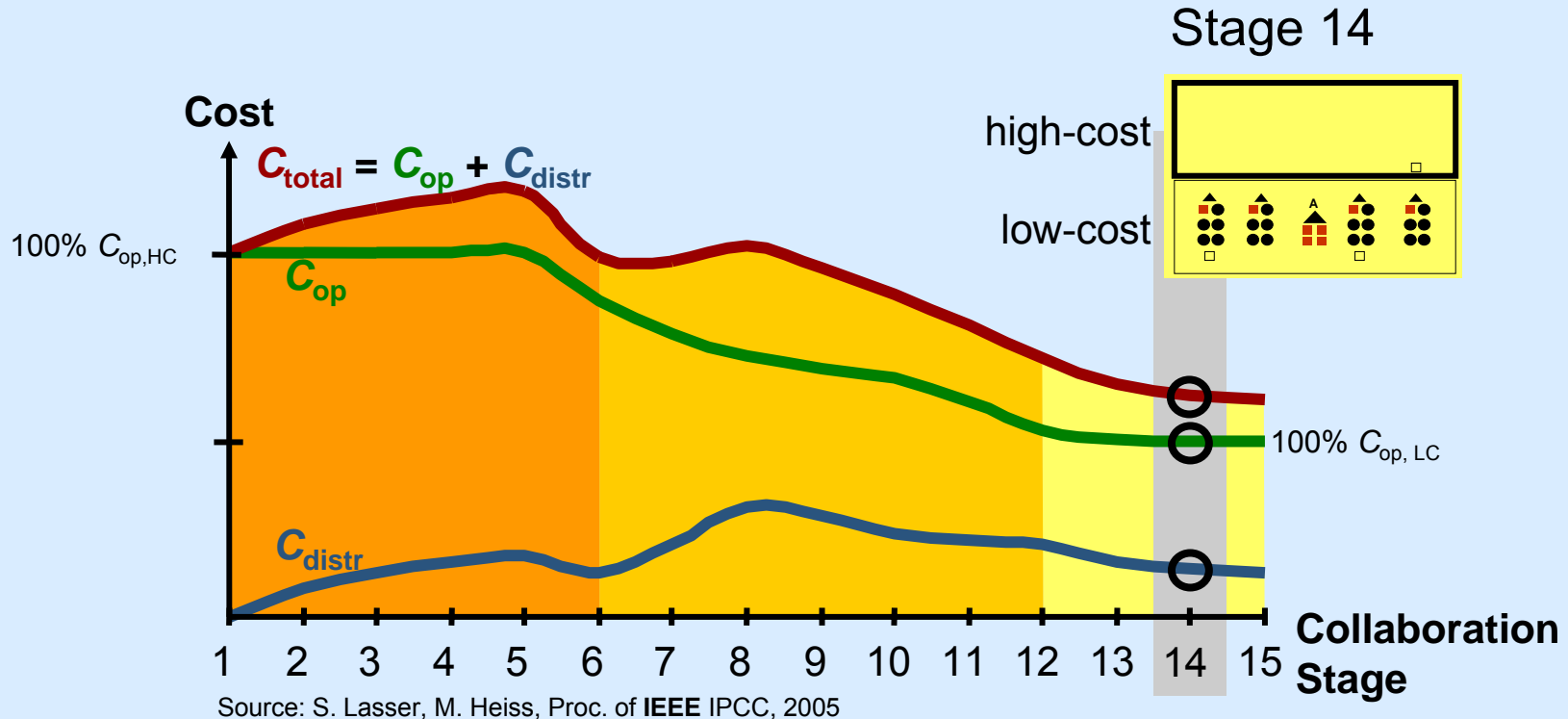
Cost Trends for Different Collaboration Stages (with high collaboration maturity)



Full project responsibility at the low-cost site,
with just the business responsibility
at the high-cost site

symbol	role
A	acquisition
▲	overall project management
▲	sub-project management
■	key function
○	non-critical tasks
●	development
□	on-demand expertise

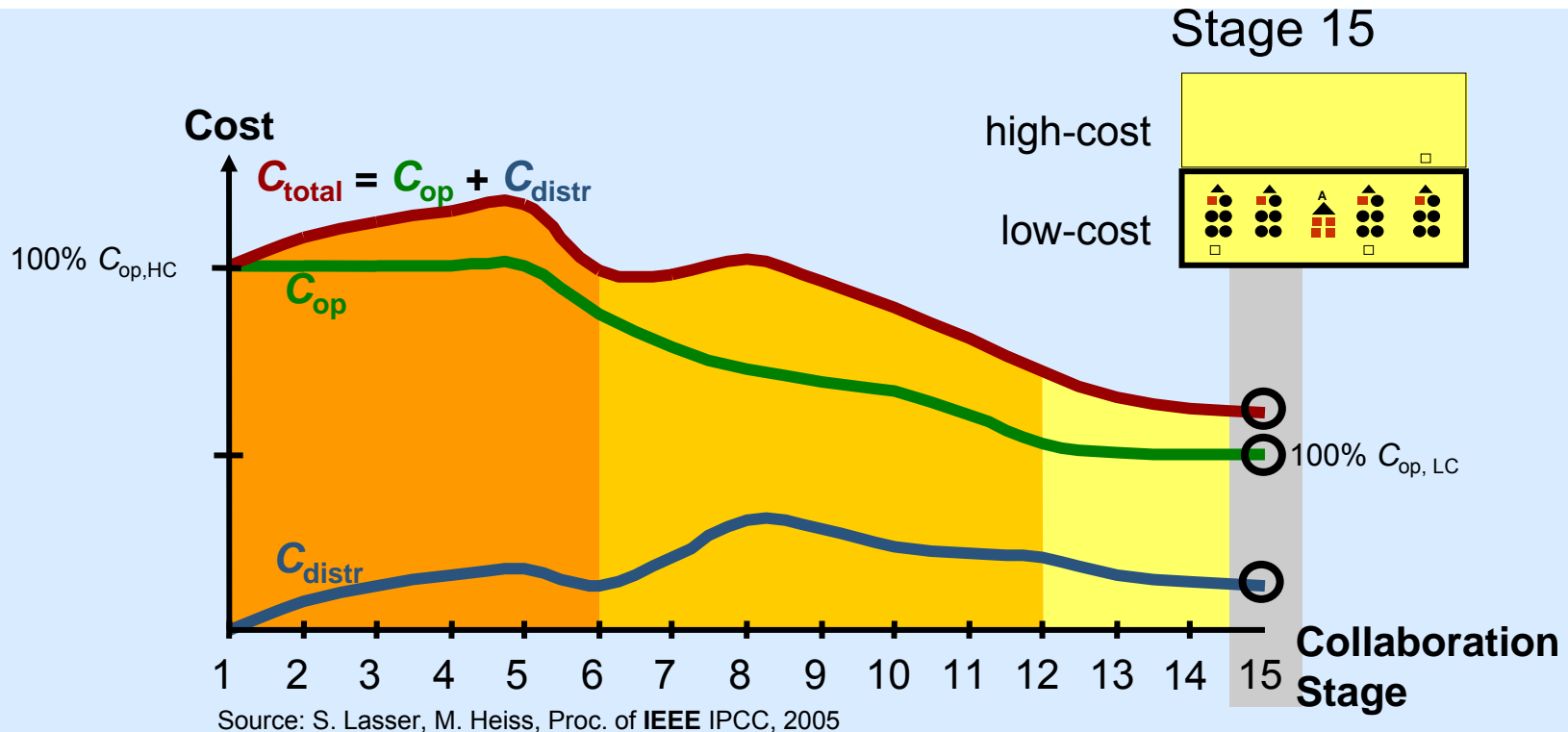
Cost Trends for Different Collaboration Stages (with high collaboration maturity)



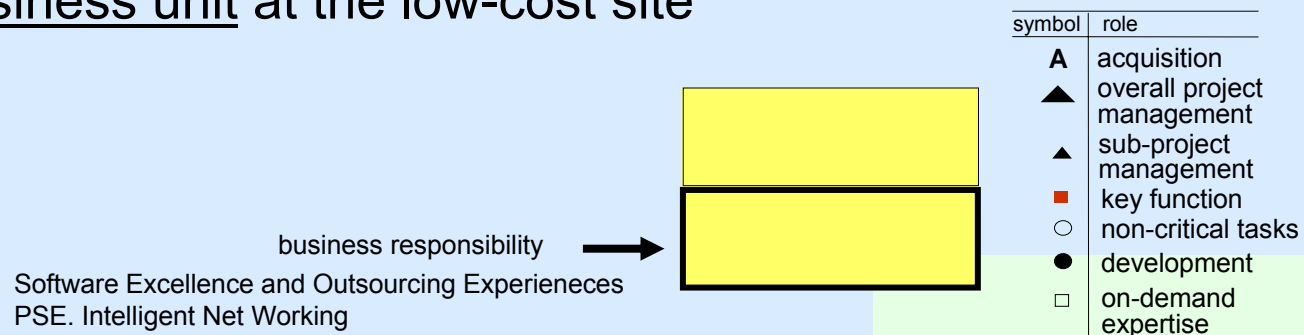
Additionally, the low-cost site takes
the responsibility for customer acquisition

symbol	role
A	acquisition
▲	overall project management
▲	sub-project management
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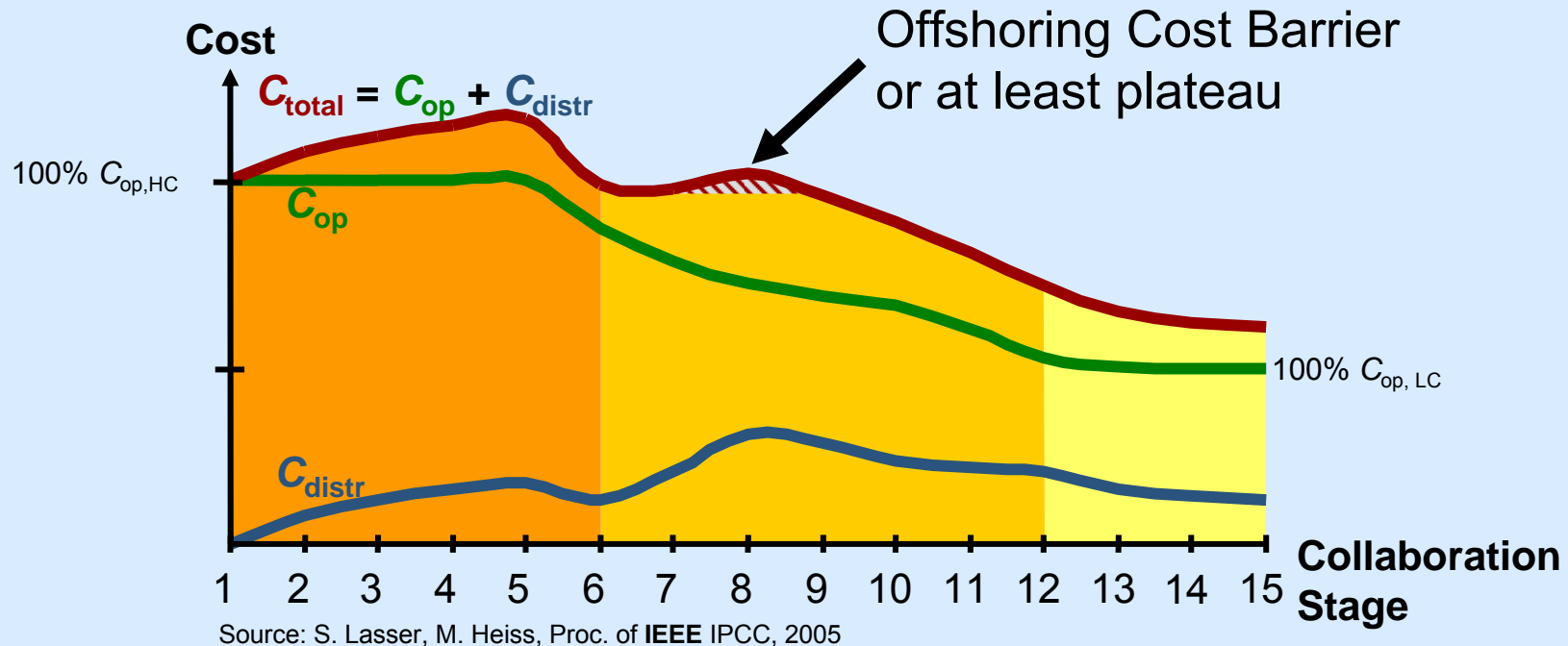
Cost Trends for Different Collaboration Stages (with high collaboration maturity)



Local business unit at the low-cost site

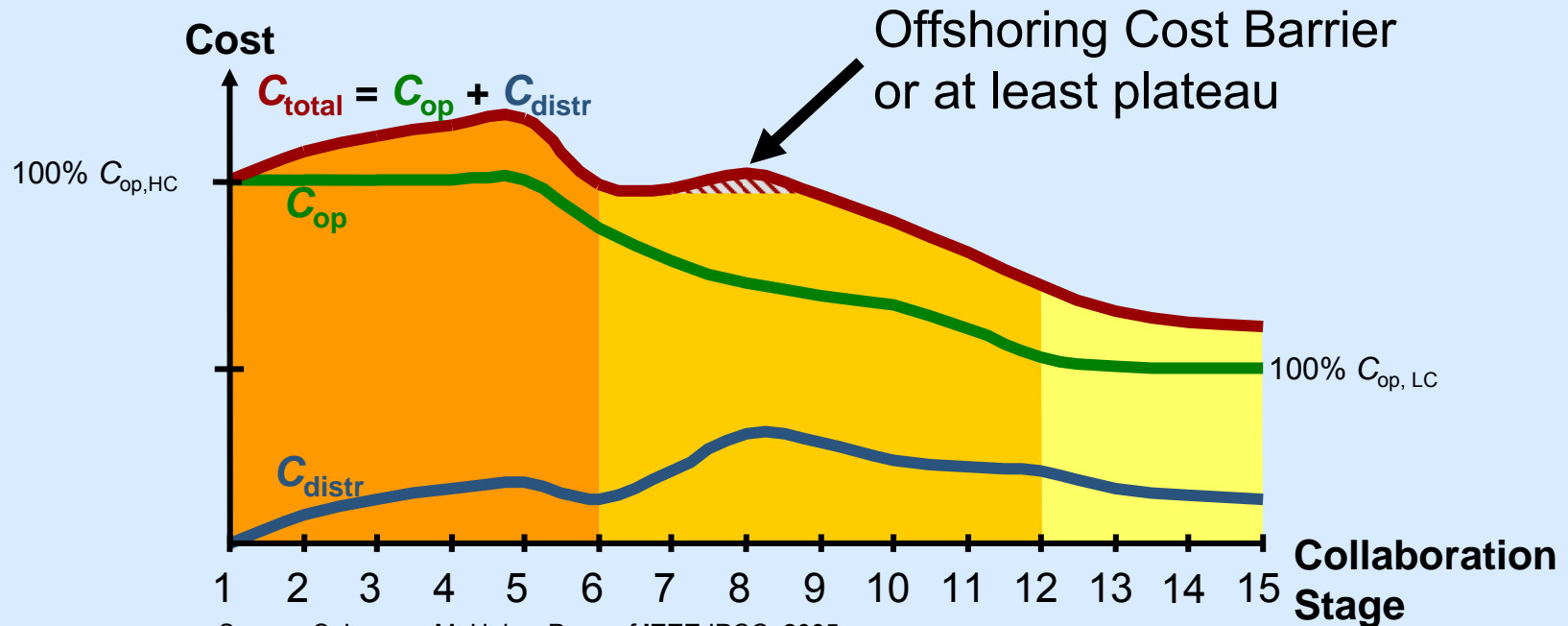


Cost Trends for Different Collaboration Stages (with high collaboration maturity)



Even for organizations with high collaboration maturity an Offshoring Cost Plateau exists: during the plateau you invest without getting immediate return

The Change of PSE over time



Source: S. Lasser, M. Heiss, Proc. of IEEE IPCC, 2005

PSE 1961

PSE 1990

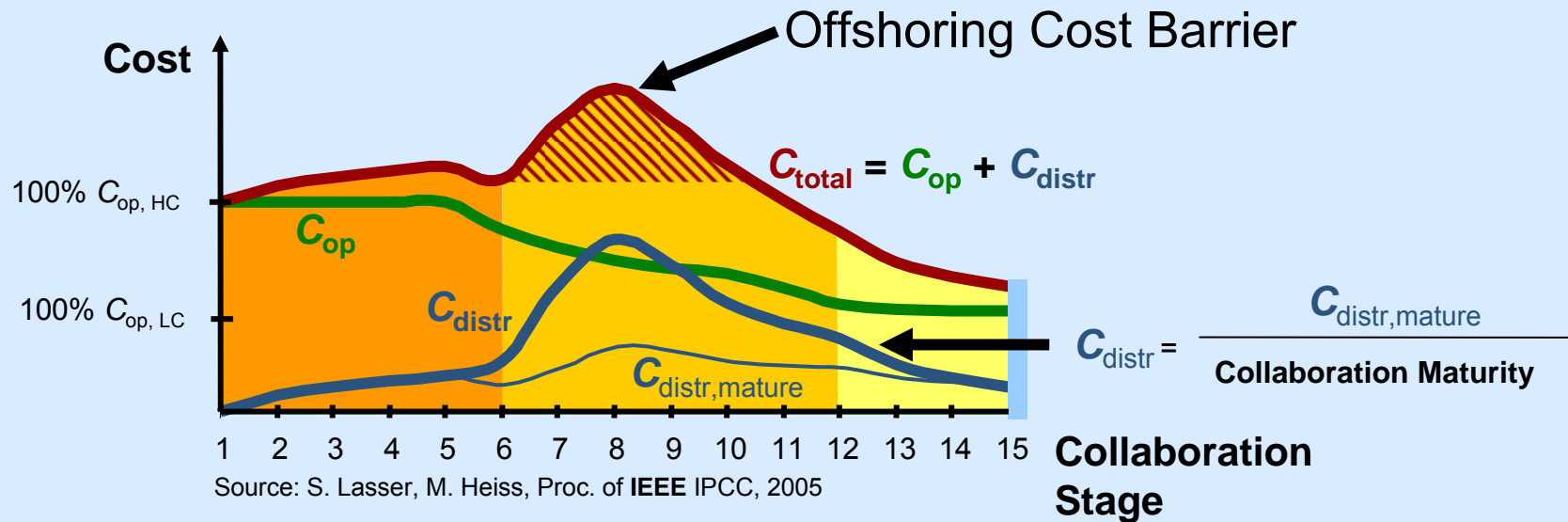
PSE 2005

time

The Collaboration Maturity is influenced by

- maturity of **processes and tools** at all sites,
- mature **communication** culture (openness, trust, respect),
- effective knowledge **networking**,
- **management** skills and organizational **structure**,
- **architectural skills** (modularity)...

Impact of the Collaboration Maturity: the lower the maturity the higher the barrier



low collaboration maturity → high distribution cost → high offshoring cost barrier

What can be done to improve productivity ?

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- Optimize your **processes and tools**
- Communicate with **openness, trust, respect.**
Take care everybody gets the relevant information.

- **Involving experts increases productivity :**
It is more efficient to ask the proper expert for help than to waste the customers time

- Find the right **project manager** and **requirement engineer.**
- Try to find the best available **architect**

Collaboration Maturity **SIEMENS**

Program and System Engineering PSE

The Collaboration Maturity is influenced by

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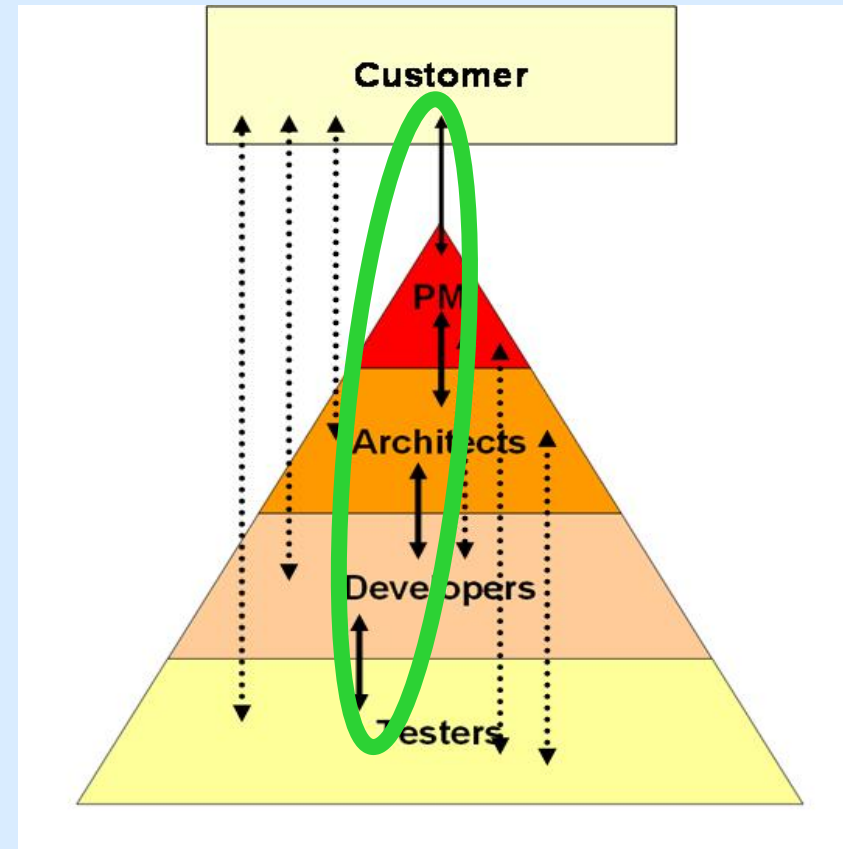
2005-05-23 PSE. A highly sophisticated intelligent network Stefan Lasser and Michael Heiss. PSE I 22

A mature
Inquiry Culture

increases the
Collaboration Maturity

and therefore the
Productivity

- Requirement Communication takes place at and among all levels of the project organization
- The one who knows about the requirement – the **Sender S**
- The one who receives the requirement – the **Receiver R**



Small project task, all project members collocated

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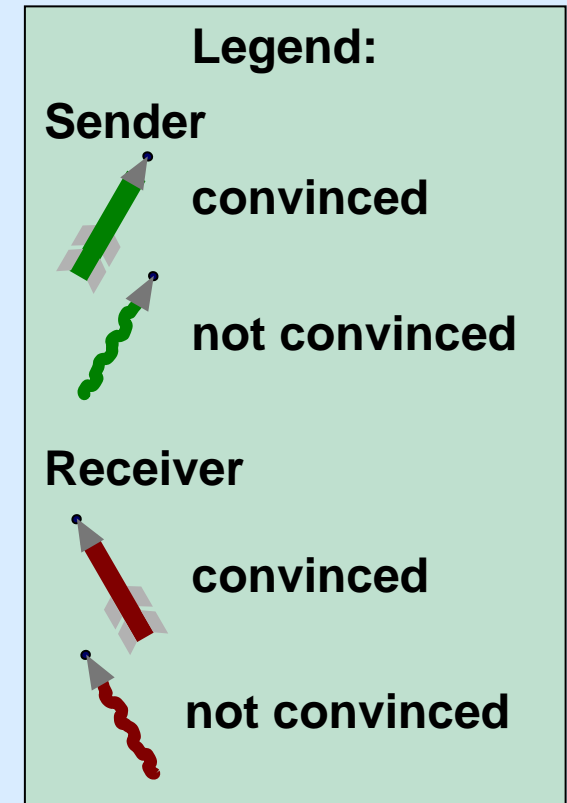
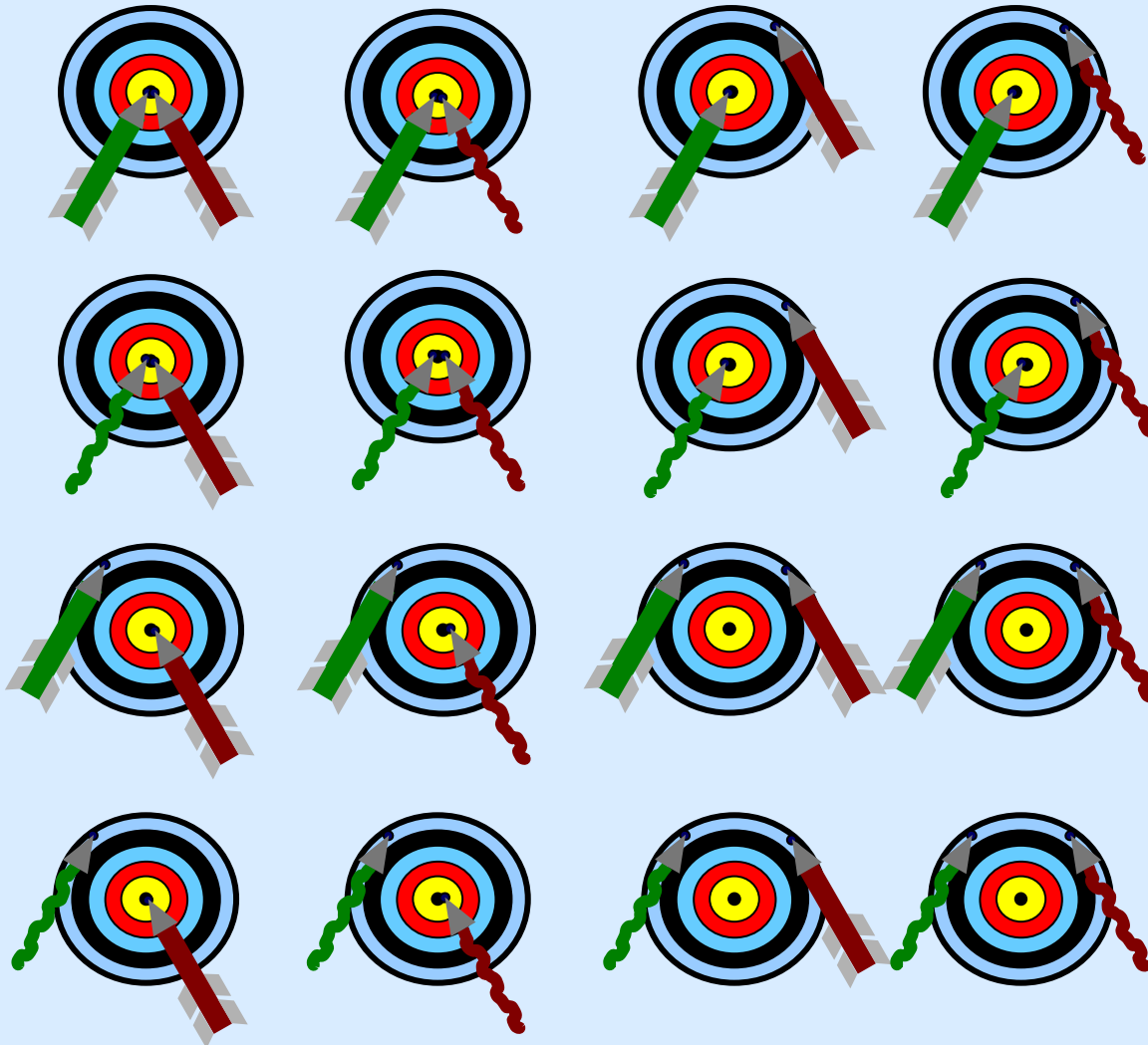
**Requirement:
We jump at 3!**

1, 2, 3,
jump!

1, 2, jump!

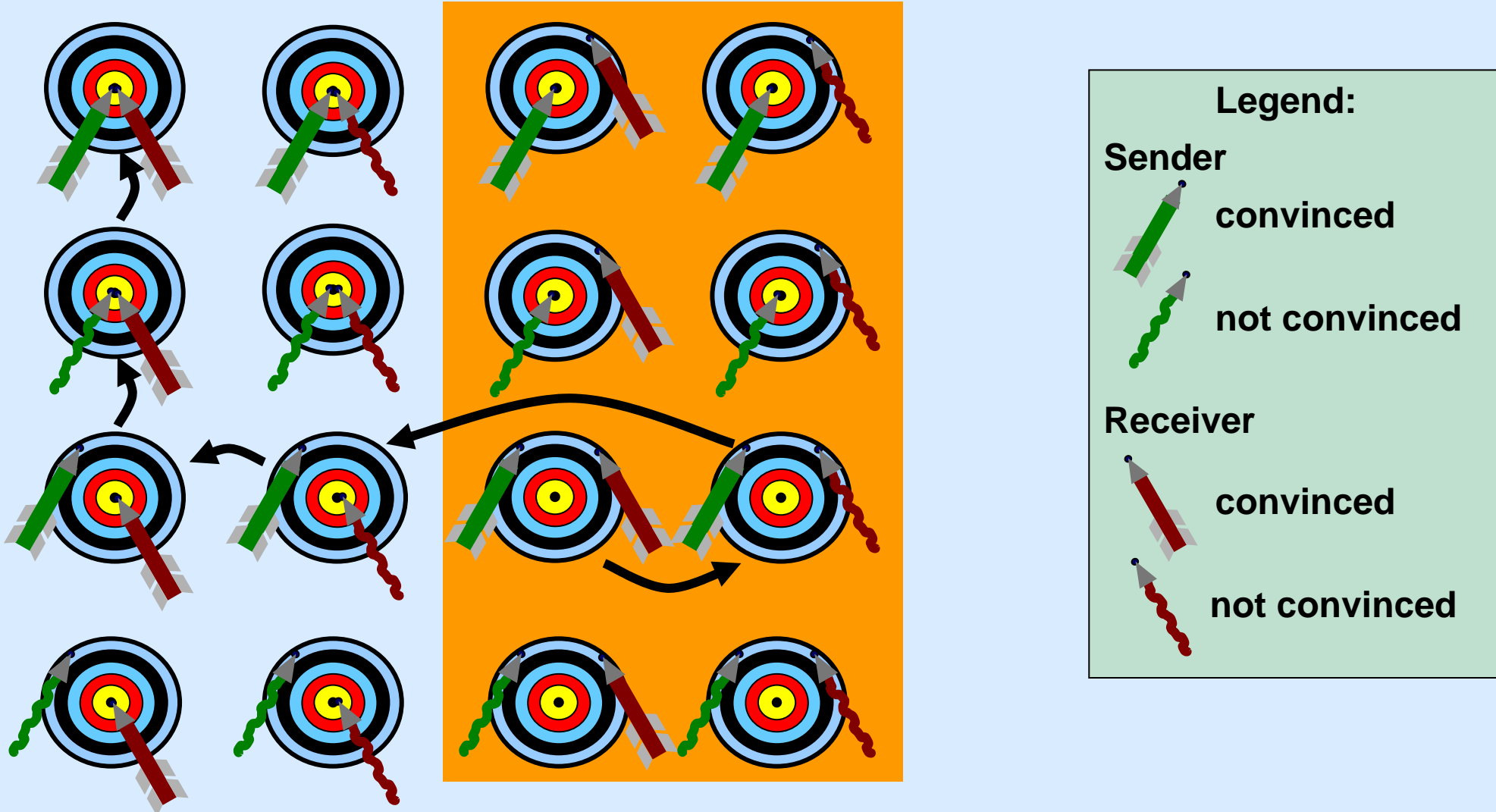


Why is the Inquiry Culture so important?



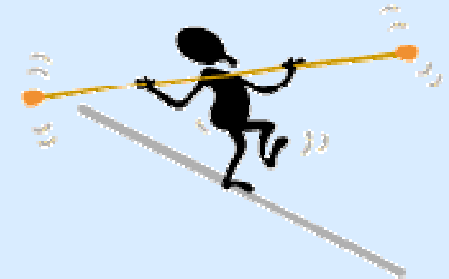
Why is the Inquiry Culture so important?
It is the only chance to leave fatal states.

SIEMENS



What is not an Inquiry Culture?

- Trade-off between too much and too less inquiries:
Utopia: One of the answers: **“The perfect employee should deliver what I want (not what I have asked for) and ask no questions!”**
- Strategy: Management communicates: **“Ask, if you do not understand something”** is not enough.
- Inquiry culture is not a behavior of the individuals within the organization, **inquiry culture is a organizational property and impacts directly the organizational maturity**



Ideal Inquiry Culture – Definition



"There are no stupid questions, only stupid answers"

An ideal inquiry culture is marked by:

- asking questions **the right person** (use your **networks**)
- at the **optimal time**
- **not** being **too proud** to ask questions, but **not** being **too shy** to ask questions
- addressing problems **openly** and **formulating** the question **accurately**, so that the other person understands it
- creating an environment of **confidence** and **trust** e.g. by showing interest in **colleagues' activities** and giving information on one's **own activities** and organizational structure
- recognizing any **lack of knowledge**
- accepting **responsibility** for one's **own activities** and **lack of activities**
- providing **alternative solutions**
- considering the **entire business** process

- Employees' awareness about the variety of inquiry practices
- If one of the “inquiry sources” is not successful, it is not a reason to stop it!!
- Communicate the increased importance of the personal networks within and outside of organization

- PSE Practices for communicating requirements:
 - **Customer Workshops**
 - Clear defined **Review Process with obligatory reviewers**
 - Involvement of **experts within the PSE e.g. for reviews**
 - **Developers involvement** during the requirements elicitation phase
 - Using **Knowledge Networks** to fill the lack of information

- By communicating requirements you should keep in mind:
 - Summarize your interpretation of the “understood” requirement
 - Involve different perspectives-do not become too one-sided!

- Training-weeks collocated in Vienna
- Project experience workshops
- Kick-off meetings
- Clear defined formal communication
- Frequent informal communication
- Readiness to travel
- Using the same development process
- Emphasizing the importance of high quality documentation
- Using the same terminology
- Task description/ Responsibility description
- Communicate: Sharing Knowledge is an asset, not a danger!
- Defining the escalation strategy
but not any conflict is worth to be escalated
- Criticism is welcome, but NOT destructive
- Readiness to respect the differences, they can help us

Thank You for Your Attention