

# Mobile Maintenance Management<sup>®</sup> – with RFID

A technology based solution for  
maximizing information quality in  
maintenance management systems

Schwetzingen / Duisburg  
June 2007

Gesellschaft zur Anwendungsberatung mbH



# ⋮ Agenda

1 GAB – company introduction

2 Problem:

Working with a virtual representation of the real world

3 Methodology:

Closed Project Collaboration (CPC)

4 The solution / technology:

Mobile Maintenance Management (MMM) / Enginius

5 The economic challenge



## Our Philosophy

### Diversity of competencies

#### IT-Consulting

Consulting and solutions  
for information technology



Client/Server Management  
(CSM)

Infrastructure service  
(ISS)

Migration management/  
client automization (MIM)

#### Business Consulting

Consulting and solutions  
for business applications



Customer Relationship Management  
(CRM)

System Related Maintenance  
(SRM)

Information- and  
communication management (IFM)

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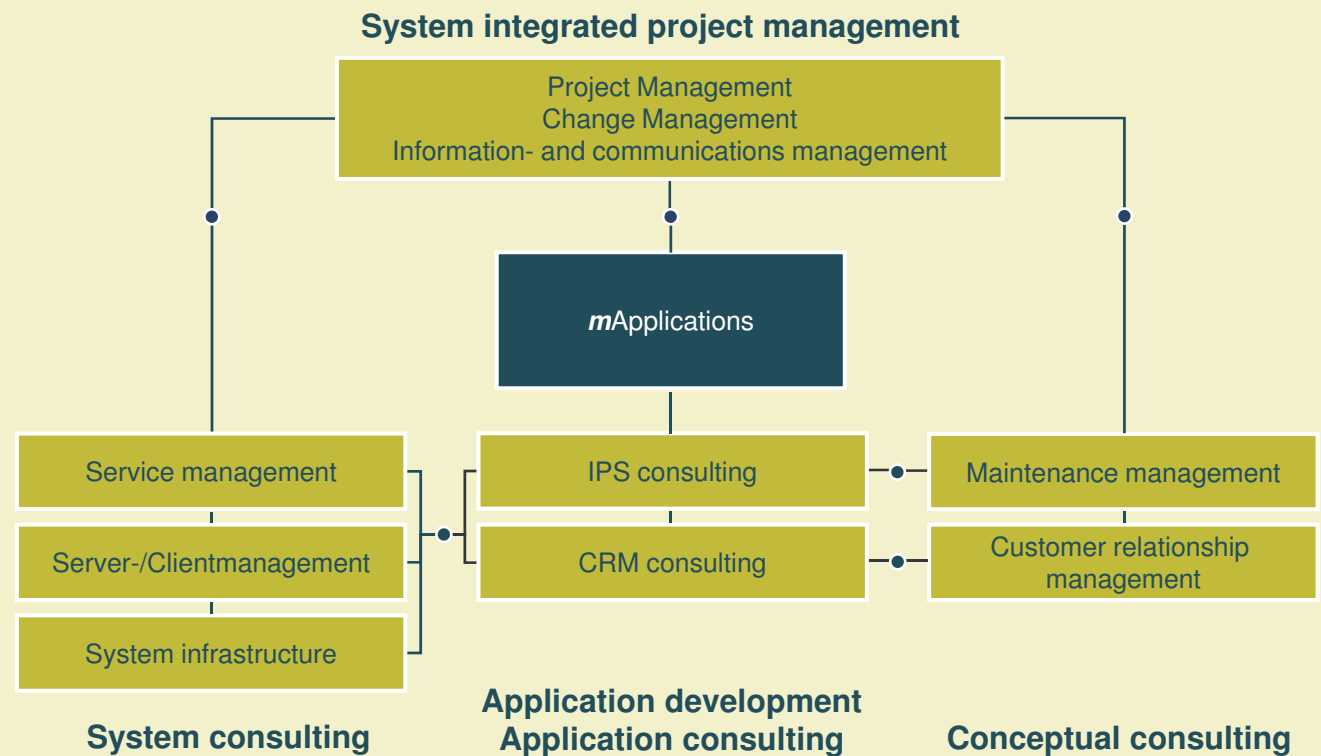
**System Related Maintenance  
(SRM)**

Information- and  
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# Our Philosophy

## Integration of competencies

The integration of consulting services and applications allow for a wholistic approach:





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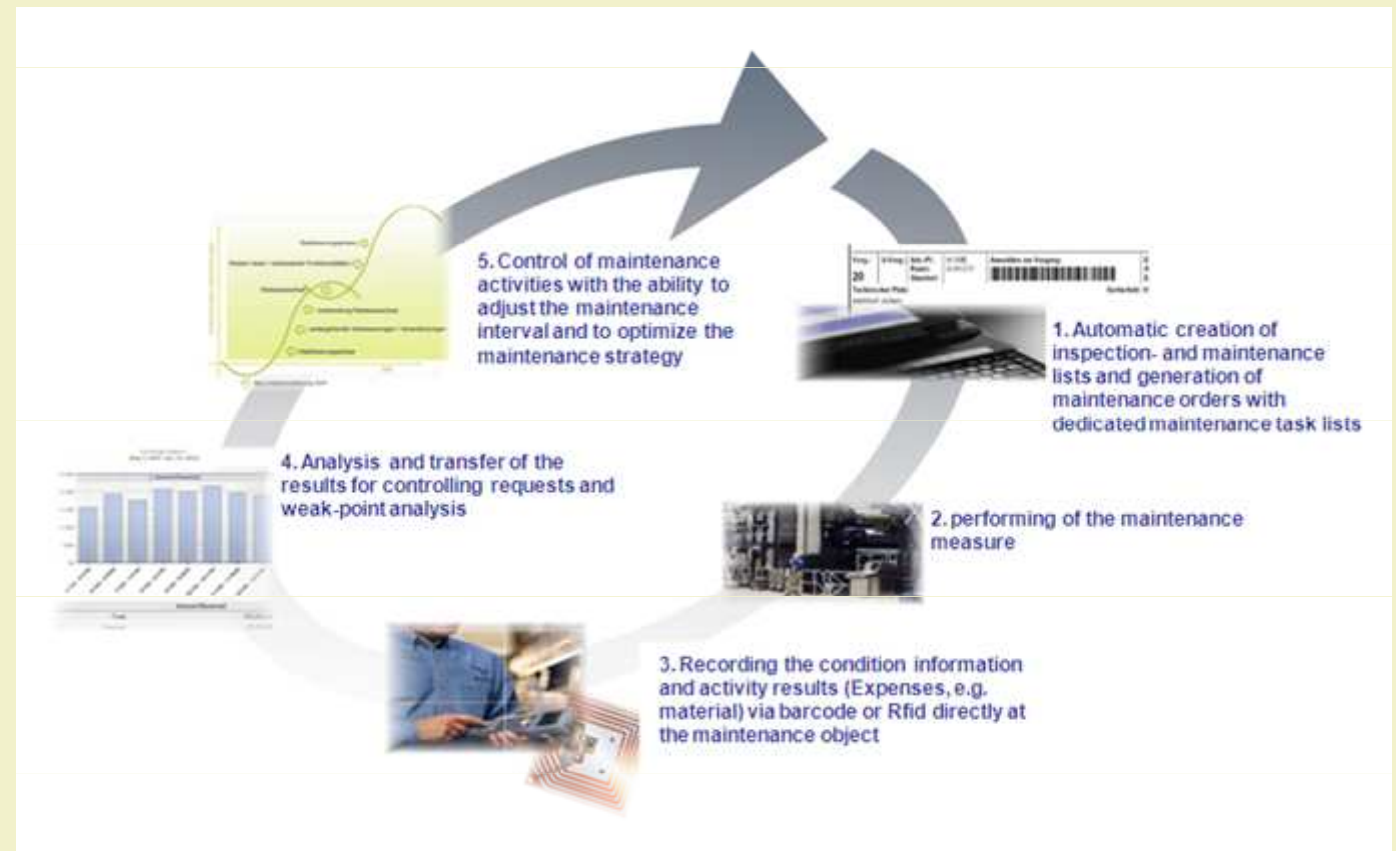
## ⋮ The challenge

# Working with a virtual representation of the real world

- Virtual representation of technical facilities have to be consistent with the real world (which is a resource intensive task)
- Correct identification of technical objects for exact correlation of data and information (which calls for unique identification of objects)
- As information and data is related to complex processes, the level of abstraction influences information quality (which requires for simplification and standardization)
- Information must be available without delay in order to support timely decisions (which requires to eliminate media-breaks)

# ⋮ The challenge Working with a virtual representation of the real world

Closing the gap within the information flow ...







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## ⋮ Approach

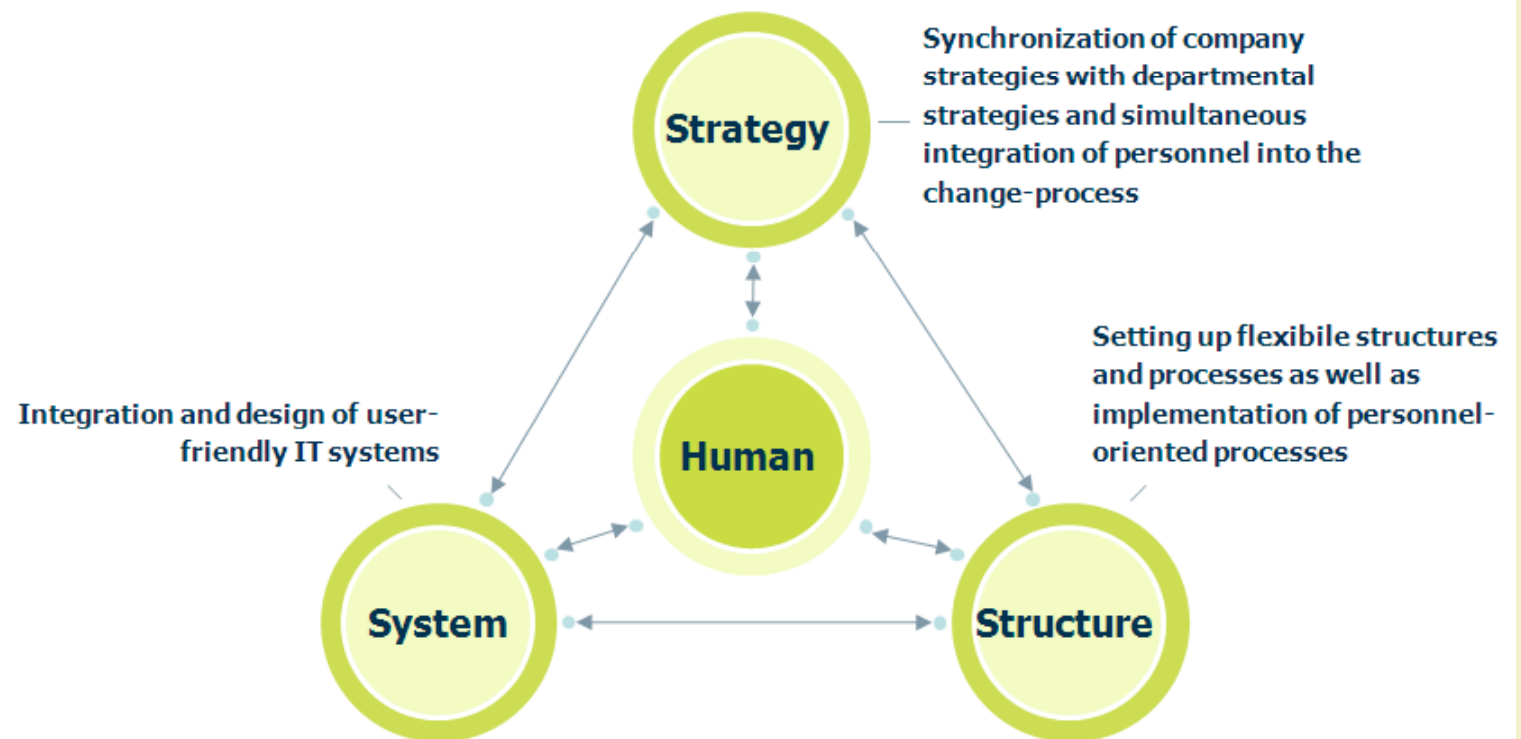
# The need for an integrated solution

- Detailed enough but as well abstract enough models of facilities and machines
- Technology (tagging facilities and machines with RFID thus uniquely identifying them)
- Simple and standardized processes which does not require special skills
- A consistent solution which avoids different media and reduces the "paperwork" significantly

# ⋮ CPC – Closed Project Collaboration

## There is more to life than technology

The simultaneous integration of strategic, organizational, technological as well as human dimensions defines the basis of this methodology ...



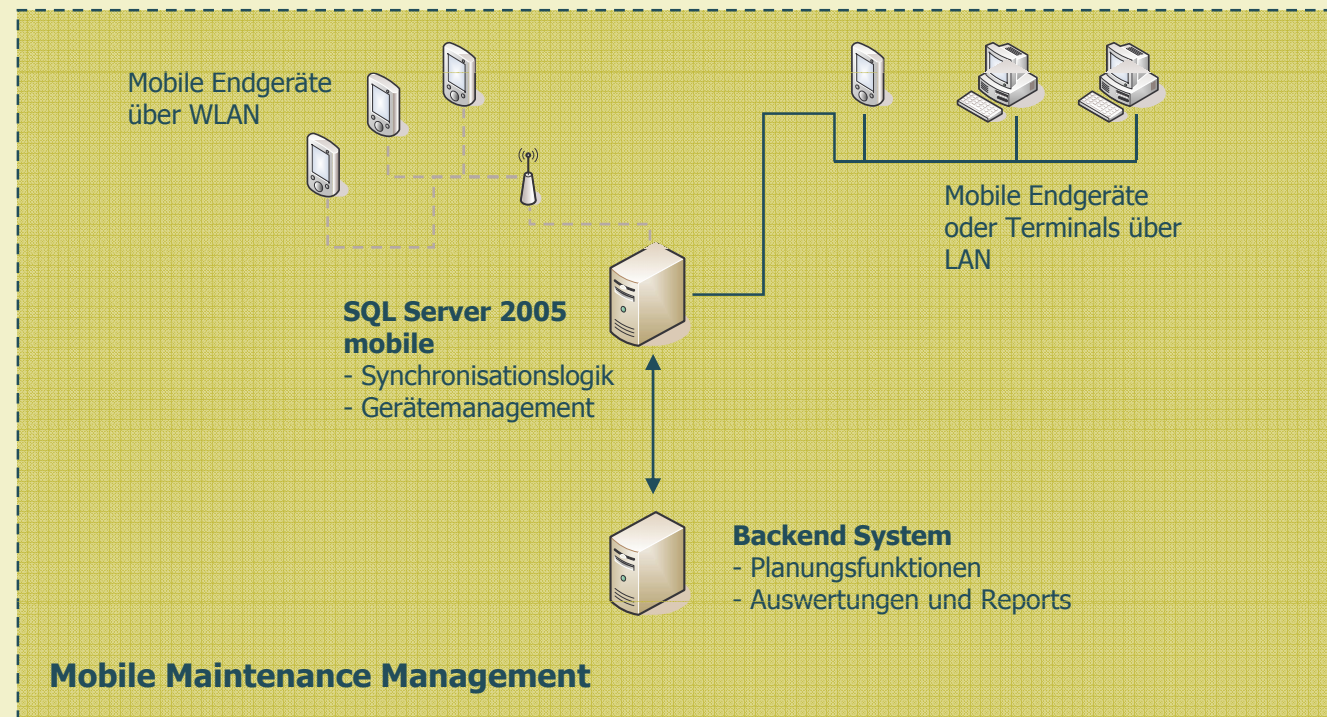


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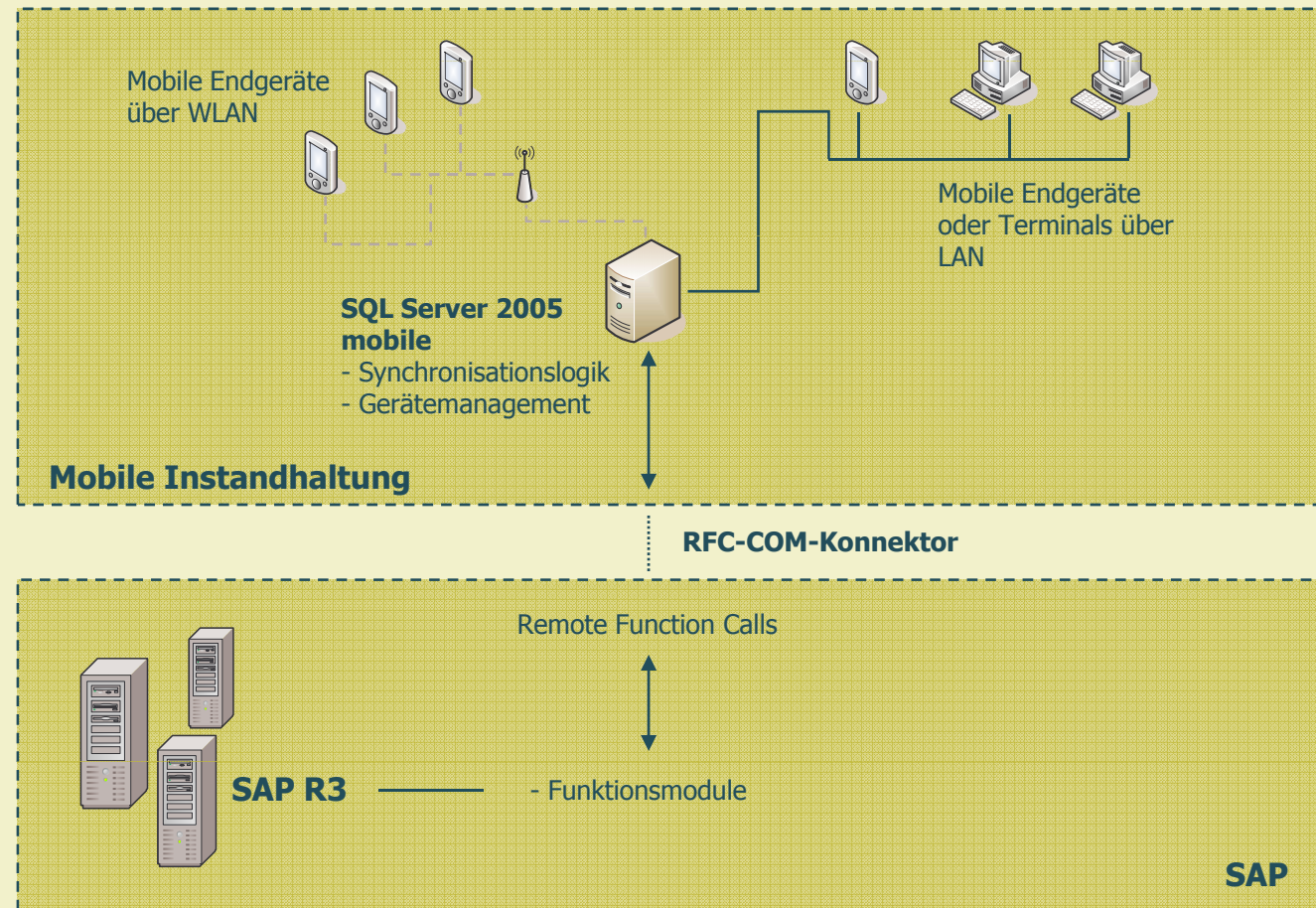
# Mobile Maintenance Management<sup>®</sup> – System layout

Utilization of SQL 2005 as middleware system ...



# Mobile Maintenance Management – System layout

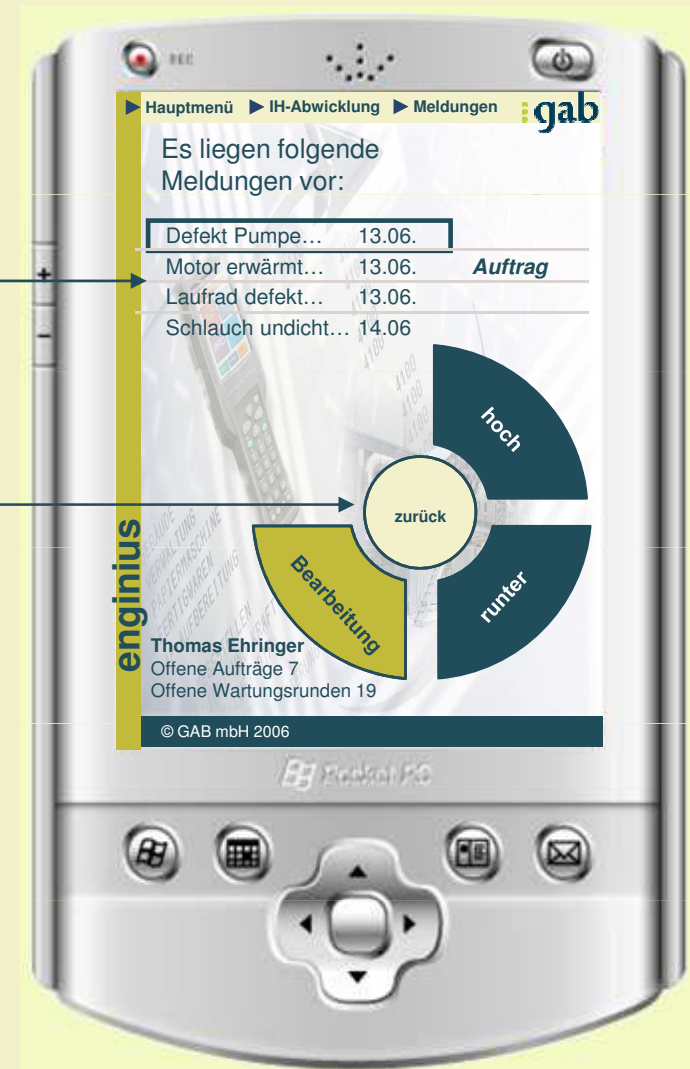
## Synchronization with SAP ...



## Integrated application with mobile devices (PDA)

Usability and simple, easy to understand processes are key success factors !

- Reduced and transparent information layout
- „One-Thumb“ concept



## Integrated application with mobile devices (PDA)

Integration of documents and multi-media content empowers the user on site !

- Integration of multiple file formats (JPG, PDF, WMV, MP4 etc.)
- Extensive amount of information through storage on SD memory cards





# Mobile Maintenance Management (MMM) Example process

## Mobile Maintenance Management – mobile notifications ...



1. Recognition of Failure or damage

### 2. Identification of the technical object



### 2a. Auto-Identification with RFID or Barcode



### 3. Automatic creation of notifications with failure classification

IH-Meldung anlegen: Störmeldung

Meldung	X06000000001 M2	Störmeldung an Getriebemotor
Status	MOFN	
Auftrag		

Meldung Zusatzdaten 1 Störung, Ausfall Standortdaten Positionen Ma

Bezugsobjekt	
Techn. Platz	41-001-001-005
Equipment	Getriebemotor
Baugruppe	

Sachverhalt

Codierung	QM	1	Problemmeldung
Beschreibung	Geräuschenwicklung		
Sachverhalt-Längstext	Ungewöhnliche Geräuschenwicklung		

4. Synchronized Creation of notifications in SAP



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## ⋮ The economic challenge

### The necessity of a “return on invest” calculation

- Increasing the information quality within a management system is a very intangible goal in terms of hard financial scrutinizing ...
- Moreover, the application of this technology is very resource intensive (~ 15 EUR costs in personnel per applied RFID-tag) ...
- The integration into existing complex IT and business landscapes is also very cost intensive and interdependencies must be considered in crucial application areas like maintenance management ...
- So there is a need for more improvement - and the need to be able to measure it ...



## ⋮ Mobile Maintenance Management – Potential for optimization within the value chain

In order to calculate and analyse the potential return on invest of such a technological solution it is necessary to focus on process costs and process optimization.

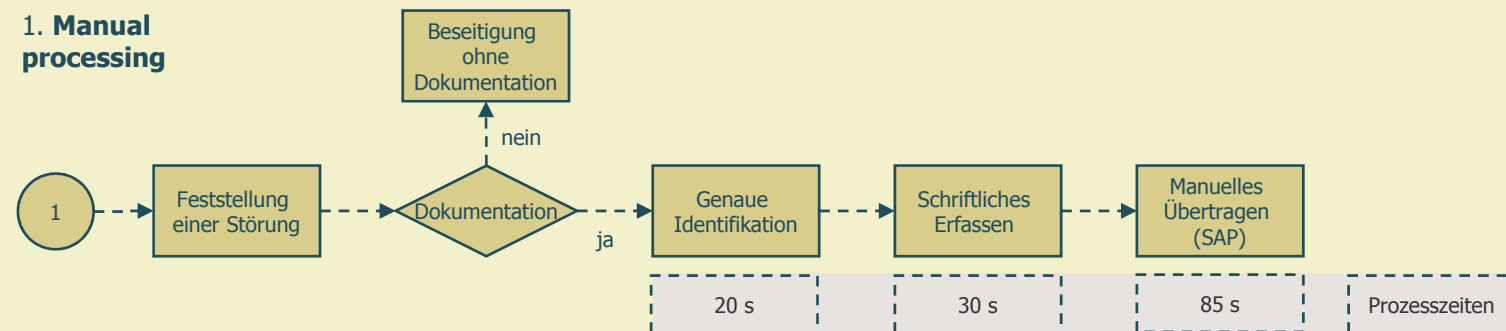
The calculation of opportunity costs leads to an ROI which is related to and depends on the depth of the changes applied to existing and projected business processes.

The projection of processes is necessary in order to be able to make assumptions about the costs of realizing a defined information and process quality with and without the mobile application as well as optimized processes.

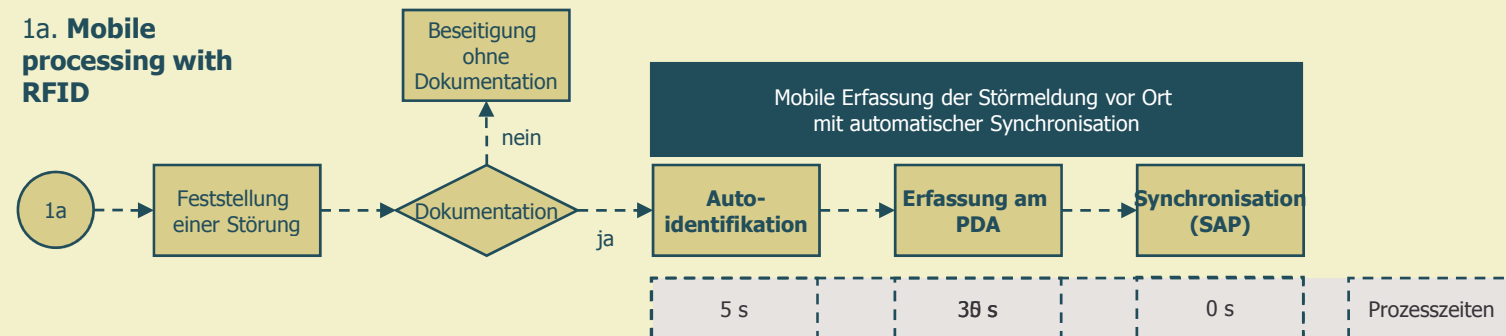
# Example for potential optimizations within the value chain

Reducing maintenance management „overhead“ times within the process of creating technical notifications:

## 1. Manual processing



## 1a. Mobile processing with RFID



# ⋮ Reducing opportunity costs

## Reduction of process costs ...

### Gathering information

1. Identifikation der Wartungsposition vor Ort und Zuweisung der Inspektions- und Wartungstätigkeiten
2. Datenrückmeldung und Erfassung des Rückmeldeergebnisses sowie Datenkontrolle
3. Protokollierung von Störmeldungen (Technisches Objekt und Schadensbild)
4. Anlegen von Störmeldungen im System und Datenkontrolle
5. Erfassung von Arbeitszeiten und Datenkontrolle



**Costs for mobile system based information gathering**

**Costs for manual information gathering**

**Opportunity costs savings per year**




## Example calculation for an instance of mobile maintenance management

### Key performance indicators

(figures per year):

- Total notifications: 120.000
- Total orders: 43.000
- Total confirmations: 810.900
- Total maintenance activities (single actions): 960.300
- Maintenance personnel: 750
- Amount of technical objects: 80.000



## Example calculation for an instance of mobile maintenance management

The calculation leads to the following figures:

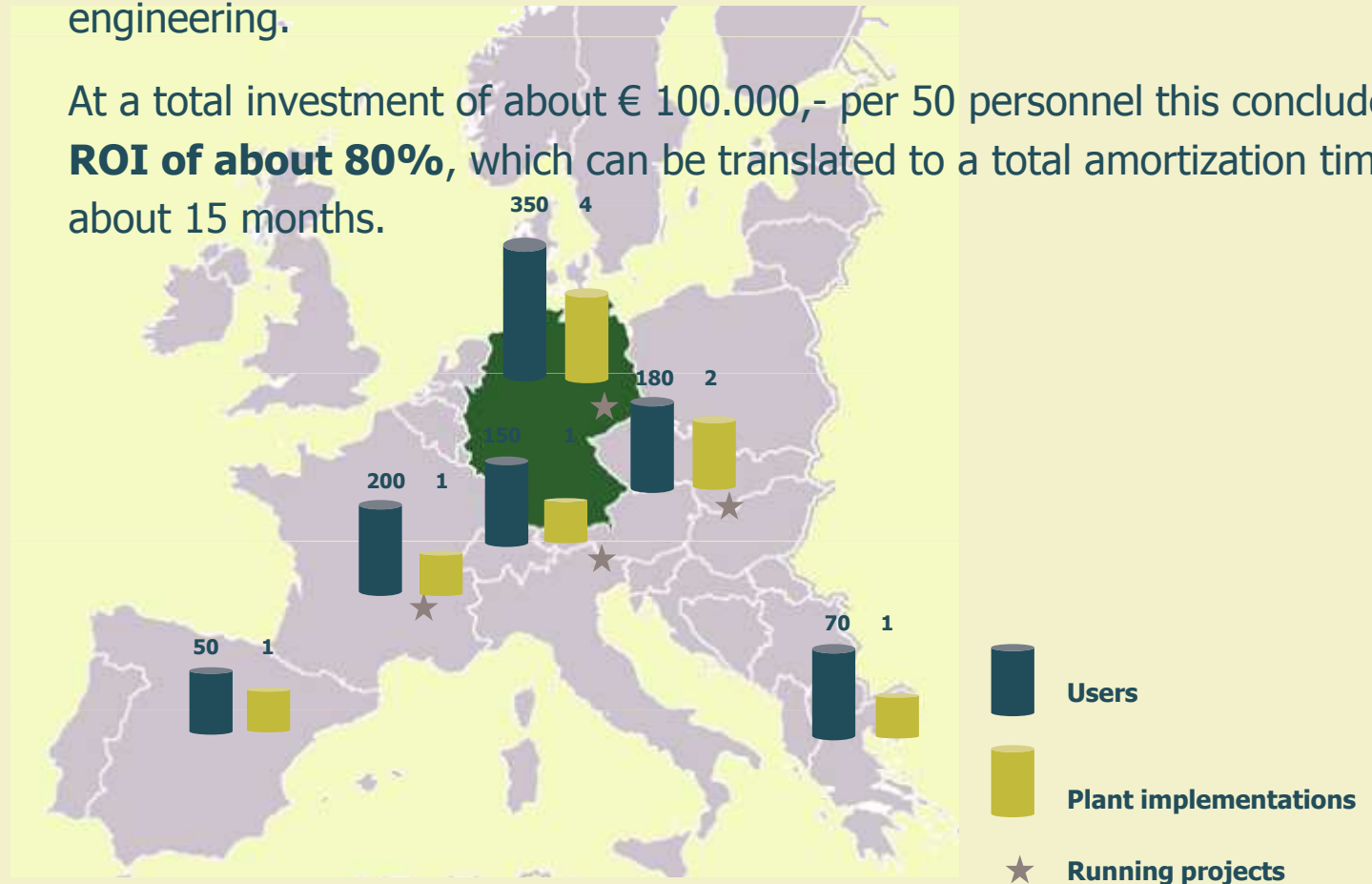
$\Delta 1$ Activities in maintenance	• 960.300	= 19.750 h
$\Delta 2$ Notification protocols	• 120.000	= 160 h
$\Delta 3$ Creation of notifications	• 12.000	= 830 h
$\Delta 4$ Creation of confirmations	• 81.900	= 12.160 h
<b>Additional time / „overhead“</b>		<b>= 32.900 h</b>




## Conclusion – Economical considerations concerning the implementation of the technical solution

Following these results the economic value of this solution is considered to be about € 80.000,- per 50 personnel in production and maintenance / engineering.

At a total investment of about € 100.000,- per 50 personnel this concludes a **ROI of about 80%**, which can be translated to a total amortization time of about 15 months.





☺ Thank you for your attention

... more important than the idea and its implementation  
is the human being.

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